

M/S LS INDUSTRIES PRIVATE LIMITED

ADDRESS: SITUATED AT 23-KM LAHORE SHEIKHPURA ROAD DISTRICT SHEIKHPURA

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

PREPARED BY



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LIST OF ABBREVIATION

EIA	Environmental Impact Assessment.
EIA	Enivornmental Impact Assessment
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
EPD	Environment Protection Department
PEQS	Pakistan Environmental Quality Standards
NOC	No Objection Certificate
PEPA	Pakistan Environmental Protection Act (1997)
PTCL	Pakistan Telecommunication Company Limited
SNGPL	Sui Northern Gas Pipelines Limited
STP	Sewage Treatment Plant
TMA	Tehsil Municipal Administration
WAPDA	Water and Power Development Authority
IMC	Islamabad Metropolitan Corporation

Saqib

EXECUTIVE SUMMARY

Title and Location of the Proposed Project

This Environmental Impact Assessment (EIA) Report is for the proposed construction project titled "Preform of Polyurethane, Plastic Compounding and Allied Products Manufacturing by LS Industries (PRIVATE) LIMITED" The project is located at 23- KM Lahore-Sheikhupura- Road, Lahore.

Name of the Proponent

The proponent of the proposed project is Mr. Muhammad Shahzad who is Director of the proposed unit.

Name of the Consultants

In alignment with the provisions of the Punjab Environmental Protection Act (PEPA), 1997 (amended in 2017), and the EIA / EIA Regulations, 2022, the proponent of the project, LS Industries (PRIVATE) LIMITED, has formally engaged the services of OWS Consultants and Trainers (SMC-Pvt.) Ltd. to undertake the Environmental Impact Assessment (EIA) for the proposed project.

This assessment is being conducted to meet the mandatory legal and regulatory requirements set forth under the aforementioned environmental legislation and to ensure that the environmental impacts associated with the proposed construction activities are adequately identified, assessed, and managed.

A Brief Outline of the Proposal (Type, Process, Technology, and Land Requirement)

LS Industries (Pvt) Ltd. proposes the construction of a Preform of Polyurethane, Plastic Compounding and Allied Products Manufacturing at 23-KM Lahore–Sheikhupura Road, Lahore. The facility will produce preform of polyurethane which is after further process is used in insulation, construction materials, adhesives, and automotive components.



The manufacturing process involves a controlled reaction for manufacturing of Preform of Polyurethane & Plastic Footwear .

For manufacturing of Preform of Polyurethane, reaction is very simple which takes place in closed vessels under regulated temperature and pressure conditions to ensure consistent product quality and zero emissions and there is no waste generated due to the process natures and type of vessel shape, also for the shoes Injection Moulding machine is used and Waste which is generated is recycled and used to make recycle shoes as well.

Key operational stages include raw material storage and handling, metering and mixing, polymerization, curing, finishing, and packaging in sold drums which are re-use-able.

The facility will incorporate modern, semi-automated systems with built-in safety and emission control features with zero waste. Closed-loop processes, high-efficiency scrubbers, advanced ventilation, and spill containment measures will be employed to reduce exposure risks and comply with national environmental standards.

Proposed Project Description

Raw Material Handling & Storage

The proposed project will use Polyols, Isocyanates (MDI/TDI) as the primary raw materials. All raw materials will be received in sealed containers/drums to prevent leakage, spillage, or contamination. Raw materials will be transferred through closed pumping/transfer lines to the production vessels, ensuring no open handling and eliminating fugitive emissions.

Manufacturing of Polyurethane Preform

The reaction of Polyol and Isocyanate takes place in closed reaction vessels under controlled temperature and pressure conditions. The process is highly efficient with no by-products and no process waste generation. The closed design ensures zero emissions to the environment and consistent product quality. The process automation minimizes manual intervention, thereby



reducing occupational health and safety risks. Negligible emissions, as vessels are sealed. No process wastewater generated. Solid Waste is none from the reaction stage.

Footwear Manufacturing (Injection Moulding Process)

The polyurethane preforms are processed in Injection Moulding Machines to manufacture footwear products. The process involves controlled heating and injection of the material into moulds to achieve the desired shoe design. Any scrap, off-cuts, or rejected pieces generated during moulding are collected and reprocessed into the system. This ensures zero raw material wastage and promotes circular use of materials. No harmful emissions from the moulding process. 100% of production scrap is recycled into new products. Limited to operation of injection moulding machines, mitigated by enclosures and PPE.

Utilities & Machinery

Closed Vessel Reactors with automated temperature/pressure control.

Injection Moulding Machines for footwear production.

Material Handling Systems (mixers , Pumps).

Electric Power Supply from grid and Solar

The proposed project is environmentally sustainable because:

Closed vessel operation ensures zero process emissions and no liquid waste

Injection moulding process incorporates recycling of all production scrap, achieving a zero-waste process. Only domestic wastewater is generated, which is manageable through simple on-site treatment. Environmental impacts are minimal, limited to energy use and minor noise, both of which are controllable with standard measures.

The proposed plant will be developed on an industrial plot spanning approximately 48 kanals which is approved by local Govt TMA. The location offers strategic advantages due to its industrial



zoning, existing infrastructure, and land-use compatibility. The site layout includes designated areas for production, storage, administration, utilities, internal roads, and greenbelt development.

i. The Major Impacts

The proposed project is expected to generate both beneficial and adverse environmental and social impacts during its pre-construction , construction phase. To minimize these negative effects, a comprehensive set of mitigation measures has been developed. The key concerns and anticipated impacts include:

- During the pre-construction and construction phases, ambient air quality may be negatively affected due to the generation of dust and particulate matter from activities such as land clearing, excavation, movement and handling of construction materials, and transportation. Additionally, gaseous emissions from construction machinery and vehicles can contribute to air pollution. To address and mitigate these environmental concerns and to ensure compliance with the conditions set forth in the EIA, several control measures will be implemented at the site. Regular water sprinkling is planned to be carried out on exposed soil surfaces, unpaved haul roads, and material stockpiles to suppress dust emissions. All vehicles transporting loose construction materials like sand, soil, and aggregates are covered properly to prevent material spillage and reduce dust generation during transit. Fine construction materials are stored in enclosed or covered areas to minimize exposure to wind, and care is taken to minimize the drop height of materials during unloading to reduce dust clouds. Construction activities are strategically scheduled to avoid execution during high-wind conditions, thereby reducing the chances of dust dispersion in surrounding areas.
- Emissions from construction equipment and vehicles are being controlled through the use of well-maintained machinery that meets national emission standards. Unnecessary engine idling is strictly prohibited to reduce fuel consumption and air pollution. Site roads are regularly maintained and stabilized with gravel or compacted material to minimize dust from vehicle movement. To reduce wind-blown dust, temporary fencing and vegetative barriers have been installed around the site. Real-time air quality monitoring is conducted at key locations to track levels of PM10, PM2.5, NO_x, and SO_x. An on-site Environmental Officer ensures effective implementation of all mitigation measures and overall compliance with



environmental requirements. Additionally, a stakeholder communication system, including grievance redressal, has been established to address concerns from the local community. These actions are in accordance with the approved Environmental Management Plan (EMP) and are being strictly enforced to keep construction activities within regulatory environmental limits.

- Elevated noise levels during the pre-construction and construction phases are anticipated due to heavy machinery operation and material transport, potentially affecting nearby residential and sensitive areas. To mitigate these impacts, construction activities are limited to daytime hours (9:00 AM to 6:00 PM). High-noise equipment is equipped with silencers or acoustic enclosures, and regular maintenance ensures quieter operation. Stationary equipment is positioned away from sensitive receptors, and temporary noise barriers have been installed along site boundaries. Transport routes are selected to avoid populated areas, and speed limits are enforced to reduce traffic-related noise. Construction personnel are trained on noise control protocols, and periodic noise monitoring is conducted to ensure compliance with National Environmental Quality Standards (NEQS). An Environmental Officer oversees implementation and addresses community concerns through a formal grievance redress mechanism. These measures ensure effective noise management in line with the approved Environmental Management Plan (EMP).
- Improper disposal of construction waste can lead to environmental contamination, visual pollution, and ecosystem disruption. To address these risks, a structured waste management plan has been implemented. Waste is segregated at the source into recyclable, reusable, hazardous, and general categories. Recyclable materials (e.g., metal, wood, plastics) are sent to certified recycling facilities, while non-recyclables are disposed of at authorized municipal landfill sites in compliance with local regulations. Designated waste storage areas with clearly marked, covered bins have been established to prevent wind dispersal and runoff. Regular site cleaning is conducted, and personnel are trained in proper waste handling procedures. Routine inspections by the Environmental Supervisor ensure compliance with the Environmental Management Plan (EMP) and applicable environmental standards.
- Poorly maintained construction equipment can contribute to elevated noise levels and air pollution. To mitigate these impacts, a preventive maintenance program is in place, ensuring only well-maintained, emission-compliant machinery operates on-site. Exhaust systems are



regularly inspected and fitted with silencers or mufflers, and equipment producing excessive noise or emissions is immediately removed from use until repaired. Engine idling is minimized to reduce fuel consumption and air pollutants. Maintenance activities are confined to designated areas equipped with spill containment systems. Additionally, all drivers and operators are trained in environmentally responsible practices. These measures align with the EMP and ensure compliance with environmental quality standards.

- The proposed project site is located within a designated industrial zone and approved and declared by TMA, which is already developed and lacks natural vegetation, including trees, shrubs, or other significant flora. Due to the absence of existing plant life and natural habitats, the area does not support any notable terrestrial or aquatic ecosystems. As a result, no significant impact on the local ecological environment is anticipated during the construction or operational phases of the project. Nevertheless, good environmental practices are being maintained throughout project activities to prevent any unintentional ecological disturbances, such as soil erosion or runoff into nearby areas. Additionally, the project remains committed to exploring opportunities for future landscaping and greenbelt development within or around the site to enhance local environmental quality in line with sustainable development principles and EIA commitments.
- Untreated wastewater from construction activities, such as equipment washing, concrete batching, and site cleaning poses a risk to surface and groundwater quality. To address this, a wastewater management plan has been implemented. Wastewater is routed to temporary sedimentation tanks to allow solids to settle before controlled discharge. No untreated effluent is released into natural water bodies, drains, or land. Vehicle and equipment washing is restricted to designated areas with proper containment and drainage systems. Portable sanitation units are provided for workers, and their wastewater is collected and disposed of through licensed contractors in accordance with regulatory requirements. Regular inspections are conducted to prevent leaks, overflows, or unauthorized discharges. These measures ensure protection of water resources and compliance with the Environmental Management Plan (EMP) and EIA commitments.
- Oil leaks and spills from construction machinery can contaminate soil and water if not properly managed. To mitigate this, all equipment is regularly inspected and maintained to



detect and repair leaks promptly. Refueling and maintenance activities are conducted in designated zones equipped with impermeable surfaces, drip trays, and containment systems. Spill response kits are available on-site, and staff are trained in immediate containment and cleanup procedures. Contaminated soil from accidental spills is removed and disposed of by authorized waste handlers. Oil and lubricants are stored in bunded, secure areas away from water sources. An Environmental Supervisor monitors compliance with the EMP to ensure ongoing protection of soil and water quality.

- Construction activities pose health and safety risks due to the use of heavy machinery, manual labor, dust, noise, and hazardous substances. To mitigate these risks, a comprehensive Health, Safety, and Environment (HSE) system has been established, aligned with national regulations and best practices. Workers are equipped with appropriate PPE and undergo mandatory safety inductions and periodic training. Safe work procedures, emergency response plans, and incident reporting protocols are strictly enforced. First aid facilities and trained medical staff are available on-site, and routine safety audits and risk assessments are carried out to identify and address potential hazards. Signage and barriers restrict access to hazardous zones. These measures help ensure a safe working environment and compliance with the EMP and occupational safety requirements.
- The project is expected to create job opportunities for local residents, contributing positively to the local economy and helping to reduce regional unemployment.

Recommendations for Mitigation Measures

To mitigate the potential environmental impacts associated with the proposed Preform of Polyurethane, Plastic Compounding and Allied Products Manufacturing by LS Industries (PRIVATE) LIMITED, located at 23-KM Lahore–Sheikhupura Road, Lahore, the implementation of well-defined mitigation strategies is essential. This Environmental Impact Assessment (EIA) has outlined a comprehensive Environmental Management Plan (EMP) to address potential risks and ensure alignment with applicable environmental regulations. The EMP includes practical measures such as dust control during construction, proper handling and disposal of solid and liquid waste, emission controls for machinery and vehicles, noise mitigation protocols, and occupational health and safety procedures. Effective and consistent implementation of these measures is critical



for minimizing environmental impacts across all phases of the project. **LS Industries (PRIVATE) LIMITED** is strongly advised to ensure full compliance with the EMP to maintain environmental integrity, protect public health, and demonstrate a commitment to sustainable and responsible industrial development.

Proposed Monitoring Plans:

To ensure compliance with the mitigation measures outlined in the Environmental Management Plan (EMP), **LS Industries (PRIVATE) LIMITED** will implement a basic environmental monitoring program during the construction and initial operation phases of the Preform of Polyurethane, Plastic Compounding and Allied Products Manufacturing . Ambient air quality (PM10, PM2.5, NO_x, SO₂) will be monitored periodically near the project boundary and sensitive areas. Noise levels will be measured at key locations to ensure they remain within NEQS limits. Wastewater from construction and sanitary sources will be tested before disposal to ensure compliance with regulatory standards. The site will be regularly inspected for proper waste handling, storage, and disposal. Routine checks will also be carried out to prevent fuel and oil leaks from machinery. Occupational health and safety practices, including PPE use and emergency preparedness, will be monitored under the supervision of the designated Environmental Officer, who will also maintain records and report compliance to relevant authorities.



Screening Determination:

As per the Pakistan Environmental Protection Agency's *Review of EIA and EIA Regulations, 2000*, the proposed project falls under Schedule II, Serial No. 2: "Chemical Complexes and Production Units", which includes the manufacture of industrial chemicals such as preform of polyurethane. Based on the scale, nature, and site-specific characteristics of the proposed facility, the anticipated environmental impacts are considered moderate and localized. Therefore, a full Environmental Impact Assessment (EIA) is not deemed necessary.

In accordance with the applicable regulatory framework, the project qualifies for an Environmental Impact Assessment (EIA). The EIA process entails the identification, prediction, and evaluation of potential environmental impacts, followed by the development of appropriate mitigation and management measures, which are documented in a comprehensive Environmental Management Plan (EMP).



CHAPTER 1

INTRODUCTION

Background

LS Industries (PRIVATE) LIMITED is a private limited company incorporated in Pakistan, engaged in the research, formulation, and manufacturing of industrial chemical products. The company will establish with the objective of supporting the national industrial base by offering high-quality, locally produced chemical solutions. LS Industries focuses on innovation, quality assurance, and environmental responsibility in all aspects of its all operations, activities and process.

With a vision to contribute to industrial self-sufficiency and reduce dependency on imported chemicals, the company is now embarking on the development of a **Preform of Polyurethane, Plastic Compounding and Allied Products Manufacturing** . The facility is designed to meet the growing domestic demand in sectors such as **construction, insulation, automotive, adhesives, and coatings**.

LS Industries adopts modern, energy-efficient technologies and aims to ensure workplace safety, resource optimization, and strict compliance with both **national environmental regulations** and **international industrial standards**. The company's operational philosophy is rooted in sustainable development, focusing on minimizing its environmental footprint while contributing to Pakistan's industrial growth. By integrating high-performance processes with responsible environmental practices, LS Industries positions itself as a reliable and forward-looking player in the chemical manufacturing sector.

1.1 Purpose of the Report

The primary purpose of this Environmental Impact Assessment (EIA) report is to assess the potential environmental impacts associated with the proposed construction of the **Preform of Polyurethane, Plastic Compounding and Allied Products Manufacturing** by **LS Industries (PRIVATE) LIMITED**, located at **23-KM Lahore–Sheikhupura Road, Lahore**. This report has been prepared in accordance with the requirements of the Pakistan Environmental Protection Act (PEPA), 1997 and the Pak-EPA Review of EIA and EIA Regulations, 2000.

"No proponent of a project shall commence construction or operation unless he has filed with the Provincial Agency an Environmental Impact Assessment or where the project is likely to cause an adverse environmental effect, an environmental impact assessment, and has obtained from the Provincial Agency approval in respect thereof."



The report aims to:

- Identify and evaluate the potential environmental impacts of the project during construction Phase
- Propose appropriate mitigation measures to minimize negative impacts
- Develop an Environmental Management Plan (EMP) for effective implementation and monitoring of these measures
- Ensure the project's compliance with relevant national environmental standards and regulations
- Facilitate the decision-making process of the regulatory authority regarding environmental approval of the project.

By fulfilling these objectives, the EIA ensures that environmental considerations are integrated into the planning and execution of the project in a responsible and sustainable manner.

1.2 Details of Proponent

The proposed project involves the development of the **Preform of Polyurethane, Plastic Compounding and Allied Products Manufacturing** by **LS Industries (PRIVATE) LIMITED**. The facility will be located at 23km Lahore-Sheikhupura- Road, LAHORE, Pakistan

The proponent of the proposed project is Mr. Muhammad Shahzad who is Director and Mrs. Sofia Shahzad, who is the Chief Executive Officer (CEO) of the proposed unit.

Contact Details

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1.3 Details of the Consultant

OWS Consultant and Trainers has conducted the Environmental Impact Assessment (EIA) study for the proposed project.

Details of the Consultant	
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Email:	saqib@owsconsultants.org
Website:	https://owsconsultants.org
Address:	1 st Floor, Building 15 CCA, DD Block, DHA Phase 4 Lahore.

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1.4 Brief Description of Nature, Size and Location of the Project:

The proposed project involves the establishment of a **Preform of Polyurethane, Plastic Compounding and Allied Products Manufacturing** by **LS Industries (PRIVATE) LIMITED**. The facility is intended to produce preform of polyurethane which will be used in insulation, adhesives, sealants, and industrial applications. The project falls under the category of chemical manufacturing and involves operations such as chemical storage, metering, mixing, polymerization, and curing.

The proposed plant will be constructed at **23-KM Lahore–Sheikhupura Road, Lahore, Punjab, Pakistan**, which is an industrial zone with existing infrastructure suitable for such activities. The site offers strategic access to transportation routes, raw material suppliers, and utility connections.

The facility will consist of:

- Closed vessel systems for controlled chemical synthesis
- Raw material storage tanks and chemical handling areas
- Warehousing for finished goods
- Utility areas including power generation and wastewater treatment units are not required as there is no waste is produced from production . Only Sanitarian Waste or machine maintenance waste is produced.
- Administrative and safety control offices

The total land area allocated for the facility is approximately **48 Kanals**, and the design capacity of the plant will allow for the production of **2000 Metric tons per year** of Preform of polyurethane. Construction activities are expected to span over **3 months**, followed by commissioning.

The project is expected to generate employment, support the industrial supply chain, and contribute to economic development, while adhering to environmental protection standards through the implementation of appropriate mitigation measures.

During the construction phase, the project is expected to generate temporary employment for 30-50 workers, transitioning to approximately 30 permanent positions once operational. To ensure uninterrupted power supply, a 20 KVA backup generator will be installed to meet the facility's energy requirements. To lower the emission the solar capacity of 1MW is installed.



The project by LS Industries (PRIVATE) LIMITED located at , 23km Lahore-Sheikhupura- Road, LAHORE, is located within an TMA-approved industrial entity, there are no historically significant landmarks such as monuments, forts, or sculptures in the vicinity.

1.5 Study Approach & Methodology

The study was carried out in line with the Environmental Protection Agency (EPA), Government of Pakistan (GOP) Guidelines, 2000, drawing upon both primary and secondary sources of data. Consultations took place with various stakeholders ranging from government officials and community representatives to local residents to gather insights into public perceptions of the project and its potential environmental implications.

The Environmental Impact Assessment (EIA) for the proposed of **Preform of Polyurethane, Plastic Compounding and Allied Products Manufacturing** by **LS Industries (PRIVATE) LIMITED** was undertaken using the following methodology:

- Initial meetings and discussions were held among the study team to establish a collective understanding of the project's key issues.
- A structured plan was created, outlining the specific data requirements, sources, timelines, and responsibilities.
- Both primary and secondary data were gathered through field observations, environmental engagement with relevant departments, and a review of published materials to develop a comprehensive baseline of physical, biological, and socio-economic conditions.
- The potential environmental impacts on physical, biological, and socio-economic aspects were assessed for the project's design, construction, and operational phases.
- Recommendations were made to the project proponent to ensure environmental considerations were integrated into the project's design phase.



1.6 Objective of the Report

"As responsible citizens of Pakistan and in compliance with EPA regulations and laws, we are preparing and submitting our report to the EPA for approval to obtain the NOC before construction activities. The objective of this Environmental Impact Assessment (EIA) Report is to identify, predict, evaluate, and mitigate the potential environmental impacts associated with the proposed project, in compliance with the Environmental Protection Act, rules, and regulations. The report aims to ensure sustainable development by integrating environmental considerations into the decision making process, thereby facilitating the granting of the No Objection Certificate (NOC) from the Environmental Protection Agency (EPA)."



CHAPTER 2

POLICY, LEGISLATION, LEGAL & ADMINISTRATIVE FRAMEWORK

2.1. General

This section deals with the current policy as well as legal and administrative framework related to carrying out impact assessment study of various projects. A number of laws exist in Pakistan, containing a number of clauses concerning protection of the environment. Like other Projects, this project is also required to go through an Environmental Assessment for getting a NOC under Section 12 of the Punjab Environmental Protection Act – 1997 (Amended 2012).

According to environmental laws of the country development projects have to undergo the process of Environmental Impact Assessment (EIA) in order to predict and mitigate the impacts of the development at an early stage. Based on nature, size, cost and associated impacts, the project under consideration has been categorized for EIA study according to the regulation 3 of Statutory Notification issued on June 13, 2000 (S.R.O.339 (1) /2001)

LS Industries (PRIVATE) LIMITED proposes to establish a Preform of Polyurethane, Plastic Compounding and Allied Products Manufacturing at 23-KM Lahore–Sheikhupura Road, Lahore, Punjab. In accordance with Section 12 of the Punjab Environmental Protection Act, 1997 (Amended 2012), and the EIA/EIA Regulations, 2022, the proposed project falls under Schedule II, Category B (Manufacturing and Processing), Subsector 2, which includes the manufacturing chemical products. As the project's total cost exceeds Rs. 500 million it requires the preparation and submission of an Environmental Impact Assessment (EIA) for obtaining environmental approval. The Director General, EPA Punjab, is the designated authority to review the EIA report and issue the Environmental Approval following a comprehensive evaluation of the project's potential environmental impacts.

2.2. National Policy Framework

The National Environmental Policy Framework under the Pakistan Environmental Protection Act (PEPA) 1997 provides the foundation for sustainable development in the country. It outlines guidelines for integrating environmental considerations into national planning, policy-making, and decision-making. The framework promotes conservation, pollution prevention, and responsible use of natural resources while supporting economic and social development.

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. Local Govt Administration Authorities, TMA & other govt institute

The proposed project site falls within the industrial zone as declared by the TMA, therefore, the provision of security, disposal of solid and liquid wastes, and connections for water supply shall be the responsibility of the TMA, Local Govt Administration Authorities, against the agreed charges.

2.2.3. Procedure for EIA Approval

This section describes the procedures required for obtaining NOCs for EIA from concerned authorities and for working in industrial estate / industrial zones and critical areas. The following general stages have to be followed in the application and approval process for obtaining an "Environmental Approval" for the LS Industries (PRIVATE) LIMITED

- Classification of the Project;
- Submission of EIA; and
- Issuance of NOC

The proposed project requires an EIA in accordance with Schedule-II of PEPA-1997. According to the TOR/ Scope of Work of the LS Industries (PRIVATE) LIMITED Consultants are required to prepare the EIA and assist Proponent in obtaining NOC from Punjab EPA.

2.3. Relevant Legal / Institutional Framework

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

2.3.1. PEPO, 1983 and PEPA, 1997 (Amended 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 (Amended 2012) on 18th April 2012. Under Sec. 8 of Environment Protection Ordinance (EPO) 1983, it was necessary to carry out EIA/EIA for all development projects, but there were no EIA regulations under that ordinance.



Under section 12 of the Punjab Environmental Protection Act, 1997 (Amended 2012) it is mandatory to take an Environmental Approval Environmental Protection Agency for commencement of any construction of project.

2.3.2 National Environmental Policy 2005

Government of Pakistan (GOP) has notified National Environmental Policy 2005, for different projects/aspects in which guidelines/priorities have been given to undertake/commerce the projects having significant environmental impacts.

2.3.3. Review of EIA and EIA Regulations, 2022

The GOP has issued Review of Environmental Impact Assessment and Environmental Impact Assessment Regulations 2022, to review the Environmental Impact Assessment (EIA).

2.3.4. Guidelines for the Preparation and Review of Environmental Reports, 1997

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

2.3.5. National Environmental Quality Standards (NEQS)

According to Punjab Environmental Protection Act, 1997 (Amended 2012), National Environmental Quality Standards (NEQS) were established for municipal and industrial effluents and air emissions.

2.3.6. 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 projects are planned and sited in way that protects the values of sensitive and critical areas.

2.3.7. Policy and procedures for the Filing, Review and Approval of Environmental Assessments, November-1997

Environmental Assessment is the Primary means of managing the approval of new development proposals in Pakistan. 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.

2.3.8. 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 (Amended 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
- National Environmental Quality Standards (NEQS)
- Detailed sectorial guidelines

2.3.9. Punjab Wildlife Protection Act, 1974

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

2.3.10. 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.

2.3.11. Explosive Act, 1884

This act deals with explosives in prohibiting either absolutely or subject to conditions, the manufacture, possession or importation of any explosive which is so dangerous in character that, in the opinion of the appropriate Government, it is expedient for public safety to issue the notification.

2.3.12. 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.

2.3.13. Pakistan Penal Code, 1860

This defines the penalties for violations concerning pollution of air, water bodies and land Sections 268 to 291 are about offences affecting public health. The offences relating to public health safety and environment are as under;

Sec 268: Public Nuisance

Sec 269: Negligent act likely to spread infection of disease dangerous to life:

Sec 270: Malignant act likely to spread infection of disease dangerous to life

Sec 278: Making atmosphere noxious to health

Sec 284: Negligent conduct with respect to poisonous substance



Sec.290: Punishment for public nuisance in cases not otherwise provided for

Sec.291: Continuance of nuisance after injunction to discontinue

2.3.14. Punjab Land Use Rules 2009

In January 2009 the Punjab Government notified "Punjab Land Use Rules 2009" for the clarification of Lahore Master Plan. In these rules permissible land use according to area type as defined.

2.3.15. Antiquities Act 1975

The law relates to protection of Antiquities, monuments, National & International heritage. The compliance of this Act is mandatory for the Installation of Generators. Under section 22 of the Act no development plan or scheme or new construction can be done within distance of 200ft from the boundary of the monuments/ National Heritage. There is no historical Site or monuments in the proximity of the project.

2.3.16. Solid Waste Management Rules 2005

The Solid Waste Management Department, CDGF has notified these rules for proper waste management.

2.3.17. Labor Laws

The labor laws apply on child labor and measuring instruments.

2.3.18. Safety & Civil Defense Laws

The civil defense laws provide details about safety, fire protection and civil defense.

2.3.19. Guidelines for Critical and Sensitive Area

These guidelines have been prepared under section 12 of Punjab Environmental Protection Act 1997 (Amended 2012) for protection and safety of critical and sensitive localities.

2.3.20. Cutting of Trees (Prohibition) Act, 1975

This act forbids cutting of trees without acquiescence of the Forest Department.

2.4. Environmental Protection Department (EPD), Punjab

The Government of Punjab promulgated “Punjab Environmental Protection (Amendment) Act 2012. Two organizations, the Punjab Environmental Protection Council (PEPC) and the Environment (EM) Committee”, are:

Environmental Protection Agency (EPA), Punjab are primarily responsible for administering the provisions of the Act. The council oversees the functioning of the EPA. Its members include representatives of the government, industry, non-governmental organizations and the private sector. The Punjab EPA is required to ensure compliance with the Punjab Environmental Quality Standards (PEQS) and establish and evaluation systems. As the primary implementing agency in the hierarchy, it is responsible for identifying the need for, as well as initiating legislation whenever necessary. One of the functions of the EPA/EPD is the review and approval of environmental assessment reports of projects undertaken in its jurisdiction.

LS Industries (Pvt) Ltd. shall be responsible for providing the complete environmental documentation required by EPA, Punjab and remain committed to the approved project design. No deviation is permitted during the project implementation without the prior and explicit permission of the EPA, Punjab.



CHAPTER 3

SCREENING & SCOPING

3.1 The Need of EIA Study

According to the Punjab Environmental Protection Act, 1997 (Amended 2012) and the EIA Regulations, 2022, any development project that could have potential environmental impacts during its implementation must undergo environmental screening. Based on the nature of the construction activities for the LS Industries' facility, the project qualifies for an EIA study during the construction stage because it falls under Schedule II of the Regulations, which includes projects with moderate environmental impact.

As the initial step of the Environmental Impact Assessment (EIA), a screening exercise was conducted to determine the project's potential for significant environmental or social impacts. This process confirmed the necessity of proceeding with a full EIA due to the project's scale, industrial nature, and proximity to environmental receptors. Key considerations included energy consumption, waste generation, emissions, and potential impacts on local communities and ecosystems. The screening also ensured early awareness among stakeholders, including regulatory bodies and the project proponent, of compliance obligations under the Punjab Environmental Protection Act (PEPA), 1997 (Amended 2012).

As a result, conducting an Environmental Impact Assessment is mandatory for obtaining Environmental Approval, with the Director General of EPA Punjab serving as the designated authority responsible for approval following a thorough review.

Additionally, the following factors were evaluated at the early stage:

- Magnitude of changes in environmental conditions
- Diversity of new features introduced into the existing environment
- Potential for transboundary or large-area environmental impact
- Number of people affected
- Likelihood of impacting different receptors (fauna, flora, businesses, facilities, etc.)



- Probability of affecting valuable or scarce resources
- Risk of breaching environmental standards
- Potential impacts on protected sites, areas, or features
- High/low probability of the effect occurring
- Short-term or long-term duration of effects
- Whether the impact is permanent or temporary
- Continuous vs. intermittent nature of the impact
- If intermittent, whether it is frequent or rare
- Reversibility of impacts
- Likelihood of mitigating, repairing, or compensating for the effects

Upon thorough evaluation, it was concluded that the project requires a full Environmental Impact Assessment (EIA) Study.

Conducting an EIA at this stage helps ensure that environmental concerns are addressed early in the project lifecycle. It allows the proponent to adopt mitigation and monitoring measures that prevent pollution, protect natural resources, and ensure health and safety for workers and the surrounding community. The EIA also assists the Punjab Environmental Protection Agency (EPA Punjab) in granting timely Environmental Approval with appropriate environmental safeguards in place.

Scope of the Study (Construction Phase Only):

This Environmental Impact Assessment (EIA) has been conducted exclusively for the proposed project for construction phase of the proposed Preform of Polyurethane, Plastic Compounding and Allied Products Manufacturing by LS Industries (PRIVATE) LIMITED, located at 23-KM Lahore–Sheikhupura Road, Lahore. The scope includes the environmental assessment of all construction-related activities such as site clearance, excavation, earthworks, installation of utilities, building of production structures, internal roads, and other infrastructure.

Construction work often involves the use of heavy machinery, movement of vehicles, consumption of raw construction materials (e.g., sand, cement, bricks), generation of waste, noise, dust, and temporary disruption to the local environment. Therefore, this EIA focuses on identifying all



potential environmental impacts arising during this phase and outlines mitigation strategies to minimize or eliminate those impacts.

3.3 Justification for the Project:

The establishment of a Preform of Polyurethane, Plastic Compounding and Allied Products Manufacturing by LS Industries (PRIVATE) LIMITED is a strategic industrial initiative aligned with the increasing demand for polyurethane-based materials in Pakistan. Polyurethane chemicals are critical components in manufacturing insulation panels, foams, adhesives, coatings, and other industrial applications that support the construction, automotive, packaging, and consumer goods sectors.

Currently, Pakistan relies heavily on imported polyurethane chemicals, resulting in high costs and supply uncertainties. By setting up a local production facility, LS Industries aims to reduce this dependency, promote import substitution, and support the local manufacturing ecosystem. The project is expected to create employment opportunities, stimulate regional economic activity, and contribute to the country's industrial growth goals.

Moreover, the selected location near Lahore–Sheikhupura Road provides strategic access to raw materials, labor, and transportation infrastructure, making it suitable for industrial development with manageable environmental concerns during the construction phase. Therefore, the EIA is essential to ensure this justified and necessary development proceeds in an environmentally sustainable and legally compliant manner.

3.4 Spatial and Temporal Boundaries of adopted for the various aspects of the study

The Environmental Impact Assessment (EIA) has been carried out with clearly defined spatial and temporal boundaries to ensure that all relevant environmental and social aspects of the proposed construction activities are adequately assessed.



✓ **Spatial Boundaries**

The spatial boundary of this study encompasses the project site and its immediate surroundings that may be directly or indirectly affected during the construction phase. Specifically, the spatial boundaries include:

Core Project Area:

The land designated for the construction of the Preform of Polyurethane, Plastic Compounding and Allied Products Manufacturing located at 23-KM Lahore–Sheikhupura Road, Lahore. This includes all zones within the premises designated for buildings, roads, storage yards, and utility installations.

Immediate Impact Zone (within 500 meters):

This buffer zone covers the area surrounding the project boundary that may be impacted by dust, noise, traffic, vibrations, and other construction-related disturbances.

Wider Influence Zone (up to 1–2 kilometers):

This zone includes nearby settlements, surface water bodies, roads, and sensitive receptors such as schools, healthcare facilities, and agricultural lands, if any. Although the direct impact is limited, it is considered to assess the potential for cumulative and indirect impacts (e.g., traffic, water demand).

✓ **Temporal Boundaries**

The temporal scope of the EIA focuses solely on the **construction phase** of the project. The estimated duration for construction is **12 to 18 months**, during which various site development activities will be carried out. Accordingly, the study assesses:

Short-term Impacts:

These include temporary impacts such as noise, dust, waste generation, and movement of machinery that occur during specific construction activities like excavation, foundation laying, and building erection.



Phase-specific Analysis:

Different phases of construction (site clearance, civil works, infrastructure development) are analyzed separately for their potential environmental impacts and mitigation needs.

Cumulative Assessment:

While the EIA does not include operational impacts, the potential cumulative environmental burden of ongoing and planned construction activities within the region is briefly considered to ensure that the proposed development does not result in localized degradation.

Table 3-1: Table of potential impacts and spatial boundaries.

Sr. No.	Potential Impacts	Spatial Boundaries	
		LSA	RSA
1	Air Quality	✓	✓
2	Increased noise level	✓	
3	Groundwater Degradation	✓	
4	Surface water Deterioation	✓	
5	Soil Quality	✓	
6	Work personnal's Health and Safety	✓	
7	Lowering of groundwater table		✓
8	Flora and Fauna	✓	✓

- **Baseline Phase:** Prior to construction, comprehensive studies are conducted to assess the ecological, physical, and socio-economic characteristics of the proposed site.
- **Construction Phase:** This stage involves developing infrastructure, mobilizing equipment and supplies, and establishing essential site facilities, including production areas, storage zones, and waste management systems.
- **Operations Phase:** During this phase, the manufacturing processes are active, leading to the production of packaging materials. Key environmental considerations include air emissions

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from production activities, noise pollution from machinery, wastewater discharge from cleaning and coating processes, and solid waste generation from material cutting and processing.

- **Decommissioning Phase:** When operations cease, activities focus on dismantling equipment, removing materials, and restoring the site to a stable condition. Efforts are made to implement reclamation procedures to prevent erosion and promote revegetation where feasible.
- **Closure Phase:** This final stage addresses long-term site conditions post-abandonment, ensuring that the area remains environmentally stable and any residual impacts are managed appropriately.

3.5. Issues Discussed During Consultation

During the scoping session, representatives from TMA, EPA, surrounding industries, and the local community will be invited to discuss the project's objectives, potential impacts, and possible environmental concerns. Key concerns raised included:

- Soil quality
- Worker health and safety
- Groundwater table reduction
- Flora and fauna impacts

Stakeholders' feedback will be actively considered to address these concerns and develop effective mitigation strategies.

Checks and Balances for Mitigation Implementation and Follow-Up:

- Will local residents be prioritized for all employment opportunities, including skilled and unskilled roles?
- How will health and safety protocols be enforced during construction and operational phases?
- What measures will be implemented to ensure fire safety and emergency response?
- What strategies will be adopted to sustainably manage and conserve water resources?
- How will solid waste and wastewater be disposed of to prevent environmental harm?
- How will noise pollution be monitored and mitigated to avoid adverse impacts?



These concerns will comprehensively addressed during stakeholder consultations, and corresponding mitigation measures have been integrated into the EIA study. The project is viewed favorably, as LS Industries (PRIVATE) LIMITED is expected to generate substantial local employment, bolster national GDP, and drive industrial growth particularly vital amid current economic challenges.

3.6 Significant Impacts and Factors

Key environmental and social impacts of the proposed unit will be identified and deliberated with stakeholders. Mitigation strategies will be jointly developed and incorporated into the EIA. Below is a summary of critical impacts and their recommended mitigation:

Table 3-2: Table of impacts and mitigation measures.

Impacts	Proposed Mitigation Measures
Dust and Emissions (construction activities: particulate matter, SO ₂ , NO _x CO generation)	Regular water spraying via trucks to suppress dust. Cover trucks transporting earth, sand, or aggregates with impermeable sheets. Ensure proper engine maintenance for vehicles on-site.
Noise Pollution (construction machinery, speech/hearing interference, sleep disturbance)	Install temporary noise barriers. Use green zones with plants to absorb sound. Restrict high-noise activities to day time hours.
Health risks for workers during construction.	Ensuring the availability of proper equipment to handle emergency situations. Safety gear such as helmets, gloves, masks, and helmets will be provided. Wearing this equipment will be mandatory for all workers. Health and safety training sessions will be conducted regularly
Improper waste disposal during construction	A comprehensive waste management plan will be developed and followed. The responsibility for this plan will rest with the construction contractor. Waste will be properly segregated and disposed of according to environmental regulations. Local stakeholders will be informed about the waste disposal methods to ensure proper handling. Garbage collection and removal arrangements will be made at the site.
Groundwater contamination due to chemical spills	Effective management will be ensured during construction activities. Special care will be taken to

	control accidental spills and leakage of oils, fuels, solvents, and other chemicals.
Impact on flora and fauna	Currently, there is no significant presence of flora or fauna at the site. To improve environmental conditions, landscaping will be undertaken to develop a greenbelt. Indigenous plants will be planted along the site's boundary
Social concerns due to project development	The project management team will adopt a socially responsible approach. Proper communication will be maintained with the local community. Local labor will be given preference for employment to promote social inclusion.
Noise pollution from machinery and equipment	Noise reduction measures will be implemented. The use of sound barriers and regular maintenance of machinery will help minimize noise levels. Vehicles and equipment will be kept well-maintained to reduce noise pollution
Health and safety risks to workers during the project's construction phase	All approved vendors will be responsible for collecting solid waste daily at LS Industries (PRIVATE) LIMITED Domestic waste will be handled in accordance with proper industrial waste management practices.
Improper management of solid waste affecting aesthetics, ecology, and safety.	During operations, the primary use of water at LS Industries (PRIVATE) LIMITED is for cooling processes, which do not generate wastewater. Any domestic wastewater produced will be directed to an internal drainage system for treatment via a septic tank.
Wastewater discharge without treatment may cause pollution and sanitation risks.	To support sustainable development, a tree plantation initiative will be carried out around the project area. This effort aims to mitigate both visual and physical impacts on the environment.

Table 3-3: Criteria for Significance of Impacts.

Category	Impact	Characteristics
Nature	Direct (D)	The environment is directly affected by activities (e.g., emissions or waste discharge).
	Indirect (ID)	Environmental changes occur as a result of alterations in another parameter (e.g., changes in water flow patterns affecting local biodiversity).

Duration of Impact	Short Term (ST)	Impacts occur during the early stages (e.g., construction), typically subsiding once the activity ceases.
	Medium Term (MT)	Impacts last beyond the immediate phase but may gradually diminish over time (e.g., temporary reduction in air quality).
	Long Term (LT)	Impacts persist for an extended period, potentially requiring extensive mitigation or restoration efforts (e.g., long-lasting habitat disturbance).
Geographical Extent	Local	Effects remain within or near the LS Industries (PRIVATE) LIMITED facility's boundaries
	Regional	Effects extend beyond the local boundary, potentially influencing surrounding districts or regions.
Project Phases	Pre-Construction	Impacts linked to planning and design activities prior to the main construction work.
	Construction	Impacts emerging from site development, infrastructure building, and equipment installation.
Reversibility of Impact	Temporary (T)	Effects can be reversed once the cause is removed (e.g., noise from construction ceases when the machinery is turned off).
	Permanent (P)	Effects that remain even after the activity ends, often requiring significant remedial measures (e.g., permanent land-use changes).
Likelihood of Impact	Likely (L)	Impacts are expected to occur under construction phase
	Possible (P)	Impacts may or may not occur, depending on specific circumstances (e.g., unusual weather events).
	Rare (R)	Impacts happen only under exceptional or unforeseen conditions.
Impact Severity	Major (M)	Significant harm to the environment or community, possibly irreversible without substantial intervention.

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	Moderate (Mo)	Noticeable yet manageable effects that can be mitigated with standard controls or practices.
	Minor (Mi)	Limited or short-lived impacts that are typically reversible with minimal effort.
	Negligible (N)	No measurable or discernible change to environmental conditions or community well-being.

Following the table represents the significance of determined impacts based upon above given criteria:

Table 3-4: Significance of the Potential Impacts

Category	Impact Significance	Potential Impacts						
		Air Quality Deterioration	Increase d Noise Level	Lowering of Ground water table	Surface water degradation	Soil Quality	Health and Safety	Flora and Fauna
Nature	Direct (D)	✓	✓			✓	✓	✓
	Indirect (ID)			✓	✓			✓
Duration of Impact	Short Term (ST)		✓				✓	
	Medium Term (MT)	✓				✓		✓
	Long Term (LT)			✓	✓			
Geographical Extent	Local	✓	✓			✓	✓	✓
	Regional			✓	✓			
Reversibility of Impact	Temporary (T)	✓	✓		✓	✓	✓	✓
	Permanent (P)			✓				
	Likely (L)	✓					✓	

Likelihood of Impact	Unlikely (UL)							
	Possibly (P)		✓					✓
	Rare (R)			✓	✓	✓		
Impact Consequence Severity	Major (M)							
	Moderate (Mo)		✓				✓	
	Minor (Mi)	✓		✓				✓
	Negligible (N)				✓	✓		

See follow

CHAPTER - 4.

CONSIDERATION OF ALTERNATIVES

This section outlines the rationale for establishing the proposed technical framework for LS Industries (PRIVATE) LIMITED. The analysis focuses on aligning the project's objectives with site-specific requirements and regulatory compliance. Key considerations include evaluating alternatives for site selection, resource allocation, and adherence to localized criteria to ensure optimal outcomes for both the facility and its surrounding community.

4.1. Alternative Site Option, and Site Selection Criteria

During the planning phase of the proposed **Preform of Polyurethane, Plastic Compounding and Allied Products Manufacturing** by LS Industries (PRIVATE) LIMITED, various site options will be considered to ensure minimum environmental impact and operational feasibility. After evaluation, the site located at **23-KM Lahore–Sheikhupura Road, Lahore** was selected due to its strategic advantages.

The selection will be based on key factors such as:

- **Proximity to Raw Materials and Market Access:** The site is well-connected via major roads, facilitating easy transport of raw materials and products.
- **Industrial Zoning:** The land falls within an industrial area, avoiding conflicts with agricultural or residential zones.
- **Environmental Suitability:** The site is not near any environmentally sensitive areas like wetlands, forests, or protected ecosystems.
- **Distance from Populated Areas:** The site is located at a safe distance from residential communities, reducing the risk of health or nuisance impacts.
- **Regulatory Compliance:** The site conforms to local land use regulations and meets the criteria for industrial development.

Roads and Other Basic Infrastructure

LS Industries (PRIVATE) LIMITED benefits from a well-established infrastructure essential for industrial operations. The facility is strategically positioned at, 23km Lahore-Sheikhupura- Road, LAHORE, , ensuring excellent connectivity. The location provides convenient access to major road networks, facilitating the transportation of raw materials and finished products. The industrial zone offers world-class infrastructure and ensures a secure working environment for employees.

Availability of Manpower

The construction phase of the LS Industries (PRIVATE) LIMITED project will require a workforce comprising technical experts, skilled tradesmen, and general laborers. The project site benefits from its location near labor-abundant areas, ensuring that the required manpower is readily accessible. This local availability of workers not only reduces labor costs but also supports timely project execution without delays due to staffing shortages.

Demand for Construction Materials and Support Services

Although LS Industries (PRIVATE) LIMITED is ultimately aimed at manufacturing polyurethane and plastic footwear, the construction phase itself generates a demand for construction materials, equipment, and support services. Given the ongoing development and industrial activity in the Lahore–Sheikhupura corridor, there is a robust local market for construction-related goods and services. This enhances procurement efficiency, reduces transportation costs, and supports the local economy during the development phase of the facility.

Environmental Considerations

The proposed project is situated on 24 KM Lahore-Sheikhupura- Road, LAHORE , Pakistan. Environmental considerations remain paramount for this project. Baseline environmental protection measures will help assess the physical and biological characteristics of the area. The surroundings of the project site show no significant environmental sensitivity.

The project site and its surrounding area do not contain any notable ecosystems, biodiversity hotspots, fisheries, significant flora or fauna, or heritage sites that could be adversely affected by the project activities. Comprehensive baseline surveys and consultations with relevant

environmental authorities have confirmed the absence of protected natural habitats or culturally important locations within the project's zone of influence. Consequently, the project is not expected to cause any direct or indirect impacts on biodiversity or heritage resources.

The proposed site is strategically located away from dense population centers, thereby minimizing the risk of direct social or community disturbances during construction. Its proximity to the Lahore–Sheikhupura National Highway ensures efficient logistical access while maintaining compliance with environmental safety measures.

The project will be executed in accordance with the **Punjab Environmental Protection Act, 1997 (Amended 2012)** and will comply with all relevant **National Environmental Quality Standards (NEQS)**. Environmentally responsible construction practices, including the use of pollution control measures and sustainable resource management, will be implemented to mitigate any potential impacts, ensuring full alignment with applicable provincial and national environmental regulations.

4.2. Design/Technology Alternatives

Chemical Heating Vessel:

In the polyurethane chemical manufacturing process, raw materials such as **Diphenylmethane, Mono Ethylene Glycol, Adipic Acid, Diethylene Glycol, and EVA granules** are carefully measured and charged into the **chemical reactor (heating vessel)**. This step begins with the controlled addition of all raw materials in specified proportions, ensuring consistent batch quality. Once loaded, the materials undergo **intense mixing** to create a homogeneous blend. The mixture is then transferred to a **heating vessel**, where it is gradually heated to the required reaction temperature, depending on the formulation. During heating, **polycondensation and cross-linking reactions** occur, forming the base polyurethane compound. The process is **monitored closely for temperature, pressure, and viscosity** to prevent degradation and ensure product stability. Heating continues until the desired chemical structure and molecular weight are achieved.

Chemical Cooling Vessel:

After the heating and reaction phase is complete, the polyurethane mixture undergoes a **controlled cooling process** to stabilize the finished product before packing. The hot material is either cooled directly in the reactor transferred to a **dedicated cooling vessel**. This step gradually lowers the temperature from around **to below 40°C**, preventing thermal degradation and ensuring safe handling. Cooling is closely monitored to maintain the **desired viscosity and flow properties** of the final product.

Packaging and Dispatch:

Once the finished preform of polyurethane product has been properly cooled and filtered, it is transferred to the **packaging station** for filling into suitable containers which are reuseable. The packaging process is carried out under controlled conditions to prevent contamination and maintain product integrity. Each drum is **accurately filled by weight or volume**, sealed tightly to avoid leakage, and subjected to **quality checks** for proper closure. After sealing, every drum is affixed with a **clear and durable label** that includes vital information such as product name, batch number, net weight, manufacturing and expiry dates, handling precautions, hazard symbols (as per GHS), and references to the **Safety Data Sheet (SDS)**. Once labeled, the drums are transferred to the **finished goods storage area**, which is well-ventilated, fire-protected, and clearly segregated from raw material and chemical reaction zones. The storage conditions are maintained to prevent exposure to direct sunlight, high humidity, or extreme temperatures. Drums are arranged systematically using the **FIFO (First-In-First-Out)** principle to ensure traceability and quality management. From this storage area, the packed goods are organized and prepared for **dispatch** according to customer orders and transportation schedules.

General Process

Waste-to-energy systems were proposed to convert process waste into usable energy, reducing landfill reliance and operational costs. Feasibility depends on waste composition and local regulatory support, with rejection tied to high setup costs or technical impracticality. **Rainwater harvesting** was evaluated to address water scarcity for non-critical processes, prioritized for

Saqib

sustainability benefits. However, inadequate rainfall or storage infrastructure in Sheikhpura may lead to its exclusion.

4.3 Environmental Alternatives

Solar installations and LED upgrades, aligned with Pakistan's Renewable Energy Policy, offer carbon and cost savings, yet high upfront investments and Sheikhpura's solar constraints demand cautious scrutiny. Finally, logistics innovations like route optimization and less emission fleets (electric fleet) aim to slash emissions and fuel dependency, but electrification costs and operational complexities pose formidable barriers. LS relentless pursuit of sustainability anchored in technical viability, regulatory adherence, and economic prudence positions it as a pioneer in eco-conscious manufacturing, where every decision fuels both planetary health and industrial resilience.

Saqib

CHAPTER 5

5. DESCRIPTION OF THE PROJECT

5.1. Objectives of Project

The primary objective of the proposed project is to establish a Preform of Polyurethane, Plastic Compounding and Allied Products Manufacturing by LS Industries (PRIVATE) LIMITED at 23-KM Lahore–Sheikhupura Road, Lahore, aimed specifically at addressing the growing demand for high-quality polyurethane-based products in Pakistan’s industrial and commercial sectors.

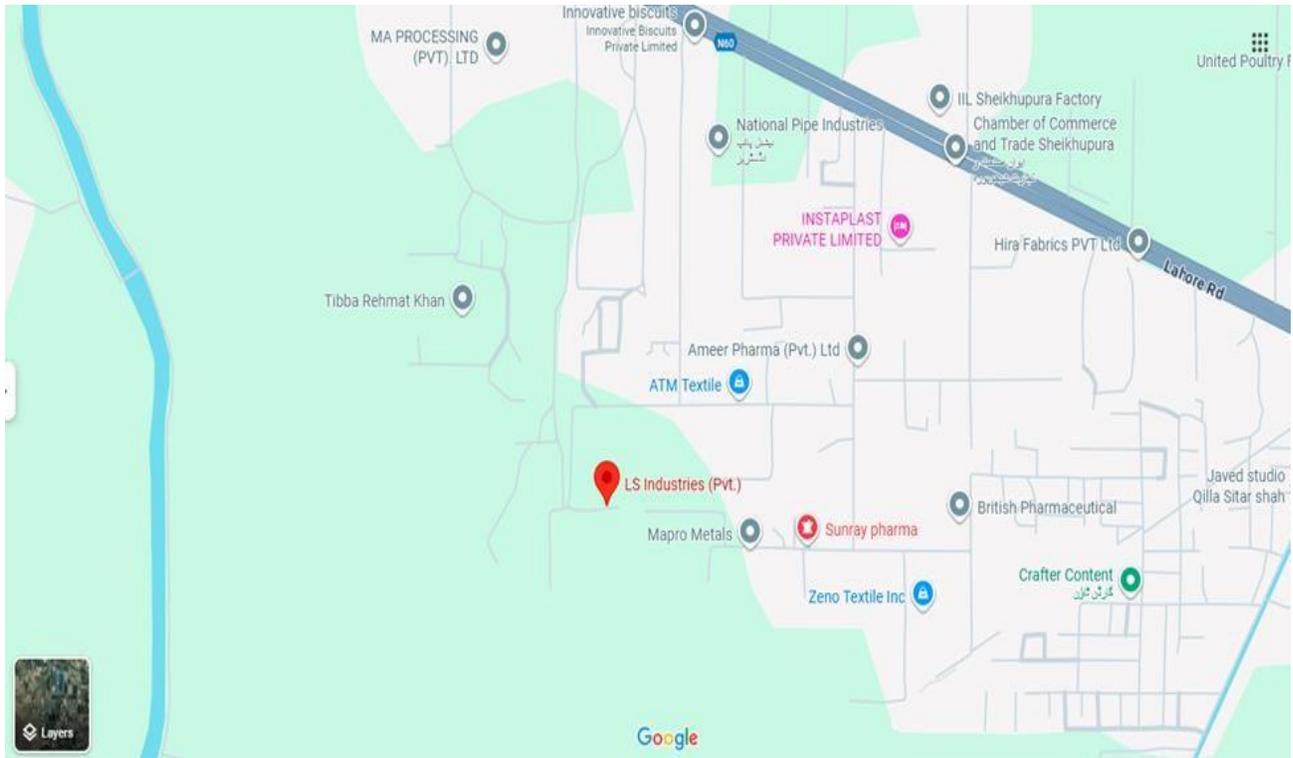
During the **construction phase**, the project seeks to:

- Develop the necessary infrastructure to support polyurethane chemical production in a safe and environmentally responsible manner.
- Create temporary employment opportunities for skilled, semi-skilled, and unskilled labor in the region, contributing to local socioeconomic development.
- Ensure compliance with environmental standards and regulatory requirements by adopting best practices in construction and site development.
- Lay the foundation for a facility that will support future industrial growth, reduce import dependency, and contribute to the local supply chain for polyurethane materials.

5.2. Location of the Project

The facility is strategically positioned at, 23km Lahore-Sheikhupura- Road, LAHORE, and managed by LS factories, Local Govt Authorities, TMA & others. The building layout plan and site layout plan are provided in the document file submitted with the report.





Map 1 : Project Location Map

5.3. Land Use on Site

The project site is situated within an industrial zone designated for industrial development approved & declared by TMA. Currently, the land is unoccupied and devoid of any existing structures or vegetation.

5.4. Vegetation Features of the Site

As the project location falls within an industrial area approved & declared by TMA for manufacturing purposes, the site currently contains no vegetation. The plot remains unused and vacant at present.

5.5. Road Access

The project site is strategically located on , approximately 23km Lahore-Sheikhupura- Road, LAHORE, . Transportation of raw materials and finished products will utilize the following routes:

Saqib

Direct access via, connecting to the Lahore - Sheikhupura - Faisalabad National Highway (N-5).

Proximity to the M-3 Industrial City and major regional highways ensures seamless connectivity to Lahore, Faisalabad, and surrounding industrial zones.

5.6. Cost and Magnitude of Operation

The proposed **Preform of Polyurethane, Plastic Compounding and Allied Products Manufacturing** by **LS Industries (PRIVATE) LIMITED** will be established over an estimated area of 48 **kanals**. The current phase of this Environmental Impact Assessment (EIA) focuses solely on the **construction phase** of the project.

During construction, the project will generate employment for approximately 30-50 **individuals**, including technical experts, skilled workers, and unskilled laborers. These jobs will provide short-term socioeconomic benefits to the surrounding communities through income generation and skill development. The **total estimated cost** of the project is 500 Million **PKR**, which includes civil works, infrastructure development, machinery foundations, utilities, environmental compliance measures, and related facilities.

Table 5-1: Cost Breakdown of the Project

Component	Estimated Cost (PKR)
Civil and Structural Construction Works	200 million
Electrical and Mechanical Installation	125 million
Environmental Safeguard Implementation	25 million
Site Preparation and Utilities Setup	50 million
Labor and Logistics during Construction	50 million
Contingency and Miscellaneous Expenses	50 million
Total Estimated Cost	500 million

5.7. Description of the Project:

LS Industries (PRIVATE) LIMITED plans to construct a Preform of Polyurethane, Plastic Compounding and Allied Products Manufacturing at 23-KM Lahore–Sheikhupura Road, Lahore.

The construction phase includes site preparation, civil works, structural development, and installation of basic utilities. All activities will follow standard engineering and environmental practices, with measures in place to control dust, waste, and noise. This EIA focuses solely on the construction phase; operational impacts will be addressed separately.

5.8. Manufacturing Process of Polyurethane

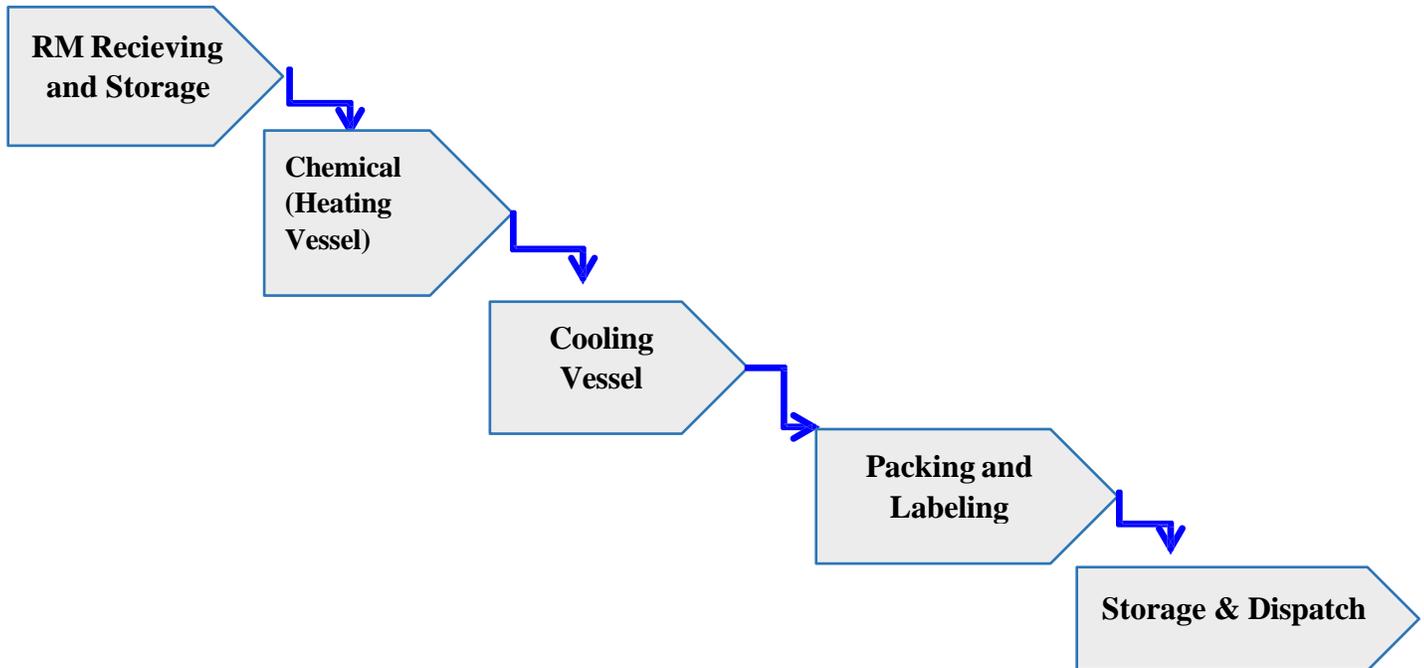
The polyurethane manufacturing process begins with the **receiving of raw materials** such as **Diphenylmethane, Mono Ethylene Glycol, Adipic Acid, Diethylene Glycol**, which are carefully inspected for quality and stored in a dedicated **raw material storage area**. These raw materials are then **issued batch-wise** to the production line and charged into a **chemical heating vessel**, where they are thoroughly mixed under controlled conditions. The mixture is then transferred to a **heating vessel**, where it is gradually heated to the required reaction temperature, allowing **polycondensation and cross-linking reactions** to take place, forming the base polyurethane compound.

Once the desired chemical structure and consistency are achieved, the hot product undergoes **controlled cooling** cooling vessel to bring the temperature down. This step ensures product stability, safe handling, and preservation of chemical properties.

Following cooling, the product is transferred to the **drum filling station**, where it is packed into **Drums**. Each drum is tightly sealed and labeled with all necessary details, including product name, batch number, hazard symbols, and references to the **Safety Data Sheet (SDS)**. The labeled drums are then moved to a **finished goods storage area**, which is well-ventilated, temperature-controlled, and equipped with fire safety measures. Here, the drums are organized using the **FIFO method** and stored until they are ready for **dispatch**. The dispatch process includes proper documentation, quality release (CoA), and adherence to transportation safety regulations, ensuring that the polyurethane product reaches customers in optimal condition.



5.9. Process Flow Diagram for Preform of Polyurethane



List of Machines for Preform of Polyurethane

- a. Heating Vessel
- b. Oil Heater
- c. Blenders
- d. Chemical Mixer
- e. Chemical Feeding Tank
- f. Cooling Tower
- g. Chillers

5.10. Manpower

During the construction phase of LS Industries (PRIVATE) LIMITED, approximately 30 to 50 workers will be engaged to carry out various civil, structural, and installation works. As the unit transitions into full operational capacity, a total workforce of 30 to 50 employees will be designated

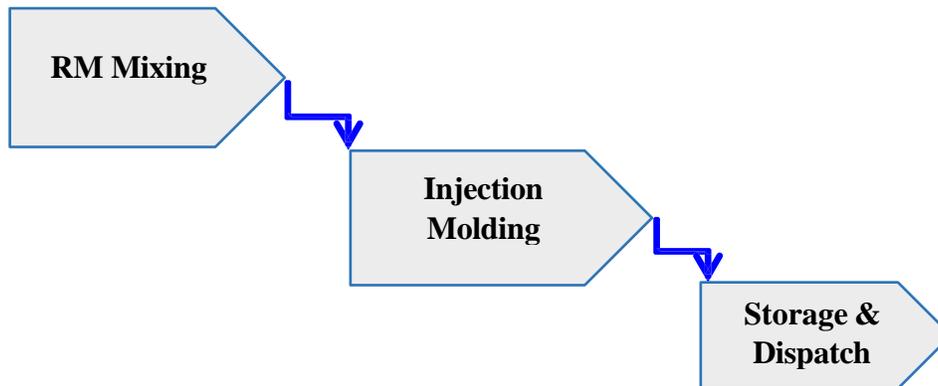
to support the production of preforms for the Polyurethane and Plastic Footwear Manufacturing Facility, which will have an annual output capacity of 2,000 metric tons.

5.11. Manufacturing Process of Plastic Compounding and Allied Products

All raw materials will first be fed into the **mixer**, from where the blended materials will be transferred to the extruder. In the **extruder**, the materials will be heated and processed into a sheet form, which will then be cut into small pieces, known as **granules**. These granules will be moved to the vibrator machine for drying, after which the dried **EVA compound** will be transferred to the **storage tank**. From the storage tank, the compound will be packed and shifted to the **godown**. Later, the dry EVA compound, along with other colors or additives, will be fed into the hopper of the EVA shoe-making plant.

In the first step, the compound will be heated until it melts into a liquid form, which will then be moved into molds within the same machine. Baking will be carried out in the molds for a certain period, after which the molds will be opened and the finished shoes will be removed. Finally, the shoes will be packed and sent to the godown for storage.

5.12. Process Flow Diagram for Plastic Compounding and Allied Products



List of Machines for Plastic Footwear

- h. EVA Compounding Machine
- i. EVA Shoe Making Plant
- j. Recycling Machine

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5.13. Manpower

During the construction phase of LS Industries (PRIVATE) LIMITED, approximately 30 to 40 workers will be engaged to carry out various civil, structural, and installation activities. As the unit transitions into full operational capacity, a total workforce of 30 to 50 employees will be designate to support the production of Plastic Footwear , which will be designed to produce 20 tons per day (TPD) of EVA compound along with a daily output of 250 dozen pairs of shoes.”

5.14. Plantation Plan

The construction activities for LS Industries (PRIVATE) LIMITED’s proposed facility did not require the clearance of *any significant vegetation or existing trees. However, to enhance the site's environmental value and visual appeal, a comprehensive plantation and landscaping plan will be implemented.

Upon completion of construction, the company will initiate the plantation of native tree species, ornamental plants, and grass within the facility’s boundary. Approximately 500 to 1,000 indigenous plants will be planted during the appropriate plantation season, in collaboration with the District Officer (Environment), TMA Sheikhpura, and other relevant local authorities. This initiative aims to promote ecological balance, support biodiversity, and improve local air quality. A dedicated budget of PKR 100,000 has been earmarked for these plantation activities and is included in the overall environmental management plan.

5.15. Fire Fighting Plan

Fire hazards are a potential risk during the operational phase of the project; therefore, LS Industries (PRIVATE) LIMITED has incorporated a comprehensive fire safety plan in line with standard safety protocols. To effectively respond to fire-related emergencies, DCPs, Foam, CO₂ fire extinguishers will be strategically installed throughout the production and assembly units.

In addition to extinguishers, the facility will also be equipped with smoke detectors, fire alarms, and automated fire detection systems, all designed and installed in accordance with NFPA (National Fire Protection Association) standards. The fire detection and suppression systems will be implemented in the following key areas:

- Parking Area
- Administrative Offices
- Workshop and Production Units
- Kitchen/Cafeteria
- Fire hydrants along the project site's boundary wall

Furthermore, portable firefighting equipment will be placed at specific locations within the facility, particularly in zones identified as potential fire risk areas. All systems and equipment will meet or exceed NFPA guidelines, ensuring a high level of fire safety and rapid emergency response capability throughout the premises.

5.16. Restoration and Rehabilitation Plans

LS Industries (PRIVATE) LIMITED is committed to maintaining environmental integrity throughout the lifecycle of the project. Although large-scale site rehabilitation is not anticipated, restoration activities will be undertaken as required, particularly during maintenance, machinery upgrades, or infrastructure improvements.

Outdated equipment will be repaired, recycled, or replaced in accordance with the latest environmental and technological standards. Any decommissioning or replacement activities will comply with applicable environmental regulations and best practices, ensuring minimal environmental disruption. These restoration measures will be integrated into routine maintenance protocols to ensure continued compliance and long-term project sustainability.



CHAPTER -6

DESCRIPTION OF THE ENVIRONMENT

6.1. General

The environmental baseline study forms the foundation for assessing and managing potential impacts associated with the proposed construction of LS Industries (PRIVATE) LIMITED's Preform of Polyurethane, Plastic Compounding and Allied Products Manufacturing . This present a comprehensive overview of the existing environmental conditions within and around the project site, serving as a reference point for evaluating changes resulting from construction activities.

To ensure accuracy, a site-specific environmental assessment was carried out through detailed field visits, stakeholder consultations, and discussions with local residents. Supplementary data was collected from relevant government agencies and non-governmental organizations (NGOs) to validate the findings.

The baseline environment has been categorized into the following components for systematic evaluation:

- **Physical Environment:** Landform, soil, air quality, surface and groundwater, and climatic conditions
- **Ecological Environment:** Flora, fauna, natural habitats, and overall biodiversity
- **Socioeconomic Environment:** Demographics, livelihoods, local infrastructure, and community welfare.

This baseline serves as a benchmark to predict and assess any environmental changes due to project interventions and ensures appropriate mitigation measures are proposed during the construction phase.

6.2. Baseline Physical Environment

6.2.1 Soil

Topography

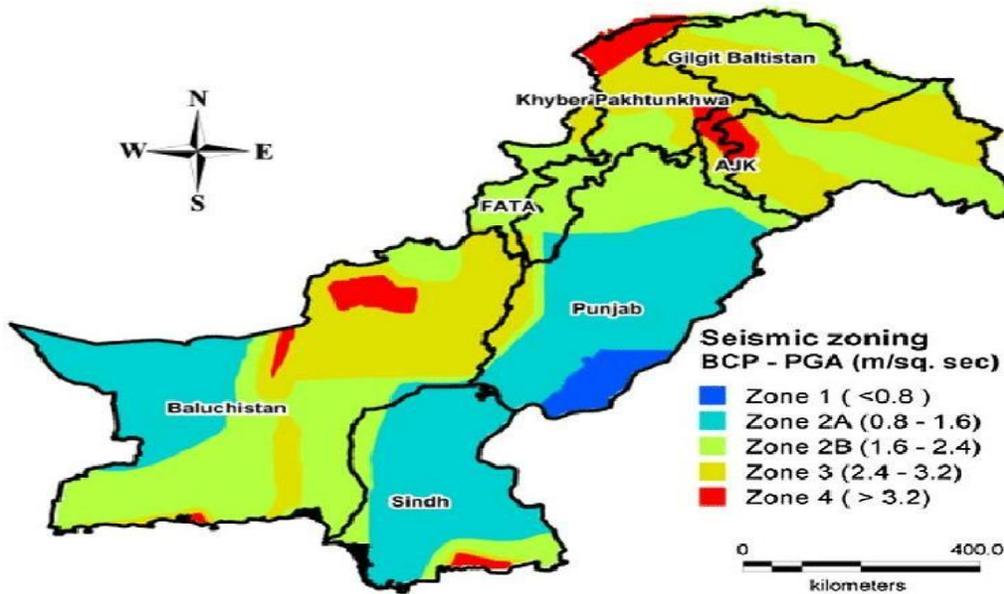
The topography of Sheikhpura is predominantly flat to gently undulating, characteristic of the central Punjab plains. The elevation generally ranges between 180 to 220 meters above sea level.

The terrain is suitable for both agricultural and industrial development due to its stability and accessibility.

The land is mostly alluvial, with fertile soils deposited by the Ravi and Chenab river systems in the distant past. The flat landscape facilitates the development of infrastructure such as roads, drainage, and industrial zones without significant earthworks.

Seismic Zone

Due to its location within the alluvial plains, Sheikhpura does not exhibit significant seismic activity, and the area falls under Zone 2B (moderate seismic risk) as per the Building Code of Pakistan. The seismic zoning shown in the figure:



Map 2 : Seismic Zone Map

6.2.2. Physical Features around the Project Area

The proposed project site is situated in Sheikhpura District, Punjab, approximately 40 kilometers northwest of Lahore. This region holds strategic industrial importance due to its location within the M-3 Industrial City, a designated and rapidly expanding industrial zone. The

site benefits from proximity to major transportation routes, including national highways, which support efficient logistics and accessibility.

The terrain in the area is predominantly flat, facilitating infrastructure development and construction activities. Basic utilities such as electricity, water, and telecommunications are readily available, enhancing the site's suitability for industrial use.

While Sheikhpura is known for its historical and cultural heritage, the vicinity of LS Industries (PRIVATE) LIMITED is primarily industrial in nature, with minimal residential presence. This minimizes potential land-use conflicts and makes the location ideal for a Preform of Polyurethane, Plastic Compounding and Allied Products Manufacturing .

6.2.3. Demographic Profile

Sheikhpura District, located in the northeast region of Punjab, Pakistan, is part of the Lahore Division and is recognized as a major industrial and agricultural hub. The district shares boundaries with Lahore, Nankana Sahib, Hafizabad, Faisalabad, and Gujranwala districts. Its strategic location near the provincial capital makes it a vital contributor to the regional economy.

According to the latest census data (2017) provided by the Pakistan Bureau of Statistics, Sheikhpura District has a population of approximately 3.46 million people. The population is distributed across both urban and rural areas, with a significant concentration in urban centers such as Sheikhpura City, Muridke, and Sharaqpur.

- Total Population: ~3.46 million
- Male Population: ~1.78 million
- Female Population: ~1.68 million
- Urban Population: ~34%
- Rural Population: ~66%
- Literacy Rate: Approximately 60–65% (higher in urban areas)
- Main Languages Spoken: Punjabi and Urdu
- Major Occupations: Industrial labor, agriculture, trade, and services

Sheikhpura is known for its diverse workforce, with many residents employed in industries such as textiles, packaging, food processing, engineering, and chemicals. The district also benefits from skilled and semi-skilled labor due to the presence of vocational training centers and proximity to Lahore's educational institutions.

The population growth rate and the increasing trend in urbanization contribute to a growing labor market, making Sheikhpura a favorable location for industrial investment and employment generation. The demographic characteristics indicate strong potential for supporting large-scale industrial operations like LS Industries (PRIVATE) LIMITED, both in terms of manpower and market proximity.



6.2.4 Geography:

Sheikhupura District is located in the northeastern part of Punjab province, Pakistan, and lies within the coordinates of 31.7131° N latitude and 73.9783° E longitude. The district is bordered by Lahore to the southeast, Faisalabad to the southwest, Gujranwala to the northeast, and Nankana Sahib to the west. The region is well-connected via a network of highways and railways, making it an important industrial and logistic corridor.

The district covers a total area of approximately 3,030 square kilometers, comprising urban centers, agricultural fields, and industrial zones, including the M-3 Industrial City, near to this LS Industries (PRIVATE) LIMITED . is located.

6.2.5. Income Status: Mostly people work in nearby industries, while some claim they run big businesses.

6.2.6 Educational Facilities : CARE HIGH SCHOOL 2, Moman Pur, Sheikhupura1.4KM

6.2.67Near By Village : Momin Pura Village1 KM

6.2.8 Police Station factory area, Karian Wala, Sheikhupura 8KM

6.2.9 Health Facilities : PESSI Social Security Dispensary Mandiali, Sarai, Pakistan 5KM

And DHQ Hospital Sheikhupura..... 15.4KM

6.2.10 Sustainability of the Site (not prohibited, environmentally sensitive, incompatible to surroundings and unsuitable)

The selected site for LS Industries (PRIVATE) LIMITED, situated at 24 KM Sheikhupura Road Lahore, Polyurethane Chemical Manufacturing is considered highly suitable for industrial development based on technical, environmental, and legal assessments.

6.2.10.1 Not a Prohibited Area

The project site is not located within any prohibited, restricted, or protected zones as identified by the Environmental Protection Agency (EPA), Punjab, or any other relevant authority. It lies within a designated industrial zones declared by TMA, developed and managed by Punjab Govt Authorities and is legally approved for industrial use.

6.2.10.2 Not Environmentally Sensitive

The site does not fall within or near any environmentally sensitive or ecologically protected areas, such as wildlife sanctuaries, national parks, wetlands, forests, or archaeological zones. The land



was previously barren and has been allocated specifically for industrial development. There are no endangered flora or fauna recorded in the immediate surroundings, and the ecological footprint of the site is minimal.

6.2.10.3 Compatible with Surrounding Land Use

The surrounding area consists predominantly of industrial facilities, open land, and supporting infrastructure, including roads, utilities, and logistics services. As such, the location of LS Industries (PRIVATE) LIMITED is fully compatible with the land use and zoning plan of the area. There are no nearby residential clusters or socially sensitive institutions (such as schools or hospitals) that would be adversely impacted by the industrial operations.

6.2.10.4 Environmental Compliance and Infrastructure Readiness

The site has access to all required infrastructure including electricity, natural gas, water supply, and road connectivity, which are essential for sustainable industrial operations. Moreover, the facility has been designed in compliance with environmental standards, and mitigation measures have been proposed to manage any potential emissions, waste, or noise, ensuring continued environmental compatibility.

In light of its legal status, environmental neutrality, industrial compatibility, and infrastructure availability, the proposed site for LS Industries (PRIVATE) LIMITED . is deemed suitable for the development Preform of Polyurethane, Plastic Compounding and Allied Products Manufacturing . The site selection complies with all local, regional, and national regulations, and poses no environmental or social conflict in the context of land use or ecological sensitivity.

6.3 Geology

Geologically, Sheikhpura lies within the Indus Basin, which is composed primarily of quaternary alluvial deposits. These unconsolidated sediments consist of clay, silt, sand, and gravel, making the sub-surface suitable for shallow foundations and civil structures. The soil composition is generally loamy, providing good drainage properties and mechanical stability for industrial construction. The groundwater table in the region is moderate and varies seasonally.

6.4 Meteorology and Climate

The climate of Sheikhpura District is classified as semi-arid and subtropical, typical of central Punjab. The area experiences distinct seasonal variations, including hot summers, a monsoon season, mild winters, and low to moderate annual rainfall.

6.4.1 Temperature

Summer (April to September): Summers are long and hot, with peak temperatures ranging between 38°C to 46°C, particularly during May and June. Winter (November to February): Winters are



relatively short and mild, with minimum temperatures ranging from 5°C to 10°C. Occasional frost may occur in January.

6.4.2 Rainfall

The district receives an average annual rainfall of 400–600 mm, the majority of which occurs during the monsoon months (July to September). Monsoon rains are often intense and short in duration, occasionally leading to localized waterlogging if not managed properly.

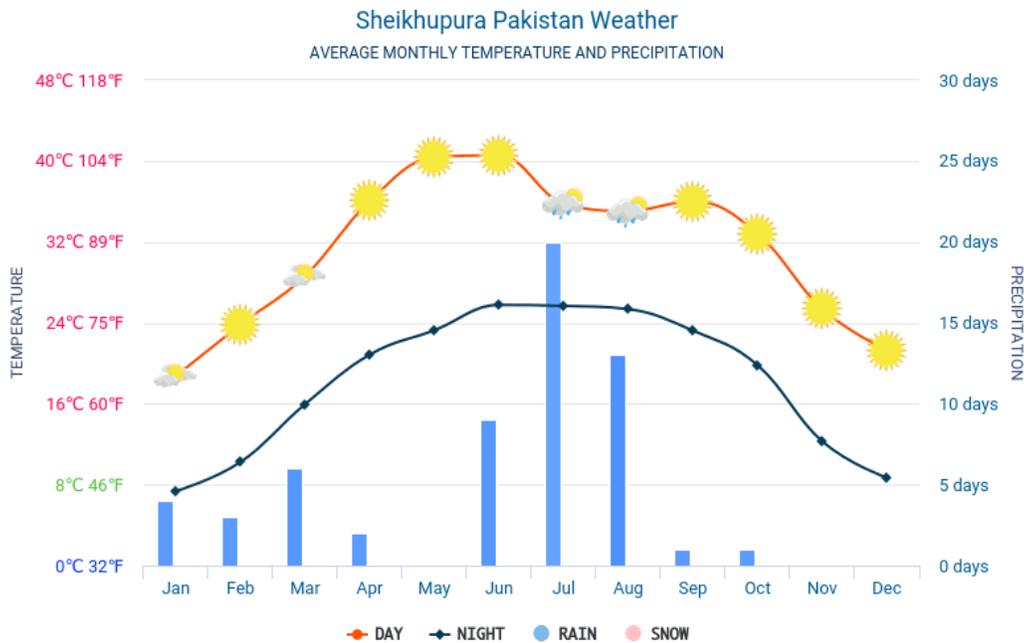


Figure 1: Monthly Variation in Temperature and Rain in Shiekhupura

6.4.3 Humidity

Humidity levels remain relatively high during the monsoon season (up to 75%), while the rest of the year is comparatively dry. During summer, dry heat and low humidity dominate, especially in May and June.

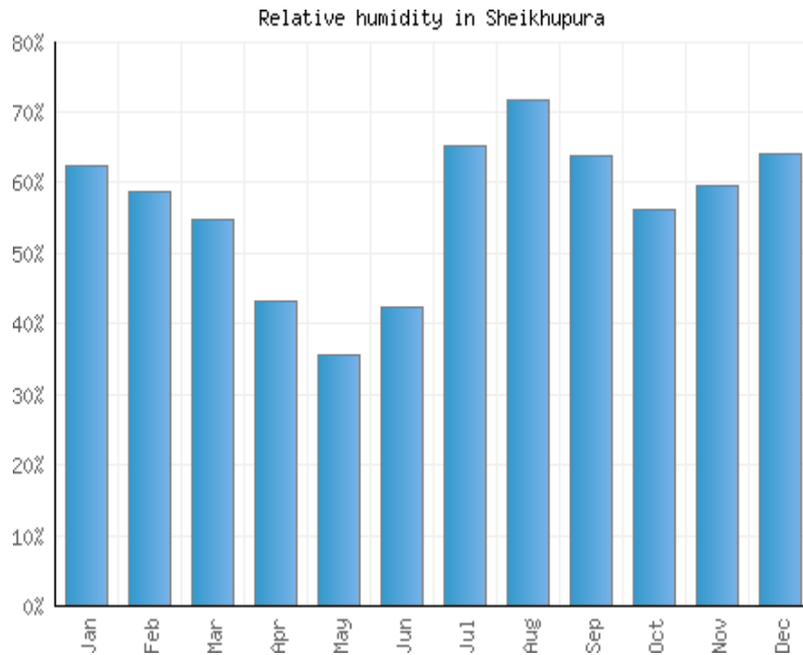


Figure 2: Relative Humidity of Shiekhupura

6.4.4 Wind Patterns

Wind speeds in the region are generally moderate, averaging 5–15 km/h, with occasional stronger gusts during thunderstorms. Prevailing winds typically blow from the west and northwest during the dry months and shift to southeast and east during the monsoon.

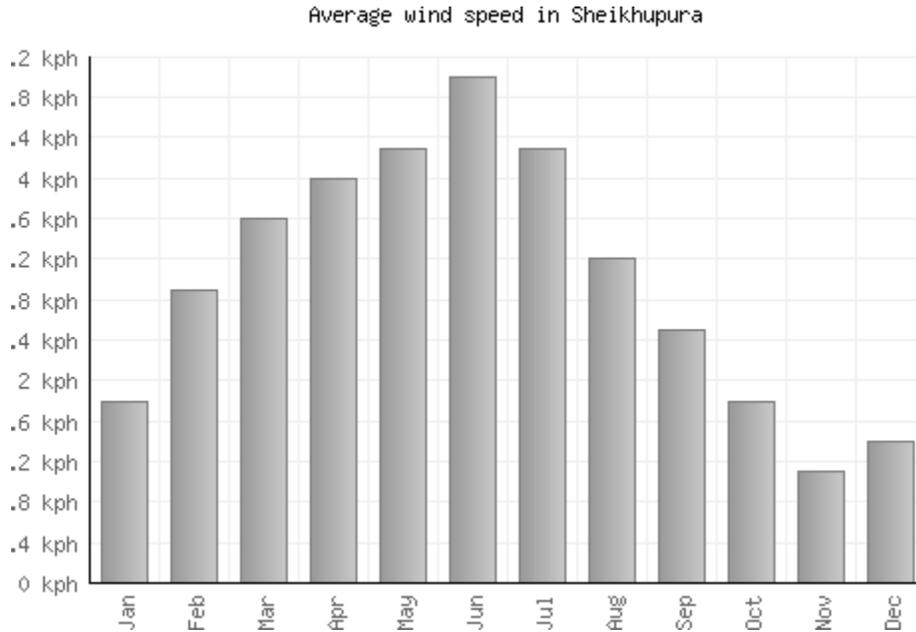


Figure 3: Average Wind Speed

6.4.5 Sunshine and Solar Exposure

Sheikhpura enjoys a high number of sunny days throughout the year, with over 3,000 hours of sunshine annually, making it suitable for solar energy potential.

6.5. Water Resources

The Sheikhpura District falls within the fertile Indus Basin and is endowed with a mix of groundwater and surface water resources, which support its agricultural, domestic, and industrial needs. The availability and quality of water in the region are critical for sustaining industrial operations such as those of LS Industries (PRIVATE) LIMITED., especially for processes like cleaning, cooling, and production in multilayer packaging.

6.5.1. Groundwater

Groundwater is the primary source of water supply in the district, including for industrial use. It is typically extracted through deep tube wells and boreholes, and the groundwater table in the region generally ranges between 20 to 40 meters below the surface, depending on the season and specific location.

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- **Water Quality:** Groundwater in Sheikhpura is mostly suitable for industrial purposes. However, in some areas, salinity, hardness, and nitrate levels may be elevated due to over-extraction and localized contamination. Regular is necessary to ensure suitability.
- **Recharge Sources:** The aquifer is mainly recharged through infiltration of rainfall, irrigation return flows, and seepage from canals.

6.5.2. Surface Water

Sheikhpura has access to a network of irrigation canals, which are offshoots of the Lower Chenab Canal system, originating from the River Chenab. While surface water is primarily used for agriculture, its proximity provides potential as an auxiliary water source for industrial use, depending on availability and permissions from the Irrigation Department.

- **Seasonal Availability:** Surface water flow is higher during the monsoon season (July–September) and lower during dry months.

6.6. Baseline Ecological Environment

The ecological environment of Sheikhpura District comprises elements of both natural and modified landscapes. The area where LS Industries (PRIVATE) LIMITED . is located falls within the M-3 Industrial City, which is a designated industrial zone with limited natural vegetation but surrounded by agricultural lands, plantations, and scattered patches of native flora and fauna.

6.6.1. Classification of Flora

The vegetation in Sheikhpura reflects a blend of natural species adapted to semi-arid conditions and cultivated plants for agricultural and urban use. The flora can be grouped into four major categories:

- **Trees**

Trees are long-lived, woody plants typically used for timber, fuel, shade, and landscaping. List of trees observed is given hereunder:

Table 6-1: List of Trees of Study Area

Sr. No	Botanical Name	English Name	Urdu Name
1	<i>Dalbergia sissoo</i>	Indian Rosewood	Sheesham
2	<i>Acacia nilotica</i>	Gum Arabic Tree	Kikar
3	<i>Azadirachta indica</i>	Neem	Neem
4	<i>Eucalyptus camaldulensis</i>	Red River Gum	Sufaida
5	<i>Populus deltoides</i>	Poplar	Poplar
6	<i>Ficus religiosa</i>	Sacred Fig	Peepal

- **Shrubs**

Shrubs are smaller woody plants with multiple stems, often found in open lands and roadside areas. The table below depicts the shrubs in the study area:

Table 6-2: List of Shrubs of Study Area

Sr. No	Botanical Name	English Name	Urdu Name
1	<i>Calotropis procera</i>	Apple of Sodom	Aak
2	<i>Ziziphus nummularia</i>	Wild Jujube	Jhari Beri
3	<i>Carissa opaca</i>	Karonda	Kareer
4	<i>Prosopis juliflora</i>	Mesquite	Jungli Keecker

- **Herbs**

As far as herbs of the area are concerned, these were observed as under:

Table 6-3: List of Herbs of Study Area

Sr. No	Botanical Name	English Name	Urdu Name
1	<i>Cynodon dactylon</i>	Bermuda Grass	Kheel Ghass
2	<i>Tribulus terrestris</i>	Puncture Vine	Ghagru
3	<i>Parthenium hysterophorus</i>	Congress Grass	Congrasi Booti
4	<i>Chenopodium album</i>	Goosefoot	Batwa

6.6.2. Fauna

A field study related to the identification of fauna was conducted in the study area. The fauna of Sheikhpura reflects the ecological characteristics of Punjab's irrigated plains, which include cultivated lands, industrial zones, and semi-natural habitats. Due to urbanization and industrial growth, large wildlife species are rare, but a range of small mammals, birds, reptiles, amphibians, and insects still thrive in agricultural fields, canal banks, and green patches.

- **Mammals**

A list of mammals noticed in residential parts, agricultural fields etc. is given in the following table:

Table 6-4: List of Mammals of Study Area

Sr. No	Scientific Name	English Name	Urdu Name
1	<i>Canis aureus</i>	Golden Jackal	Geedar
2	<i>Herpestes edwardsii</i>	Indian Grey Mongoose	Neola
3	<i>Lepus nigricollis</i>	Indian Hare	Khargosh
4	<i>Funambulus pennantii</i>	Northern Palm Squirrel	Gilahri
5	<i>Mus musculus</i>	House Mouse	Chooah
6	<i>Rattus rattus</i>	Black Rat	Kala Chooah

- Birds**

Most common species of birds observed included:

Table 6-5: List of Birds of Study Area

Sr. No	Scientific Name	English Name	Urdu Name
1	<i>Passer domesticus</i>	House Sparrow	Chiriya
2	<i>Acridotheres tristis</i>	Common Myna	Myna
3	<i>Columba livia</i>	Rock Pigeon	Kabootar
4	<i>Corvus splendens</i>	House Crow	Kawa
5	<i>Streptopelia decaocto</i>	Eurasian Collared Dove	Fakhta
6	<i>Psittacula krameri</i>	Rose-ringed Parakeet	Tota
7	<i>Upupa epops</i>	Hoopoe	Hudhud
8	<i>Anas platyrhynchos</i>	Mallard Duck	Batakh

- Reptiles**

A list of reptiles noticed in residential parts, agricultural fields during the survey is given in the following table:

Table 6-6: List of Reptiles of Study Area

Sr. No	Scientific Name	English Name	Urdu Name
1	<i>Varanus bengalensis</i>	Bengal Monitor Lizard	Goh
2	<i>Calotes versicolor</i>	Garden Lizard	Khonkhar Chhipkli
3	<i>Naja naja</i>	Indian Cobra	Naag
4	<i>Eryx johnii</i>	Sand Boa	Sanp

5	<i>Hemidactylus frenatus</i>	Common House Gecko	Chhipkli
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- Amphibians**

Amphibians are fewer in number noticed during the survey and mostly appear during the monsoon season or near stagnant water sources.

Table 6-7: List of Amphibians of Study Area

Sr. No	Scientific Name	English Name	Urdu Name
1	<i>Hoplobatrachus tigerinus</i>	Bullfrog	Maindak
2	<i>Euphlyctis cyanophlyctis</i>	Skittering Frog	Daddu

- Insects**

Insects are abundant and include both beneficial species (pollinators) and pests.

Table 6-8: List of Insects of Study Area

Sr. No	Scientific Name	English Name	Urdu Name
1	<i>Apis mellifera</i>	Honeybee	Shehad ke Makhi
2	<i>Papilio demoleus</i>	Lime Butterfly	Titli
3	<i>Locusta migratoria</i>	Migratory Locust	Tiddi Dal
4	<i>Culex pipiens</i>	Common Mosquito	Machar
5	<i>Blatta orientalis</i>	Cockroach	Laal Baig
6	<i>Gryllus bimaculatus</i>	Field Cricket	Jhenga

- Threatened Speices**

Table 6-9: List of Insects of Study Area

Sr. No	Scientific Name	English Name	Urdu Name
1	<i>Passer domesticus</i>	House Sparrow	Chiriya
2	<i>Acridotheres tristis</i>	Common Myna	Myna
3	<i>Columba livia</i>	Rock Pigeon	Kabootar
4	<i>Corvus splendens</i>	House Crow	Kawa
5	<i>Streptopelia decaocto</i>	Eurasian Collared Dove	Fakhta

6	<i>Psittacula krameri</i>	Rose-ringed Parakeet	Tota
7	<i>Upupa epops</i>	Hoopoe	Hudhud
8	<i>Anas platyrhynchos</i>	Mallard Duck	Batakh

6.7. Baseline Socio-Economic Environment

This section outlines the socio-economic profile of the area surrounding the proposed site of LS Industries (PRIVATE) LIMITED , 24 KM Lahore - Sheikhpura road, located near to M-3 Industrial City, Sheikhpura District. The analysis includes demographics, livelihood patterns, infrastructure, and quality of life indicators, and it is informed by both secondary data and field investigations.

6.7.1. Study Objectives

The objectives of the socio-economic assessment will be:

- Establish a baseline profile of the local population and community dynamics.
- Identify potential social and economic impacts of the proposed project.
- Understand local livelihood systems, access to infrastructure, and services.
- Assess public perception and community expectations from the project.
- Provide a foundation for formulating social management and mitigation plans.

6.7.2. Methodology

The socio-economic data will be collected using a combination of primary and secondary sources:

- **Secondary Data:** Official statistics from the Pakistan Bureau of Statistics, District Government records, and previous planning studies.
- **Primary Data Collection:**
 - Field visits and visual observation of the site and surroundings.
 - Informal interviews with local residents, shopkeepers, workers, and community elders.
 - Consultations with local government officials, NGOs, and health/education service providers.
 - Public participation exercises to gather opinions about the proposed project.

The study focused on a 5–10 km radius around the project site, covering both urban peripheries and rural settlements.

6.7.3. Population and Demographics

According to the 2017 Population Census, Sheikhpura District has a population of approximately 3.46 million, with around 66% residing in rural areas and 34% in urban centers. The male population stands at around 1.78 million, while the female population is approximately 1.68 million. The most commonly spoken language is Punjabi, followed by Urdu. The majority of the population is Muslim, with small minority groups also present. Communities living near the project site are primarily composed of laborers, small farmers, and industrial workers, many of whom have migrated from nearby towns in search of employment.

6.7.4. Occupation and Economic Activities

Sheikhpura's economy is strongly supported by industrial and agricultural activities. Key employment sectors include manufacturing, packaging, textiles, food processing, and light engineering, especially within the industrial zones declared by TMA & M-3 Industrial City. The region also has a substantial agricultural base, with major crops such as wheat, sugarcane, rice, maize, and fodder. A large portion of the rural population is engaged in small-scale farming and livestock rearing. Many residents also work as drivers, construction workers, mechanics, and vendors. The establishment of LS Industries (PRIVATE) LIMITED is expected to strengthen the local economy by creating jobs and supporting supply chain businesses.

6.7.5. Infrastructure and Utilities

The infrastructure in and around the project site is well-developed due to its location within an established industrial zones declared by TMA. The site is connected by major roads including the Lahore–Sheikhpura–Faisalabad Road and the M-3 Motorway, allowing easy transportation of goods and workforce. Electricity and gas are reliably supplied to industrial zones. Water for domestic and industrial use is generally sourced from underground via tube wells. Mobile and internet connectivity are widely available. Public transport is available in the form of vans, rickshaws, and buses, though rural areas may still rely on informal transport systems.

6.7.6. Education and Health

Education facilities in the district include both government and private institutions. The literacy rate ranges 60% to 65%, with urban areas having better access to education than rural regions. Technical training centers are gradually becoming more common, especially near industrial clusters, equipping the workforce with skills needed for factory-based employment. Health facilities include district hospitals, basic health units (BHUs), and private clinics. While healthcare is reasonably accessible in urban areas, rural populations often face limited access to quality medical services. Seasonal diseases, poor sanitation, and respiratory conditions remain common health concerns.

6.7.7. Quality of Life Indicators

The overall quality of life in Sheikhpura varies across regions but is improving due to industrial expansion and infrastructural development. Employment opportunities are on the rise, especially for semi-skilled and unskilled labor. Income levels are moderate and gradually increasing in areas near industrial estates. Housing is basic in rural villages but better structured in semi-urban and urban zones. Access to clean water and sanitation services is inconsistent, particularly in rural pockets. Educational attainment and healthcare access continue to improve with ongoing development. Social cohesion remains strong, with communities showing resilience and cooperation.

6.8. Environmental Baseline

Environmental baseline is a critical component of the Environmental Impact Assessment (EIA), as it provides a reference point for assessing the potential environmental impacts of the proposed industrial project. The purpose of the baseline is to establish the pre-project environmental conditions of the area surrounding LS Industries (PRIVATE) LIMITED .

The environmental program was conducted through field surveys, sample collection, and laboratory testing, along with secondary data reviews. The focused on the key environmental components likely to be affected by the project during its construction and operational phases. Following environmental components were monitored:

6.8.1. Air Quality

Ambient air quality was carried out at and around the project site to determine the concentration of major air pollutants, including:

- Particulate Matter (PM₁₀ & PM_{2.5})
- Sulphur Dioxide (SO₂)
- Nitrogen Dioxide (NO₂)
- Carbon Monoxide (CO)

The results showed that all measured pollutant levels were within the Pakistan Environmental Quality Standards (PEQS) for industrial and mixed-use areas. The area experiences occasional dust and vehicular emissions, but there are no significant point sources of pollution near the site.

6.8.2. Noise Levels

Noise was conducted at multiple locations around the proposed site, including entry and boundary points. The observed noise levels during day and night times were within the **permissible limits** specified by PEQS. Noise levels are mainly influenced by traffic and nearby industrial activity. No high-decibel or sensitive noise-generating sources were found near the site during baseline .

6.8.3. Soil Quality

Soil samples were taken from the topsoil (0–15 cm depth) at the proposed construction site. The samples were analyzed for:

- pH
- Electrical Conductivity (EC)
- Organic Matter Content
- Soil Texture
- Heavy Metals

The analysis confirmed that the soil is predominantly loamy to sandy, with moderate fertility and low organic matter content. There were no signs of contamination or toxic substances. The soil is stable and suitable for industrial construction.

6.8.4. Water Quality

Groundwater samples were collected from boreholes and nearby tube wells used by local residents and businesses. Parameters tested included:

- pH
- Turbidity
- Total Dissolved Solids (TDS)
- Hardness
- Nitrates
- Heavy Metals (where applicable)

The results indicated that the groundwater quality was generally suitable for industrial use, though some parameters like TDS and hardness were on the higher side in certain samples. The water is not suitable for direct drinking without treatment, but it is acceptable for operational and sanitation use in the industry.

6.9. Environmental Estimates

6.9.1. Water Balance

Water Quality

The quality of groundwater in the project area has been analyzed through laboratory testing. The detailed laboratory report on water quality parameters is attached as part of the supporting documentation submitted with the EIA report.



Estimated Quantity of Wastewater

The water utilized in the industrial process, is recycled and subsequently repurposed for use in the facility's washrooms, ensuring minimal wastage. Additionally, water employed in the painting process is neutralized and reused throughout the day. However, a small amount of wastewater approximately 15–20 liters per day is generated from leftover ink. This residual wastewater is safely discharged into the designated government drainage system in accordance with regulatory practices.

6.9.2. Source of Water Supply

The primary source of water for drinking and domestic purposes at the project site is provided through a ground potable water from motor /turbine or government-regulated supply system. This ensures a consistent and safe provision of potable water, meeting the daily needs of the staff and operational requirements of the facility.

6.10. Quantification and Disposal of Solid Waste

6.10.1. Process Solid Waste Quantification:

At LS Industries (PRIVATE) LIMITED, no solid waste is currently being generated as the company has not yet been constructed. In the future, the process itself will not produce any solid waste, except for empty raw material drums, which can either be reused or sold to external suppliers. These wastes will be non-hazardous, fully recyclable, and will be handed over to third-party vendors for further processing and recycling.

6.10.2. Municipal Solid Waste Quantification:

The domestic waste that will be generated at the facility will be minimal, estimated at around 3–5 kg per day.

6.10.3. Disposal Mechanism of Solid Waste

LS Industries (PRIVATE) LIMITED will establish a structured and environmentally sound solid waste management system to ensure compliance with environmental regulations and promote sustainability across its operations.

6.10.4. Process Solid Waste Disposal:

All process-related solid waste will be managed responsibly. There will be no such process waste, and no hazardous solid waste will be generated.



6.10.5. Municipal Solid Waste Disposal:

Municipal waste will be segregated on-site at the point of generation. Waste bins will be placed strategically around the premises for separate collection of organic and inorganic waste. Final disposal will be handled by the Government of Punjab through regular waste collection services using dumpers or compactors

6.10.6. Intermediate Disposal Site:

To ensure effective waste management, three types of bins will be used for intermediate disposal, dedicated to paper, plastic, and organic food waste. This segregation at the source will aid in efficient recycling and environmentally friendly disposal practices.

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CHAPTER 7

IMPACT ASSESSMENT

7.1. Methodologies for Impact Identification

To identify potential impacts arising from the proposed project activities, a comprehensive assessment was conducted. This involved an in-depth evaluation of project activities, an analysis of the surrounding environment, a review of relevant literature, and insights from expert opinions.

7.1.1. Checklist Methodology

A checklist methodology is utilized for systematically screening and identifying potential impacts. Additionally, expert judgment was incorporated to recognize any residual impacts that may persist despite the implementation of mitigation measures.

Potential Environmental Impact	Significance of Impact				Recommended mitigation measures
	None	Small	Medium	Large	
A. Due to Project Location					
Changes in hydrology affecting existing property values of land.		✓ ST			Careful design and planning to minimize/offset problem.
Changes in drainage pattern/water flow obstruction		✓ ST			Appropriate design to minimize/offset problem.
Changes in land uses		✓ LT			Appropriate design and careful planning.
Loss of ecology		✓ ST			Careful planning and design to avoid cutting of large trees.
Displacement of population/Resettlement	✓				Project lies in an approved Industrial Estate.
Loss of Historical/monuments/cultural values	✓				Project lies in an approved Industrial Estate.

Endangering of species	✓				There do not exit any endangered species at the site.
Environmental aesthetics		✓ ST			Ensure minimum loss of vegetation and do excessive plantation.
B. Due to Project Design					
Unnecessary damages because Operation & Maintenance (O&M) requirements are too high		✓ ST			Realistic O&M assumptions
Assumed pollution removals not realized		✓ ST			Appropriate design/equipment selection
Environmental pollution control operations		✓ ST			Careful planning, designing, , and use of appropriate standards
Impairment of downstream beneficial water uses	✓				Careful planning &
Impacts on adjacent land economic users including recreation/tourism		✓ ST			Careful planning/O&M
Intensification of national socioeconomic imbalances					Planning to be consistent with policies
Traffic congestion and nuisances along routes					Careful planning and time preferences
C. Construction and Decommissioning Phase					
Changes in land use		✓ LT			Careful planning
Environmental aesthetics	✓				Ensure minimum loss of vegetation and excessive plantation
Water pollution		✓ ST			Design proper sewerage system and

					dispose of wastewater after treatment
Dust emissions			✓ ST		Time-to-time water sprinkling
Gaseous emissions		✓ ST			Regular maintenance of vehicles and other machinery
Runoff erosion		✓ ST			Careful planning, proper storage/piling of construction & demolition waste
Increased noise & vibration levels			✓ ST		Ensure proper lubrication of machinery and vehicles, excessive plantation, prefer daytime hours
Uncovered cut & fill trenches/areas		✓ ST			Careful planning and implementation
Explosion/fire hazards/hazardous materials spills		✓ ST			Firefighting system, fire alarms, emergency response system, careful transfer of oils, etc.
Sanitation disease hazards		✓ ST			Training sessions for workers, proper disposal of wastewater and solid waste, provision of sanitation-related facilities at the site
Thrust Boring/Trenching/quarrying/blasting hazards		✓ ST			Careful accomplishment of the related activities and tasks

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Workers' accidents/health & safety risks			✓ ST		Conduct training, provide PPEs, arrange firefighting system, provide first aid kit on site.
Blockage of wildlife passageways	✓				There do not exist any wildlife passageways
D. Operational Phase					
Inadequate Operation & Maintenance		✓ ST			Adequate O&M according to set procedures
Inadequate operations phase/environmental		✓ ST			Adequate as per provided plan
Hazards to workers' health & safety			✓ ST		Readiness for emergency, provision of first aid facility at the site
Air quality deterioration	✓				Vehicles and other machinery maintenance on a regular basis, time
Increased noise levels		✓ ST			Regular lubrication and maintenance of machinery, periodic noise , use of noise barriers where necessary
Water resources contamination	✓				Install and maintain proper sewerage system, ensure wastewater is treated and reused where possible, implement water quality

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Lowering of ground water table		✓ ST			Implement rainwater harvesting, adopt water conservation techniques, regular inspection for leakages and wastage
Land/soil contamination	✓				Strict handling, segregation, collection, and disposal of waste materials as per environmental regulations
Nuisance to public due to industrial & transportation activities		✓ ST			Schedule transportation activities during off-peak hours, use low-emission vehicles, enforce speed limits within sensitive areas
Changes in human settlements	✓				Ensure zoning compliance, conduct stakeholder consultations, minimize project impact on surrounding areas
Depreciation of environmental aesthetics		✓ ST			Implement landscape restoration, greenbelt development, and excessive plantation around the project site

Once the potential impacts have been identified, the next step involves evaluating each impact using a structured approach. The assessment process includes the following steps:

- Classification of Impacts: Anticipated impacts are categorized into direct, indirect, and induced impacts. These impacts are further classified based on their nature, such as:
 - Positive or negative impacts
 - Minor, moderate, or major impacts
 - Local or widespread impacts

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- Temporary or permanent impacts
- Short-term or long-term impacts
- Reversible or irreversible impacts

This classification helps in understanding the severity and extent of each impact.

- **Impact Quantification and Comparison:** Where possible, impacts are described quantitatively; otherwise, qualitative assessments are conducted. The magnitude of these impacts is determined by comparing baseline conditions with predicted scenarios. Various models or past experiences with similar activities may be used for comparison. However, uncertainties in baseline conditions, external developments, and proposed activities can influence impact predictions.
- **Identification of Significant Impacts:** If the predicted impact is found to be significant based on the established criteria for determining significance, suitable mitigation measures are proposed. These measures aim to reduce, control, or eliminate adverse impacts.
- **Mitigation Measures and Residual Impacts:** Implementing recommended mitigation measures minimizes the negative effects of the project and ensures that impacts remain within acceptable limits. After applying mitigation strategies, any remaining impacts are referred to as residual impacts.

Impact Matrices Methodology

To systematically assess project impacts, an impact evaluation matrix is used. This matrix categorizes impacts across different project phases, such as:

- Design Phase
- Construction Phase
- Operational Phase

By structuring the evaluation process into these phases, a comprehensive understanding of project-related impacts is achieved, allowing for effective mitigation strategies at each stage.

Classification	Impacts		
	Design	Construction	Operation
Physical Environment			
Geographical Landscaping	-2P	-3T	2P
Quality of Air	-2P	-3T	2P
Quality of Drinking Water	T	1	3P
Quality of Wastewater	-1T	-2T	-1T
Noise Levels	-1T	2T	1T
Infrastructure Arrangement	-2P	1P	3P
Solid Waste Management	-1T	-1T	3P
Ecological Environment			
Trees	1P	-1T	2P

Shrubs	1P	-1T	2P
Birds	P	-1T	1P
Socio-Economic Environment			
Quality of Life	-2T	-3T	2P
Value of Assets	-2T	-3T	3P
Traffic & Transportation	-2T	-3T	P
Business Opportunities	-2P	-3T	3P
Aesthetic Value	2P	-3T	T
Public Health & Infrastructure			
Public Health	-2P	-3T	1P
Graveyard	0	0	0
Mosques	0	0	0
Key: + = Positive; - = Adverse; 3= High; 2= Medium; 1= Low; 0= Negligible; P= Permanent; T= Temporary			

7.1.2. Inspection Procedures

As the project has entered the operational phase without prior EIA approval—resulting in a legal non-compliance—regular environmental inspections are now being conducted to ensure alignment with EIA mitigation requirements. Third-party environmental consultants and internal HSE teams perform periodic inspections to monitor environmental parameters such as emissions, effluents, noise, waste management, and resource consumption. The inspection results are documented and submitted to the Environmental Protection Agency (EPA) as part of post-violation compliance efforts. Any deficiencies identified are addressed through Corrective and Preventive Action Plans (CAPA).

7.1.2.1 Document Resources

The following documentation is maintained to demonstrate compliance and transparency after the EIA violation:

Retrospective EIA submission and approval correspondence

Baseline environmental assessments conducted post-construction

Environmental Management Plan (EMP)

and inspection reports

Legal notices and responses

Waste disposal records and third-party waste recycling agreements

Community grievance log (if applicable)

All records are available for review by regulatory authorities and third-party auditors.

7.1.2.2 Public Consultation

Public consultation is conducted during the retrospective EIA process to address concerns resulting from the initial unauthorized construction. Meetings with nearby residents, local government officials, and other stakeholders were held to explain the current environmental performance and corrective measures undertaken. Concerns related to air quality, noise, and waste disposal were noted and addressed in the EMP. Ongoing community engagement mechanisms are in place, including a designated contact person for environmental queries and a complaint redressal system.



Figure: 01



Figure: 02



Figure: 03

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7.2 Characteristics of Impacts

As part of the Environmental Impact Assessment (EIA) study for the project, the anticipated impacts were thoroughly evaluated. Below is a list of the key categories used for impact characterization:

- Nature of Impact (Direct or Indirect)
- Duration of Impact (Short-term, Medium-term, Long-term)
- Geographical Scope (Local or Regional)
- Timing (Project Phase)
- Reversibility (Reversible or Irreversible)
- Likelihood of Occurrence (Certain, Likely, Unlikely)
- Severity of Consequences (Severe, Moderate, Mild)
- Significance of Impact (High, Medium, Low)

Table : 7-2 Characteristics of Impacts

Categories	Impact	Characteristics
Nature of Impact	Direct	The environmental parameters are directly affected by the project construction or operation.
	Indirect	The environmental factor changes as a result of alteration in another parameter.
Duration of impact	Short Term	The impacts that last only during the construction of the proposed project (e.g., noise from construction activities).
	Medium Term	Lasting for a period of few months to a year; naturally returning to original condition (e.g., loss of vegetation due to campsite clearing, soil/water contamination).
	Long Term	Lasting for a period much greater than medium term before reverting to original condition (e.g., soil erosion).
Geographical Scope	-	The geographical extent may be local or regional.
Project Phases	-	Pre-construction Phases (designing), Construction Phases, Operational Phases.
Reversibility	Reversible	The impacts that don't cross ecosystem threshold value of resilience.
	Irreversible	The impacts that exceed ecosystem threshold value of resilience.
Likelihood of Occurrence	Certain	Impact will probably occur under most circumstances.
	Likely	Impact could occur at some time.
	Unlikely	Impact may occur but only under exceptional circumstances.

Severity of Consequences	Severe	Irreversible damage to unique environmental features; long-term socio-economic effects.
	Moderate	Reversible long-term damage; short-term socio-economic effects.
	Minor	Short-term reversible damage; localized effects.
	Negligible	No measurable damage; aligns with legislative requirements.
Significance of Impact	-	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.

7.3. Impact Analysis and Prediction

In order to give correct categorization to the present project Rapid Environmental Assessment Procedure will followed. It revealed that there are environmental impacts relating the proposed project which can be controlled by adopting proper mitigation measures. These impacts mainly attributed to the release of dust during construction phase and proper disposal of waste discharges from the industry but most of the impacts are projected as moderate/minor impacts. Also, the project has many positive impacts on local public and national economy. The management of proposed project will adopt proper procedures to carry out the construction and operation of the unit operation or in environmental friendly way.

7.3.1. Meetings

For the impact analysis and predictions detailed meetings were held with the proponent, management of proposed project and with other stakeholders. Potential factors that can affect the environment or local community in any way were discussed in relation to the implementation of proposed project. All possible mitigation measures were considered and are incorporated in the Environmental Management Plan.

7.3.2. Consultations

Scoping sessions, focused group discussion and way side consultations were held with the relevant stakeholders, inhabitants of the villages, shopkeepers and workers in the area. These included local government departments, educational institutes, TMA representatives, public representatives and local residents. The purpose of such consultations is to obtain the feedback from the relevant persons.

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7.4. Objectives:

The primary objective of this phase is to identify potential environmental, social, and health-related impacts associated with the proposed project using a comprehensive checklist method. The checklist approach ensures that all possible impacts are considered systematically.

7.4.1. Impacts Identification with Checklist

These include physical aspects such as air quality, water resources, soil conditions, and geological stability; biological aspects including flora, fauna, and potential disruption to natural habitats; and socio-economic considerations such as employment generation, land use changes, and the potential for displacement or resettlement. Cultural factors, including the presence of archaeological, historical, or religious sites, are also taken into account, along with health and safety concerns related to noise, exposure to pollutants, and occupational hazards.

The checklist facilitates categorization of impacts by classifying them as positive or negative, direct or indirect, short-term or long-term, and reversible or irreversible. It also serves as a foundation for further analysis in the subsequent phases of impact prediction and evaluation. To ensure accuracy and context-specific relevance, the checklist is developed by referring to international EIA guidelines, adapted to local conditions, and validated through a review of similar projects, field visits, and stakeholder consultations. Additionally, the checklist aligns with national and provincial regulatory frameworks to ensure full compliance. The final output of this phase is a comprehensive and tabulated summary of the likely impacts, highlighting their nature, duration, and significance, and indicating whether further investigation or mitigation measures are required.



CHAPTER NO 8

SCREENING OF POTENTIAL IMPACTS AND MITIGATION MEASURES

This chapter presents an evaluation of potential environmental, social, and economic impacts associated with the project, along with an assessment of their severity based on stakeholder feedback and baseline data collected at the inception of the Environmental Impact Assessment (EIA) process.

The screening process is a crucial component of environmental assessment, ensuring that all significant environmental and social aspects related to the industrial unit are identified at various stages, including pre-construction, establishment, and operation. Environmental concerns raised during stakeholder meetings and through the screening process have been assessed for their severity, and appropriate mitigation strategies have been proposed accordingly.

Institutionalizing compensatory mitigation involves integrating impact assessment procedures to discourage projects that may result in irreversible environmental damage. The mitigation strategies outlined in this chapter are designed to be implemented by the project proponent to minimize, reduce, and, where possible, compensate for negative impacts. These measures can be effectively identified and implemented by addressing the following key questions:

8.1. What is the Problem?

The planet faces numerous environmental challenges, including the depletion of natural resources and adverse effects on livelihoods. Many of these issues are intensified by unsustainable industrial practices. If left unaddressed, environmental degradation can directly impact businesses through supply chain disruptions and indirectly affect public health, leading to reduced workforce efficiency and increased operational costs.

To ensure sustainability and long-term financial viability, industries and businesses must proactively address these environmental concerns.

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

The environmental challenges associated with the project will primarily manifest within the project premises and its surrounding areas. The extent of the impacts will depend on the geographical range affected by project-related activities. These impacts are likely to become evident after the commencement of project development.

To mitigate potential risks, environmental concerns must be identified during the planning phase. Effective mitigation strategies should be integrated into project design to minimize adverse effects. The primary objective should be to prevent environmental damage from occurring; however, if it

does happen, swift mitigation measures should be implemented at the earliest possible stage to reduce its impact.

8.3. Where the problem should be addressed!

The issues will arise within the project premises and extend to areas near the project's boundaries. To effectively mitigate them, interventions should be implemented at the source, ensuring that potential environmental risks are minimized where they originate.

8.4. How the problem should be addressed!

The identified issues should be assessed based on their severity and addressed through environmentally sustainable practices. Impacts should be either prevented entirely or minimized to the greatest extent possible. Effective mitigation strategies must be implemented, and adherence to the Environmental Management & Plan is essential to ensure long-term sustainability.

8.5. Anticipated Environmental Impacts due to Project & Mitigation measures

The proposed project site will be situated in industrial zones declared by TMA an area already approved by the Environmental Protection Department. Additionally, there are no human settlements within the project's vicinity, nor are there any archaeological sites of significance nearby. Given these findings, no sensitive receptors are present in the immediate surroundings of the project site. Following a comprehensive environmental assessment of the study area, the selected location has been deemed most suitable for project execution.

Mitigation measures

As a result, no mitigation measures are required.

8.6 Environmental Screening of the Proposed Project

The environmental screening process is an essential part of the Initial Environment Examination (IEE), particularly for projects such as the proposed LS Industries (PRIVATE) LIMITED Polyurethane chemical manufacturing, located at 23-KM Lahore–Sheikhupura Road, Lahore. This section identifies the project's likely environmental impacts and evaluates the need for mitigation measures, as per the standards and regulatory requirements of the Pakistan Environmental Protection Agency (EPA) and provincial EIA regulations.

8.6.1 Objectives

The key objectives of the environmental screening for LS Industries' proposed Preform of Polyurethane, Plastic Compounding and Allied Products Manufacturing are:

- **To determine the nature, scope, and scale of potential environmental impacts** from project activities across all phases—pre-construction, construction, and operation—in accordance with EIA guidelines

- **To assess the project's compatibility with existing land use**, particularly given that the site is within a designated industrial zone approved by TMA and the Environmental Protection Department.
- **To support regulatory classification** under Schedule II or II as per EPA's regulatory framework.
- **To identify if a full Environmental Impact Assessment (EIA)** is needed based on screening results.
- **To facilitate informed decision-making by regulatory bodies**, ensuring that environmental, social, and health-related risks are addressed early in the project lifecycle.
- **To proactively incorporate stakeholder feedback**, collected during consultation sessions, into the project's environmental planning.

8.6.2. Environmental Impact Characterization

Environmental impact characterization for the proposed project involves assessing the **type, intensity, duration, extent, frequency, and reversibility** of potential impacts in line with national EIA procedures and EPA requirements.

Type of Impact: Predominantly related to emissions, noise, solid waste, energy consumption, and raw material use during manufacturing.

Duration: Long-term impacts during operational life; short-term during construction.

Extent: Primarily limited to the project premises and surrounding industrial area.

Reversibility: Most impacts are **reversible** through standard environmental management practices.

Severity: Given the absence of sensitive receptors (e.g., residential areas, schools, hospitals, heritage sites) near the site, the severity of potential impacts is considered **low**.

The project's impacts have been deemed **manageable** under an Environmental Management Plan (EMP) and do not trigger irreversible damage, satisfying EPA and EIA impact characterization benchmarks.

8.6.3. Environmental problems due to installation of Project at present location

As per EIA site evaluation protocols and EPA screening criteria, the selected location for LS Industries' Preform of Polyurethane, Plastic Compounding and Allied Products Manufacturing does **not pose significant environmental problems**, owing to the following reasons:



The site is located in a **pre-approved industrial zone**, free from ecologically sensitive or protected areas.

There are **no nearby residential communities** or **heritage structures** that could be affected by noise, air emissions, or traffic congestion.

Infrastructure access (roads, utilities, etc.) is already available, reducing the need for additional development that could stress local ecosystems.

Topography and soil conditions are suitable for industrial use, with minimal risk of erosion or runoff-related impacts.

Ambient air and noise quality levels, based on baseline studies, are within acceptable limits and not expected to deteriorate significantly due to this project.

Conclusion:

Considering the project's location, scale, and nature, **no major environmental problems are anticipated** due to installation at the present site. Hence, the **environmental screening confirms the appropriateness of the project location**, and no relocation or significant redesign is warranted. Mitigation, if needed, will be addressed via the project's comprehensive Environmental Management Plan.

8.7. Anticipated Environmental Impacts during Proposed Project

Design/Pres-Construction Phase

The industry's construction and operational phases will be executed in a structured and well-planned manner, incorporating state-of-the-art machinery. Various factors have been carefully evaluated to anticipate and mitigate any potential environmental impacts.

8.7.1. Land Acquisition

The project is planned for development at , 23km Lahore-Sheikhupura- Road, LAHORE, . The necessary Provisional Allotment Letter is included in the documents submitted along with the Environmental Impact Assessment (EIA) Report.

8.7.2. Topography

Impact:

The project site features a relatively flat topography, and no major excavation activities are planned. Therefore, no significant alterations to the natural landscape are anticipated.

Mitigation:

Since no major changes to the topography are expected, mitigation measures are not required.

8.7.3. Changes in Land Value

Impact:

The proposed project is likely to influence land value in the surrounding areas, bringing both positive and negative effects. However, the overall impact is expected to be permanent and beneficial, particularly for nearby residential and commercial zones.

Mitigation:

Since the impact is projected to be positive, no specific mitigation measures are needed.

8.7.4. Safety of Infrastructure

Impact:

As stated earlier, the project site falls within zone. Therefore, all building structures have been designed in accordance with seismic safety requirements and other essential structural parameters to ensure stability and resilience.

Mitigation:

Given that necessary precautions have already been incorporated into the design, no further mitigation is required.

8.7.5. Flora

Impact:

The project site does not contain significant vegetation or large trees. However, a small number of self-growing shrubs and herbs will need to be cleared to facilitate construction activities.

Mitigation:

Although the impact on vegetation is minimal, a plantation plan will be implemented, ensuring that trees are planted along the boundary of the industrial site as part of environmental conservation efforts.



8.7.6. Impact of Infrastructure Development

Impact:

The project site is situated in zones declared by TMA, Shiekhupura, where essential infrastructure such as roads, electricity, water supply, and drainage systems are readily available. Additionally, the area has significant potential for further infrastructure expansion in the near future.

Mitigation:

No mitigation measures are necessary.

8.7.7. Traffic Flow Patterns

Impact:

The proposed site includes a single designated entrance and exit point, which will continue to be used in the future. As a result, existing traffic flow patterns will remain unaffected.

Mitigation:

Since no traffic disruptions are anticipated, mitigation is not required.

8.7.8. Water Supply Availability

Impact:

Water supply for the project site will be managed by govt of punjab & LS. To ensure adequate water availability, tube wells have already been installed at various locations **Mitigation:**

No mitigation measures are necessary as the existing water supply infrastructure is sufficient.

8.7.9. Seismic Risk Assessment

Impact:

Pakistan is located in an active seismic zone. According to UN-Habitat's seismic classification, the project site falls within Zone 2B. Seismic indicates that the region experiences numerous minor tremors annually, though most of them are of low intensity and do not pose significant risks.

Mitigation

The proposed industrial structure will be designed and built to withstand low to moderate seismic activity. To ensure structural integrity, updated seismic and structural evaluations will be conducted by the design engineers. The durability and strength of the structure will be assessed to confirm its capability to endure moderate to high-intensity earthquakes.



8.8. Anticipated Environmental Impacts during the Construction Phase of Proposed Project.

The potential environmental impacts expected during the construction of the proposed industrial facility are outlined below:

8.8.1. Topography

Impact:

Since the project site is located in a flat terrain, extensive excavation work is not required except for leveling purposes. Consequently, the impact on the natural topography will be minimal.

Mitigation:

No specific mitigation measures are required.

8.8.2. Soil

Impact:

The project area consists of flat land with paved roads. However, minor soil erosion may occur along roadsides and within construction camps. Additionally, contamination risks exist due to possible oil and chemical spills in areas such as asphalt plants, workshops, and equipment washing zones. Despite these factors, the overall impact on soil quality is expected to be minor and localized.

Mitigation:

All excavated soil will be disposed of at designated sites, and disturbed areas will be restored to their original condition. To minimize erosion, low embankments will be stabilized by planting grasses and shrubs in appropriate locations.

8.8.3. Ambient Air Quality

Impact:

Air quality may be affected by dust emissions from construction activities, including machinery operations, movement on unpaved surfaces, and transportation of materials. These airborne particles and emissions can disperse over extended distances, potentially impacting surrounding areas. Depending on wind speed, direction, surrounding air temperature, and atmospheric stability, there may be fluctuations in dust dispersion. Additionally, an increase in traffic due to construction activities can contribute to emissions of sulfur dioxide (SO₂), nitrogen oxides (NO_x), carbon monoxide (CO), and suspended particulate matter. Moreover, the use of uncovered vehicles for transporting construction materials such as gravel, sand, and cement along with improper storage practices, can lead to the dispersal of particulate matter into the surrounding environment.

These fugitive dust emissions have the potential to cause significant nuisance to workers at the site as well as to nearby communities.

Mitigation:

To reduce dust emissions, several mitigation measures will be implemented, including:

- Haul trucks carrying earth, sand, aggregate, and other materials shall be covered with tarpaulin to help contain construction materials within the body of each carrier.
- Surface areas of stockpiles will be kept minimized to reduce the exposed surface area and prevent wind scouring. Dust-producing building materials such as sand and cement should be stockpiled in low structures and stored in covered areas where they cannot be easily washed away by rainfall.
- Dust suppression methods, such as periodic water sprinkling, should be adopted.
- All construction plant and equipment must be maintained in good working condition and should not be left running when not in use.
- All vehicles, machinery, equipment, and generators used during construction activities should be kept in good working condition, properly tuned, and maintained to minimize exhaust emissions.
- Open burning of solid waste from contractor camps should be strictly prohibited.
- Preventive measures against dust should be adopted for on-site material mixing and unloading operations.
- Regular water sprinkling of the site should be carried out to suppress excessive dust emissions.
- Emissions from power generators and construction machinery are major point sources at construction sites. Proper maintenance and repairs are necessary to minimize hazardous emissions.
- NEQS (National Environmental Quality Standards) applicable to gaseous emissions generated by construction vehicles, equipment, and machinery should be enforced during construction work.
- Construction workers should be provided with masks for protection against dust inhalation.
- Regular of air quality in accordance with NEQS shall be carried out.

8.8.4 Noise and Vibration

Impact:

During construction, processes like compaction, blistering, mixing of raw material machinery, granulation, use of heavy machinery for site clearing, and transportation of construction materials can generate noise and vibration around the project site. The likely impacts of increased noise levels include psychological effects such as distraction of attention, irritation, and short-temperedness in exposed individuals due to persistent high noise levels.



The noise and vibration would not directly affect the residents of the nearby area, as residential units are farther from the site, making noise impacts localized. Overall, the environmental impact of noise from construction would be low and mainly confined to daylight hours.

Mitigation:

- A cost-effective way to reduce noise at a construction worksite is to employ quieter equipment. Avoid using over-powered or under-powered equipment. Generally, electronic-powered equipment is quieter than diesel-powered, and hydraulically powered equipment is quieter than pneumatic-powered.
- Work activity scheduling is an administrative measure to control noise exposure. Planning how noise sources are sited and organized at the worksite can reduce noise hazards. Jobs can be rotated to limit exposure time.
- Noisy equipment should not be operated longer than necessary and should be switched off when not in use.
- Regular maintenance of tools and equipment should be ensured to reduce worksite noise levels. Keeping machinery in good condition not only reduces noise but also increases its life but makes it safer to use and quieter. Loose and worn parts should be fixed as soon as possible.
- An effective way of reducing noise is to locate noisy equipment behind purpose-built barriers. The barriers can be constructed on the work site from common construction building material. The noise source should not be visible and barrier should be located as close as possible to either the noise source or the receiver.
- Vehicles' drivers will be instructed not to play loud music and avoid usage of horn around the site. Noise control measures will be taken such as provision of silencers on the heavy construction vehicles.
- The green zone of plants will also help decrease sound levels.

8.8.5. Construction Waste Disposal

Impact:

Due to construction activities, waste will be generated at construction and contractors camp site. If it is not managed properly, it could have negative impacts on the site and surrounding area. If not disposed of at approved disposal sites and gets dispersed, it can result in the blockage of drainage channels if.

Mitigation:

- Employees will be trained in basic segregation procedures, giving incentives and rewards to ensure they follow them.
- Reusable/recyclable (iron bars, aluminum) waste should be sold to waste vendors and those which cannot be sold out may be used as a filling material for leveling the depressions, subject to technical feasibility.

- The material which is in good and resalable condition, such as; doors, windows, wood and wood products, some metals, cardboard, paper, plastic crates, containers, bags and sheets, in good, will be recycled or reused.
- A site waste management plan will be made the responsibility of the building contractor. A schedule for the timely collection and disposal of construction debris to an approved dump site will be developed.
- Solid waste generated during construction and camp sites should be safely disposed in demarcated waste disposal sites.

8.8.6. Municipal Solid & Liquid Waste

The municipal waste will be in the form of food, cans, paper and wastewater, toilets and washing yards. If not managed properly, this will result in unhygienic conditions, health risk to work force at the camp site. If left unintended, it can become a source of nuisance and environmental pollution in the project area. The impact is considered to be temporary and moderate adverse in nature.

Mitigation:

- Solid waste generated should be safely disposed in demarcated waste disposal sites and the contractor should provide a proper waste management plan.
- The sewage system for camps should be properly designed (pit latrines or, as required, septic tanks) to receive all sanitary wastewaters.
- Lined wash areas should be constructed within the camp site or at site, for the receipt of wash waters from construction machinery.
- Construction workers and supervisory staff should be encouraged and educated to practice waste minimization, reuse and recycling to reduce quantity of waste.

8.8.7. Health and safety

Impacts:

Possibility of health and safety hazards of workers is always present during construction phases relating to working at height, moving objects, noise, slips, trips & fall, material & manual handling, electrical works, collapse and usage of harmful material. Health risks and work safety problems may result at the construction site if the working conditions provide unsafe and/or unfavorable working environment and due to storage, handling and transport of hazardous construction material. A number of factors having a negative impact on health and safety management include problems of communication due to low literacy level; unregulated practices on construction sites; adherence to traditional methods of working; non availability of equipment; extreme weather conditions; improper use of equipment and corruption.



Mitigation:

- Basic medical training shall be provided to specified work staff and basic medical service and supplies to workers.
- Layout plan for camp site, indicating safety measures taken by the contractor, e.g. firefighting equipment, safe storage of hazardous material, first aid, security, fencing, and contingency measures in case of accidents shall be developed
- Work safety measures and good workmanship practices are to be followed by the contractor to ensure no health risks for laborers
- Protection devices (ear muffs) should be provided to the workers doing job in the vicinity of high noise generating machines.
- Adequate sanitation, washing, cooking and dormitory facilities including light up to satisfaction shall be provided.
- Protective clothing for laborers handling hazardous materials, e.g. helmet, adequate footwear, protective goggles, gloves etc. shall be provided and usage of wearing these protective clothing during work activities shall be ensured.
- A worker will be assigned duties in relation to his physical and mental health and skills.
- To handle emergency medical situation, first aid facilities will be made readily available at the site and the contractor will ensure availability of transport to handle any emergency condition during construction activities at the project site.
- Training programs, that support the achievement of unit's staff and personnel's competency in relation to health, safety and environment, will be implemented.
- The supervisory staff and workers to the extent possible will be made to follow the messages and instructions displayed on HSE notice boards installed in the premises of the site, such as:
 - Be aware of emergency escape routes
 - Promptly report all accidents to the concerned environmental manager
 - Not smoke or produce flame in No Smoking Areas

8.8.8. Groundwater

Impact:

Groundwater table can get affected in two ways; Groundwater contamination and lowering of groundwater table.

There is a possibility that various materials like fuel, lubricant oil and other oily products, which are used during the construction phase may contaminate groundwater, if they are not handled properly. During the construction phase, the sanitary wastewater will be generated at the workers' camp(s). If this wastewater is allowed to stagnate in water ponds on the site, it can percolate into the soil, thereby, contaminating groundwater. This impact is temporary and minor negative in nature.



Mitigation

- Groundwater reserves will be protected from any source of contamination such as construction and oily waste that can degrade its potable quality
- The solid waste should be disposed of in designated sites to sustain the water quality for domestic requirements
- Water conservation strategy will be adopted to not cause the lowering of groundwater table
- Regular water quality shall be done.

8.8.9. Surface Water Quality

Impacts:

There is not any appreciable surface water body in the project influenced area in respect of wastewater discharge; hence, no impacts are predicted.

Mitigations:

No mitigation is required

8.8.10. Flora & Fauna

Impacts

The proposed project lies in an industrial zones declared by TMA, and thus there exist no flora & fauna at the project site. Hence, no negative impact on ecological environment will take place on account of cutting trees and clearing of vegetation from the site.

Mitigation

In order to reduce construction impacts on surroundings and workers, a tree plantation program has been designed by the project proponent as it would help in cleaning the environment during operational life of the project too. The landscape plan would assure that designated trees are planted and that areas suitable for planting are identified and landscaped using majority local trees and shrub species used for feeding by local bird species.

8.8.11. Socio-Economic Environment

A number of categories of employees will be required during the construction phase including skilled and unskilled laborers, engineer, contractor and a small number of other professionals. These levels of short-term employment will have a positive impact on the local economy and regional unemployment. The management of the Project shall capitalize positive attitude of people of Study Area towards this project by offering them maximum employment opportunities at construction stage of the project. Strong and comprehensive plantation plan will help lessen the fear of the local people towards environmental issues.

Saqib

Sustainable development approach through conservation of natural resources will prove to be the best strategy to compensate negative socio-environmental impacts. Environmental aspects of the project should be well taken care through the implementation of the Environmental Management and Plan (EMMP) as recommended in this report. Socially responsible attitude of the project management towards local people and resources will make the project people friendly. This is a moderate beneficial impact.

8.9. Anticipated Environmental Impacts during Operational Phase of Proposed Project

After completion of construction phase; operational stage will be commenced. Following impacts are foreseen during this phase;

8.9.1. Air quality

Impacts

The gaseous emissions from vehicles and generator can deteriorate the air quality of surroundings, though there will be slight increase in vehicular movement.

Mitigation

An awareness program will be run for owners of the vehicles to keep the vehicles always tune-up and ensure proper maintenance. The standby generator will be maintained well in time to avoid the black smoke. Proper tuning & lubrication work will be ensured on regular basis. Emissions of exhaust gases will be kept to minimal level employing state of the art and environment friendly machinery for the manufacturing process. Plantation will be done around the boundary wall to minimize the impact of gaseous emissions.

8.9.2. Noise

Impacts

Industrial noise from machinery such as reactors, and pumps can disrupt human health and daily activities. Elevated noise levels may lead to communication difficulties, increased stress, disturbed sleep, reduced concentration, and lower worker efficiency. Generators and high-speed production lines may further contribute to workplace noise.

Mitigation

- Earmuffs and earplugs will be provided to workers operating near high-noise machinery to ensure hearing safety.
- Dense tree plantations along facility boundaries around noisy equipment will reduce noise propagation.
- Regular tuning, lubrication, and maintenance of production machinery and generators will minimize noise emissions.

Saqib

- Noise levels will adhere to PEQS standards (75 dB (A) daytime limit for industrial zones). Production hours are confined to 9:00 a.m. – 6:00 p.m. to align with regulatory limits.
- Periodic noise audits will ensure compliance with permissible limits, preventing adverse impacts on workers or nearby communities.

8.9.3. Health & Safety

Impacts

Operational hazards in Polyurethane manufacturing include risks from high-speed machinery, thermal processes (e.g., melting polymers), chemical handling (e.g., adhesives, solvents), and electrical equipment. Potential incidents include burns, entanglement injuries, chemical exposure, and equipment malfunction.

Mitigation

- Machine guarding on Chemical reactors and pumps or lines to prevent physical injuries.
- Automated emergency shut-off systems for overheating or mechanical failures.
- Ventilation systems and PPE (gloves, goggles, respirators) for workers handling adhesives or solvents.
- Spill containment kits and trained response teams for chemical accidents.
- Regular drills on fire safety, equipment operation, and emergency evacuation.
- Mandatory safety certifications for staff operating specialized machinery.
- Routine health check-ups for workers exposed to heat, chemicals, or repetitive motions.
- First-aid stations and partnerships with nearby medical facilities for emergencies. Implementation of OSHA and PEQS standards for workplace safety, including ergonomic workstation design and fatigue management.

8.9.4. Solid Waste

Impacts

Improper management of production waste (e.g. empty drums of raw materials and chemicals) can lead to aesthetic degradation, soil contamination, and resource inefficiency.

Mitigation

Polyurethane manufacturing generated waste during the production will be segregated and will sell to the external contractor.

Municipal Waste:

Daily office/canteen waste (approx. 3–5 kg) will be segregated into recyclables (paper, plastic packaging) and organic waste. Punjab Govt will oversee secondary collection and disposal.



8.9.5. Wastewater

Impacts

Untreated wastewater from equipment cleaning, adhesive mixing, or cooling systems may contain micro plastics, chemical solvents, or adhesive residues, risking soil and water pollution.

Mitigation

Cooling water used in the cooling vessels for reducing the product temperature closed-loop systems to eliminate discharge. Water from floor cleaning (approx. 15–20 liters/day) sent to govt approved facility. Sanitary wastewater will be routed sent to govt approved facility as per compliance standards. there is no use of freshwater for cleaning of machines.

8.9.6. Landscaping

Impacts

The impacts on natural vegetation and sensitive plant communities are largely restricted to the construction phase. Operational phase impacts are likely to be restricted to maintenance activities within the site such as vegetation clearing through brush cutting from the internal road network. As such these impacts are considered to have a low intensity, and an overall Moderate-Minor significance.

Mitigation

Landscaping in the form of excessive plantation will be done at the site and the process of plantation will be kept continuous throughout project life. The massive tree rising along walls, rare end, vacant spaces available near the parking area and other places will act as a buffer zone. The plantation process to be started at construction stage shall be kept continued during operation phase of the project too. This will also make the air cleaner due to the production of pure oxygen and by adsorbing particulates from the air.

8.9.7. Socio-economic environment:

Impact

According to the social survey, the pressing needs of the area are provision of drinking water supply, health care facilities, education institutions and solid waste collection facilities along with development of road infrastructure.

Mitigation

A number of categories of employees will be required during the operation phase. This will include skilled and unskilled laborers, engineers, contractors and a small number of other professionals. These levels of employment will have a positive impact on the local economy and regional unemployment. The development of the proposed project will cause high positive impacts on them and their communities.

DEPT/AREA`	ACTIVITY	ASPECT	IMPACT	AIR EMISSIONS				EFFLUENTS				NOISE				REMARKS
				O	D	C	T	O	D	C	T	O	D	C	T	
Chemical Reactor (Heating Vessel) Cooling Vessel	Charging of chemicals into reactor	Use of hazardous raw materials	Air, water, and land contamination if spilled Air pollution; occupational health hazards	4	0	4	16	-	-	-	-	2	0	2	4	Current Control:
	Heating operation	Energy consumption (steam, hot oil systems)	Energy consumption	WASTE				ENERGY USED				SPILLAGE/ LAND.C				Closed-loop charging system Use of energy-efficient heaters - Monitor fuel usage
	Transfer to cooling vessel	Spillage/leakage during transfer	Soil and water contamination; fire hazard	O	D	C	T	O	D	C	T	O	D	C	T	Maintenance of transfer lines - Safety valves Lower Noise equipment used Ear protection (PPE) - Noise monitoring
	Noise from pumps and agitators	High noise levels	Occupational health impacts (hearing loss)					2	0	2	4	2	1	2	6	PPE provided to operators Additional Control: Develop SOP for handling of chemicals and waste Awareness training for

DEPT/AREA	ACTIVITY	ASPECT	IMPACT	AIR EMISSIONS				EFFLUENTS				NOISE				REMARKS
				O	D	C	T	O	D	C	T	O	D	C	T	
Injection Moulding	Transfer of hot product to cooling vessel Cooling of polyurethane mixture	Potential for leaks or spills of semi-reacted material	Soil and water contamination	-	-	-	-	-	-	-	-	4	0	4	16	<p>Current Control:</p> <ul style="list-style-type: none"> - Enclosed transfer lines - Regular line inspections - Spill containment system - Use of closed-loop cooling systems - Temperature control - Waste segregation and collection - Temperature monitoring & control system - Operators wear PPE - Machine maintenance schedules <p>Additional Control:</p>
		Energy use (heat and cooling)	Water resource consumption	WASTE				ENERGY USED				SPILLAGE/L AND.C				
		Noise from machines	Occupational health issues (hearing damage)	O	D	C	T	O	D	C	T	O	D	C	T	
		Use of cooling water or chilled water														
		Potential leakage of coolant fluids					4	1	4	20	4	0	4	16		

DEPT/AREA	ACTIVITY	ASPECT	IMPACT	AIR EMISSIONS				EFFLUENTS				NOISE				REMARKS
				O	D	C	T	O	D	C	T	O	D	C	T	
Packing and Storage	Filling of finished product into drums	Spillage or leakage of polyurethane product	Soil and water contamination; fire risk	4	0	4	16	4	0	4	16	-	-	-	-	<p>Current Control:</p>
			Risk of leaks, odor,	WASTE				ENERGY USED				SPILLAGE/L AND.C				
				O	D	C	T	O	D	C	T	O		C	T	

	Drum sealing and labeling	Residual hazardous material	and contamination																Trained operators - Spill containment system
	Drum movement using forklifts	Noise from machines	Solid waste generation																Use electric forklifts where possible - Forklift operator training
	Packaging material waste	Fuel use, emissions, and risk of drum damage	Soil or air contamination; safety hazard	4	0	4	1	6	4	1	4	2	0	4	0	4	1	6	Waste segregation and collection
	Improper drum stacking	Physical damage leading to spills																	Fireproof storage area - Fire extinguishers, hydrants - MSDS display Operators wear PPE Machine maintenance schedules - Store in shaded, ventilated area - Regular temperature checks

DEPT/AREA	ACTIVITY	ASPECT	IMPACT	AIR EMISSIONS				EFFLUENTS				NOISE				REMARKS	
				O	D	C	T	C	D	C	T	O	D	C	T		
Dispatch	Loading onto trucks	Fuel usage and emissions (trucks, forklifts)	GHG emissions	3	1	4	1	6	-	-	-	-	4	0	2	8	Current Control:
	Final packaging and sealing		Noise pollution	WASTE				ENERGY USED				SPILLAGE/L AND.C				Scheduled truck arrivals	
	Documenting delivery and consignment	Noise (engine idling, loading)	Resource use														Reduced vehicle idling
	Vehicle movement	Use of paper/plastic for labeling	Minor risk of ground contamination	3	1	4	1	6	4	0	2	8	3	1	4	1	6

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- The vehicles used for transportation of material will be properly designed, covered and cleaned to avoid any risk while departing to and from the project site.
- No structural changes shall be made in the project after grant of relevant NOCs.
- Environmental Management and Plan (EMMP) will be strictly operational throughout the project life.

Saqib

CHAPTER 9

ENVIRONMENTAL MANAGEMENT & PLAN (EMMP)

A comprehensive management plan is necessary to implement the recommendations and mitigation measures suggested after assessing and evaluating potential environmental impacts due to the development of the project.

The implementation of EMMP should be carefully coordinated with the design, construction and operation program of the project to ensure that relevant mitigation measures are implemented at the appropriate stage and that adequate resources are properly allocated to achieve the desired results. This EMMP has been prepared to satisfy the requirements of the Pakistan Environmental Impact Assessment (EIA) Review Procedures, 2022.

For effective environmental management, the management of the project should assign the necessary responsibilities to its Health, Safety and Environment team, which should be responsible for environmental of the project.

9.1. Objectives of EMMP

The EMMP provides a delivery mechanism to address potential impacts of the project activities, to enhance project benefits and to introduce standards of good practice to be adopted for all project works. The EMMP has been prepared with the objectives of:

- Defining roles and responsibilities of the project proponent for the implementation of EMMP and identifying areas where these roles and responsibilities can be shared with other parties involved in the execution and of the project.
- Outlining mitigation measures required for avoiding or minimizing potential impacts assessed in the EIA report.
- Developing a mechanism and identifying requisite parameters to confirm effectiveness of the mitigation measures recommended in the EIA report.
- Defining the requirements for communication, documentation, training and , management and implementation of the mitigation measures.

9.2. Schedule for Implementation and Environmental Budget

A dedicated environmental budget of PKR 260,000/annum has been allocated to implement mitigation measures, restore environmental damages, and ensure compliance with health, safety, and sustainability standards. This includes costs for pollution control technologies, environmental training, , and landscape rehabilitation.

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9.3. Responsibilities of Environmental Management Team

A dedicated environmental management team will be established to supervise environmental performance within the industry. This team will design, execute, and evaluate strategies aimed at fostering sustainable production practices. The team structure will include an Environmental Manager and Assistant Managers, with their key responsibilities outlined below:

Table 9-1: Roles and Responsibilities of Environmental Management Team

Position of Team Member	Roles and Responsibilities
Environmental Engineer	<ul style="list-style-type: none"> • Implement environmental policies and practices. • Design strategies to achieve targets and promote best practices. • Develop tools and systems to monitor performance and execute strategies. • Ensure compliance with environmental legislation. • Analyze and compile environmental performance data; report findings to staff, clients, and regulatory bodies. • Verify ethical and sustainable sourcing of materials. • Manage budgets for environmental initiatives. • Collaborate with senior management and directors. • Advocate for environmental priorities within the organization. • Deliver environmental training to all staff levels. • Prepare plans, reports, and educational resources. • Stay updated on environmental legislation (local and international). • Liaise with regulatory agencies (e.g., Environment Agency).
Assistant Manager (Compliance)	<ul style="list-style-type: none"> • Develop and manage systems to prevent legal and policy violations. • Evaluate control efficiency and implement improvements. Audit procedures and reports to identify risks or non-compliance. • Draft, update, and enforce company policies. Partner with HR and legal teams to uphold standards. • Assess future projects for compliance risks. • Review colleague work to detect compliance gaps and provide guidance. • Monitor regulatory updates and industry best practices.

	<ul style="list-style-type: none"> • Prepare compliance reports for senior management and regulators.
Assistant Manager EHS	<ul style="list-style-type: none"> • Research occupational health and safety regulations (e.g., OSHA standards) and develop organizational safety protocols. • Oversee safety and security teams. • Investigate company-wide accident and injury claims to align outcomes with organizational objectives. • Train all staff on health and safety policies and corporate safety targets.

9.3.1 Field Management and Quality Control

- Regular site inspections to monitor adherence to environmental and safety practices.
- Verification of waste management, emission controls, and resource usage.
- Documentation and reporting of non-compliance or deviations.
- Immediate corrective actions to address identified issues.
- Coordination with contractors and subcontractors to enforce environmental and safety requirements.

9.3.2 Independent Consultant

- Conducting environmental audits and compliance reviews.
- Validating environmental monitoring data and reporting.
- Advising on best practices and emerging environmental regulations.
- Supporting risk assessments and mitigation planning.
- Facilitating third-party verification for environmental certifications and compliance.

9.3.3 ON -the - Job Supervision

- Monitor work practices to ensure compliance with the Environmental Management Plan.
- Provide real-time guidance and corrective actions for environmental and safety deviations.
- Serve as the first point of contact for environmental and safety concerns on-site.
- Facilitate continuous communication between workers, management, and the Environmental Management Team.
- Promote awareness and accountability for environmental stewardship among all employees and contractors.

9.4. Institutional Capacity

Following functionaries will be involved in the implementation of EMMP:

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- Project proponent as the executor of Environmental Management and Plan
- Project contractor(s) as executors of the EMMP during construction phase of the project
- HSE/ Project Manager
- Environmental Protection Agency (EPA), Punjab as Government Department to review and monitor the implementation of remedial and mitigation measures as provided in EIA.

Specific responsibilities of key role players are illustrated hereunder.

9.4.1. Responsibilities of Management of Project

Management of the project will be responsible for the environmental management and supervisory affairs during the project activities. Environmental personnel designated by the management of the project will look after the environmental related issues during the project activities. The responsibilities of Environmental personnel are as follows:

- progress of the project as per planned schedule of activities.
- Exercising oversight over the implementation of environmental mitigation measures by the contractor.
- Documenting the experience in the implementation of the environmental process.
- Preparing training materials and implementing programs.
- Maintaining interfaces with the other lined departments/stakeholders and
- Reporting to the management of the projection the status of EMMP implementation.

9.4.2. Responsibilities of Project Contractor

Contractor appointed for the commissioning of the project including the auxiliary facilities is responsible for:

- Implementation of, or adherence to, all provisions of the EMMP and with any environmental and other codes of conduct required by the project.
- Provision of proper Personal Protective Equipment (PPE) to the workers and train them for their proper use.

9.4.3. Responsibilities of EPA :

As per Govt Laws.

9.5. Environmental Management and Plan (EMMP)

The Environmental Management and Plan (EMMP) serves as a strategic framework to systematically implement and monitor the mitigation measures outlined in the Initial Environment Examination (EIA) report.

The EMMP matrix delineates the following components:



- Specific actions recommended in the EIA report to minimize environmental impacts.
- Entities accountable for implementing these measures and compliance.
- Criteria to evaluate adherence to mitigation requirements.
- Timelines for executing mitigation actions and conducting activities.
- The project proponent retains ultimate responsibility for ensuring complete EMMP execution.
- Scrubbers are already installed at our operational site, and if further requirements arise in accordance with EIA guidelines, we will comply accordingly.

Table 9-2: Air Quality Management and Plan

Management Plan			Plan	
Sr. No.	Potential Impacts	Management and Measures	Timeframe	Responsible Authority
Reduce Exhaust Emissions				
1	Reduce Exhaust Emissions	Vehicle idling time shall be minimized.	Pre-construction, Construction	Proponent & Contractor
		Use alternatively fueled construction equipment where feasible; ensure equipment is properly tuned and maintained.	Pre-construction, Construction	Proponent & Contractor
		Sensitize truck drivers to avoid unnecessary engine racing at loading/unloading points and parking areas. Ensure engines are switched off at these points.	Pre-construction, Construction	HSE Representative
Reduce Dust Emissions				
2	Dust Emissions	Enforce on-site speed limits for vehicles.	Pre-construction, Construction, Decommissioning.	HSE Representative
		Cover construction materials to prevent wind dispersal.	Pre-construction, Construction,	Contractor
		Avoid excavation during extremely dry weather.	Pre-construction, Construction, Decommissioning	HSE Representative

		Sprinkle water on access routes to reduce dust.	Pre-construction, Construction, Decommissioning	HSE Representative
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Table 9-3: Noise Quality Management and Plan

Management Plan			Plan	
Sr. No.	Potential Impacts	Management and Measures	Timeframe	Responsible Authority
Minimization of Noise and Vibration				
	Minimization of Noise and Vibration	Sensitize construction vehicle drivers and machinery operators to switch off engines when not in use.	Pre-construction, Construction & Decommissioning	HSE Representative
		Sensitize drivers to avoid engine revving and unnecessary honking near sensitive areas (churches, mosques, schools, residential zones).	Pre-construction, Construction & Decommissioning	HSE Representative
		Ensure construction machinery is kept in good condition to reduce noise generation.	Pre-construction, Construction & Decommissioning	Proponent & Contractor
		Insulate generators/heavy-duty equipment or place them in enclosures to minimize ambient noise.	Pre-construction, Construction & Decommissioning	Proponent & Contractor
		Schedule noisy construction activities during daytime to minimize	Pre-construction, Construction & Decommissioning	Proponent & Site Foreman

		disturbance to neighboring areas.		
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Table 9-4: Waste Management and Plan

Management Plan			Plan	
Sr. No.	Potential Impacts	Management and Measures	Timeframe	Responsible Authority
Minimization of solid waste generation ensure efficient solid waste management				
	Increased solid waste generation	Implementation of a comprehensive solid waste management system following a prioritized approach: <ul style="list-style-type: none"> • Source reduction • Recycling • Reuse • Sanitary land filling 	Pre-construction, Construction & Decommissioning phase	Proponent/Contractor/HSE representative
		Accurately estimate material sizes and quantities required, order materials pre-cut to needed dimensions, and avoid excess residual materials	Pre-construction, Construction & Decommissioning phase	Project manager/Proponent/HSE representative
		Reuse leftover construction materials in other projects rather than disposing of them	Pre-construction, Construction & Decommissioning phase	Proponent/Project manager
		Properly manage damaged or wasted materials (e.g., pipes, doors, plumbing fixtures, marbles)	Pre-construction, Construction & Decommissioning phase	Proponent/Project manager

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	Donate recyclable, reusable, or surplus materials to local community groups and institutions.	Pre-construction, Construction, and Decommissioning phases	Proponent
	Use durable, long-lasting materials to reduce replacement frequency and minimize construction waste over time	Construction Phase	Proponent & Contractor
	Implement proper storage and handling facilities to prevent material damage or environmental waste	Pre-construction, Construction, and Decommissioning phases	Proponent & Contractor
	Prioritize building materials with minimal or no packaging to reduce packaging waste	Construction Phase	Proponent & Contractor

Table 9-5: Occupational Health and Safety Risks Management and Plan

Management Plan			Plan	
Sr. No.	Potential Impacts	Management and Measures	Timeframe	Responsible Authority
Minimization of Occupational Health and Safety Risks				
1	Health and Safety Impacts	Maintain continuous safety by deploying 24/7 security personnel and ensuring adequate lighting across the premises.	Continuous	Proponent/HSE Representative
		Construct a perimeter wall	Upon project commencement	Contractor/HSE Representative

		around the project site.		
		Provide PPE (overalls, safety footwear, masks, respirators, gloves, ear protection) and train personnel on proper usage.	One-time	Proponent/Contractor/HSE Representative
		Implement measures to safeguard worker and public health/safety during project operations	Continuous	Proponent/Contractor/HSE Representative
2	Health & Safety	Ensure availability of a well-stocked, easily accessible first aid kit on-site.	Pre-construction, Construction, Decommissioning	Proponent & Contractor
		Train personnel in certified first aid courses (accredited by recognized institutions).	One-time	Proponent & Contractor
3	Fire Protection	Install fire extinguishers in strategic locations (e.g., storage areas, construction zones).	One-time	Proponent & Contractor
		Conduct quarterly inspections and maintenance of equipment through certified service providers; maintain inspection records.	Quarterly	Proponent/Contractor/HSE Representative

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		Clearly mark fire escape routes and assembly points across the site.	Continuous	Proponent/Contractor/HSE Representative
		Display "NO SMOKING" signage prominently, especially near flammable material storage areas.	One-time	Proponent & Contractor

Table 9-6: Energy Consumption Management and Plan

Management Plan		Plan	
Potential Impacts	Management and Measures	Timeframe	Responsible Authority
Minimization of Energy Consumption			
Increased Energy Consumption	Turn off electrical equipment, appliances, and lights when not in use.	Throughout construction phase	Proponent & Contractor
	Replace high-energy bulbs with energy-efficient fluorescent tubes at all lighting points.	Pre-construction, Construction, and Decommissioning phases	Proponent & Contractor

Table 9-7: Water Consumption Management and Plan

Management Plan			Plan	
Sr. No.	Potential Impacts	Management and Measures	Timeframe	Responsible Authority
Minimization of Water Consumption				
	High Water Demand	Regularly inspect and repair water pipelines and tanks to prevent leaks.	Continuous	Proponent

		Ensure all taps are turned off when not in use.	Continuous	Proponent
		Install discharge meters at water outlets to track and monitor total water usage	One-time	Proponent/Construction Manager

9.5.1. EMMP for Construction Phase

The EMMP during Construction phase includes following:

- Air quality management & plan
- Noise management & plan
- Waste management & plan
- Health and safety management & plan
- Energy management & plan
- Water management & plan

Table 9-8: Air Quality Management and Plan

Management Plan			Plan	
Sr. No.	Potential Impacts	Management and Measures	Timeframe	Responsible Authority
Minimization of Air Quality Deterioration (Dust and Gaseous Emissions)				
	Gaseous Emissions	Maintain vehicles and generators regularly to ensure optimal performance. Plant vegetation around the site to reduce emissions.	Continuous	Proponent/HSE Representative

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Table 9-9: Noise Management and Plan

Management Plan			Plan	
Sr. No.	Potential Impacts	Management and Measures	Timeframe	Responsible Authority
Minimization of Noise and Vibrations from Machinery				
	Noise and Vibrations	Purchase noise-reducing machinery designed for minimal vibrations.	One-time	HSE Representative
		Conduct regular inspections and maintenance of operational machinery to address wear and tear.	Throughout operation period	Proponent & Contractor
		Insulate generators and heavy-duty equipment to minimize noise levels.	Throughout operational period	Proponent & Contractor
		Schedule noisy operations during daytime hours to reduce disturbance to neighboring communities.	Throughout operational period	Proponent & Site Foremen
		Implement basic engineering and administrative controls for machinery operation.	Throughout operational period	HSE Representative

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Table 9-10: Waste Management and Plan

Sr. No.	Potential Impacts	Management and Measures	Timeframe	Responsible Authority
Minimization of Solid Waste Generation				
	Solid Waste Generation	Provide waste handling facilities (e.g., bins, skips) for proper segregation and disposal.	One-time	Proponent
		Collect and dispose of solid waste generated at offices and industrial areas.	Continuous	Proponent
		Train staff to manage waste efficiently through recycling, reuse, and proper disposal procedures.	Continuous	Proponent
		Donate reusable furniture and materials to charities and institutions.	Continuous	Proponent
Minimization of Sewage Release Risks				
	Sewage Disposal	Implement water conservation strategies to reduce sewage generation.	Continuous	Proponent & HSE Representative
		Inspect drainage pipes regularly for blockages or damage; repair issues promptly.	Continuous	Proponent & HSE Representative

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		Monitor wastewater discharge to ensure compliance with effluent quality standards and regulations.	Continuous	Proponent
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Table 9-11: Fire and Health & Safety Risks Management and Plan

Sr. No.	Potential Impacts	Management and Measures	Timeframe	Responsible Authority
Minimization of Fire and Health & Safety Risks				
	Health and Safety Impacts	Implement measures to safeguard worker and public health/safety during project operations.	One-time	Proponent
		Train workers on fire safety protocols	One-time	Proponent
		Install firefighting equipment (fire extinguishers, alarms, smoke detectors, hydrants) on-site.	One-time	Proponent

Table 9-12: Energy Consumption management and Plan

Management Plan			Plan	
Sr. No.	Potential Impacts	Management and Measures	Timeframe	Responsible Authority
Minimization of Energy Consumption				
		Turn off electrical equipment, appliances, and	Continuous	Proponent

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	Energy Resource Utilization	lights when not in use		
		Install occupancy-sensing lighting in low-traffic areas (e.g., storage zones).	One-time	Proponent
		Replace high-energy bulbs with energy-efficient fluorescent tubes across all lighting points.	One-time	Proponent
		Monitor energy consumption during operations and establish efficiency targets.	Continuous	Proponent
		Train workers on energy-efficient practices.	Continuous	Proponent

Table 9-13: Water Consumption Management and Plan

Management Plan			Plan	
Sr. No.	Potential Impacts	Management and Measures	Timeframe	Responsible Authority
Minimization of Water Consumption				
	Water Demand	Detect and repair leaks in water pipelines and tanks promptly.	Continuous	Proponent
		Ensure taps are turned off when not in use.	Continuous	Proponent

		Educate users on water conservation practices (e.g., minimizing water loss).	Continuous	Proponent
		Install automatic shut-off taps to reduce water wastage.	One-Time	Contractor/Construction Manager

9.6. Proposed Plan

Environmental will be structured into two categories:

- Compliance
- Effects

The activities will adhere to SMART criteria (Specific, Measurable, Achievable, Relevant, Time-bound) and comply with EPA regulations.

9.6.1. Compliance

Compliance aims to verify adherence to the stipulations outlined in the Environmental Impact Assessment (EIA) and Environmental Management & Plan (EMMP). Routine inspections will be conducted by project staff and contractors, including site-specific as outlined in the EMMP.

9.6.2. Effects

Effects focuses on evaluating the actual impacts of the project on designated sensitive receptors. This ensures timely identification of impacts either not foreseen in the EIA report or exceeding anticipated levels, enabling prompt implementation of corrective mitigation measures.

9.6.3. Components

The management of the proposed unit will perform periodic environmental assessments for the following critical components:

- Noise Levels
- Ambient Air Quality
- Water Quality
- Solid Waste Management
- Wastewater Disposal
- Vehicular Emissions
- Soil Contamination

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- Health and Safety

The can be performed through observation, in laboratory or by both means as per requirement such as;

Table 9-15: Proposed Program

Environmental Component	Type		Timeframe
	Observation	Laboratory	
Noise Levels	✓	✓	Twice a year
Ambient Air Quality	✓	✓	Twice a year
Water Quality	-	✓	Twice a year
Solid Waste Management	✓	-	Weekly
Wastewater Disposal	✓	-	Weekly
Vehicular Emissions	✓	-	Monthly
Soil Contamination (if needed)	✓	-	Twice a year
Health & Safety	✓	-	Twice a week

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9.6.4. Proposed EMP Reporting & Reviewing Procedures

The Environmental Management Plan (EMP) Reporting and Reviewing Procedures require the EMP to comprehensively outline all design measures, programs, best management practices, and emergency/contingency plans. These details ensure that potential environmental impacts are systematically controlled and appropriately mitigated. In addition to reviewing recommendations from the Initial Environment Examination (EIA) report, industry management must align the EMP with applicable guidelines for industrial units. This comparison ensures the EMP incorporates relevant standards and addresses site-specific requirements.

Furthermore, employee education and training materials must be submitted for review at least three weeks prior to the start of staff training programs to ensure alignment with EMP objectives and regulatory expectations.

9.6.5. Equipment Maintenance & Safety Protocol

The proposed project involves establishing LS Industries Pvt Ltd (Pvt.) Ltd. within the Industrial Zone. To ensure operational safety and compliance, the following measures will be implemented:

Key Responsibilities

- Management will:
 - Maintain comprehensive Health, Safety, and Environment (HSE) records.
 - Appoint a dedicated HSE Manager to oversee safety protocols and address HSE-related issues.
- Equipment & Vehicles:
 - All industrial machinery, tools, and vehicles will undergo routine maintenance to safeguard worker safety and operational efficiency.

Hazards & Mitigation

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While maintenance tasks carry inherent risks (e.g., mechanical failures, exposure to hazardous materials), a structured maintenance program will mitigate these hazards through:

1. **Organization & Scheduling:** Prioritize preventive maintenance to minimize unscheduled downtime.
2. **Hazard Control:** Implement lockout-tagout (LOTO) procedures during repairs.
3. **Standard Operating Procedures (SOPs):** Define clear protocols for equipment handling and maintenance.
4. **Personnel Training:** Train staff on risk identification, emergency response, and safe maintenance practices.

Preventive Maintenance

Regularly scheduled maintenance is critical to:

- Extend machinery lifespan.
- Reduce workplace accidents.
- Ensure compliance with environmental and safety regulations.

9.6.6. Meetings.

9.6.7. Change Management Plan

The Environmental Impact Assessment (EIA) acknowledges that adjustments to the Environmental Management and Plan (EMMP) or operational processes may become necessary during project execution. To address such scenarios, a structured Change Management Plan is outlined below, covering revisions to the EMMP and operational workflows:

Process for Modifications

1. Trigger for Changes:

Revisions may arise due to;

- a) Non-applicability of certain EMMP measures in specific operational areas
- b) Findings from environmental during construction/operation phases that necessitate additional mitigation.

2. Implementation Steps:

Project management and contractors will convene to discuss proposed deviations from the original EMMP, including revised designs or mitigation strategies. A formal report will detail the original EMMP clause/design, agreed-upon modifications, and rationale for changes. The finalized report will be signed by all parties, archived at the site office, and shared with project management and contractor headquarters.



9.7. Staff and Training:

The main thing for the enhancement of the project's overall environmental performance is to organize environmental training for the project personnel and the Contractor's team

9.7.1 Environmental Committee & Responsibilities

One of the most important mechanisms for the enhancement of the project's overall environmental performance is to organize environmental training for the project personnel and the Contractor's team. Environmental Committee will form part of the ongoing environmental management of the project. Contractor's 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 for the Contractor(s) workforce to implement effective environmental protection measures. Adoption of these measures will help Proponent and the Contractor to achieve a high level of environmental awareness in the project team, which should, in turn, promote sound environmental management during project lifespan.

9.7.2. Technical Training Program

Objective:

To provide employees of LS Industries (Pvt.) Ltd. with the technical skills and knowledge required to safely and efficiently operate equipment, manage production processes, and comply with environmental and safety standards.

Induction training for all new employees.

Safe operation of polyurethane preform and plastic compounding machinery.

Proper handling and storage of chemicals and raw materials.

Preventive maintenance and troubleshooting of equipment.

Training on Good Manufacturing Practices (GMP) and workplace safety.

Emergency response: fire safety, first-aid, and spill control.

Awareness of environmental compliance and pollution prevention.

Annual refresher training and quarterly drills for all staff.



9.7.3 Environmental Technical Assistance and Training Plan

Objective:

To ensure that all employees and contractors of LS Industries (Pvt.) Ltd. are competent, aware, and equipped with the technical knowledge and skills necessary to comply with environmental regulations, minimize environmental impacts, and maintain sustainable manufacturing operations.

1. Scope of Training

Covers employees involved in:

- Polyurethane preform production
- Plastic compounding operations
- Allied products manufacturing
- Waste handling, storage, and disposal
- Utilities and maintenance teams
- EHS (Environment, Health & Safety) staff

2. Training Needs Identification

Training needs will be identified based on:

- Regulatory requirements (EPA, PEQS, SEPA, etc.)
- Environmental aspects and impacts identified through risk assessments
- Operation of pollution prevention equipment (e.g., scrubbers, filters, ETP)
- Emergency preparedness and response requirements
- Periodic performance evaluations and audits



3. Types of Training Programs

Induction Training (for new employees):

- Company's Environmental Policy & NOC conditions
- Significant environmental aspects & impacts of operations
- Basic waste management practices (segregation, recycling, safe disposal)
- Chemical handling & spill response

Job-Specific Technical Training:

- Operation and maintenance of process equipment
- Safe handling of polyurethane, plastics, and chemical additives
- Control of air emissions, noise, and wastewater
- Energy and resource efficiency in production processes

Emergency Preparedness & Response Training:

- Fire prevention and firefighting drills
- Chemical spill control and neutralization
- Evacuation procedures
- First-aid and PPE use

Specialized Environmental Training (for EHS & Supervisors):

- Environmental legislation and compliance requirements
- ISO 14001:2015 Environmental Management System awareness
- Environmental monitoring (air, water, noise, waste)
- Reporting and record-keeping for regulatory compliance

Refresher Training:

- Conducted annually or after major process change/incident

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9.7.4 Training Schedule

A training schedule will be developed by the Health & Safety manager and organized and maintained by the management of the project and contractors. Following is the comprehensive form of the training schedule;

Table 9-16: Training Schedule

Provided by	Trainee	Contents	Duration	Responsible Authority
HSE Manager & Training Assistant	All working personnel	<ul style="list-style-type: none"> • Environmental laws and regulations, daily and supervision Introduction to project EIA and EMMP Importance of safety practices and usage of PPEs • Environmental sensitivities of the project area. • Communication of environmental problems to corresponding officials • Waste disposal 	Monthly	Project Management & Contractor
Consultants specializing in social management	Staff handling social matters	<ul style="list-style-type: none"> • Social awareness seminars • Effective public speaking workshops 	Monthly	Project Manager
Drivers	As specified	<ul style="list-style-type: none"> • Road safety and restrictions • Vehicle/driving regulations • Defensive driving techniques 	Twice a month	Project Management & Contractor
Occupational health and safety consultants	Relevant personnel	Lectures on occupational safety and health standards	Twice a year	Project CEO

9.7.5 Emergency Preparedness Plan

The Emergency Preparedness Plan (EPP) at **LS Industries (PRIVATE) LIMITED** is designed to ensure rapid, effective, and coordinated response to any emergencies that may arise during the construction, commissioning, and operational phases of the Polyurethane manufacturing Unit. This plan complies with national environmental regulations, occupational health and safety requirements, and best industry practices to minimize harm to personnel, property, and the environment.

Key Components:

Risk Identification and Assessment

Identify potential emergency scenarios specific to the project, such as chemical spills, fire outbreaks, machinery failure, power outages, and natural disasters (e.g., floods or earthquakes). Periodic risk assessments will be conducted to update preparedness measures.

Emergency Response Organization

Establish an Emergency Response Team (ERT) comprising trained personnel responsible for incident management, firefighting, first aid, evacuation, and liaison with external emergency services.

Emergency Communication System

Develop and maintain reliable communication channels, including alarms, two-way radios, emergency hotlines, and notification procedures to inform employees and external responders immediately.

Evacuation Procedures

Define clear evacuation routes, assembly points, and headcounts to ensure orderly and swift evacuation during emergencies. Regular evacuation drills will be conducted to familiarize all personnel.

Resource and Equipment Management

Maintain emergency response equipment such as fire extinguishers, spill kits, first aid supplies, personal protective equipment (PPE), and emergency power backup systems. Regular inspections and maintenance will be carried out.

Training and Awareness

Conduct regular training sessions and drills for employees and contractors to build capacity in emergency recognition, response actions, and use of emergency equipment.

Coordination with External Agencies

Establish links with local fire departments, hospitals, police, and environmental authorities to ensure prompt assistance and compliance with legal reporting requirements.

Incident Reporting and Investigation

Implement a system for documenting all emergency incidents, analyzing root causes, and integrating lessons learned into continuous improvement of the EPP.

Implementation and Review:

The Emergency Preparedness Plan will be integrated into the overall Environmental Management System (EMS) and regularly reviewed and updated based on operational changes, incident reports, and evolving best practices to ensure ongoing effectiveness and regulatory compliance.



CHAPTER 10

STAKEHOLDERS CONSULTATION

Public consultation is a mandatory component of the Environmental Impact Assessment (EIA) process, serving as a platform to engage diverse stakeholders, share project-related information, gather feedback, and address concerns. Its adequacy in disclosure and exclusivity is critical for ensuring compliance with national and international safeguard policies.

The consultation process followed Pakistan's Environmental Procedures and aimed to:

- Inform stakeholders about the proposed project's scope and objectives.
- Engage local residents and other stakeholders in participatory discussions.
- Share details on project design, construction, and anticipated environmental, biological, and socioeconomic impacts.
- Document stakeholder concerns regarding project activities, existing facilities, and potential positive/negative effects during construction and operation.
- Assess community perceptions and social impacts near the project site.
- Solicit constructive suggestions for project design improvements.
- Mitigate conflicts by identifying contentious issues early and collaboratively resolving them.

This section summarizes the outcomes of consultation sessions held with stakeholders directly or indirectly affected by the project.

10.1 Objectives of Consultation:

The main objectives of the public consultation were to:

Assess the social and environmental concerns of the affected stakeholders post-construction.

Ensure transparency by disclosing project activities and impacts.

Gather feedback on the current operational phase for future environmental management improvements.

Satisfy legal compliance under PEPA 1997 for retrospective EIA approval.



10.2. Methodology of Consultation

To evaluate stakeholder perspectives on the project during its construction and operational phases, consultation meetings were held near the proposed site from April 1st to 3rd, 2025. These engagements were conducted as part of the EIA regularization process due to the project having initiated construction activities prior to formal environmental approval, thereby falling under the violators' category.

The consultations aimed to:

Gather community feedback regarding environmental, social, and health impacts observed during the construction and current operational phase.

Address concerns related to air emissions, noise, wastewater discharge, and solid waste management.

Inform stakeholders of the mitigation measures being implemented post-construction under the Environmental Management Plan (EMP).

Rebuild trust with local communities through transparent communication and grievance redressal mechanisms.

Stakeholders received verbal project briefings, and their feedback was recorded. All concerns raised during consultations were forwarded to the project management team for review.

10.3. Stakeholders Consultations

Stakeholders consulted included:

Local residents living within 1 km of the facility.

Company Owner & Executive Assistance

Community elders .

10.3.1. Study Area and Identification of Stakeholders

The study area encompasses 24 KM Sheikhpura Road Lahore, under the jurisdiction of the Punjab Industrial Zone by TMA & other govt authorities. The proposed project site is located within the Industrial Zone declared by TMA.

Stakeholders, defined as entities with direct or indirect interests in the project, were identified through field surveys. Key stakeholders include:



- Management and employees of nearby industries.
- TMA administrative authorities.
- Local residents near the project site or industrial estate.
- Environmental experts.
- Customers, pedestrians, and road users.

Each stakeholder group's concerns and stakes were categorized based on their professional or residential affiliations. Informal group discussions supplemented individual assessments to gauge stakeholder perceptions and apprehensions regarding the project's implementation.

10.3.2. Categories of Stakeholders Consulted

The Stakeholders contacted during the survey belonged to different categories, as under;

10.3.2.1 Proponent's Environmental Management Team

Possible potential impacts and mitigation measures related to the proposed project during its construction phases were discussed in detail with the project proponent. They assured to undertake all the suggested mitigation measures to control, eliminate or minimize the anticipated potential impacts and control any discrepancy arose by the project to make the project environmental friendly. The environmental management team of the proponent was made aware of their responsibilities which include;

- Oversee daily activities of team members to maintain environmental management system (EMS).
- Ensure that industrial operations are in compliance with local, state and federal environmental regulations.
- Follow and enforce environmental policies and procedures.

10.3.2.2 The responsible Authority

The management of the industry is the responsible authority to take all mitigation measures to protect the environment prior to commencement of the project.

10.3.2.3 Other departments and agencies

Scoping Sessions, focused group discussion and way side consultations were held with the relevant stakeholders in the area. The purpose of such consultation was to obtain feedback from relevant personnel.

For the analysis of anticipated potential impacts, detailed meetings were held with the management of the subject industrial unit, local community surrounding the project area and bearers/ members of Faisalabad Industrial Estate. Issues were discussed that might affect the environment and implementation of proposed project. All the possible mitigation measures were considered and have been incorporated in the Environmental Management Plan (EMP) provided in this EIA report.



10.3.2.4 Environmental Practitioners and Experts

The expert team of OWS Consultants and Trainers visited the proposed project site, had discussion with stakeholders and consulted the personnel working in neighboring industries and local community residing nearby the industrial estate. People of the area belonged to different professions such as doctors, lawyers, government employees, teachers, agriculture etc. and some had their own business. People provided massive information about the project and most of them showed positive remarks regarding the project development.

Our Team

Name	Post	Qualification
Muhaamad Saqib Bashir	CEO	BE Chemical Engineering Lancaster University UK
Mehrab Fatima	Environmentalist	BS (Environmental Sciences)
Faisal Saeed	HSE	BS Chemical Engineer
Tanzeela Bashir	Environmentalist	MS (Environmental Sciences)

10.3.2.5. Affected Wider Community

There will be no affected community present within the radius of the study area. The local people are expected to show an optimistic attitude towards the development of the proposed unit. Stakeholder participation will be ensured through the use of EIA Public Consultation Forms and socio-economic questionnaires, which are filled to evaluate the potential impacts of the project, particularly socio-economic impacts. These completed consultation forms and questionnaires will be attached as appendices to this EIA report.

10.3.2.6 Issues Discussed.

Dust emissions and respiratory discomfort during construction

Lack of prior information about project impacts

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Figure 5



Figure 6

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CHAPTER 11.

CONCLUSION & RECOMMENDATIONS

This section outlines the conclusions of the Environmental Impact Assessment (EIA) Report. The EIA study has been conducted in accordance with the requirements of the EPA, Punjab. Based on the findings of this environmental review, the key observations are summarized as follows:

11.1. Conclusion

The implementation of the proposed project is expected to bring several positive outcomes, including:

- The industrial unit will help meet the increasing local demand for quality wire, corrugated pipes, and bicycles.
- The establishment of this unit will support industrial growth in the country, contributing positively to national GDP.
- Employment opportunities will be created for local residents, thereby improving the socio-economic conditions of the area.

While the project offers many benefits, it also presents potential environmental risks during various phases, particularly construction. Most of the negative impacts during this stage are expected to be temporary. These can be managed or minimized through appropriate mitigation or remedial measures as outlined in the EIA Report. Key environmental concerns identified in the study include:

- Improper location and management of construction camps may cause various environmental and social issues, including loss of vegetation, generation of solid waste, discharge of wastewater, water pollution, and social or cultural conflicts.
- Poor working conditions at construction sites or camps could lead to health and safety hazards due to inadequate storage, handling, and transportation of materials, or malfunctioning of machinery and equipment.
- Air quality may be impacted by dust emissions generated from construction machinery, unpaved surfaces, and movement of construction vehicles. These emissions can travel over long distances depending on wind speed, wind direction, air temperature, and overall atmospheric conditions.
- Air pollution is likely to worsen during both the pre-construction (site clearance) and construction phases due to industrial activities. This includes the operation of machinery, vehicle movement, and dust generation, which may contribute to increased air and noise pollution as well as related health risks.
- Construction activities will produce waste at both the main construction site and worker camps. This includes oil leaks from machinery, domestic refuse, and general solid waste, all of which can create unsanitary conditions and pose health hazards to workers and nearby communities.



- During both construction and operational phases, the rise in vehicular traffic will lead to more emissions and heightened noise and vibration levels.

11.2. Recommendations

Following recommendations must be incorporated prior to any of the decision about the proposed project:

- A comprehensive Health and Safety Plan for workers will be strictly followed throughout both the construction and operational stages of the project.
- A tree plantation plan will be developed, implemented, and maintained effectively.
- An Environmental Management and Monitoring Plan (EMMP) will be included in all contractor agreements, and its proper implementation will be ensured during all phases of the project.
- All personnel, employees, and contractors will undergo relevant training before construction begins to ensure they understand their responsibilities regarding environmental and social concerns.
- Drivers will be instructed to avoid using horns and refrain from playing loud music near the project site.
- Only properly maintained (tuned-up) vehicles will be permitted on-site to minimize gaseous emissions.
- Water conservation practices will be adopted to promote the efficient use of water resources.
- Wastewater will be properly treated, preferably through septic tanks, before being disposed of.
- Solid waste will be properly managed; open dumping and littering will be avoided. Segregation of waste at the source will be encouraged.
- First aid facilities will be made readily accessible at both the construction site and within the industrial unit during operations.
- Continuous environmental monitoring will be conducted to ensure that all parameters (such as air quality, noise, and water) remain within the limits defined by the Pakistan Environmental Quality Standards (PEQS).

