ENVIRONMENTAL IMPACT ASSESSMENT

OF THE PROJECT

EXPANSION OF - MANUFACTURING UNIT OF HAMDARD LABORATORIES (WAQF) PAKISTAN ESTABLISHED BEFORE PEPA 1997

AT

PLOT NO. 163, QUAID-E-AZAM INDUSTRIAL ESTATE, LAHORE

December 2025

SOLUTION ENVIRONMENTAL & ANALYTICAL LABORATORY

ES: EXECUTIVE SUMMARY

Hamdard Laboratories Pakistan was founded in 1948 in the old Arambagh area of Karachi on a modest scale. In 1953, it set up its first manufacturing unit, Al Rabia Hamdard, marking its transformation into a leading pharmaceutical company and was declared as a Waqf (a Muslim endowment entity). Over time, its network expanded to Rawalpindi, Lahore, and Peshawar.

Hamdard has introduced Rooh-Afza, a wide range of herbal products, medicines and supplements worldwide. Over 500 Hamdard products are available globally in more than 30 countries in 06 continents that comply with international markets and safety standards.

In 1983, Hamdard Laboratories (Waqf) Pakistan (HLWP) established a manufacturing unit at Plot No. 163, Quaid-E-Azam Industrial Estate, Lahore**.** As this Manufacturing Unit was established prior to the promulgation of the Punjab Protection Act 1997, therefore the environmental approval under Section 12 of the Environmental Act 1997 was not required under the Law.

Now, M/s HLWP has engaged M/s Seal to prepare an Environmental Impact Assessment (EIA) report for its proposed Expansion Project which is to be carried out within the existing facility located at Quaid-E-Azam Industrial Estate, Lahore

ES. 1 TITLE

Expansion of - Hamdard Laboratories (WAQF) Pakistan Established before PEPA 1997 at Plot No. 163, Quaid-E-Azam Industrial Estate, Lahore

ES.2 LOCATION

Plot No. 163, Quaid-E-Azam Industrial Estate, Lahore

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ES.3 PROPONENT

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Designation: General Manager Factory
Phone:03004409376
Email: m.abid@hamdard.com.pk
CNIC NO. 33202-1348805-1
Address: Plot No 163, Quaid –e-Azam Industrial Estate, Lahore

ES.4 CONSULTANT

Solution Environmental & Analytical Laboratory (SEAL)
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Address: Plot No. 12, Water Avenue, Green View Society, Off Kacha Jail Road, Kot Lakhpat Lahore

ES.5 SCOPE OF EIA REPORT

Scope 1 (Base Plant) Exemption from Environmental Approval	To Establish that the Hamdard Manufacturing Unit in Quaid-E-Azam Industrial Estate, Lahore was established prior to the promulgation of the Punjab Protection Act 1997; therefore it is exempted from environmental approval.
Scope 2 (Expansion Project)	To Prepare EIA Report in accordance with EIA Check List for Expansion Project of HLWP within is existing premises located at Plot No. 163, Quaid-E-Azam Industrial Estate, Lahore

ES.6 SUPPORTING DOCUMENTS FOR EXEMPTION OF BASE PLANT (SCOPE 1)

The plot No. 163 was allotted to Hamdard on 31st July 1965 as notified by the Allotment Board for Industrial Sites in New Lahore Township Scheme. Later on the factory was established in 1983 and started production in the same year.

In order to establish that the Hamdard's Manufacturing Unit in Lahore was established before 1997, M/s HLWP presents the following documentary evidences:

	Document	
1	Allotment Letter of Plot dated 12-08-1965	**Annexure I**
2	Electricity Bill showing date of connection at Manufacturing Unit, Lahore as on 29-11-1982.	**Annexure II**
3	Factory Registration Certificate dated 10-04-1983	**Annexure III**

ES.7 A BRIEF OUTLINE OF THE PROPOSAL (TYPE, PROCESS, TECHNOLOGY AND LAND REQUIREMENT)

ES 7.1 Project Type: The expansion involves an increase in production capacity of an exsting manufacturing Unit and an addition of Wastewater Treatment Plant within its existing premises.

The proposed project involves mainly the formulations of herbs and herbal based chemicals/arqiat and installation of small-sized WWTP with estimated expansion project cost of PKR 40 Million, therefore the project was considered to fall under Schedule I C.

ES 7.2 Processes and Technology (Herbal Products Manufacturing)

In Lahore, the manufacturing facility is equipped with state-of-the-art machinery and utilizes modern techniques to produce syrups and medicines.

The manufacturing of Rooh Afza, along with herbal products and medicines, involves a combination of several of the following processes and technologies:

- Washing of herbs
- Cutting/grinding
- Mixing
- Soaking
- Cooking/Heating
- Distillation
- Cooling
- Decoction
- Filtration
- Ransfer to Storage
- Filling and Packaging
- Dispatch
-

ES 7.3 Land Requirement

Expansion will be carried out within the existing premises of M/s HLWP covering a total land area of 19.46 Kanal.

ES 8 MAJOR IMPACTS

The following is a summary of the expected impacts associated with the preconstruction, construction, and operating phases of the proposed expansion project:

ES 8.1 Preconstruction Phase Impacts

Project Location/Land Acquisition/Resettlement

No negative impact is expected associated with Project Location or Land acquisition as the proponent legally owns the required land within the existing premises of M/s HLWP. No resettlement is involved as the project is located within an Industrail Estate.. No protected or sensitive area is nearby.

On the other hand, positive impact of project location is anticipated as the project site is compatible to the surroundings and infrastructure is already established.

Design

Appropriate design has positive impact as it prioritizes enhancing safety, environmental sustainability, plant integrity, energy efficiency, maintenance efficiency and seamless operation of the proposed project while considering site's seismic zone, compliance with international design and environmental standards, incorporate emergency exits, ensures an optimized layout and address other pertinent design factors. Air emissions including GHG, noise levels, waste minimization should be considered during all equipment selection and procurement.

ES 8.2 Construction Phase Impacts

Noise: Hearing loss and other physical and psychological issues - Noise Caused by Construction Machinery, Construction activities, Generators, Material transportation, Misuse of mobile.

Dust emissions: Health hazard – Emissions Caused by Excavation, Construction material handling and storage, Vehicles' movement on soft soil.

Air Emissions: Health and Environment Damage - Gaseous emissions from Construction machinery, equipment, vehicles and diesel generators.

Soil Erosion: Safety Hazard - Mainly by excavation, trees removal (Not required)

Soil Water contamination – Caused by improper Solid and Liquid Waste Management; leakages of oil /fuel/chemicals from poorly maintained machinery and vehicles, spillage of HFO/diesel during handling and storage.

Water Supply: Poor and insufficient water supplies can lead to health risks and sanitization problems.

Solid Waste Management – Poor waste management can lead to air pollution, water and soil contamination (Open landfills can contaminate groundwater) and disease transmission.

Wastewater Management - Improper management can cause health hazards and ecological disruptions.

Occupational Health and Safety: Construction Activities

Traffic Congestion; Safety Hazard - Construction Material transport

Socio-economic Impacts: Positive impact through job creation and business expansion for local community

Biological Impact: Adverse impacts on the environment and ecosystems caused by the clearing of trees and vegetation.

ES 8.3 Operation Phase Impacts

Noise: Hearing Loss, physical and psychological impact, Sometimes it may cause safety hazard. Source - High Noise from operation machinery, standby generators and auxiliaries in operation.

Air Emissions: Mainly CO2, CO, NOx, SOx, Particulates, Causing health and environmental harm, originating from the stacks of boilers and standby generator.

Poor Solid Waste Management: Soil and water contamination, along with financial losses from excessive waste in the absence of recovery or recycling measures

Poor Wastewater Management: Soil and groundwater contamination, health risks, unpleasant odors, excessive discharges into external drains, penalties, and potential business closure due to non-compliance with PEQS.

Occupational Health and Safety; Health and Safety Hazards due to exposure to gaseous emissions, Noise, Insufficient and poor water supply, Inappropriate solid and liquid disposal, Spillages/Leakages of Oils/Chemicals, fire and explosions, work on machineries, at heights and enclosures, etc.

ES 8.4 Positive Impacts

Socio-economic Impacts: A positive impact by creating jobs, and offering opportunities for business growth within the local community.

Change of Land Use: A positive impact as unused land will be utilized for a productive purpose

ES 9. RECOMMENDATIONS FOR MITIGATION MEASURES

ES 9.1 General:

- Integrate the Environmental Management Plan (EMP) into the agreement with the construction contractor.
- Incorporate safety and environmental considerations into the employee appraisal system.
- Ensure that proper workplace housekeeping is maintained.

ES 9.2 Proposed Mitigations for Construction Phase

Noise:

- Ensure use of PPEs such as ear plugs and ear muffs in areas with high noise level
- Place Sign boards in areas with loud noise levels.
- Address Noise hazards in accordance with "OSHA Standards for Construction".
- Fit an acoustic enclosure if machine is stationary.
- Ensure to switch off all equipment when not in use.
- Regular monitoring and control of Noise level
- Use well maintained construction machinery and equipment.
- Use electric supply from electric system of HLWP (Base Plant) to avoid the use of diesel generators during Construction Phase.

Dust Emissions:

- Minimize dust emissions by wet suppression – Use water sprays at appropriate frequency
- Cover open stockpiles of construction materials with tarpaulin.
- Cordon off project area to minimize dust migration to nearby facilities
- Site Restoration as early as feasible
- Provide PPEs – masks etc. to the workers

Air Emissions:

- Ensure exhaust emissions from construction machinery and equipment, Generators to comply with PEQS for exhaust emissions; Ensure maintenance of Construction machinery
- Avoid open burning of solid waste
- Supply power preferably from the existing power source of HLWP.

Soil and Water Contamination:

- Ensure appropriate solid waste management
- Ensure appropriate sewage disposal through Septic Tank.
- Conduct regular and proactive maintenance of all machinery, vehicles, and generators to ensure they remain free of leaks.

- Verify the roadworthiness and fitness of material transportation vehicles.
- Conduct daily inspections of the construction site to identify any leaks or spills of oil, fuel, or chemicals.
- Designate specific areas for vehicle washing and servicing to prevent soil contamination.

Water Supply

- Ensure sufficient supply of groundwater that meet PEQS of drinking water.
- Water supply from the water supply system of existing Unit will be preferable.

Solid Waste Management

- Develop a comprehensive Solid Waste Management Plan and ensure its strict implementation.

Wastewater Treatment

- Install new sewerage lines at construction site and dispose of after treatment at Septic Tank.

Occupational Safety and Health

- Establish and enforce procedures in compliance with Occupational Safety and Health Administration (OSHA) standards
- Develop emergency response plans and provide training to the workers
- Place fire extinguishers at critical locations.
- Develop firefighting plan, train workers accordingly
- Provide first aid boxes suitable locations of the site.
- Ensure use of PPEs where required.
- Follow SOPs for dengue control.
- Communicate safety hazards with adequate signage.

Traffic

- Existing road infrastructure is adequate to handle increased traffic during construction phase. .
- Trucks entering and leaving the mill gate safety should be supervised by security personnel.
- Avoid material transportation during peak traffic hours.

Socio-economic Impacts

- The majority of unskilled jobs should be allocated to members of the local community.

Biological Impact

- Undertake extensive plantation and develop landscaped areas at the Project site.

ES 9.3 Proposed Mitigations for Operational Phase

Noise

- Install low noise machinery.
- Ensure compliance with PEQS noise standards.
- Install acoustic enclosures for stationary equipment.
- Deploy noise barriers where necessary.
- Provide and encourage the use of hearing protection, such as earplugs, earmuffs to minimize or eliminate noise exposure when needed.
- Perform regular maintenance of machinery and promptly identify and repair faulty equipment to address noise issues.
- Conduct noise level surveys every quarter and place signboards in high-noise areas. Ensure wearing PPEs in these areas. Ensure that PPE is worn at all times in these locations.

Air Emissions

- To minimize air emissions and ensure compliance with the relevant PEQS, all utilities used in project operations must be carefully selected and proactively maintained in optimal working condition in accordance with manufacturers' specifications.
- Vehicle speed within the facility should be limited to 20 km/h, and water spraying should be used to control dust from unpaved access roads and areas.
- Ensure appropriate ventilation of operation sites, and storage area. Provide localized ventilation in laboratories.
- Keep chemical containers tightly sealed to prevent leakage or spillage, which could lead to air contamination and vapor inhalation.
- Wear PPEs during cutting, grinding, and crushing of raw materials to protect against fine particles.
- Monitoring of gaseous emissions from boilers stacks on quarterly basis.

Solid Waste Management

- Implement a Solid Waste Management Plan
- Segregate solid waste at the source into different categories and store at a designated area within the HLWP before disposal.
- Dispose of segregated domestic waste using the industrial estate's designated waste collection system.
- The sludge from ETP will be disposed of through EPA approved contractor.
- Open burning of solid waste is not permitted

Wastewater Management

- Install wastewater treatment plant (WWTP) to treat process wastewater before its discharge to drain of Industrial Estate.
- Treat domestic wastewater through Septic Tank and discharge to the Irrigation Drain.
- Dispose of sludge from WWTP through EPA approved contractor.
- Establish plan for wastewater minimization.

Water Supply

- Tube wells are installed at manufacturing unit to ensure a reliable and clean water supply, in compliance with PEQS drinking water standards.
- Process water and condensate are recycled to conserve water and minimize process wastewater generation.
- Drinking water is provided to workers only after confirming compliance with PEQS standards.
- Groundwater analysis is conducted quarterly by an EPA-certified laboratory to ensure compliance with PEQS drinking water standards.

Socio-economic Impacts

- The majority of unskilled jobs should be allocated to members of the local community. For semi-skilled positions, young, academically qualified individuals from the local community should be recruited and given appropriate training.

Biological Impacts

- Undertake extensive plantation and develop landscaped areas at the Project site, ensuring regular follow-up to support tree growth.

Occupational Health and Safety

- Mitigation measures for Noise, gaseous emissions, inadequate solid and liquid waste management etc., have been outlined above
- Establish and enforce procedures in compliance with Occupational Safety and Health Administration (OSHA) standards
- Develop Safety Plans for handling chemicals according to their MSDS
- Develop emergency response plans and provide training to the workers
- Develop firefighting plan, train workers accordingly
- Provide fire-fighting equipment and first aid boxes at suitable locations of the site.
- Ensure use of PPEs where required.
- Follow SOPs for dengue control.
- Communicate safety hazards with adequate signage.
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ES 10. PROPOSED MONITORING

. Table ES-1: Environment Monitoring Plan for Construction and Operational Phases

Components	Parameters (PEQS Compliance)	Remarks	Frequency	
			Construction	Operations
Noise	Noise Level dB(A) (PEQS)	PEQS Compliance	Quarterly	Quarterly
Ambient Air Quality	CO, *SO_2, NO_x, Particulates (PM_{10}, $PM_{2.5}$) (PEQS)	PEQS For Ambient Air	Quarterly	Quarterly
Gaseous Emissions	CO, SO_2, NO_x, Particulates	PEQS for Industrial Gaseous Emissions	Biannual	Quarterly
Water Quality	Drinking water PEQS	PEQS for Drinking water	Quarterly	Biannual
Effluent	Flow, T, pH, COD, BOD_5, TSS, Oil and grease	PEQS for Industrial Effluents	Quarterly	Quarterly
Trees Plantation	Visual Inspection	Environmental Sustainability	Regular Monitoring by Site Management.	

ES.11 CONCLUSIONS AND RECOMMENDATIONS

ES 11.1 CONCLUSIONS

Base Plant

M/s HLWP has submitted supporting documents demonstrating that the project was originally established and was operational prior to the enactment of the Punjab Protection Act 1997. Therefore, as per the law, the base plant does not require environmental approval under Section 12 of the Environmental Protection Act 1997.

Expansion Project

The EIA study was carried out for the Expansion Project of HLWP. The Study confirms that the proposed expansion project is legally, environmentally and socially viable. The proponent is committed to executing the project in an environmentally responsible manner, taking all necessary measures to mitigate potential impacts. Additionally, the project will create employment opportunities for the local community.

ES 11.2 RECOMMENDATIONS

Base Plant (Exemption)

It is respectfully requested that the honorable Agency (Punjab EPA) grant Exemption from Environmental approvals for the Manufacturing Unit of Hamdard Laboratories (Waqf) Pakistan located at Plot No. 163, Quaid-E-Azam Industrial Estate, Lahore

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Expansion Project

It is recommended to grant Environmental Approval for the Construction Phase of the Proposed Expansion Project, provided the Proponent effectively implements the Environmental Management Plan (EMP).

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1. INTRODUCTION

Hamdard Laboratories Pakistan was founded in 1948 in the old Arambagh area of Karachi on a modest scale. In 1953, it set up its first manufacturing unit, Al Rabia Hamdard, marking its transformation into a leading pharmaceutical company and was declared as a Waqf (a Muslim endowment entity). Over time, its network expanded to Rawalpindi, Lahore, and Peshawar.

Hamdard has introduced Rooh-Afza, a wide range of herbal products, medicines and supplements worldwide. Over 500 Hamdard products are available globally in more than 30 countries in 06 continents that comply with international markets and safety standards.

In 1982, Hamdard Laboratories (Waqf) Pakistan (HLWP) established a manufacturing unit at Plot No. 163, Quaid-E-Azam Industrial Estate, Lahore. As this Manufacturing Unit was established prior to the promulgation of the Punjab Protection Act 1997, therefore the environmental approval under Section 12 of the Environmental Act 1997 was not required under the Law.

Now, M/s HLWP has engaged M/s Seal to prepare Environmental Impact Assessment (EIA) report for its proposed Expansion Project which is to be carried out within the existing facility located at Quaid-E-Azam Industrial Estate, Lahore

1.1 PURPOSE OF THE REPORT

The report is aimed to:

1. Establish that the HLWP was established before 1997, and therefore does not require environmental approval under Section 12 of the Environmental Act 1997.

2. Comply with the Punjab Environment Protection Act 1997 (as amended up to 2017) and the Punjab-Environmental Protection (Review of IEE and EIA) Regulations 2022, and to obtain the necessary environmental approval prior to commencing expansion project construction.

1.2 IDENTIFICATION OF PROJECT

Hamdard Laboratories manufacture a wide range of herbal products, medicines and supplements worldwide along with Rooh Afza. Now HLWP intends to carry out its expansion project within its existing premises covering a land area of 19.46 Kanal at Plot No. 163, Quaid-E-Azam Industrial Estate, Lahore

The project is categorized under Schedule II B-2, which covers manufacturing of pharmaceuticals and requires an Environmental Impact Assessment (EIA) to obtain environmental approval prior to the construction phase.

1.2.1 Scope of EIA Report

Scope 1 (Base Plant) Exemption from Environmental Approval	To Establish that the Hamdard Manufacturing Unit in Quaid-E-Azam Industrial Estate, Lahore was established prior to the promulgation of the Punjab Protection Act 1997; therefore it is exempted from environmental approval.
Scope 2 (Expansion Project)	To Prepare EIA Report in accordance with EIA Check List for Expansion Project of HLWP within is existing premises located at Plot No. 163, Quaid-E-Azam Industrial Estate, Lahore

1.3 PROPONENT

Name: Mr. Abid Khan

Designation: General Manager Factory

Phone:03004409376

Email: m.abid@hamdard.com.pk

CNIC NO. 33202-1348805-1
Address: Plot No 163, Quaid –e-Azam Industrial Estate, Lahore

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1.4 ENVIRONMENTAL CONSULTANT

M/s HLWP has engaged Solution Environmental & Analytical Laboratory (SEAL), as Environmental Consultants to apply to EPA Punjab for conducting the EIA of the proposed expansion project. The Seal has vast experience and expertise in this field.

The contact details of SEAL are given as under:

Contact Person: Syed Nihal Asghar (Director)

Phone: 0300 9768799

Email ID: nihalasghar@seal.com.pk

Address: Plot No. 12, Water Avenue, Green View Society, Off Kacha Jail Road, Kot Lakhpat Lahore

1.5 BRIEF DESCRIPTION OF PROJECT NATURE AND SIZE

The project nature is industrial and involves **Expansion** of existing manufacturing facility of HLWP located at Plot No. 163, Quaid-E-Azam Industrial Estate, Lahore.

- **Land Area** 19.46 Kanal (Existing premises of HLWP)
- **Products**: Herbal products, herbal medicines, supplements and Sharbat Rooh Afza.
- **Expansion** invoves addition of machinery for production increase and installation of wastewater treatment plant.

Exemption from Environmental Approval - The Base Plant (HLWP)

HLWP wasestablished its manufacturing Unit in Quaid-E-Azam Industrial Estate, Lahore. As this Manufacturing Unit was established prior to the promulgation of the Punjab Protection Act 1997, therefore the environmental approval under Section 12 of the Environmental Act 1997 was not required under the Law.

Expansion of HLWP

Expansion will be carried out within the existing premises of HLWP at Plot No. 163, Quaid-E-Azam Industrial Estate, Lahore Lahore. Land Area = 19.46 Kanal

The expansion project involves addition of machinery for production increase by 20% and installation of wastewater treatment plant.

The total estimated cost of the expansion project is PKR 40 million, with an expected completion timeframe of 6 months.

1.6 LOCATION

HLWP is located at Plot No. 163, Quaid-E-Azam Industrial Estate, Lahore. The project site's coordinates are given in Table 1.1 whereas the location of the Project site is illustrated in Figure 1.1.

Table 1.1: Location Coordinates of Project Site

	Coordinates	
	Latitude	**Longitude**
HLWP	31.44614	74.32048

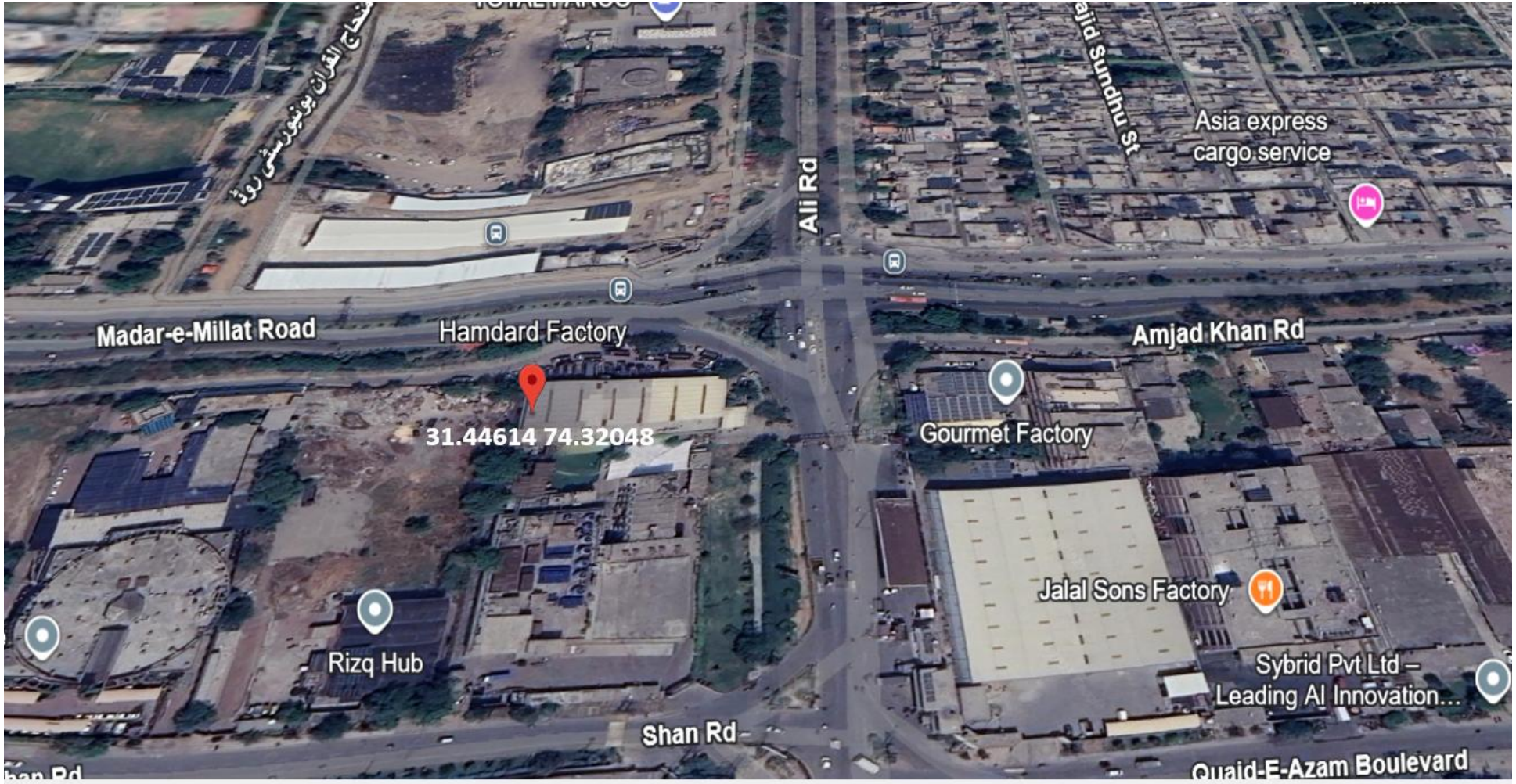


Figure 1.1: Location of Project Site and Surroundings

1.7 SCREENING (EIA OR IEE)

The screening was performed to determine whether the proposed project is required to be supported by:

- Initial Environmental Examination (IEE), Schedule I (Regulation 3), or
- Environmental Impact Assessment (EIA), Schedule II (Regulation 4)

The proposed project involves the manufacturing of herbal-based products, including arqiat, medicines, and supplements, as well as food products such as Rooh Afza, along with the installation of a small-sized wastewater treatment plant (WWTP). Accordingly, the project has been classified under Schedule II, Category B-2, which covers pharmaceutical manufacturing.

1.8 SCOPING

1.8.1 Spatial and Temporal Boundaries of Environmental Assessment

The expansion project will be constructed/installed within the premises of existing M/s Hamdard Laboratories (Waqf) Pakistan, therefor the major construction activities of the project will remain confined within the project boundaries, access roads and related infrastructure. For the physical environmental study, the spatial boundary was considered to be “Local” where the impact was limited to the local area in close proximity to the proposed Project. The Local Study Area (LSA) was established based on the zone of the Project influence, beyond which the potential environmental, cultural, and socio-economic effects of the Project are expected to be non-detectable. Some relevant information about Lahore District was also included where required. In the case of the biological and socioeconomic environment, efforts were made to collect the information within two Km around the project area and even up to the region of 10 Km surrounding the proposed project where any direct or indirect impacts were envisaged.

The temporal boundaries have been defined as lasting with the life of the project. Segments of the temporal boundaries include the duration of the construction and operation phases of the Project.

1.8.2 Important Issues and Concerns raised during Consultation

During consultation, a broad spectrum of concerns and potential impacts were identified related to the project’s activities:

- The local community stressed the need of giving local residents preference when it comes to employment. They expressed doubts that construction companies often hire a significant percentage of their staff from outside sources.
- No major concern was the anticipated during the Construction and Operational Phase phases as the expansion project is being carried out within the premises of existing production unit.
- Academics emphasized the need of complying with OSHA standards and preparation of Safety Plan.
- Environmentalists suggested to install solar power system.
- Another concern raised by the stakeholders pertains to the gaseous emissions from boiler and solid waste disposal.

-

1.8.3 Significant Impacts and Factors to be Determined

Key impacts and factors to be addressed during the construction phase include noise, dust, and gaseous emissions; safety risks; housekeeping practices; proper arrangements for water supply and wastewater disposal; employment opportunities for the local community; and issues related to traffic congestion and potential road accidents.

During the operational phase, the significant concerns are occupational health and safety, management of solid and liquid waste, conservation of water and energy, control of gaseous emissions from stacks, safe disposal of effluents after treatment through the ETP, and ensuring equal employment opportunities for women.

1.9 CONSIDERATION OF ALTERNATIVES

1.9.1 No Project Alternative

To address the increasing local and global demand, the expansion project is essential. Additionally, the installation of a Wastewater Treatment Plant is necessary to ensure compliance with PEQS. Hence, the 'No Project Alternative' was not considered.

1.9.2 Location/Site Alternatives

Alternative sites, including Hamdard's manufacturing units in other cities were also evaluated. The feasibility of expansion at Lahore Unit was found to be more feasible due to sufficient space available in the existing premises and relatively high local demand in District Lahore. In addition, all the required amenities and expertise are readily available to support expansion within the existing premises. The current Utilities will be sufficient to meet the trequirements of increased production.

1.9.3 Technology Alternatives

HLWP critically evaluated alternate technologies and ultimately they finalized to install similar machines as already installed in existing unit. The choice of machinery for the plant expansion was primarily guided by:

- Compatibility with the existing setup,
- Less spare parts inventory requirement,
- in-house expertise, and the company's established relationship with the vendor.
- Energy Efficiency and Environmental Sustainability.
- Operational reliability
- Reduced Operation and Maintenance cost

Following technologies were eassessed for wastewater treatmemt Plant.

- Activated sludge type
- Trickling Filters
- Moving Bed Biofilm Reactor (MBBR)
- Membrane Bioreactor (MBR)

Considering ease of operation and strong performance references in the Pakistani industry, the Activated Sludge process combined with DAF and MBBR was selected.

1.9.4 Environmental Alternatives

To promote environmental sustainability and partially mitigate greenhouse gas emissions, HLWP is committed to undertaking extensive plantation of native tree species. In addition, the company plans to implement a rainwater harvesting system. The installation of a Wastewater Treatment Plant further reflects HLWP's commitment to fostering a cleaner environment

2. PROJECT DESCRIPTION

2.1 OBJECTIVES OF EXPANSION PROJECT

The expansion project of HLWP is intended:

- To increase the production capacity of existing manufacturing Unit by 64% within existing premises of HLWP at Plot No. 163, Quaid-E-Azam Industrial Estate, Lahore in order to meet the increased demand

- To install wastewater treatment plant within the existing premises

2.2 REGULARIZATION OF PROJECT – EXISTING PLANT

2.2.1 The Base Plant (HLWP) Established Before 1997

In order to establish that the Hamdard's Manufacturing Unit in Lahore was established before 1997, M/s HLWP presents the following documentary evidences:

Table 2.1: List of Supporting Documents For Exemption From Environmental Approval

	Document	
1	Land ownership documents of M/s HLWP before 1997	**Annexure I**
2	Electricity Bill showing date of connection at Manufacturing Unit, Lahore as on 29-11-1982.	**Annexure II**
3	Factory Registration Certificate dated	**Annexure III**

2.3 LOCATION AND LAYOUT OF HLWP

HLWP is located at Plot No. 163, Quaid-E-Azam Industrial Estate, Lahore. Location of project site is illustrated in Figure 1.1. The layout Plan of HLWP is given in Figure 2.1. Proposed area for expansion project has been marked on the layout.

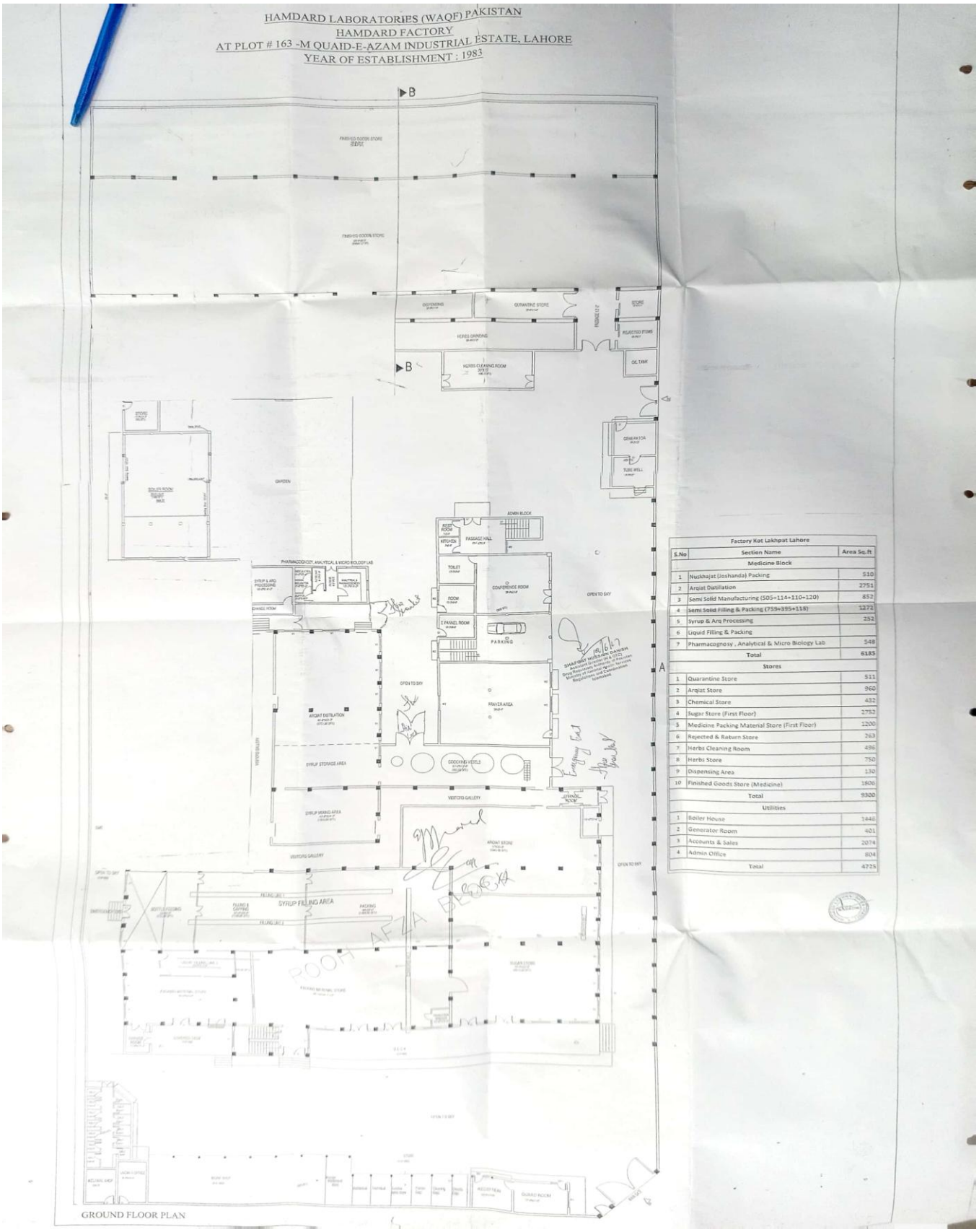
2.4 LAND USE ON THE SITE

The land for the proposed Expansion Project is unused land within the existing premises of HLWP.

2.5 ROAD ACCESS

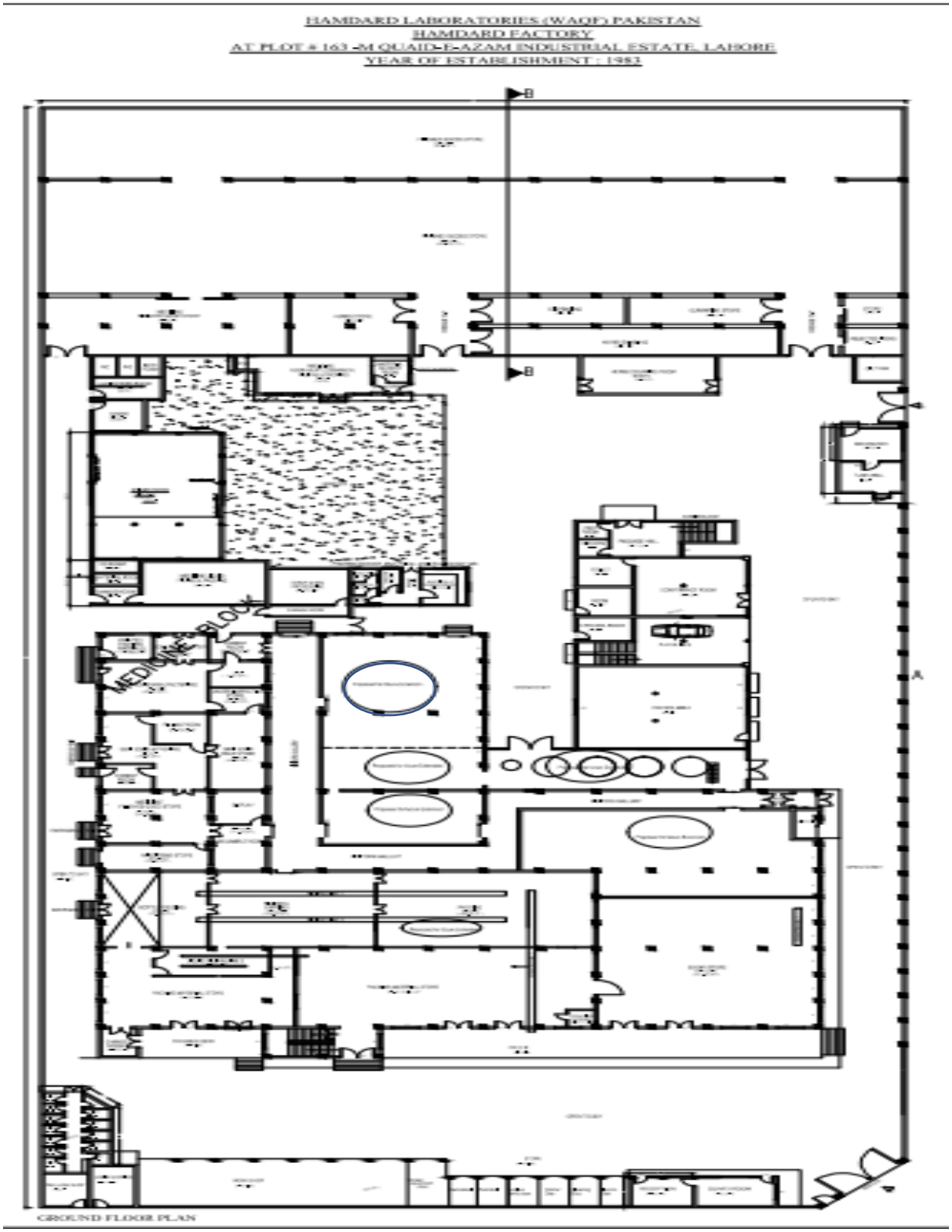
The project site is situated along Madar-e-Millat Road, which directly links to Lahore–Kasur Road (Ferozepur Road). This strategic location provides convenient access to Kot Lakhpat Railway Station as well as major cities, highways, and motorways across the country. The road access to HLWP is shown in Figure 2.4.

Figure 2.1 Layout Plan of HLWP (Existing)



Factory Kot Lakhpat Lahore		
S.No	Section Name	Area Sq.ft
	Medicine Block	
1	Nushkajat (Joshanda) Packing	510
2	Arqiat Distillation	2751
3	Semi Solid Manufacturing (505+114+110+120)	852
4	Semi Solid Filling & Packing (759+395+118)	1272
5	Syrup & Arq Processing	252
6	Liquid Filling & Packing	
7	Pharmacognosy , Analytical & Micro Biology Lab	548
	Total	6183
	Stores	
1	Quarantine Store	511
2	Arqiat Store	960
3	Chemical Store	432
4	Sugar Store (First Floor)	2752
5	Medicine Packing Material Store (First Floor)	1200
6	Rejected & Return Store	263
7	Herbs Cleaning Room	496
8	Herbs Store	750
9	Dispensing Area	130
10	Finished Goods Store (Medicine)	1806
	Total	9300
	Utilities	
1	Boiler House	1446
2	Generator Room	401
3	Accounts & Sales	2074
4	Admin Office	804
	Total	4725

Figure 2.2: Layout Plan of HLWP (After Expansion)



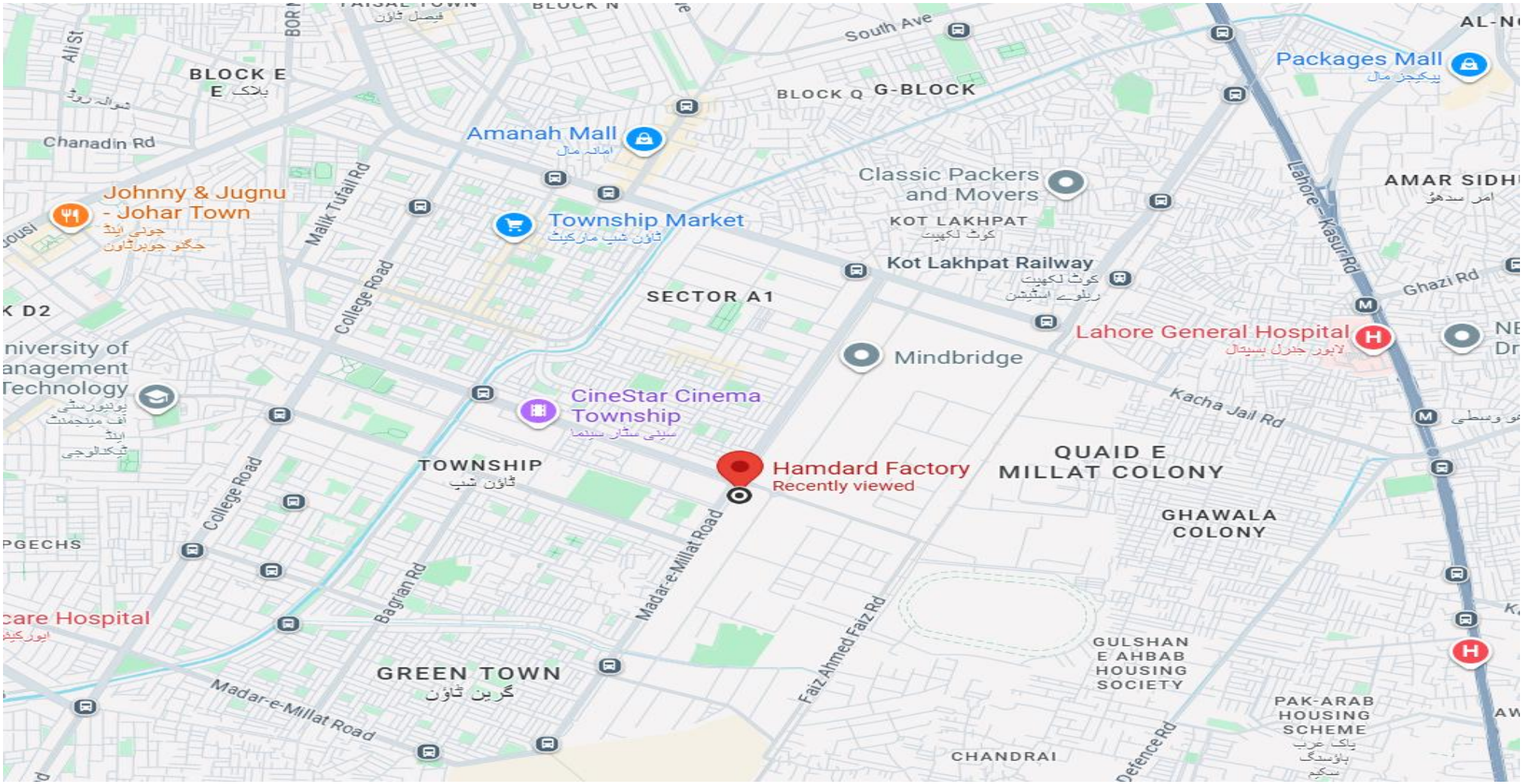


Figure 2.3 Road Access

2.6 VEGETATION FEATURES OF THE SITE

The proposed land for expansion project is devoid of any vegetation; with no presence of trees, shrubs and does not require any tree removal. Due to the absence of vegetation, there will be no direct impact on local flora as a result of the proposed development.

2.7 COST AND MAGNITUDE OF OPERATION

The estimated cost of the Expansion project (Civil, Mechanical, Electrical and others) is around PKR 80 Million.

The Expansion Project involves civil, electrical and mechanical activities along with the installation of equipment, machinery, instrumentation and pipelines etc. to enhance production capacity by 64% and installation of wastewater treatment plant.

2.8 SCHEDULE OF IMPLEMENTATION

The construction will be started just after getting the Environmental approval. As per original plan, the completion duration for Construction phase is about 6 Month.

2.9 DESCRIPTION OF THE PROJECT

The project nature is industrial and involves **Expansion** of existing manufacturing facility of HLWP located at Plot No. 163, Quaid-E-Azam Industrial Estate, Lahore.

- **Total Land Area** 19.46 Kanal
- **Products**: Herbal products, herbal medicines, supplements and Sharbat Rooh Afza.
- **Expansion** invoves addition of machinery for production increase and installation of wastewater treatment plant.

2.9.1 HLWP's Products and Process Flow Charts for Different Products' Production

2.9.1.1 Hamdard Products at Manufacturing Unit Lahore

Table 2.2 provides a list of products being manufactured at HLWP's Lahore manufacturing unit.

Table 2.2: List of Products from HLWP's Manufacturing Unit Lahore

Products			
1	Itrifal Kishinizi 100 Grm	19	Sharbat Arzani 800 ML
2	Itrifal Ustukhdoos 100 Grm	20	Sharbat Badiyan 800 ML
3	Itr. Zamanni 100 Grm	21	Sharbat Bazuri Barid 800 ML
4	Jaw. Amla 100 Grm	22	Sharbat Dinar 800 ML
5	Jaw. Jalinus 100 Grm	23	Sharbat Mawaiz 800 ML
6	Jaw. Kamuni 100 Grm	24	Sharbat Saddar 800 ML
7	Maj. Dabeed ul Ward 100 Grm	25	Sharbat Ushba Khas 800 ML
8	Maj. Filasfa 100 Grm	26	Sharbat Zanjabeel 800 ML
9	Maj. Suranjan 100 Grm	27	Siknajbeen Bazuri 800 ML
10	Maj. Ushba 100 Grm	28	Siknajbeen Lemon 800 ML
11	Joshanda 32 Grm	29	Siknajbeen Sada 800 ML
12	Sharbat-E-Bazuri (Motadil) 800 ml	30	Rooh Afza 800ml
13	Sharbat-E-Bazuri (Motadil) 400 ml	31	Rooh Afza 1500ml
14	Sharbat-E-Toot Siah 800 ml	32	Rooh Afza 3000ml
15	Sharbat-E-Toot Siah 120 ml	33	Herbal Hair Oil
16	Sharbat Ahmed Shah 800 ML	34	Arq e Badiyan
17	Sharbat Anjbar 800 ML	35	Arq e Kasni
18	Sharbat Anjbar 400 ML	36	Arq e Mako

2.9.1.2 Process Flow Diagrams

Figure 2.4 -2. illustrate the process flow diagram of Different Product Manufacturing

Figure 2.4 Process Flow Diagram of Medicated Sharbat

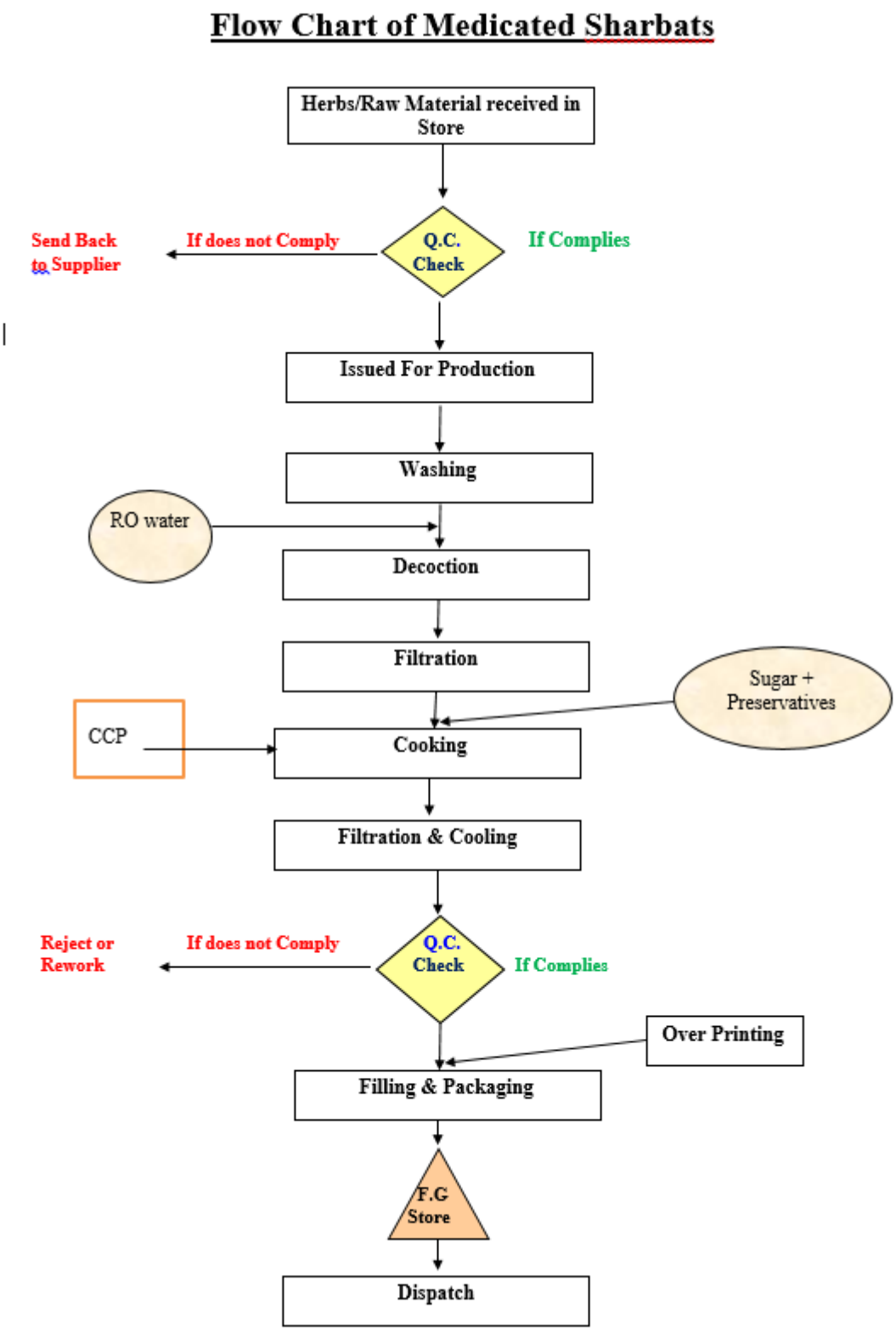


Figure 2.5 PFD of Semisolids

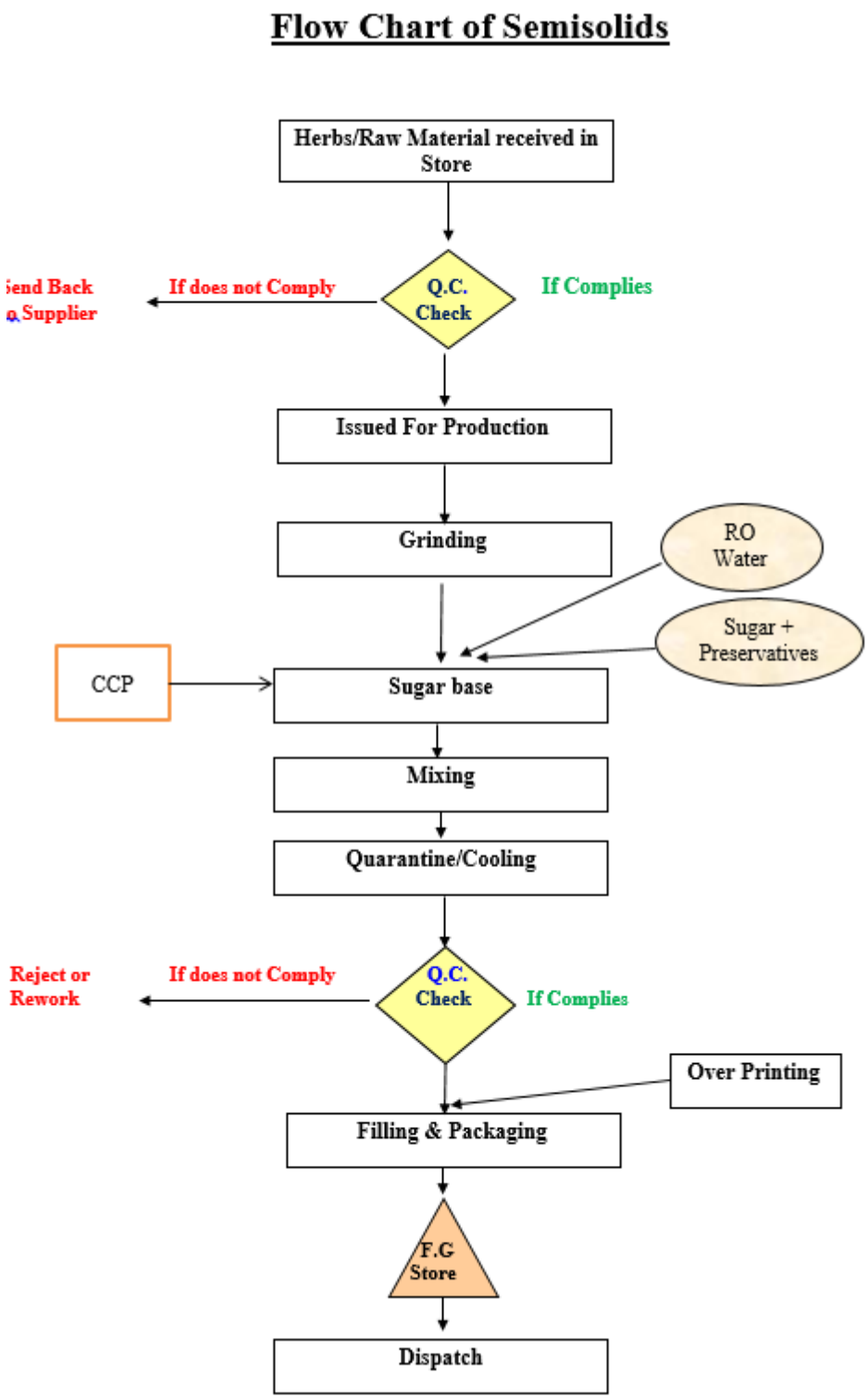


Figure 2.6 PFD of Joshanda

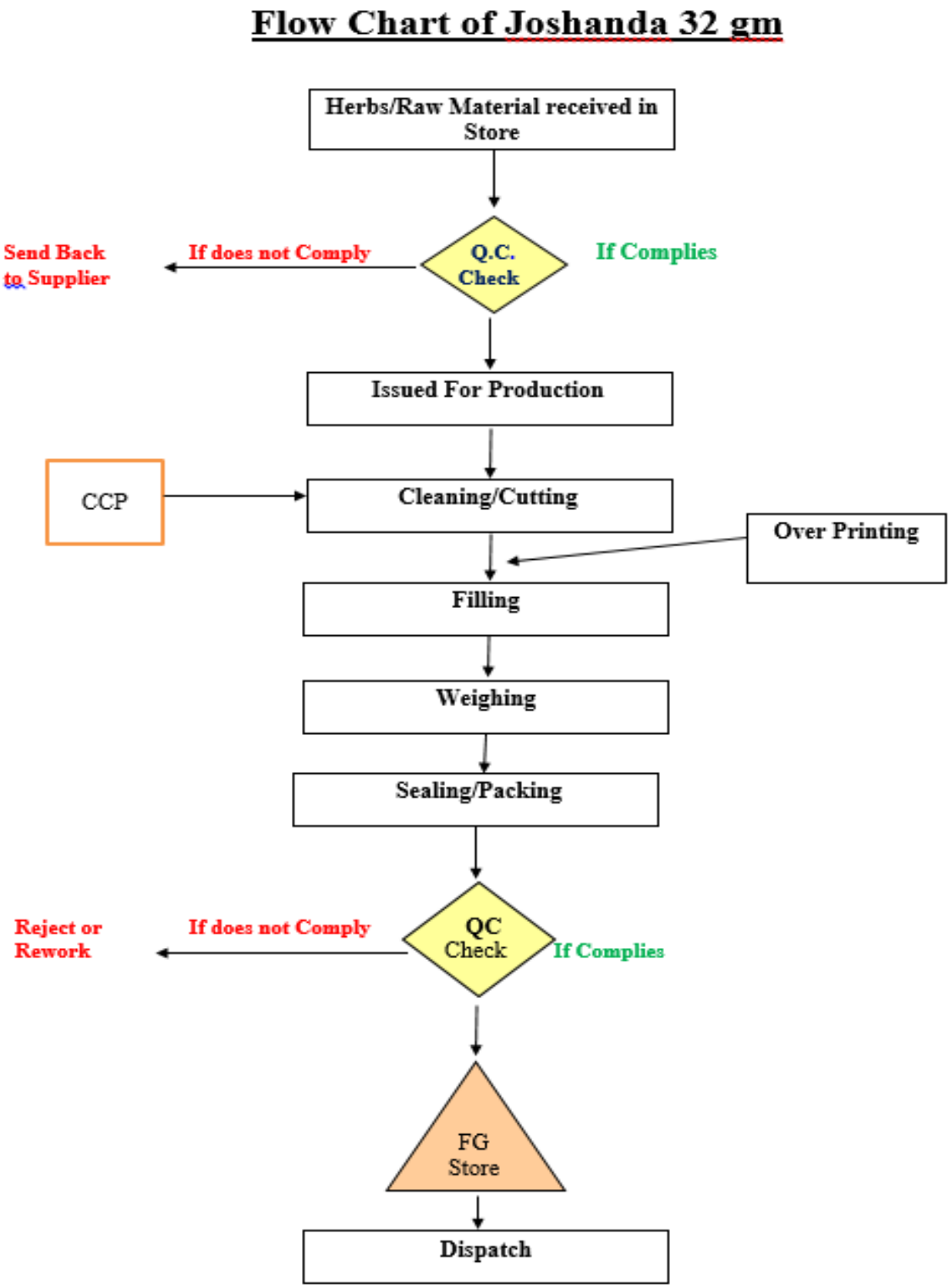


Figure 2.7: PFD of Hamdard Herbal Hair Oil

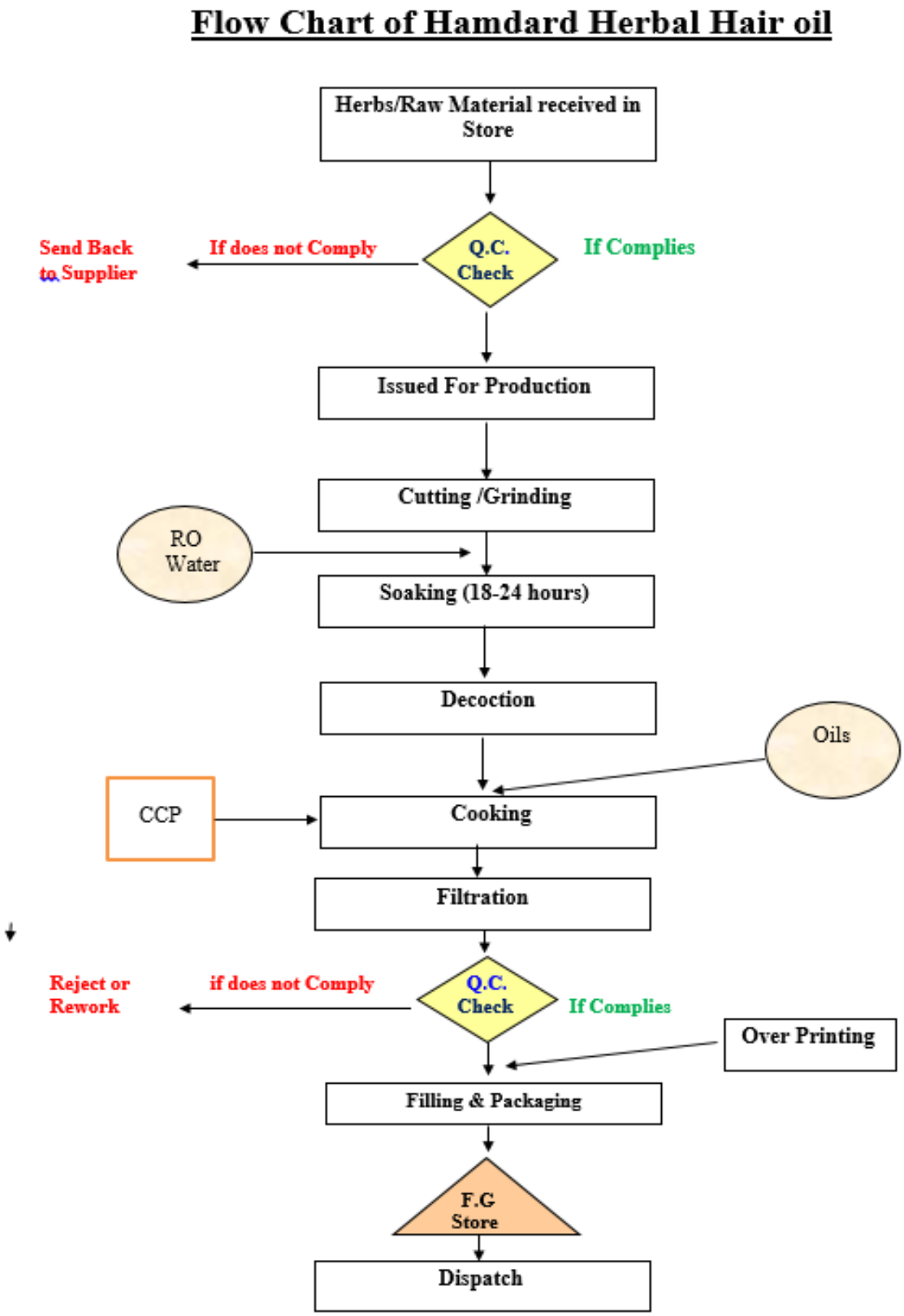


Figure 2.8: PFD of Rooh Afza

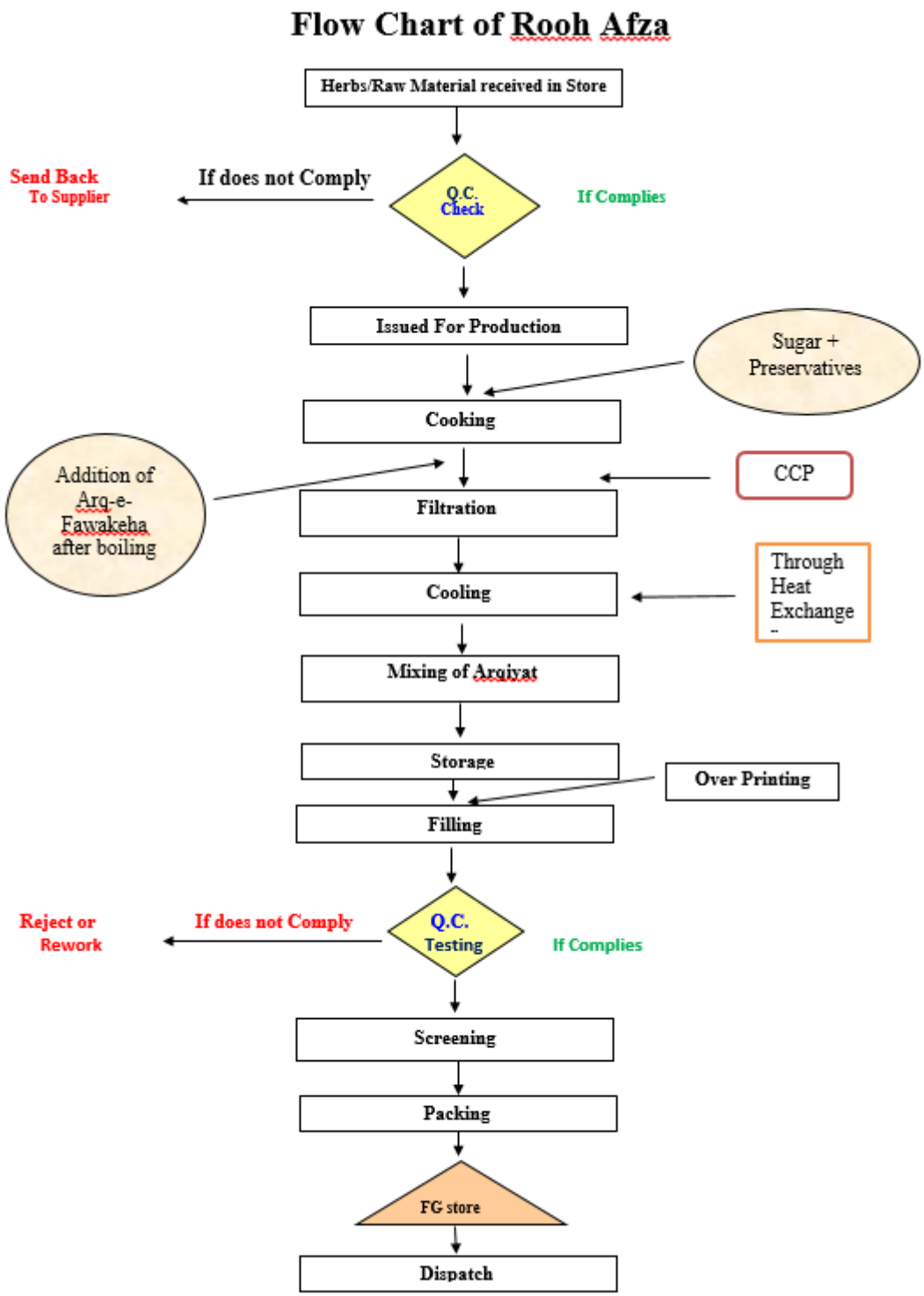
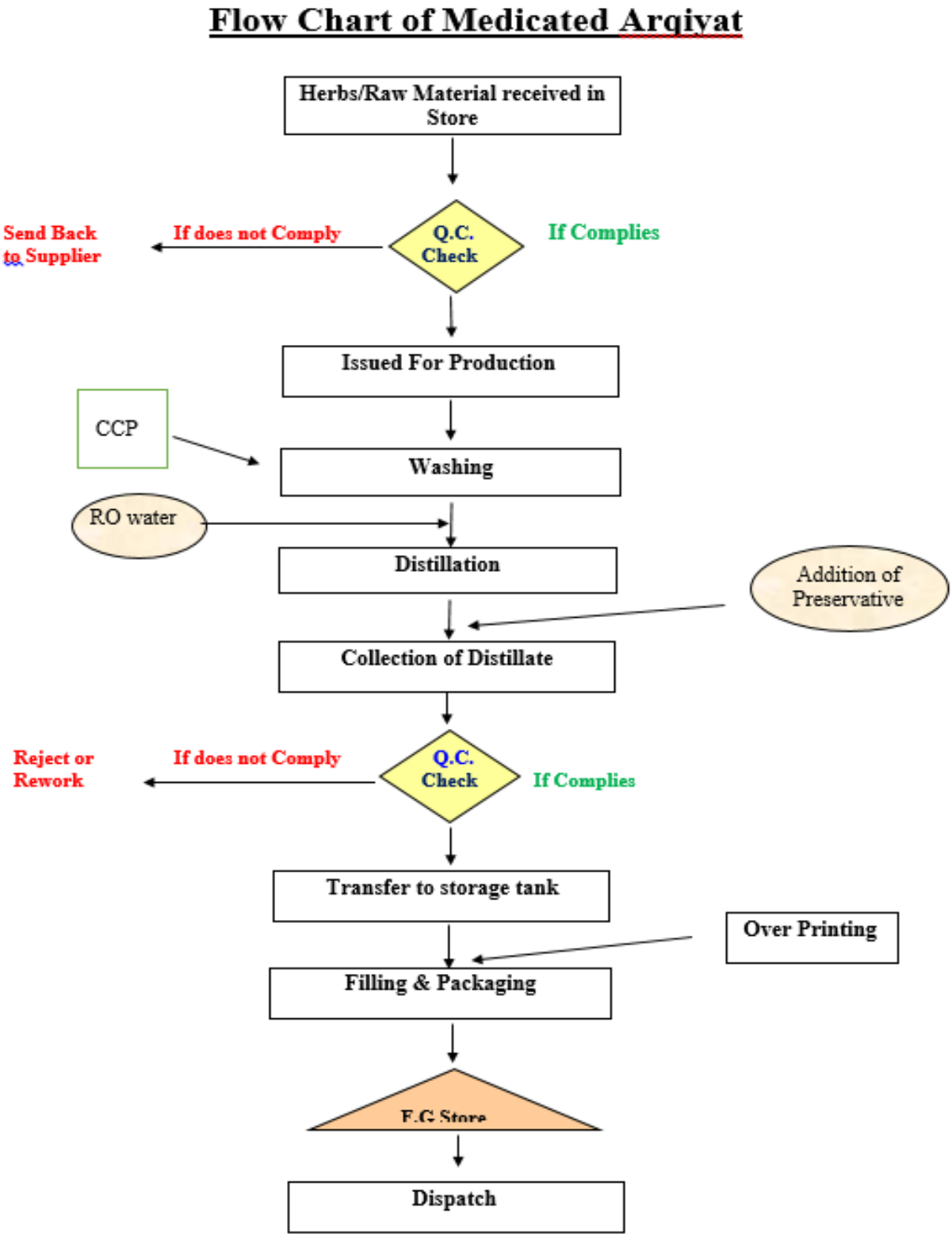


Figure 2.9: PFD of Medicated Arqiyat



2.9.2 Salient Features of HLWP (Before And After Expansion)

Table 2.3 Salient Features of the Project

Title	Expansion of Hamdard Laboratories (Waqf) Pakistan Established Before PEPA 1997 at Plot No. 163, Quaid-E-Azam Industrial Estate, Lahore	
	Before Expansion	**After Expansion**
Major Products	Herbal products, herbal medicines, supplements and Sharbat Rooh Afza.	
Production Capacity	May be provided if required	64% Increase in Production
Raw material	A variety of natural and herbal ingredients specific to each product, Sugar, Preservatives,	
Major Manufacturing Units	Manufacturing Units of Medicated Sharbat, Medicated Arqiyat, Semi Solids, , Hair Oil and Rooh Afza and Joshanda Packing	
Other Facilities	Utilities, Warehouses, Workshops, Stores, Parking, Offices etc.	
Total Area	19.46 Kamal	
Boilers, Nos. Fuel	2 Boilers: 4 Ton NG Fired, 8 Ton HFO Fired	
Water Supply	Tube-wells	
Water Requirement	500 m3/ day	700 m3 per day
Process Domestric	490 m3/day 10 m3 /day	685 m3/day 15 m3 /day
Wastewater Generation	96 m3/day	120 m3/day
Wastewater Treatment Plant Capacity	Septic Tanks	144 m3 per day
Wastewater Disposal	Sewage (Domestic wastewater) is treated in Septic Tanks before discharge into Industrial Estate Drain. Process Wastewater to be treated in WWTP before discharge to Industrial Estate Drain	
Solid Waste Generation per day and Disposal	Domestic 60 Kg per day and Process Waste 100 Kg per day Disposed of through Industrail Estate Waste Collection	Domestic 100 Kg / day Process Waste 160 Kg/day Disposed of through Industrail Estate Waste Collection System. Sludge from ETP will be disposed of through EPA approved contractor
Air Pollution Control Systems (APCS)	Wet scrubbers are installed at boilers' stacks.	
Project Cost, PKR	-	80 Million

2.10 MACHINERY AND EQUIPMENT AT HLWP

The list of Machinery and Equipent is illustrated in Table 2.4

Table 2.4: Machinery and Equipment at Hamdard Laboratories

S. #	Equipment Names	Qty	Location
1	COOKING VESSEL 1	1	RA Cooking Area
2	COOKING VESSEL 2	1	RA Cooking Area
3	COOKING VESSEL 3	1	RA Cooking Area
4	COOKING VESSEL 4	1	RA Cooking Area
5	COOKING VESSEL 5	1	RA Cooking Area
6	Heat Exchanger	6	RA Cooking Area
7	FILTER FOR VESSEL 1	1	RA Cooking Area
8	FILTER FOR VESSEL 2	1	RA Cooking Area
9	FILTER FOR VESSEL 3	1	RA Cooking Area
10	FILTER FOR VESSEL 4	1	RA Cooking Area
11	FILTER FOR VESSEL 5	1	RA Cooking Area
12	TRASNFER PUMP FOR VESSEL 1	1	RA Cooking Area
13	TRASNFER PUMP FOR VESSEL 2	1	RA Cooking Area
14	TRASNFER PUMP FOR VESSEL 3	1	RA Cooking Area
15	TRASNFER PUMP FOR VESSEL 4	1	RA Cooking Area
16	TRASNFER PUMP FOR VESSEL 5	1	RA Cooking Area
17	TRASNFER PUMP FOR HEAT EXCHANGER	1	RA Cooking Area
18	VESSEL FOR BOILED WATER	1	RA Cooking Area
19	HEAT EXCHANGER LARGE	2	RA Cooking Area
20	HEAT EXCHANGER MEDIUM	1	RA Cooking Area
21	HEAT EXCHANGER SMALL	1	RA Cooking Area
22	MIXING TANK 1	1	RA Cooking Area
23	MIXING TANK 2	1	RA Cooking Area
24	MIXING TANK 3	1	RA Cooking Area
25	MIXING TANK 4	1	RA Cooking Area
26	STORAGE TANK 1	1	RA Storage Area
27	STORAGE TANK 2	1	RA Storage Area

28	STORAGE TANK 3	1	RA Storage Area
29	STORAGE TANK 4	1	RA Storage Area
30	STORAGE TANK 5	1	RA Storage Area
31	STORAGE TANK 6	1	RA Storage Area
32	STORAGE TANK 7	1	RA Storage Area
33	STORAGE TANK 8	1	RA Storage Area
34	STORAGE TANK 9	1	RA Storage Area
35	STORAGE TANK 10	1	RA Storage Area
36	STORAGE TANK 11	1	RA Storage Area
37	STORAGE TANK 12	1	RA Storage Area
38	STORAGE TANK 13	1	RA Storage Area
39	STORAGE TANK 14	1	RA Storage Area
40	STORAGE TANK 15	1	RA Storage Area
41	STORAGE TANK 16	1	RA Storage Area
42	STORAGE TANK 17	1	RA Storage Area
43	STORAGE TANK 18	1	RA Storage Area
44	STORAGE TANK 19	1	RA Storage Area
45	STORAGE TANK 20	1	RA Storage Area
46	STORAGE TANK 21	1	RA Storage Area
47	STORAGE TANK 22	1	RA Storage Area
48	STORAGE TANK 22	1	RA Storage Area
49	STORAGE TANKS 24	1	RA Storage Area
50	MIXING TANK FOR ARQ ROOH AFZA	1	Distillation Area
51	ARQ KEWRA TANK	1	Distillation Area
52	ARQ DISTILLATOR 1	1	Distillation Area
53	ARQ DISTILLATOR 2	1	Distillation Area
54	ARQ DISTILLATOR 3	1	Distillation Area
55	ARQ DISTILLATOR 4	1	Distillation Area
56	ARQ DISTILLATOR 5	1	Distillation Area
57	ARQ DISTILLATOR 6	1	Distillation Area
58	ARQ DISTILLATOR 7	1	Distillation Area
59	ARQ DISTILLATOR 8	1	Distillation Area

60	ARQ DISTILLATOR 9	1	Distillation Area
61	ARQ DISTILLATOR 10	1	Distillation Area
62	ARQ DISTILLATOR 11	1	Distillation Area
63	ARQ DISTILLATOR 12	1	Distillation Area
64	ARQ DISTILLATOR 13	1	Distillation Area
65	ARQ DISTILLATOR 14	1	Distillation Area
66	ARQ DISTILLATOR 15	1	Distillation Area
67	CONDENSOR 1	1	Distillation Area
68	CONDENSOR 2	1	Distillation Area
69	CONDENSOR 3	1	Distillation Area
70	CONDENSOR 4	1	Distillation Area
71	CONDENSOR 5	1	Distillation Area
72	CONDENSOR 6	1	Distillation Area
73	CONDENSOR 7	1	Distillation Area
74	CONDENSOR 8	1	Distillation Area
75	CONDENSOR 9	1	Distillation Area
76	CONDENSOR 10	1	Distillation Area
77	CONDENSOR 11	1	Distillation Area
78	CONDENSOR 12	1	Distillation Area
79	CONDENSOR 13	1	Distillation Area
80	CONDENSOR 14	1	Distillation Area
81	CONDENSOR 15	1	Distillation Area
82	COLLECTION TANK 1-12	1	Distillation Area
83	COLLECTION TANK 2-11	1	Distillation Area
84	COLLECTION TANK 3-10	1	Distillation Area
85	COLLECTION TANK 4-9	1	Distillation Area
86	COLLECTION TANK 5-8	1	Distillation Area
87	COLLECTION TANK 6	1	Distillation Area
88	COLLECTION TANK 7	1	Distillation Area
89	COLLECTION TANK 13	1	Distillation Area
90	COLLECTION TANK 14	1	Distillation Area
91	Weighing Balance	1	Distillation Area

92	Platforms for feeding in Distillation Tanks	6	Distillation Area
93	JOSHANDA VESSEL	1	Medicated Syrup Cooking Area
94	COOKING VESSEL	1	Medicated Syrup Cooking Area
95	FILTER SMALL	1	Medicated Syrup Cooking Area
96	TRANSFER PUMP	1	Medicated Syrup Cooking Area
97	STORAGE TANK	1	Medicated Syrup Storage Area
98	CRUSHER MACHINE MASH NO 5	1	Majun Grinding Area
99	GRINDING MACHINE MASH NO 10	1	Majun Grinding Area
100	GRINDER MACHINE MASH NO 20	1	Majun Grinding Area
101	Juice Extractor	1	Majun Cooking Area
102	GRINDER	1	Majun Cooking Area
103	COOKING VESSEL 1	1	Majun Cooking Area
104	COOKING VESSEL 2	1	Majun Cooking Area
105	DRYER 42 KG	1	Joshanda Pkg Area
106	RO Plant	1	RO Area
107	SYRUP FILLING MACHINE	1	RA Filling Line # 1
108	FILTER ON SYRUP LINE	1	RA Filling Line # 1
109	RESERVE TANK FOR SYRUP FILLING	1	RA Filling Line # 1
110	CAPPING MACHINE	1	RA Filling Line # 1
111	Caser Machine	1	RA Filling Line # 1
112	Optical Checking Screen	1	RA Filling Line # 1
113	Taping Machine	1	RA Filling Line # 1
114	Convayer Belt	1	RA Filling Line # 1
115	Printers	2	RA Filling Line # 1
116	SYRUP FILLING MACHINE	1	RA Filling Line # 2
117	FILTER ON SYRUP LINE	1	RA Filling Line # 2
118	RESERVE TANK FOR SYRUP FILLING	1	RA Filling Line # 2
119	CAPPING MACHINE	1	RA Filling Line # 2
120	Caser Machine	1	RA Filling Line # 2
121	Optical Checking Screen	1	RA Filling Line # 2
122	Taping Machine	1	RA Filling Line # 2
123	Convayer Belt	1	RA Filling Line # 2

124	Printers	2	RA Filling Line # 2
125	SYRUP FILLING MACHINE	1	RA Filling Line # 3
126	FILTER ON SYRUP LINE	1	RA Filling Line # 3
127	RESERVE TANK FOR SYRUP FILLING	1	RA Filling Line # 3
128	CAPPING MACHINE	1	RA Filling Line # 3
129	Optical Checking Screen	1	RA Filling Line # 3
130	Conveyer Belt	1	RA Filling Line # 3
131	Printers	1	RA Filling Line # 3
132	Semi Automatic Filling Line	1	Medicated Syrup Filling & Pkg
133	Printer	1	Printing Section
134	Conveyer Belt	1	Printing Section
135	JOSHANDA POUCH SEALING MACHINE	3	JOSHANDA Filling & Pkg Section
136	JOSHANDA 10 PKTS SEALING MACHINE	3	JOSHANDA Filling & Pkg Section
137	Weighing Balance	8	JOSHANDA Filling & Pkg Section
138	Shrink Sleeving Machine	1	Shrinking Area
139	Hair Oil Cooking Pan	1	Oil Manufacturing Section
140	OIL FILLING MACHINE	1	Oil Filling & Pkg Section
141	OIL CAP Sealing MACHINE	1	Oil Filling & Pkg Section

2.10.1 Machinery and Equipment Before and After Expansion

Table 2.5: Detail of Machinery and Equipment Before and After Expansion

S NO	DEPARTMENT	BEFORE	AFTER
1	RA Cooking	Vessel 1 = 1125L	Vessel 1 = 1250OL
2		Vessel 2 = 1125L	Vessel 2 = 625OL
3		Vessel 3 = 1125L	Vessel 3 = 625OL
4		Vessel 3 = 1125L	Vessel 4 = 625OL
5		Vessel 4 = 1125L	Vessel 5 = 625OL
6		Vessel 5 = 1125L	
7		Vessel 6 = 1125L	
8		Vessel 7 = 1125L	
9		Vessel 8 = 1125L	
10		Vessel 9 = 1125L	
11		Vessel 10= 1125L	
12		Vessel 11= 1125L	
13		Vessel 12 = 1125L	
14	Arqiat Distillation	Distillator 1=158 L	Distillator 1= 240L
15		Distillator 2= 158 L	Distillator 2=240L
16		Distillator 3=158 L	Distillator 3=240L
17		Distillator 4=158 L	Distillator 4= 240L
18		Distillator =5158 L	Distillator 5= 240L
19		Distillator 6=158 L	Distillator 6=240L
20		Distillator 7=158 L	Distillator 7= 240L
21		Distillator 8=158 L	Distillator 8= 240L
22		Distillator 9=158 L	Distillator 9= 240L
23		Distillator 10=158 L	Distillator 10= 240L
24		Distillator 11=158 L	Distillator 11= 240L
25		Distillator 12= 158 L	Distillator 12= 240L
26			Distillator 13=560L
27			Distillator 14= 1000L
28			Distillator 15= 560L
29	Filling and packing	Manual Filling	Line 1=135 BPM
30			Line 2= 135 BPM
31			Line 3 = 135 BPM

2.11 WATER SUPPLY AND CONSUMPTION:

Water supply is through tube-wells**.**

Water Consumption:

Domestic: Including drinking, sanitary needs, ablution, kitchen, cleaning, gardening, losses and miscellaneous

- Current: 10 m3 per day
- After expansion: 15 m3 per day

Process Water:

Process water is utilized

- For washing of raw materials and vessels
- As an ingredient in product manufacturing
- RO Plant
- As a feed water source in boilers for steam generation.

Process Water Requirement:

- Current: 500 m3 per day
- After expansion: 700 m3 per day

Construction Phase: (Additional): 40 m3 per day for civil work, water spray to suppress dust emissions and domestic use (washrooms, kitchen, drinking etc.).

-

2.12 WASTEWATER GENERATION, TREATMENT AND DISPOSAL

Process wastewater generation:

- Current: 96 m3 per day
- After Expansion: 120 m3 per day.
- Construction Phase: Additional 10 m3 per day.

Sewage is/will be disposed of after treatment in Septic Tank and discharged into Industrial Estate Drain. Process wastewater will be treated in wastewater treatment plant before discharge into Industrial Estate Drain. Sewerage and drain charges are paid on monthly basis to Industrial Estate (Annexure IV).

During Construction phase, the sewage from Construction site will be disposed of after treatment in Septic Tank.

2.12.1 Effluent Treatment Plant (ETP)

Design capacity : 144 m3 per day (6 m3 per hr)

Type: Activated sludge type combined with DAF and MBBR

Process diagram is given in Figure 2.10.

Proposed Treatment Scheme includes:

Primary Treatment:

- Influent Collection Chamber,
- Static Screening
- pH Neutralization Equalization/Homogeneous Tank
- DAF Dissolved Air Flotation.
- Sludge Screw Press.

Secondary Treatment

- MBBR Aeration "Moving Bed Bio Reactor"
- Secondary Clarifier.

Treatment Target

To comply with PEQS of Industrial Wastewater.

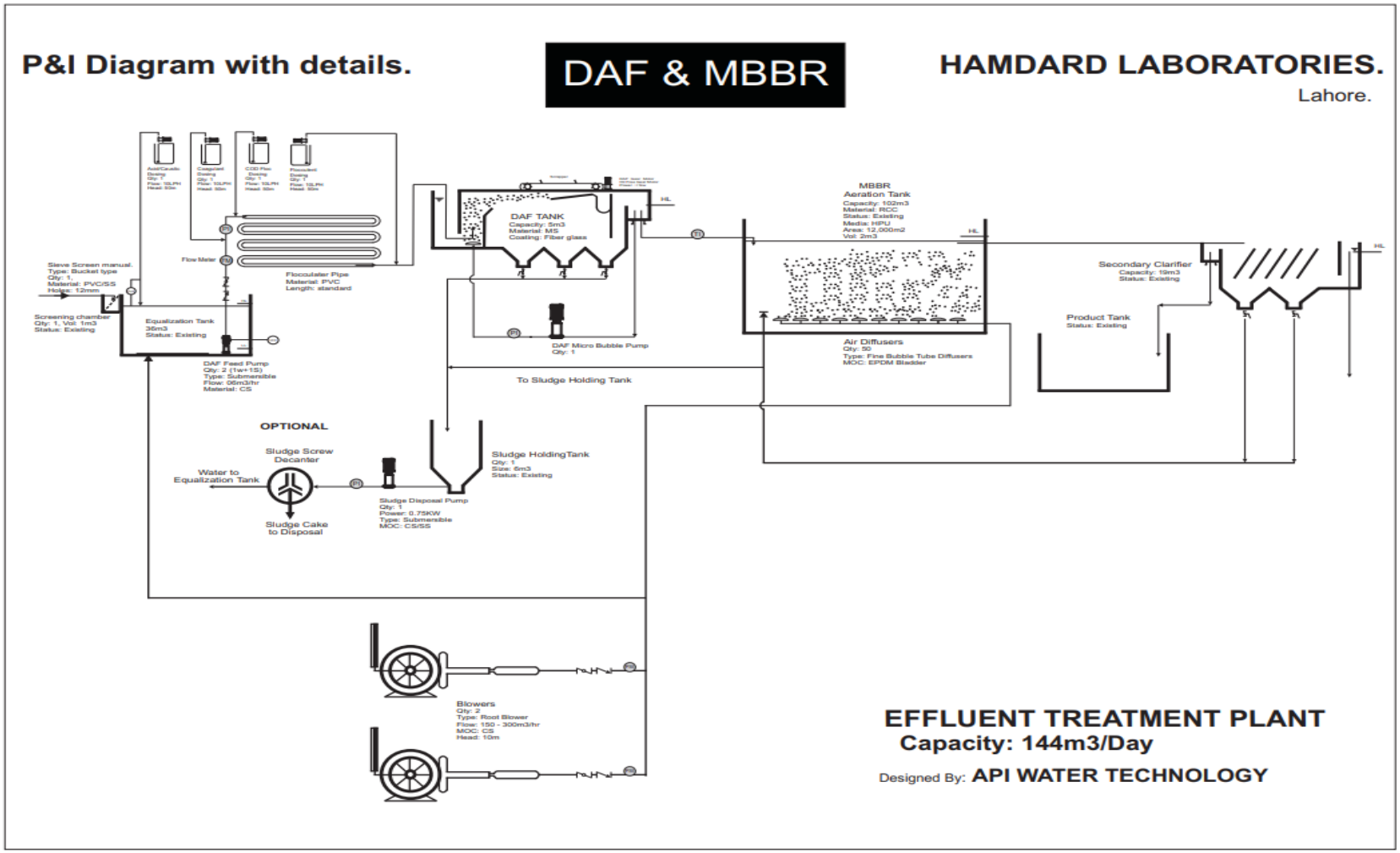


Figure 2.10: P&ID of Effluent Treatment Plant

2.13 SOLID WASTE GENERATION AND DISPOSAL

Solid waste from offices and kitchen etc. is segregated at the source into different categories and collected/stored at a designated area within the premises. The segregated solid waste is of domestic nature and is disposed of through Industrial Estate Collction System.

The process waste generated during manufacturing is recycled and re-consumed leaving no process waste to be disposed of. The packaging material is collected and stored at a designated area and sold through a contractor.

- Domestic waste:
    - Current: 60 Kg per day Approximate
    - After Expansion: 100 Kg per day.

- Process Waste:
    - Packaging of raw material: 100 Kg per day (Before expansion)
      : 160 Kg per day (After Expansion)
      Non-hazrdous solid waste will be sold
    - Dried sludge from WWTP will be disposed of through EPA approved contractor.

- During Construction Phase
    - Construction (Civil) waste will be removed through a contractor
    - Domestic waste: 100 Kg/day approximate, to be disposed of through Contractor.
    - Hazardous waste if generated will be disposed of through EPA certified contractor (In the scope of Construction Contractor)
    - The excavated earth for WWTP will be utilized for leveling, filling pits, and landscaping during construction and restoration. Extra earth will be removed by a contractor.

2.14 RESTORATION AND REHABILITATION

The objective of the restoration and rehabilitation activities is to minimize the environmental impact of the construction and industry installation, and to ensure that the site is safe, functional, and aesthetically pleasing after the work is completed.

- A clause will be included in the contract with the contractor to ensure restoration and rehabilitation of the site after completion of construction phase.

- All the temporary cabins and containers will be removed from the construction site.

- The construction area will be thoroughly cleaned, including the removal of material stockpiles, and proper disposal of any metal, hazardous or non-

hazardous waste, debris, and residues remaining after the completion of construction.

- The excavated earth will be stored at a designated location and utilized for leveling, filling pits, and landscaping during and after the construction phase.

- Any damaged infrastructure, such as fences, roads, or utility services, will be repaired or restored to their original condition.

- Finally, the EMP Team will inspect the site to ensure proper restoration has been completed before granting clearance to the contractor for final payments.

- Landscaping and the plantation of indigenous trees will be carried out on the open land and along the boundary wherever practicable.

2.15 SAFETY AND HEALTH AT HLWP

Hamdard ensures that its processes and facilities comply with both local and international health, safety and environmental standards, including those set by the Drug Regulatory Authority of Pakistan (DRAP).

2.15.1 Personal Protective Equipment

Workers will be provided with dust mask, ear plug, ear muffs, safety boots, safety gloves, safety belt, helmet and goggles etc. during the working hours to ensure personnel health & safety. Implementation of PPEs is ensured by the proponent for the project. The detail of PPEs is given in Table 2.6.

Table 2.6 Recommended PPES for Various Hazards

Protection Required	Potential Hazard	Recommended PPEs
Head Protection	Falling objects, inadequate height clearance, and overhead power cords	Helmets with or without electrical protection
Hand protection	Hazardous material, cuts or lacerations, vibrations, extreme temperatures	Synthetic or Rubber gloves, leather, insulating material etc.
Eye and face protection	Flying particles, molten metal, liquid chemicals, gases or vapors, light radiation	Safety goggles, shield protective, etc.
Hearing protection	Noise	Hearing protectors like ear plugs, ear muffs

Respiratory protection	Dust, fogs, fumes, gases, smokes, vapors, oxygen deficiency	Facemasks or air supply
Body protection	Extreme temperatures, hazardous materials, biological agents, cutting and laceration	Aprons, insulating clothing etc. of appropriate materials
Foot Protection	Chemical/Biological, Compression, Impact, Electrical shock, Extreme heat/cold, cutting tools, Slippery/wet surface, fire/explosion	Safety shoes/boots according to hazard
Fall Protection (Work at height)	Severe injury, Disability and even death	Safety harness, lanyards and other gears designed to safeguard workers from fall
Electrical Protection	Electric Shock	Shock protective equipment to isolate the wearer from the electrical current. All equipment should be non-conductive materials and rated for voltage. Always read the labels of shock protective equipment. Color is just a guideline - Rubber and leather gloves and sleeves. Leather gloves are used to protect the rubber insulating gloves. - Foot Protection – EH rated leather footwear - Eye Protection – Nonconductive safety glasses or goggles Other Shock Protective equipment is listed below: a. Rubber mats b. Rubber blankets c. Rubber tubes and line covers d. Non-conductive ladders e. Non-conductive Tools Arc Flash Hazard PPE

2.15.2 Fire Protection and Firefighting System

An addressable fire protection system with detection, alarm annunciation, and other installations has been implemented to safeguard against fire hazards. Fire buckets, extinguishers, fire hydrants and fire hose pipes are strategically placed at all critical locations within the plant

2.15.3. Emergency Exit Plans

Emergency exit points are made available for easy evacuation in case of any emergency. Emergency exist plans for HLWP.

2.15.4 Quality Policy of HLWP

Figure 2.11: HLWP's Quality Policy Statement

2.15.5 First Aid Boxes

First aid boxes are placed at suitable places of HLWP

2.15.6 Security:

The present site is secured by means of boundary walls along with the presence of security guards round the clock

2.15.7 Dengue Control

Housekeeping of the premises is up to the mark. It is ensured on daily basis that there is not any stagnant water in the premises. SOP for Dengue control is strictly followed. Posters for dengue prevention have been displayed at selected locations. (Figure 2.12)

Figure 2.12 Dengue Control

2.15.8 Food Business Licence Certificate

HLWP has obtained Food Business Licence Certificate fro Punjab Food Authority (Figure 2.13)

Figure 2.13: Food Business Licence Certificate for HLWP

2.16 ENVIRONMENTAL SUSTAINABILITY

2.16.1 Social and Environmental Responsibility Policy

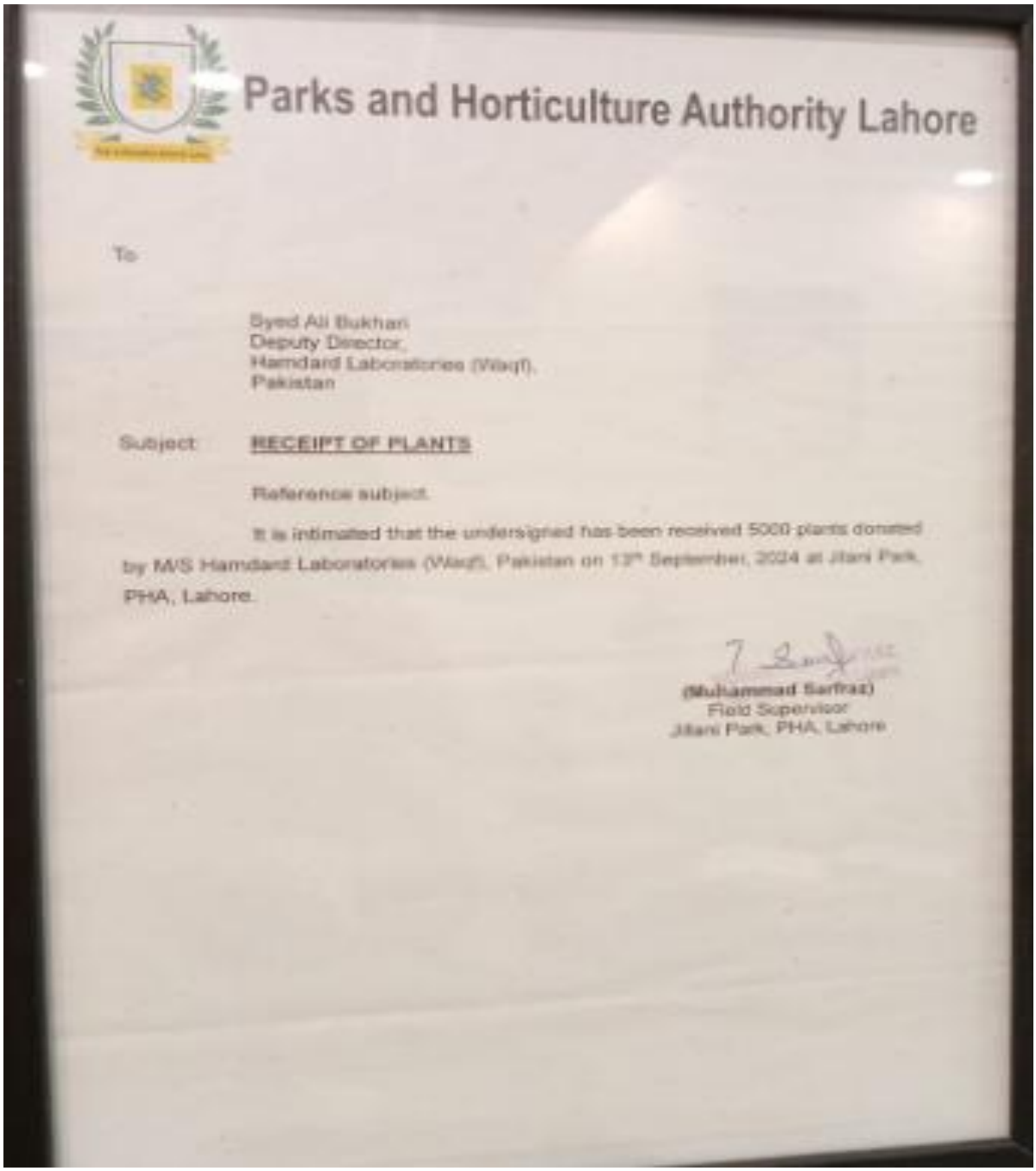
"HLWP is committed to conducting its business in a socially responsible and environmentally sustainable manner. Our social and environmental responsibility policy aims to integrate ethical and sustainable practices into all aspects of our business, recognizing that our activities have a direct and indirect impact on the communities and environments in which we operate. We adhere to all applicable local, national and international laws and regulations concerning social and environmental matters. Further, we seek to go beyond mere compliance by engaging in initiatives that advance environmental conservation, social well-being and economic prosperity. We expect all employees, suppliers and partners to uphold these principles in alignment with our Company's values."

2.16.2 Adherence to Environmental Regulations

Hamdard ensures that its processes and facilities comply with both local and international health and safety standards, including those set by the Drug Regulatory Authority of Pakistan (DRAP).

2.16.3 Tree Plantation and Landscapes

HLWP planted native trees during recent years within and in the surroundings of the Mill. The Hamdard Laboratories donated 5000 plants to PHA, Lahore last year as shown in Figure 2.15



Parks and Horticulture Authority Lahore

To

Syed Ali Bukhari
Deputy Director,
Hamdard Laboratories (Waqf),
Pakistan

Subject: **RECEIPT OF PLANTS**

Reference subject.

It is intimated that the undersigned has been received 5000 plants donated by M/S Hamdard Laboratories (Waqf), Pakistan on 13th September, 2024 at Jilani Park, PHA, Lahore.

(Muhammad Sarfraz)
Field Supervisor
Jilani Park, PHA, Lahore

Figure 2.14 Donation of Trees to PHA, Lahore

3 DESCRIPTION OF ENVIRONMENT

3.1 GENERAL

This section describes the baseline conditions, which covers all the relevant information on the current status of the environment of the Project Area. Information on these aspects has been derived from the desk study of available data, field visits to the project area as well as information obtained from official websites of Government departments and other relevant agencies.

The data regarding the physical environment was collected mainly within the project surroundings. In case of the biological and socioeconomic environment, efforts were made to collect the information within one Km around the project area and even up to 10 Km where any direct or indirect impacts were envisaged.

3.2 METHODOLOGY OF CONDUCTING BASELINE STUDY

Establishing the environmental baseline includes both the present and likely further state of the environment, taking into account changes resulting from natural events and other human activities, assuming the project is not undertaken – the no action alternative.

The guiding factors for the present baseline study are the EPA's requirements for the Environmental Impact Assessment and IEE/EIA Regulations 2022, local regulations and directives. The studies were conducted by considering both primary and secondary means i.e. by sampling, monitoring, observations and field verification along with review of past relevant EIA and IEE studies and literature survey.

The data generation were formulated with interdisciplinary team discussions, criteria questions, and professional judgment.

The baseline data provides the “base line” against which severity of the future impacts can be assessed.

3.3 PHYSICAL ENVIRONMENT

This Section examines the physical resources such as topography, geology and soil, climate, surface and groundwater resources, wastewater effluent handling, noise levels and ambient air quality of not only the Project site but also the surroundings as a whole to assess whether the project under assessment can or does have any impact on any of these parameters

3.3.1 Topography, Geology and Soil

The geographical coordinates of project site are 31.44614 E and 74.32048 N with elevation of 213 m. The topography of the project site is almost flat. The area around the project site is covered by industries.

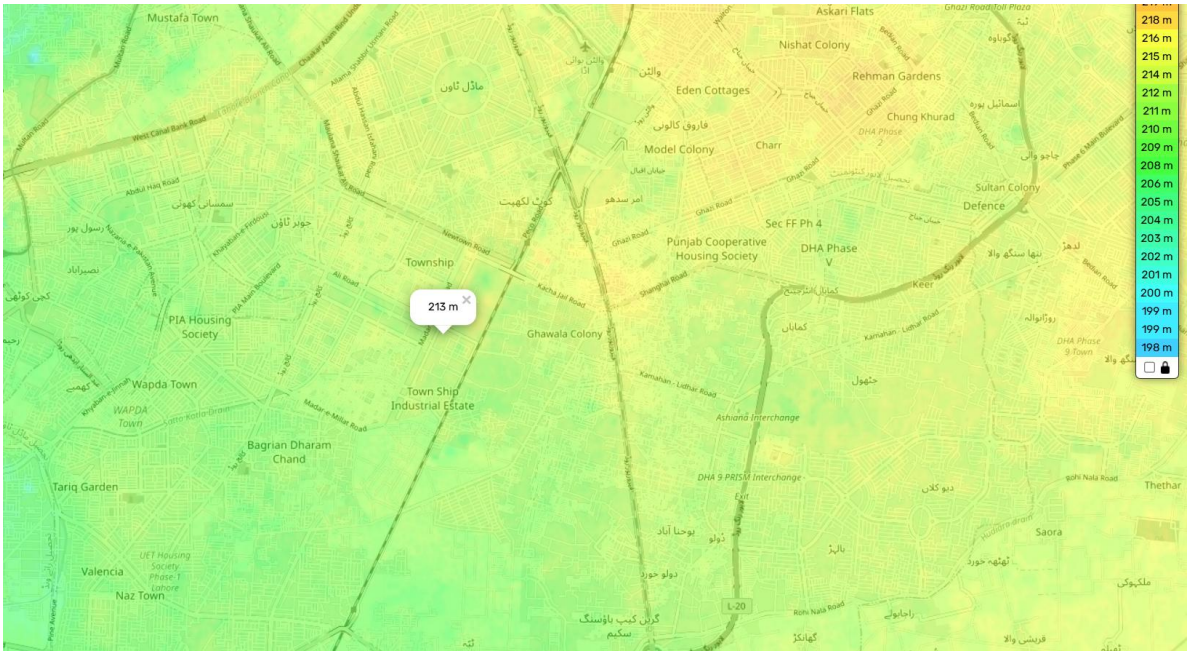


Figure 3.1: Elevation of Project Site

Clayey silt, sandy silt, silty sand, lean clay, and sand make up the majority of Lahore soil. Coarse sand or gravel beds are rare. On the other hand, silty or clayey sand may contain mudstone or siltstone pebbles. Quartz, muscovite, and clinochlore make up the majority of the minerals found in Lahore soil, indicating that the alluvial deposit acquired sediments with metamorphic origins.

3.3.2 Seismology

Seismic zoning map of Pakistan proposed by the building code of Pakistan (BCP: 2007) is shown in Figure 3.2. According to this map, Pakistan is divided in five seismic hazards zones (Zones 1, 2A, 2B, 3 and 4); Zone 1 being the lowest and Zone 4 is the highest seismic zone. Figure 3.2 shows the seismic zoning map of Pakistan. The project area falls in Zone 2A that shows a low to moderate level of seismicity. Zone 2A represents peak ground acceleration (PGA) from 0.08 to 0.16g (Table 3.1).

Table 3-1: Seismic Zones

Seismic Zone	Peak Horizontal Ground Acceleration	Zone Factor Z
1	0.05 to 0.08g	0.075
2A	0.08 to 0.16g	0.15
2B	0.16to 0.24g	0.20
3	0.24 to 0.32g	0.30
4	➢0.32 g	0.4
Where "g" is acceleration due to gravity		

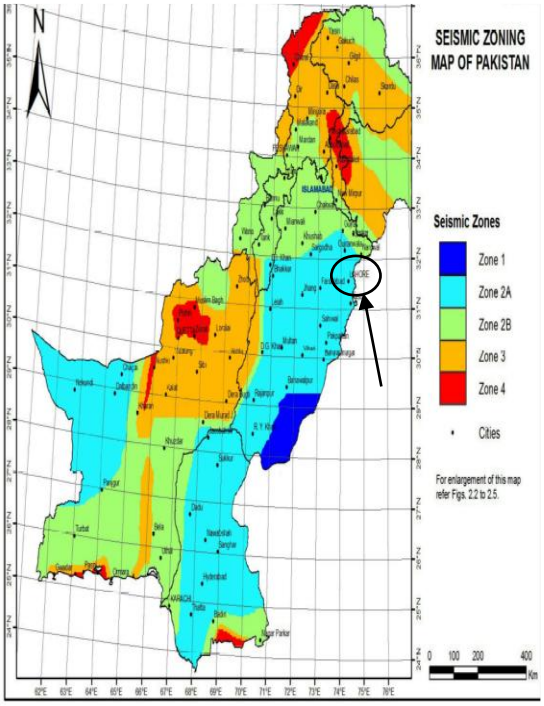


Figure 3.2 Seismic Zoning Map of Pakistan

The epicenters of low to moderate magnitude earthquakes recorded in the Punjab Plain are associated with the subsurface fractures in the basement rocks which are concealed by the thick alluvial deposits. The known main active fault near Sargodha is the Main Boundary Thrust (MBT) which passes at a distance of about 180 km towards the northeast along the Himalayan front. The project region has also been subjected to severe shaking in the past due to earthquakes in the Himalayas; these should also be taken into consideration while designing.

3.3.3 Land Use and Land Cover (LULC)

Land cover (LC) is defined as the physical properties on the land's surface for example forest, mountain and water. On the other land use (LU) is the change of LC due to the human actions and requirements such as roads and urban infrastructure. Land use and land cover (LULC) impact on the ecosystem processes, biodiversity, hydrology and climate due to human activities.

Transformation of one land-use type to another, may bring changes in surface energy, because different classes of LULC have different reflectance and evapotranspiration. Such rapid changes lead to significant changes in local climate, particularly having impacts on land surface temperature (LST) and local air temperature. The LST increases with decrease in vegetation and with increase in urban built-up and barren land.

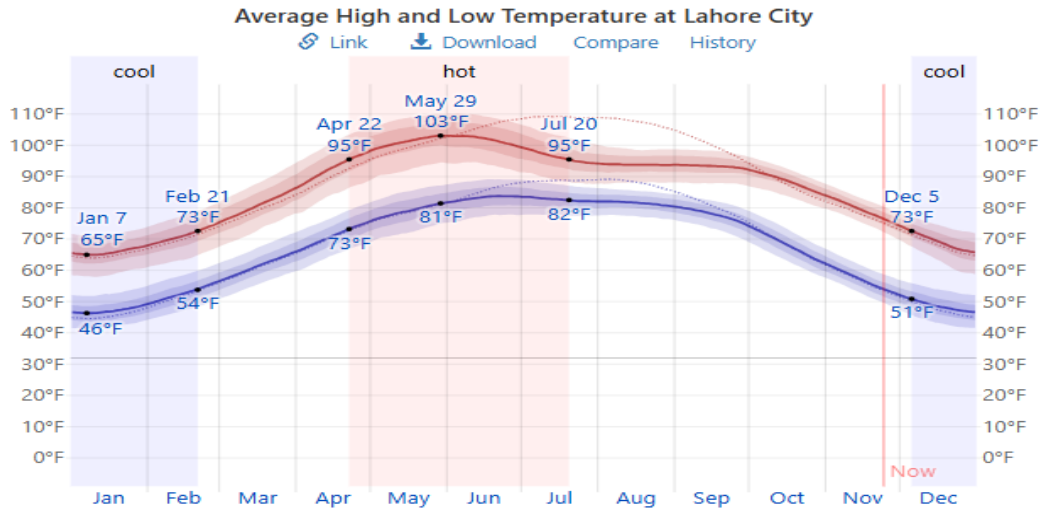
Total area of Lahore is 1,774 square kilometers. Table 3.3 illustrates the Land-use Distributions of Lahore in 2013, 2013 and 2023.

Table 3.2 Land-use Distributions of Lahore in 2003, 2013 and 2023

Sr. No	Land Use Classes	Area (sq.km)		
		2003	2013	2023
1	Vegetation	148.749054	316.462949	328.4721624
2	Urban area	308.6491261	314.13595	336.9702759
3	Barren land	1296.792774	1125.779011	1099.13587
4	Water bodies	20.47684918	18.316907	10.47416794

3.3.4 Climate

The project site in Lahore falls under hot long summers and mild short winters. There is a monsoon season between July and September. .June is the hottest month with average maximum temperature around 102 ºF. Over the course of the year, the temperature typically varies from *46°F* to *103°F* and is rarely below *41°F* or above *110°F*. The coldest month of the year at Lahore City is *January*, with an average low of *47°F* and high of *66°F*. Figure 3.3 shows the temperature data of Lahore.



The daily average high (red line) and low (blue line) temperature, with 25th to 75th and 10th to 90th percentile bands. The thin dotted lines are the corresponding average perceived temperatures.

Average	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
High	66°F	71°F	81°F	93°F	101°F	102°F	96°F	94°F	93°F	88°F	79°F	69°F
Temp.	56°F	62°F	71°F	82°F	91°F	93°F	90°F	88°F	86°F	78°F	67°F	58°F
Low	47°F	53°F	61°F	71°F	79°F	83°F	83°F	81°F	78°F	68°F	57°F	49°F

Figure 3-3: Temperature Data Lahore (Data Source: Weather Spark)

3.3.4.1 Rainfall

Lahore City experiences *extreme* seasonal variation in monthly rainfall. The *rainy* period of the year lasts for *9.4 months, from January 1 to October 14,* with a sliding 31-day rainfall of at least *0.5 inches*. The month with the most rain at Lahore City is *July*, with an average rainfall of *5.2 inches*. The *rainless* period of the year lasts for *2.6 months,* from *October 14 to January 1*. The month with the least rain at Lahore City is *November*, with an average rainfall *of 0.2 inches*. Figure 3.4 illustrates monthly rainfall patterns.

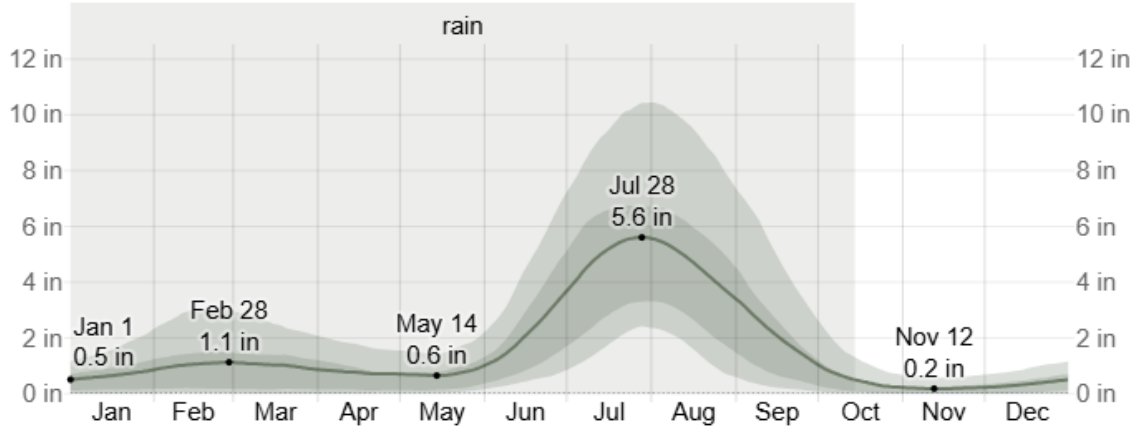


Figure 3-4: Average Monthly Rainfall of Lahore (Data Source: Weather Spark.com)

3.3.4.2 Humidity

Month-wise average humidity is illustrated in Figure 3.5

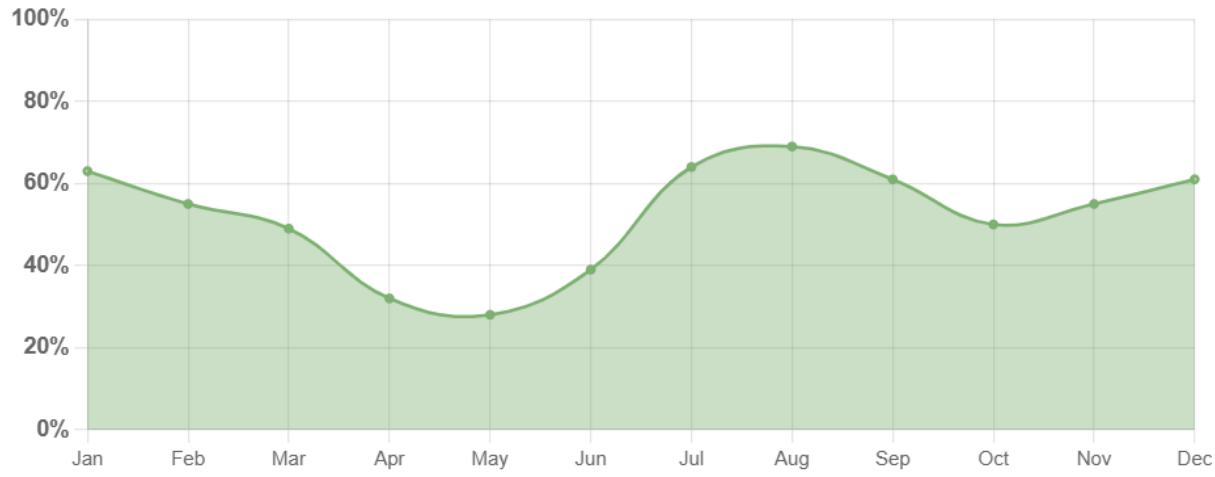


Figure 3-5: Average Humidity in Lahore (Data Source: Weather and Climate)

3.3.4.3 Wind

Throughout the year, there is a slight seasonal fluctuation in Lahore's average hourly wind speed. The 5.9 months from January 21 to July 17 are the windiest time of year, with average wind speeds above

5.3 miles per hour. With an average hourly wind speed of 6.2 miles per hour, April is the windiest month in Lahore. The 6.1-month period from July 17 to January 21 is the quieter time of year. With an average hourly wind speed of 4.3 miles per hour, September is the calmest month of the year in Lahore.

Average wind speed in Lahore are exhibited in Figure 3.6.

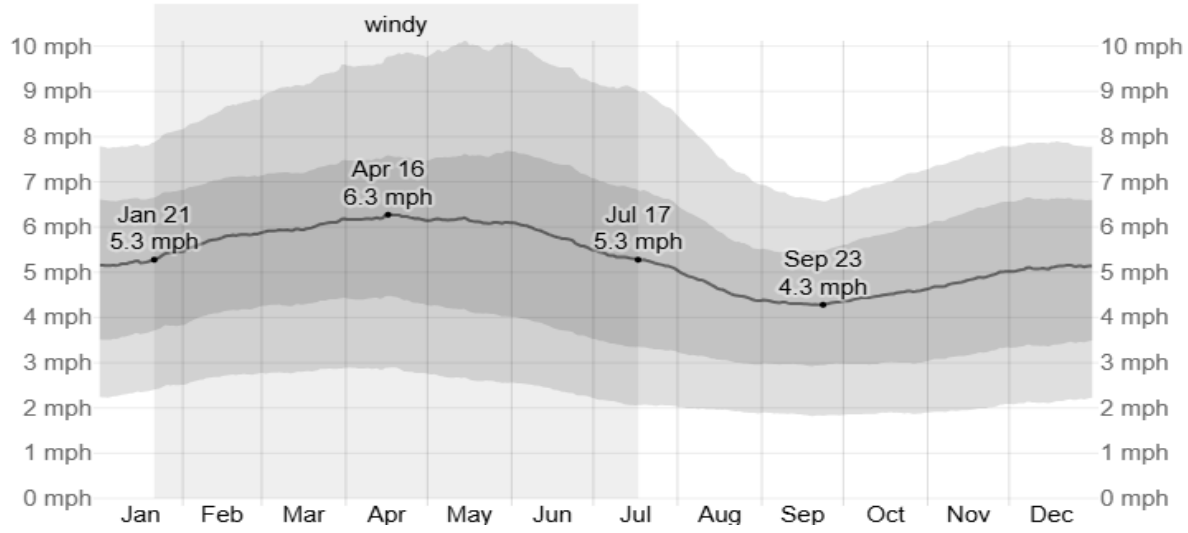


Figure 3-6 Average Wind Speed in Lahore (Data Source: Weather Spark.com)

3.3.5 Water Resources and Drains

3.3.5.1 Surface Water and Drain

There is no Surface water source near the Project site. The wastewater is discharged into Industrial estate drain..

3.3.5.2 Groundwater

As illustrated in Figure 3.7., the quality of groundwater water in the study area of Lahore is sweet making it suitable as a primary source of drinking water.

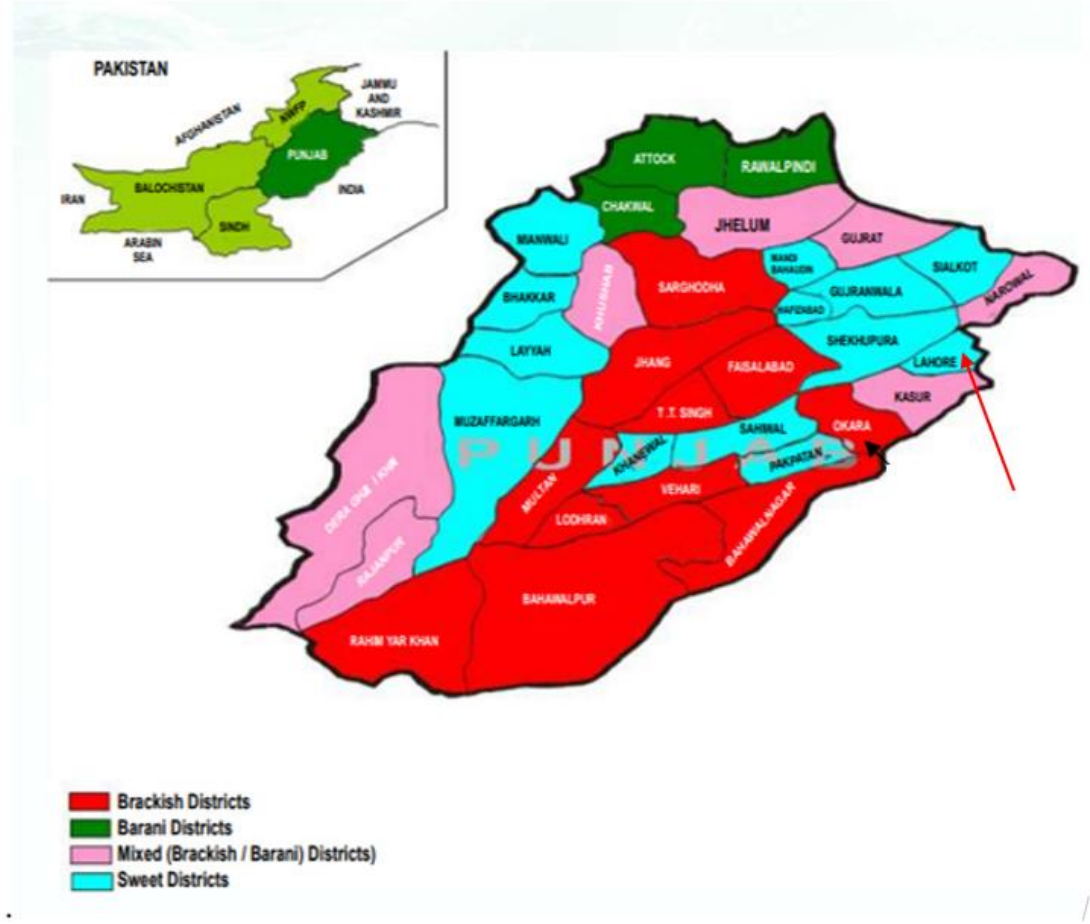


Figure 3.7 Quality of Water in Punjab

3.4 BIOLOGICAL ENVIRONMENT

3.4.1 Flora

The project site is surrounded by agriculture land. Wheat, rice and corn are the major crops. Native trees such as Sheesham (Dalbergia sissoo), Keekar (Acacia arabica), Bar (Jujube), and Jamun (Syzygium cumini) are commonly found in and around villages near the project site.

3.4.2 Fauna

Common birds found in neighborhood of the Project site are house crows, sparrows, pigeons, and common mynas.

Buffaloes, cows, stray dogs, feral cats, palm squirrel, frogs, house mouse and common lizards were observed in the study area. No protected species are present.

3.5 SOCIOECONOMIC ENVIRONMENT

3.5.1 Demographics

The population of Lahore was determined (Census 2023) to be at 13.004 m with 2.7% annual growth from 2017 to 2023. Gender-wise, 52.9% of the population is male, while 47.1% is female.

Table 3.3 Population of Lahore District

Name	Status	Population Census 1972-09-16	Population Census 1981-03-01	Population Census 1998-03-01	Population Census 2017-03-15	Population Census 2023-03-01
Lahore	District	2,587,621	3,544,942	6,340,114	11,119,985	13,004,135

Lahore is a young city with around 40% of its inhabitants below the age of 15. There are Muslims (95.3%), Christians (4.6%), Hindus (0.02%), Ahmadiya (0.06%), others (0.02%) in Lahore. Major casts include Kashmiris (30%), Arain (40%), Kamboh 5%, Rajput 5%, Miscelleneous20%. The majority of people speak Punjabi (73%), followed by Urdu (21%), while Pashto, Mewati, Saraiki, Hindko, and other languages are also spoken.

3.5.2 Education

Literacy rate of Lahore District is 73%. Lahore District has 1120 schools and 63 Colleges (26 boys + 37 girls). With more colleges and institutions than any other Pakistani city, Lahore is regarded as the country's educational capital. Lahore is the prospective hyper-high-tech hub in Pakistan and the country's greatest producer of experts in the domains of science, technology, IT, engineering, medical, and other fields.

Several schools and colleges are easily accessible from the project site.

3.5.3 Emergency Services

The Quaid-e-Azam Industrial Estate (QIE) operates its own Emergency Services Centre, offering ambulance, fire brigade, and disaster response support. For emergencies elsewhere in Lahore, provincial emergency services are available through Rescue 1122.

3.5.4 Health Facilities

Healthcare needs are met by both the public and private sectors. All major hospitals in Lahore such as Jinnah Hospital, Ittefaq Hospital and Ghulab devi Hospital are conveniently accessible from the HLWP project site. All employees undergo an annual medical check-up in compliance with Section 23 of the Factories Act. HLWP takes measures to protect workers from contagious or infectious diseases.

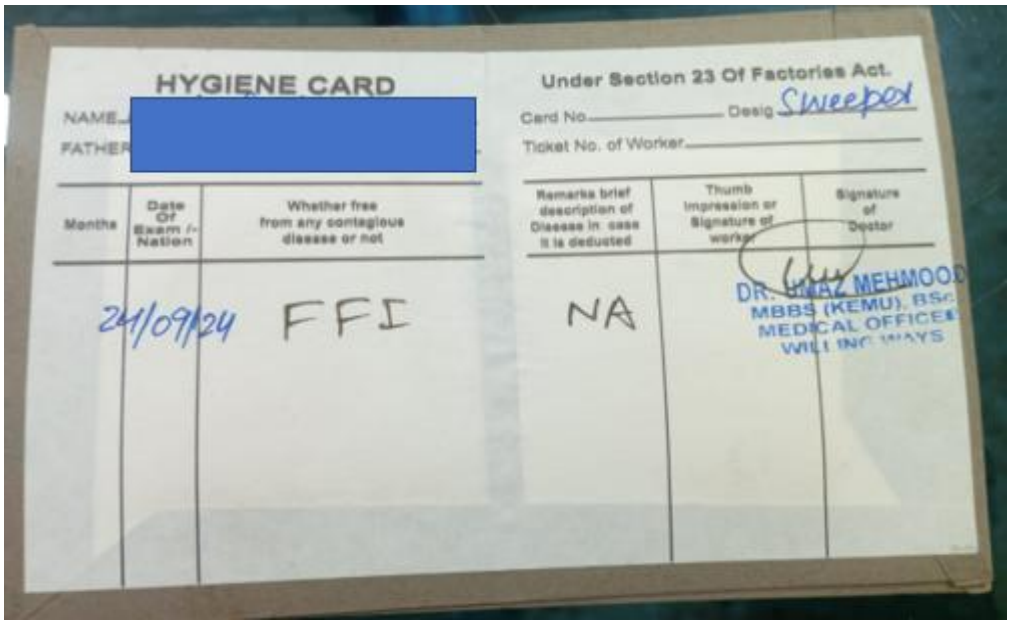


Figure 3.8 Employee's Hygiene Card

3.6 LAB ANALYSIS REPORTS

Baseline environmental data of the project area was monitored . The lab monitoring reports of noise, ambient air quality and groundwater quality are given in Annexure XI and are summarized in the following.

3.6.1 Noise

The sound levels at center of the project area were measured continuous for 24 hr. during day (6 AM – 10 PM) and night time (10 PM -6 AM). The results are summarized in Table 3.5 and monitoring report is attached as Annexure-XI. The measured sound levels comply with PEQS for noise of Category C.

Table 3-4: Noise Levels at Project Site

Sr. No.	Location	Day Time dB(A) 6 AM -10 PM	Night Time dB(A) 10 PM – 6 AM
1.	Site	(Avg)	(Avg.)
2.	PEQS	75	65

3.6.2 Ambient Air Quality:

Monitoring was carried out for SO_2, NO_x, CO, and particulates PM_{10} and $PM_{2.5}$ for 24 hours at Project Site. The measured data are exhibited in Table 3.5. Lab analytical report is attached as Annexure XI. Results for all parameters are well within PEQS limits for Ambient Air.

Table 3.5 Ambient Air Quality at Project Site for 24 hours.

		Unit	Results	PEQS
1	Particulate Matter (PM_{10})	µg/m^3		150
2	Particulate Matter ($PM_{2.5}$)	µg/m^3		35
3	CO	µg/m^3		5
4	NOx	µg/m^3		120
5	SO2	µg/m^3		120

3.6.3 Groundwater Quality

Analysis report of groundwater by EPA certified lab is given in Annexure XI and also illustrated in Table 3.6

Table 3.6: Groundwater Analyses Results

Sr. No	Parameters	Units	Results	PEQS
1	pH	--		6.5-8.5
2	Total Dissolved Solids (TDS)	mg/l		1000
3	Chloride	mg/l		250
4	Fluoride	mg/l		1.5
5	Taste	Objectionable. /Acceptable		Acceptable
6	Odour	Objectionable. /Acceptable		Acceptable.
7	Colour	TCU		15
8	Nitrate (as NO_3^-)	mg/l		50
9	Nitrite (as NO_2^-)	mg/l		3
10	Lead	mg/l		0.05
11	Total Hardness as $CaCO_3$	mg/l		500
12	Turbidity	NTU		5
13	Zinc	mg/l		5
14	Aluminum	mg/l		0.2
15	Chromium	mg/l		0.050
16	Cadmium	mg/l		0.01
17	Copper	mg/l		2
18	Boron	mg/l		0.300

19	Barium	mg/l		0.700
20	Antimony	mg/l		0.020
21	Arsenic	mg/l		0.050
22	Cyanide	mg/l		0.05
23	Mercury	mg/l		0.001
24	Nickel	mg/l		0.020
25	Residual Chlorine	mg/l		0.2 – 0.5
26	Total Thermo Coliform	Number/100ml		0/100 ml
27	Total Coliform	Number/100ml		0/100 ml
28	E. coli	Number/100ml		0/100 ml

*BDL: below detection limit

3.7 SUITABILITY OF SITE

The proposed site was further evaluated based on the following parameters and deemed suitable.

Table 3.7 Site Suitability

Parameters	**Current Status**
Dislocation, Resettlement, Rehabilitation, Infrastructure Clearing	Not Required
Land Legal Status	The land is legally owned by the proponent and has no legal obligations
Natural Hazards	Site is not prone to any natural hazard – flood, landslide or any other hazard
Hydrology or Waterways	Project will not alter/deteriorate surface hydrology or waterways
Sensitive or Protected area	Project site is not in or near any sensitive or protected area. There are no historical or archeological structures of any kind on or near the property.
Accessibility	The project site is conveniently accessible through road network from all Pakistani towns and ports. Connected to Ferozepur Road, Kot Lakhpat Railway Station.
Availability of Utilities	All the Utilities needed are available. Wapda supply is available, Groundwater complies with PEQS of drinking water. The treated wastewater is discharged into Industrial Estate Drain System.

4 STAKEHOLDERS CONSULTATION

4.1 GENERAL

Any person, group or organization with an interest in the project or who can be affected directly or indirectly, negatively or positively by the project activities is a project stakeholder. There are two types of stakeholders - primary and secondary stakeholders. Primary stakeholders are those which are directly affected by the project activities and secondary stakeholders are those which are affected indirectly. Stakeholder consultation is a mean of involving the primary and secondary stakeholders in the project decision making process by getting feedback from the community and addressing their concerns.

Stakeholder consultation was therefore conducted in the project area, not only to comply with the obligation imposed by Punjab EPA for conducting EIA Study but also to improve and enhance the social and environmental design of the project and achieve the goal of sustainable development.

4.2 OBJECTIVE OF THE STAKEHOLDER'S CONSULTATION

Role of the public participation is very important in the design making process to achieve the goal of sustainable development. The major objectives of public consultation are as follows:

- Promote better understanding of the project, its objectives and its likely impacts and their management.
- Identify and address the concerns of all interested and affected parties of the project.
- Provide a mean to Identify and resolve issues before plans are finalized and development commences, thus avoiding public anger, resentment and potentially costly delays.
- Encourage transparency and build trust among various stakeholders to promote cooperation and partnership with the communities and local leadership.

4.3 STAKEHOLDERS IDENTIFICATION

Identifying the stakeholders for the proposed project is crucial for its success as it helps to quantify and integrate the contributions of the various parties. Residents of neighboring communities of the project site are considered to be the primary stakeholders. Construction activities, if not properly performed, may cause damage to their health, stakeholders' crops and agriculture land. Therefore, their concerns should be incorporated into the EIA for both the construction and operational phases. Furthermore, employees involved in the operation and maintenance of the Plant are at risk, if the Plant is poorly designed or if inappropriate equipment or contractors are selected. Therefore, engaging HLWP personnel as stakeholder and considering their suggestions is vital to avoid equipment failure or safety incidents.

Projects should always leverage the expertise and vision of environmental and social experts to meet sustainability goals.

4.4 CONSULTATION PROCESS

Based on the discussion above, the following stakeholders should be engaged:

- Local Community (living in the vicinity of project site)
- Environment & Social Experts (Public and Private Institutes/Academia)
- Grass-root stakeholder discussions

Stakeholders were consulted during informal and formal meetings held in the project area. The consultation process was carried out in Urdu and native language. During these meetings, a simple, non-technical, description of the project was presented, with the overview of the project's likely human and environmental impacts. This was followed by an open discussion allowing participants to voice their concerns and opinion. Their feedback along with their major concerns and suggestions were documented for analysis and mitigation. Focus group discussions and in-depth interviews were also conducted. The issues recorded in the consultation were examined, validated, and addressed in the EIA report.

The consultation process will continue even after the EIA report submission to create consensus among the stakeholders on specific environmental and social issues in context of the project in order to incorporate sustainability in the on-going project.

It is important not to raise community expectation unnecessarily or unrealistically during the stakeholder consultation meetings in order to avoid undue conflicts with local administration

4.5 STAKEHOLDERS FEEDBACK

The consultation with various stakeholders is summarized in Tables 4.1 and 4.2.

Table 4.1 Consultation with Stakeholders

Name	Designation	Organization	Concerns/Advice
Mr. Abid Khan	General Manager Factory	M/s HLWP	- Hamdard Laboratories operate sustainably, prioritizing environmental responsibility as part of its corporate social responsibility (CSR) initiatives, which focus on health, education, and the environment. - At HLWP, mostly herbs as used as raw materials instead of chemicals, which are non-hazardous and present minimal safety and health risks. - We ensure compliance with PEQS.

			- Installation of Wastewater Treatment Plant is a step forward in promoting Environmental sustainability -
Hafiz Zia Ullah Zia	Deputy Manager HR/Admin	HLWP	- We are committed to plant native trees and recently donated 5000 trees to PHA, Lahore. - Local public is preferred for new jobs. - Every worker undergoes regular medical checkup to comply with Section 23 of the Factories Act.
Mr. Muhammad Imran	Manager Engineering	M/s HLWP	- HLWP is highly committed to total productive maintenance (TPM) and operational integrity. - The high efficiency of wet scrubbers is always ensured to maintain compliance with PEQS. - A work permit protocol has already been implemented for all maintenance activities.
Mr. Mubashir Hussain	Unit Incharge HSE	M/s Fatimafert Limited	- HLWP is well known for its high quality products. It should also set a benchmark in occupational safety and health. - Water conservation remains a significant gap area within the local industry. - HLWP should arrange 2nd party and 3rd party environmental and safety audits .
Dr. Naveed Ramzan	Dean Engineering	UET Lahore	- The factory should conduct process hazard analysis of expansion project. - Energy efficient and low noise machines should be selected for new expansion. - Ensure the proper use of PPEs, especially in grinding sections and

			operational areas involving flavorings and essences.
Mr. Adeel Ahmad	Production Manager	Fatimafert Limited, Lahore Sheikhupura Road	- Contractors should be enforced to provide PPEs to the contract workers. During Construction phase, safety talks should be arranged before starting new jobs. - Provide adequate localized and general ventilation in production halls and raw material storage areas. -
Mr. Maryam Siddique	Environment Practitioner	Lahore	- Safe disposal of ETP sludge should be ensured through EPA approved vendor. - Measures should be taken to conserve water and minimize wastewater generation.
Mrs. Maham Ayesha	Environmentalist		- HLWP should focus on reducing greenhouse gas emissions and considering using alternative biofuels in their boilers instead of currently used fossil fuels. - Construction activities should be managed to ensure that existing plant operations remain unaffected.
Mr. Adnan Khan	Manager Environment Social Risk Management	*MCB Bank Limited, Lahore*	- Conduct daily inspections to ensure no stagnant water is present within the premises or surrounding areas for effective dengue control. - Contain all spillages to prevent discharge into the sewerage system. - Maintain the wastewater treatment plant in good condition and ensure compliance with PEQS.
General Public			

4.5.1 Public Consultation

Conversations were held with those who lived close to the project site. Additionally, general public feedback was gathered. Below is a summary of the public consultation.

- Most of the local public expressed interest in new job opportunities.
- They suggested opening free Hamdard Matabs at multiple locations in Lahore.
- Overall, expansion project is considered a positive step for National Economy, particularly if it increases the export of Hamdard's products worldwaide.
-

Table 4.2 Consultation with General Public

Sr No	Name	CNIC Number	Tehsil/District	Comments
1				- The Company should offer new jobs to members of local community. . - The company should open Hamdard Matabs at various locations. - Transportation of construction materials should be scheduled during off-peak hours to minimize the risk of safety incidents.. - Overall, the propsed expansion project is beneficial for National econmy.
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				

Figure 4.1: Discussion with HLWP's Management

5. POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATIONS

5.1 GENERAL

This section addresses the Project's potential impacts on physical, biological and socio-economic environment of the area that may be encountered during preconstruction, construction and operations phases. Impacts have been predicted and assessed. Where applicable, mitigation measures have been suggested to be implemented in order to reduce the adverse impacts, if not eliminated. It is aimed to:

- Find different alternatives and ways of doing the project activities.
- Enhance the environmental and social benefits of proposal.
- Avoid, minimize and remediate adverse impacts.
- Ensure that residual adverse impacts are kept in acceptable limits

5.2 IMPACT ASSESSMENT METHODOLOGY

5.2.1 Screening of Potential Impacts

Based on site visit, observations, brain storming, provided information and social interviews, significant impacts were evaluated in the light of technical and regulatory concerns. Then qualitative and quantitative (where possible) assessment of these anticipated impacts was carried out.

5.2.2 Mitigation Measures

After anticipation and screening of significant impacts, certain mitigation measures are to be provided in order to enhance benefits of project by reducing negative impacts.

5.2.3 Evaluation of Residual Impacts

Incorporation of suggested mitigation measures may reduce the magnitude of the environmental impacts of the project but sometimes, it may fail in bringing them within the acceptable limits. This step refers to the identification of the anticipated remaining impacts after mitigation measures have been applied.

5.2.4 Identification of Monitoring Requirements

The last step in the assessment process is the identification of minimum monitoring requirements. The scope and frequency of monitoring depends on the residual impacts. The purpose of the monitoring is to confirm that the impacts are within the prescribed limits and to provide timely information if acceptable limits are being breached.

5.3 IMPACT SCREENING

Screening of the potential impacts associated with various Project's activities of preconstruction, construction and operational phases was conducted to determine impacts with high severity. A matrix developed for the proposed Project was used which relates Project's activities with various components of the environment. The impacts were ranked with respect to their severity as under:

High negative impact	- 2	No impact	N
Low negative	-1	Low positive impact	+ 1
Insignificant impact	0	High positive impact	+2

NA Not applicable

After screening, following six impacts were categorized as moderate to highly negative in severity. These impacts were considered to be significant and mainly focused in EIA.

- Air Quality
- Noise
- Health Hazards mainly due to inappropriate occupational health plans and waste management
- Safety Hazards: Handling of waste; construction and operation activities,
- Soil Contamination
- Water contamination

Table 5-1: Environmental Screening Matrix (Impact before Mitigation)

Project Activities	***Physical***							***Biological***			***Social and Socioeconomic***												
	Soil	**Air Quality**	**Surface Water**	**Groundwater**	**Water Consumption**	**Topography**	**Noise**	**Natural Vegetation**	**Wildlife**	**Reduction of Biodiversity**		**Economical activities**	**Livelihood and Economy**	**Resettlement**	**Safety Hazards**	**Employment**	**Traffic congestion**	**Health Hazards**	**Natural Risks**	**Gender Issues**	**Site Aesthetic**	**Historical/ Archeological Sites**	
Preconstruction Phase																							
Project Location	-1	N	N	N	N	N	N	N	N	N		+ 1	+1	N	-1	+1	-1	-1	N	N	N	NA	
Design	N	+1	0	0	0	N	+1	N	N	N		N	N	N	+1	0	0	+2	+2	0	+1	NA	
Construction Phase																							
Contractor Mobilization	-1	-1	0	-1	0	-1	-2	-1	0	0		+1	0	N	-2	+1	-2	-1	NA	0	-2	NA	
Site Preparation	-1	-1	-1	-1	0	-1	-2	-2	-1	-1		0	0	N	-2	+1	-1	-1	NA	N	-2	NA	
Transportation of Construction Material	- 1	-1	-1	-1	-1	-1	-1	-1	-1	-1		+1	+1	N	-2	+1	-1	-1	N	N	-1	NA	

	Soil	Air Quality	Surface Water	Groundwater	Water Consumption	Topography	Noise	Natural Vegetation	Wildlife	Reduction of Biodiversity	Habitat	Economical activities	Livelihood and Economy	Resettlement	Safety Hazards	Employment	Traffic congestion	Health Hazards	Natural Risks	Gender Issues	Site Aesthetic	Historical/ Archeological Sites	
Construction of Campsites	-1	0	-1	0	0	-1	-1	-1	-1	0	-1	+1	0	N	-1	+1	0	-1	N	0	0	N	
Excavation	-2	-1	-1	-1	0	-1	-1	-1	-1	0	-1	N	0	N	-2	+1	0	-1	N	0	-2	N	
Machinery, Generators Operation	-1	-1	0	-1	0	-1	-2	0	0	N	-1	+1	0	N	-1	+1	0	-1	N	0	0	N	
Civil Construction	-1	-1	0	0	0	0	-2	-1	0	0	-0	+1	0	N	-2	+2	-1	-1	N	0	-1	N	
Equipment Transportation	-1	-1	0	0	0	0	-2	-1	-1	0	0	0	0	0	-2	+1	-2	0	N	0	0	N	
Equipment/Machinery Installation	0	-1	0	N	N	N	-2	N	N	N	0	0	0	N	-2	+1	0	0	N	0	0	N	
Solid Waste disposal	-2	-1	-1	-1	N	0	0	0	-1	0	0	0	N	N	-1	0	N	-2	N	N	-1	N	
Wastewater Effluent	-1	-1	-1	-1	N	0	N	0	0	0	0	N	N	N	-1	0	N	-2	N	N	0	N	
Contractor's Demobilization	-1	-1	0	0	0	0	-1	0	0	0	-1	0	0	N	-2	-1	-1	0	N	N	0	N	
Restoration	+1	0	0	0	0	+1	0	+1	0	0	+1	N	N	N	0	0	0	0	N	N	+1	N	

Project Activities	Physical							Biological				Social and Socioeconomic											
	Soil	Air Quality	Surface Water	Groundwater	Noise	Water Consumption		Natural Vegetation	Wildlife	Biodiversity	Habitat	Livelihood and Economy	Resettlement	Safety Hazards	Employment	Traffic congestion	Health Hazards	Cultural Issues	Gender Issues	Recreational Sites	Site Aesthetic	Historical/Archeological Sites	
Operational Phase																							
Production	-1	-2	0	-2	-2	-1		0	0	0	0	+1	N	-2	+2	0	-2	0	-1	0	0	N	
Boilers Operations	0	-2	0	-2	-2	-1		0	0	0	0	0	0	-2	+1	0	-2	0	0	0	0	N	
Solid Waste Disposal	-1	N	-1	-1	N	N		N	N	N	0	N	N	-1	N	N	-2	N	N	N	0	N	
Transport	-1	-1	-1	-1	-1	N		0	0	0	-1	+1	N	-1	0	-1	0	0	N	N	-1	N	
Wastewater Treatment	-1	-1	0	-2	N	0		0	0	0	0	0	0	-1	N	N	-2	N	N	N	N	N	
Wastewater disposal	-1	-1	-1	02	N	0		-1	-1	0	0	0	0	-1	N	N	-2	N	N	N	N	N	

Note: Key: -2: High negative impact; -1: Low negative impact; 0: insignificant/negligible impact; +1: low positive impact; +2: High positive impact, N: no impact. NA Not applicable;

5.4 IMPACT CHARACTERIZATION AND ASSESSMENT

Impacts are characterized on the basis of significance, probability and prevalence of the potential impacts on the surrounding environment. Primarily, anticipated impacts have been categorized as:

- Direct or Indirect
- Positive or Negative
- Local or Widespread
- Reversible or Irreversible
- Probability (Unlikely, Likely, Certain)
- Severity (Low, Medium, High)

5.4.1 Significance of Impact

Significance of impact is assessed as low, medium and high based on Impact consequences severity and likelihood (Table 5.2), reversibility, impact duration, public concern and mainly the compliance with the EPA Rules and Regulations.

Table 5-2: Impact Assessment

Probability of Impact Occurrence		Impact Severity		
		Mild	Moderate	High
		1	2	3
Unlikely	1	Low Significance	Low Significance	Medium Significance
Likely	2	Low Significance	Medium Significance	High Significance
Certain	3	Medium Significance	High Significance	High Significance

Summary of characterization and significance is summarized in Table 5.3 and 5.4

Table 5-3: Summary of Characterization and Significance of Impacts for Construction Phase.

	Air Quality	Noise	Health Hazard	Safety Hazard	Soil Contamination	Water Contamination
Direct and indirect	Direct	Direct	Direct	Direct	Direct	Indirect
Positive and negative	Negative	Negative	Negative	Negative	Negative	Negative
Local or widespread	Local and widespread	Local	Local	Local	Local	widespread
Short- or long-term	Long-term	Both	Both	Both	Short Term	Short Term
Reversible or Irreversible	Reversible	Both	Both	Both	Reversible	Reversible
Severity	Moderate	High	Moderate	High	Moderate	Moderate
Probability	Likely	Likely	Likely	Likely	Likely	Likely
Significance	Medium	High	Medium	High	Medium	Medium

Table 5-4: Summary of Characterization and Significance of Impacts for Operational Phase

	Air Quality	Noise	Health Hazard	Safety Hazard	Soil Contamination	Water Contamination
Direct and indirect	Direct	Direct	Direct	Direct	Direct	Indirect
Positive and negative	Negative	Negative	Negative	Negative	Negative	Negative
Local or widespread	Local and widespread	Local	Local	Both	Local	Widespread
Short- or long-term	Short term	Short term	Long Term	Long Term	Long Term	Long Term
Reversible or Irreversible	Reversible	Reversible	Reversible	Both	Reversible	Reversible
Severity	High	Moderate	Moderate	High	Moderate	Moderate
Probability	Likely	Likely	Likely	Likely	Likely	Likely
Significance	High	Medium	Medium	High	Medium	Medium

5.5 IMPACTS ASSOCIATED WITH PROJECT LOCATION

Potential Impact:

Environmental and social impacts may arise with poor siting and improper land acquisition. Impact significance can be high.

Mitigation

Negative impacts can be mitigated by investigating following parameters:

Parameters	Project Site
Dislocation, Resettlement, Rehabilitation, Infrastructure Clearing	Not Required
Land Legal Status	No legal obligations or case in any court
Land ownership	Proponent legally owns the land for expansion project within the existing premises.
Natural Hazards	Site is not prone to any natural hazard – flood, landslide or any other hazard
Hydrology or Waterways	Project will not alter/deteriorate surface hydrology or waterways
Sensitive or Protected area	Project site is not in or near any sensitive or protected area. There are no historical or archeological structures of any kind on or near the property.
Accessibility	The project site is conveniently accessible from all Pakistani towns and ports through Road network – Easy access to Ferozepur Road and Kot Lakhpat Railway Station
Compatibility to surroundings and suitability	The project's is within an Industrial Estate having developed infrastructur. Skilled and unskilled workforce is easily manageable.
Availability of Basic Utilities and Industrial Drain	Wapda Power Supply, good quality groundwater, NG supply from SNGPL are available. The effluent is discharged into Industrial Estate drain.

Residual Impact

Impacts significance pertaining to Project location will reduce to low significance

5.6 IMPACTS ASSOCIATED WITH DESIGN

Potential Impacts

Impacts that may be addressed during design phase include:

- Physical trauma associated with failure of building structure
- Energy Conservation
- Water Conservation/Water quality
- Appropriate waste disposal system
- Sustainability considerations such as rain water harvesting, use of renewable or low/No carbon fuels
- Safety and health hazards – including firefighting system, emergency exits,
- Selection of Technology and equipment
- Proper manufacturing layout
- Infrastructure

Reduction of potential hazards is best accomplished during the design phase when the structural design, layout, technology selection and pollution abatement measures can be adapted more easily.

Impact is of medium to high negative significance prior to mitigation.

Mitigation Measures

The following issues should be considered and incorporated as appropriate into the planning, siting, and design phases of a project.

- Inclusion of buffer strips or other methods of physical separation around project sites to protect the public from major hazards associated with hazardous materials incidents or process failure, as well as nuisance issues related to noise, odors, or other emissions
- The project structures should be designed in accordance with engineering and design criteria mandated by site-specific risks, including but not limited to seismic activity, wind loading, and other dynamic loads·
- Application of locally regulated or internationally recognized building codes to ensure structures are designed and constructed in accordance with sound architectural and engineering practice, including aspects of fire prevention and response

Residual Impact

Positive Impact

5.7 IMPACTS ASSOCIATED WITH CONSTRUCTION PHASE

The Environmental and Socio-Economic Impacts associated with the construction activities of the proposed project are:

- Impacts on Physical Environment
- Impacts on Biological Environment
- Social Impacts

5.7.1 Impact on Physical Environment

5.7.1.1 Impact on Soil and Topography

Potential Impact

Soil of the Project site may be affected by earthworks including excavation, dumping of construction debris, leveling of the site; installation of water drainage channels; spillage of fuel and oil from construction machinery, transportation and storage; silt-water from concrete batching and accidental leakage of chemicals to be used.

The likely impacts of these activities may include:

- Soil erosion, Physical scarring of the landscape.
- Increased risk of land slippage.
- Increased sediment load in surface run off.
- Soil contamination

Mitigation Measures

- Good engineering practices will help control soil erosion.
- Excavation work and construction material should be sprayed with water.
- Spill Prevention and Response Plan for storage, use and transfer of fuel and hazardous materials should be prepared.
- Workers should be trained on spill prevention and response plan.
- Fuels, lubricants and chemicals should be stored in covered areas, underlain with impervious lining.
- Maintenance and washing of vehicles and equipment should be carried out at designated areas.
- Regular inspections should be carried out to detect leakages in construction vehicles and equipment. Their scheduled maintenance should be carried out.
- Appropriate arrangements, including shovels, plastic bags and absorbent materials, should be available near fuel storage areas.
- Document all related incidents of spillage to take corrective actions and to avoid recurrence.

Residual impacts:

The implementation of above-mentioned measures is expected to reduce the adverse effects within low range.

Monitoring requirement:

Soil of the construction site should be visually inspected for any adverse effect and its mitigation on daily basis by Contractor's Engineer/Supervisor.

5.7.1.2 Water Consumption

Potential Impact

Water during construction phase will be required mainly for domestic water consumption at the construction camp and for the construction activities.

An adverse impact on the water resources is not expected as water consumption is low and construction phase is for a short period.

Mitigation Measures:

Water supply will be from existing water distribution system. Water conservation program will be initiated to prevent wastage of water,

Residual Impact

No residual impact is expected.

5.7.1.3 Water Quality

Potential Impact

The quality of surface and groundwater supplies may deteriorate in case pollutants mix with surface runoff during rain are carried to water resources in the vicinity, or if pollutants leach into the ground. Potential sources of pollution in such cases may include:

- Domestic waste (sanitary and kitchen discharge)
- Fuel, Oil and grease from vehicles and construction machinery
- Sediments from altered land surfaces
- Spillage of fuel or chemicals on ground

Chemicals in fuel and oil can quickly move through soil and pollute groundwater. A significant impact on the groundwater will be interpreted if pollutants are not effectively controlled.

Mitigation Measures

- Sewage from Construction site will be diverted through sewerage channels to Septic Tank before its discharge to external drain.
- Fuels, lubricants and chemicals will be stored in areas with impervious floors. The accidental spills should be handled in accordance with the relevant SOPs.

- The scheduled maintenance of vehicles and construction machinery shall be carried out to prevent fuel and oil leakages. Fueling and vehicles washing will be carried out at designated areas.

Residual Impact

Low scale residual impact is predicted if mitigation measures are incorporated.

Monitoring Requirement

The Contractor's mechanical crew will closely monitor any leakages from vehicles and machineries on regular basis. Groundwater will be analyzed for parameters of drinking water PEQS on quarterly basis during Construction Phase.

5.7.1.4 Air Quality

Potential Impact

During the construction phase, major sources of potential impacts on air quality are the **dust emissions** generated from civil work. Also, the exhaust emissions of CO, NO_x, SO_2 and particulates from diesel generators, construction machinery/vehicles can pose significant adverse impact on health and environment when the emissions are not in compliance with PEQS. The other construction activities which can pose occupational health hazards are welding, metal cutting and painting fumes.

Potential impact is of moderate significance.

Mitigation Measures

To make the construction activities lawful and neighbor friendly, following are the practical ways to control nuisance:

- To avoid gaseous emissions from diesel generators, Use Wapda electricity supply through the existing plant.
- Dampening of material and unsurfaced roads. The most effective means of reducing the dust emission is wet suppression. Use water sprays and commence landscaping as early as practicable.
- Dust emission from soil piles and aggregate storage stockpiles will be reduced by covering the piles, for example with tarpaulin or thick plastic sheet.
- Restricting dust generating activities during extremely dry or windy days.
- Construction materials that are susceptible to dust formation will be transported only in securely covered trucks to prevent dust emission during transportation. Restrict vehicles speed.
- Provision of dust respirators to equipment operators and other permanent and contract employees who are exposed to dust.

- Use of vehicles, machinery and generators with high combustion efficiency. Scheduled maintenance will be carried out to meet specifications of the Manufacturer as to minimize the emissions. Do not leave machinery, vehicle or equipment running when not in use.
- Before and during the building works, all excavations must be fenced or otherwise guarded against being a danger to the life or property.
- Welders, painters and their co-workers should understand the hazards of material they are working with. Prolonged exposure of fumes may cause serious health complications. They should be enforced to wear PPEs. Develop SOPs for welding including relevant guidelines of OSHA.

Residual Impact

- After taking mitigation measures, impact is assessed to be of low to moderate significance.

Monitoring requirements

- Ambient air quality will be checked for CO, NO_x, SO_2 and particulates at project site on quarterly basis.
- Dust emission will be visually monitored on regular basis
- Exhaust emissions of diesel generator (if installed) will be monitored by EPA certified lab on quarterly basis.

5.7.1.5 Noise

Potential Impacts

The potential sources of significant noise include the construction machinery, generators at camps and construction related traffic, crushing, scaffolding and radios and mobile phones. The noise will be maximum during the day time when construction activities are ongoing.

The noises loud enough to impair someone's hearing will contribute to hearing loss and accidents when can't hear the alarm.

Loud sound levels at workplace leads to unhappy workers.

Impact is of moderate significance and preventable.

Mitigation Measures:

- Noise hazards should be addressed in compliance with OSHA standards for construction.
- Use low noise machinery (use of silencer and mufflers) which is properly maintained and operated.
- Fit an acoustic enclosure if machine is stationary.
- Switch off all equipment when not in use.
- For scaffolding, reduce drop from heights.
- Keep the music volume of radio or mobile phone down
- Provide sound related PPEs to the workers.

- Noise levels shall be controlled within PEQS limits as monitored near the project boundaries. For noisy areas, the workers must use hearing protective devices such as ear muffs, ear plugs.

- Place Warning Sign Boards at high sound level areas.

Residual Impact

Low residual impact is expected after taking mitigation measures, however use of ear muffs or ear plugs are essential where sound levels are above the PEQS.

Monitoring requirement

Monitoring of ambient sound levels and machinery generated noise will be done by EPA certified lab on quarterly basis to avoid increase in noise level beyond PEQS limits.

5.7.1.6 Solid Waste Management

Potential Impacts

Solid waste during Construction Phase is classified as domestic solid waste, packaging waste, construction waste (includes cables, copper, empty containers, steel etc.) and excavated material. Other waste includes oily rags, used air and oil filters, waste fluorescent and used cartridge etc. The waste if inadequately managed, can cause health hazard and contamination of soil and groundwater.

Impact is of moderate negative significance

Mitigation Measures

- Site Waste Management Plan (SWMP) should be prepared and implemented by the Construction Contractor that details the amount and type of waste to be produced at construction site and how it will be reused, recycled or disposed of at a legitimate site.
- Domestic waste will be disposed of through Industrial Estatae Waste Collecting System. Hazardous waste such as ETP sludge will be disposed of through EPA approved contractor.

- Avoid open burning of solid waste.

Residual Impact

Impact can be significantly reduced to low intensity provided the above-mentioned mitigations are appropriately incorporated.

Monitoring Requirements

The Contractor's site engineer will monitor and ensure the good practices of SWMP at Construction site.

5.7.1.7 Wastewater Management

Potential Impacts

During the construction phase, the wastewater will be domestic in nature and will originate from the campsite.

Impact is of moderate significance if not properly mitigated

Mitigation Measures

Effluents from Construction site will be diverted through sewerage channels to Septic Tank before discharge to Drain.

Residual Impact

Impact can be significantly reduced to low intensity.

Monitoring Requirements

The Contractor's site engineer will monitor and ensure the implementation of above mitigation measures.

5.7.2 Biological Environment

5.7.2.1 Vegetation/Trees Loss

Potential Impact

During construction phase, No cutting of trees will be required.

Mitigation Measures

- Plant native trees species. Landscaping will be done after construction phase
- Maintain a record of new planted trees for follow up and maintain their growth

Residual Impact

Positive impact.

Monitoring

Planting and maintaining trees will be monitored by Admin Officer.

5.7.3 Socio-Economic Impacts

5.7.3.1 Land Use

Potential Impact

Positive effects are anticipated since the land use will create jobs; encourage the growth of supporting businesses like suppliers, transport, and services.

Mitigation Measures

Tree Plantation

Residual Impact

Overall positive impact.

Monitoring Measures

Admin Manager will ensure plantation of new trees and restoration of site by the Contractor.

5.7.3.2 Impact on Livelihood of Local Communities

Potential Impact

The construction phase will generate employment. The project will provide the communities with the opportunity to expand their existing businesses such as restaurants, transport. Overall, it will pose a positive impact on livelihood of local communities.

Mitigation Measures

- The local community will be given preference for the employment of unskilled labor. Those meeting the required criteria may also be considered on a priority basis for semi-skilled and skilled positions..
-

Residual Impact

Overall positive impact

5.7.3.3 Community Health and Safety

Potential Impact

Inappropriate management of solid waste, wastewater, emissions, and noise and traffic may pose a threat to the community. Also, noteworthy issues are public safety regarding construction activities. Piles of construction debris, excavated land and deep trenches may pose a risk to public safety in case of unattended walking through the construction site. There will be a temporary increase in traffic due to the construction of the proposed development, however this will cease once the development has been completed. This will involve deliveries of steel, concrete, building materials, equipment etc.

Potential Impacts related to health and safety are of moderate to high significance.

Mitigation Measures

- Unauthorized entry to the construction site will be restricted and barricaded where required.
- Environment management will ensure that all waste disposal, air emissions and noise from construction activities comply with EPA rules, PEQS and Safety Standards.
- To reduce road accidents involving project vehicles during construction, avoid activities during heavy traffic at office and schools timings.
- Provision of appropriate warning sign boards at near work site and roads where necessary
- Adopt risk management strategies to safeguard the community from physical, chemical, and other hazards related to the construction sites.

Residual Impact

Impact after mitigation measure is expected to be within low-moderate significance.

5.8 IMPACTS ASSOCIATED WITH OPERATIONAL PHASE

5.8.1 Impact on Physical Environment

5.8.1.1 Air/Dust Emissions

Potential Impact

Air emissions from boilers and standby generators can adversely impact the health of company employees and nearby public.

Particulates/Dust can be emitted from unpaved soil.

Potential impact is of high significance if not mitigated.

Mitigation

- The primary power supply is sourced from WAPDA, with diesel generators operated only in emergency situations. Consequently, gaseous emissions from power generation are considered negligible.
- Wet scrubbers are installed on boilers' exhausts. It is always ensured that gaseous emissions from NG/HFO-fired boilers are in compliance with the PEQS for industrial gaseous emissions.
- Maintain good indoor air quality in the production halls by providing adequate ventilation systems.
- Carry out restoration at the earliest possible and develop landscapes. The remaining open area should be paved.
- Limit vehicle speed not more than 20 Km/hr within the premises.
- Ensure the use of PPEs.

Residual Impact

Low to moderate impact

Monitoring

Perform monitoring gaseos emissions from boilers on quarterly basis by EPA certified Lab.

Ambient air will be analyzed for given parameters of PEQS on quarterly basis by EPA certified Lab. Manage regular monitoring of indoor air quality.

5.8.1.2 Noise

Potential Impact

If you need to raise your voice to speak to someone 3 feet away, noise levels might be over 85 decibels.

Noise may be a problem in your workplace if you:

- Hear ringing or humming in your ears when you leave work.
- Have to shout to be heard by a coworker an arm's length away.
- Experience temporary hearing loss when leaving work.

High noise level causes psychological effects and physical damage, Long-term exposure to Environmental noise may cause premature deaths, hearing loss, contribute to ischemic heart disease, chronic high annoyance and chronic high sleep disturbance.

Noise in HLWP can be caused by operation of machinery, boilers auxiliaries, standby generators (when they operate).

Potential Impact before mitigation is of medium significance.

Mitigations

- This may be addressed by using noise barriers or noise canceling acoustic devices.

- The employees working near high Noise level should be provided with PPEs such as earplugs or ear muffs.
- Select the machines with low sound level.
- Place signboards in areas with high sound levels and ensure workers wearing required PPEs in these areas.

Residual Impact

Residual impact will be of low significance provided above mitigation measures are implemented.

Monitoring

(Several sound-measuring instruments are available to measure the noise levels in a workspace. These include sound level meters, noise dosimeters, and octave band analyzers.)

Carry out quarterly noise monitoring to ensure compliance with the PEQS for Noise.

Conduct a sound level survey across the entire facility to identify high-noise areas and implement appropriate mitigation measures.

5.8.1.3 Water Quality

Potential Impact

The quality of surface and groundwater supplies may deteriorate in case pollutants mix with surface runoff during rain are carried to water resources in the vicinity, or if pollutants leach into the ground.

Poor solid and liquid waste handling and disposal may result groundwater contamination. Spillages of oil/fuel/chemicals may contaminate soil with consequent contamination of groundwater.

Mitigation Measures

- Effluents from Operation site will be diverted through sewerage channels to Wastewater Treatment Plant.
- Ensure the implementation of Solid waste management Plan to avoid soil contamination.
- Spillage or leakage of fuel/oils/chemicals will be cleaned at the earliest possible to avoid any soil/water contamination.

Residual Impact

A low residual impact is predicted if mitigation measures are incorporated.

Monitoring Requirement

Groundwater will be analyzed for parameters of drinking water PEQS on quarterly basis during Operational Phase by EPA certified Lab.

5.8.1.4 Solid Waste

Potential Impact

Improper management of Solid waste generated at manufacturing Unit such as:

- Manage process solid waste (such as packaging materials and herbal residues from cleaning) generated during product manufacturing.
- Domestic waste from kitchen, mess or offices
- Dried sludge from ETP

Potential impact is of moderate significance.

Mitigation Measures

- Develop a solid waste management plan based on waste management hierarchy of prevention, reduction, recycling, recovery using disposal as a least preferred phase.
- Packaging materials of raw materials are stored in designated place within premises and subsequently sold.
- Herbal residues/remainings and domestic waste are disposed of through Industrial Estate Cwaste collecting system.
- Dried sludge from ETP will be disposed of through EPA approved contractor.

Residual Impact

Expected Impact after mitigation is of low significance.

Monitoring

Keep auditable record of solid waste generation and disposal.

5.8.1.5 Wastewater

Potential Impact

Soil and Water contamination and health hazard can be caused by improper wastewater management.

Mitigation Measures

- Domestic wastewater generated from washrooms, kitchens etc. will be treated in Septic Tan before its discharge into external drain.
- Reduce the organic load of wastewater by preventing the entry of solid wastes and concentrated liquids into the wastewater stream:

- Fit and use floor drains and collection channels with grids and screens or traps to reduce the amount of solids entering the wastewater
- Recycle process water and apply to the washing of incoming raw material.
- The wastewater will be treated in wastewater treatment plant before its discharge to Industrail Estate drain.

Residual Impact:

Implementing mitigation measures, residual impact can be reduced to low significance

Monitoring Measures

- Quarterly monitoring of treated effluent before its discharge into external drain.

5.8.1.6 Traffic

Potential Impact

While the proposed development will alter the traffic to and from the site, this may cause an adverse impact on the local road network.

Potential impact is of moderate significance.

Mitigation Measures

The adjacent roads will easily handle the load of increase in traffic associated with this expansion.

The adoption of safe driving procedures by company drivers will be guaranteed. Vehicles speed will be limited to 20 Km/hr. on nearby roads and within the premises of HLWP.

Residual Impact

Impact is of low significance.

Monitoring

Gate security will ensure the safe entry and exit of the transport to and from the site.

5.8.1.7 Occupational Health and Safety

Occupational health and safety hazards include:

- Exposure to Gaseous emissions
- Electric Shock
- Poor management of Liquid and solid waste
- Sanitation and health issues due to insufficient and poor quality water
- Moving Machinery
- Oil spillage and leakage

- Raw material and finished goods Transportation
- Over exertion
- Slips and Falls
- Work on height
- Struck by objects
- Fire and explosion
- Exposure to Dust
- Work in Confined Spaces, other site hazards such as exposure to chemicals, hazardous or flammable materials, and wastes in a combination of liquid, solid, or gaseous forms
- People from the project area cannot be considered isolated from the rest of the country. They are regularly exposed to illnesses common to other populations and have similar levels of immunity.

Impact before mitigation is of high significance.

Mitigation Measures

- Enforce the use of appropriate PPEs for different hazards.
- Prepare and implement operating and maintenance procedures.
- Ensure the use of SOPs for work on height and in confined space.
- Manage proper housekeeping to avoid safety incidents.
- Fire prevention plan, Emergency evacuation Plan for Operational Phase should be implemented.
- Organize HSE trainings for permanent and on- contract employees.
- Place fire extinguishers at all critical locations within the premises
- Provide first aid boxes at sensitive locations.
- Ensure implementation of SOP for dengue control.
- Comply with all PEQS for air emissions, effluent, groundwater/drinking water, noise and ambient air to prevent employees from relevant safety and health hazards.
- Every worker undergoes regular medical checkup to comply with Section 23 of the Factories Act.
-

Residual Impact

Impact of low to medium significance is expected after implementing mitigation measures.

Monitoring

Prepare a monitoring plan for gaseous emissions, noise, effluent, groundwater and ambient air on quarterly basis through EPA certified Lab.

Conduct audits on safety, hygiene and house keeping.

5.9 POTENTIAL ENVIRONMENTAL ENHANCEMENT MEASURES

Besides the concrete measures to be adopted as described above, the quality of the environment will further be enhanced through the running of the project in complete accordance with the 5RS Principles- Reduce, Reuse, Recycle, Refurbish and Retrofit. Good housekeeping practices will be the order of the day. The proposed project will be installed with all precautionary measures to enhance and save the environment. Following necessary measures will be adopted during construction and operation:

- **Compliance with Regulations:**

  All waste disposal, air emissions, and noise generated during construction activities will strictly comply with EPA regulations, Punjab Environmental Quality Standards (PEQS), and applicable safety standards.

- **Environmental Approval & EMP Implementation:**

  The contractor will be provided with the Environmental Management Plan (EMP) and the conditions of Environmental Approval to ensure full compliance and effective implementation.

- **Dust Control Measures:**

  Regular water sprinkling will be conducted on unpaved and dusty roads/tracks to minimize airborne dust.

- **Workforce Safety:**

  The provision and mandatory use of Personal Protective Equipment (PPE**)** for the contractor's workforce will be included as a binding clause in the contract.

- **Waste Management:**

  All construction and domestic solid waste will be appropriately disposed of or utilized in accordance with environmental best practices.

- **Community Awareness:**

  Local residents will be informed in advance before any construction activity begins in their area to ensure transparency and cooperation.

- **Machinery and Transport Safety:**

  Machinery will not be left unattended at any time. All transport vehicles involved in the project will be required to adhere strictly to road load limits, and overloading will not be permitted under any circumstances.

- **Safety Signage:**

  Safety signs and warning boards will be installed throughout the construction and operational phases to ensure public and worker safety.

- **Standardized Operating and Maintenance Procedures**

  Standardized operating and maintenance procedures will be developed and followed.

- **Ecological Restoration & Tree Plantation**

The project area will be restored using native plant species and landscaping, and a detailed tree plantation plan will be developed and implemented to enhance environmental quality.

- **Sustainability Initiatives:**

  Projects promoting environmental sustainability, such as rainwater harvesting will be initiated. The solar power system is already installed.

- **Hygiene and Quality Control:**

  Hygienic conditions will be maintained throughout the project, and strict quality control testing will be conducted to ensure compliance with health and safety standards.

- **Commitment to Environmental Responsibility:**

  Every possible measure will be adopted to ensure that the project remains safe, environmentally responsible, and sustainable.

6. ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

6.1 GENERAL

This chapter outlines a comprehensive approach to managing and monitoring environmental issues while detailing the institutional framework and reporting mechanisms for implementing the Environmental Management Plan (EMP) during the pre-construction, construction, and operational phases of the proposed project.

6.2 OBJECTIVE OF EMP

The EMP has been developed with the following objectives:

- Detail the project's impacts along with proposed mitigation measures and an associated implementation schedule.
- Establish the roles and responsibilities of the project proponent, contractor, and supervisory consultants to ensure effective communication of environmental issues among all stakeholders.
- Develop a monitoring framework, including reporting frequency, auditing processes, and identification of monitoring parameters, to ensure complete and effective implementation of all mitigation measures.
- Specify the requirements for documenting EMP compliance and effectively communicating it to the relevant regulatory authorities.
- Provide an estimated cost for implementing the key actions outlined in the EMP.

6.3 MANAGEMENT APPROACH

The organizational roles and responsibilities of the Proponent and Contractor are outlined as follows:

Proponent:

The project proponent will hold overall responsibility for ensuring compliance with the EMP. Relevant Departments will carry out verification checks to confirm that the contractors are effectively accomplishing their environmental and social responsibilities.

Contractors:

The contractors will implement the majority of environmental and social mitigation measures within their field activities as part of the project. The contractors are subject to certain liabilities under the national laws and specific clauses outlined in their contract with the proponent. The responsibilities detailed in the EMP should be explicitly included in the contractor's scope of work during the agreement.

6.4 ENVIRONMENTAL MANAGEMENT TEAM, ROLES AND RESPONSIBILITIES

The project proponent of HLWP is committed to implementing the Environmental Management Plan (EMP) and holds the primary responsibility for ensuring compliance with

EMP. The proponent has designated GM Plant to oversee overall activities involved in implementation of EMP during Construction and Operation phases.

The main HLWP's personnel involved in the EMP Implementation are

- GM Factory,
- Manager HR & Admin
- Manager Engineering
- HSE Manager/Engineer
- Project Engineer

6.4.1 Construction Phase

As the EMP is included in the contract between HLWP and the contractors, it becomes the contractor's responsibility to ensure its implementation during the construction phase. The Contractor's Site Manager will oversee all construction activities, manage the construction crew and site personnel, and ensure environmentally responsible practices. The Site Manager will coordinate with HLWP's HSE Engineer and Manager Engineering. For environmental monitoring, the HSE Engineer will collaborate with an EPA-certified laboratory. In addition, HSE Engineer will also coordinate with the EPA Punjab to ensure compliance of provisions of environmental approval of the project. Additionally, HLWP will establish an Inspection Team to conduct daily inspections and weekly/monthly audits of construction activities, with a particular focus on those related to the EMP.

Contractor Site Manager will be assisted by Projector Engineer and HSE Engineer of HLWP.

The Site Engineer of the Contractor will:

- Prepare compliance reports as per schedule and will submit to HLWP's Project Engineer/HSE Engineer
- Ensure the use of PPEs by the workers and train them on proper use;
- Conduct the environmental and health and safety trainings to the workers / labor.
- Prepare Emergency Preparedness and Evacuation Plan and train the workers on these Plans.

6.4.2 Operational Phase

Throughout the Project operational phase, the GM Factory will oversee the timely implementation of EMP and Monitoring Plan. HSE Manager is responsible to manage timely environmental monitoring including Noise level and ambient air monitoring and lab analyses of Effluent and groundwater on quarterly basis. HSE Team and Admin Manager will assist GM Factory in implementing EMP and provide support in implementation of Sustainability Projects.

6.5 ENVIRONMENTAL MANAGEMENT PLAN (EMP)

Table 6.1 illustrates the overview of proposed mitigation measures for possible implications for location, design and construction and operational phases of the expansion project. The responsibilities for each mitigation measures have been marked to use this Table as an EMP.

6.6 ENVIRONMENTAL MONITORING PLAN

Environmental monitoring is a vital component of the Environmental Management Plan.

The feedback provided by the environmental monitoring is instrumental in identifying any problem or lapse in the system under implementation and planning the corrective actions.

Main objectives are:

- To provide a mechanism to determine whether the Construction contractors are carrying out the project in conformity with the EMP.
- To document the actual project impacts on physical, biological, and socioeconomic receptors, quantitatively where possible, in order to evaluate adequacy of EMP and determine the need for any improvement.
- To ensure that all the negative impacts generated during Construction and Operational activities have been mitigated to an acceptable level to meet EPA Rules and Regulations and are compliant with Punjab PEQs.

Table 6.2 presents the Monitoring Plan for Construction and Operational Phases.

Following record should be maintained:

- Periodic inspection reports of the site
- Audit reports of Environment, Energy, Safety and Health
- Record of all moderate and major spills and other incidents; investigation reports.
- Waste tracking registers keeping records of waste generation and disposal.
- Analyses reports of groundwater, Ambient air, particulates emissions and sound level survey reports, record of reports submission to EPA Field Office
- Record of Utilities
- Employment opportunities offered to local community
- Community complaints and corrective measures taken

Table 6.1 ENVIRONMENTAL MANAGEMENT PLAN

	Potential Impacts	Proposed Mitigation Actions	Institutional Responsibility		Monitoring/ Actions
			Mitigation	Supervision	
A	**PROJECT LOCATION**				
A.1	Impacts associated with: - Land acquisition - Resettlement/displacement - Environmentally sensitive or protected area - Conflict with stakeholders - Road accessibility - Natural Hazards - Compatibility with surroundings and Availability of Utilities	- Land is legally owned by the proponent - No resettlement or displacement is required - There is no sensitive or protected area around the project site. - No conflict exists with the stakeholders. - Easily accessible to all cities and ports. - Project site is not prone to any natural hazard – flood, landslide or any other hazard - All utilities are available such as Power, industrial drain, sufficient groundwater of appropriate drinking water quality - The expansion project site is located within the premises of existing factory which is legally owned by the Waqf.	HLWP Admin Manager	Proponent	Monitor and resolve any conflict with stakeholders that may arise during construction and throughout the project's lifespan
B	**DESIGN**				
B.1	Impacts relevant to - Physical trauma associated with failure of building structure - Energy Conservation	- All project structures will be designed in accordance with engineering and design criteria mandated by site-specific risks, including but not limited to site seismic zones, soil bearing capacity, wind loading and other dynamic loads·	Designing Firm	HLWP Engineering Manager	Review of design documents by Factory's project team.

	- Appropriate waste disposal system - Sustainability considerations such as water conservation, use of renewable or low/No carbon fuels - Safety and health hazards – including firefighting system, emergency exits, - Selection of Technology and equipment - Proper Site layout	- It is ensured that the designer adheres to International Engineering Standards. - Environmental and energy conservation related considerations are also incorporated. - Water conservation will be ensured by incorporating water-management, water recirculation option. - In case water quality is not appropriate for drinking, water treatment plant (RO Plant) should be designed for installation. - Fire-prevention, fire alarms, water sprinklers - all have been taken into account at design phase - Firefighting and Emergency evacuation plans can be properly prepared. - At the design stage, it is important to choose environmentally friendly technology along with equipment of minimal carbon footprints and low noise operation - Appropriate site layouts should be created to support employees and ensure safe and efficient operations and maintenance.			
C	**CONSTRUCTION PHASE**				
C.1	**Soil Erosion and Soil Contamination**				
	The likely impacts of earthworks may include: - Soil erosion, Physical scarring of the landscape.	- Good engineering practices will help control soil erosion. - Water will be sprayed on excavation work on daily basis or more frequently if required.	Contractor's Site Manager/	Project Engineer/ HSE Manager	Daily inspection to check any

	- Increased risk of land slippage. - Increased sediment load in surface run off. Spillage of fuel and oil from construction machinery, transportation and storage may cause**:** - Soil contamination with subsequent groundwater contamination	- Spill Prevention and Response Plan will be prepared and implemented. - Restoration will be done as soon as feasible along with extensive tree plantation - - Groundwater will be analysed on quarterly basis to check for any contamination			fuel/oil spillage on the soil Analysis of groundwater by EPA certified Lab on quarterly basis
C.2	**Noise**				
	- Long-term exposure to Environmental noise may cause premature deaths, contribute to ischemic heart disease, chronic high annoyance and chronic high sleep disturbance - Impact of noise from poorly maintained construction machinery and construction activities.	- Only low-noise, well-maintained machinery will be permitted on the construction site - Proper PPEs such as ear plugs and ear muffs will be provided to each employee - Sign boards will be placed in areas with loud noise levels. - An acoustic enclosure will be fitted if machine is stationary. - It will be ensured to switch off all equipment when not in use. - The use of mobile phones will be kept to a minimum.	Contractor's Site Engineer/ HLWP HSE Engineer	Manager HSE	Noise level survey will be conducted on quarterly basis. .

C.3	**Air Emissions**				
	Health hazards due to: - **Dust emissions** generated from civil works - Dust emissions due to vehicles on un-metaled roads. - Dust emissions due to construction material unloading at site and improper storage - **Exhaust emissions of CO, NO_x, SO_2 UHC and particulates** from diesel generators, construction machinery/vehicles - Other construction activities such as welding, metal cutting and painting fumes.	- Haul trucks carrying earth, sand, aggregate, and other materials will be kept covered during transportation of materials and storage at site, with tarpaulin. - The sprinkling of water by water truck will be done on roads and other dusty areas - Enforce the use of PPEs where required. - Commence restoration as early as practicable - Speed of vehicles is already limited to 20 Km/hr within HLWP premises. - Tuning of vehicles shall be made mandatory to reduce the emissions of NO_x, SO_x, CO, and particulates to comply with PEQS - Electricity will be supplied to Construction site from the existing electricity system to avoid gaseous emissions and noise nuisance from Diesel Generators. .	Contractor's Site Manager/HSE Engineer	Manager HSE	Quarterly monitoring of ambient air for PEQS parameters and submit the verified reports to EPA
C.4	**Water Supply**				
	- Insufficient water supply can cause inadequate	- Sufficient Groundwater supply will be available through the existing water supply system	Contractor's Site	Manager HSE	.

	sanitation and health hazards - Poor Water Quality is also a health hazard - Water wastage may lead to sustainability challenges.	- Treated groundwater from RO plant will be provided to workers for drinking purposes. - Prepare water conservation plan (e.g., reduce, reuse and recycle) to reduce water use and wastewater generation. - Prevention of soil/water contamination from poor management of sewage, solid waste, oil spillage/leakages, vehicles' washing etc., will be ensured - Groundwater will be analyzed on quarterly basis	Engineer/HSE Engineer		Arrange lab analysis by EPA certified lab for compliance with PEQS of drinking water.
C.5	**Wastewater**				
	Inappropriate wastewater management can cause: - Soil and water contamination - Health Hazard	- Sewage from Construction site and campsite will be diverted to Septic Tank through sewerage pipelines before its discharge to the Industrial Estate Drainage system.	Contractor's Site Manager/ HSE Engineer	HLWP HSE Manager	Quarterly analysis of treated Effluent by EPA certified Lab
C.6	**Solid Waste**				
	Inappropriate solid waste management can cause: - Soil and water contamination	- Contractor will submit and implement Solid Waste Management Plan (SWMP) before mobilizing to Construction Site.	Contractor's Site Manager/ HSE Engineer	Manager HSE	Daily Inspection of Construction site to ensure

	- Health Hazard - Economical loss	- Waste Segregation at the source will be managed and will be disposed of/sold through local contractor. - Ensure proper house keeping - Hazardous waste will not be mixed with non-hazardous waste and will be disposed of by the Contractor through EPA approved contractor. - Construction material waste will be utilized for road infill or upkeep. - Open burning of solid waste is prohibited.			proper housekeeping and the use of separate bins for different type of waste
C.7	**Occupational Health and Safety**				
	Occupational safety and health hazards associated with Construction activities Safety risks associated with Installation of Plant Equipment and Machinery	- Enforce the use of PPEs - Ensure the use of SOPs for work on height and in confined space and excavations. - Manage proper housekeeping to avoid safety incidents. - Excavation sites should be barricaded. - Provision of appropriate warning sign boards at near work site. - Spray water to suppress the dust as required. - Vehicles' speed are already limited at 20 Km/hr. within the HLWP's premises.	Contractor's Site Engineer/HSE Engineer	HLWP-Manager HSE	Safety and Environment Audits will be conducted by Contractor Site Engineer and HLWP HSE Engineer

		- Ensure proper maintenance of construction machinery and vehicles to minimize exhaust emissions and leakages of fuel and oil - Ensure appropriate solid and liquid waste handling and disposal. - Load testing of the cranes will be carried out before installation of Plant equipment and machinery. - Fire extinguishers will be placed at Construction site especially where welding jobs are executed - Fire prevention and evacuation plans for Construction Phase shall be implemented. - Supply of appropriate quality of water, meeting PEQS, to the workers will be ensured. - Availability of first aid boxes will be ensured at the construction site - SOPs of Dengue Control will be strictly implemented			
C-8	**Socioeconomic Impacts**				
C8.1	**Traffic**				
	Traffic congestion increases the environmental pollution, noise, stress and exhaustion and decrease the time availability for people to spend with their families - Safety Hazard	- The existing roads are sufficient to accommodate the additional traffic associated with this expansion project. - Construction materials will not be transported at peak working hours to avoid traffic congestion and avoid accidents. - Gate security guard will ensure the safe exit and entry of a vehicle to and from the road.	Contractor's Site Manager/ Admin Officer	Manager Admin	The traffic control plan will be monitored regularly.

C.8.2	**Livelihood Of Local Communities And Economic Growth**				
	Overall, positive impact is anticipated by - Creating stable Employment opportunities - Economic growth - Skill improvement of locals. - Providing the chances of business expansion	- Unskilled job opportunities will be offered to the local community. - Training will be arranged for the new employees - Preference for both skilled and semiskilled positions will be given to local residents, provided they meet the required job qualifications. - Any grievances or concerns raised by Project-affected community shall be appropriately addressed through a grievance mechanism - Child labor is not allowed	Admin Officer	Admin Manager	Auditable record will be maintained
C-9	**Biological Environment**				
	Adverse impacts associated with Trees and shrubs removal	- Expansion project does not involve any tree cutting - Donations for tree plantation will be arranged as they were last year.	Admin Officer	Admin Manager	Trees growth will be monitored on regular basis.
D	**OPERATIONS**				
D.1	**Air Emissions**				
	- Health hazard due to Gaseous emissions Boilers/generators - Poor indoor ventilation	- Boilers stacks are equipped with wet scrubbers to control and reduce emissions.	HSE Engineer	Manager HSE	Lab monitoring of gaseous emissions from boilers stacks

	- Site visiting Vehicles/trucks for transportation of raw material and finish products Poor indoor quality in production halls and storage areas.	- The emissions from HFO/NG fired boilers comply with the PEQS requirements. - Appropriate ventilation will be provided in production halls and storage areas to ensure proper indoor air quality. - Prohibit open firing of solid waste. - Carry out regular preventive maintenance of vehicles and machinery - Transport Contractor will be enforced to permit only the properly tuned and well-maintained vehicles to access the HLWP. - Internal roads will be maintained properly to reduce fugitive dust and for the smooth movement of vehicles. - Vehicles/trucks speed has been limited to 20 Km per hr. within the premises - The Use of appropriate PPEs will be ensured.			on quarterly basis.
D.2	**Noise**				
	Noise from machinery, boilers' auxiliaries, emergency generators etc.	- This can be mitigated through the installation of noise barriers or the use of noise-canceling acoustic devices.	HSE Engineer	HSE Manager	Noise level survey will be

	Exposure to high noise levels can lead to psychological effects and physical harm including hearing loss.	- The machines have been selected that have with low sound levels complying with PEQS for noise. - Proactive maintenance of Plant machinery and standby generators will be carried out to minimize elevated sound levels resulting from inappropriate maintenance. - Use of ear plugs and ear muffs by the employees will be ensured in working areas of high Noise level. - Warning Sign Boards will be placed at high sound level areas.			conducted on regular basis.
D.3	**Soil/Groundwater Contamination**				
	Health hazard caused by poor waste management and spillages/leakages of oil/fuels/chemicals	- Immediate cleanup of any spillage/leakage of oil or fuel will be ensured - To prevent soil and groundwater contamination, allow only well-maintained vehicles/trucks/machinery to avoid oil/fuel leaks within the premises of HLWP. - Ensure appropriate solid and liquid waste management	HSE Engineer/ Area Engineer	Manager HSE/ Admin Manager	Regular inspections for housekeeping/ leakages/spillages on daily basis. Groundwater will be analysed on quarterly basis to check any contamination.

		- Vehicles Washing and maintenance will be carried out in a designated area paved with concrete with its discharge to sewerage system.			
D.4	**Water Supply**				
	Insufficient and poor quality of water supply can cause sanitation issues and health hazard	- HLWP ensures the provision of sufficient supply of potable water, compliant with PEQS, to safeguard the health and well-being of all employees. - RO plant is installed to supply drinking water - Ensure water conservation by condensate recycling.	HSE Engineer	HSE Manager	Groundwater and drinking water will be analyzed by EPA certified Lab on quarterly basis.
D.5	**Solid Waste**				
	Inadequate Solid waste disposal may cause health and safety hazards	- Solid waste at offices and kitchen is segregated at the source and collected/stored at a designated area within the HLWP. It is subsequently disposed of through local contractor. - Process waste generated during manufacturing is non hazardous in nature and is disposed of through Industrial Estate Waste Collecting System. - Hazardous waste generated (if any) will be disposed of through EPA approved contractor. - Open burning of solid waste is not permitted.	HSE Engineer /Admin Officer	Admin Manager	Auditable record will be maintained.

D.6	**Wastewater**				
	Improper wastewater management can contaminate soil and groundwater and cause health hazard	- The sewerage system is properly constructed and well maintained. - The domestic wastewater is treated in Septic Tank before its discharge into external Drain of Industrial Estate. - The process wastewater will be treated in ETP before its discharge into Industrial Estate Drain. - Monthly bill for treated effluent discharge into Industrial drain is presented in Annexure IV. - Vehicles and equipment maintenance and washing is carried out in a designated area underlain with concrete slabs and proper drainage system - Ensure that the treated effluent complies with PEQS.	HSE Engineer	Manager HSE/Admin Manager	Analyses of treated effluent by an EPA certified Lab and submission of reports to EPA Field Office on quarterly basis
D.7	**Traffic**				
	Additional traffic load is anticipated on adjacent roads and within HLWP premises after expansion project	. - The adjacent roads will adequately accommodate the increased traffic load.	Admin Officer	Admin Manager	Close monitoring by Factory Gate Security staff

	.	To minimize traffic disruption, deliveries of raw materials and transportation of finished products will be scheduled outside peak hours. - Gate security staff will ensure that trucks are parked at the factory parking area instead of on the main roads			
D.8	**Occupational Safety and Health**				
D8.1	Safety and Health Hazards	Follow the plans/policies/Systems that have been implemented such as - Emergency evacuation Plan - Firefighting - Use of appropriate PPE for specific risks. - Work permit system for maintenance activities particularly those conducted at heights or in confined space - Ensure “No smoking” in areas other than the designated space for Smoking. - Sign boards will be placed at high-noise and high-risk areas - Spills will be quickly handled and contained, - Adequate ventilation will be provided in production halls, chemicals stores - The staff will be trained on emergency handling, firefighting and first aid.	HSE Engineer/ Admin Offices/ Area In-charges	Manager HSE	Safety audits will be carried out. HSE Trainings will be arranged for all employees.

		- Inspection schedule is in place to check fire-extinguishers and first aid boxes on bi-monthly basis. - First aid boxes are placed at different locations. - SOPs for Dengue control have been implemented - Annual medical checkup of employees and/or vaccination is carried out to comply with Section 23 of Factories Act.			
D.9	**New Hiring for Plant Operations**				
	Positive Impact of New Hiring for Plant Operations	- New plant operators, maintenance technicians, and HSE personnel will be recruited from the neighborhood and given training in occupational health and safety and other necessary skills. - Child labor will not be allowed	Admin/HR Manager	HSE Manager	Auditable record will be maintained
D.10	**Tree Plantation**				
	Positive impact of tree Plantation	- Donations of native trees will be continued in the same manner as last year. - Plantation wil be carried out on open areas.	Admin Manger	HSE Manager	Growth of planted trees will be monitored on regular basis.

Table 6.2 Environmental Monitoring Plan for Construction and Operational Phases

Components	Parameters (PEQS Compliance)	Remarks	Frequency	
			Construction	Operations
Noise	Noise Level dB(A) (PEQS)	PEQS Compliance	Quarterly	Quarterly
Ambient Air Quality	CO, *SO_2, NO_x, Particulates (PM_{10}, $PM_{2.5}$) (PEQS)	PEQS For Ambient Air	Quarterly	Quarterly
Gaseous Emissions	CO, SO_2, NO_x, Particulates	PEQS for Industrial Gaseous Emissions	Biannual	Quarterly
Water Quality	Drinking water PEQS	PEQS for Drinking water	Quarterly	Biannual
Effluent	Flow, T, pH, COD, BOD_5, TSS, Oil and grease	PEQS for Industrial Effluents	Quarterly	Quarterly
Trees Plantation	Visual Inspection	Environmental Sustainability	Regular Monitoring by Site Management.	

6.7 SCHEDULE FOR IMPLEMENTATION AND ENVIRONMENTAL BUDGET

6.7.1 Schedule for Implementation

Construction Phase completion time is 5-6 month

6.7.2 Environmental Budget

HLWP is committed to creating and promoting an environmentally sustainable and responsible culture and foster continuous improvement in its performance in terms of its environmental footprint. The budget proposed for effectively implement the EMP is summarized in Table 6.3.

Table 6.3 Annual Environmental Budget for EMP Implementation

Activity	**Description**	**Cost (PKR)**
Environment Monitoring Cost	Analyses of Noise, boilers' emissions, Effluent and Water Quality (Quarterly)	300,000
Solid Waste and wastewater Disposal	Monthly bill to Industrial Estate	300,000
HSE	PPEs for existing employees, PPEs for new employees (Expansion Project)	500,000 700,000
Plantation Plan	Tree Plantation	200,000
Training Program	Trainings	200,000
	Grand Total	2,200,000

6.8 PROPOSED EMP REPORTING AND REVIEWING PROCEDURE

The EMP will be incorporated into the contract between project contractor/s and HLWP. It will be a contractor's responsibility to implement the EMP during Construction Phase. However, HLWP Manager HSE and Admin Department will provide support to the Contractor's team whenever required to work for a common cause.

- The contractor's Site Engineer will prepare periodic progress report of EMP implementation and share with HSE Engineer of HLWP. After review by HSE Manager, the report will be submitted to GM Factory.
- GM Factory will review the report and assess the compliance with EMP. GM Plant will discuss the report with internal departmental meetings.
- At the completion of project construction, the Contractor will prepare the project completion report and submit to GM Plant.
- In case of non-compliance by the contractor, the Proponent will take proper action on non-compliance in accordance with a clause of contract and may recommend to make deductions from the payments to the contractor.
- Change of management plan will be implemented to incorporate any change required in the EMP during design and construction stage.

6.9 TRAININGS

HLWP regularly conducts HSE training sessions, along with job-specific training, for both permanent and contract employees. These sessions play a vital role in ensuring the effective implementation of the Environmental Management Plan (EMP)..

The trainings will include, but not be limited to, basics of Plant Operations, proper safe work procedures, hazard awareness and identification, proper use of PPE, proper lockout/tagout procedures, first aid including proper rescue procedures. Provisions shall be made for periodic re-training as necessary.

7 CONCLUSIONS AND RECOMMENDATIONS

7.1 CONCLUSIONS

Base Plant

M/s HLWP has presented supporting documents to establish that the Project of HLWP was established and operational prior to the promulgation of the Punjab Protection Act 1997, hence the environmental approval under Section 12 of the Environmental Act 1997 is not required for the base plant.

Expansion Project

The Environmental Impact Assessment (EIA) study was carried out for the Expansion Project of HLWP. The EIA Study confirms that the proposed project is legally, environmentally and socially viable. The proponent is committed to executing the project in an environmentally responsible manner, taking all necessary measures to mitigate potential impacts. Additionally, the project will create employment opportunities for the local community.

7.2 RECOMMENDATIONS

Base Plant

It is respectfully requested that the honorable Agency (Punjab EPA) grant Exemption from Environmental approvals for the Manufacturing Unit of Hamdard Laboratories (Waqf) Pakistan located at Plot No. 163, Quaid-E-Azam Industrial Estate, Lahore
.

Expansion Project

It is recommended that the honorable Agency (Punjab EPA) grant Environmental Approval for the Construction Phase of the Proposed Expansion Project, provided the Proponent effectively implements the Environmental Management Plan (EMP).

ANNEXURE I

LAND OWNERSHIP DOCUMENTS

(ALLOTMENT LETTER DATED 12-08-1965)

Registered

DEMAND NOTICE

(Industrial Sites New Lahore Township)

No. 3335-AURD-65/

DIRECTORATE-GENERAL
WEST PAKISTAN HOUSING AND SETTLEMENTS
AGENCY, LAHORE.

Dated Lahore, the 12.6. 1965.

To

M/S Hamdard Dawakhana (Waqf).
Pakistan (Tele: No.3819)
LAHORE.

MEMORANDUM

The Allotment Board for Industrial Sites in New Lahore Township Scheme has decided in its meeting held on the 31st July, 1965 to allot to you Plot No. 17 measuring approximately [illegible] acres in the Industrial Area of Lahore Township Scheme as shown in Drawing No. LTP/2436/64, dated the 10th November, 1964, on the following conditions:-

i) that for the present you will make payment at the tentative rate of Rs.27,000.00 per acre which may further increase reasonably. The tentative cost at the above rates works out to Rs. [illegible],000/-.

ii) that you will make payment of 20% of the provisional cost of the plot amounting to Rs. 12,[illegible]/- immediately and not later than one month of the issue of this notice with the Housing Officer, Lahore.

iii) that the aforesaid 20% of the total provisional price shall be treated as security for the proper compliance of the terms and conditions of allotment.

iv) that you will make next payment of 20% of the provisional price within one month of first payment.

ANNEXURE II

ELECTRICITY BILL

CONNECTION ON 29-11-1982

Connection Date

LAHORE ELECTRIC SUPPLY COMPANY ELECTRICITY CONSUMER BILL - (MDI)

www.lesco.gov.pk

LESCO GST # 0305271600291

CONN DATE	MNFG. CD	NO OF AC	ED@	BILL MONTH	READING DATE	ISSUE DATE	DUE DATE
29 NOV 82			1 %	SEP 25	01 OCT 25	04 OCT 25	21 OCT 25

CONSUMER ID / UNIQUE KEY	TARRIF	SANC.LOAD	OLD A/C NUMBER
3000391 / 3000391	B2b (12)T	340	24112132400100
REFERENCE NO		DIVISION	TOWN SHIP
24 11213 1016400		SUB DIVISION	GREEN TOWN

FEEDER NAME: INDUSTRIAL NO. 7 (042823)

MONTH	MDI	KWH UNITS	BILL	PAYMENT
SEP24	170	65213	3053466	3053466
OCT-24	170	65730	3043745	1674059
NOV24	170	68519	3143164	1571582
DEC24	0	24480	1099464	1099464
JAN25	0	47840	2098902	2098902
FEB25	160	29280	1477065	1477065
MAR25	1	10560	456901	456901
APR25	0	17600	764256	764256
MAY25	160	17600	828478	828478
JUN25	0	33280	1315874	1315874
JUL25	0	22080	970807	970807
AUG25	0	22240	968133	968133

FPA JUL-25 @ -1.7856

Total FPA -49337

WATTAGE :
LINE LENGTH :

NAME & ADDRESS
M/S HAMDARD LABOROTIES
C/O RAHEEM ELAHI
(WAQAF) PAKISTAN

I-TAX PAID 2025-2026 94140
GST # 202210600137

CNCT LOAD = 340
NTN # 0700900-3

آپکے اس بل میں جولائی 25 کے صرف شدہ یونٹس کے ایندھن کی قیمت(FPA) کے 49337- روپے بھی شامل ہیں

SAY NO TO CORRUPTION

WEB GENERATED BILL

PRV.CUMM MDI	PRS.CUMM MDI	RESET NO	MONTHLY ADV.BILL	POWER FACT
93.71	93.71	74	0	0.94

KWH	KWH METER READING			KVARH METER READING			MDI METER READING		METER STATUS
METER NO	PREVIOUS	PRESENT	MF	PREVIOUS	PRESENT	MF	PRESENT	MF	
95856 95856	23565 4524	23689 4541	160 160	11137 2139	11183 2146	160 160	0	160 160	0

UNITS CONSUMED (O) 19840 (P) 2720 (O) 7360 (P) 1120 (O) 0 (P) 0

LESCO CHARGES		GOVT CHARGES	
UNITS CONSUMED	22560	E.D.	6009.88
ENERGY CHARGES	643584	TV FEE	
FIX CHARGES	115000	GST	143109
LPF PENALTY		INCOME TAX	47858
SEASONAL CHARGES		EXTRA TAX	
METER RENT	181.50	FURTHER TAX	
SERVICE RENT		ITS	
VAR. FPA	-39426.06	STAX - 2014	
QTR TARRIF ADJ	-42595.54	N.J SURCHARGE	
TOTAL	676743.91	SALES TAX	
		FC SURCHARE	72868.80
		TR SURCHARGE	
		TAXES ON FPA	-9911.26
		TOTAL	259934.42
		GST ADJ	
		DEFERRED AMOUNT	3093455
		OUTSTANDING INST. AMOUNT	

BILL CALCULATION

GOP
Tariff X Units
27.410 X 19840
36.880 X 2720

ARREAR	
CURRENT BILL	936678
BILL ADJUSTMENT	
INSTALLMENT	
TOTAL FPA	-49337
PAYABLE WITHIN DUE DATE	936678
L.P.SURCHARGE	39443
PAYABLE AFTER DUE DATE	976121

Till 241121310 | After 241121310: 78886 / 1015564

Please call for customer
1. Complaint: 118
2. SMS: 8118
3. Whatsapp

CUT HERE

LAHORE ELECTRIC SUPPLY COMPANY - ELECTRICITY CONSUMER BILL (MDI)

www.lesco.gov.pk

CONSUMER ID	3000391
BILL NO	2130311

ANNEXURE III: FACTORY REGISTRATION CERTIFICATE

DIRECTORATE OF LABOUR WELFARE
GOVERNMENT OF THE PUNJAB,
LAHORE

Reg No: [illegible]
Issuance Dated: [illegible]

Old Reg No: F.I.R/202
Old Reg Dated: 16-04-1961

Factory Registration Certificate

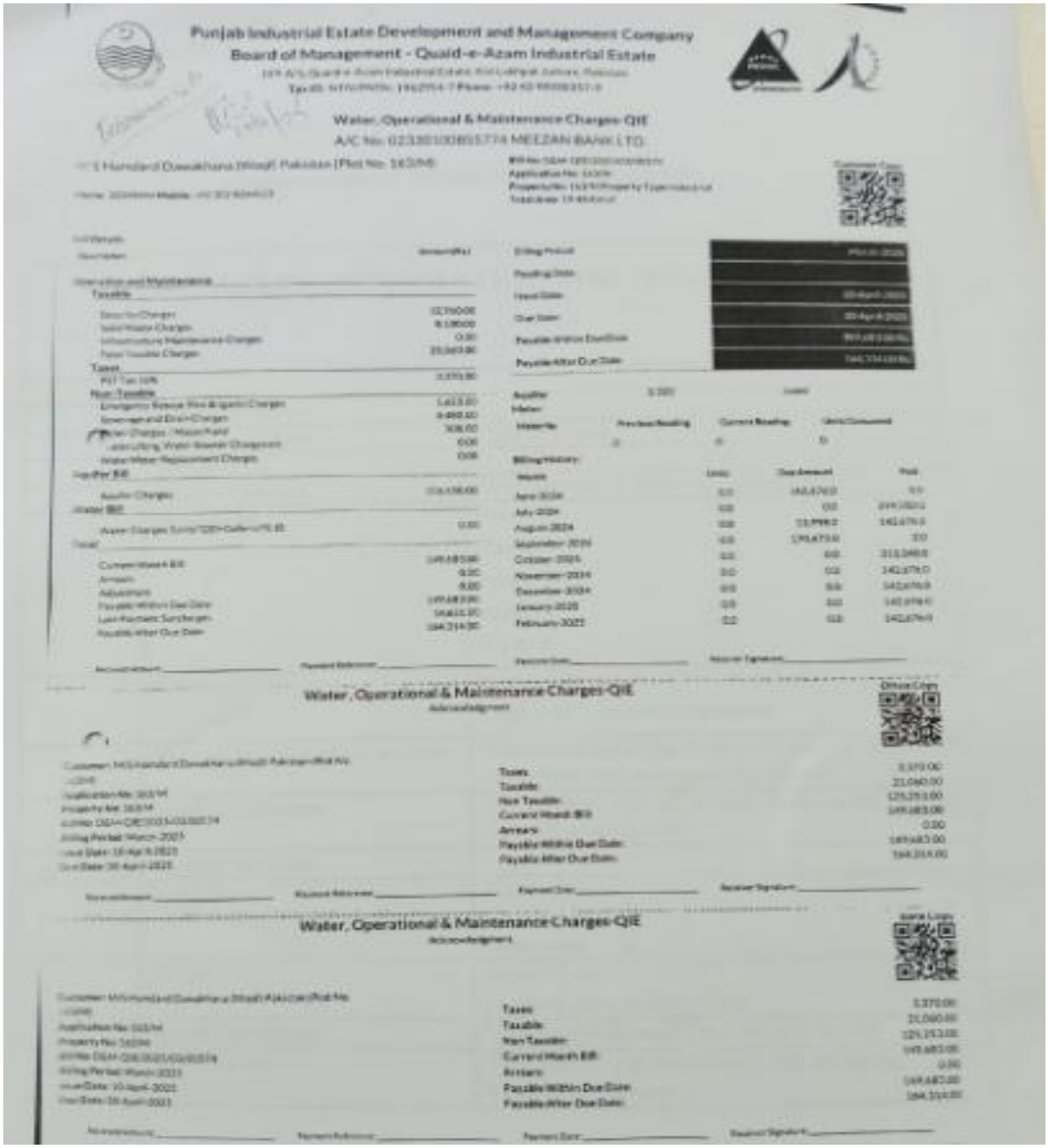
*This is to certify that the premises known as M/S HAMDARD LABORATORIES (WAQF) PAKISTAN PLOT NO. 163 INDUSTRIAL AREA KOTLAKHPAT, LAHORE, TEHSIL MODEL TOWN DISTRICT LAHORE is hereby registered as it falls within the definition of "**factory**" under Section 2(J) of the Factories Act, 1934.*

Chief Inspector of Factories,
Punjab

This is a system generated certificate and does not require signature.

ANNEXURE IV

MONTHLY BILL FROM INDUSTRIAL ESTATE FOR WASTEWATER DISPOSAL



Punjab Industrial Estate Development and Management Company
Board of Management - Quaid-e-Azam Industrial Estate

Water, Operational & Maintenance Charges-QIE
A/C No. 0233810308015774 MEEZAN BANK LTD.

Water, Operational & Maintenance Charges-QIE
Acknowledgment

Water, Operational & Maintenance Charges-QIE
Acknowledgment

ANNEXURE V: GLOSSARY

Aesthetic Value	The value derived from the beauty, visual appeal, and experiential qualities of a landscape or place.
Ambient air quality	Ambient air quality refers to the quality of outdoor air in our surrounding environment.
Archaeology	The study of human history and prehistory through the excavation of sites and the analysis of artefacts and other physical remains.
Biodiversity	The variety of plant and animal life in the world or in a particular habitat, a high level of which is usually considered to be important and desirable.
Climate.	The weather conditions prevailing in an area in general or over a long period
Conservation	Official supervision of rivers, forests, and other natural resources in order to preserve and protect them through prudent management
Construction Waste	Waste generated from the buildings and construction industry and includes material like bricks, concrete, tiles, debris, ceramics and more.
Consultant	A person who provides professional advice or services to companies for fee
Cultural Heritage	Valued objects and qualities such as historic buildings and cultural traditions that have passed from previous generations.
Decoction	A concentrated liquor resulting from heating or boiling a substance, especially a medicinal preparation made from a plant.
Demographic	A single vital or social statistic of a human population, as the number of births or deaths
Ecology	The branch of biology that deals with relations of organisms to one another and to their physical surroundings
Effluent	Liquid wastes such as sewage and liquid waste from industries
Electromagnetic Field (EMF)	Electromagnetic fields are a combination of invisible electric and magnetic fields of force. They are generated by natural phenomena like the Earth's magnetic field but also by human activities, mainly through the use of electricity.
Environment	Relationship of natural world (human beings, animals and plants) with physical surroundings (air, land, water).
environmental impact assessment (EIA)	(EIA) is an analytical process that systematically examines the possible environmental consequences of the implementation of projects, programs and policies
environmental management plan	(EMP) is a site specific plan developed to ensure that all necessary measures are identified and implemented in order to protect the environment and comply with environmental legislation.
Excavation	The act or process of digging, especially when something specifics being removed from the ground.
Fauna	The animals of a particular region, habitat, or geological period.
Flora	The plants of a particular region, habitat, or geological period.
Framework	A real or conceptual structure intended to serve as a support or guide for the building of something that expands the structure into something useful
Hazardous Waste	Waste that poses substantial or potential threats to public health or environment
Impact	The action of one object coming forcibly into contact with another.
IEE	Initial Environmental Examination

Livelihood	A set of activities involving securing the basic necessities –food, water, shelter and clothing of life.
Peak ground acceleration	Peak ground acceleration (PGA) is equal to the maximum ground acceleration that occurred during earthquake shaking at a location
Policy	A policy is a deliberate system of principles to guide decision and achieve rational outcomes
Proponent	A person who advocates a theory, proposal, or course of action.
Rehabilitation	To restore to a condition of good health, ability to work, or the like
Resettlement	The settlement of people in a different place
Resource	A stock or supply of money, materials, staff, and other assets that can be drawn on by a person or organization in order to function effectively.
Sanitation	Conditions relating to public health, especially the provision of clean drinking water and adequate sewage disposal
Seismic Hazard.	A seismic hazard is the probability that an earthquake will occur in a given geographic area, within a given window of time, and with ground motion intensity exceeding a given threshold.
Seismology	The branch of science concerned with earthquakes and related phenomena.
Stakeholder	A stakeholder is a party that has an interest in a company, and can either affect or be affected by the business. The primary stakeholders in a typical corporation are its investors, employees and customers.
Topography	Topography is the study of the shape and features of the surface of the Earth and other observable astronomical objects including planets, moons, and asteroids
Vegetation	Plants considered collectively, especially those found in a particular area or habitat.

ANNEXURE VI: ABBREVIATIONS & ACRONYMS

3R	Reduce, Reuse & Recycle
AIS	Air Insulated Station
CO	Carbon Monoxide
CSR	Corporate Social Responsibility
dB(A)	Decibel- A
EHS	Environmental Health & Safety
EIA	Environmental Impact Assessment
EMMP	Environmental Management and Monitoring Plan
EPA	Environmental Protection Agency
EPD	Environmental Protection Department
ERP	Emergency Response Plan
GRM	Grievance Redress Mechanism
HSE	Health Safety & Environment
IEE	Initial Environmental Examination
IFC	International Finance Corporation
ILO	International Labor Organization
LAA	Land Acquisition Act
LST	Land Surface Temperature
LULC	Land Use and Land Cover
MSDS	Material Safety Data Sheets
NCSW	National Commission on the Status of Women
NFPA	National Fire Protection Association
NOC	No Objection Certificate
NOx	Oxides of Nitrogen
OSHA	Occupational Safety & Health Administration
PEPA	Punjab Environmental Protection Act
PEPC	Punjab Environmental Protection Council
PEQS	Punjab Environmental Quality Standards
PGA	Peak Ground Acceleration
PM	Particulate Matter (2.5 or 10)
PPE	Personal Protective Equipment
SEAL	Solution Environmental & Analytical Laboratory
SF	Square Foot
SOPs	Standard Operating Procedures
SOx	Oxides of Sulfur

ANNEXURE VII:

LIST OF INDIVIDUALS AND ORGANIZATIONS CONSULTED ALONG WITH THEIR FEEDBACK

Name	Designation	Organization	Concerns/Advice
Mr. Abid khan	General Manager Factory	M/s HLWP	- Hamdard Laboratories operate sustainably, prioritizing environmental responsibility as part of its corporate social responsibility (CSR) initiatives, which focus on health, education, and the environment. - At HLWP, mostly herbs as used as raw materials instead of chemicals, which are non-hazardous and present minimal safety and health risks. - We ensure compliance with PEQS. - Installation of Wastewater Treatment Plant is a step forward in promoting Environmental sustainability -
Hafiz Zia Ullah Zia	Deputy Manager HR/Admin	HLWP	- We are committed to plant native trees and recently donated 5000 trees to PHA, Lahore. - Local public is preferred for new jobs. - Every worker undergoes regular medical checkup to comply with Section 23 of the Factories Act.
Mr. Muhammad Imran	Manager Engineering	M/s HLWP	- HLWP is highly committed to total productive maintenance (TPM) and operational integrity. - The high efficiency of wet scrubbers is always ensured to maintain compliance with PEQS.

			- A work permit protocol has already been implemented for all maintenance activities.
Mr. Mubashir Hussain	Unit Incharge HSE	M/s Fatimafert Limited	- HLWP is well known for its high quality products. It should also set a benchmark in occupational safety and health. - Water conservation remains a significant gap area within the local industry. - HLWP should arrange 2nd party and 3rd party environmental and safety audits .
Dr. Naveed Ramzan	Dean Engineering	UET Lahore	- The factory should conduct process hazard analysis of expansion project. - Energy efficient and low noise machines should be selected for new expansion. - Ensure the proper use of PPEs, especially in grinding sections and operational areas involving flavorings and essences.
Mr. Adeel Ahmad	Production Manager	Fatimafert Limited, Lahore Sheikhupura Road	- Contractors should be enforced to provide PPEs to the contract workers. During Construction phase, safety talks should be arranged before starting new jobs. - Provide adequate localized and general ventilation in production halls and raw material storage areas. -
Mr. Maryam Siddique	Environment Practitioner	Lahore	- Safe disposal of ETP sludge should be ensured through EPA approved vendor. - Measures should be taken to conserve water and minimize wastewater generation.
Mrs. Maham Ayesha	Environmentalist		- HLWP should focus on reducing greenhouse gas emissions and

			considering using alternative biofuels in their boilers instead of currently used fossil fuels. - Construction activities should be managed to ensure that existing plant operations remain unaffected.
Mr. Adnan Khan	Manager Environment Social Risk Management	*MCB Bank Limited, Lahore*	- Conduct daily inspections to ensure no stagnant water is present within the premises or surrounding areas for effective dengue control. - Contain all spillages to prevent discharge into the sewerage system. - Maintain the wastewater treatment plant in good condition and ensure compliance with PEQS.
General Public			

ANNEXURE VIII: REFERENCES

1. I. Khan, O. Ahmed, and S. Ahmad Yar, “Analyzing Land Use and Land Cover Dynamics Using Geospatial Approaches: A Case Study of District Lahore, Pakistan: Analyzing Land Use and Land Cover Dynamics Using Geospatial Approaches: A Case Study of District Lahore, Pakistan”, *IJEEG*, vol. 14, no. 04, pp. 1–6, Jun. 2024.

2. EIA Checklist

3. https://www.citypopulation.de/en/pakistan/admin/punjab/724__lahore/)

4. Pak EPA Guidelines for Preparation and Review of Environmental Reports, 1997”, Https://epd.punjab.gov.pk

ANNEXURE IX: TERMS OF REFERENCE (TOR)

PURPOSE: Terms of Reference (TOR) For Appointment of Consulting Firm for Conducting Environmental Impact Assessment (EIA) for the Project "Expansion of Hamdard Laboratories (WAQF) Pakistan at Plot No. 163, Quaid-E-Azam Industrial Estate, Lahore Established Before PEPA 1997".

The Consultant will conduct the EIA and prepare a report in accordance with guidelines of EIA set by EPA Punjab and the IEE/EIA regulations 2022.

The Consultant will:

- Review published literature and all relevant data/drawings provided by the Proponent, as well as collect additional pertinent information.
- Examine all applicable legislation, standards, and policies.
- Conduct a Baseline Environmental Study, including environmental monitoring of the project site by a field team from an EPA-certified laboratory.
- Engage in public consultations and hold meetings with stakeholders.
- Identify all potential positive and negative impacts of the proposed project during the pre-construction, construction, and operational phases.
- Recommend mitigation measures to eliminate or reduce negative impacts to acceptable levels.
- Prepare an Environmental Management Plan (EMP) and a Monitoring Plan.
- Finalize the EIA report in collaboration with HLWP.
- Assist the proponent (until obtaining the NOC) with:
    - Submission of the report to the Punjab EPA for review.
    - Addressing all queries raised by the EPA following their review of the report.

The **Consultant EIA Team** will consist of environmentalists, ecologist, sociologist (as a minimum requirement), all possessing relevant academic qualifications and experience. The team leader must have over 15 years of diversified experience and have conducted at least 10 large size industrial-level IEE and EIA studies.

Duration: Preparation of draft EIA report within 6 week for review of Proponent and submission of final report to EPA within 8 weeks for review of EPA, Punjab.

ANNEXURE X: EIA TEAM

Name	Position	Qualification
Dr. Sajid Hassan	Team Leader	PhD Combustion Engineering, Imperial College, London Diploma In "Combustion and Environment Pollution" Imperial College London BSc Chemical Engineering, UET, Lahore
Mr. Muhammad Tayyab Muzammal	Environmentalist	BSc Environment Sciences,
Mr. Arshad Ali	Chief Chemist	BSc Chemistry (Hon) University of Punjab, Lahore
Sheikh Obaid ur Rehman	Sr. Ecologist	MSc Forestry
Mr. Naveed Sajjad	Sociologist	MA Sociology, University of the Punjab

ANNEXURE XI

LAB REPORTS