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LIST OF ABBREVIATIONS

PEPA	Punjab Environmental Protection Act
NEQS	National Environmental Quality Standards
PEQS	Punjab Environmental Quality Standards
WAPDA	Water and Power Development Authority
EMP	Environmental Management plan
WWTF	Waste Water Treatment Facility
Pak-EPA	Pakistan Environmental Protection Agency
W.H.O	World Health Organization
PET	Punjab Environmental Tribunal
SWM	Solid Waste Management
CSR	Corporate Social Responsibility
MSWs	Municipal Solid Wastes
TMA	Town Municipal Authority
KVA	Kilo Volt Ampere
PPEs	Personal protective equipment's
PM	Particulate matter

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ANNEXURE-A	Term of References
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ANNEXURE-C	Land Ownership Documents
ANNEXURE-D	Project Layout Map

EXECUTIVE SUMMARY

Project Title and Location

The Said project for which this Environmental Impact Assessment (EIA) Study has been conducted is the establishment of pharmaceutical unit under the name of Pharmista Laboratories Pvt Ltd at Khewat No: 200/194, Khatooni No: 309 to 317, Khasra No: 1449, 1453, 1454, 1459, 1461, 1546, 1547, 1554, 1555 Mouza Bhai Kot 8-KM Sunder Raiwind Road Tehsil Raiwind District Lahore.

Project Proponent

The proponent intends to get Environmental approval of said unit by submitting the Environmental Impact Assessment Report for the compliance of section 12, PEPA, 1997 (Amended 2012).

Table 0-1: Details of Project Proponent

Name	Amber Asher S/O Muhammad Ashar Hussain Malik
CNIC	35202-7247169-6
Mailing Address	H:No 85, Block F, DHA EME Sector, Lahore City District Lahore

The EIA Study Consultant

Safe Enviro-Solutions, as independent consultants, has been appointed by the proponent to conduct Environmental Impact Assessment (EIA).

Company office address: 99/Burj Al-Saeed building Room #110, Main Ferozepur Road, Ichra, Lahore. .

Phone: +92 336 8779107

Email: safe.envirosolutions@gmail.com

Positioning of the Project

Pharmaceuticals units fall under category of Chemical Projects mentioned in Schedule-II (B) (2) Of Review of IEE/EIA Regulations 2022, hence such projects require submission of EIA Report to obtain Environmental Approval, under Section 12 of Punjab Environmental Protection Act 1997.

Brief Description of the Project

The Said project is the construction of Pharmaceutical unit under the name of M/S Pharmista Laboratories Pvt Ltd. The total area of the plot is 33750.00SFT.

Brief Outline of the Proposal

Name of the Said project	Pharmista Laboratories Pvt Ltd .
Purpose of the Project	➤ To establish the Pharmaceutical unit to meet medicinal requirement of country. ➤ To establish the business of proponent. ➤ To enhance economic growth of the country.
Process Details	
Manufacturing Process	Pharmaceutical Unit
Raw Materials	Penicillin Powder
Finished Products	Tablets, Capsules, Dry Syrup & Injectable
Production Capacity	200KG/day
Land Requirement	
Total Area of Industry	Total area of the unit is 33750.00Sft
Status and location	
Location of the proposed site	Khewat No: 200/194, Khatooni No: 309 to 317, Khasra No: 1449, 1453, 1454, 1459, 1461, 1546, 1547, 1554, 1555 Mouza Bhai Kot 8-KM Sunder Raiwind Road Tehsil Raiwind District Lahore.
Description of project	The subject project is the Pharmista Laboratories Pvt Ltd that will manufactures Pharmaceutical Products.
Water Requirement	
Water consumption for the project	1000 Liter/ day during construction phase
Ways of extraction	Motor pump
Source of Water consumption	Underground.
Amount of waste water	20% of total used water. 80% water will be recycled within Company.
Source of waste water	Constructional and Domestic Waste
Mode of treatment	During land development septic tanks will be installed for the safe disposal of domestic and constructional wastewater.
Solid Waste	
Source of solid waste generation	Construction and Domestic sources
Mode of disposal	Construction waste will be reuse in construction. Domestic waste will be handed over to local contractors.
Solid waste during operation of unit	Waste only from offices.
Manpower	
Labor Force	About 15-20 persons during construction
Labor Force	About 30-40 persons during operation
Power requirements	
Source of power	Power requirements at the project site will be fulfilled by LESCO. Power requirement of the firm is 100 KVA.

Location

Land coordinates are given below:

North Industry

South... Industrial Plot

East.....Open Plot

West... Road

Major Impacts & their Mitigations

In order to identify all the activities associated with the project during construction and operation phase with potential to cause significant environmental impacts and harm a thorough review has been conducted. Project will not have significant negative impacts on the nearby community and on environment. Overall the project will have positive impacts on the local population and country as a whole. Moreover, area for plantation is also reserved for environmental enhancement measures

Table 2: Summary of Major Impacts & their Proposed Mitigation during Construction Phase

Potential Impact	Key Mitigation Measures
Dust Emissions — Dust and PM may be generated during road construction and excavation activities. Gaseous emissions from site generators and transportation vehicles may affect ambient air quality in the vicinity of the project site.	Sprinkling of water on dusty roads, tracts and surfaces is recommended; During excavation works drop heights will be minimized to control the fall of materials reducing dust escape; Vehicle speed restrictions should be applied in the project area; Raw materials should be transported in covered trucks;
Solid waste Management — If solid waste will not be managed properly, it may cause negative impacts	Constructional waste should be utilized for road filling and maintenance purposes; Domestic waste should be disposed off properly, handed over to contractors, placed in bins; Proper solid waste management plan should be devised and implemented.
Waste water - water used in construction process and excessive water generate as wastewater and it also produced from campsite domestic activities	Waste water after treatment in septic tank should be drain out in nearby drain
Construction Noise - Noise may be generated during landscaping activities and from generators and transportation vehicles at the project site; which may be a nuisance for the workers.	Activities generating high levels of noise should be minimized at the project site. If the noise level will exceed the permissible limits with reference to national and OSHA standards, following recommendations are suggested to take action against the high noise levels: • Proper tuning of construction machinery and vehicles is recommended. • Ear muffs and ear plugs are recommended in case of high noise levels. • Rubber wounds should be placed underneath the generator to avoid the vibration.

Vegetation Loss/ Soil erosion— Minor negative impact may arise as only some weeds and grasses are present at the project site which will be cleared for the purpose of construction.	No tree cutting/ vegetation loss issue will be involved in the subject project as project site is free of any dense vegetation and trees. Preparation of a Reinstatement Plan to restore the land after the constructional activities is recommended.
Soil Contamination—Oil and Chemical spills can contaminate the soil.	Provision of spill prevention and control kits; Use of impermeable surfaces in workshops, and storage areas; Contaminated soil will be collected and incinerated.
Traffic issues- Traffic issues may arise due to the constructional activities at the project site if traffic will not be managed properly.	Traffic impact assessment study should be conducted at the project site; Speed limit of 10 km/h should be maintained on the access road; Ample parking area must be allocated at the project site. Guards should be hired to manage the traffic at the project site.
Socioeconomic impacts—Inter-cultural differences between the project staff from other areas and the local community may arise due to the subject project. Positive socioeconomic impacts due to increased infrastructure, employment opportunities and economic growth.	Training of the non-local project staff on local culture and norms; Employment opportunities should be provided to the local people.

Table 3: Summary of Major Impacts & their Proposed Mitigation during Operation Phase

Potential Impact	Key Mitigation Measures
Dust Emissions- Particulate matter emissions during project activities can deteriorate the air quality in the working area and be a nuisance for the workers' health. Gaseous emissions from site generators and transportation vehicles can result in deterioration of ambient air quality of the outdoor environment.	PPEs i.e. masks have been provided to workers during the working hours. Proper ventilation should be ensured in the working area. Vehicles to use for the transportation of materials should be properly tuned. Monitoring should be conducted as per EPA PEQS Rules.
Machinery Noise- Working of machinery can be a nuisance for the workers in the working area.	PPEs i.e. ear muffs have been provided to workers in case of high noise.
Health & Safety Issues- Health and Safety issues e.g. Cuts and Injuries may be caused during the machinery handling.	Proper training of the staff has been conducted to avoid the accidents at regular basis and training record will be maintained by the management. First aid measures should be provided at the workplace. HSE policy will be formulated and implemented during admitted by management. Use of PEP's has been ensured during project activities
Discharge of wastewater- The discharge of untreated wastewater can be a negative impact.	No wastewater will be disposed of into drain without having treatment in septic tank. After treatment wastewater will be disposed of into nearest drainage system. Compliance of PEQS for Municipal and Liquid Industrial Effluents will be ensured. Monitoring will be conducted as per PEQS and reports will be submitted to EPA as per Rule (if required)

Solid waste management- Improper solid waste management may cause health problems and aesthetic Issues	Waste bins have been placed at suitable areas at unit, contract has been made with local contractor. Domestic and process related waste should be handed over to contractors.
Groundwater —The increased withdrawal of groundwater for the project will affect the groundwater resources of the project area	No impact on the community groundwater needs is envisaged as a result of the project (ensured by management)

Proposed Environmental Monitoring

To oversee the environmental performance of the project through its lifecycle enforcing the PEQS an Environmental Monitoring Program should be formulated which ensures effective surveillance of the environmental parameters at various stages of the project development and compliances with PEQS and legal obligations. Monitoring for following Environmental Parameters is recommended:

- **Ambient Air**

Monitoring for ambient air should be conducted during operational activities of the project and report should be submitted to EPA Punjab.

- **Noise**

Regular monitoring for noise level should be maintained periodically during operational phases of the project and report should be submitted to EPA Punjab as per rule.

- **Water Quality**

Regular monitoring of water quality should be conducted during operational phases of the project and report should be submitted to EPA Punjab. Record should be maintained regarding the underground water pump and consumption.

Schedules of Proposed Monitoring:

Sr. No.	Parameters	Monitoring Schedules
1	Ambient Air Monitoring (NO _x , CO _x , SO _x , VOCs, PM ₁₀)	Regularly
2	Noise Level	Regularly
3	Water quality	Regularly

Note: Environmental Monitoring data log book should be maintained by the projectproponent.

SCREENING:

The Said project for which this Environmental Impact Assessment (EIA) Study has been conducted is the establishment of pharmaceutical unit under the name of Pharmista Laboratories Pvt Ltd at Khewat No: 200/194, Khatooni No: 309 to 317, Khasra No: 1449, 1453, 1454, 1459, 1461, 1546, 1547, 1554, 1555 Mouza Bhai Kot 8-KM Sunder Raiwind Road Tehsil Raiwind District Lahore.

According to the Punjab Environmental Protection Act 1997 (Amended 2012) and its interpretation as per Review of IEE & EIA Regulations, 2022 for filling, review and approval of environmental assessments, the construction of Pharmista Laboratories Pvt Ltd falls under Schedule-II (EIA) category B (2).

Further, the client is required to fulfill the legal requirements of the Section-12 of the Punjab Environment Protection Act 1997(Amended 2012).

CHAPTER # 1

INTRODUCTION

1.1 Purpose Of Report

The development of any Project brings about changes, both positive and negative, in the environmental and social settings of the Project Area. The intensity and level of change, however, depends upon the nature of the Project and the baseline environmental conditions of the area. For the last four decades, this aspect has gained momentum both at official and public level. Because of this, official regulations and laws have been promulgated for the protection and conservation of the physical, biological and social environment. The law makes it mandatory to carry out Initial Environmental Examinations (IEE) or detailed Environmental Impact Assessment (EIA) of the development Projects depending upon the nature and magnitude of the impacts.

1.2 Identification Of The Project

Subject project is the construction of Pharmaceutical unit. According to the IEE and EIA Regulations, 2022, the project fall under Schedule II (List of projects requiring an EIA), Category B (Manufacturing and Processing), and Clause 2 (Chemical Products)

1.3 The Proponent

It is intending of Amber Asher S/O Muhammad Ashar Hussain Malik, proponent of Said project, wants to get Environmental approval of said unit by submitting the Environmental Impact Assessment Report for the compliance of section 12, PEPA, 1997 (Amended 2012).

Table 1-1: Details of Project Proponent

Name	Amber Asher S/O Muhammad Ashar Hussain Malik
CNIC	35202-7247169-6
Mailing Address	H:No 85, Block F, DHA EME Sector, Lahore City District Lahore Cantt. Lahore

TORs of the study between Proponent & Consultant under clause 5 (f) of policy and procedure for the filing, review and approval of environmental assessment are annexed as **ANNEXURE-A**.

CNIC of proponent is attached as **ANNEXURE-B**.

1.4 The Consultant

Safe Enviro-Solutions, as independent consultants, has been appointed by the proponent to conduct Environmental Impact Assessment (EIA).

Company office address: 99/Al-Saeed building Room #110, Main Ferozepur Road, Ichra, Lahore.

Phone: +92 336 8779107



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The current work has been carried out by the following professionals:

Name	Qualification	Position in the EIA/IEE Team
Muhammad Rehman Majeed	M.Phil (Environmental Science) GCU Lahore	Project Incharge And Supervisor
Muhammad Shahzad	M.Phil Environmental Science GCU Lahore	Team Leader and Coordinator (Author of the Report)
Mohsin Ali	M.Phil Environmental Science GCU Lahore	Senior Environmentalist (Field Analyst)
Gulzaib Afzal	BS (Hons) Environmental Engineering (UET Lahore)	Environmental Engineer
Ammara Anwar	MS (Environmental Science) (PU Lahore)	Research Associate (Author of the Report)

1.5 Brief Description Of Project

1.5.1 Nature & Size Of Project

Subject project is the establishment of medicine formulation unit under the name of Pharmista Laboratories Pvt Ltd at Khewat No: 200/194, Khatooni No: 309 to 317, Khasra No: 1449, 1453, 1454, 1459, 1461, 1546, 1547, 1554, 1555 Mouza Bhai Kot 8-KM Sunder Raiwind Road Tehsil Raiwind District Lahore and many other industrial units are already in process of establishment and operation in the surroundings. The total area of the plot is 33750.00SFT.

Location

Land coordinates are given below:

North.....Industry

East.....Godown

South.....Industry

West.....Road



- ***Screening and Scoping***

2.1 Screening/Type and Category of Project

Section 12 of Punjab Environmental Protection Act, 1997 (amended 2012) states "No proponent of a project shall commence construction or operation unless he has filed with the Government Agency designated by Federal Environmental Protection Agency or Provincial Environmental Protection Agencies, as the case may be, or, where the project is likely to cause an adverse environmental effects an Environmental Impact Assessment (EIA), and has obtained from the Government Agency approval in respect thereof." Punjab Environmental Protection Act provided the guidelines for categorizing the projects. According to Schedule-II of IEE and EIA Regulations, 2022; the proposed project falls under **Category B (Manufacturing and Processing)** i.e., the project requires an EIA Study. Thus, an EIA Report is being prepared and submitted accordingly for approval.

The proposed project is the Pharmaceuticals industry.

2.2 Scoping:

- **Spatial and Temporal Boundaries of Environmental Assessment:**

Temporal and spatial boundaries for the effects assessment are defined by the characteristics of the project and the VECC being assessed. These boundaries encompass time periods and areas during and within which the VECCs are likely to interact with or be influenced by the project.

- **Temporal Extent (during construction and operation)**

- **Spatial Extent (local or widespread)**

Temporal and spatial boundaries for the effects assessment are briefly discussed in chapter-6.

- **Views, Concerns and Suggestions of Various Stakeholders**

Community showed a lot of concerns; a few are being mentioned here:



- The project will become the source of income for local to earn their livelihood easily and honorably
- The area is industrial & no impacts will be occur
- Employment opportunities will be generated, and locals should be hired on the priority basis
- The air pollution is one of the major impacts of the proposed project, so ambient air quality should be monitored regularly
- Water spraying/sprinkling should be done on the regular basis during construction phase to avoid dust emissions
- Removal of shrubs and trees should be avoided to the extent possible
- Good relations with the local communities will be promoted by encouraging Proponent to provide opportunities for skilled and unskilled employment to the locals as well as on-job training
- The proponent should prefer hiring local labor from adjacent nearby villages
- Indigenous tress around the facility should be planted to control air pollution and as the compensation
- Noise reducing barriers should be installed to reduce noise pollution as the nearest community lies within the radius of 2km.

Concerns

- **Workers should be hired from local community**
- **The provision of medicines should be at economical rates**
- **Indigenous tress around the facility should be planted to control air pollution**
- **Significant impacts and factors to be determined**



There are few minor impacts associated with the operation of manufacturing unit includes the management of the municipal solid waste generated during the, raw-material storage which will be managed according to local practices of area.

The impacts from the establishment of pharmaceuticals will occur during the construction and operation due to the civil work involved and the people residing in the project area. These issues included; noise generation, fugitive dust emissions, solid waste management, wastewater disposal, top-soil removal, Health and Safety issues and change in the geographic features of the area. These all problems should be addressed on-site where they are being generated, to avoid the residual or adverse impacts.

2.3 Alternatives

The details of the site alternatives and technology alternatives are discussed below:

2.3.1 Site Alternatives

No other site alternative was available to be considered as feasible option for the installation of the unit as the land is already located in Industrial Estate. The proposed site was selected because of the following reasons;

- *The site is located in designated industrial area*
- *No human settlements displacement or relocation associated with the project development and operation*
- *Operation of the Pharmaceutical unit in the respective zone will provide job opportunities to local people and will improve their socio-economic status of the study area as 8-10 employees will be hired during the operational phase*

2.3.2 Project Alternatives.

The alternative of the proposed project is to import medicines form foreign countries. The Pakistan Pharmaceutical Industry meets around 90% of the country's demand of finished dosage



forms and 4% of Active ingredients. Specialized finished dosage forms such as soft gelatin capsules, parenteral fat emulsions and Metered-dose inhalers continue to be imported. There are only a few bulk drug Active ingredient producers and Pakistan mainly depends on imports of bulk drugs for its formulation needs resulting in frequent drug shortages. Political disturbances and allegations of under-invoicing add to the uncertainty of import and clashes with the customs and tax authorities are common.

The National pharma industry has shown growth over the years, particularly over the last decade. The industry is trying to upgrade itself and today the majority industry is following local Good Manufacturing Practices (GMP) laws, with a few in accordance with international guidance. Currently the industry has the capacity to manufacture a variety of traditional products ranging from simple pills to capsules, ointments and syrups.

Environmental Alternatives:

As project is located in industrial estate no important religious, archaeological, recreational site or ecologically/declared protected area and human settlement exists within proximity of the selected site i.e., within 5 Km which is a safe distance. In view of these facts, it can be concluded that the selected site is best suited for the project and will not pose any adverse impact or threat on any component of the environment. For this reason, no environmental alternatives have been considered.

Technology Alternatives

The technology being offered by is considered to be 'state of the art' in terms of being environment friendly, efficiency modern & process design for similar capacity of units.

Economic Alternatives:



Pharmaceutical industry in Pakistan has grown during the past recent decades. At the time of the [independence](#) of [Pakistan](#) in 1947, there were few production units in the country. Currently Pakistan has more than 800 large volume pharmaceutical formulation units, including those operated by 25 multinationals present in the country. Almost all the raw materials used in making of medicine are sourced from abroad. About 50 percent of them are imported from [India](#).

The Pakistan Pharmaceutical Industry meets around 90% of the country's demand of finished dosage forms and 4% of [Active ingredients](#). Specialized finished dosage forms such as soft gelatin capsules, parenteral fat emulsions and [Metered-dose inhalers](#) continue to be imported. There are only a few bulk drug [Active ingredient](#) producers and Pakistan mainly depends on imports of bulk drugs for its formulation needs resulting in frequent drug shortages. Political disturbances and allegations of under-invoicing add to the uncertainty of imports^l and clashes with the customs and tax authorities are common.

1.6 Structure Of The Report

EIA Study comprises of Executive Summary following nine chapters as detailed below;

Chapter 1, Introduction; gives rationale and overview of the Project, need for Environmental Impact Assessment study, its objectives and finally structure of the report.

Chapter 2, Project Description; gives a rather detailed account of the Project particularly emphasizing those Project components which are of importance in relation with environmental and social aspects.

Chapter 3, Analysis of Alternatives; describes the analysis of alternatives, which could be site alternative, design or technology alternatives.

Chapter 4, Stakeholders and Public Consultations; deals with the outcome of the consultation carried out with the local communities, knowledgeable people, public representatives, etc. It discusses the concern of various types of the people and provides an outline how these have been addressed within the study of the Project.

Chapter 5, Environmental and Social Baseline Conditions; provides information about the environmental and social settings of the Project Area including geology, climate, flora, fauna, water resources, socioeconomic conditions etc.

Chapter 6, Environmental and Social Impacts and Mitigation Measures; identifies the potential impacts due to the implementation of Project on the physical, biological and social environment of the Project Area.



Chapter 7. Environmental Management and Monitoring Plan; outlines the environmental management plan, identifies the roles and responsibilities to implement EMMP, suggest monitoring frequencies of various parameters and EMMP costs etc

Chapter 8. Conclusion and Recommendations; sums up the report and conclusions and recommendations resulting from the study



CHAPTER # 2

2 DESCRIPTION OF PROJECT**2.1 Type & Category Of The Project**

Subject project is the construction of Pharmaceutical unit. According to the IEE and EIA Regulations, 2022, the project fall under Schedule II (List of projects requiring an EIA), Category B (Manufacturing and Processing), and Clause 2 (Chemical Products)

2.2 Objective Of Project

Following are the main objectives of the Said project:

- Established business for the proponent
- Provide the product to nearby area's market and hospitals
- Reduce the import by locally producing the medicines
- To provide the job opportunities in the area

2.3 Location & Site Layout Of Project

To fulfill the Industrial aspects of the project under reference of this EIA Report, it is to be sited at a place where industrial processing activity is either already going on or there are bright prospects of the same. Concurrently, it must also meet the legal requirements of the Punjab Environmental Protection Act, 1997 (Amended 2012). Availability of land at the best convenient place is equally important among other considerations for the site selection. Availability of access roads, communication facilities, electricity, basic infrastructure, sewerage etc. is yet the other necessary requirements. Land is the property of proponent, land ownership documents are attached as **ANNXURE-C**.

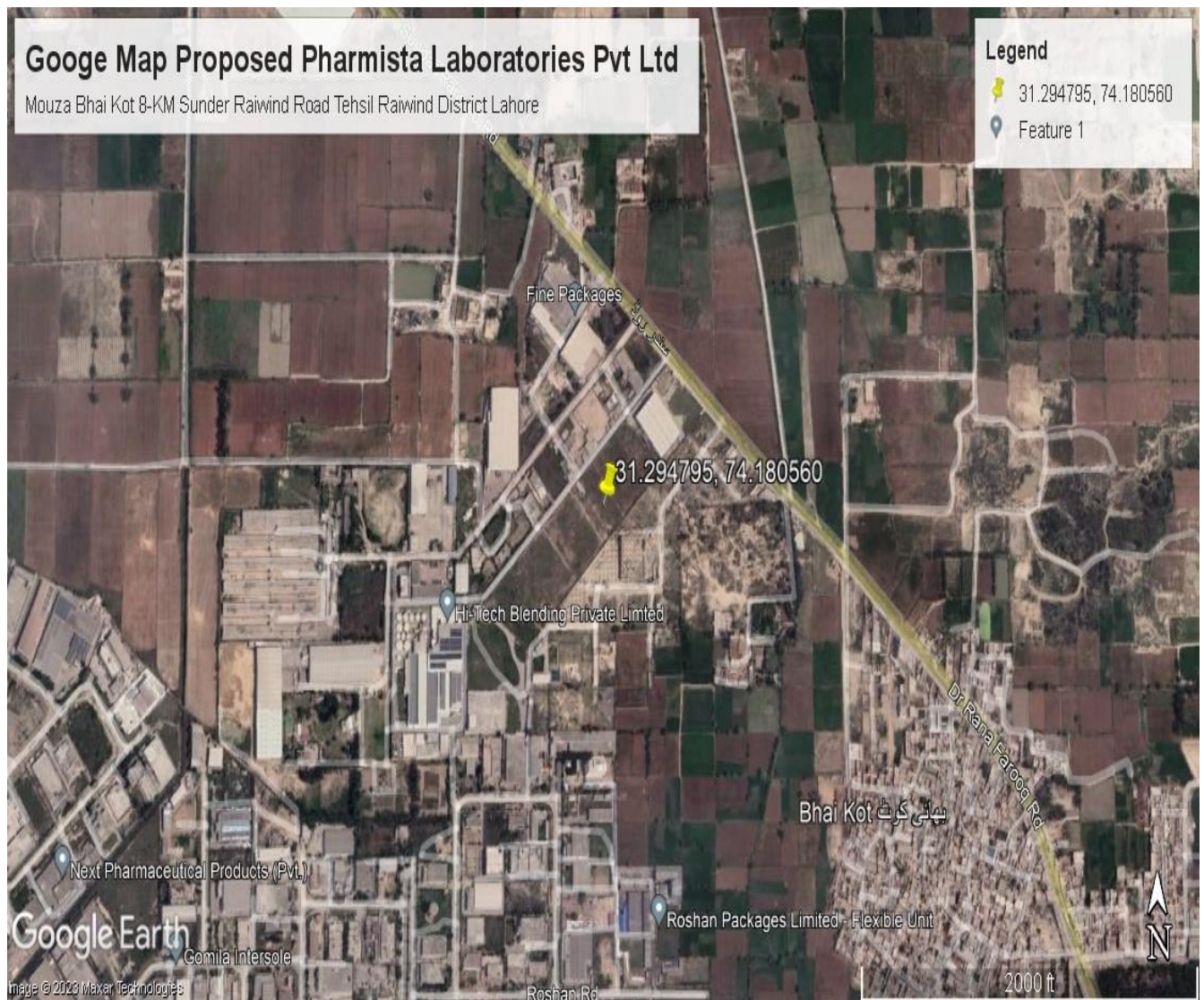
Obviously, environmentally sound, neat and clean environment are the other considerations for site selection. The project will also facilitate the people of the area with increasing the opportunity of employment, and other related facilities.

The site selected on the following reasons:

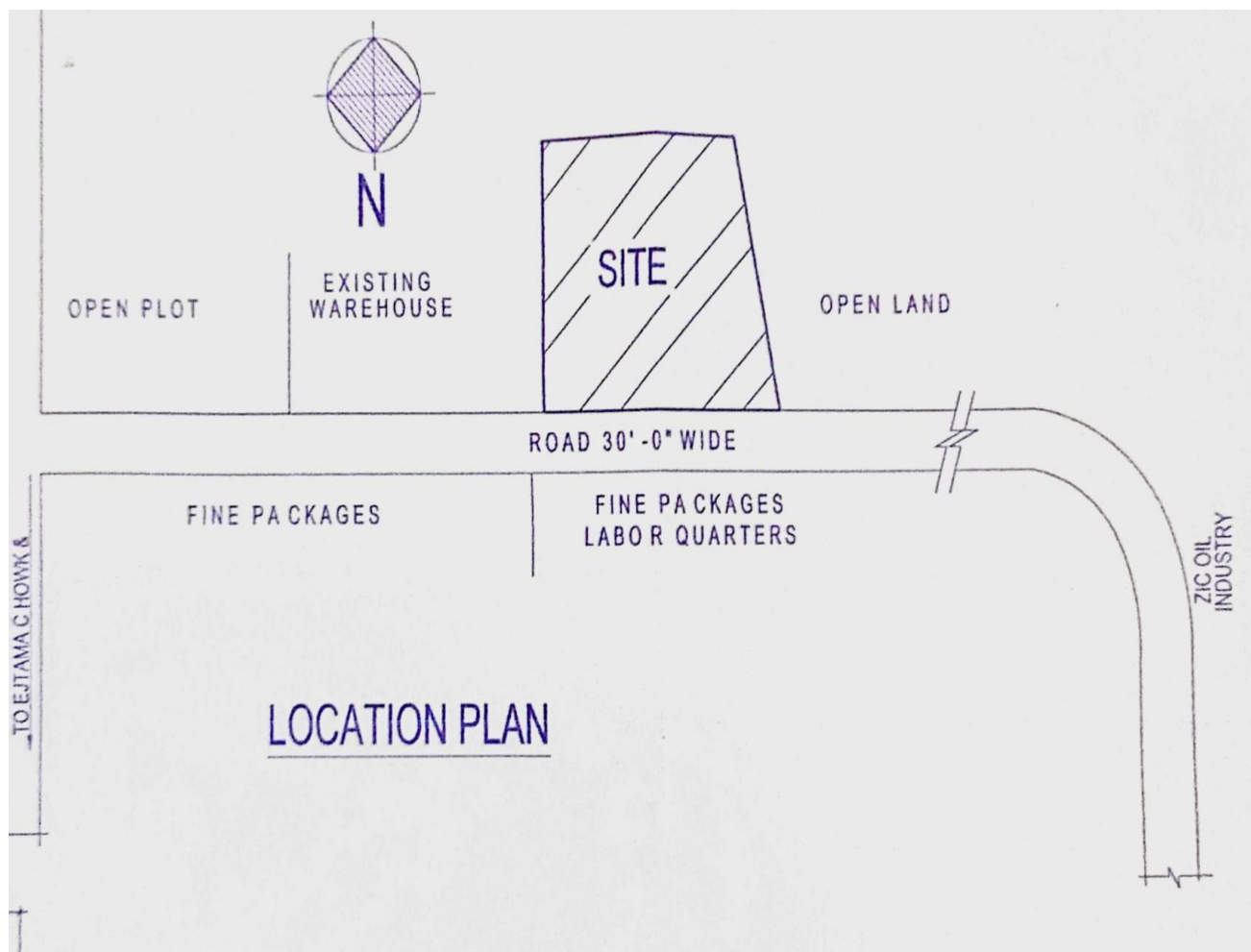
- The site is at industrial estate.
- Easy access to road
- Site is safe from any kind of flood
- Site is away from residential areas



- No issue regarding this project to all adjacent land owners



Google map of the project:



Project Site Plan:

2.4 Land Use & Vegetation Features On Site

The land is fall in industrial area. The land is free from any type of vegetation. Small grasses and weeds are present in small amount at the site and there is no need to clear any vegetation because they are out of vicinity of the project.

2.5 Road Access

Project site is located in access with, Sunder Raiwind Road Lahore present at the front of the site.

2.6 Cost & Magnitude of the Project

Total cost of the Said project is 400 Million. Cost includes the entire thing regarding this project. 200KG/day is the production capacity of the unit.

2.7 Schedule of Implementation

Detailed feasibility studies and designing of the project have been completed. Necessary legal, administrative and financial formalities have been also completed. The project is expected to be completed within 6-7 months from the date of environmental approval. Subsequently the operational and maintenance aspects of the project will be undertaken by the proponent.

Project Area Schedule:

SCHEDULE OF AREAS.				
TOTAL AREA OF PLOT. AS PER SITE	K 7	M 10	SFT 000	33750.00 SFT
OPEN AREA OF PLOT.				23954.00 SFT
S.NO	FLOORS			TOTAL
1-	BASEMENT COV: AREA			9796-SFT
2-	G.F COV: AREA			9796-SFT
3-	MEZZANINE.F COV: AREA			3283-SFT
4-	F.F COV: AREA			9796-SFT
	TOTAL COV: AREA			32671-SFT

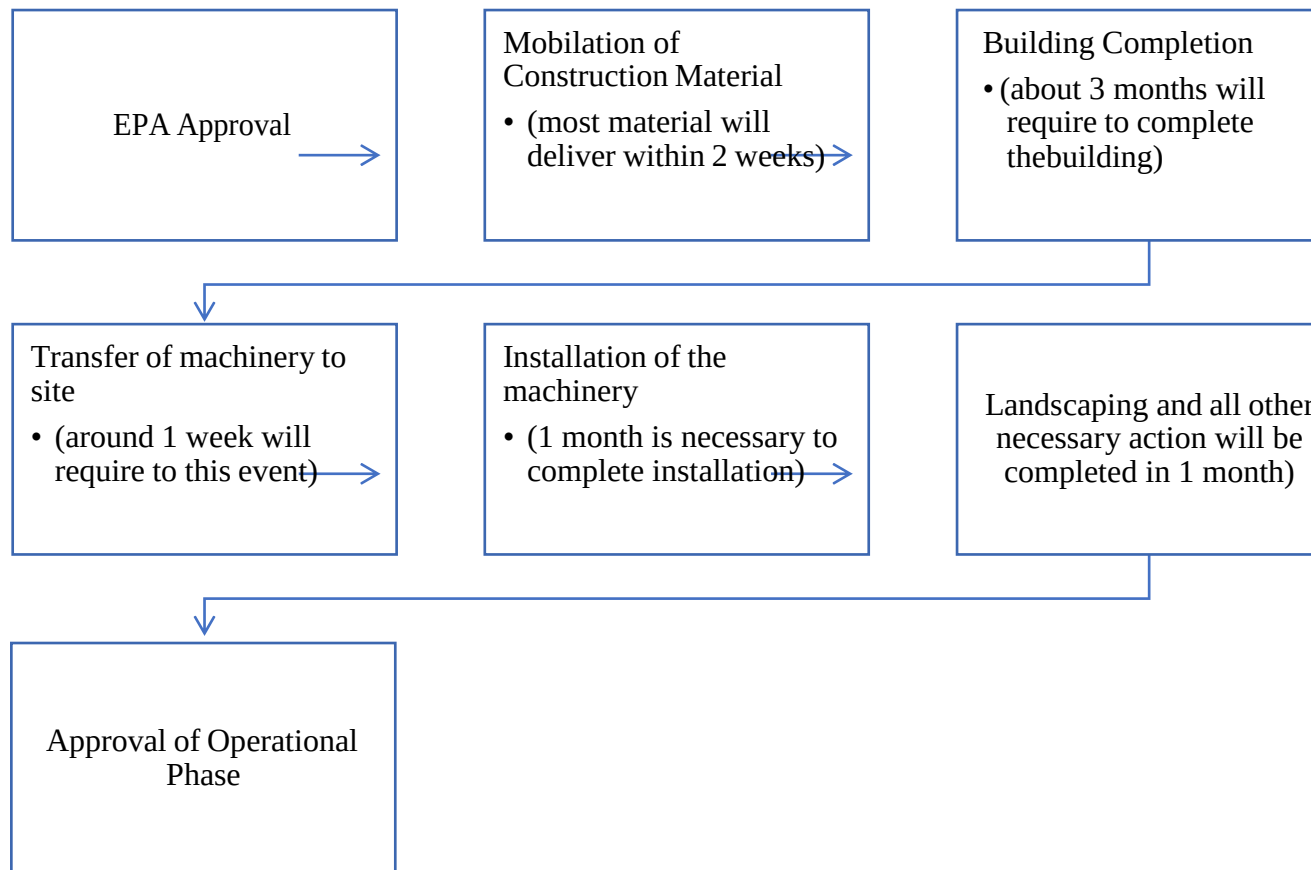


Figure 1: Schedule of implementation

2.8 Project Description

The Said project is the construction of Pharmaceutical unit under the name of M/S Pharmista Laboratories Pvt Ltd. The total area of the plot is 33750.00SFT. The total covered area of the Basement is 9796 SFT. The total covered area of the G.F is 9796 SFT. The total covered area of the F.F is 9796 SFT.

Project capacity

Capacity of the said unit is 200KG/day.

2.8.1 Raw Material

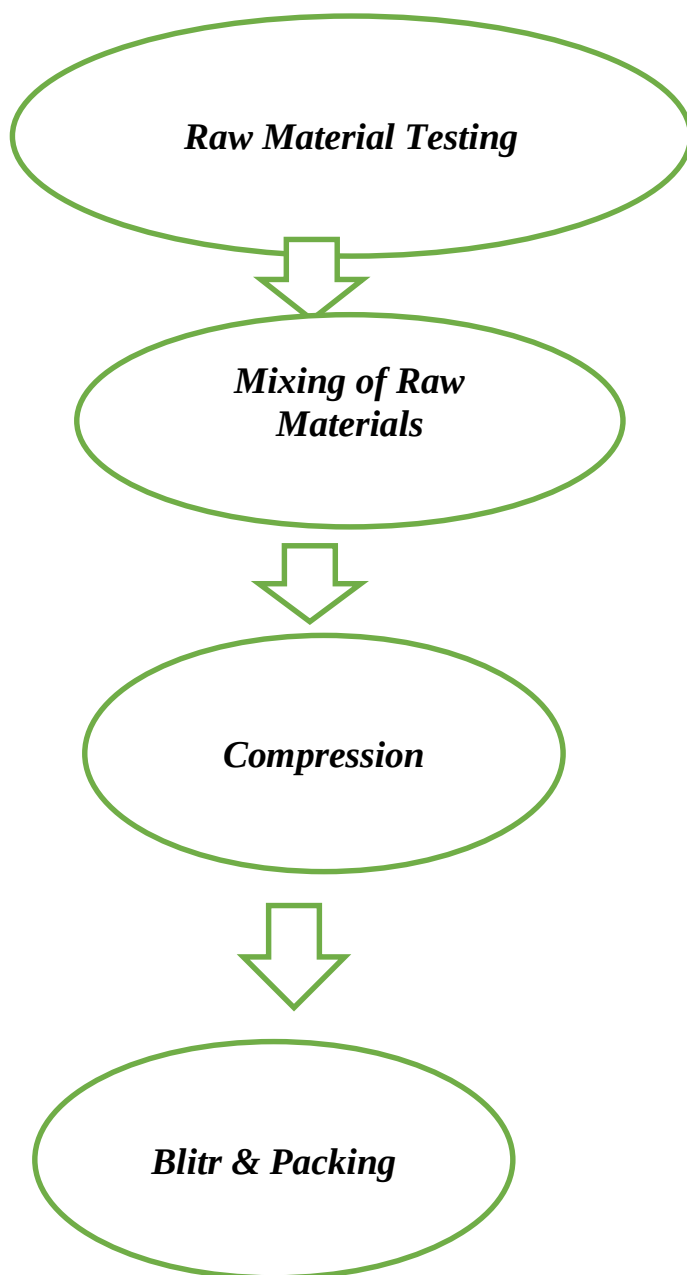
Penicillin Powder

Final Products Detail

Tablets ,Capsules, Dry Syrup & Injectable



PROJECT PROCESS FLOWCHART IS GIVEN BELOW:





2.8.2 Water Consumption & Wastewater Disposal

In constructional phase, 1000 l/day ground water will be used.

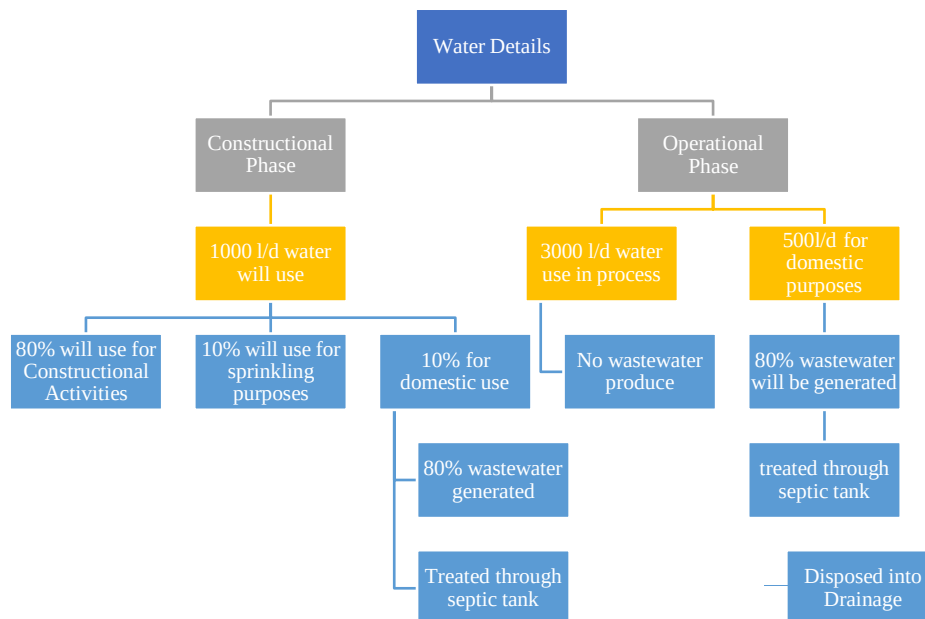


Figure 2: Water Detail

2.8.3 Solid Waste

;

In constructional phase all waste materials such as landscape and land clearing debris, gravel and aggregate products, concrete, masonry scrap and rubble (brick, concrete masonry, stone), and plastics and paper from cement bags will be recycled during the construction activities as road filling and maintenance purposes. Solid waste by domestic sources will be generated during construction phase which will be placed in separate bins.

In operational phase, according to an estimate, approx. 200 kg/day domestic and project related solid waste will be produced during the operation phase of the project.

The Solid waste will be managed in proper way by following operations:

1. Placement of separate waste bins for domestic and project related waste in all workinghalls and designated points.
2. Collection of waste from all the working halls at one designated point by the sanitaryworkers on daily basis.
3. Collection of waste from designated area and handling to the solid waste contractorsfor its final disposal.

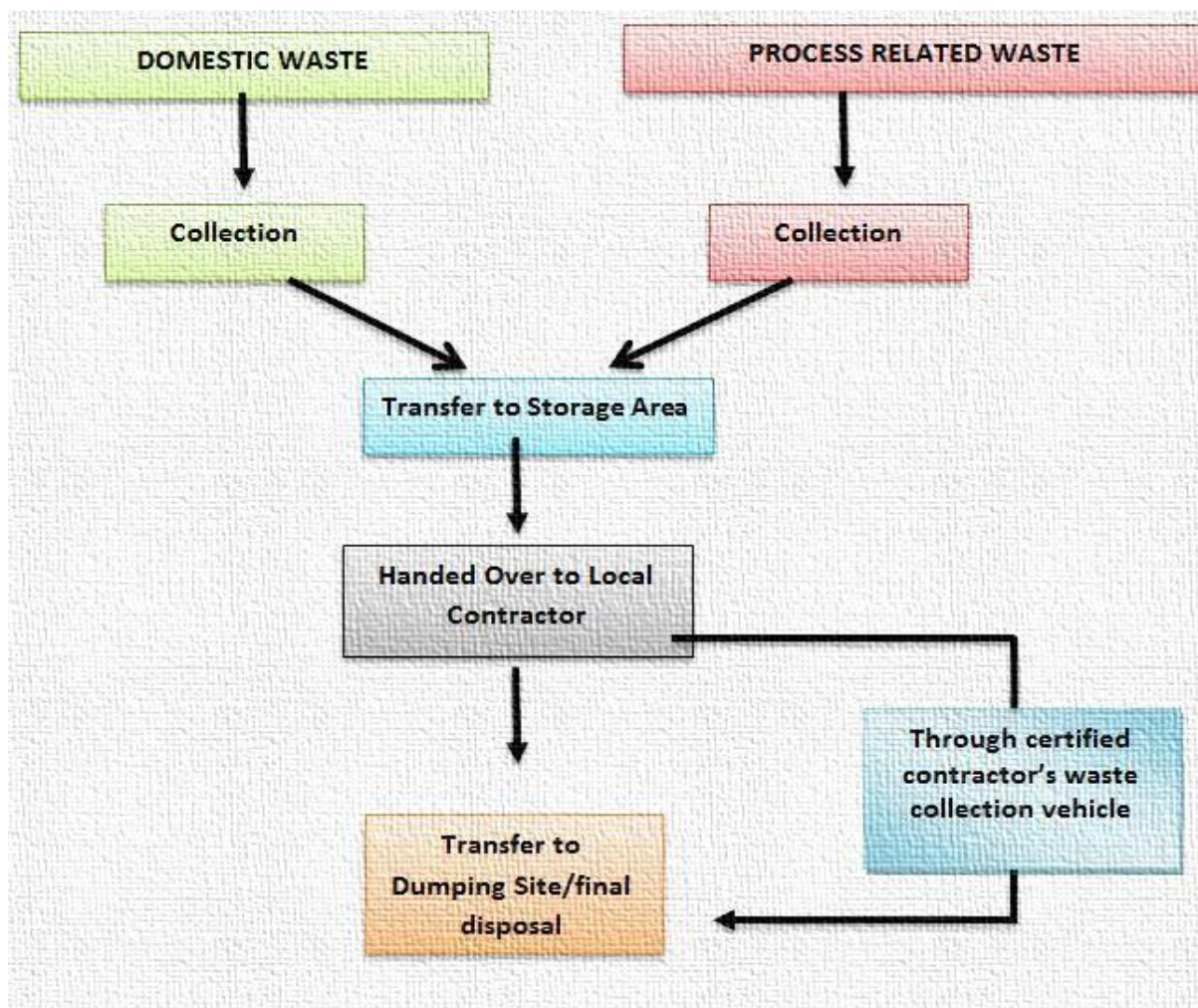


Figure 3: Solid Waste Detail

2.8.4 Health And Safety

A well maintained health and safety plan will be established. It will assure the contractor will maintain all the safety measures in construction. Mainly ear muffs and helmets will be provided at the time of operation. In operation no activity is involved because 98% system is automated. Beside this safety mats, shoes, gloves all will be part of the work's dress.

Table 2: Details of PPEs

Protection	Occupational Hazards	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.
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Eye and face protection	Flying particles, molten metal, liquid chemicals, gases or vapors, light radiation	Glasses, shield protective, etc.
Hearing protection	Noise, ultra sound	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

2.8.4.1 Safety Signs/Safety Boards:

At any workplace Safety signs and symbols are very important to avoid many accidents. They must be in easy and understandable language to all the workers. Workers should have the knowledge of sign wordings and they must be trained and aware about them. Safety signs, symbols and boards must be provided by every site to protect the workers and employees from the risks of hazards that has not been controlled by other means. Safety signs and boards give safety message and they must be of different colors that workers could understand their meanings easily. At the subject project, safety signs and boards will be placed to avoid the workers and staff from any risk. .

2.8.5 Plantation

Area for plantation will be reserved. Proper plantation will be done to control the suffocation and for the esthetic purpose.

2.8.6 Fire Protection System:

An addressable fire protection system with detection and alarm annunciation and other installations etc. will be provided to protect against any fire hazards in the Said project. Fire buckets and fire extinguishers will be installed at all sensitive places within the working area of Said project.

2.9 Restoration And Rehabilitation Plans:

All possible precautions will be taken to prevent an untoward incident in terms of life and property losses. On completion of the project, solid waste will be removed from the site in order to maintain aesthetics of the area. All measures will be undertaken for ensuring occupational safety, security and clean environment during the working hours. Vegetation and landscaping will be done by the proponent after the completion of project.

2.9.1 Details Of Restoration And Rehabilitation At The End Of The ProjectLife:

There will be no matter of rehabilitation as the proposed site is already owned by the project ~~ppmt~~ & located in designated industrial estate. At the end of the life of the project, it will be duly dismantled with special

precautions to avoid/ minimize pollution and at the same time taking all safety precautions to protect human life and property around the building.

Debris or any other wastes resulting from demolishing of the building will be disposed off in environmentally sustainable fashion. The materials capable of recycling/reuse will be either sold in the market or to be reused for other suitable purposes. While dismantling the building all Government rules and regulations are applicable to such activities will be strictly adhered to.

2.10 Government Approvals:

The proponent is very purposive about the approval from all local and government bodies but NOC from EPA is prerequisite for approval from all these bodies.



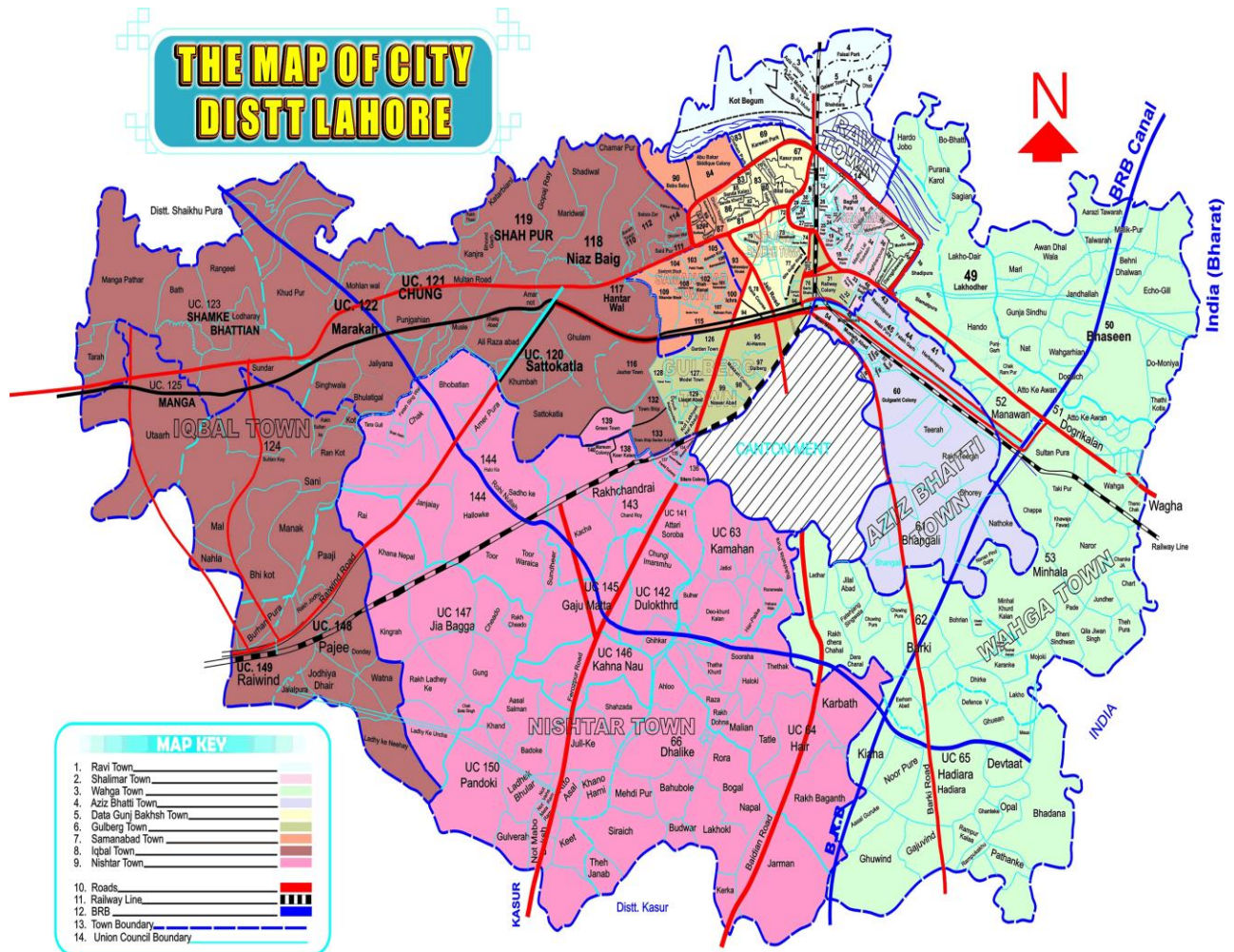
CHAPTER # 3**4****DISCRIPTION OF
ENVIRONMENTAL & SOCIAL
BASELINE CONDITONS****5.1 Baseline Conditions**

Baseline conditions refer to the existing physical, environmental and socio-economic status of the Project area. The baseline information and indigenous knowledge is required for scoping potential environmental issues associated with the implementation of the Project. On the basis of baseline information, the Project interventions are assessed and mitigation measures are proposed. The baseline information also helps to indicate the specific issues to be monitored during Operational phase of the Project. The baseline data (physical, biological and socio-economic parameters) related to the Project area is described below. Information provided is based on primary and secondary data collected by site visits and desk studies respectively.

5.2 Physical Environment
Topography

An account of different components of the physical environment of the area is given hereunder:





- Physical resources topography, soils, climate, surface water, ground water, geology;**

This chapter contains a brief description of the prevailing environmental state of the area. The main components of the environment include physical resources, ecological resources, cultural resources and socio-economic conditions of the area. A comprehensive detail of each is given below:

Topography

Lahore city is lying between $31^{\circ}15'$ — $31^{\circ}45'$ N and $74^{\circ}01'$ — $74^{\circ}39'$ E, Lahore is bounded on the north and west by the Sheikhupura District, on the east by Wagah, and on the south by Kasur District. The Ravi River flows on the northern side of Lahore. Lahore city covers a total land area of 1014 km² and is still growing. Lahore is generally flat and slopes towards south and south-west at an average gradient of 1:3000. It can be divided into two parts i.e. the low lying area along River Ravi and the comparatively upland area in the east away from Ravi. The low lands are generally inundated by the river water during monsoon floods. River Ravi flows in the west of Lahore District forming a

boundary with Sheikhpura District. The original physiographic features like channels remnants and levees have been destroyed or changed by the construction of urban infrastructure. Flood plains have been confined by construction of embankments (bunds) and spurs. Sub-recent flood plain is 4 to 8 meters higher than the recent flood plain and can be identified at number of places i.e. Shalimar Garden, Mughalpura and Multan Road. Lahore city is situated at an average elevation of 210 meters above mean sea level.

Soil

The soil is different in color and generally inclined to be dry. The alluvial complex consists principally of fine to medium sand, silt and clay. Beds of gravel or coarse sand are uncommon. However pebbles of siltstone or mudstone may be found embedded in silty or clayey sand in many places. Except for a few local lenses, few feet thick beds of hard compacted clay are rare in the area. However it is rich in potential plant nutrients. The soil is of alluvial type and deposited by Ravi River. Alluvium is soil or sediments deposited by a river or other running water. A river length. Where the river flow is fast, more particles are picked up than dropped. Where the river flow is slow, more particles are dropped than picked up. Areas where more particles are dropped are called alluvial or flood plains and the dropped particles are called alluvium.

Climate

Lahore features a five season semi-arid climate and the seasons are winter, summer, spring, autumn and monsoon. The hottest month of the year is June when temperatures routinely exceed 40 °C. The wettest month is July, with heavy rain falls and evening thunderstorms with the possibility of cloudbursts. The coolest month is January with dense fog.

A short description is given hereunder to present the climatic conditions of the area.

1. 2. 3. Mon th	4. Mean Temperature		5. 6. Precipi tation (mm)	7. Relati ve Humidity AT 0500 8. HRS (%)	9. Relati ve Humidity AT 2000 10. HRS (%)
	11. 12. Ma ximum	13. 14. Mi nimum			
15. Janu ary	16. 19. 8	17. 5. 9	18. 2 8.92	19. 8 0.4	20. 51. 9
21. Febr uary	22. 22. 0	23. 8. 9	24. 3 7.14	25. 7 9.0	26. 52. 4
27. Marc h	28. 27. 1	29. 14 .0	30. 3 4.3	31. 6 8.6	32. 42. 2

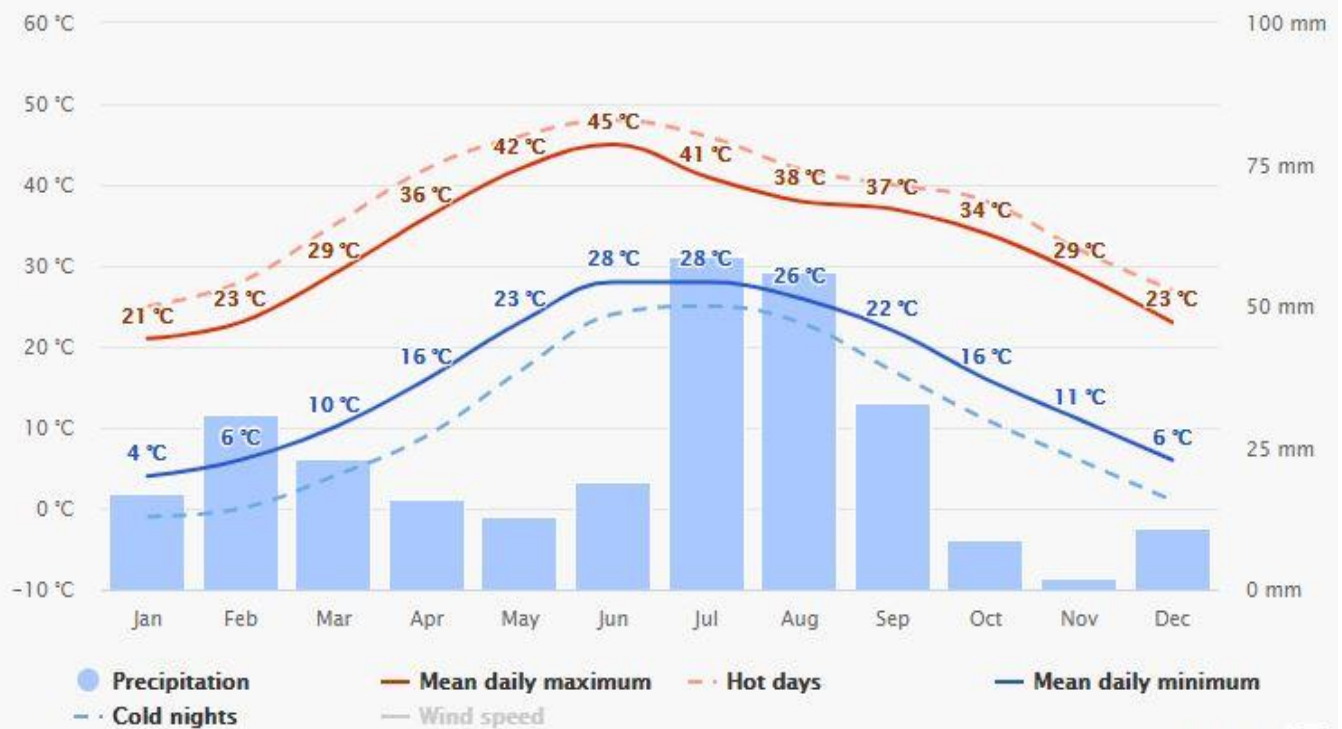


33. April	34. 33. 9	35. 19 .6	36. 4 4.32	37. 5 0.2	38. 25. 3
39. May	40. 38. 6	41. 23 .7	42. 2 4.38	43. 4 5.7	44. 27. 2
45. June	46. 40. 4	47. 27 .3	48. 9 1.62	49. 5 9.1	50. 40. 9
51. July	52. 36. 1	53. 26 .8	54. 1 50.5 2	55. 7 6.7	56. 60
57. Aug ust	58. 35. 0	59. 26 .4	60. 1 61.4 2	61. 7 8.8	62. 65. 9
63. Sept ember	64. 35. 0	65. 24 .4	66. 6 7.28	67. 7 4.4	68. 56. 4
69. Octo ber	70. 32. 9	71. 18 .2	72. 1 1.74	73. 7 0.6	74. 44. 2
75. Nov ember	76. 27. 4	77. 11 .6	78. 4 .44	79. 7 7.1	80. 48. 8
81. Dec ember	82. 21. 6	83. 6. 8	84. 9 .94	85. 8 2.9	86. 53. 73
87. Ann ual	88. 30. 8	89. 17 .8	90. 6 66	91. 70.34	92. 47. 4

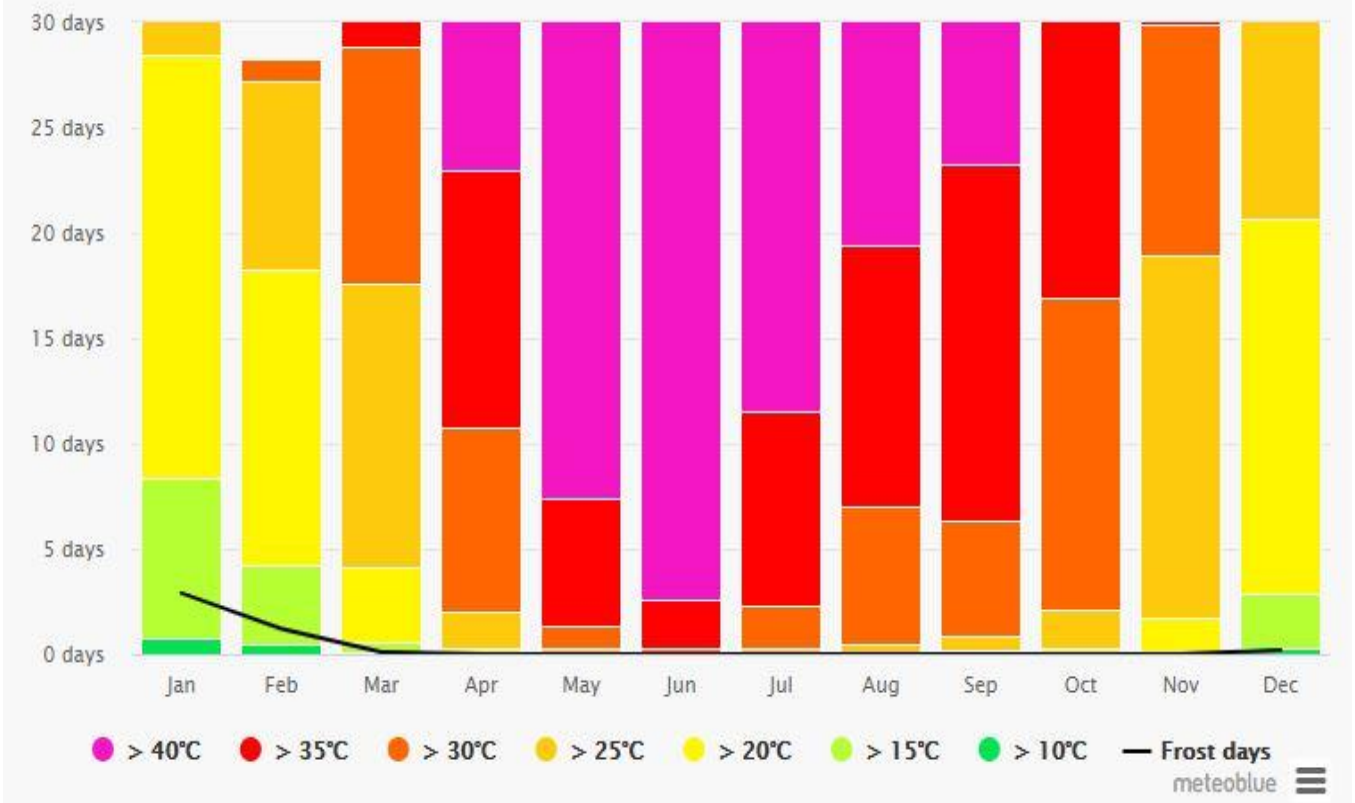
Temperature

The climate of the project area is hot in summer and cold in winter. May and June are the hottest months with maximum temperature reaching 40.4°C. January is the coldest month with minimum temperature falling to 5.9°C. The summer season starts towards the end of April and continues till September. The winter begins in November and lasts till February. The spring season exists during March and April and is pleasant.

Average temperatures and precipitation

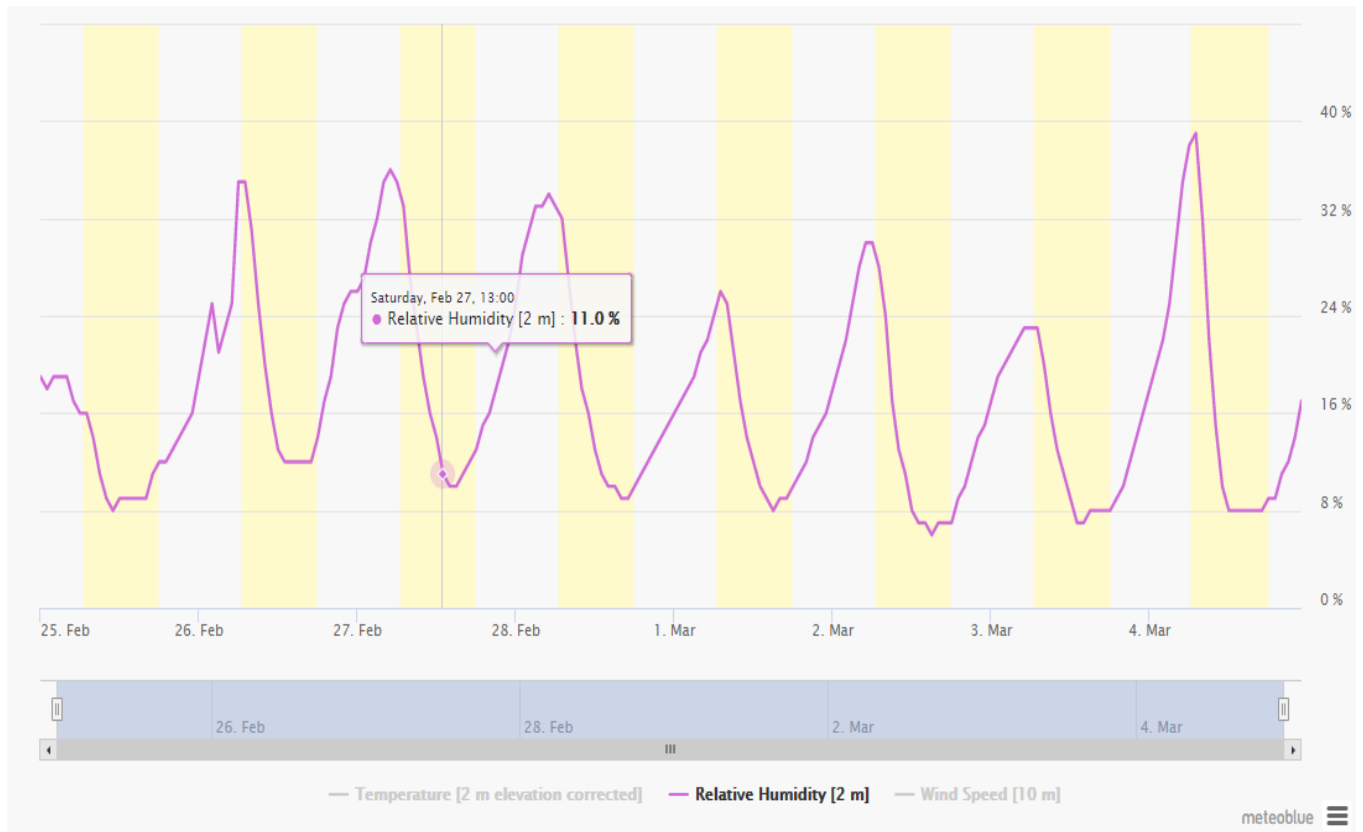


Maximum temperatures



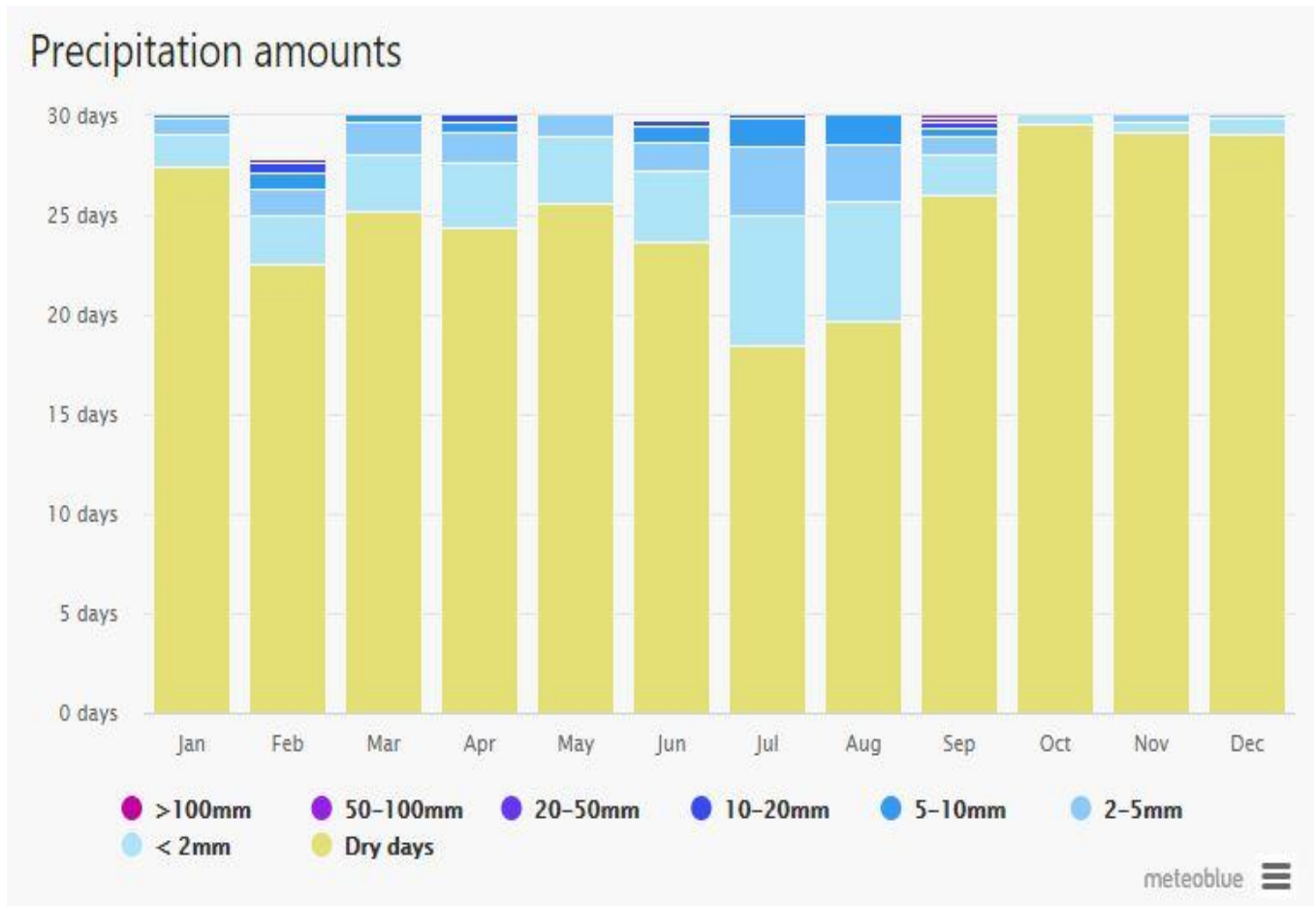
Humidity

Annually relative humidity for this area has been worked out as 70.34%. The maximum recorded humidity for the district is 82.9% in December while the minimum humidity is 45.7% in May.



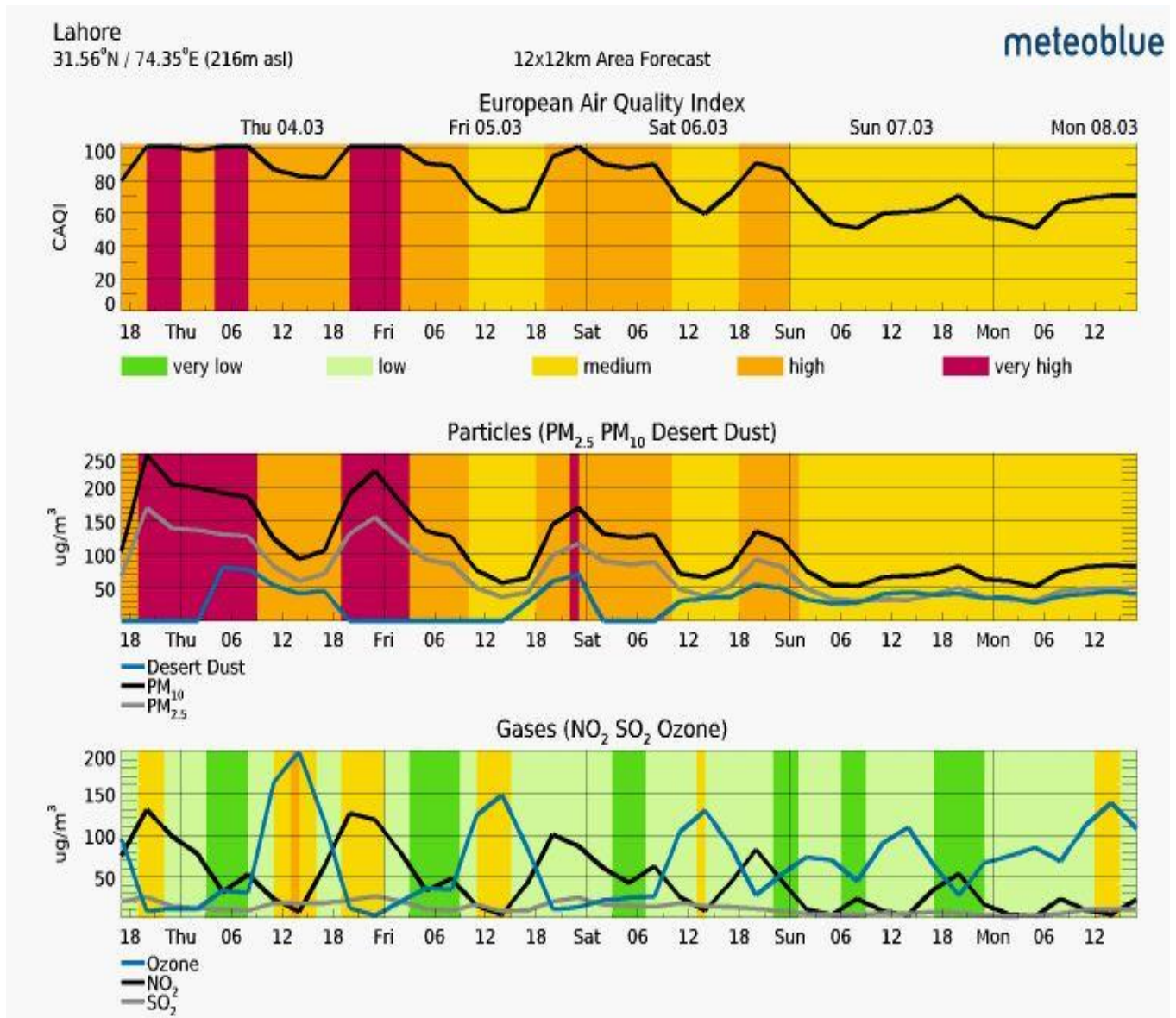
Precipitation

The average annual rainfall is 666 mm. Most of the rain occurs during monsoon in summer which often results in flooding of the nearby water drain and canal. The groundwater level is improved toward the end of the season in September and October.



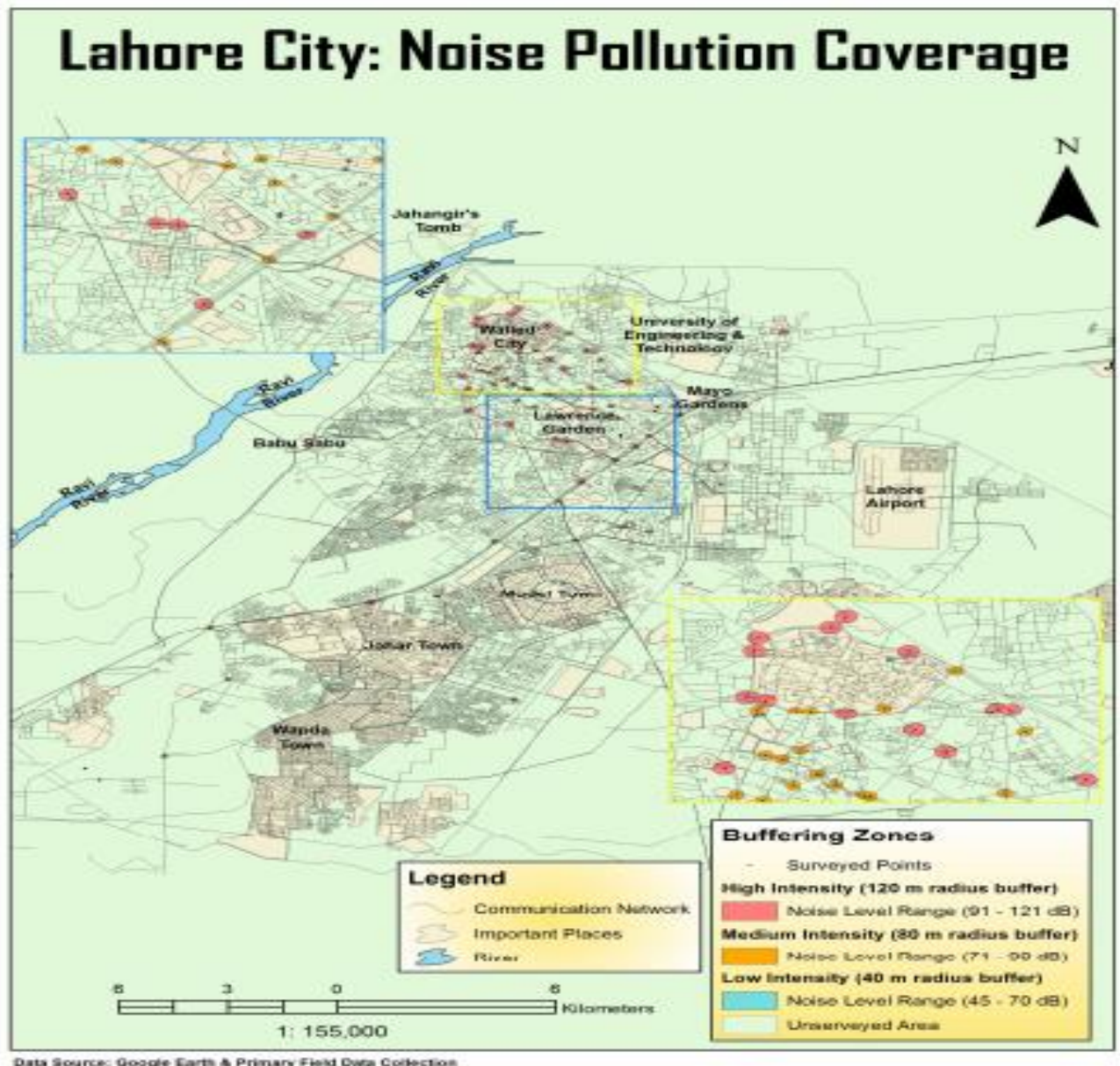
Ambient Air Quality

In the project area, Particulate Matter (SPM & PM₁₀) and Oxides of Nitrogen (NO_x), Sulphur Dioxide (SO₂) and Carbon Monoxide (CO) are the major air pollutants. Traffic on road is the main source of air pollutants including NO_x, SO₂, CO, PM, HCs, smoke, etc. Factories and industries are also contributing to the pollution in the district



Ambient Noise

A common form of noise pollution is from transportation, principally motor vehicles. Other sources are car alarms, office equipment, factory machinery, construction work, audio entertainment systems, loudspeaker etc.



Ground Water

The water table depth in the central part of the city has fallen below 130 feet (40 metres) approximately and is projected to drop below 230 feet (70 metres) in most areas by 2025. The total surface water diverted to Lahore is 6.02 million cubic metre per day (MCM/day) and is mainly used for agricultural purposes. The Bambawala-Ravi-Badian-Deplapur (BRBD) Canal mainly feeds the command area of Upper Bari Doab Canal on the Pakistan side of the Pak-India border. The Upper Bari Doab Canal irrigates command areas of Lahore Branch, Canal, Butcher Khana distributary, Main Branch Lower and other smaller channels. The remaining flow of the BRBD Canal supplements Depalpur Canal. The Lahore aquifer is broadly viewed as a single contiguous,

unconfined aquifer. Groundwater for drinking purposes is extracted from a depth of 120-200 meters (m). It is pumped for Lahore's domestic, industrial and commercial purposes. In order to deal with the vagaries of surface water supplies, more than 10,000 tube wells have been installed for agricultural purposes. The average annual rainfall of Lahore is 715 mm. However, its recharge to groundwater in urban areas is minimal due to urbanization. In general, groundwater discharge is higher than recharge, which is the main reason for the rapid depletion of groundwater in the city.

Geology

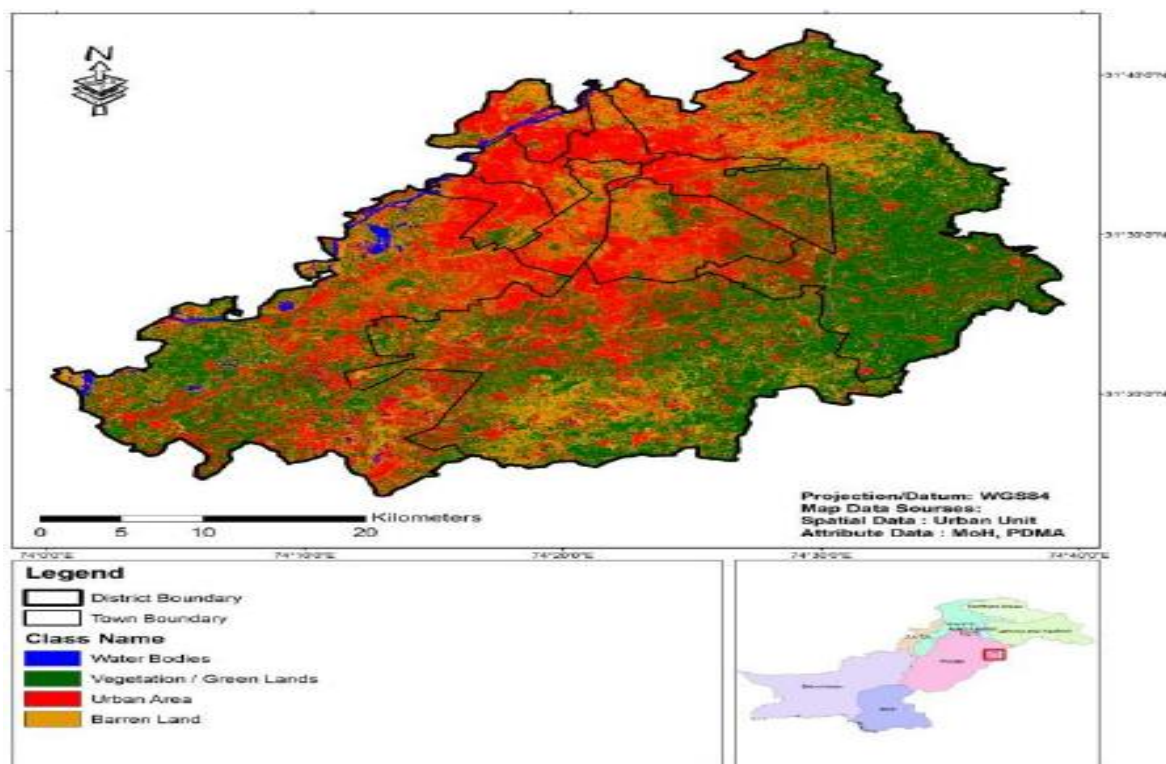
Lahore city is situated at an average elevation of 210 meters above mean sea level. Lahore city lies on the alluvial plain called Bari Doab. Doab is a local word for area between rivers. Bari Doab is a part of the Indo-Gangatic alluvial plain formed by the Indus River and its tributaries. It is bounded by Ravi and Chanab rivers in the northwest and west and by Sutlej River in the southeast. North eastern boundaries of Doab lie near the foothills of the Himalayan Ranges. The Bari Doab is covered by Quaternary alluvium which overlies semi-consolidated Tertiary rocks or Metamorphic and igneous rocks of Precambrian age. Except for a small area in the northeastern part of Doab where basement rock was encountered no information is available at present regarding the distribution of Tertiary and Precambrian rocks in the Doab. Probabilistic seismic hazard assessment recently carried out for Lahore area as part of the revision of Seismic Provisions of the Building Code of Pakistan shows that the Project area falls in Zone 2A.

Land Use

Limited and its surrounding area fall in industrial area. The growth and spread of the city is seen towards south-west direction. The reason is that the availability of well-constructed and connected roads provides means to residents for having residences far away from the main city center. This condition will have adverse repercussions in the area because of the allied difficulties connected to the urban sprawling, environmental issues, and transportation problems, lack of civic amenities, crime and associated social issues.

Land Use Map Lahore:





1. Ecological Environment

A detail of ecological account of the Project and Study Area is given below:

Flora

The area in which the project site is located was once covered with native vegetation, mostly consisting of trees like Kikar (*Acacia nilotica*) and Shisham (*Dalbergia sissoo*). With the onslaught of civilization and industrialization, this vegetation was cleared for agricultural, commercial or industrial land use purposes. The current ecological details of the area in general and study area in particular are given below:

Trees

A field study related to the identification of tree species in the study area was also conducted. A vast majority of trees were observed in the localities visited as well as open fields. These are Tali/Sheeshum (*Dalbergia sissoo*), Kikar (*Acacia nilotica*), Safeda (*Eucalyptus cinerea*), Neem (*Azadirachta indica*), Papaya (*Carica papaya*), Bottle Brush (*Callistemon citrinus*) and Borh (*Ficus bengalensis*).

A tabular comparison is given hereunder to explicit frequency of each species in three zones of study area:



List of Trees Identified in the Project Area

Serial Number	Common Name	ScientificName
1	Tali/Sheshum	Dalbergia sissoo
2	Kikar	Acacianilotica
3	Safeda	Eucalyptus cinerea
4	Neem	Azadirachta indica
5	Piple	Ficus religiosa
6	Papaya	Caricapapaya
7	Shree	Acaciagreggii

Grasses

A number of grass species were identified. These are Crow Foot Grass (*Dactyloctenium aegyptium*), Dabri Grass (*Dichanthium annulatum*) and Indian Dab (*Cynadone dactylone*).

Grasses in Study Area

Different types of grass species were also identified outside the project site during our visits to the nearer localities, these species include Dabri Grass (*Dichanthium annulatum*), Lesser Bulrush (*Typha angustifolia*) and Indian Dab (*Cynadone dactylone*).

Frequency (of occurrence) of these species in different zones of the study area is as under:

List of Grasses Identified in the Project Area

Common Name	ScientificName
IndianDab	Cynadonedactylone

Dabri Grass	Dichanthium annulatum
Lesser Bulrush	Typha angustifolia

Herbs and Shrubs

A large number of herbs and shrubs species were identified in the area. Among these species, the most dominant were Jangli Booti (*Parthenium hysterophorus*), Bathu (*Chenopodium album*) and Ak (*Calotropis procera*). Frequency of these species in different zones of the study area is as under:

List of Herbs and Shrubs Identified in and Around the Project Area

Common Name	Scientific Name
Jangli Buti	<i>Parthenium hysterophorus</i>
Puth canda	<i>Achyranthes aspera</i>
Bathu	<i>Chenopodium album</i>
Ak	<i>Calotropis Procera</i>
Bhang	<i>Canibus sativa</i>

Medicinal Plants

Medicinal Plants within project site

A number of medicinal plants in the area were identified which are AK (*Calotropis procera*), Amaltas (*Cassia fistula*), Pilak, Jangli kashni and Itsit (*Boerhavia diffusa*).

List of Medicinal Plants Identified in the Project Area

Sr #	Study Area
------	------------



	Common Name	ScientificName
	AK	Calotropis procera
	Amaltas	Cassia fistula
	Itesit	Boerhavia diffusa
	Ajwain	Hyoscyamus niger

Ornamental Plants

Ornamental Plants Project Site

During our ecological survey to the nearby localities, a number of ornamental plants were identified at some houses and Deras, which are listed in table below.

List of Ornamental Plants Identified in and Around the Project Area

S r #	StudyArea	
	Common Name	ScientificName
1	Bottle Brush	Callistemone citrinus
2	Araucaria	Araucariaheterophylla
3	Bougainvillea	Bougainvilleaspectabilis
4	Milkwood pine	Alostonia scholaris

Vegetables

Vegetables in around and Project Site



No vegetables are grown in or around project site.

Vegetables in Study Area

Some important of these are Phool Gobhi/cauliflower (Brassica oleracea Ver. botrytis), Band Gobhi (Brassica oleracea Ver. capitata) Turnip, Raddish (Raphanus sativus), Carrot (Daucus carota), Bhindi, Tomato (Lycopersicum esculentum), Vegetable Marrow (Cucurbita pepo), Baingan, etc.

List of vegetables Identified in and Around the Project Area

Sr #	StudyArea	
	Common Name	Scientific
1	Bangun	Solanum melongena
2	Bhendi	Abelmoschus esculentus
3	Karela	Momordica charantia
4	Phool Gobhi	BrassicaoleraceaVer. Botrytis
5	Raddish	Raphanus sativus
6	Tomato	Lycopersicum esculentum
7	Marrow	Cucurbitapepo

Agriculture

The soil of the area is quite suitable for all kinds of vegetation including fodder, orchards, vegetables and other seasonal crops. The pattern mainly consists of wheat-rice system, while other agriculture practices include the cultivation of sugarcane, Maize, etc.

Farm Traction Power

Tractor is the sole source of farm traction power. No farmer was found using animal traction power. There was significant variation in tractor ownership across farm size groups. However, more than half of the farmers owned tractor while rest were hiring the services for land preparation.



Irrigation

The tube-wells and canal water are the main source of irrigation water for wheat, rice and other crops and fodder. Also, many farmers irrigate their fields with contaminated water of drain and also many studies have been conducted to assess the level of toxic heavy metals in the soil and vegetables irrigated by drain water and their ultimate impacts on human health. It has been highly recommended during these studies not to use the contaminated water of drains for agricultural practices. On the other hand plenty of ground water is easily accessible for agriculture use.

Fauna

The area provides healthy environment for the growth and reproduction of a diverse nature of fauna. A short description is given in the following paragraphs

Mammals

Mammals within project site

During our survey to the project site, some mammals were identified evidently while some were reported by the workers like Cats (Felis catus), Rats (Rattus rattus) and Squirrel (Sciurus carolinensis).

Mammals in Study Area

The wild and common or domesticated mammals found in the study area are Dogs (Canis familiaris), Cats, House Rats (Rattus rattus), Bats, Horses (Equus caballus), Donkeys (Equus africanus asinus), Mules, Buffaloes, Cows (Bos indicus), Goats (Capra hircus) and Sheep.

List of Mammals Present in and Around the Project Area

Project Site		Study Area	
Common Name	Scientific Name	Common Name	Scientific Name
Cat	Felis catus	Cats	Felis catus
Rat	Rattus rattus	Dogs	Canis familiaris



Squirrel	Sciurus carolinensis	Cows	Heracleum lanatum
		Goats	Copra hircus
		Horses	Equus caballus
		Donkeys	Equus africanus
		Sheep	

Reptiles

Reptiles within Project Site

No reptiles were identified within the project site

Reptiles in Study Area

Above reptiles were also seen in study area in localities and field. The most common reptiles include Snakes, Pakistani Cobra (Naja naja karachiensis), Lizards, Varanis (Goh/large lizard), Spiders and Scorpions, etc.

List of Reptiles Present in and Around the Project Area

Common Name	ScientificName
Lizards	
Spiders	
Scorpions	
Pakistani cobra	Naja naja karachiensis
Goh/large lizard	Varanis

Amphibians

A number of Amphibians found in the tract include Common Frog (Rana tigrina), Common Toad (Bufo bufo) and Tortoise (Chitra indica).

List of Amphibians Present in and Around the Project Area

Project Site	StudyArea



Common Name	ScientificName	Common Name	ScientificName
Common Frog	Ranatigrina	Common Frog	Ranatigrina
Common Toad	Bufo bufo	Common Toad	Bufo bufo
		Tortoise	Chitraindica

Birds

Different types of birds' species were identified within the project site. The bird's species identified in these areas include House Sparrow (*Passer domesticus*), House Crow (*Corvus splendens*), Common Mynah (*Acredotheres tristis*), Tatiri (*Vanellus indicus*), Cheel, Bagle, Bulbul (*Pycnon tus cafer*), Parrots (*Psittacula krameri*), Pigeons (*Columbia livia*), Dove (*Stigmatopelia senegalensis*), Surkhab, Ullu, etc. are also seen in the area.

List of Birds Present in and Around the Project Area

S r #	Project Site		StudyArea	
	Common Name	ScientificName	Common Name	ScientificName
1	House Sparrow	Passerdomesti cus	Parrots	Psittacula krameri
2	HouseCro	Corvus	HouseSparro	Passerdomestic
3	Common Mynah	Acredotheres Tristis	HouseCrow	Corvus splendens
4	Tatiri	Vanellus indicus	Common Mynah	Acredotheres tristis
5	Pigeons	Columbia livia	Tatiri	Vanellus indicus



6			Pigeons	Columbia livia
7			Dove	Stigmatopelia Senegalensis
8			Bulbul	Pycnon tus
9			Cheel	

Wildlife Sanctuaries and Game Reservoirs

The Safari Zoo Park & Wildlife Park Lahore is present in the Lahore for the conservation of endangered species. However, no wild life sanctuary or game reservoir is located in the vicinity of the project area or in the project influenced area.

Rare or Endangered Species

There are no rare or endangered species in the study area.

3. Socioeconomic Environment

Human settlements are symbol of typical haphazard rural growth based on ill planned developmental procedures showing common indicators of all the unorganized procedure of rural settlement of the province. These localities were developed on need oriented basis. No bye-laws, rules and obligations necessary for human settlement, construction or expansion and infrastructure development were considered. These localities are also the picture of stereotype rural residential areas which lack basic amenities, improper roads, and poor drainage system, deteriorating hygienic and sanitary conditions causing bad effects on human health.

Objectives of the Study

The main objectives of socio- economic study of the project area were:

- To furnish appropriate information about the baseline socio-economic conditions
- To identify and assess significant social impacts of the Project activities on the surrounding area and people
- To propose suitable means for probable mitigation of the significant adverse social impacts

An Overview of Socio-economic Conditions

This section describes the status of overall socio-economic baseline conditions prevailing in the study area. It deals with various socio-economic and cultural aspects of the community including



income, employment, professions, basic facilities, education and health, social structure, culture, women's status, traditions, ethnics, sectarian status and residential needs of the local people.

Area represents lacking some basic amenities of an urban area. Improper social structure, deprived status of youth and aged are common social factors in the area.

Analysis of Socio-economic Conditions

This section presents a locality-wise analysis of existing status of various socioeconomic parameters such as income, employment, basic facilities, education, health, recreation, migration, conflicts, ethnic status, role of women, professions, residential conditions, etc.

A) Sources of Income

The economy of Lahore has a diversified base spanning from telecommunication, information technology, manufacturing industry, engineering, pharmaceuticals, steel, chemicals and construction material. As a major urban center, the economy of Lahore has relatively prospered. Lahore is hailed as the industrial belt of Pakistan and is home to the largest IT Park in Pakistan. It is the country's second largest economic hub and the commercial capital of Punjab. In 2008, the city was ranked with high efficiency to be classified as a gamma world city. Majority of the people are working as labors in industries, and many do their own common business (shopkeepers).

B) Basic Facilities

Basic facilities like electricity, roads, transport etc. are present in almost every area of the Lahore but are disorganized and mismanaged. Civic amenities like markets are not available in some of the slum areas.

C) Educational Facilities

Educational facilities up to master level are available in almost all the localities and are easily approachable. Lahore is Pakistan's largest producer of professionals in the fields of science, technology, IT, engineering, medicine, nuclear sciences, pharmacology, telecommunication, biotechnology and microelectronics. Most of the reputable universities are public, but in recent years there has also been an upsurge in the number of private universities. The current literacy rate of Lahore is 64%.

The system is divided into five levels: primary (grades one through five); middle (grades six through eight); high (grades nine and ten, leading to the Secondary School Certificate); intermediate (grades eleven and twelve, leading to a Higher Secondary School Certificate); and university programs leading to graduate and advanced degrees.



D) Medical Facilities

The proper health care facilities are present in the area for both male and female population.

E) Recreational Facilities

Lahore is the hub of cultural & religious recreational places. Many famous recreational places such as Badshahi Mosque, Shahi Qila, Tomb of Jahangir, Shalimar Garden, Minar-e-Pakistan, Lahore Zoo, Lahore Museum, Safari Park, Jallo Park, etc. are present for recreational activities. Urs and Melas are playing a vital role to provide some recreational opportunities to the locals. Religious, ethnic, political and tribal conflicts do not exist among the people of the study area.

G) Types of Community

The main religion in Lahore is Muslim – mostly Sunni or Shia- which makes up 94% of the population. The remaining 6% are nearly all Christians. There are also a small number of minority religions such as Sikh and Hindu. The Lahoris are a cultural bunch of people celebrating many festivals around in the year – some religious, some historical and some are combinations of ancient and modern- even western – celebrations.

H) Types of Family

The joint/extended family system is generally prevailing among people of the whole area; however, nuclear family system is also observable in the area.

I) Ethnic Status

The main castes and groups of the Lahore district are Arain, Jat, Rajput, Malik, Pathan, Mughal, Sheikh, Kombh and Gujjar. Besides, there are also village artisans, which include Lohars (blacksmiths), Tarkhan (carpenter), Kumhars (potters), Mochis (cobblers), Machhis (water-carries), barbers and weavers etc.

J) Status of Women Literacy

A vast majority of the females of the Study Area are illiterate which shows very low educational trend among females; however, young females have high literacy rate showing positive trend in female education.

K) Decision Making Authority

Majority of the females have no authority in decision-making process regarding their life. This shows non-participation of the females in decision-making process regarding the females and other issues.



L) Role of Women

Role of female is conventional and traditional. Most of the females are engaged in housekeeping. However, females also perform outdoor activities and duties. Females are supposed to be responsible to perform all the family activities and are involved in all types of family functions.

4.5.3 Quality of Life Values

If we specifically about the project area then majority of the people has to adopt seasonal occupation to supplement their income due to low-income level and inconsistent income opportunities. Majority of the people were working as labors, farmers and many do their own common business (shopkeepers). A fair number of people work as laborers in the nearby cities. The locals of this are provided with basic facilities like electricity, roads, transport etc. but are disorganized and mismanaged. If we talk about educational facilities then education up to primary level are available in almost all the localities and are easily approachable. The proper health care facilities are not present in the area for both male and female population. Open and level fields of the localities are used as playgrounds by the youth. Urs and Melas are playing a vital role to provide some recreational opportunities to the locals.

It was observed that being the members of a typical/traditional blend of rural and urban community, almost all the old people are very conservative in their life style. People practice their traditional, social and cultural values strictly in all walks of life. The joint/extended family system is generally prevailing among people of the whole area; however, nuclear family system is also observable in the area.

Suitability of Site:

Comprising all assessment of above baseline data there will be no significant ecological/ environmental impact expected in and around the present selected project site, hence it is suitable for the proposed project.

CHAPTER # 6



5 POTENTIAL ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

The following chapter describes the overall possible impacts of project on the physical, biological and socioeconomic environment because of operation phases and mitigation measures to minimize the significance of the possible impacts up to an acceptable level. The anticipated impacts related to location, design, construction and operation of the Said project have been assessed and mitigation measures have been suggested in this report.

Impacts are assessed by analyzing their magnitude and sensitivity. The sensitivity and magnitude of the impact are described with reference to legal requirements, accepted scientific standards or accepted impact assessment practice, and/or social acceptability; where possible.

But where no known published ‘standard’ criteria exists for determining the magnitude of effects, established professional criteria and best practice techniques are used.

6.1 Methodology For Impact Evaluation:

The methodology adopted for impact evaluation includes the Modified Leopold Matrix.

6.1.1 Leopold Matrix

The analysis is performed with the Leopold Matrix (LM). This matrix has:

- 1) On the horizontal axis, the actions which cause environmental impact, and
- 2) On the vertical axis, the existing environmental conditions which may be affected by those actions.

This provides a format for comprehensive review of the interactions between proposed actions and environmental factors.

The most important blocks marked are evaluated individually, and a number between 1 and 10 is placed in the upper left-hand corner to indicate the relative magnitude of the impact (1 represents the least magnitude, and 10 the greatest). Likewise, a number between 1 and 10 is placed in the lower right-hand corner to indicate the relative importance of the impact (again, 1 represents the least magnitude and 10 the greatest).

Table 5: Scale Table of Importance & Magnitude

Sr. No.	Type of Impact	Scale of Magnitude (0 – 10)	Scale of Importance (0 – 10)
1	No Impact	0	0
2	Low Impact	1 – 4	1 – 4
3	Medium Impact	5 – 6	5 – 6
4	High Impact	7 – 10	7 – 10

For the evaluation of this project, each action checked was evaluated in terms of magnitude of effect on environment characteristics and conditions [on the vertical axis]. From upper right to lower left across each block where significant interaction is expected slash \ was placed diagonally. The most important blocks marked are evaluated individually, and a number between 0 to 10 is placed in the upper left-hand corner to indicate the relative magnitude of the impact 1 is the best magnitude, and 10 the greatest magnitude. In the same way, a number between 0 and 10 in the lower right-hand corner to indicate the relative importance of the impact again, 0 is the magnitude, and 10 the greatest.

The next step is to evaluate the numbers which have been in the slashed boxes. The high or low numbers on any one box indicates the degree of impact of the appropriate action on the given characteristic of the environment. The assignment of magnitude and importance numbers is based, to the extent possible, on factual data rather than on the evaluator's preference.

For the rating design regarding the probable impacts requires the evaluator to quantify his/her judgment. The rating scheme\ scheme allows the reviewers to thoroughly follow the evaluator's line of reasoning, to aid in identifying points of agreement and disagreement. In fact, matrix is the abstract for the text of the environmental impact assessment.

Table 6: Leopold Matrix

Construction Phase															
Magnitude Importance			Actions											Total Score of Impact	Average Score of Impact
			Transportation of raw material	Construction Activities	Operation of generators	Water consumption	Wastewater generation	Storage of raw materials	Social activities	Public welfare	Economic activities	Employment	Infrastructure improvement		
PHYSICAL	Soil	Soil Quality	2 1	3 2	0 0	1 1	5 2	4 4	1 1	0 1	1 1	1 3	4 6	22 22	2 2
		Erosion	2 1	6 6	0 0	0 0	2 2	1 1	2 1	0 0	1 1	1 1	3 4	18 17	1.6 1.5
		Geomorphology	0 0	5 5	0 0	4 2	5 3	2 1	0 0	0 0	1 1	2 1	4 6	23 19	2.09 1.7
	Water	Surface Water	0 0	0 0	0 0	6 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	6 0	0.5 0
		Subsurface Water	1 2	1 1	0 0	7 8	5 7	1 1	0 0	0 0	1 1	0 0	2 2	18 22	1.6 2
	Air	Air Quality	2 1	6 6	0 0	0 0	2 2	1 1	2 1	0 0	1 1	1 1	3 4	18 17	1.6 1.5

		Odors	1 1	1 1	3 3	0 0	5 7	4 6	1 1	0 1	0 1	1 1	1 1	17 23	1.5 2.0
		Noise	5 6	9 10	7 8	0 0	5 4	2 2	5 0	0 1	5 6	4 6	4 6	46 55	4.1 5
BIOLOGICAL	Fauna & Flora	Crops	2 2	5 6	3 2	0 0	4 6	2 2	2 3	4 3	5 7	3 3	3 3	33 37	3 3.3
		Birds	2 2	7 7	5 5	2 1	4 4	1 1	5 4	0 0	5 5	3 4	4 4	34 37	3.4 3.3
		Mammals	5 4	6 7	2 2	2 1	4 3	2 1	3 3	0 0	4 3	3 4	3 3	34 31	3.3 2.8
SOCIO-ECONOMIC	Social	Industrial	5 6	7 7	5 5	4 6	6 7	4 5	6 6	5 6	8 8	9 9	7 7	66 72	6 6.5
		Recreational Use	2 3	3 4	2 3	3 3	3 3	1 1	3 4	4 5	4 5	2 1	4 3	31 35	2.8 3.1
		Historical / Cultural	2 2	7 7	2 2	2 1	4 4	1 1	5 4	4 4	5 5	3 4	4 4	39 38	3.5 3.4

6.2 Impact Analysis And Prediction:

In order to evaluate the socioeconomic and environmental impacts, filed surveys are extremely essential. In addition to the surveys at the preliminary stage, consultation with the community and their active participation plays a vital role in successful implementation of the project. For the impact analysis and predictions following methods were adopted:

6.2.1 Consultations/ Case Studies:

To study the impacts of the project on physical and biological environment, site visits were conducted by the environmental practitioners and experts and possible physical and biological impacts which may arise due to the subject project were identified through consultations and case studies and their mitigation measures were suggested accordingly.

6.2.2 Meetings:

For the identification of the social impacts of the project, meetings and group discussions were held with the local people, stakeholders, nearby residents and passerby because social acceptability of the project and the area is a key to success. Consultation with the stakeholders is a tool for managing two-way communication between the project proponent and the affected public. Its goal is to improve decision making and built understanding by actively involving individuals, groups and organizations, which have stake in the project. This involvement increases project's long term viability and enhances its benefits to locally affected people and other stakeholders.

To identify the different types of stakeholders and ascertain their perceptions about the project, an initial environmental examination was conducted. Informal group discussions were also held as an additional tool for obtaining feedback from the stakeholders that are being discussed in the following.

The EIA team carried out public consultations at various locations around the Project Site. The stakeholder's consultation during this phase of the work targeted the project area, administrative and private offices, Govt. offices, shops, etc. near the Project area:

- Selection of the stakeholders for consultation, reconnaissance of the Said projectsite and initial discussions with the neighboring factory workers, villagers, shopkeepers, drivers etc.
- Environmental consultants and social specialists and documenting the opinions of the stakeholders expressed during the meetings etc.

6.3 Characteristics Of Impacts:

6.3.1 Impact Assessment Criteria:

The impacts were assessed in the light of criteria given as under:-

- Magnitude or degree of impact
- Time and duration of impact

- Likelihood of impact occurrence
- Sensitivity of impact
- Risk related to impact

Table 7: Impact Assessment criteria

Rating of Consequence of Effect on Environment	Rating of Frequency of Occurrence				
	A. Very low: Not heard of but could occur	B. Low: Has occurred in other industry	C. Medium Has occurred in oil and gas industry	D. High: Occurs several times a year in oil and gas industry	E. Very high: Occurs several times a year in PDO
Slight effect: Local environmental damage. Within the fence and within systems. Negligible financial consequences	LOW RISK				
Minor effect: Contamination. Damage sufficiently large to attack the environment. Single exceedence of statutory or prescribed criterion. Single complaint. No permanent effect on the environment.		MEDIUM RISK			
Localized effect: Limited loss of discharges of known toxicity. Repeated exceedence of statutory or prescribed limit. Affecting neighborhood.					
Major effect: Severe environmental damage. The company is required to take extensive measures to restore the contaminated environment to its original state. Extended exceedence of statutory limits		HIGH RISK			
Massive effect: Persistent severe environmental damage or severe nuisance or nature conservancy extending over a large area. In terms of commercial or recreational use, a major economic loss for the company. Constant, high exceedence of statutory or prescribed limits				EXTREME RISK	

6.4 Analysis Of Impacts And Recommended Mitigations

6.4.1 Environmental Impacts Due To Project Location:

The proponent aims to a establishing a manufacturing plant for production of pharmaceuticals. If the project proponent maintains HSE conditions and comply with the PEQS limits than, there will not be any significant impacts of the project on the environment. If the mitigation measures are effectively implemented, the residual impact of the Subject project activities on the area's geophysical environment is expected to be insignificant.

Impact significance: Low to moderate

Nature of impact: Direct

Duration: Long-term

Timing: Construction & Operation phase

Reversibility: NA

Likelihood: Low

Consequences: Mild or may be positive

Mitigation Measures



- Project site will have good and efficient road infrastructure that already exists there at the project site
- Location can be considered as the positive impacts due to enhanced infrastructure.
- The project will also have positive socioeconomic impacts because of provision of jobs to the local residents of the area.
- No human settlement within the radius of the study area
- There would be no issue of congestion of traffic due to presence of good road network in the area.
- Provision of embankments, designed by considering the Geotechnical investigation studies. Due consideration should be given to aesthetic improvement during the design phase.

6.4.2 Environmental Impacts Due To The Project Design

The current project is land development. Area for parking, waste water treatment facility and solid waste management will be reserved within unit. Firefighting plan, health & safety plan, tree plantation plan, emergency response plan will be incorporated during the design phase of the project.

Following are the major Environmental impacts due to the development related to the design:

- Low utilization of available space
- Soil structure and soil bearing capacity
- Improper road infrastructure design
- Emergency exit in the Said project
- Firefighting system
- Wastewater disposal system design
- Rain water harvesting capacity of the drainage system
- Electricity hazards
- Low social acceptability & functionality of design

Impact significance: moderate to high

Nature of impact: direct

Duration: Long-term

Timing: Constructional phase & Operation phase

Reversibility: NA

Likelihood: moderate to high

Consequences: moderate to high

Mitigation measures and recommendations

Following are the mitigation measures and recommendations to minimize the anticipated impacts:



- Each industrial unit will incorporate all HSE measures regarding the design of project.
- Structure stability of the building should be ensured.
- Emergency exist points should be marked within the project building and in overall plan.
- Firefighting system should be designed for the emergency situations.
- Electricity system should be design safe and sound.
- Electricity wires should be covered by thick plastic/electricity resistant covers.
- Design should be professional which accommodate the maximum space and has high social acceptability & functionality.

6.4.3 Environmental Impacts During Construction Phase:

6.4.3.1 Impacts On Physical Environment

6.4.3.1.1 Topography

Project has plan land and some digs. In the proposed area there are little trees and excavation and leveling is involved in this construction.

Impact:

- Change in topography due to excavation
- Land filling of the area
- Construction of roads

Impact significance: Low

Nature of impact: Direct

Duration: Short-term

Timing: Constructional phase

Reversibility: NA

Likelihood: moderate

Consequences: Very Low

Mitigation:

- Cuttings of trees will be avoided
- Use of existing paved tracks as many as possible.
- Working should be in such a way that minimum excavation is involved

6.4.3.1.2 Air Quality:

Air quality will be affected by fugitive dust emissions from construction machinery; dust from the unpaved surface and construction vehicles. The critical sources of dust pollution during the construction phase will be

- Unpaved road surface

- Transportation of materials and other construction activities that create dust emissions

Impact significance: Low

Nature of impact: Direct

Duration: Short-term

Timing: Constructional phase

Reversibility: NA

Likelihood: moderate

Consequences: Very Low

Impact:

Air quality deterioration, particulate matter/dust emissions due to construction activities; stand by generator, equipment's and vehicle.

Mitigation:

- Sprinkling of water on track will reduce dust pollution
- Provision of dust masks for workers.
- Air quality monitoring is recommended on regular base
- Proper paved road infrastructure is recommended
- All vehicles, machinery, equipment and generators used during construction activities should be kept in good working condition and be properly tuned and maintained in order to minimize the exhaust emissions
- Blowing of dust and particulate matter from stockpiled loose materials (e.g. sand, soil) should be avoided either by sheeting them with tarpaulin or plastic sheets or by sprinkling them with light shower of water
- Open burning of solid waste from the Contractor's should be strictly banned;

6.4.3.1.3 Noise

Noise is a by-product of human activity, and area of exposure increases as function of mobility and construction activities. Sources of noise during construction are heavy machinery such as bulldozers, excavators, stabilizers and other equipment. Noise generated by construction machinery is likely to affect sensitive receptors located within 50 meter of the Said project.

Impact

- Persistently higher noise levels can produce psychological effects of distraction of attention, irritation and short temperedness in the exposed persons
- Noisy settings and higher background levels can cause temporary threshold shift and the consequent habit of speaking loud, which may cause damage to vocal cords in the persons exposed

- Noise produced from moving construction vehicles and blowing of pressure horns, at times, could be intolerable particularly during quiet hours of night

Impact significance: Low

Nature of impact: Direct

Duration: Short-term

Timing: Constructional phase

Reversibility: NA

Likelihood: moderate

Consequences: Low

Mitigation:

- Selection of up-to-date and well-maintained plant or equipment with reduced noise levels ensured by suitable in-built damping techniques or appropriate muffling devices
- Confining excessively noisy work to normal working hours in the day, as far as possible
- Providing the construction workers with suitable hearing protection like ear cap, or earmuffs and training them in their use
- Preferably, restricting construction vehicles movement during night time
- Vehicles and equipment used should be fitted, as applicable, with silencers and properly maintained
- Use of low noise machinery, or machinery with noise shielding and absorption
- Contractors should comply with submitted work schedule, keeping noisy operations away from sensitive points; implement regular maintenance and repairs; and employ strict implementation of operation procedures

6.4.3.1.4 Water Resources

There is no impact on surface water quality during the construction of the project area. Persistent and prolonged withdrawal of groundwater higher than the safe yield limits of the aquifer can initiate early depletion of aquifer. This situation can result in reduced water supplies for other users who share the same groundwater resource. Abstraction of the groundwater over and above the safe yield limit can produce serious hydrological and environmental consequences.

Impact:

- Early depletion of the aquifer resources
- Persistent lowering of the water table
- Reduced availability or non-availability of the groundwater to the neighboring communities sharing the same aquifer

These impacts are temporary and minor negative in nature

Impact significance: Low

Nature of impact: Direct

Duration: Short-term

Timing: Constructional phase

Reversibility: NA

Likelihood: moderate

Consequences: Low

Mitigation:

- Regular water quality monitoring according to determined sampling schedule
- Prohibit washing of machinery and vehicles in surface waters, provide sealed washing basins and collect wastewater in sedimentation/retention pond
- Continuous withdrawal and over pumping of groundwater should be avoided. Instead, intermittent pumping be carried out to conserve the groundwater resources
- Take precautions construct temporary or permanent devices to prevent water pollution due to increased siltation

6.4.3.1.5 Soil

The project area is open land with no paved area. Soil erosion and contamination may occur on site due to the following likely impacts:

Impact:

- Excavation of earth/cutting operations
- Land leveling activities
- If the excavated area is left unfilled for long, which may lead to rainfall induced soil erosion;
- The unspent materials and debris produced from consumed up materials, if left as such and allowed to mix with soil underneath, can degrade the quality of receiving soils and may render them unfit for plantation later on
- Leakages of oils, lubricants, chemicals, and other similar substances from their storage sites and from engines of the generators, machines, equipment and vehicles can spoil the receiving soils and may undermine ability of the spoiled soils to support growth of vegetation and plants
- Washing of the gadgets, machinery and equipment without proper drainage of the washout water can adversely affect the soil quality. This impact is, however,

temporary.

Impact significance: Low to Moderate

Nature of impact: Direct

Duration: Short-term

Timing: Constructional phase

Reversibility: NA

Likelihood: moderate

Consequences: Low

Mitigation:

- Non-bituminous wastes from construction activities will be dumped in approved sites, in line with the legal prescriptions for dumpsites, and covered at appropriate place.
- As applicable and needed, plantation of grasses and shrubs will be done at unnecessary excavations should be avoided
- Oils, lubricants, chemicals, and other listed hazardous materials should be stored safely at their designated spots, enclosures or store rooms, which should be safe from rainfall and away from any potential source of fire
- Septic tanks of adequate capacities should be constructed for receiving and treating wastewater from all temporary worksite toilets and at the temporary container offices, if any. The toilet wastewater should not be discharged untreated onto the adjacent lands
- All machineries and materials should be stored at the designated areas and compounds
- All the unspent and left over materials should be completely removed offsite upon completion of construction
- Washout from washing of equipment and gadgets should be drained into either a septic tank or a sand-gravel bed for removal of the grit and contaminants

6.4.3.1.6 Wastewater

Impact:

- Wastewater generation due to construction activities

Mitigation:

- Wastewater generated during construction and domestic activities will be stored temporarily in septic systems comprising of septic tanks from where it will be routed to local drain present near the project.
- Waste segregation measures will be employed to minimize entry of solid waste into the wastewater stream.
- An appropriately designed septic tank will be used to treat sewage/waste water to

achieve PEQS.

- Periodic cleaning of the septic tank is recommended.

6.4.3.1.7 Solid Waste

Due to construction activities waste will be generated at construction and contractors camp site. The construction waste will include wastewater, oil spillage from machinery, domestic waste and solid waste etc. The handling and storage of oil, asphalt/bitumen may be a source of environmental pollution as a hazardous waste. This will result in unhygienic conditions, health risk to work force and public at the camp site.

Impact

- Insecure and unhygienic disposal of the solid wastes generated at the worksite, particularly garbage and trash may cause degradation of soil and land
- Insecurely disposed off heaps of wastes containing kitchen garbage and food waste can serve as breeding grounds for the disease spreading vectors and rodents
- Throwing away of solid wastes into water channels and the wastewater network can result into choking of the latter.

Impact significance: Low

Nature of impact: Direct

Duration: Short-term

Timing: Constructional phase

Reversibility: NA

Likelihood: moderate

Consequences: Moderate

Mitigation:

- An efficient and responsive solid waste management system should be devised for the entire duration of the construction phase. Such a system should provide for separate collection of different categories of constructional wastes. The wastes which will be reusable/recyclable (iron bars, aluminum) should be sold to waste vendors and those which cannot be sold out (brick pieces) may be used as a filling material for leveling the depressions, subject to technical feasibility
- Training of working force in the storage and handling of materials and chemicals that can potentially cause soil contamination
- Solid waste generated during construction and camp sites will be safely disposed in demarcated waste disposal sites or handed over to the contractor

6.4.3.1.8 Health and Safety

Health risks and work safety problems may result at the workplace if the working conditions



provide unsafe and/or unfavorable working environment and due to storage, handling and transport of hazardous construction material. Workers should be provided with safe and healthy working environment taking into account risks inherent to the particular sector and specific classes of hazards in project area. Mitigation measures will include:

Impact significance: Low to Moderate

Nature of impact: Direct

Duration: Short-term

Timing: Constructional phase

Reversibility: NA

Likelihood: moderate

Consequences: Moderate

Mitigation:

- Providing basic medical training to specified work staff and basic medical service and supplies to workers
- Layout plan for site, indicating safety measures taken by the contractor, e.g. firefighting equipment, safe storage of hazardous material, first aid, security, fencing, and contingency measures in case of accidents
- Work safety measures and good workmanship practices are to be followed by the contractor to ensure no health risks for labourers
- Protection devices (ear muffs) should be provided to the workers doing job in the vicinity of high noise generating machines
- Provision of protective clothing for laborers handling hazardous materials, e.g. helmet, adequate footwear for bituminous pavement works, protective goggles, gloves etc.
- Adequate signage, lightning devices, barriers, yellow tape and persons with flags during construction to manage traffic at construction sites, haulage and access roads.

6.4.3.2 Impact On Biological Environment

There is no any fauna or flora is present on the Said project site. Few trees are there. On their behalf a complete plantation plan has been provided.

6.4.3.3 Impact On Socio-Economic Environment

6.4.3.3.1 Economic Activity

Due to the construction of the Said project, economic activity will be generated in the project area as the laborers and semi-skilled staff will have an opportunity to work for the construction of the Said project. This will help in developing their skills and capacities.

This is a moderate positive impact.

6.4.3.3.2 Lifestyle And Culture

There are chances of arising of issues related to cultural differences/conflict between the Contractor's workforce and the local inhabitants, conflicts arising due to the mix of local and migratory job seekers as the use of local resources and products will be increased. In this situation, local residents may resist contractor's workforce attitudes, cultural clashes particularly when local/international contractors are engaged, social disturbance and dissatisfaction with employing outsiders may arise. This impact is temporary and minor negative in nature.

6.4.4 Impacts During Operational Phase:

The positive and negative impacts of subject project, during its operation are discussed below:

6.4.4.1 Impacts On Physical Environments

6.4.4.1.1 Solid Waste/ Sludge Management:

In the operation of Said project proper solid waste management system will be adopted for the prompt, timely and efficient disposal of solid waste & sludge for the reduction of its impacts. Impacts due to solid waste & sludge may be temporary and minor in nature.

Nature of impact: Direct

Duration: Short term

Timing: operation

Reversibility: Not applicable

Likelihood: Low (unlikely) if mitigation measures will ensure that Solid waste management in efficient way.

Consequences: Mild, as it will be removed from site within few hours

Impact significance: Low, based upon low likelihood and mild to moderate consequence.

Mitigation measures:

- Devise plan & develop guidelines for the safe handling, storage & disposal;
- Sludge is placed at the site after cleaning of wastewater treatment facility;
- PPEs are strongly recommended for workers for the handling of sludge;
- Separate bins at various places must be present for solid waste collection and segregation;
- Waste will be handed over to EPA approved waste contractor;
- Solid waste will be recycling at maximum level;
- Industrial ecology practices will be implemented wherever possible;
- 7 R's of sustainability is recommended;

6.4.4.1.2 Wastewater

Waste water will be produced only from domestic activities. In operation, no activity is place



to used water and wastewater produced from it.

Nature of impact: Direct

Duration: Short term

Timing: operation

Reversibility: Not applicable

Likelihood: Low

Consequences: Mild

Impact significance: Low.

Mitigation measure

- Wastewater that is finally disposed off, will be in limits of PEQS
- Septic tank should be available.
- Water conservation approaches will be follow to reduce its wastewater
- Wastewater treatment facility will be installed to treat the wastewater

6.4.4.1.3 Gaseous Emissions:

Emissions will be produced by generators, boilers and vehicles and equipment will similar to those produced by generators in terms of the resulting pollutants (SO₂, NO_x, PM, etc.). However, the extent to which they can produce would keep considerably lower, since much smaller engines will use in vehicles and construction machinery.

Nature of impact: Direct

Duration: long term

Timing: operation

Reversibility: irreversible

Likelihood: moderate if mitigation measures will be ensured.

Consequences: moderate, if pollutant levels in the ambient air will be control within acceptable limits by adopting proper mitigations.

Impact significance: moderate, based upon low likelihood and mild to moderate consequence.

Mitigation Measures

None of the potential effects discussed above will be exceeded to acceptable limits.

The mitigation measures given below used to reduce their impact, and ensure that they remain within acceptable limits.

- All equipment and vehicles during the operation of project will be properly tuned and maintained in good working condition in order to minimize exhaust emissions.
- Vehicle speed will be reduced on track passing through or close to shops
- Speed limits will be imposed and encourage more efficient journey management worked to reduce the dust emissions produce by vehicular traffic. Water sprinkling

will be done where necessary.

- Management make sure process will be environment friendly
- Pollution abatement technologies regarding air pollution will be adopted.
- For generators, small scrubbers will be install.

6.4.4.1.4 Energy Requirement

Energy consumption in industrial area is usually very high. Machinery work runs all day in different industries. Energy conservation technique should be in mind.

Mitigation measures

- Do not waste the energy/electricity when there is no need of it.
- Use energy efficient machinery and equipment
- Use energy saving products
- Conduct and maintain records for energy audits
- Do not leave the machinery in running form when there is no working being done
- Machinery must never be left unattended

It is recommended to save and conserve the energy and adopt energy efficient technologies during the construction phase

6.4.4.1.5 Noise Level:

Noise is the major concern during the operation phase. It can be generated from the traffic on the road and from the machinery used for operations.

Nature of impact: Direct

Duration: long term

Timing: operation

Reversibility: Not applicable

Likelihood: low

Consequences: slightly significant

Impact significance: moderate, based upon low likelihood and mild to moderate consequence.

Mitigation measures:

- Machinery and vehicles will be tuned and maintained
- Limits will impose on unnecessary use of horns
- Safety signs will be displayed. public & drivers will be aware of them
- Sound proof wall will be constructed for generator.

6.4.4.1.6 Health And Safety

Workers should be provided with safe and healthy working environment taking into account risks inherent to the particular sector and specific classes of hazards in area. Mitigation

measures will include:

Impact significance: Low to Moderate

Nature of impact: Direct

Duration: Short-term

Timing: Operational phase

Reversibility: NA

Likelihood: moderate

Consequences: Moderate

Mitigation:

- Layout plan for site, indicating safety measures taken by the contractor, e.g. firefighting equipment, safe storage of hazardous material, first aid, security, fencing, and contingency measures in case of accidents
- Protection devices (ear muffs) should be provided to the workers doing job in the vicinity of high noise generating machines
- Provision of protective clothing for laborers handling hazardous materials, e.g. helmet, adequate footwear for bituminous pavement works, protective goggles, gloves etc.
- Ensure strict use of wearing these protective clothing during work activities
- Instruct foremen to strictly enforce the keeping out of non-working persons, particularly children, off work sites
- Adequate signage, lightning devices, barriers, yellow tape and persons with flags during construction to manage traffic at construction sites, haulage and access roads.

6.4.4.2 Impact On Biological Environment

6.4.4.2.1 Natural Vegetation

Project activities will not impose any potential impact on the area's natural vegetation and plantation.

Assessment of Impact:

A significant impact can be caused due to the unnecessary or excessive removal and burning of plants for fuel wood.

Nature of impact: Direct

Duration: long term

Timing: construction phase

Reversibility: irreversible



Likelihood: moderate

Consequences: Mild, as no rare plant species were present in the areas.

Impact significance: significant

Mitigation Measures:

The following mitigation measures will reduce the impact on vegetation:

- Prohibition to park vehicles on green belts/ grass;
- Unnecessary damage to vegetation is strictly avoided;
- Proponent planted trees and other species after construction phase;
- Proponent will plant 10 trees if he removes a single plant during the construction/ development of the project.

6.4.4.2.2 Fauna

The fauna including wildlife specially endangered species do not exist at the project site.

Nature of impact: Direct

Duration: short term

Timing: construction phase

Reversibility: not applicable

Likelihood: low

Consequences: Nil, as no rare animal species are present in the areas.

Impact significance: not significant

Mitigation:

- Maximum plantation is recommended
- Fauna will be preserved by different conservation strategies (in-situ and ex-situ), if any.

6.5 Potential Environmental Enhancement Measures

The Said project will be installed with all precautionary measures to enhance and safe the environment. Following necessary measures will be adopted during construction and operational phase of the project:

- Sprinkling of water will be done on dusty roads and tracks.
- PPEs will be provided during construction activity.
- Constructional waste and domestic solid waste will be disposed-off or utilized properly.
- Local people will be informed in advance when work is about to start in an area.
- Machinery will never be left unattended.
- Efforts should also be made to discuss traffic conditions so that regular traffic is not disturbed. Transporters engaged for the project would be forced to adhere to the load

- specifications of the access road. No overloading would be allowed in any case.
- Safety signs and boards will be placed during construction.
 - Air pollution controlling devices will be installed within the project during operation.
 - Machinery will be kept maintained.
 - Waste water will be treated through septic tank that will be installed within the premises of the subject project.
 - Proper SOPs will be followed with proper schedule along with the HSE conditions.
 - Area will be restored with native plants. A proper tree plantation plan will be formulated to save the environment.
 - Solid waste will be handed over to contractors and agreement will be made.
 - Noise will be controlled by adopting proper measures.
 - PPEs will be provided to workers during working.
 - Firefighting equipment's and system will be installed.
 - Safety signs will be placed at all locations where required.
 - Hygienic conditions will be ensured and proper quality will be maintained by quality control testing.
 - First aid facilities will be made available.

6.6 Purpose Of Mitigation Measures

6.6.1 What is the problem i.e. In terms of –major environmental impacts|| which may arise by the subject project activity?

The major impacts which may arise by the subject project are air, water and noise pollution. Other impacts are of minor importance. These impacts may arise during operational phase of the project because the constructional phase of the project includes the construction of boundary walls, roads and offices, so they will not cause any major harmful impacts on the environment and during the operational phase of the subject project, as different industries will be installed in the industrial estate, they may cause the issues of air, water and noise pollution if proper precautionary measures to avoid this pollution will not be taken but it will be ensured that precautionary measures will be adopted prior to start the activity, during the activity and post activity to cause minimum impacts to the environment.

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

Negative impacts may arise during the constructional and operational phase of the project if proper precautionary measures and procedures will not be followed. If proper precautionary measures and procedures will be implemented, there will not be any major problem. If any impact would arise due to the subject project activity, it will be addressed on site. Trainings will be conducted on site prior to start work while other precautionary measures will also be adopted to make the project safe and environmental friendly.

6.6.3 Where and how the problem should be addressed?

The problem should be address at the site and immediate response should be provided to address the problem which may arise. Institutional capacity responsible for the implementation of EMMP will be responsible for addressing such problems if arise.. They will assess any impact that could be arisen during both phases and they would also be responsible to address the problem and to mitigate it.

6.7 Whys Of Achieving Mitigation Measures

6.7.1 Changing in planning and design:

By adopting proper mitigation measures, any anticipated major or minor environmental impacts could be controlled or mitigated. The details of impacts and mitigation measures have been discussed in previous chapters.

6.7.2 Improved monitoring and management practices:

Management shall take appropriate measures to provide pollution free and safe environment during the Said project activity by implementing improved management practices and monitoring techniques suggested in EMP.

6.7.3 Compensation in money terms:

Site proposed for the subject project is the property of the Government and free of any activity. As the site is the property of the government and vacant that's why there is no need of money in terms of land cost or any other mean. However, rehabilitation will be done in the vicinity of the project site to restore the beauty of the area.

6.7.4 Replacement, relocation and rehabilitation:

Subject project site is the property of the government, there is no need of replacement or relocation of a single person or economic activity. Management will develop Restoration/ reclamation or tree plantation plan to restore the project area after the construction phase of the project. Maximum Plantation will be done with native species within and outside the premises of the industrial estate, along the boundary wall and road side if directed.

• ENVIRONMENTAL MANAGEMENT AND MONITORING PLANS

This chapter summarizes the various mitigation measures as outlined previously in this EIA Report that will be implemented during the construction, operational and decommissioning stages of project. It does not discuss further the mitigation measures which have been adopted within the design and planning of the project, as these are comprehensively covered in previous section of this EIA Report.

Outline and key features of the EMMP for operations phase is presented. As per the environmental legislation in Pakistan, the EMMP for the operations phase, along with other documents, is to be submitted to the environmental protection agency to obtain confirmation for compliance and Environmental Approval for project operation. Even after implementation of the suggested mitigation measures, the impact may remain significant, and require monitoring.

8.1 Objectives

An Environmental Monitoring Plan was outlined alongside Environmental Management Plan to ensure all the corrective actions to counter adverse impacts which gives a detailed EMMP. The EMMP will serve as a principal execution module of the project that would not only mitigate adverse environmental impacts during the construction and the operational phase of the project but also ensures that environmental standards and good in-housekeeping are being practiced. Continuous environmental monitoring is exercised to ensure that preventive measures are in place and effective to sustain environmental integrity. The key objectives of EMMP are:

- To outline functions and responsibilities of persons

- To state and implement standards and guidelines which are required under environmental legislations particular in context to the Project
- To facilitate the implementation of the mitigation measures by providing the technical details of each Project's impact and proposing implementation schedule of the proposed mitigation measures
- Define a monitoring mechanism and identify monitoring parameters to ensure that all proposed mitigation measures are completely and effectively implemented
- Identify the resources required to implement the EMMP and outline corresponding financing arrangements

8.2 Management Approach

The organizational roles and responsibilities of the key players are summarized below:

8.2.1 Proponent

The project proponent will undertake overall responsibility for compliance with the EMMP. The concerned departments will carry out verification checks to ensure that the contractors are effectively implementing their environmental and social requirements.

8.2.2 Contractors

The contractors will implement the majority of environmental and social mitigation measures. The contractors will carry out field activities as part of the project. The contractors are subject to certain liabilities under the environmental laws of the country, and under its contract with proponent.

8.3 Components of EMMP

The EMMP consists of the following:

- **Institutional arrangements**
- **Mitigation plan to reduce the severity of associated impacts**
- **Monitoring plan to monitor the impacts and their severity**
- **Environmental and social trainings to raise awareness**

8.3.1 Remedial and Mitigation Measures

The objective of remedial and mitigation measures in any project is to identify practices, technologies or activities that would prevent, minimize or mitigate all significant negativities that are likely to occur due to the proposed project.

8.4 Environmental Management and Monitoring Framework

The purpose of the environmental management and monitoring framework is to facilitate the implementation of environmental commitments, included in the environmental impact assessment. The proponent is committed for the protection of the environment and to the sustainable management of its related operations and activities.

Sr. No.	Project Activities	Potential Impacts	Mitigation Measures	Monitoring Measures	Frequency	Responsible Authority	Environmental Budget
Pre-Construction Phase							50,000
1	Site Selection for construction materials	• Temporary disturbance due to increased traffic • It may involve tree cutting for placement of construction materials, asphalt and batching plant site. • Land acquired for construction material that may cause blockage of roads	• Provision of sign boards and alternative routes	• Cutting of Trees will be monitored. • The proponent is the owner of land	--	Proponent, Contractor	

2	Handling of construction material	• Construction material such as sand, cement may pose health risks. • Scattered construction material may obstruct mobility	• Material will be appropriately covered to prevent dispersal of sand material. • Implement dust suppression measures for all stockpiles. • Protective health & safety measures will be adopted. • Concrete mixing on the ground will not be allowed. • Material will be kept aside in designated place without creating	a) Proper covering of construction material will be checked on regular basis b) Wastewater runoff from the construction site to nearby water bodies will be monitored	Weekly	Construction contractor	
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			disturbance to public mobility				
3	Identification site for Labor Camps/ site offices	• Generation of solid waste may pose health issues. • Sanitary problems may arise due to bathing and washing of clothes by labors	• Proper site will be selected without disturbing environment and to avoid conflict with locals. • Dustbins should be provided at project site; • Involvement of local authorities at project level will	Surface water quality of local water bodies will be monitored by examining its various parameters such as pH, DO, TSS, TDS, COD, BOD5, Alkalinity and Turbidity etc by assigned laboratory	--	Consultant	

			be ensured • Designated staff will be hired at project site to collect SW at consecutive/regular intervals; • Identification of disposal site for SW with due involvement of local community • Ensure the provision of toilets for labors and septic tank for its deposal. Further, site engineer and the project environmentalist will identify the			
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			location of wastewater discharges • Strict instruction will be issued to avoid wastewater discharge into freshwater bodies/lakes. • Capacity building of labors at the site to follow the moral ethics				
4	Movement of heavy machinery	• May cause disturbance to infrastructure such as roads, nearby residences etc. through vibration • May cause noise	a) Noise Monitoring and Mitigation Plan to Limit noisy activities; b) Avoid using heavy equipment	a) Noise level of the proposed project site will be monitored	--	Consultant	

		pollution harmful for nearby residents and labors					
5	Excavation of Earth	a) Change of soil characteristics b) Loss of fertile top layer of soil c) Air quality may also deteriorate d) Generated stockpiles may be a nuisance e) Vibrations may arise due to machinery	a) Water sprinkling must be ensured at regular intervals to avoid dust pollution b) Minimal effort should be taken to disturb top soil cover c) Cover construction materials and stockpiled soils if they are a source of fugitive dust. d) Site should be selected for proper disposal of stockpiles to avoid any disturbance in mobility e) Contractor needs to obtain approval for	- Ambient air quality will be monitored by examining its various parameters such as CO, NO, NO2, NOX, SOX, H2S etc - Soil quality will be monitored by examining its various parameters such as soil type, soil erosion, soil	--	Consultant	

			excavation and for plan of rehabilitating the site after excavation; f) Locations must be identified for transportation or to be reused or dumped of excavated material g) Minimize the amount of land to be disturbed and vegetation to be removed. h) Restore or apply protective covering on disturbed soils as quickly as possible	color, soil characteristics, pH, porosity, electrical conductivity, permeability				
6	Public Privacy and Cultural Properties	a) Disturbance to people visiting public properties i.e. mosque, schools, shrines, and graveyards b) Privacy issues due to labour camping	a) There is no cultural heritage and public institutions in the proposed project area to be disturbed b) Capacity building of labours					

			at the site to follow the moral ethics				
Construction Phase							
1	Land clearing, (Leveling, tree cutting, drainage, etc.) and other off-site sources of materials	a) Loss of vegetation may occur b) Soil contamination from spills and fuel leaks c) Disposal of cleared debris d) Soil compaction, sediment production, soil erosion and un-stability of the soil e) Noise and vibration would affect wildlife and property of locals f) Disruption and dislocation of migratory birds g) Spread of invasive species or loss of indigenous species, ecosystem loss and loss of habitat forever	a) Clear small areas for active work at a time and minimize the impact on flora at the site. Also, Photographical, and botanical inventory of vegetation will be prepared before clearing the site. b) Clear without destroying large plants and turf where possible and preserve them for replanting in temporary nurseries. c) Assure minimum disturbance to native flora during construction especially where the asphalt, batching and crushing plants will	a) Surface water quality of local water bodies will be monitored by examining its various parameters such as pH, DO, TSS, TDS, EC, COD, BOD5, Alkalinity and Turbidity etc. b) Soil quality will be monitored by examining its various parameters	--	Construction Manager	Air Monitoring: 50,000/- Water Quality Monitoring: 50,000/-

			be installed. Also, Re-vegetate area with recovered plants and other appropriate local flora				
2	Handling/transportation of construction materials	Soil contamination, toxicity and air pollution are the major impacts which may arise due to mishandling of construction materials.	- Prevent dumping as it may be hazardous or proper labeling of containers, including the identification and quantity of the contents, hazard contact information etc. - Emergency response plan must be prepared to address the	Regular Visual Inspection		Construction Manager	Noise Monitoring: 50,000/-

			accidental spillage of fuels and construction materials. • Ensure the training of workers in waste management handling procedure.				
3	Handling of solid Waste	a) Solid waste may be generated from: i. the active construction sites and, ii. the camp sites b) Solid waste may pose health issues or disturb scenic beauty of the site c) Ban on-site debris burning. d) Heaps of solid waste may cause	a) Proper storage and site practices to minimize the potential of damage or contamination of construction material. b) Scattered solid waste should be properly managed in order to avoid contamination and provision of	a) Solid waste generated by the local community should be disposed off properly in dustbins and must be collected on regular basis b) Perform routine site inspection	Bi-Monthly	Regular collection of solid waste will be ensured and checked by, Contractor & Environmental Specialist	50,000/-

		disturbance in mobility	enclosed bins for general refuse at project site; c) Involvement of local authorities d) Capacity building of site personnel in waste management procedures;				
4	Health & Safety of Workers at active construction and camp site	a) Health problems or immediate risk may emerge at construction site: b) Dust particles c) Air and Noise pollution d) Accidental risks	Providing basic medical training & medical service (First Aid Boxes) to workers; b) Personal Protection equipment PPE's (ear muffs) will be provided to the workers operating in the vicinity of high noise generating machines. c) Provision of proper safety signage at sensitive/accident-prone spots;	a) Provision of PPEs will be ensured	Weekly	Proponent	Health & Safety: 25,000/- Workers Training: 25,000/-

			d) Ensure strict use of wearing these protective clothing during work activities; e) Provision of adequate sanitation, washing & cooking facilities including lighting up to satisfaction;				
5	Tree Plantation Plan	a) Clearing of vegetation and cutting of tree cover from the site due to construction of unit may have adverse environmental impacts on bio-physical environment	Tree plantation practices will be introduced in case of removal/cutting.	Re-plantation of native floral species will be ensured.	--	Proponent	0.1 million

Table 13: Environmental Management and Monitoring Plan

Category	Impact	Project Activity	Monitoring Mechanism	Frequency	Monitoring Agency
Operational Phases					
Land Resource	Solid Waste and By-Products	Implementation of SW* Management System	Record keeping and timely transfer of SW from bins to the disposal site for ultimate management and disposal	Weekly and Annually	Proponent
	Soil Contamination	Implementation of Management Plans	Visual monitoring and regular site inspection	Daily and Annually	Project Manager
Air Resource	Air Emission	Air quality will deteriorate due to transportation related activities	Monitor the emissions as per PEQ standards	Once before start of operation and after that as when required during operational phase	EA**

Ecological Resource	Flora	Uprooting of trees during Construction phase and maintenance of photographic record	Re-vegetation during operation phase	During Baseline Survey, once in a year and after the completion of the Project	Project Manager
Wastewater		Wastewater will be generated mainly from domestic use and cooling tower	Regular testing of the effluents that are being discharged	On the monthly basis	Project Manager
*SW= Solid Waste, **EA= Executive Agency					

8.4.1 Institutional Arrangements and Responsibilities

The proposed institutional arrangement for the implementation of EMMP is based on the discussions held with the Forest Department, Environmental Protection Department, Local Union Council Office and Proponent. The discussion concluded that three types of institutional arrangements are essential for the effective implementation of EMMP, these are follows:

- **Establishment of Environment/Social Management Group**
- **External Monitoring by EPA certified laboratory**
- **EMC established by Proponent after consultation with consultant**

a. Roles and Responsibilities

Following are the designated roles and responsibilities of the employees involved in the monitoring and management of the adverse impacts:

Table 14: Roles and Responsibilities

Roles and Responsibilities		
Sr#	Concerned Persons	Duties
1	The Project Manager	Following will be the responsibilities of the Project Manager • Ensure that the contractor is aware of all specifications, legal constraints, standards and procedures pertaining to the project specifically with regards to environment. • Ensure that all stipulations within the EMMP are communicated and adhered to by contractor(s)

4	HSE Manager	• Monitor the implementation of the EMMP throughout the project by means of site inspections and meetings. This will be documented as part of the minutes of the site meeting documents • Ensuring project execution within defined budget and timelines • Conducting regular check of the project status and meetings with project team • Provide support and guidance to project team as and when needed • Project Manager is expected to continually monitor and improve the overall performance of their operation In addition to the health and safety responsibilities held by staff, managers and supervisors must do whatever is reasonably practical to ensure that both the workplace and the work itself are safe. This includes: • Ensuring that staff are appropriately trained and supervised • Identifying, assessing and managing health and safety risks • Consulting with workers (including staff, affiliates and contractors): • Health and safety risk assessments
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		• Decisions are made about the measures to be taken to eliminate or control these risks • Health and safety risk assessments • Implementing health and safety risk management programs relevant to their operations, teaching, research and consulting functions and work environment • Reporting (to the Human Resources Unit), investigating and responding to all hazards, accidents, incidents and taking action to control the risk • Assisting with the development, implementation and maintenance of a return to work program for injured staff. • Be fully conversant with the EIA and conditions of its approval • Be fully conversant with the EMMP • Be fully conversant with all relevant environmental legislation, policies and procedures, and ensure compliance • Convey the contents of this document to the contractor site staff and discuss the contents in detail with the Project Manager and Contractor • Undertake regular and comprehensive inspection of the site and surrounding areas in order to monitor
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		compliance with the EMMP • Take appropriate action if the specifications contained in the EMMP are not followed • Monitor and verify that environmental impacts are kept to a minimum, as far as possible • Review and approve construction methods, with input from the Site Manager, where necessary • Ensure that activities on site comply with all relevant environmental legislation • Compile progress reports on regular basis, with input from the Site Manager, for submission to the Project Manager, including a final post excavation audit • Liaise with the Site Manager regarding the monitoring of the site • Report any non-compliance or remedial measures that need to be applied • All environmental problems arising on the construction area will be reported to the Site Manager by the Environmental Manager. Reports on such problems will be submitted to the Project Manager by the Site Manager
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8.4.2 Proposed Monitoring Program to Assess Performance or Output of EMP

The following environmental issues are considered to warrant specific management actions for the implementation of project. These issues have specific regulatory requirements (contained in the development consent or Environmental Approval) and/or are considered to

have the potential to result in a non-compliance with a legislative requirement or generate community complaints. To manage the adverse environmental impacts on the physical parameters of the environment following management and monitoring plans will be adopted:

Table 15: Air Quality Management and Monitoring Plan

Air Quality Management and Monitoring Plan				
<i>Potential Impacts Mitigation Plan</i>	Operational Phase			
	Dust emissions and particulate matter during the transport of material Installation of dust collection and control equipment to minimize the emissions - Regular sprinkling of water will be done to control the suspended dust particles during the construction phase - The transporting vehicles will be maintained on the regular basis - Enforce strict speed limits to reduce airborne fugitive dust emission from vehicular movement - Minimize the land disturbance as much as possible by re-vegetating disturbed areas as soon as possible - Regular water sprinkling to suppress the fugitive dust emissions during the construction work - Cover dump trucks before travelling on public roads - Train workers to handle loose materials and debris to reduce fugitive emissions - Water sprinkling will be done on the regular basis during the construction phase - Good quality (low sulphur) fuel will be used in the vehicle to ensure less emissions - Visual inspections to detect air pollution generated during the construction phase will be carried out on the regular basis - Indigenous trees around the facility will be planted to control the odour and air pollution - Rehabilitation of areas outside of the site security fence will be undertaken by the successful implementation of the landscaping plan - Tree species like <i>Dalbergia sissoo</i>, <i>Cassia seamea</i>, <i>Acacia mangium</i> and <i>Peltaphorum</i> can be planted in areas as they have high growing rate as well they will help in noise, dust and pollution reductions.			
<i>Monitoring</i>	Responsibility	Responsible	Environmental Budget	Monitoring Duration
	Preparation of required or requested	Project Manager/Contractor	50,000/-	As & when

	information for submission to the Project Manager including air quality monitoring data • Liaising with the Project Manager with respect to all significant air quality matters			required
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Table 16: Solid Waste and By-Products Management and Monitoring Plan

Solid Waste Management and Monitoring Plan	
Potential Impacts	Operation Phase No hazardous waste will be generated in the process activity except the municipal waste. In addition, domestic solid waste will be generated .
Mitigation Management Plan	Waste Management Plan • Hazardous and non-hazardous waste will be separated prior to the transportation of the waste. As the aforesaid project generates no hazardous waste, no segregation is required.

- Record of all waste generated during the project activity should be maintained on the regular basis. Quantity of the waste disposed, recycled or reuse will be logged on a waste tracking register
- Regular training will be given to the workers dealing with the waste management it will include identification, segregation and management of waste.

General Waste

- General waste cannot be recycled or used, it will be stored in appropriate receptacles and picked up as required by a worker and will be disposed of at the designated sites/bins
- The generated waste will be collected by the contractor on the regular basis and will be disposed off by using standard practices
- No on-site burning of wastes will be allowed at any time
- Tree species like *Dalbergia sissoo*, *Cassia seamea*, *Acaccia mangium* and *Peltaphorum* are ideal for bio-reclamation of overburden dumps.

Green Waste

- It will be ensured that minimum green waste will be generated on-site
- It will be generated from landscape maintenance activities. It will be reused on-site where possible or disposed off un-contaminated by using the standard practices at the designated sites.
- Green waste can be used as the fuel wood by the nearby residents.
- No on-site burning of green wastes will be allowed at any time on-site

Monitoring	Solid Waste - For the collection of the solid waste at site bins will be installed at various positions in the proposed facility - The installed bins will be covered in order to reduce the chances of the disease vector production and ensure the health of the workers - The amount of the solid waste generation will be disposed off as per industrial estate practices			
	Responsibility	Responsible	Environmental Budget	Monitoring Duration
	- Coordinate the training needs for all employees in environmental awareness training as a legal responsibility - Waste collection and disposal will be monitored on a regular basis - Solid Waste documentation will be completed and available for	Project Manager	75,000/-	Visual Monitoring on Regular basis

	inspection on request A complaints register will be held, complaints will be investigated and, if appropriate, acted upon			
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Table 17: Wastewater Management and Monitoring Plan

Wastewater Management and Monitoring Plan	
Potential Impacts	Operation Phase During the operational phase chances of the groundwater contamination will be quite high if un-treated wastewater will be discharged in the waterways. It is estimated that 0.3m³ per day of municipal wastewater will be produced. The water will be used for the cooling of the plant and as a result 50% of the water will be loss as a result of evaporation No process wastewater water will be produced that need treatment.
Mitigation	Sanitary wastewater treatment system such as septic tank will be constructed on-site for the disposal of wastewater.
Management Plan	Monitoring of effluents shall be carried out as per requirement of Self-Monitoring and Reporting Tools (SMART) to ensure compliance with the PEQS

- There is no surface water body present in the project proximity that could be impacted due to the discharge of the wastewater
- The closed system should be installed for the cooling of the plant to ensure the minimal water loss
- Good in-house keeping practices should be adopted to ensure water conservation
- Closed the taps when water isn't in use
- The domestic wastewater will be discharged into the septic tank prior to final disposal in the sewerage line. The design specifications of the septic tank are:
- The wastewater after primary treatment will be used for on-site horticultural activities and the excess wastewater will be disposed off in the nearby wastewater drain after necessary approval

Monitoring	Responsibility	Responsible	Environmental Budget	Monitoring Duration
	Monitoring of the safe disposal of the generated wastewater as per Environmental Monitoring of this EMMP	Project Manager	75,000/-	Monthly
A complaints register will be held, Complaints will be investigated and, if appropriate, acted upon				

Table 18: Transport Code of Conduct

Transport Code of Conduct	
	Operation Phase
<i>Potential Impacts</i>	During operational phase, vehicles carrying the raw material may impact the nearby community by the frequent movement. It may generate fugitive dust emissions, noise and may cause social issues.
<i>Mitigation</i>	Traffic Management Plan
	The traffic management plan is given below:
<i>Management Plan</i>	• Heavy vehicles shall only be to enter and leave the site between during day hours. • The need to ensure that noise levels are kept to a minimum especially through the site and into the relevant zone • Loads entering or leaving site will be suitably covered to ensure loads are secure • Proper maintenance and tuning of the vehicles should be carried out to ensure the minimum emissions • High quality (low sulphur) fuel will be used to keep the emissions in check

	• Strict speed limits will be enforced to reduce the chances of accidents • A complaints register will be kept, complaints will be investigated and, if appropriate, will be acted upon			
<i>Monitoring</i>	Responsibility	Responsible	Environmental Budget	Monitoring Duration
	Informal Observations Report on Compliance	Project Manager	30,000/-	Weekly basis

Table 19: Health and Safety Management and Monitoring Plan

Health and Safety Plan Management and Monitoring Plan		
Physical Hazards	The health and safety risks to workers include but are not limited to: • Floor surfaces shall be maintained regularly and kept clean and free of oil spills, other slippery fluids and obstructions • Workers who may be exposed to noise levels exceeding occupational standards shall receive regular audiometric testing • The effective use of hearing protection devices shall be ensured	Environmental Budget

Chemical	Following mitigation measures will be adopted: • Proper training will be provided to workers entering and working in the confined space of the hazards, protective measures and emergency rescue procedures • Only authorized persons shall be allowed near grinding unit • People working in and around the processing areas shall be provided with suitable PPEs to protect them against molten metal burns, noise and physical hazards • Proper radiation shielding may be provided • Edged parts of rolls shall be securely guarded to prevent severe injuries • Transport routes shall be planned and constructed to minimize the risk of collision and with sufficient safe clearance to allow for aisles and turns, or other types of control area. Where appropriate, maps showing the proposed route should be provided. • Transport routes shall be clear of obstructions and, where possible, without irregular surfaces. • Loads should be lowered slowly and smoothly to avoid physical hazards	25,000/-
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Hazards	• Personal Protective Equipment (PPEs) should be given to workers including protection and impermeable clothing for use during disinfection • Wearing of the PPEs should be regulated strictly by the concerned authority • Chemical spillage will be avoided by developing proper SOPs for the handling of the chemicals • Chemicals and detergents will be stored properly, and all precautionary measures will be adopted	25,000/-
	Accidental Spillage Following mitigation measures will be adopted: Inspection of the chemical storage areas shall be conducted on a monthly basis for sanitation, maintenance, and housekeeping purposes. Safety, housekeeping, and chemical storage problems will be addressed as part of normal facility operations and maintenance programs. Inspection observations shall record on the Chemical Inspection Form included with this Plan. Potentially reactive or non-compatible materials will not be stored together in the same storage or containment unit. Damaged or leaking containers will be isolated,	25000/-

	when possible, in a containment area or repackaged to prevent loss, exposure or hazards. Containment areas should be kept clear of extraneous materials. Containment areas should be kept in good repair. Chemicals are to be stored in designated areas. Spill response equipment maintained at the site includes spill kits, a full array of maintenance equipment and tools, and a variety of forklifts and service equipment. Spill kits are located at the tool storage sheds. Spill kits will contain absorbent media, portable containment booms, and pads. All current and future employees are to receive training with regard to the Accidental Spill Prevention Plan. Training will be provided as part of new employee orientation and includes a review of chemicals stored and utilized at the Facility. This training includes a basic review of MSDS, availability of MSDS for chemicals present at the Facility, familiarization with basic emergency procedures, location and contents of spill kits, emergency escape routes, and responsibilities.	
Security	To eliminate the security issues following mitigation	

Risks	measures will be adopted: • Proper Security will be provided to the workers • Security guards will be appointed • Before hiring any worker and his criminal record may be checked • CNIC of all the workers will be kept by the Proponent • Strict law will be enforced to control the crime at site	25,000/-
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8.4.3 Biodiversity Management and Monitoring Plans

As far as the management plans are concerned, they will protect the environment and mitigate the adverse impacts but, in order to keep in check the whole biodiversity of the project and study area a bio-diversity plan is required. During construction and operational phase there would be a removal of flora from the designated areas. The biodiversity plan is designed to mitigate the immediate as well as aftereffects. The detailed bio-diversity management plan includes the following sub-plans:

Table 20: Biodiversity and Invasive Plants Management and Monitoring Plan

Procedure for Prevention/ Mitigation of Impact from Invasive Plants	
<i>Potential Impacts</i>	If suitable controls are not adopted invasive species could colonize the site, reducing biodiversity and threatening the ecology of the area. It would largely impact flora and fauna of the area. Although Lahore District is not rich in biodiversity. The remnants of the native vegetation will be at the verge of disturbance and removal.

<i>Management Plan</i>	Following management practices will be adopted: • Sowing/planting will be undertaken as soon as possible following the closure of the exhausted pit, to reduce the likelihood of the exposed areas being colonized by invasive and non-native species which are of lower ecological values • Reasonable precautions will be taken during operational phase to avoid the spreading of soil borne pests and diseases, animal and crop diseases and invasive species. • The ecological; verification walkover of the whole site will check the status of known stands of alien/invasive plants and record any new stands
<i>Monitoring</i>	Monitoring will be undertaken by HSE Manager throughout project life.
<i>Emergency Measures</i>	• Environmental Coordinator to be informed immediately if any new stands of alien or invasive weeds are found. • Where invasive species are found, an environmental exclusion zone will be created. This will entail a physical fence and proper signage. • A liaison with local landfills to check the specific arrangements they require for the disposal of constructional waste arising, which may be treated as hazardous waste
<i>Environmental Budget</i>	

	100,000/-
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8.4.4 Decommissioning Plans

Following management plans will be adopted to manage habitat during operational as well as at the end of the operational phase to reduce the envisaged impacts. At the end of the operational phase following practices will be adopted to reclaim and restore the site:

Table 21: Habitat Management Plan

Habitat Management Plan	
<i>Potential Impacts</i>	If suitable mitigation was not implemented chance of loss or damage of valuable local habitats could arise. This would reduce local biodiversity and the rate of soil erosion will increase many times.
<i>Management Plan</i>	• If required by the HSE Manager will be constrained to a prescribed working corridor thereby reducing damage to habitats, potential direct mortality and disturbance to species • Existing trees and vegetation will be retained wherever practicable and incorporated with new planting proposals • Vegetation buffer strips will be maintained where practically possible. • Vegetation clearance will involve the removal of the shrubs and grasses be agreed with the HSE Manager and Contractor, if required • An environmentalist will perform a pre-clearance site visit to advise the contractors on which trees can be retained as they are which can be retained with some remedial works and which need to be removed • Where the removal of dead standing is necessary, the material will be relocated into areas of existing and newly created green zone within the limits of the site where practicable. • Sowing/planting will be undertaken as soon as possible to reduce the likelihood of the areas being colonized by invasive species which are of lower ecological value. • During the operational phase, management and maintenance of

roadside verges is to be undertaken to maintain and enhance floral diversity

- Appropriate management will be undertaken of existing bound habitats such as hedges for the conservation concern for; tree sparrow (*Passer montanus*), House Sparrows (*Passer domesticus*), House Crow (*Corvus splendens*), Domestic Pigeon (*Columba livia domestica*), Parrot (*Psittaciformes*), Quail (*Coturnix coturnix*), teal (*Francolinus pondicerianus*), Dove and Humming Bird.
- Planting will be undertaken to enhance biodiversity and conserve the integrity of existing habitats.

Topsoil Management

- **Appropriate sediment controls will be installed at the base of stockpiles to prevent soil loss**
- **Weed growth will be monitored and subsequently controlled, if necessary.**
- **Prior to re-spreading, weed growth will be scalped from the top of the stockpiles to minimize the transport of weeds into rehabilitated areas**

Management of Remnant Vegetation

- **The remnant vegetation present within the consent area will be managed during the life of the project to maintain its ecological values and promote biodiversity**
- **Strategies include management of grazing impacts, weeds, feral animal control, erosion, sediment control and encouragement of**

natural regeneration

- **One of the aims of remnant vegetation management is to improve connectivity of remnant vegetation patches within the consent area to provide improved habitat corridor function**
- **Annual inspections of remnant areas will be undertaken by qualified persons to identify any weed or feral animal issues, identify any areas affected by erosion and to assess the extent of natural regeneration occurring. Actions will be taken to address any issues identified**

Landscape Management

- **The site is to be maintained in a weed free condition and any newly planted trees or shrubs which die, or are destroyed, within 24 months of mine closure shall be replaced in the appropriate season with plants of the same species**
- **Existing mature trees are to be inspected once annually by a suitably qualified contractor and any arboricultural works are to be carried out accordingly**
- **Shrub bed areas shall be maintained as bare earth and kept free from weed growth, litter and rubbish at all times. Any shrubs overhanging pedestrian routes or adjacent grassed areas are to be pruned back.**
- **Pruning of ornamental shrubs should be done to encourage healthy and bushy growth and promote desirable ornamental features, e.g. flowers, fruit, autumn color, stem color.**

	• Smooth flowing curves of edges with adjacent shrub areas to be left neat and well defined.
<i>Monitoring</i>	Monitoring will be undertaken by the HSE Manager throughout the project life. Monitoring of planting and seeding will be undertaken for 5 years after completion of project.
<i>Emergency Measures</i>	Environmental Coordinator to be informed immediately if any adverse impact to habitat occurs in the project proximity which is set aside for operation of the project
<i>Environmental Budget</i>	70,000/-

8.5 Training and Capacity Building

Training and capacity building trainings are conducted on the regular basis to enhance the capacity of the workers hired for the working. Following is the detailed plan along with the schedules of the training:

Table 22: Training and Capacity Building Plan

Training and Capacity Building Plan	
	Operation Phase
Potential Impacts	During operational phase, nearby society will face problems like: • Noise Pollution due to processing and movement of vehicles • Disease vector production due to improper management of solid waste • Contamination of ground water if the wastewater is not disposed off properly • HSE issues may arise
Mitigation	Training and Capacity Building Plan
Management Plan	Project will ensure in-house training for the project staff and the supervisory staff of the Proponent/EA through the provision of one day basic training and one day advanced training, covering environmental and social aspects of the projects in general, and

	implementation requirements will emphasis on the development projects in general, and implementation requirements with emphasis on the roles and responsibilities of the staff and the labour while executing the environmental monitoring plan in particular. The training protocols will include the following aspects: • Procedures for monitoring water quality parameters and measures to			
	• be adopted for avoiding or minimizing water pollution, particularly from the wastewater effluent generated from municipal uses and in the process activity • Safe solid and process waste disposal practices • Safety measures against hazards for workforce and the local communities arising from the construction activities • Use of safety gadgets by the workforce • Training for the use of PPEs			
Monitoring	Responsibility	Responsible	Environmental Budget	Monitoring Duration
	Training of staff, vehicle operators and labour	Project Manager / HSE Manager	20,000/-	1-day training once a year

8.6 Proposed EMP Reporting and Reviewing Procedures

An effective mechanism to store and communicate environmental information during the project is an essential requirement of an EMP.

8.6.1 Meetings

As environment is multidisciplinary subject with environmentalist having a dynamic role therefore Environment Officer would be considered as integral part in both constructional and operational team. Participation of Environment Officer in daily morning meeting and any other special meeting is mandatory. Besides internal meeting HSE Engineer/Environment Officer is also responsible to conduct meeting with local in keeping administration in liaison.

8.6.2 Changes-Record Register

A change-record register will be maintained at the site, in order to document any changes in

project design. These changes will be handled through the change management mechanism.

8.6 Impacts and their Mitigation Summary

Environmental and social impacts have been identified for the process of medicines processing; their impacts had been mitigation by adopting required measures as recommended in EMMP of this EIA Report within the Project Area of Influence. The major impacts on physical, biological and social environment are described as under:

Table 23: Impacts Summary of Pharmaceuticals Processing

Environmental Parameters	Impact Assessment during operational Phase
	Operational
A: Physical	
Land Resources	
Soil Erosion and Contamination	0
Transportation	-1t
Solid Waste and By-Products	-2p
Land Use	NA
Air Resources	
Noise Pollution	-1t
Air Pollution	-1t
Dust Emissions	-1t

Water Resources		
Ground Water	-1p	
Surface Water	NA	
Wastewater	-2p	
B : Ecological		
Flora		
Tree Cutting	+1p	
Fauna		
Terrestrial Fauna	+1p	
C: Socio-Economic		
Employment Opportunities	+3p	
Land Value Appreciation	+2t	
Availability of Local Raw-Material	+2p	
Economic Uplift	+3p	
D: Hazards		
Physical Hazards	-1p	
Chemical Hazards	-1p	
Health and Safety	-1p	

Legends: 1= Low; 2= Medium; 3= High; 4= Extremely High; NA= Not Applicable; t= Temporary; p= Permanent; app= Applicable; 0= Negligible

8.7 Equipment Maintenance Details

The Client and Contractor will be responsible to maintain equipment with higher efficiency and in good working conditions. The equipment will be maintained twice a year as well as monthly inspection will be done on the regular basis to keep the process going without any interruption.

8.8 Environmental Budget

The environmental budget for the project is PKR 5 lacs which will be used for the control of the air pollution by the tree plantation at various designated sites, EMMP for the operational phase and monitoring of environmental parameters (such as ambient air, noise and wastewater). The total cost of the project is PKR 400 Million. EMMP and the monitoring will be carried out on the regular basis. So, more than 1% of the total project cost will be allocated for the environmental protection.

PUBLIC CONSULTATION, PARTICIPATION AND DISCLOSURE

7. INVOLVEMENT OF STAKEHOLDERS/PUBLIC CONSULTATION

7.1 GENERAL

This section describes the regulatory policy, planning and current practices of project proponent pertaining to the stakeholder engagements and outcomes of stakeholder consultation process initially done as part of the IEE/EIA report. The feedback from communities and other stakeholders directly or indirectly affected by the project is collected so that it may be used to adjust and improve the project's design, planning, implementation and help the implementation structure ensuring that the project is both environmentally and socially sound. The consultation process was carried out in accordance with the requirements of the Punjab Environmental Protection Act and Government of Pakistan on public consultation.

The objectives of this process were;

- To disseminate information on the project and its expected impact, long-term as well as short-term, among primary and secondary stakeholders,
- To gather information on relevant issues so that the feedback received could be used to address these issues at an early stage of the project,
- To determine the extent of the negative impacts of different project activities and suggest appropriate mitigation measures.

7.2 IDENTIFICATION OF STAKEHOLDERS

There are two types of stakeholders, i.e.

- a. Primary stakeholders
- b. Secondary stakeholders

7.2.1 Primary Stakeholders

The primary stakeholders are the initial stakeholders, such as affected persons, general public and women residing in the project area. Accordingly, the consultations / focus group discussions were made with all primary stakeholders for sharing of information about the proposed project and expected impacts and understanding about the concerns by category of stakeholders.

7.2.2 Secondary Stakeholders

The secondary stakeholders are the representatives of Government Departments/Agencies involved in

the planning, design, implementation and operation of the project, including various government departments such as District Administration, EPA, WAPDA, and other relevant departments.

7.3 STAKEHOLDER ENGAGEMENTS PLANNING

A two fold stakeholder engagement is planned and carried out for the proposed project as following:

(a) Stakeholder Consultation during the Preparation of EIA Report:

The consultation with the primary and secondary stakeholders has been conducted initially during the preparation of the IEE/EIA report, details of which have been given in the subsequent paragraph at 10.4.

2.2. STAKEHOLDER CONSULTATION PROCESS

The overall strategy for stakeholder's consultation is as follows:

a. Table - 9.1: Process of Stakeholder Consultation

Stakeholders	Purpose of Consultations	Methodology	Stage
Primary Stakeholder	- Information gathering and data collection. - Information sharing about the project (disclosure) - Opinion seeking (concerns and expectations) - Grievance redress	- Focus Group Discussions - Household surveys - Formal and informal Community meetings	Base line Study Impact Assessment
Secondary Stakeholder	- Participation in the development process - Information gathering - Authentication and validation of the development processes - Verification of the record	- One on one meetings - In-depth interviews	- During the EIA preparation - On need basis during the project implementation and

Stakeholder consultation for this project was planned during the preparation of IEE report. In first step during the scoping, which has already taken place, consisted of meetings with individuals,

groups, relevant organizations and government departments, which are in some way linked to the project and therefore considered stakeholders. The meetings were conducted to inform stakeholders about the project and how it may affect their lives/activities, and to record their concerns, whether real or perceived. Through the use of various tools the study team tried to involve the stakeholders in active decision-making. The results of this exercise are described below, where mitigation measures have been developed addressing the pertinent stakeholder concerns.

2.3. PRIMARY STAKEHOLDERS CONSULTATION

Apart from gathering of quantitative data through household survey of the area of influence of the project and survey of local community to share the information about the project and record their concerns/ feedback associated with this project. In this context, nearest community shared their view point regarding the assessment especially procedure for entering their concerns/ grievances, employment opportunities, and implementation of the project.

9.5.1. Topics for Discussion

The topics discussed in the consultations were:

- Employment and livelihoods of communities.
- Gender and women issues
- Contractor's camp and access
- Environmental issues during construction and operation of project
- Company responsibility for employment, etc
-

9.6 PROPONENT ENVIRONMENTAL MANAGEMENT TEAM:

All possible impacts and mitigation measure related to the project were discussed with the proponent and management. They assured to take all suggested mitigation measures to control any discrepancy arose by the project and to make the project environment friendly.

Roles and Responsibilities

Sr#	Concerned	Duties
-----	-----------	--------

	Persons	
1	The Project Manager	Following will be the responsibilities of the Project Manager • Ensure that the contractor is aware of all specifications, legal constraints, standards and procedures pertaining to the project specifically with regards to environment. • Ensure that all stipulations within the EMMP are communicated and adhered to by contractor(s) • Monitor the implementation of the EMMP throughout the project by means of site inspections and meetings. This will be documented as part of the minutes of the site meeting documents • Ensuring project execution within defined budget and timelines • Conducting regular check of the project status and meetings with project team • Provide support and guidance to project team as and when needed • Project Manager is expected to continually monitor and improve the overall performance of their operation
4	QHSE Manager	In addition to the health and safety responsibilities held by staff, managers and supervisors must do whatever is reasonably practical to ensure that both the workplace and the work itself

		are safe. This includes: • Ensuring that staff are appropriately trained and supervised • Identifying, assessing and managing health and safety risks • Consulting with workers (including staff, affiliates and contractors): • Health and safety risk assessments • Decisions are made about the measures to be taken to eliminate or control these risks • Health and safety risk assessments • Implementing health and safety risk management programs relevant to their operations, teaching, research and consulting functions and work environment • Reporting (to the Human Resources Unit), investigating and responding to all hazards, accidents, incidents and taking action to control the risk • Assisting with the development, implementation and maintenance of a return to work program for injured staff. • Be fully conversant with the EIA and conditions of its approval
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		• Be fully conversant with the EMMP • Be fully conversant with all relevant environmental legislation, policies and procedures, and ensure compliance • Convey the contents of this document to the contractor site staff and discuss the contents in detail with the Project Manager and Contractor • Undertake regular and comprehensive inspection of the site and surrounding areas in order to monitor compliance with the EMMP • Take appropriate action if the specifications contained in the EMMP are not followed • Monitor and verify that environmental impacts are kept to a minimum, as far as possible • Review and approve construction methods, with input from the Site Manager, where necessary • Ensure that activities on site comply with all relevant environmental legislation • Compile progress reports on regular basis, with input from the Site Manager, for submission to the Project Manager, including a final post excavation audit • Liaise with the Site Manager regarding the monitoring of the site
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		• Report any non-compliance or remedial measures that need to be applied • All environmental problems arising on the construction area will be reported to the Site Manager by the Environmental Manager. Reports on such problems will be submitted to the Project Manager by the Site Manager
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9.7 THE RESPONSIBLE AUTHORITY

The Pharmista Laboratories Pvt Ltd Management shall be the responsible authority to take all measures prior to start the project and during operation.

9.8 OTHER DEPARTMENTS AND AGENCIES

For the impact analysis detailed with the management, local community, educational institutes, health institutes, hospitals and NGOs. All issues were discussed related to implementation of the project. Scoping sessions, focused group discussion and way side consultations were held with the relevant stakeholders in the area.

Environmental Experts & Other Departments Discussion:

When Discussion has been made with Environmental researchers & students and other concerned departments, they were very much interested for this project to be constructed in the **Lahore District**. Regular monitoring of emissions will be practiced to comply with the PEQS. They were very much satisfied about environmental issues because there is no removal of trees and habitat destruction due to project activities as there exist no any trees or habitat at the proposed site. Tree plantation is the part of project to improve the environmental conditions of the site. Tree plantation activities will be carried out by the project proponent on regular intervals. The vehicles carrying wastes would be properly covered to reduce the odor problem. Waste produced during the project activities would be properly managed and disposed off. Regular environmental monitoring would be ensured to meet PEQS.

Public Consultations:

The consultations were made with the local community to share the information about the project and record their concerns/ feedback associated with project.

7.4.1 Concerns Regarding the Project:

During the field survey, people were asked about their views regarding the said Project. In general, local community has positive attitude towards this said Project that this will help to improve the development of the area.

7.4.2 Major Stakeholders identified

In the Project Area, all the possible stakeholders were identified during the survey. Following is the list of potential stakeholders in the Project Area

- Local residents Teachers
- Shop owners
- Office Workers Laborers
- Pedestrians
- Mosque users.
- Transport users
- Environmental Experts
- Responsible authority & other departments

Issues Discussed

Following issues were discussed during the stakeholder 's consultation:

- Overall activities of the project and their possible impacts.
- Possible impacts on natural vegetation, flora and fauna
- Possible mitigation measures;
- Beneficial factors and involvement opportunities of the local people in the set of activities of Project; and
- Management of traffic during construction and operational phase of the project.

7.5.1 General

Majority of stakeholders appreciated the project and taken it as a necessary step towards the current situation of waste problems. Few people had some reservations regarding the emissions of gases.

7.5.2 Environmental

Few people were concerned about the gaseous air emissions due to the operation of the furnace. Some people also show their apprehension regarding noise pollution due to loading and unloading of

billets and raw scraps, respectively.

7.5.3 Socio Economic

Expectations about employment opportunities and community development were extremely high among all stakeholders.

Pictorial Evidence of Public Consultation





Consultation With Locals

SOCIOECONOMIC SURVEY AND PUBLIC CONSULTATION

For ascertaining the perceptions of different stakeholders about the project, meetings were held with them. These meetings were held in an open atmosphere, in which participants expressed their views freely. Informal group discussions were also held as an additional tool for the assessment of the perceptions of the stakeholders.

Consultation Areas

1. Mouza Bhai Kot
2. Sunder Adda

1.1.1 List of people consulted

Sr. No.	Name of Respondent	Education Status	Age	Occupation
1	Waqas Ali	Middle	33	Worker

2	Shabbir	Matric	29	Guard
3	Muhammad Farhan	Primary	42	Driver
4	Fahim	Intermediate	38	Shopkeeper
5	Adnan Bashir	Graduation	26	Employee
6	Arsahd Sial	Nil	21	Labour
7	Muhammad Tayyab	Nil	18	Labour
8	Muhammad Tayyab	Graduation	22	Student
9	Farruk nazir	Undergraduate	20	Intern
10	Ghulam Ishaq	B.sc	40	Employee
11	Irfanullah	Primary	38	Driver
12	Saeed Rasool	Nil	35	Labor
13	Iqra Batool	Intermediate	28	Employee
14	Syed Nasir Khan	B.A	30	Employee
15	Waqif Shah	Middle	32	Shopkeeper
16	Hikmat Shah	Matric	37	Guard
17	Rohina Aziz	Matric	34	Worker
18	Gul Sher	Intermediate	28	Shopkeeper

19	Astam Khan	Intermediate	26	Salesman
20	Muhammad Umer	Graduation	25	Medical Wrap
21	Salma Bashir	Nil	40	Nil
22	Zainab Bashir	Intermediate	18	Student
23	Jahanzeb	Matric	24	Guard
24	Rasheed Khan	Middle	40	Driver
25	Shaheen Idrees	Matric	27	Worker
26	Sabir Khan	Nil	33	Labour
27	Alam Noor	B.Com	24	Employee
28	Ali Rehman	Intermediate	21	Salesman
29	Abdul Waheed	Masters	30	Self Employed
30	Gul Rasool	Nil	36	Labour

Awareness Regarding the Project

Following issues were discussed during the stakeholder consultation:

- Overall activities of the project;
- Possible impacts on natural vegetation, air, land and properties;
- Possible mitigation measures;
- Benefits of the project specifically for the local people.

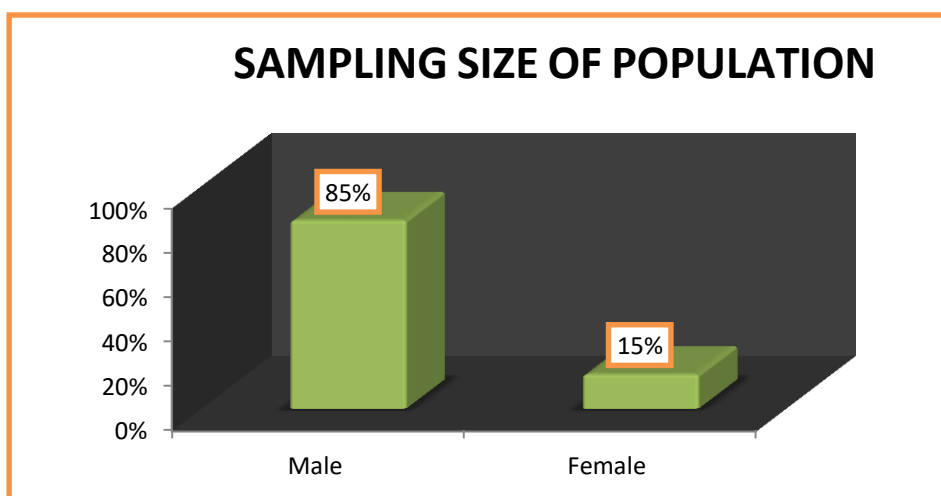
2 Sample size

Sample size of 30 respondents was selected by the Team of consultants for conducting the socioeconomic survey. Women were also consulted for the said survey; some of their names are mentioned in the above list of respondents while most of them were not willing to give personal information. List of respondents is attached at the end of this chapter.

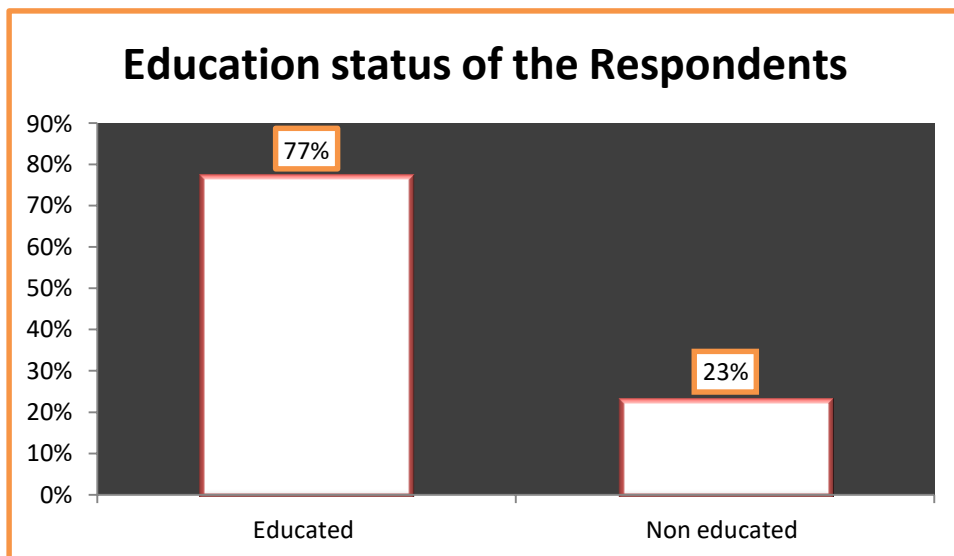
3 Statistical Analysis

SPSS 19.0 has been used for the statistical analysis of the data collected during the visit of study site area through questionnaires.

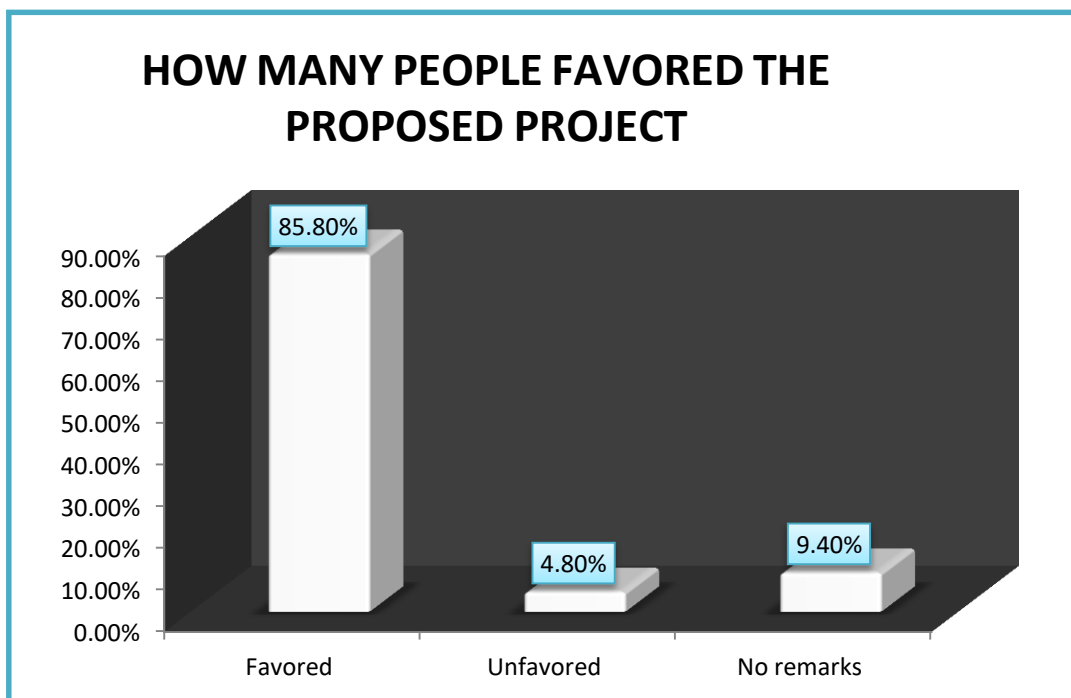
Graphical representation of analysis is given below:



In the sampled population, 85% respondents were male while 15% respondents were female. The number of female respondents is less as compared to male respondents because according to the social binding female hesitates to respond or communicate comfortably.

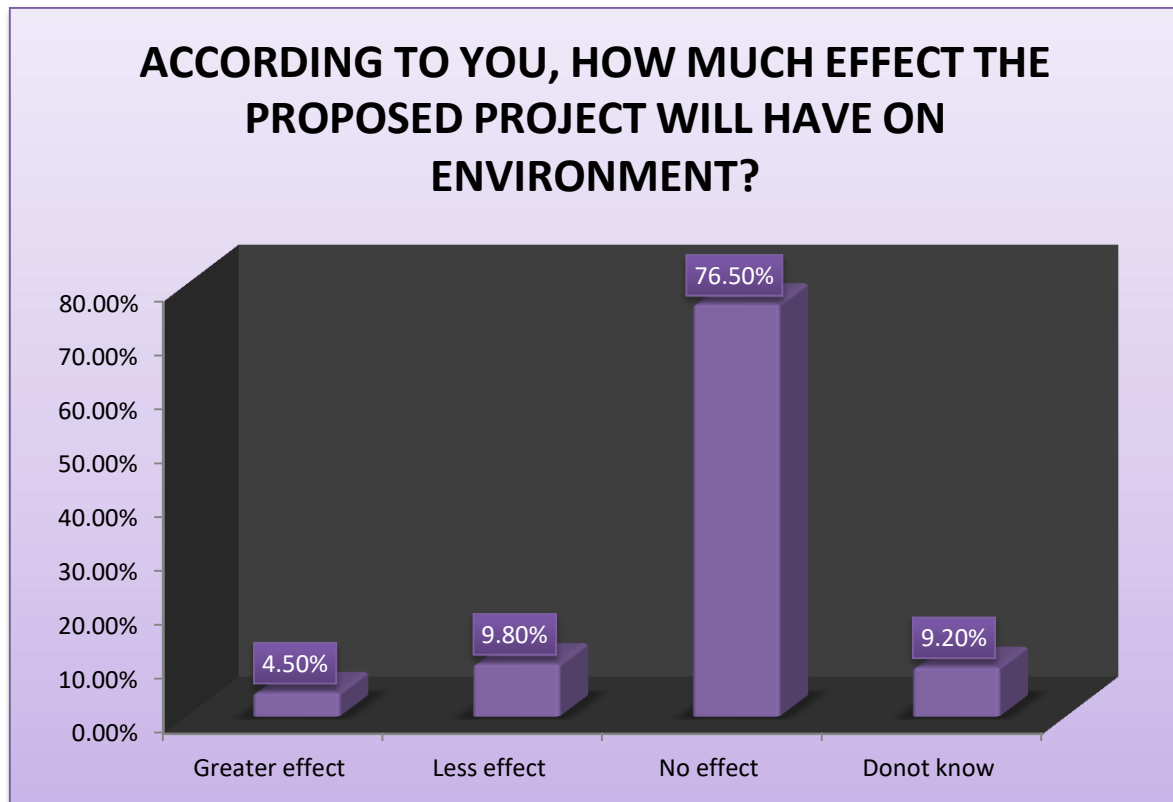


In the sampled population, 77% respondents were educated while 23% were uneducated. Overall education status of the area is good.

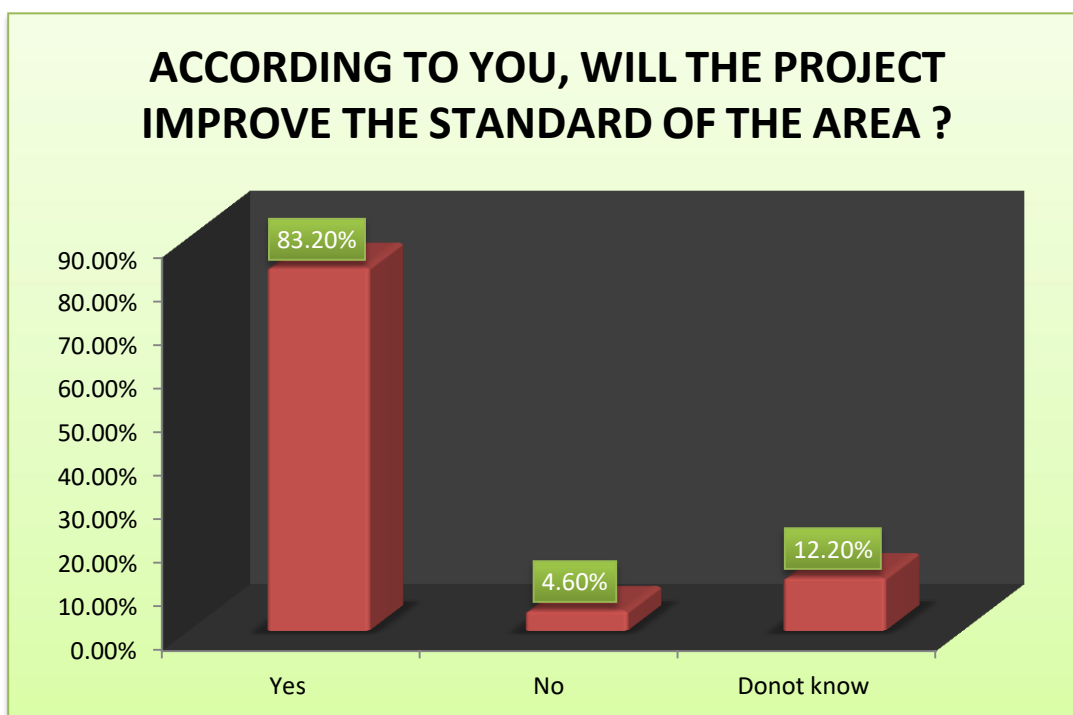


As per survey, 85.80 % people favored the project and they gave positive remarks regarding the subject project. While 9.40% respondents had no opinion regarding

the project and 4.80% respondents were not satisfied with the project because they think that development will affect the natural aesthetics of the area.



As per survey, 4.50% respondents said that subject project will affect the environment of the area, 9.8% said that there will be less effect on the environment, 76.50% respondents said that the project will not affect the environment and 9.20% said that they have no idea regarding the subject project. Most of the population was not aware about the environmental importance; they were giving their remarks according to their own knowledge.



As per survey, 83.2 % people said that the project will improve the standard of the area, 4.60% said that it will have no impact on the area while 12.20 % respondents gave no remarks.

4 Findings of the Overall Discussion:

- After the completion of the project the site will be used for industrial activities.
- It will enhance the socio-economic conditions/values of the area.
- Project will increase revenue generation for the Government.
- It will create employment opportunities.

5 Findings of the Overall Discussion:

- After the completion of the project the site will be used for medicines manufacturing.
- It will enhance the socio-economic conditions/values of the area.
- Project will increase revenue generation for the Government.
- It will create employment opportunities.
- Local people will be given preference for employment in the proposed project.
- Construction of the project will be completed in the designated timeframe to limit adverse impacts of construction.
- There will be no significant additional load on the existing infrastructure i.e. utilities of water, telephone, electricity etc. due to the development of the proposed project.

Majority of people favored the project in a sense that the construction of the said project will generate employment opportunities for local people and revenue for the government, will enhance the socioeconomic conditions of the area and automatically will contribute to the national economy of the country.

5.1.1 Concerns and solutions:

COMPONENTS	CONCERNS	SOLUTIONS
Environmental Enhancement	Trees should be planted to avoid any impact	- Trees will be planted along boundary of project - Indigenous trees around the facility should be planted to control air pollution
Socio-Economic Uplift	Workers should be hired from local community	Proponent has considered hiring labor from local community to enhance the socio-economic condition of the area as this aspect is included in the scope of the project.
Solid Waste	Proper disposal of solid waste should be practiced	A designated area has been planned to establish in the site for the collection of solid waste. Solid waste will be disposed of regularly from the site as per practice.
Fire Hazard	Proper fire-fighting should be placed at site	Firefighting equipment such as Fire Hydrant Fire Extinguisher will be installed in the said unit for mitigating the impact associated with the fire hazard.

Stakeholders Consultation

S #	Participant	Designation	Concerns/Remarks
Responsible Authority			

1	Muhammad Mumtaz	Inspector Environment Lahore	• Environmental enhancement measures such as; Tree plantation, monitoring and safety should be ensured • Septic Tank should be constructed • Preventive measures should be adopted to avoid any unfortunate incident • Tree plantation must be ensured
Other Departments			
1	Muhammad Abdullah	Local Govt (LGCD)	• There is no endangered/indigenous species • However, plantation should be done to enhance environment
Proponent's Environment Management Team			
1	Proponent and Environment Management Team	Manager	• Local employment will be ensured during construction phase • Tree plantation will be done to make project environment friendly • No waste will be dumped improperly • Quality will be ensured
Environmental Practitioners and Experts			
1		PhD. Environment	• Health and safety arrangements must be provided • All type of waste should be managed to avoid nuisance
Affected and Wider Community			
1	Mr. Zohaib	Local NGO	• Local employment should be ensured • Proponent shall work for betterment of community

CHAPTER # 8

6 CONCLUSION & RECOMMENDATIONS

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

8.1 Conclusion

The EIA study reveals that the project is economically viable and socially acceptable and the proponent will implement the project in the environment friendly manner. He will adopt all the necessary measures to control any impact if resulting from the project. He will provide the safe drinking water, safe working environment, proper training and first aid facility to all workers and staff. The project will generate additional jobs during construction and operation phases.

8.2 Recommendations

In view of the comprehensive screening process and findings of the present study there is no need of conducting further investigations.

- Tree plantation inside and near the project area is recommended.
- The Management of will continue to assist the local communities as a corporate/social responsibility (CSR).
- Any seepage and leakage will be controlled through proper mitigation measures.
- Sound proof room should be constructed for generator to control its sound.
- Use of narcotics and smoking must be prohibited during working, filling or handling of fuel.
- PPEs must be provided to workers such as gloves, masks, etc.
- Proper solid waste management system must be adopted.
- Safety signs, safety board's etc. must be placed on site during various developmental stages.
- Machinery will never be left in running condition.
- First Aid measures, health & safety Equipment (PPEs) will be provided to workers.
- Fire Fighting station & system will be installed.
- The management of subject project will assist the local communities as a corporate social responsibility.
- Jobs and employment will be provided to the local area.

The present EIA report is enough to meet the administrative and legal framework. After the



complete study of the project, it is concluded that project will not have significant adverse impacts on the nearby community and on environment. Overall the project will have positive impacts on the local population and country as a whole. Therefore, it is requested for the environmental approval for the subject project.

Appendices

REFERENCES:

- <https://www.epa.gov/sites/production/files/2015-10/documents/njmc-wpp-2.pdf>
- Schedule I of Punjab Environmental Protection Act 1997 (Amended 2012)
- *section 12 of Punjab Environmental Protection Act 1997 (Amended 2012)*
- Information and data provided by the proponent
- Project feasibility report
- Technical design data related to the project
- Interviews with project related persons of project proponent
- Technical documents of various machinery/equipment
- Meteorological Data from Pakistan Meteorological Department
- Pakistan Environmental protection act 1997
- Punjab Environmental Protection Act 1997 (Amended 2012)
- Guideline for the Environmental Assessment
- Regulations of Environmental Assessment, Regulations 2022
- National Conservation Strategy- Pakistan
- Guideline for the public consultation
- National Resettlement Policy and Ordinance
- National Environmental Quality Standards (Self-monitoring and reporting by the industry)
- Labor laws
- Canal And Drainage Act, 1873
- National Environmental Policy 2005.
- The Land Acquisition act, 1894
- The Punjab local Governmental ordinance, 2001.
- Meteorological data from meteorological department and website
- Pakistan Biosafety rules 2005
- Pakistan Environmental agency (review of IEE/EIA) regulation 2022.
- Punjab Portal (<http://www.punjab.gov.pk/attock>)
- Attock Chamber of Commerce Industries (<http://www.acci.org.pk/Attock.html>)
- Sectorial Guideline for environmental reports, industrial states
- Pakistan Environmental Protection ordinance (PEPO), 1983
- OSHAS 1800 for health and safety

GLOSSARY

GLOSSARY

1.1 Annexure: A: Glossary

- I. **Environment:** means air, water and land; all layers of the atmosphere; all organic and inorganic matter and living organisms; the ecosystem and ecological relationships; buildings, structures, roads, facilities and works; all social and economic conditions affecting community life; and the inter-relationships between any of the factors mentioned
- II. **Environmental Impact Assessment:** means an environmental study comprising collection of data, prediction of qualitative and quantitative impacts, comparison of alternatives, evaluation of preventive, mitigatory and compensatory measures, formulation of environmental management and training plans and monitoring arrangements, and framing of recommendations and such other components as may be prescribed
- III. **Initial Environmental Examination:** means a preliminary environmental review of the reasonably foreseeable qualitative and quantitative impacts on the environment of a proposed project to determine whether it is likely to cause an environmental effect for requiring preparation of an environmental impact assessment
- IV. **Effluent:** means any material in solid, liquid or gaseous form or combination thereof being discharged from industrial activity or any other source and includes a slurry, suspension or vapour
- V. **National Environmental Quality Standards:** means the permissible standards for emission of air pollutants and noise and for discharge of effluent and waste
- VI. **Domestic Wastewater:** The wastewater from households' & Sanitary uses
- VII. **Discharge:** means spilling, leaking, pumping, depositing, seeping, releasing, flowing out, pouring, emitting, emptying or dumping
- VIII. **Waste:** means any material, substance, or by-product eliminated or discarded as no longer useful or required after the completion of a process
- IX. **Sustainability:** means such developments that meet the needs of the present generation without compromising the ability of future generations to meet their needs
- X. **Baseline:** Conditions prevailing at the time of study or before initiation of any project

- XI. **Environment budget:** Monetary assets reserve for environmental activity.
- XII. **pH:** negative log of hydrogen concentration:
- XIII. **Flora:** plant life occurring in particular region or time.
- XIV. **Fauna:** Animal life occurring in particular region or time.
- XV. **Nuisance:** A person, thing or circumstances causing inconvenience or annoyance.
- XVI. **Proponent:** the person who intends to carry-out a proposed project.

LIST OF ABBRIVIATIONS

CO	Carbon monoxide
CO₂	Carbon dioxide
NFPA	National Fire Protection Association
SO₂	Sulphur Dioxide
°C	Degree Celsius
PM₁₀	Particulate Matter >10
EIA	Environmental Impact Assessment
EMMP	Environment Management & Monitoring Plan
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
EPD	Environment Protection Department
PEQS	Punjab Environmental Quality Standards
SPM	Suspended Particulate Matter
HSE	Health Safety and Environment
UDT	Urban Development and Tourism
SEP	Standard Engineering Practices
ERP	Emergency Response Plan
SWM	Solid Waste Management
IEE	Initial Environmental Examination
Km	Kilometer
CUM	Cubic Unit per Meter

GWT	Ground Water Table
Ltd.	Limited
HC	Hydrocarbon
Mm	Millimeter
NEQS	National Environmental Quality Standards
No.	Number
NOC	No Objection Certificate
NOx	Oxides of Nitrogen
PA	Protected Area
PEPA, 1997	Pakistan Environmental Protection Act, 1997
PEPA, 2012	Punjab Environmental Protection (Amendment) Act, 2012
PEPO	Pakistan Environmental Protection Ordinance
PKR	Pakistani Rupees
PM	Particulate Matter
PPEs	Personal Protective Equipments
Pvt.	Private
SFT	Square Foot
SOPs	Standard Operation Procedures
SOx	Oxides of Sulphur
TMA	Town Municipal Authority
WAPDA	Water and Power Development Authority
WASA	Water and Sanitation Agency

WHO	World Health Organization
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LIST OF EIA STUDY TEAM WITH QUALIFICATION AND POSITION IN TEAM.

Name	Qualification	Position in the EIA/IEE Team
Muhammad Rehman Majeed	M.Phil (Environmental Science) GCU Lahore	Project Incharge And Supervisor
Muhammad Shahzad	M.Phil Environmental Science GCU Lahore	Team Leader and Coordinator (Author of the Report)
Mohsin Ali	M.Phil Environmental Science GCU Lahore	Senior Environmentalist (Field Analyst)
Faisal Irshad	BS (Hons) Environmental Engineering (UET Lahore)	Environmental Engineer
Ammara Anwar	MS (Hons) Environmental Science (PU Lahore)	Research Associate (Author of the Report)