Environmental Impact Assessment (EIA) Report

M/S METAL PLUS ENTERPRISES PVT LTD

SAGGIAN ROAD, NEAR INAM RE-ROLLING STEEL MILL MOUZA MEHMOOD BOOTI, TEHSIL SHALIMAR DISTRICT LAHORE

Report Submitted By:

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Report Prepared By:

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EXECUTIVE SUMMARY

1. Title of the Project

This report presents the findings of the Environmental Impact Assessment (EIA) study of Aluminum & Copper Casting Unit by Metal Plus Enterprises Pvt Ltd.

2. Location of the Project

The proposed project site is located at Saggian Road, Near Inam Re-Rolling Steel Mill Mouza Mehmood Booti, Tehsil Shalimar District Lahore.

3. Name of the Proponent

The proponent of proposed project is Rashid Waheed S/O Sheikh Abdul Waheed R/O Paragon City Barki Road, House No: 4 Block Mounds Lahore Cantt District Lahore .

4. Name of the Organization Preparing Report

To comply with IEE/EIA regulations 2022 as per Punjab Environmental Protection (Amendment) Act (PEPA) 2012, the proponent of Metal Plus Enterprises Pvt Ltd has entrusted the ***Safe EnviroSolutions*.**

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Phone: *+92 336 8779107* **Email:** *safe.envirosolutions@gmail.com*

5. A Brief Outline of the Proposal

The proponent intends to establish the Copper & Aluminum casting unit under name & style Metal Plus Enterprises Pvt Ltd to from the copper & aluminum ingot. The area of the project site is 5 Kanal-15 Marla. Capacity of the proposed project is 150 Tons/month. Capital cost of the project including Land, construction and Machinery Installation is 20 Million PKR.

In compliance with the legal requirement of Section 12 of Punjab Environment Protection Act-1997 (amended act), the proponent is required to submit the Environmental Impact Assessment (EIA) report before the commencement of the said project, therefore, Environmental Impact Assessment (EIA) report is being submitted to the Environmental Protection Agency (EPA), Government of the Punjab, Lahore.

6. The Major Impacts

7.1 Impacts During Construction Phase

The study team reviewed the Project with the aim to determine the likely impacts of the project on the environmental and socio-economic conditions of the area. All the necessary elements of the project were reviewed and compared with the existing conditions in the vicinity of the Project Area.

- During the construction vehicles and machinery are employed. Most of these operates using diesel engines that generate noise and exhaust emissions. The possibility of exhaust emissions increases when old vehicles/plants are utilized for the execution purposes. Generally, the above activity is generating particulate- matter (PM_{10}), smoke, dust, CO and NOx in the ambient air, which is deteriorating the air quality and resulting in potential impacts on human health. These machines generate some dust and smoke temporarily due to which PM_{10} and $PM_{2.5}$ levels in the ambient air may exceed the permissible limits.
- The movement of heavy machinery and vehicles on the dirt tracks is also causing fugitive dust emissions. Source of air pollution for this project activities are unpaved roads. Dust plumes behind vehicles moving along unpaved roads represent a typical occurrence, since as the vehicle travels over an unpaved road, the force of the wheels on the road surface causes pulverization of the surface material. Particles are lifted and dropped from the rolling wheels, and the road surface is exposed to strong air currents in turbulent shear with the surface. As an approximation, fugitive dust (dust generated from unpaved roads is termed "fugitive dust" because it is not discharged into the atmosphere in a confined-flow stream) from unpaved roads can be considered to average. This dust would be a problem for the nearest communities.
- Safety issues could also arise for workers during construction phase of the project.

Mitigation Measures

The following mitigation measures will be adopted to overcome the impacts on resources;

- Tuning of vehicles should be made mandatory to reduce the emissions of NOx, SOx, CO and PM_{10}. Equipment and vehicles powered with diesel should be well maintained to minimize particulate emissions.

- Trucks carrying, sand, aggregate and other materials should be kept covered during transportation of materials and during storage at site, with tarpaulin.
- For the construction machinery generating noise level in excess of that prescribed in PEQS, Contractor will make arrangements to bring the noise level within applicable limits (including proper tuning of vehicles and mufflers/silencers). Movements of the trucks and other construction machinery causing high noise levels must be restricted at night time to avoid disturbance to the nearby locality. Truck drivers should be instructed not to play loud music at night and stop use of horn. It is suggested that noise barriers should be installed at construction site during the construction phase of the project.
- The fugitive dust emission will be a problem for the nearby communities which will be mitigated by sprinkling of water.

7.2 Impacts During Operational Phase

During the operation phase of the project to the major source of the pollutions are the following;

- Gaseous and particulates emissions from project operation
- Noise during the operation of the unit
- Domestic Wastewater sewage from toilets
- Solid Waste

Mitigation Measures

The following mitigation measures will be adopted;

To control the particulates and gaseous emissions from the stack of the unit proper mitigation measures will be taken (installation of scrubbing system) to make the emissions up to PEQS levels.

- The wastewater will be domestic in nature & treated till the PEQS levels before the final discharge from the unit.
- Worker will be provided the ear plugs /muffs as the case may be and low noise producing equipment's will be employed.

Impact	Nature	Duration	Geo-Extent	Reversibility	Likelihood	Consequence Severity/Utility
Physical Impact	ID	ST	LO	RE	LK	MN
Air Quality	D	ST	LO	RE	LK	MN
Ground Water Pollution	ID	ST	LO	RR	PO	MO
Surface Water Pollution	D	ST	LA	RE	PO	MN
Natural Vegetation	ID	ST	LO	RE	LK	MN
Wildlife	ID	ST	LO	RE	LK	MN
Socio-Economic Impacts	D	LT+	LA	IR	PO	MJ
Traffic Congestion	D/ID	ST	LO	RE	PO	MN
Noise and Vibration	D	ST	LO	RE	CE	MO
Safety Hazards	D	ST/LT	LO	RE/IR	CE	MU
Employment	D	LT	LO/LA	RE/IR	CE	MU
Infrastructure	D/ID	LT	LO/LA	RE/IR	CE	MO
Public Health and Nuisance	D	ST/LT	LO	RE/IR	LK	MN

IMPACT CHARACTERIZATION CONSTRUCTION PHASE

- **D:** Direct: **ID:** Indirect; **CN:** Certain; **LK**: Likely; **LT**: Long Term; **ST**: Short Term; **PO**: Possibly; **MN:** Minor; **MJ**: Major; **MT**: Medium Term; **MO**: Moderate; LO: Local; **LA:** Large; **SV**: Severe; **RE**: Reversible; **IR**: Irreversible.

IMPACT CHARACTERIZATION OPERATIONAL PHASE

Impact	Nature	Duration	Geo-Extent	Reversibility	Likelihood	Consequence Severity/Utility
Physical Impact	D	ST	LA	RE	LK	MN
Air Quality	D	LT	LO	RE	PO	MN
Ground Water	ID	ST	LO	RR	PO	MO
Water consumption and water availability	D	ST	LA	RE	PO	MO
Biological	ID	ST	LO	RE	LK	MN
Natural Vegetation	ID	ST	LO	RE	LK	MN
Wildlife	ID	ST	LO	RE	LK	MN
Socio-economic Impacts	D	LT+	LA	IR	PO	MJ
Traffic Congestion	D/ID	ST	LO	RE	PO	MN
Noise and Vibration	D	ST	LO	RE	CE	MO
Safety Hazards	D	ST/LT	LO	RE/IR	CE	MU
Employment	D	LT+	LO/LA	RE/IR	CE	MU
Infrastructure	D/ID	LT	LO/LA	RE/IR	CE	MO
Public Health and Nuisance	D	ST/LT	LO	RE/IR	LK	MN

- **D:** Direct: **ID:** Indirect; **CN:** Certain; **LK**: Likely; **LT**: Long Term; **ST**: Short Term; **PO**: Possibly **MN:** Minor; **MJ**: Major; **MT**: Medium Term; **MO**: Moderate; LO: Local; **LA:** Large; **SV**: Severe; **RE**: Reversible; **IR**: Irreversible.

8. Proposed monitoring

Environmental monitoring has been proposed for construction and operation phase of the project. During construction phase, the construction contractor will be responsible for annually monitoring of all environmental parameters (ambient air, ground water and noise level). One (1) environmental monitoring report will be prepared on monthly basis and one (1) comprehensive report will be prepared at the end of the construction phase and will be submitted to Environmental Protection Agency Punjab.

Whereas biannually and quarterly monitoring of ambient air, ground water and noise level will be carried out by the proponent during operation phase of the project. One (1) environmental monitoring report will be prepared biannually and one (1) comprehensive report will be prepared and submitted to the EPA-Punjab. Contents of the final report will include results of environmental monitoring in comparison to the standards for the various parameters, location and sampling time along with recommendations for the future projects.

Sr. No	Monitoring Parameter	Monitoring Location	Remarks
A. Construction Stage			
1.	Noise	Construction Vehicle/ Machinery/ generators/Welding work	Construction vehicles / machinery / generators will be checked regularly for noise level by the contractor during construction phase.
2.	Smoke Emissions (CO, NOx, PM, SO_2 etc.)	Construction Vehicle/ Machinery/ generators	Construction vehicles / machinery / generators will be checked regularly for smoke emissions by the contractor during construction phase.
3.	Water Quality As per PEQS	Ground Water/ Surface Water	Sampling and laboratory testing will be done on monthly basis during the construction.
4.	Solid Waste	Worker Camp/ Construction Site	Collection of solid waste shall be checked regularly by the contractor during construction phase.
B. Operation Stage			
1.	Security	Unit Area	Security arrangement will be made.
2.	HSE Plan	---	Health, safety and Environment will be monitored on daily basis.
3.	Indoor Gaseous	Generators Room	Will be carried out on quarterly

	Emissions		basis from the stacks of generator

9. Conclusion & Recommendations

The report provides conclusion based on the impacts assessed and mitigation measures suggested. The report recommends that EMP will be made a part of all bidding /tender documents. The design of the plant should meet the PEQS parameters in all aspects. Construction contractor will be bound to completely implement relevant mitigation measures set out in the EMP during construction phase while during regular operation of the project proponents will be responsible to ensure all the compliance of PEQS. If there are any changes in the plant layout, or any other changes in project description then changes should be carried out through amendments in environmental assessment report and EMP of the EIA Report.

GLOSSARY

Words	Dictionary
Domestic wastewater	Wastewater from sanitary uses
Residential	For living of people
Economically viable	Suitable in monetary terms
Endangered species	Which will extinct in near future
Threatened species	Those in danger of extinction
Aesthetic beauty	Scenic beauty of the area
Ambient	Surrounding of all sides
Topography	Physical features of the site
Silence zone	Where transmission/sound cannot be received
Anticipated Impacts	Expected Impacts
Baseline	Conditions prevailing at the time of study or before initiation of any project
Environment Budget	Monetary assets reserve for Environmental activity
Evaluation	Assessment
Fauna	Variety of Animals found in an area
Flora	Variety of Plants found in an area
Million	10,00,000
Mitigation Measures	Measures aimed to curtail or entirely control an adverse impact or to compensate some loss or cause additional improvements
Orientation Session	Direction Session

Nuisance	Annoyance
pH	Negative log of hydrogen ion concentration
Potential Issue	Problems likely to arise
Proposed Project	Planned activity
Residual Impacts	Impacts left behind after implementation of the mitigation measures
Significant	Important

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INTRODUCTION

Scope of the Study

The scope of this EIA study aims at collection and scrutinization of data related to physical, biological and socio-economic environment of the project area and to prepare the baseline environmental profile. It also aims at the identification, prediction and evaluation of the possible environmental impacts of the proposed project on its immediate surroundings on both short and long-term basis. Based on the nature and levels of those impacts, appropriate mitigation measures are proposed in this EIA Report.

Study Objectives

The specific objective of the EIA study includes the following:

- Collection and scrutinization of data related to physical, biological and socio-economic environment of the project area and to prepare baseline environmental profile;
- Identification, prediction and evaluation of potential environmental impacts of the proposed project;
- Suggesting mitigation measures to minimize the adverse impacts of the project; and
- Preparation of an Environmental Management Plan (EMP).

Purpose of the Report

An Environmental Impact Assessment (EIA) study report has been prepared to identify and assess the significant environmental impacts likely to occur due to proposed project construction along with environmental impact statement followed by appropriate Environmental Management Plan. EIA study of this proposed project has been carried out in order to conform to the requirements of the **Punjab Environmental Protection Act, 1997, amended in 2012 under section 12** of which no development activity can be initiated anywhere in Punjab without filing before the designated government agency an Initial Environmental Examination or an Environmental Impact Assessment, as may be required and having an NOC for construction and operation.

The purpose of this EIA study is to predict all the probable adverse environmental impacts and plan adequate mitigation measures for eliminating, controlling or compensating them and drafting the complete institutional framework for their implementation.

Identification of the Project and Proponent.

The proponent of the said project is Rashid Waheed S/O Sheikh Abdul Waheed R/O Paragon City Barki Road, House No: 4 Block Mounds Lahore Cantt 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 current project, entitled as Metal Plus Enterprises Pvt Ltd falls in the ***Schedule* I1-*Category B (19),* and requires to conduct Environmental Impact Assessment (EIA) study.** Further, the client is required to fulfill the legal requirements of the Section-12 of the Punjab Environment Protection Act 1997(Amended 2012).

Detail of Environmental Consultants

This EIA study has been carried out by ***Safe Enviro-Soluations***. This company comprises environmental engineers, Senior Environmentalists, sociologist, chemical engineers having diversified experience in national system and assignments. The company address and contact information is as follow:

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

Phone: 0336-8779107 ***Email: safe.envirosolutions@gmail.com***

Table 1: Detail of team conducting IEE study with qualification and position in team.

Name	Qualification	Position in the EIA Team
Muhammad Rehman Majeed	M. Phil (Environmental Science) GCU Lahore	Project Incharge & Supervisor
Muhammad Shahzad	M. Phil Environmental Science GCU Lahore	Team Leader & Coordinator (Author of the Report)
Mohsin Ali	M. Phil Environmental Science GCU Lahore	Senior Environmentalist (Field Analyst)
Muhammad Maqbool	PhD Scholar Chemistry (UMT Lahore)	Senior Chemist
Muhammad Zeeshan	PhD Scholar Botany (PU Lahore)	Senior Botanist

Anum Waheed	BS (Hons) Environmental Science (GCU Lahore)	Research Associate (Author of the Report)

**Only the main roles of the team members are given. However, their role was not restricted to these, rather it also includes many other studies in their respective fields in the context of this EIA studies.*

Brief Description of Nature, Size and Location of Project

1.7.1 Title of the Project

This report presents the findings of the Environmental Impact Assessment (EIA) of establishing Aluminium & Copper Casting Unit by Metal Plus Enterprises Pvt Ltd

1.7.2 Location of the Project

The proposed project site is located at Saggian Road, Near Inam Re-Rolling Steel Mill Mouza Mehmood Booti, Tehsil Shalimar District Lahore.

1.7.3 A Brief Description of the Project

The proponent intends to establish the Copper & Aluminum casting unit under name & style Metal Plus Enterprises Pvt Ltd to from the copper & aluminum ingot. The area of the project site is 5 Kanal-15 Marla. Capacity of the proposed project is 150 Tons/month. Capital cost of the project including Land, construction and Machinery Installation is 20 Million PKR.

Screening:

The proponent intends to establish the Copper & Aluminum casting unit under name & style Metal Plus Enterprises Pvt Ltd to from the copper & aluminum ingot *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 this unit by Metal Plus Enterprises Pvt Ltd falls in the Schedule I1-Category B (19) i.e. Smelting plants, and requires to conduct Environmental Impact Assessment (EIA) study.

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

Scoping:

Spatial and Temporal Boundaries of Environmental Assessment

Project site is open vacant plot currently in RUDA industrial area. After its development with time nature of area will change from open land to project site (industrial). Already operation of many industries of such nature are being taking place near around. Currently there is no significant population center present in the area. The current project site is 5 kilometers from population centers. No environmental sensitive area is present that could be impacted due to the current project.

1.5.3 Important issues and concern raised during consultation

During consultation it was observed that maximum of people was in favor of project and following issues and concerns were raised which have also been discussed in length in Chapter 9 Stakeholder Consultation:

- Air pollution should be controlled effectively.
- Locals should be preferred for the job opportunities.
- Wastewater should be treated prior to final disposal.
- Solid waste should be managed effectively by adopting the standard practices of the area.
- Cleanliness of the area should be ensured.
- An effective EMMP should be designed and enforced with true spirit.
- Health of the workers should be ensured.
- Workers should be hired from local community.
- Indigenous tress around the facility should be planted to control air pollution.

1.5.4 Significant impacts and factors to be determined

Main impacts and factors to be determined are;

- Occupational Health and safety
- Site Security
- Traffic Management
- Hygiene management
- Community impacts
- Control Air emissions

- Job opportunities for locals
- Confined noisy activities
- Resource conservation
- Avoid excessive water consumption
- Energy efficient techniques must be adopted
- Proper site restoration after construction
- Tree plantation at designated green areas
- Emergency preparedness

1.9) Structure of the Report

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

Section 2: Policy, Legal and Administrative Framework comprise policy guidelines, statutory obligations and roles of institutions concerning EIA study of the proposed Project.

Section 3: Description of the Project furnishes information about the location of the proposed Project, cost and size of the project, its major components and alternatives considered for the proposed project to select at the preferred alternative for detailed environmental assessment.

Section 4: Environmental Baseline Profile establishes baseline conditions for physical, biological and socio-economic conditions prevalent in the project area.

Section 5: Screening of Potential Environmental Impacts and Mitigation Measures identifies, predicts and evaluates impacts of the project activities during the construction and operation stages and deals with the measures proposed to mitigate potential environmental impacts of the proposed project.

Section 6: Environmental Management and Monitoring Plan outlines institutional arrangements for the implementation of the proposed mitigation measures, training needs of the staff for implementation of the mitigation measures, monitoring requirements and monitoring cost.

Section 7: Explains the Stakeholders Participation

Section 8: Conclusions and Recommendations provide the outcome of the study and major observations of EIA and suggestions for environmental management and pollution control.

Section 9: References.

DESCRIPTION OF THE PROJECT

3.2 Type and Category of the Project

The proponent of the said project is Rashid Waheed S/O Sheikh Abdul Waheed R/O Paragon City Barki Road, House No: 4 Block Mounds Lahore Cantt 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 current project, entitled as Metal Plus Enterprises Pvt Ltd falls in the ***Schedule* I1-*Category B (19) Smelting Plant,* and requires to conduct Environmental Impact Assessment (EIA) study.** Further, the client is required to fulfill the legal requirements of the Section-12 of the Punjab Environment Protection Act 1997(Amended 2012).

3.3 Objectives of the Proposed Project

- The main objective of the proposed project is manufacturing of copper ingot
- To recycle waste compressors.
- To create job opportunities for the locals
- To raise the socioeconomic status of the area

3.4 Consideration of Alternatives

3.4.1 The Project Alternative

A zero-alternative entail maintaining existing use to which the project site has previously been put to. This alternative would eventually evade any short-term potential negative impacts from project execution. To this end, any potential positive impacts envisaged during midterm and long-term project implementation will be missed.

Adopting zero alternatives would mean abandoning all the potential that the site offers to investor(s), contribution to government revenue and even local community livelihoods improvement.

3.4.2 Location Alternatives

To fulfill the industrial aspects of the project under reference of this EIA Report, it is to be sited at a place where there are bright prospects of the proposed project. Concurrently, it must also meet the legal requirements of the Punjab Environmental Protection Act, 1997.

3.5 Modified Construction Technology Alternatives

The development will be constructed using modern, locally and internationally accepted technology and materials to achieve public health, safety, security and environmental aesthetic requirements. Equipment that saves energy and water will be given first priority without compromising on cost or availability factors. The concrete pillars and walls will be made using locally sourced stones, cement, sand (washed and clean), metal bars, iron sheets and fittings that meet the quality standards requirements.

3.6 Technology Alternatives

There is local machinery available that is environmentally friendly. Final design of Machinery is based on the latest available technology to produce high quality ingot. These machines have pollution remove technologies built in. Therefore, it is the best option to use that technology.

Site Suitability

The site does not fall in environmental sensitive area and all commodities are at a suitable distance from project site as they will not impacted by the construction activities even locals will get more benefits and job opportunities. No replacement, relocation and rehabilitation are required for the development of proposed project. The said project is located in industrial area declared by RUDA.

3.5Location and Site Layout of the Project

3.5.1 Location of the Project

Location of the Project

The proposed project is located as Saggian Road, Near Inam Re-Rolling Steel Mill Mouza Mehmood Booti, Tehsil Shalimar District Lahore.

The project is surrounded by the following industries

Front	Re-rolling mill
Back	Open Plot
Left	Open Plot
Right	Open plot

3.5.2 Layout Plan of the Proposed Project

Layout map of the project site is attached with the report.

Figure 1: Satellite Image of Project Location

3.6 Road access

Main roads and markets are in easy and close access of the project site. The said Metal Plus Enterprises Pvt Ltd site is located in access with Saggian Road.

3.7 Project Administrative Jurisdiction

The proposed project lies in the city of Lahore Punjab Province.

3.8 Vegetation Features of the Site

Land is clear and there are no plants or vegetation on site. Significant or well-shaped trees and shrubs are not present on the project site. There is neither the biologically important or endangered species of plants or vegetation of any significance stands at the site to be dismantled. However, various local plants will be grown at the project site in the open areas and grounds.

3.9 Cost and Magnitude of the Project

The total cost of the project would be around PKR 20 million. The project includes the site survey, geotechnical investigations, site clearing work, infrastructure work, structural work, electrical and mechanical works and activities of construction includes the following:

a) Demarcation of the Area for various facilities

b) Infrastructure works (Pathways, water supply, sewerage and drainage, gas, electrical works etc.)

c) Installation of machinery

e) Installation of overhead loading crane

f) Installation of safety system including fire extinguishers & alarms

3.10 Schedule of Implementation

a- Phase-I (Start-up Phase)

Phase -1 is the start-up phase, which involves construction of boundary wall around the entire site. Most of the NOC's from various departments are in approval process and this report has been prepared to obtain NOC from EPA Punjab. It will take 2-3 months.

b- Phase-II (Main implementation Phase)

In phase II, required machinery will be purchased for installation in the casting unit . During this phase, machinery will be brought on site and installed. The activities for this phase includes the following:

- Foundations for main motor, gears and wheel pulleys
- Erection of sheds
- Installation of cranes, machinery and electric panels
- Mechanical work etc.

It will take 3 months approximately.

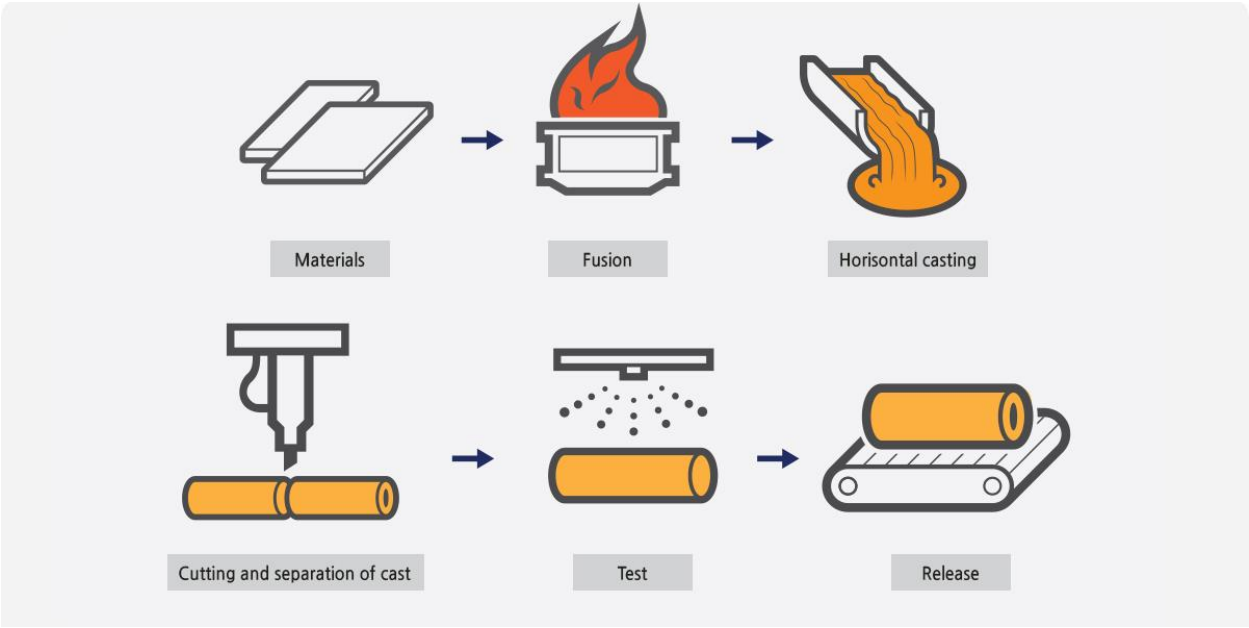
c- Phase-III (Wrap-up Phase)

Phase-III is the wrap-up phase. In this phase, all outstanding activities will be completed, required staff will be recruited, and contracts with suppliers and purchasers will also be signed after which the operational phase finally commenced. It will take 3 months.

3.11 Description of the project

The said project is the installation of Copper & Aluminum casting unit under name & style Metal Plus Enterprises Pvt Ltd to from the copper & aluminum ingot. The area of the project site is 5 Kanal-15 Marla. Capacity of the proposed project is 150 Tons/month. Capital cost of the project including Land, construction and Machinery Installation is 20 Million PKR.

Copper ingots is formed through smelting raw copper in a furnace. Recycled aluminium is sorted, cleansed and remelted to form molten aluminium. The molten aluminum is then formed into ingots for rolling, casting or extruding. The proposed project final product is ingot is being used in wires & exported.



3.12 Restoration and rehabilitation plans

There exists no human settlement on the selected project site to be displaced owing to the commencement of the Project. No structure of any significance stands at the site to be relocated or dismantled. However, the proponent has reserved the space for planation at the open areas of the site.

At the end of the life of the unit, 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 project site. Debris or any other wastes resulting from demolishing 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 all Government rules and regulations as applicable to such activities will be strictly adhered to. During entire construction period, necessary precautions will be taken to ensure that no damage is done to the basic infrastructures like sewer system, power transmission lines roads, private or public property and daily human life as well. Safety measures as desired under the code of demolition will be adopted to avoid any harm to humans, property around, or the environment in the project area. Dust to be generated will be minimized by constant sprinkling of water. After completion; all construction matrix, debris and garbage will be removed off immediately from the site within the minimum possible time under safe conditions. Any minor spillover of these materials will be cleared adequately. The land, if and where pitted will be adequately leveled. On the whole, the project site and the area in its near vicinity will be made neat and clean.

3.14 Supplies

a) Water supply

The underground water of this area is fit for drinking and domestic proposes. The said project intended to install electric motor pumps for the extraction of ground water

The features of water supply are as follow:

- Quantity (1 X 1HP and 2X 2HP)
- Depth 300 ft

b) Electricity

Source of power will be LESCO. The electricity connection capacity would be 500 KVA. For backup system proponent is intended to install his own stand by electricity generators.

c) 30-35 workers

On the proposed project site 7-8 workers will be present daily throughout the construction period of proposed project. While during operational phase 15--20 workers will be hired by the management.

d) Fire Fighting Arrangements

The following firefighting equipment will be installed in the said unit for mitigating the impact associated with the fire hazard:

a) DCP fire extinguisher 2 kg QTY (2)
b) DCP fire extinguisher automatic 3 kg QTY (2)
c) Smoke detectors QTY (6),
d) Fire Alarms QTY (2)

3.15 Management of Wastewater

Only domestic wastewater will be generated, which will be collected through sewerage system and it will be disposed of in nearby drain.

3.16 Solid Waste Management

Waste generated during construction would include mostly construction material, empty cement bags, excavated earth and general packaging waste. Waste will be stored within the site until transfer to the waste disposal site. Domestic solid waste during operation phase will be collected at solid waste collection point and from that point it will be carried out municipality for disposal. During operational phase the Iron sludge will be disposed of in the nearby municipality facility solid waste dumping facility.

3.17 Government Approvals

Management has applied for Environmental Approval and after getting Environmental Approval, they will apply for other required approvals.

DESCRIPTION OF THE ENVIRONMENT

4.1General

For any development project, the prevailing environmental conditions need to be assessed prior to the preliminary stages of planning, designing and execution of the project. Identification of physical, ecological and social aspects of environment and collection of relevant data is essentially important for the evaluation of impacts as well as for the suggestion of adequate mitigation measures which forms the basis of the Initial Environmental Impact Examination exercise.

The existing environmental conditions of the proposed project have been considered with respect to physical, biological and socio-economic aspects. Information has been collected from variety of sources, including published literature, field observations and surveys conducted specifically for this project have been analyzed for this study.

4.2Methodology

For baseline data collection, following sequences of various techniques has been adopted. These techniques were chosen because of their pragmatic application in very short span of time.

1. Reconnaissance survey;
2. Field investigations/ Surveys;
3. Meteorological analysis;
4. Environmental analysis (air, noise and water quality surveys);
5. Collection and review of secondary environmental and social data; and
6. Basic parameters collection from published sources.

4.2.1 Reconnaissance Survey

Reconnaissance survey of the proposed project site was conducted from June, 2023 for the collection of preliminary information about the flora, fauna and existing human intervention along with ecological characteristics. Reconnaissance survey helped us to delineate the ecological habitats and to explore the diversified ecological rich environment.

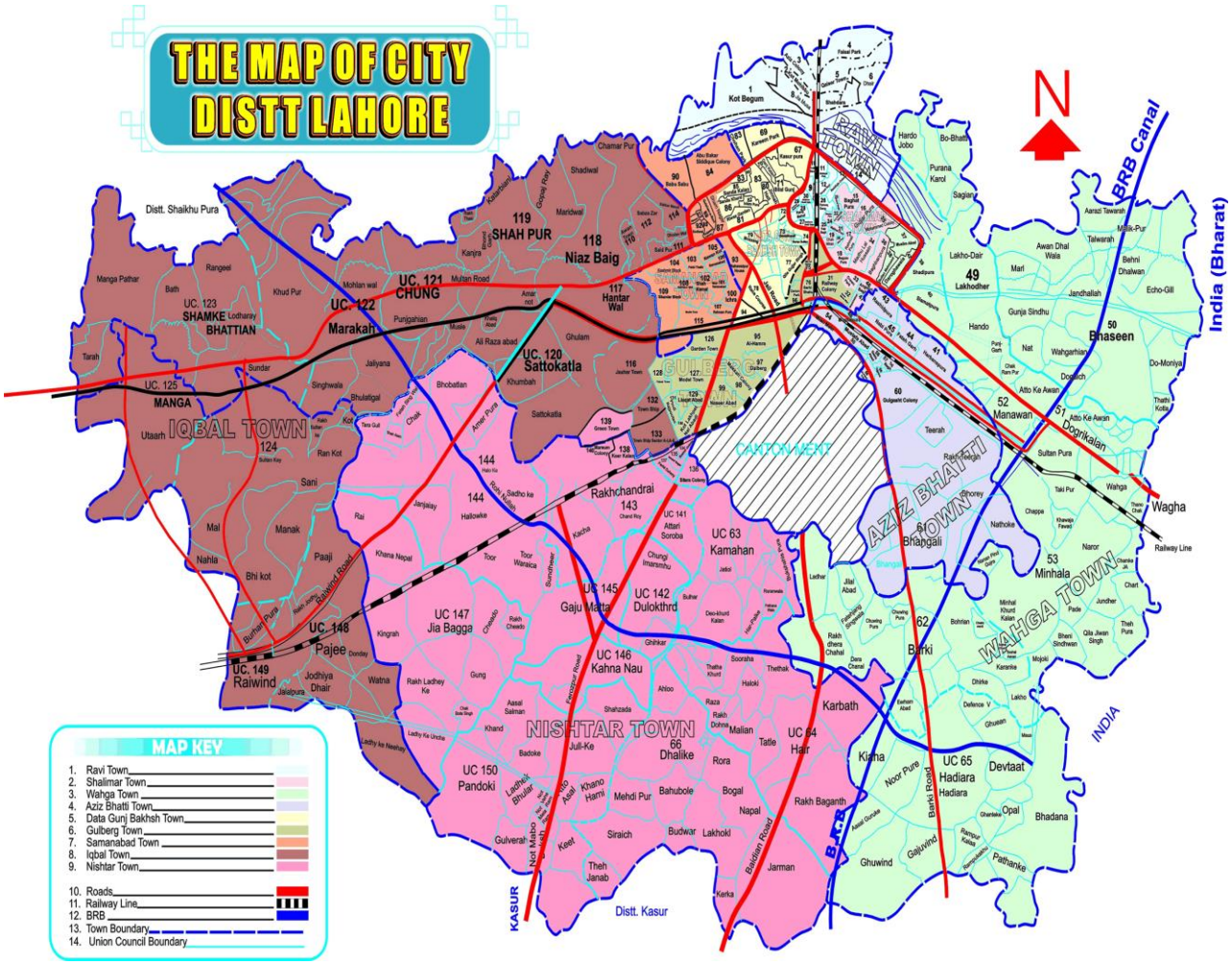
This information has become the baseline information for the detailed survey that specifically targets those areas which are going to be affected by the implementation of the proposed project. As a result of this survey, basic plants and animals' families were identified

that actually prevailing in the associated habitats.

4.3 Physical Environment

4.3.1 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°15′—31°45′ N and 74°01′—74°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 Sheikhupura 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.

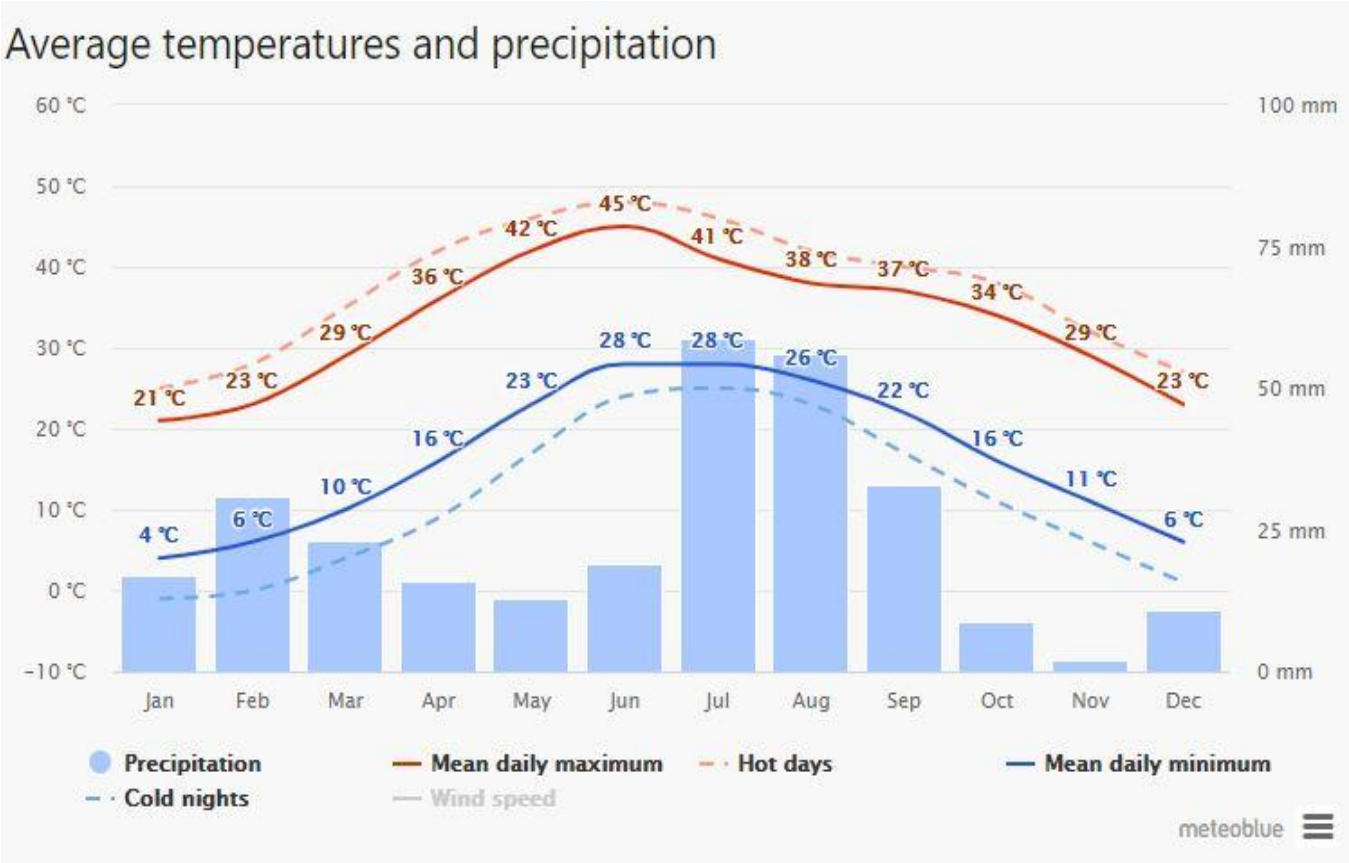
Climate

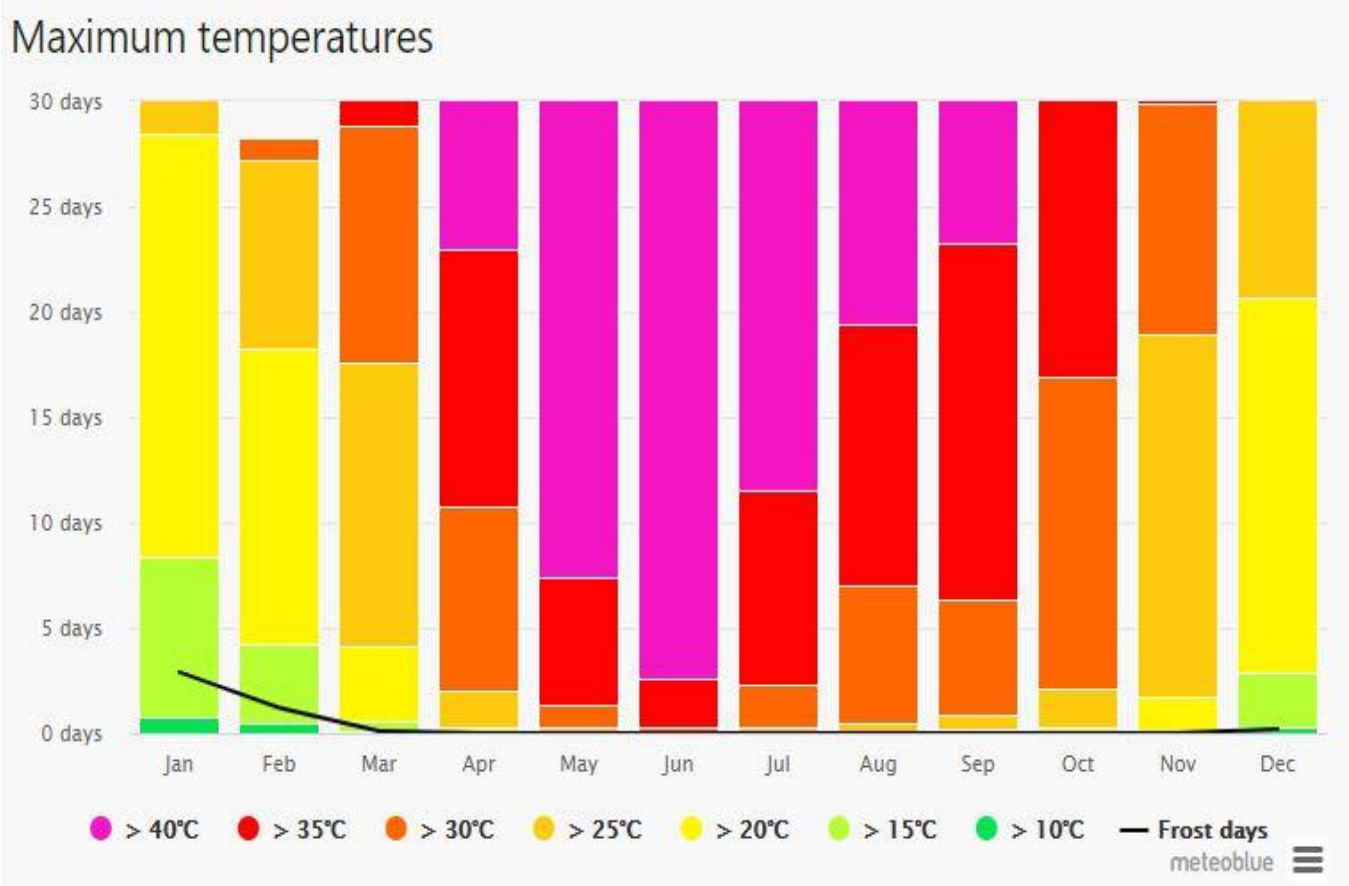
Lahore features a five season semi-arid climate and the seasons are winter, summer, spring, autumn and monsoon. The hottest month of the year is June when temperatures routinely exceed 40 ^{0}C. The wettest month is July, with heavy rain falls and evening thunderstorms with the possibility of cloudbursts. 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. Month	4. Mean Temperature 11. 12. Maximum	13. 14. Minimum	5. 6. Precipitation (mm)	7. Relative Humidity AT 0500 8. HRS (%)	9. Relative Humidity AT 2000 10. HRS (%)
15. January	16. 19.8	17. 5.9	18. 28.92	19. 80.4	20. 51.9
21. February	22. 22.0	23. 8.9	24. 37.14	25. 79.0	26. 52.4
27. March	28. 27.1	29. 14.0	30. 34.3	31. 68.6	32. 42.2
33. April	34. 33.9	35. 19.6	36. 44.32	37. 50.2	38. 25.3
39. May	40. 38.6	41. 23.7	42. 24.38	43. 45.7	44. 27.2
45. June	46. 40.4	47. 27.3	48. 91.62	49. 59.1	50. 40.9
51. July	52. 36.1	53. 26.8	54. 150.52	55. 76.7	56. 60
57. August	58. 35.0	59. 26.4	60. 161.42	61. 78.8	62. 65.9
63. September	64. 35.0	65. 24.4	66. 67.28	67. 74.4	68. 56.4
69. October	70. 32.9	71. 18.2	72. 11.74	73. 70.6	74. 44.2
75. November	76. 27.4	77. 11.6	78. 4.44	79. 77.1	80. 48.8
81. December	82. 21.6	83. 6.8	84. 9.94	85. 82.9	86. 53.73
87. Annual Temperature	**88. 30.8**	**89. 17.8**	**90. 66**	**91. 70.34**	**92. 47.4**

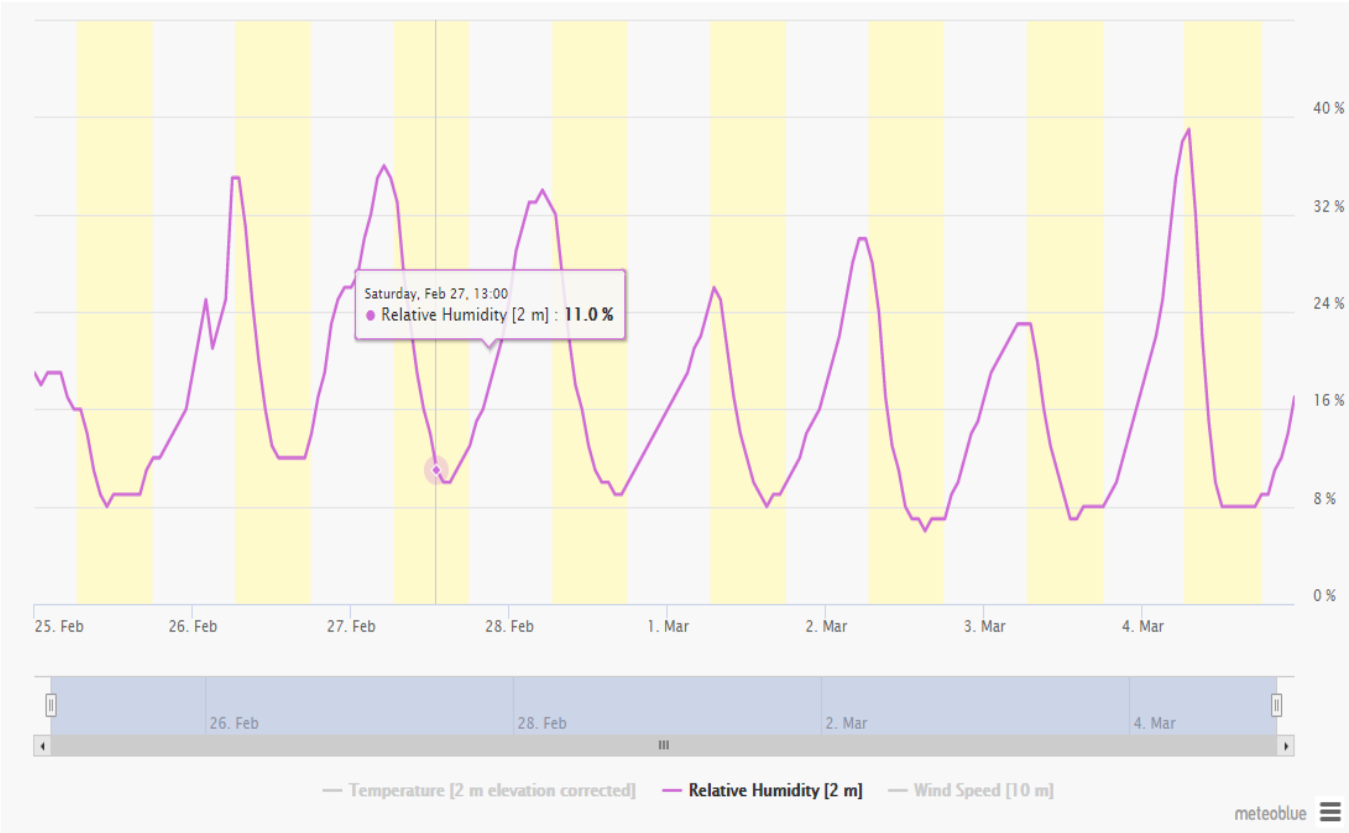
The climate of the project area is hot in summer and cold in winter. May and June are the hottest months with maximum temperature reaching 40.4°C. January is the coldest month with minimum temperature falling to 5.9°C. The summer season starts towards the end of April and continues till September. The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





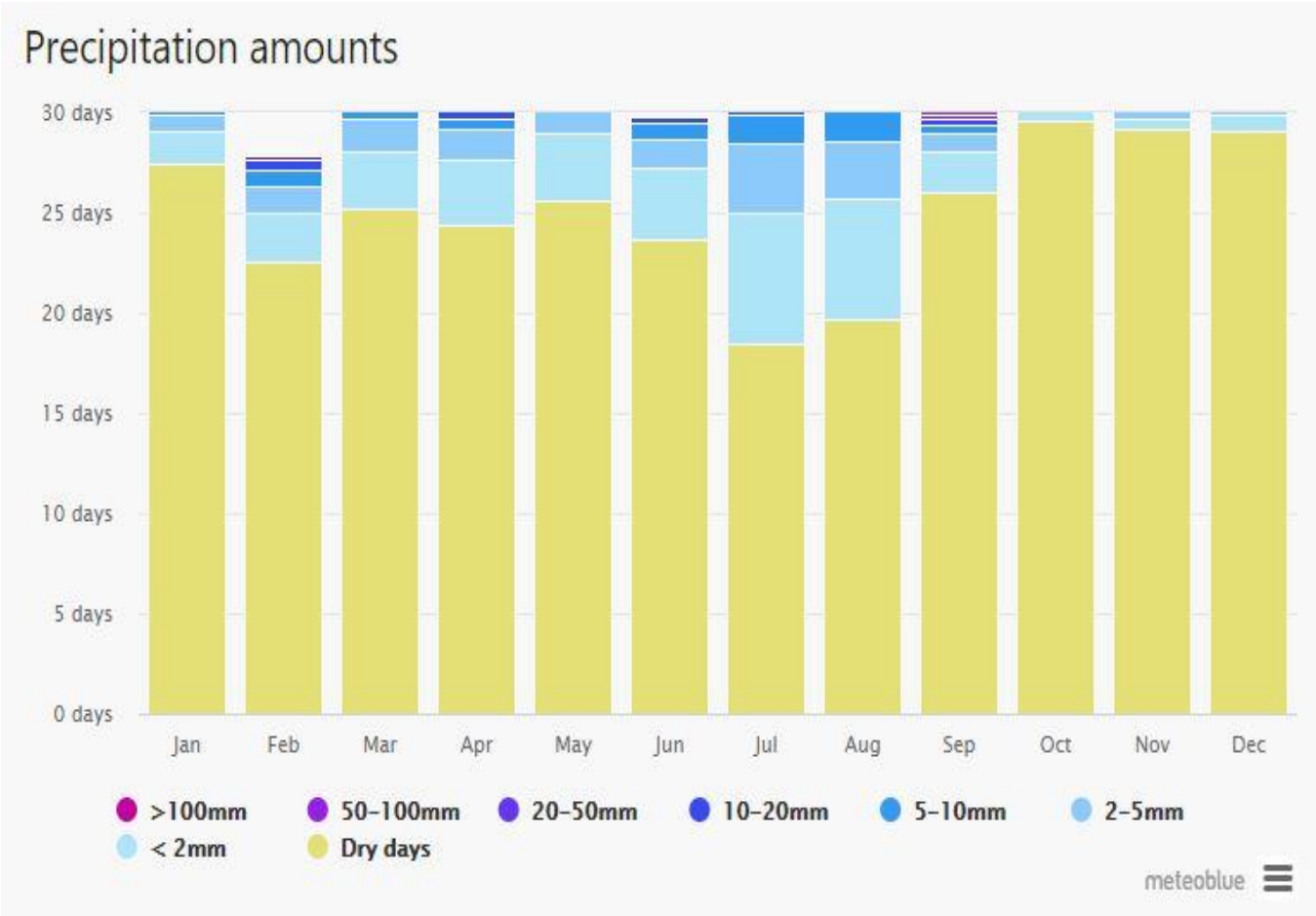
Humidity

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.



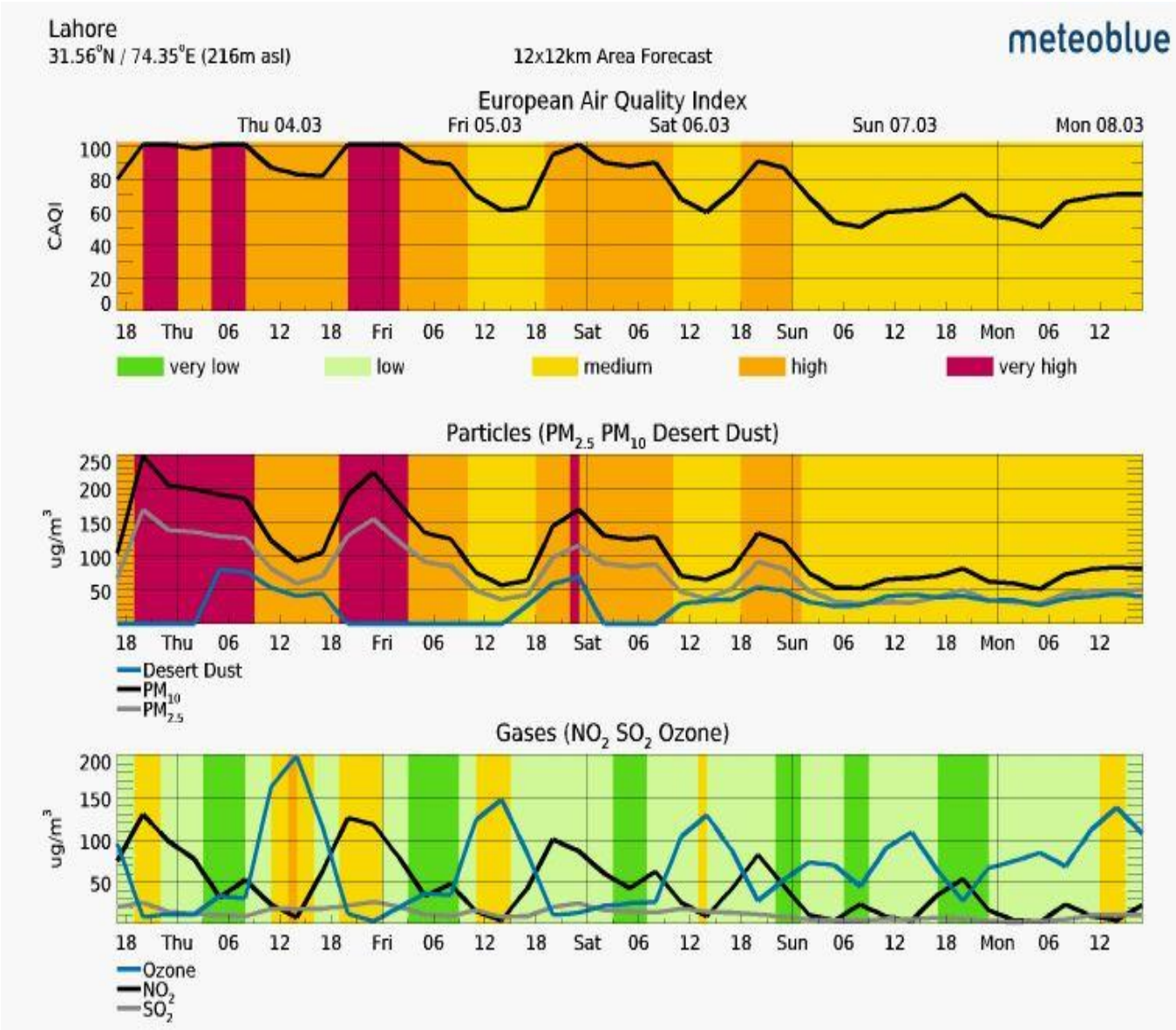
Precipitation

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.



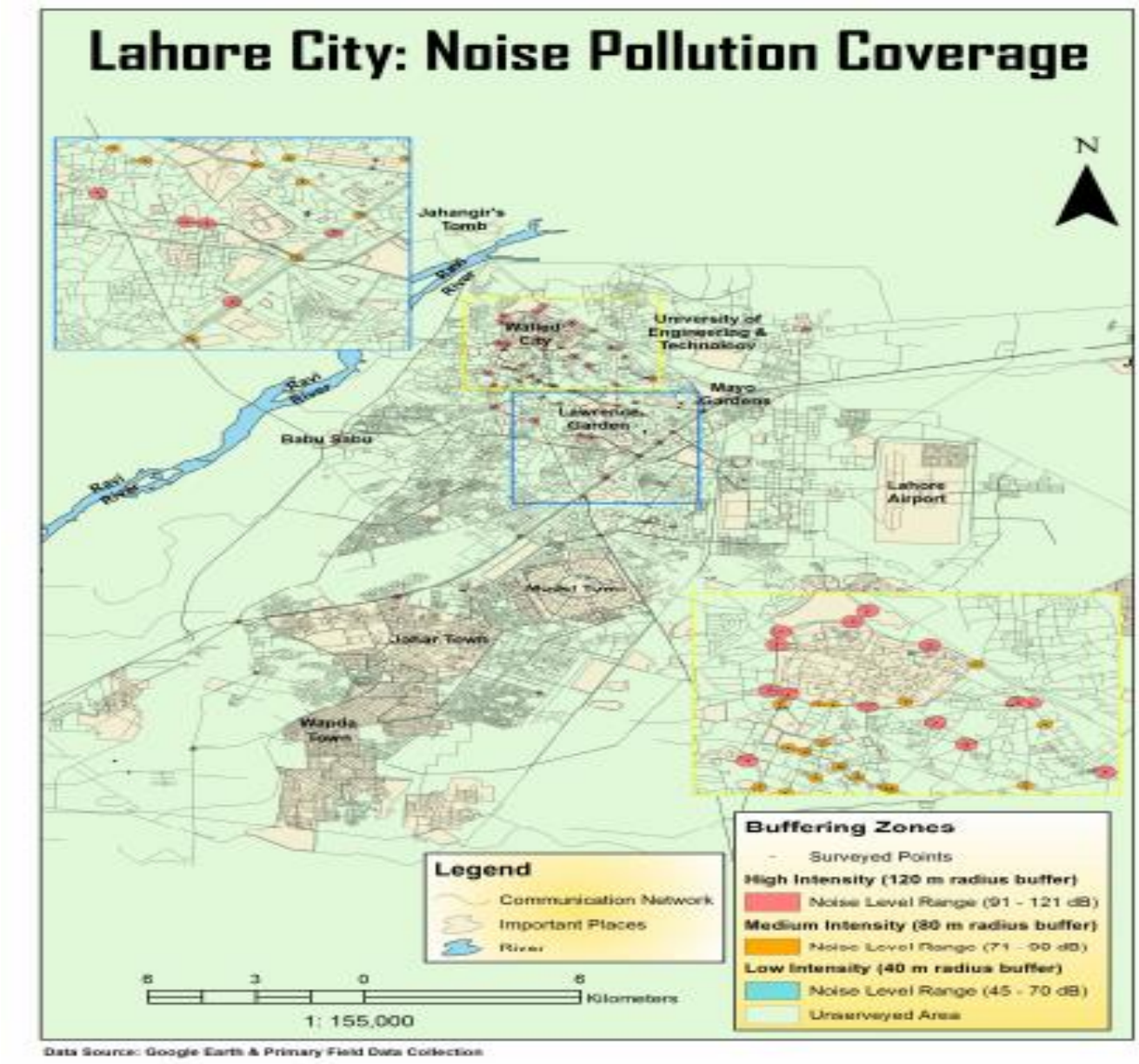
Ambient Air Quality

In the project area, Particulate Matter (SPM & PM10) and Oxides of Nitrogen (NOx), Sulphur Dioxide (SO2) and Carbon Monoxide (CO) are the major air pollutants. Traffic on road is the main source of air pollutants including NOx, 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

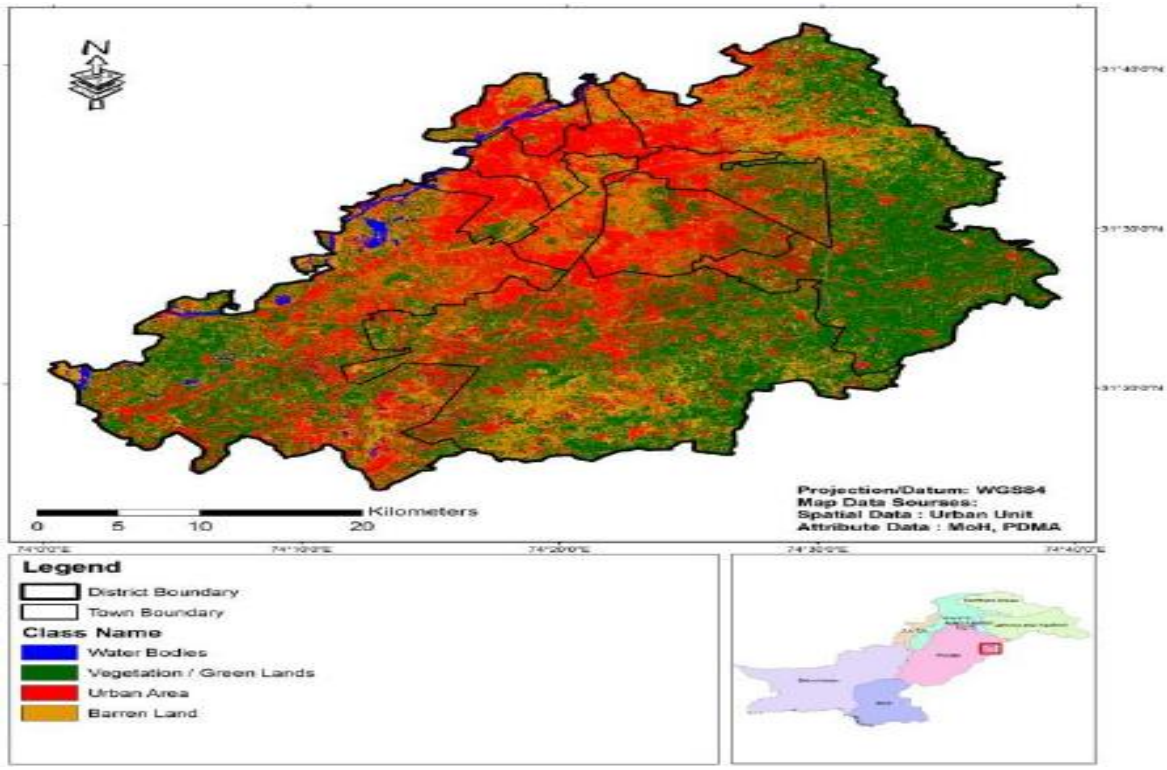
Lahore city is situated at an average elevation of 210 meters above mean sea level. Lahore city lies on the alluvial plain called Bari Doab. Doab is a local word for area between rivers. Bari Doab is a part of the Indo-Gangatic alluvial plain formed by the Indus River and its tributaries. It is bounded 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 (Callistemone 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:

Listof GrassesIdentifiedin theProject Area

Common Name	ScientificName
IndianDab	Cynadonedactylone
Dabri Grass	Dichanthium annulatum
LesserBulrush	Typhaangustifolia

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	ScientificName
JangliButi	Partheniumhysterophorus
Puth canda	Achyranthesaspera
Bathu	Chenopodiumalbum
Ak	Calotropis Procera

Bhang	Canibus sativa

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 #	StudyArea	
	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

Sr #	StudyArea	
	Common Name	**ScientificName**

1	Bottle Brush	Callistemone citrinus
2	Araucaria	Araucariaheterophylla
3	Bouginvillea	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. capitate) 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 caballos), Donkeys (Equus africanus asinus), Mules, Buffaloes, Cows (Heracleum lanatum), Goats (Copra hircus) and Sheep.

List of Mammals Presentin and Around the Project Area

Project Site		**StudyArea**	
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 caballos
		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.

Listof 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 ofAmphibiansPresent in andAroundtheProject Area

Project Site		StudyArea	
Common Name	ScientificNam	Common Name	ScientificNam
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 (Stigmetopelia senegalensis), Surkhab, Ullu, etc. are also seen in the area.

<u>List of Birds Present in and Around the Project Area</u>

Sr #	Project Site		StudyArea	
	Common Name	ScientificName	Common Name	ScientificName
1	House Sparrow	Passerdomesticus	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	Stigmetopelia 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, Komboh 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.

5. Lab Reports of Environmental Analysis

Testing of different parameters has been done by proponents. The copies of lab reports of different environmental parameters are given in annexure.

SITE SUITABILITY:

The present site for Metal plus Enterprises Pvt Ltd Industry is under the ownership of proponent & located in industrial area declared by ravi urban development authority. All commodities are at a suitable distance from project site as they will not impacted by the construction and operational activities even locals will get more benefits and job opportunities. No replacement, relocation and rehabilitation are required for the development of said project.

All facilities of infrastructure, electricity, roads, and communication facilities are present in current location. The project site is devoid of flora & fauna having significant importance & also declared industrial by RUDA.

SCREENING OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

This section discusses the project's potential environmental impact on the area's geomorphology, soil, water resources, air, biological resources and socioeconomic condition and, where applicable, identifies mitigation measures that will reduce, if not eliminate, its adverse impact. The assessment carried out in this section is based on potential impacts on overall environmental receptors within the project area.

Objectives of screening out all possible impacts and then providing their mitigation measures are:

- To find different alternatives and ways of carrying out the project activities.
- To enhance the Environmental and Social benefits of proposal.
- To avoid, minimize and remediate adverse impacts.
- To ensure that residual adverse impacts are kept in acceptable limits

5.1Evaluation of Identified Impacts

Methodology adopted for the identification, evaluation and analysis of environmental impacts by the proposed project is "Matrix Method and Significance Rating of Impacts".

5.2.1 Environmental Impact Matrices

The environmental impact matrices have been developed to evaluate magnitude of the impacts of various project activities on different environmental settings for construction and operation phases and are shown in Table 5.1 and Table 5.2 respectively.

A Matrix method helps in identifying the potential temporal & spatial impact and screens the project for environmental and social soundness. Each project activity is screened separately with regard to its construction and operation phases according to the various physical, ecological and social parameters. These impacts are characterized on the basis of extent, timing, magnitude, reversibility, probability, nature and duration. Table 5.3 shows the characterization of impacts.

Legend	**+ Positive**	**O**	**No Impact**	**2**	**Minor Impact**	**4**	**Severe Impact**
	- Negative	**1**	**Negligible Impact**	**3**	**Moderate Impact**	**-**	**-**

Table 5.1: Environmental Impacts Evaluation Matrix During Construction Phase

Components	VEC's /VSC's	VEC's/ VSC's Rating	Activities								
			Establishment & functioning of construction camps, workshops etc.	Excavation operations of burrow & quarry areas	Transportation of construction materials and equipment's	Open storage of construction materials, fuel etc.	Operation of concrete plants	Functioning of Power generators	Land of Acquisition	Solid & liquid waste management	Impact Score
Biophysical Environment	Air Quality & Dust	0.20	-3	-3	-2	-2	-3	-2	0	-1	-3.2
	Soil Erosion & Contamination	0.20	-2	-2	-3	-2	-3	-1	0	-2	-3.0
	Ground Water Quality	0.10	-3	-2	-2	-2	-2	-1	0	-2	-1.4
	Noise & Vibration	0.25	-3	-3	-2	0	-3	-3	0	-1	-3.75
	Flora	0.10	-1	-1	-1	-1	-1	0	0	-1	-0.6
	Fauna	0.10	-2	-2	-2	-1	-2	-2	-2	-2	-1.5
Socio-Economic Environment	Traffic Management	0.15	-3	-3	-3	-3	-2	-1	0	-2	-2.55
	Social & Cultural Conflicts	0.05	-3	0	-1	-1	-1	-1	0	-2	-0.45
	Health & Safety of workers	0.20	-3	-3	-3	-2	-3	-2	0	-3	-3.8
	Employment/ Economic Activity	0.30	3	3	2	0	2	1	0	3	4.2

Note: The above table reveals that in biophysical environment air and noise pollution are considered to be significant (adverse) impact while in socio-economic environment traffic management is considered to be significant (adverse) impact during construction phase.

Table 5.2: Environmental Impacts Evaluation Matrix During Operational Phase

Components	Valued Ecological Components (VECs)/Valued Social Components	VECs Rating	Activities				Impact Score
			Scarp Combustion	Intensive Refining	Finishing & Rolling	Product Transportation	
Biophysical and Social Environment	Flora	0.05	0	0	0	0	0.00
	Fauna	0.05	0	0	0	1	0.05
	Noise & vibration	0.20	-2	-2	-2	0	-1.20
	Air Quality	0.30	-3	-2	-2	-2	-2.10
	Surface Water	0.05	-1	-1	-1	-1	-0.20
	Ground Water	0.05	-1	-1	-1	-1	-0.20
	Soil Erosion & Contamination	0.10	-2	-2	-3	-2	-0.90
	Solid Waste	0.10	-2	-1	-1	0	-0.40
	Urban Heat Island	0.20	-3	-2	-2	-1	-1.60
Socio-Economic Environment	Health & Safety	0.30	-3	-2	-2	-1	-2.40
	Economic Activity	0.60	4	0	0	2	0.36

Note: The above table reveals that in biophysical environment impact on drainage is considered to be significant (adverse) impact while in socio-economic environment road safety is considered to be significant (adverse) impact during operational phase.

Table 5.3: Characterization of Impacts

Extent	Timing	Magnitude	Reversibility	Probability	Nature	Duration
Site Specific	Short Term	Negligible	No Change	Very Unlikely	Indirect	Temporary
Local Impact	Medium Term	Low	Reversible	Unlikely	Direct	Permanent
Area Impact	Long Term	Medium	Slowly Reversible	Likely	-	-
Regional Impact	Multi-Year & Permanent Impact	High	Irreversible	Certain	-	-

In addition to assigning the numerical values to each marked box in the Matrix, plus (+) or minus (-) sign are used to show whether an impact is beneficial or adverse.

The weighted matrix was applied to the environmental components listed on the y- axis against the activities of the proposed project listed on the x-axis prior to mitigation measures. In this process, numerical values were assigned from 0 to 1 for biophysical environment and socio-economic environment to indicate the significance of the affected environmental and social components. These numerical values were than multiplied with the individual project activity rating/values and all added to get an overall impact score. This impact score gives the relative significance of impacts for a specific component. The highest impact score gives the level of significance of that impact.

5.2.1.1 Identification of VECs

Valued Environmental Components (VECs) are defined as broad components of the biophysical and human environments that, if altered by the project, would be of concern to regulatory agencies, indigenous community, resource managers, scientists, stakeholders, and/or the general public. VECs are typically selected for assessment on the basis of regulatory issues, guidelines, and requirements; consultation with regulatory agencies, the public, stakeholder groups; field reconnaissance; and the professional judgment of the Study Team.

5.2.1.2 Significance Rating of Impacts

The overall significance of the impacts was defined based on the result of a combination of the ratings. Each identified impact was analyzed individually according to a number of criteria including descriptions of their extent, timing, magnitude, reversibility, probability, nature and duration. Taking into account these criteria, potential significance was classified as either:

- Low: The impact which has a slight influence on the natural and socio-economic environment;
- Medium: The impact which can be eliminated/ mitigated after applying the appropriate mitigation measures; and
- High: an impact, which, if not mitigated, could stop the project from proceeding.

5.3 Impact Analysis and Prediction

In order to give correct categorization to the present project Rapid Environmental Assessment Procedure was followed. It revealed that there some major impacts of the project have identified which will be controlled by adopting proper mitigation measures. These impacts are mainly attributed to the release of dust and harmful gases to the atmosphere during the manufacturing activity but most of the impacts are projected as moderate/minor impacts although project has many positive impacts on local public and economy.

Meetings:

For the impact analysis and predictions detailed meetings were held with the proponent, management of **M/s Metal Plus Enterprises Pvt Ltd** and with other stakeholders. Issues were discussed that may affect the environment and also the implementation of proposed project. All possible mitigation measures were considered and incorporated in the Environmental Management Plan.

Consultations

Scoping sessions, focused group discussion and way side consultations were held with the relevant stakeholders, inhabitants of the villages, shopkeepers and workers in the area. These included local government departments, educational institutes, NGOs, health

departments, public representatives and local residents. The purpose of such consultations is to obtain the feedback from the relevant persons.

The environmental issues have been identified during literature review, consultation with stakeholders, relevant reports and visits to project site. Various types of environmental issues likely to crop up during the life cycle of project are grouped in the following stages:

- Project location
- Project design
- Construction stage
- Operation stage

5.4 Environmental impacts due to Project Location

This section discusses the project's potential environmental impacts on the area's geomorphology, soil, water resources, air, biological resources and socioeconomic condition and, where applicable, identifies mitigation measures that will reduce, if not eliminate, its adverse impact. The assessment carried out in this section is based on potential impacts on overall environmental receptors within the project area.

Objectives of screening out all possible impacts and then providing their mitigation measures are:

- To find different alternatives and ways of carrying out the project activities.
- To enhance the Environmental and Social benefits of proposal.
- To avoid, minimize and remediate adverse impacts.
- To ensure that residual adverse impacts are kept in acceptable limits

Project Location

The said proposed project is located at Saggian Road, Near Inam Re-Rolling Steel Mill Mouza Mehmood Booti, Tehsil Shalimar District Lahore. The proponent has selected the site owing to the following reasons:

- The said project site lies in the industrial area overall.
- The site is undisputed and under the ownership of the proponent.

- There is no community or human settlement on the site
- There is no fauna flora (particularly belonging to an endangered species) on the site
- Main road network runs in front of the project area.
- There is no ecologically sensitive or declared protected area (PA) like forest, fish hatcheries, Territorial Waters, wildlife or game reserves, any structure of socio-cultural significance (historical or archaeological site or religious structures; Masjid, temples, etc.) within 5 km of the selected site

It can be concluded in view of these reasons 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.

5.5 Impacts Associated with Design Phase

At the design phase, considerable impact can occur on land, soil, topography, ground water, and on people of the area. The design has sought to minimize any environmental potential impacts by ensuring that the project should be in according to the environmental standards. The design to be used for the said Aluminium & Copper Casting facility is state-of-art and environmentally friendly.

Mitigation Measures at Design Phase

At design phase special attention should be given to the design of the project in the sense that it has been designed in such a way as to cause minimum disruption and deterioration of environment and surroundings. Local aesthetic value is another issue to be considered during project design. In particular the design of the plant will be in the downward air stream of the air direction, so that to avoid the smell or smoke problems.

Design of the said Aluminium & Copper Casting Unit by Metal Plus Enterprises Pvt Ltd will be adhere to all standard technical requirements in order to avoid adverse impacts on environment and human health. There will not be any environmental problems at any stage from design stage to its operational stage.

The project is to be designed in a way that it guarantees all out compliance with the Punjab Environmental Quality Standards (PEQS). The Proponent intends to construct the unit on

modern lines, meeting International Standards, with incorporation of new Technology. The design, if maintained and operated in an environment-friendly manner, is expected to cast positive impact on the Environment and will not pose any adverse impact or threat on any component of the Environment.

5.6 Impacts during construction / development phase

The potential environmental impacts of the proposed project at site and surrounding area during the development / construction phase are described as follows:

5.6.1 Physical Environment

The main impacts of the project during development/construction of civil works, development of installation/laying pipelines, sewer system and installation of utility and equipment's will be the dust and noise from transportation of construction materials and equipment's. Standard Engineering Practices will be enforced on the construction / development site.

5.6.1.1 Seismic Hazard

Impact

In this zone, distant earthquakes with fundamental periods greater than 1.0 second may cause damage to structures. This factor requires special consideration of the designers. This will be a moderate negative impact.

Mitigation

All the foundations of the structure will be designed to withstand even moderate to large earthquakes. For seismic hazard analysis updated structural and seismic evaluations will be consulted.

5.6.1.2 Impact on Soil

Impact

During construction phase the soil quality may be affected due to very small amount of discharges during vehicle and equipment maintenance and leakage from equipment's and vehicles. The impact is not significant.

Mitigation

Any spill if occur will be immediately clean up. If the problem of water logging occurs during development phase the area will be immediately reclaimed. The impact is not significant. Depending on the nature of the material, location of spill and quality of spill, soil can get contaminated. Low permeable membrane should be present at the bottom of vehicles. Proper tuning of vehicles is also necessary. Due to mitigation measures, the overall impact on soil during construction phase is minor.

5.6.1.3 Impacts on Air Quality

Following potential impacts on air quality may occur during construction phase.

(a) Emission of Dust and Particulate Matter

During the development/construction vehicles and machinery will be employed. These will generate some dust and smoke temporarily. During construction phase due to continuous operation of machinery and movement of heavy trucks and vehicles can generate gaseous emissions and can have a slight adverse effect on the surrounding environment. Combustion exhaust from vehicles and construction equipment's during construction phase can affect ambient air quality of project area.

Mitigation

All vehicles, machineries, equipment and generators used during construction activities should be in good working condition, properly and be properly maintained in order to minimize exhaust emissions. This impact is classified to be short term, reversible and limited, as it will only occur during the excavation activities. Also, these impacts are expected to be contained within the site boundaries. For dust sprinkling of water is done to avoid dust.

5.6.1.4 Solid Waste

Impact

The solid waste generated during the construction phase of Project can pose a health hazard, pollute soil, surface and ground water if not managed properly. A significant impact will be interpreted if the waste management is not carried out properly; which may affect to health of workers, pollution of soil, surface or groundwater.

Mitigation

The Potential sources of solid waste from operational activities include excavated material, construction waste, food waste, plastics, and paper. Dumping of excavated waste will be done at a designated site approved by TMA, and it will be ensured minimum degradation to the soil around the Project area. Construction waste will also be disposed off as per TMA procedures. Other generated solid waste comprises of a domestic waste. Waste storage bins will be installed. The waste from these bins will be collected by the sanitary workers. The waste will be disposed-off in accordance with the procedures of Tehsil Municipal Administration. No significant impact on the environment is anticipated from solid waste generation at the project site as the solid waste is managed efficiently.

5.6.1.5 Water Resources and Quality

During Construction phase, water demand will be enhanced and chances of contamination of ground water will increase. Water will be required for water sprinkling to control dust, construction activities, domestic and for other use of labor and staff onsite.

5.6.1.6 Noise and Vibration

Impact:

When the construction work is undertaken, constant rattle of heavy machinery will raise the noise level in the Project Area. This noise and vibration will affect directly the residents of nearby areas. Noise due to the construction will be a minor negative impact.

Mitigation

Mitigation measures mentioned below will be adopted to minimize the noise pollution. Those measures include, but are not limited to the following:

- Selection of up-to-date and well-maintained plant or equipment with reduced noise levels ensured by suitable in-built dampening techniques or appropriate muffling devices.

- Confining of excessively noisy areas and limiting the work to normal working hours in the day;

- Providing the construction workers with suitable hearing protection like ear cap, or earmuffs and training them in their use; and

- Regular checkups and maintenance of the construction equipment, and oiling and greasing of the noise making mechanical parts.

5.6.1.7 Ecology

a) Flora

Trees are vital ecosystem, which perform variety of functions for the improvement of environment such as reduction in air pollution, noise abatement, cooling effect on earth, supply of oxygen etc. No tree will be affected by the said project, as the site was previously agricultural land. However, some shrubs and herbs will be cleared off for the construction activities. The impact is mild in nature.

b) Fauna

The usual fauna found in the project area have already been mentioned earlier in Section-4. Due to the implementation of the proposed project, the free movement of fauna would not be disturbed. However, the probable dislocation of rodents and birds may occur due to the construction activities.

Mitigation

- Plantation of large number of trees along the proposed project to regain the ecological habitat;
- New and good condition machinery with minimum noise should be used in construction;
- Noisy work should not be carried out in night time so that there should be no disturbance to local birds and animals;

5.6.2 Impact on Socioeconomic Environment

5.6.2.1 Traffic Congestion and Disturbance to People

Impact

During the construction phase, the movement of heavy machinery and transportation of raw material and equipment may cause traffic congestions. As a result, the daily activities of the people of nearby localities as well as of the visitors may be disturbed, which will require proper mitigation measures. This will be a moderate negative impact.

Mitigation

During construction, following mitigation measures will be followed:

- Observation of timing by the vehicles carrying construction material of infrastructure to cause minimum disturbance to traffic on existing road. The construction equipment and machinery must be stationed in the boundary premises to avoid the traffic congestion on the main Road.

- Transportation of raw material and heavy machinery will be done early in the morning; and

- All the machinery will stay inside the periphery of project so it will not cause disturbance in the traffic.

5.6.2.2 Workers' Safety

Impact

During construction phase minor and severe injuries to workers due to operation activities may occur. The construction activities impose certain negative impacts on health and safety of the workers and public in case of unsafe and/or unfavorable working conditions. Mitigation measures will be required to minimize health and safety related negative impacts of the project. This will be a minor negative impact.

Mitigation

Mitigation measures will be required to minimize health and safety related negative impacts of the project. This will be a minor negative impact.

Implementation of the following measures will ensure health and safety of the workers and the public during the construction phase:

- Construction workers will be provided with proper safety equipment such as helmets, goggles, masks, etc.;

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

- The safety of the public at all stages of the construction will be ensured through appropriate public education and safety measures such as use of sign boards, barriers and flags; and Proper illumination will be provided at night.

5.6.2.3 Economic Activity

Due to the construction of the proposed 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 proposed project. This will help in developing their skills and capacities. This is a moderate beneficial impact.

5.6.2.4 Visual Impacts and Aesthetics

Possible visual impacts during construction phase activities are likely to arise from fugitive dust, on-site storage of construction material, storage of construction debris, physical presence and operation of labor camp which may affect visual and aesthetic aspects of the proposed project area. This impact is temporary and low adverse in nature.

Mitigations

- The construction site should be fenced and all the construction activities should be restricted within the demarcated site;
- Condition of the site approach road should be kept free of dust and mud as much as possible through implementation of dust suppression measures; and
- All temporary structures, surplus materials and wastes should be completely removed on completion of works.

5.6.2.5 Social/ Cultural Conflicts

During the construction phase of the project, conflicts may arise between labor force and local community. Use of local resources and products by the construction workers can generate stress on the local biophysical resources. Furthermore, difference in cultural values may also cause discomfort to local residents. This impact is temporary and low adverse in nature.

5.7 Impacts during operational phase:

The anticipated impacts related to the proposed project have been studied for operational stage and is discussed as follows:

5.7.1 Impact on Biophysical Environment

5.7.1.1 Flora

There will be no damage to the flora of the project site during operation stage. Maximum possible number of trees of suitable species shall be raised during the operation stage, which shall result in a healthy impact on the flora of the area.

5.7.1.2 Fauna

The project activities will bring some adverse impacts on the fauna of the project area such as the uneasiness of movement and increased probability of accidents, if the animals/livestock approach the proposed project. This impact is permanent and high adverse in nature. Noise and air pollution caused due to project will be the source of disturbance to the fauna of the project area and especially to the avifauna of the area, which is another high adverse impact.

Mitigation

Raising of dense plantation of shady trees on available spaces along the project will provide resting, nestling and roosting habitat to the avifauna which is a high beneficial impact.

5.7.1.3 Surface and Groundwater

No major adverse impact on surface and groundwater is anticipated during the operational phase.

Mitigations

- The impact can be controlled/ reduced by timely and continuous maintenance/ cleaning of the drainage system; and

5.7.1.4 Air Quality

Air quality of the project area may deteriorate due to the operational activities of this project. During the smelting of copper and aluminum, the gaseous emissions including NOx, SOx, PM 2.5, CO, and CO_2 may result, which is a severe impact to the air quality. This is permanent and irreversible impact in nature.

Mitigations

Wet Scrubber will be installed by the project proponent to control the gaseous emission's from the furnace.

Hoods are generally designed to operate under negative static pressure implying that the pressure outside the hood should be greater than the pressure inside the hood. The fan, located downstream from the hood, creates the suction that draws the air into the hood. Since air from all directions moves toward the low-pressure hood, it must be as close as possible to the process equipment in order to capture the pollutant laden air and not just the surrounding air.

5.7.2 Impact on Socio-Economic Environment

5.7.2.1 Noise

During the operational phase, the noise levels are anticipated to increase due to unloading of scrap and the loading of the final product. Vibrations from movement of heavy vehicles and mainly use of pressure horns. This impact is permanent and minor adverse in nature.

Mitigations

- Noise measurements should be carried out at locations and schedule specified in the Environmental Management Plan (EMP) to ensure the effectiveness of mitigation measures;
- Loading and unloading activities would be carried out during the night times.
- Ambient noise measurements of the equipment/machinery will be designed to operate with a total noise level not exceeding the prescribed standards of PEQS in the very near vicinity of the machinery.

5.7.2.2 Economic Impact

The project will provide new jobs in the project area. Most people of the area make their living directly or indirectly from job in private, commercial or industrial sector. Short-term economic benefit will be realized by providing janitorial services, horticultural services, loading/unloading workers, canteen, and semi-skilled & some skilled activities, as well as by increased use of available rental property. Long-term benefits will include indirect employment, as a result of improved and reliable economic benefits provided by increased employment. As a result, continued operation of the proposed project will generate revenue into the Country's economy. There are no negative or detrimental potential impacts on the socio-economic setting of the area arising as a result of the proposed project. As such no mitigation measures are required.

5.8 Potential Environmental Enhancement Measures

Tree and shrub plantation within the premises of the project site have been planned by the proponent for environmental enhancement. The Proponent will also make arrangements for protection and maintenance of trees.

Names of Trees, Plants etc.

The following plants are recommended for this project, however other trees will be consulted with gardening experts and other endangered trees will also be planted.

Local Name	Scientific Name
Cono Tree	*Conocar pieceo*
Arabic Gum tree	*Acacia nilotica*
Golden Shower tree	*Casia Fistula*
Indian Beech tree	*Pongamia Pinata*
Kachnar	*Bauhinia variegate*

Jasmine	*Jasminum*
Lilly	*Lilium*
Rose	*Rosa Indica*

Excavation for planting shall include plant pits and planting beds. The minimum depths of plant pits or beds shall be measured from cold Store the grade. Plants beds and pits shall be tested for drainage before planting by filling with water twice in succession. Conditions permitting the retention of water in planting the beds or pits for more than 24 hours shell be brought to the attention of the Architect. If rock, underground construction, obstructions, tree roots or other obstructions are encountered in the excavation of plant pits, alternate locations may be select by the architect. The contractor shall be responsible for all damages resulting from any neglect and failure to comply with this requirement.

Following excavation planting pits, the pits shall be back filled with the sweet soil mixture as specified. Three day prior to planting, the pits shall then be filled with water for consolidation of soil. The dimensions of the panting pits are as follows:

A. Trees: 3x3x3
B. Shrubs: 2x2x2
C. Hedges: trenching 2wide x'2 deep of required length.
D. Creepers and vines: 2wide x 2 deep of required length.
E. Edges and flowers beds: 'fill flower box with sweet soil as per the Architect's drawings. For seasonal flowers, the beds are to have the minimum of 12" sweet soil and 4" 'manure.

Planting areas and plants shall be protected all times against trespassing and damage of all kinds for the duration of maintenance period. If any plants become damage or injured, they shall be treated or replaced. Protection shall also include all temporary protections fences and barriers. all signs and all other work incidental to proper maintenance.

ENVIRONMENTAL MANAGEMENT & MONITORING PROGRAM

The primary objectives of the EMMP are to:

1) Facilitate the implementation of the mitigation measures identified in the EIA.
2) Define the responsibilities of the project proponent.
3) Define a monitoring mechanism and identify monitoring parameters in order to:
4) Ensure the complete implementation of all mitigation measures.
5) Ensure the effectiveness of the mitigation measures.
6) Provide a mechanism for taking timely action in the face of unanticipated environmental situations.
7) Identify training requirements at various levels.

8.1 Institutional Capacity

The overall responsibility for compliance with the environmental management plan rests with the project proponent. He will appoint a HSE/Project Manager of relevant qualification. HSE/Project Manager will act as Environmental Manager and will manage all HSE conditions at the PEQS.

A certain degree of redundancy is inevitable across all management levels, but this is in order to ensure that compliance with the environmental management plan is crosschecked.

Following functionaries will be involved in the implementation of EMP:

- Project Proponent
- HSE Officer
- In-Charge Administration
- Supervisor of project

8.2 Training Schedule

Training for the management/contractors/engineers and workers on environmental aspects of the project will be arranged during the constructional phase of the project. It will be imparted by a team of experienced trainers.

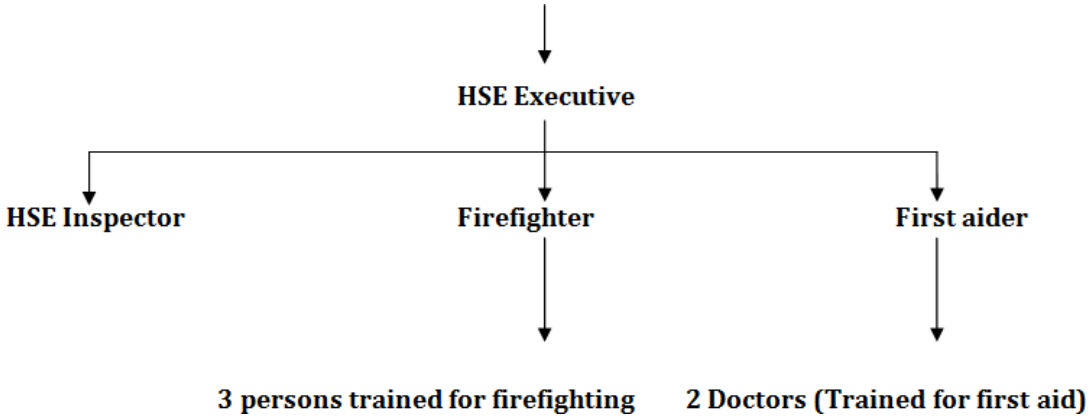


Figure: Institutional Capacity for the implementation of EMP

Management will hire or appoint HSE officer before the initiation of constructional work at the project site. HSE officer will be responsible for conducting the training of the labor, which will be organized either by the management of industry or by the contractor. Following schedules of training will be implemented:

Table: Training Program

Sr. No.	Description of program	Labor/ Personnel involved	Time/ duration
1)	General HSE Training	Trainers and whole labor	Quarterly for 1 hour
2)	Instrument use/ workplace specific items	Trainers and whole labor	Quarterly for 1 hour
3)	PPEs use and safe work practices at work sites.	Trainers and whole labor	Quarterly for 1 hour
4)	Reporting and investigating accidents / incidents	Trainers and whole labor	Quarterly for 1 hour
5)	Emergency procedures	Trainers and whole labor	Quarterly for 1 hour
6)	Medical and first aid	Trainers and whole labor	Quarterly for 1 hour
7)	Health and safety promotion	Trainers and whole labor	Quarterly for 1 hour

In order to raise the level of professional and managerial staff, there is a need to upgrade their knowledge in the related areas. HSE/Project Manager should play a key role in this

respect and arrange the training programs. HSE/Project Manager will provide training to staff and workers about the best environmental management practices at the construction site and effective implementation of the EMMP. The training modules will include air, noise and water pollution monitoring, social awareness, Environmental Laws, National Environmental Quality Standards (PEQS), Usage of personal protection equipment, and health and safety related issues on the construction site.

The HSE/Project Manager will train all workers & staff in basic sanitation and health care issues (e.g., how to avoid malaria and transmission of Sexually Transmitted Infections (STI) HIV/AIDS and in general health and safety matters, and on the specific hazards of their work. Training should also consist of basic hazard awareness, site specific hazards, safe work practices, and emergency procedures for fire, evacuation.

HSE/Project Manager is being conducted Training on monthly or quarterly basis regarding health & safety, hygiene, firefighting and first aid.

8.3 Training of Building Contractor

Training of building contractor & workers will be the part of the TORs regarding the construction of the scheme.

TORs will be including the training and submission of reports in the following area:

1) Handling of Machineries in a safe way
2) Use of PPEs
3) Maintenance of vehicles and submission of Environmental Monitoring Reports
4) Maintenance of Water Consumption records
5) Testing of water and waste water and submission of Environmental Monitoring Reports
6) Placement of safety signs/boards during construction
7) Sprinkling of water on the roads and dusty tracks
8) Monitoring of generator emissions

Training regarding all other aspects of HSE will be ensured by the contractor during the construction phase.

8.4 Summary of Impacts and their mitigation measures

Serial	Environmental Issues/ Impacts	Mitigation Measures
PLANNING, SITE SELECTION AND DESIGN STAGE		
1	Observance of administrative and legal formalities	It is recommended to obtain the approvals from all other relevant departments.
2	Acquisition of land	Land is the property of the project proponent.
3	Loss of environmentally sensitive areas	There is no sensitive area near the project site however the project proponent will achieve the PEQS at the boundary wall of the subject project to avoid the environmental impacts on the nearby community
4	Changes in traffic pattern	There is no need to change the traffic pattern due the development of the subject project because only few vehicles will visit the project on daily basis.
5	Potential conflicts with stakeholders	• There is no conflict at the current stage of the project. People of the surrounding area have no objection regarding development of the subject project as per proposed design. • It is recommended to Settle the issues through scoping and specific group discussions.
6	Resettlement issues	No resettlement issues

7	Project Design	• Provision of Emergency Exits, Assembly Points, firefighting arrangements, water storage for firefighting should be incorporated in the design.

		• Installation of Dust/flue gases/odor controlling devices should be incorporated in the design. • Project proponent is committed to provide all these provision in the design of the project.
SITE DEVELOPMENT STAGE		
1	Erosion due to stripping and site clearance	Sprinkling of water on the road side or dusty tracks.
2	Generation of dust	• Careful loading and unloading of construction materials is recommended. • Sprinkling of water on construction site and surrounding areas is recommended.
3	Generation of noise	• Avoid suing forbidden horns at thesite. • Do not throw heavy equipment and construction materials in haphazard manner.
4	Local flooding/ponding	Immediate repair and maintenance of water supply pipes and sewers in case of any defect will be undertaken.
5	Outbreak of fire	Firefighting equipment must be maintained at the site in good working condition.
6	Safety	• Safety of the workers and others must be ensured. • Privacy of the neighbors must not be disturbed.

7	Labor issues	• Employ the local labor as far as possible • Wages of the labor should be as per Government policy
CONSTRUCTION STAGE		
1	Minor erosion of land	• Add more vegetation; restore the land by more plantations. • Sprinkling of water on dusty tracks is recommended. • Clearing of land should be step wise; vegetation should be removed only from the area where the main building will be developed.
2	Contamination of land and water	Essential services like water supply, sewerage disposal and solid waste management must be in working condition.
3	Air Pollution (PM)	• Sprinkling of water on dusty tracks is recommended • Do not throw heavy equipment and construction materials in haphazard manner • Prohibit idling of vehicles • Workers on the site should be issued with dust masks during dry and windy conditions
4	Noise pollution	• Construction should be carried out only during daytime. • Workers wear ear muffs if working in a noisy section.

5	Traffic density	• Proper signage put in place to notify neighbours of the activity and presence of heavy vehicles and to direct traffic. • Presence of boards directing patrons to the site. • Strict adherence to traffic rules. • Provide adequate parking and driveways. • Control and management of traffic through enforcement of speed limits. • Provide bill boards at the site/entrance to notify motorists about the development.
6	Ecological considerations (flora & fauna)	The flora and fauna should be restored after construction by landscaping and maintaining the introduced plants
7.	Solid Waste	• Excavation waste should be re-used or backfilled. • Waste generated should be collected by a privately contracted waste collection company. • The site should have waste receptacles with bulk storage facilities at convenient points to prevent littering. • Unusable construction waste, such as damaged pipes, formwork and other construction material is handed over to the local contractor. • For wastewater treatment facility 5 Marla is reserved in housing scheme.
8	First Aid	A well-stocked first aid kit shall be maintained by qualified personnel

9.	Occupational Health and Safety	• Train workers on personal safety and how to handle equipment and machines. • Report any accidents / incidents and treat and compensate affected sanitary workers. • To reduce health and safety risks, effective emergency response plans will be observed during construction. • Proper personal protective equipment i.e. safety shoes, helmet, goggles, respiratory equipment and gloves shall be used at all times on site. • Provide first aid kits and contact points in case of injury and accidents. • From a safety and health committee to coordinate safety and health issues at workplace. • Provide regular safety awareness talks and training.
10.	Material transportation	• All fine earth materials must be enclosed during transportation to the site to prevent spillage and dusting. Trucks used for that purpose should be close properly and with tarpaulins to cover the materials. • The transportation of lubricants and fuel to the construction site should only be done in the appropriate vehicles and containers, i.e. fuel tankers and sealed drums. • As far as possible, transport of construction materials should be scheduled for off-peak traffic hours. • This will reduce the risk of traffic congestion and of road accidents on the access roads to the site.

OPERATION STAGE		
1	Contamination of land and water sources	• Continuous vigilance on maintenance of services • Tarpaulin sheets or concreted area must be placed to avoid leaching of oil into ground • Plantation to avoid land erosion
2	Noise Pollution	• Maintain plant equipment. • Workers wear ear muffs if working in a noisy section. • Management to ensure that noise from the residents is kept within reasonable levels • There should not be unnecessary horning of the involved machinery • Training for safe driving practices & HSE trainings of the employees and workers is recommended.
3	Fire breakouts	• Training of workers regarding flammable substances will be ensured. SOPs of fire prevention will be adopted like forbidden of smoking, regular testing of electricity infrastructures and regular testing of gas supply systems to the industry. • Firefighting drills carried out regularly. • Firefighting emergency response plan. • Ensure all firefighting equipment is regularly maintained, serviced and inspected.

		• Fire hazard signs and directions to emergency exit, route to follow and assembly point in case of any fire incidence
4	Air Emission	• Wet scrubber installation for control of gaseous emission's • All equipment, generators, and vehicles used during the project will be properly tuned and maintained in good working condition in order to minimize exhaust emissions. • Imposing speed limits and encouraging more efficient journey management will reduce the dust emissions produced by vehicular traffic. • All project vehicles will be checked regularly to ensure that engines are in sound working condition and are not emitting smoke.
5	Safety/security concerns	• Safety of the workers and others will be ensured. • Privacy of the neighbors will not be disturbed.
6	Malfunction of utilities	It is proposed to appoint maintenance engineers with technicians like plumber and Electrician for smooth operation of utility services.
7	Occupational Health, Safety and Environment	• Regular medical check-ups must be ensured to improve the working condition and efficiency of workers. • Relevant safety devices like ear muffles, gloves and glasses must be strictly used by the operators at the work site. • Safety of management, workers and visitors must be ensured. • Observance of construction and safety codes must be ensured.

		• Provision of emergency exits must be ensured. • Equipment's should be marked and tagged properly
8	Ecological considerations (flora & fauna)	The flora and fauna should be restored after construction by landscaping and maintaining the introduced plants
9	Solid Waste	• Separate waste bins will be placed for different type of wastes - plastic, paper, metal, glass, wood, and cotton. • Recyclable material will be separated at source. • Non-hazardous non-recyclable wastes will be disposed off on designated site. • No waste will be dumped at any location outside the plant boundary. • All hazardous waste will be separated from other wastes. Hazardous wastes will be stored in designated areas with restricted access and proper marking. • An emergency response plan will be developed for the hazardous waste (and substances). • All containers of hazardous waste will be appropriately labeled. • Area for solid waste must be reserved within the subject project. • Solid waste must be managed on a regular basis. • The domestic waste will be disposed-off in environment friendly way. • The site should have waste receptacles with bulk storage facilities at convenient points to prevent littering during operation.

10	Traffic Management	• Night time driving of project vehicles will be limited where possible. • Vehicles will remain confined to defined access. • Speed limit of 10 km/h will be maintained on the section of the access roadthat is adjacent to the village.
10	House Keeping	• Sites shall be properly managed with a good standard of housekeeping to reduce the risks of accidental injury.
11	Energy use & use	• Install electricity meters and monitor them regularly to measure efficiency. • Turn Off Lights, Machines and other equipment when not in use.
12	Water consumption	• Avoid unnecessary toilet flushing • Promptly detect leaking taps and repairthem • Turn off taps when not inuse • Install water conserving taps that turn of immediately when water is not in use • Install a discharge water meter in the premises to check on total water use and for billing purposes
13	Electricity use	• Erect a meter in the premises to check on total kilowatts used and for billing purposes • Switch off light that are not in use • Use of energy conserving bulbs/tubes • Use of natural light for lighting purposes

		• Use natural ventilation from windows and doors and avoid using Air Con that use electricity • Provide a standby generator in the premises in cases power goes out • Switch off lights in the offices at night
14	Wastewater disposal	• Wastewater treatment facility will be installed for treatment of wastewater. • Waste water should empty to the septic tank via well laid sewage pipes • Conduct inspections for sewer pipe blockages or damages and fix them

8.5 Equipment Maintenance Detail

The proponent of the subject project will maintain records for Health, Safety & Environment and will hire Environmental / unit manager to check and deal with the unit issues.

All mobile equipment is to be inspected and maintained according to the following Equipment Inspection Schedule as a minimum. Records of all inspections and maintenance are completed and maintained for review and approval.

Maintenance of equipment, release of lubrication fluids, etc., is performed only in approved areas. Spills and leaks from equipment are cleaned up promptly.

Table: Equipment Inspection Detail

Type of Equipment	Type of Inspection	Schedule
Cranes – Crawler, Truck, Hydraulic, etc.	Complete inspection and certification	Before put to work and annually
	Critical items, controls, overall functioning	Daily
	Safety device, hooks, cables, electrical	Monthly
	Complete inspection	Every 3 months
	Repair	When failure occurs
	Preventative maintenance	Manufacturer's recommendation
Heavy Equipment	Complete inspection	Before put to work
Dozers, Backhoes	Complete inspection	Every 3 months
Compactors, Trucks	Repair	When failure occurs
	Preventative maintenance	Manufacturer's recommendation
	Operator's checklist	Daily
Miscellaneous	Complete inspection	Before put to work
	Complete inspection	Every 3 months
	Repair	When failure occurs

Compressors, Welding Machines, Generators	Preventative maintenance	Manufacturer's recommendation

8.6 Environmental Budget

The cost which is required to effectively implement the mitigation measures is important for the sustainability of the Project in operation stage of the Project. Management will allocate 2% of total cost of the project as Environmental Budget for meeting the following purposes:

Table: Allocation of Environmental Budget

HSE training	On quarterly basis
Maintenance and management of Environment	On regular basis
Maintenance of equipment	On regular basis
Restoration	As per requirement
Plantation	During the operation phase
Availability of PPEs	During construction and operation
Strategic planning to cope with any Emergency	As per policy
Formulate the disaster management plan to cope with natural disaster	As per policy

Implementation of all these parameters will be included in the environmental budget. Any equipment failure will not be included in this budget.

Environmental Management Plan for Metal Plus Enterprises Pvt Ltd

Table: Environmental Management Plan

SR. NO.	Environmental Parameter/ Element	MITIGATION MEASURE TO BE TAKEN DURING		
		CONSTRUCTION	REGULAR OPERATIONS	RESPONSIBILITY
PHYSICAL ENVIRONMENT				
1	Waste water	The sewage to be generated will be discharged into the septic tank for its primary treatment and then it drained out into sewer. Domestic/construction wastewater after Treatment in a septic tank will be drained into nearby local sewage drain.	No process wastewater will be generated Sewage and other waste effluents will be handled to avoid contaminating surface and groundwater. No contaminated effluents will be released into the environment without having been treated. Monitoring will be conducted by EPA certified lab if required.	Environmental / Project Manager
2-	Health & safety	Local people will be informed in advance when work is about to start in an area. Safe driving practices will be adopted, particularly while passing through settlements Basic health facilities will be provided to employees Open fires will not be allowed anywhere outside the site.	Basic health facilities will be provided to employees. Proper firefighting system will be installed. Security guards will be present round the clock. Regular medical check-ups must be ensured to improve the working condition and efficiency of workers.	Environmental / Project Manager

			Relevant safety devices like ear muffles, gloves and glasses must be strictly used by the operators at the worksite. Safety of management, workers and visitors must be ensured. Provision of emergency exits must be ensured. Equipment's should be marked and tagged properly	
3-	Water supply	It will be ensured that no activity tempers with the water supply system.	It shall be ensured that no activity tempers with the water supply system. Project proponent committed to provide safe drinking water to all workers and staff	Environmental/ Project Manager
4-	Solid wastes	Excavation waste will be re-used or backfilled. Waste generated will collected by a privately contracted waste collection company	Separate waste bins will be placed for different type of wastes - plastic, paper, metal, glass, wood, and cotton. Recyclable material will be separated at source. Non-hazardous non-recyclable wastes will be disposed off on designated site. No waste will be dumped at any location outside the plant boundary. All hazardous waste will be separated from other wastes. Hazardous wastes will be stored in designated areas with restricted access and proper marking. An emergency response plan will be developed for the hazardous waste (and substances). All containers of hazardous waste will be appropriately labeled.	Environmental/ Project Manager

			Area for solid waste must be reserved within the subject project. Solid waste must be managed on regular basis. The domestic waste will be disposed-off in an environmentally friendly way. The site should have waste receptacles with bulk storage facilities at convenient points to prevent littering during operation.	
5-	Noise	In order to avoid noise in the project area, vehicles carrying raw materials shall be operated during night time as far as possible. The project construction activities will not involve any activity which may create high noise levels. Ear plugs will be provided & implemented.	In order to avoid noise in the project area, vehicles to carry domestic and commercial materials, shall be operated during night as far as possible. No activity producing extraordinary levels of noise will be allowed as a policy matter. PPE will be provided to workers. Generators will be installed in a specially constructed room where its noise will be curtailed within the limiting values of the Punjab Environmental Quality Standards. Monitoring will be conducted by EPA Certified lab as per PEQS if required	Environmental/ Project Manager
6-	Gaseous emissions and particulate matter/dust emissions	Construction materials i.e. sand, clay and like will be transported to the project site during night time. All equipment, generators, and vehicles used during the project will be properly tuned and maintained in good working condition in order to minimize exhaust emissions.	Generators should be maintained properly Generators will be installed in a specially constructed room. Avoid off road travel Maintain vehicle speeds Monitoring should be conducted as per instruction of the Environment Protection Department.	Environmental/ Project Manager

		All project vehicles will be checked regularly to ensure that engines are in sound working condition and are not emitting smoke.	Speed for traffic movement in the scheme should be limited to avoid noise. Canopies should be built over generators to avoid noise pollution.	
7	Soil disturbance/ erosion	Control earthworks and compact loose soils Landscaping of project is done after construction. Controlled and managed excavation activities will be done Soil erosion control and conservation structures/means where necessary was provided. To the greatest extent possible, phase site clearance so as to minimize the area of exposed soil at any given time	Maximum plantation is recommended within and outside the land subdivision and for this area is reserved. Tarpaulin sheets will be placed under generator (s), and other leaching substances. Land will be restored by planting indigenous plants. Landscaping on project completion	Environmental/ Project Manager
8	Traffic related problems	The vehicle number will be regulated in a way that no stampedes occur on the site. Large size vehicles in very limited numbers will be visit the project site during night time.	The project site has additional area reserved exclusively for parking cars and motorcycles.	Environmental/ Project Manager
9	Trash burning	No trash burning will be done during construction phase.	No trash burning will be allowed on the roads and streets.	Environmental/ Project Manager
10	Dust	The open place will be cleaned after sprinkling of water to avoid any dust to spread around.	Plantation will be ensured in open space to avoid dust.	Environmental/ Project Manager

BIOLOGICAL ENVIRONMENT				
11	Fauna and Flora	Site is devoid - off any protected species of both fauna & flora	Awareness programs will be planned regarding the protection of fauna & flora. Species of Indigenous plants will be planted at site.	Environmental/ HSE Manager
SOCIOECONOMIC IMPACTS				
12	Resettlement Issues	There is no issue of resettlement due to the construction of the subject project.	There will not be any issue of resettlement due to the operation of the subject project.	Environmental/ HSE Manager
13	Change in cultural language	Maximum employment of Local people is recommended to preserve the local cultural language. It will be helpful in communication with the local people to resolve any emerging issue near the project area.	Maximum employment of Local people is recommended to preserve the local cultural language. It will help in communication with the local people to resolve any emerging issue near the project area	Proponent
14	Education	Schools and colleges already exist in the area.	Schools and colleges exist in the area. The project proponent is committed to initiate an educational awareness program.	Proponent
15	Health	A Heath facility already exists near the project site. The project proponent will be provided first aid facilities at site and also social security and medical checkups of the workers.	Heath facility already exists near the project site. The project proponent is committed to provide first aid facilities at site and also social security and medical checkups of the workers.	Proponent
16	Culture, Norms of the area	Maximum local employment will be ensured to preserve the culture of the area	Maximum local employment should be ensured to preserve the culture of the area	Proponent

17	Gender inequality	Women involvement will be ensured in decision making process.	Women involvement in decision making process should be ensured	Proponent
			Others	
18	Environment quality enhancement measures: Flowers and plants and decoration lights.	---	Flower pots containing flowers and plants will be planted in front of the buildings to add to the improvement of the environment around. Street lights will be provided in the roads and streets.	Environmental/ Project Manager
19	Staff for catering the Environmental Management Plan	---	Special staff will be recruited to implement this Environmental Management Plan on a regular basis.	Environmental/ Project Manager
20	Enhancement of aesthetic beauty of the building and the area.	---	All other necessary measures shall also be taken to maintain standards of cleanliness so that the building may add to the scenic/aesthetic beauty of the area around.	Environmental/ Project Manager

8.7 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:

Table: Environmental Monitoring

Sr. No.	Parameters	Monitoring Schedules	Monitoring Duration
1	Ambient Air Monitoring (NOx, CO, SOx, PM_{10})	Regularly	24 Hours
2	Noise Level	Regularly	24 hours
3	Water quality	Regularly	Some parameters on site, Others in lab

CONSULTATION, PARTICIPATION AND DISCLOSURE

Objectives of Consultation:

Public consultation plays a vital role in studying the effects of any development project on stakeholders and in its successful implementation and execution. It affords an opportunity to exchange knowledge with those who as members of the society are concerned with the Project, immediately or remotely. Referring particularly to a project related to environmental assessment, involvement of public is all the more essential, as it leads to better and more acceptable decision-making. The overall objective of the consultation with the stakeholders is to help verify the environmental and social issues, besides technical ones, that have been presumed to arise and to identify those which are not known or are unique to the Project. In fact, discourse with many who have thoroughly observed the site conditions in the pre-developmental phase, goes a long way in updating the knowledge and understanding.

7.1 The proponent

The proponent of the said unit is Rashid Waheed S/O Sheikh Abdul Waheed R/O Paragon City Barki Road, House No: 4 Block Mounds Lahore Cantt District Lahore .

7.2 Consultative Aspects:

The said Project involves stakeholders from various segments of the society, who have direct or indirect interest in the developmental activity. The consultant team has endeavored to hold consultative sessions with a number of prominent stakeholders to evince their views on the proposed Project, inter-alia, their opinions, suggestions, understanding on various issues and concerns. The consultations aimed specifically at:

- Exchange of information related to the Project and its possible utilization in the Project planning and execution.
- Dissemination of information through discussions, education and liaison.
- Collaboratively solving the problems.
- Eliciting the comments and feedback on the proposed Project.
- Documentation of information narrated by the stakeholders.
- Documentation of mitigation measures proposed by the stakeholders.
- Incorporation of public concerns and their addressable in the EIA

7.3 Stakeholder's Consultations:

There are two types of stakeholders, i.e. primary and secondary stakeholders. The primary stakeholders are the initial stakeholders, such as affected persons, general public including women resided in villages in the vicinity of the sub-project area. Accordingly, the consultations were made with all primary stakeholders for sharing the information regarding project components, i.e. construction of project and community feedback regarding the project.

5.1 Meetings with stakeholders

A series of consultations was carried out with stakeholders and the general public in. The purpose of this survey was to achieve the objectives of the consultation, highlight the main issues in the implementation of the project and finally propose mitigation measures. Open and close ended questionnaire was used to collect the views concerning the assessment survey. Scoping sessions and informal group discussions were also carried out with local residents and local government representatives regarding the project. The outcome of the whole consultation process was very encouraging. The following issues were discussed during Informal Meetings with local representatives:

a. Brief Description of the Project
b. Current economic condition in the area
c. Suggestions for improvement in the current industrial system and all activities related to industry
d. Perceptions about the project
e. Perceived impacts of the project

The local poor people predominantly requested for unskilled and semi-skilled jobs during implementation of the Project. On the basis of the consultations so far, it appears that the Project will have no insurmountable environmental and social impact. The community generally supported the project. Consultative meeting forms are annexed as **Annexure-I.**

Table: List of Consulted Stakeholders

Sr.#	Categories of Official Stakeholders Consulted	Categories of Local Stakeholders Consulted
1.	Environmental Protection Agency Punjab (EPA Punjab), Lahore	Local Residents
2.	Office of the Municipal Corporation	Vendors

4.	Pakistan Council for Scientific and Industrial Research (PCSIR), Lahore	Business/ Shop Owners
5.	University of Engineering & Technology (UET) Lahore. Department of PHE & Environment.	Ahl-e-Hunar Foundation, S(NGO).
6.	Government College University Lahore. Sustainable Development Study Centre.	Pedestrians

5.2 Analysis of Stakeholder Consultation

5.5.1 Sample Size

Sample size 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 togive personal information.

5.5.2 Statistical Analysis

Statistical analysis of the data collected during the visit of study site villages through questionnaires.

5.5.3 Result and Discussion

The socio-economic survey of the proposed project was conducted properly following guidelines. During the survey 50 people were interviewed out of which 20 persons were selected for this study. The 90% people are literate and matric and college / university qualified and 50% people are between 30-50 years old. According to the survey, 100 % of respondents were male. So, according to the survey overall education status of the area is good.

As per survey, 78 % people were satisfied with the project and they gave positive remarks regarding the existing unit and project as they got a job over there, their living standard raised over working there. While 13 % respondents were having no opinion regarding the project and 9% respondents were not satisfied with the production unit due to their concern regarding the aesthetic degradation and no preference to local people for jobs. Majority were in favor that no effect will be produced by this project. The 100% people interviewed were in favor of the project and heard about this project. The 70% people responded that there is no impact of the project on the water quality & quantity due to construction and operation of the project. Moreover, 65% of people's opinion is that project have no impact on soil quality. The survey analysis reflected that there is no or minor impact on air quality (smoke, rise in temperature, visibility issue etc.) and nearby population problem (irritation, sleeping problems) which will be controlled by the installation of proper pollution control devices and also there will be no problem of traffic congestion.

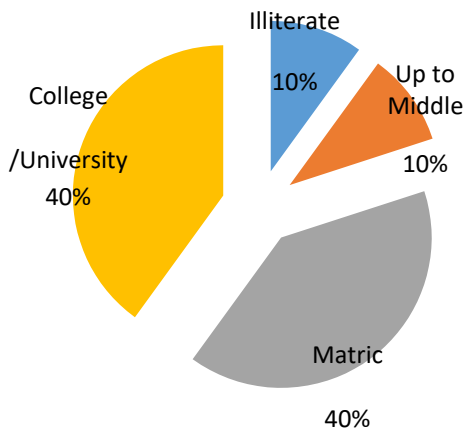


Fig.: Literacy rate of interviewed persons

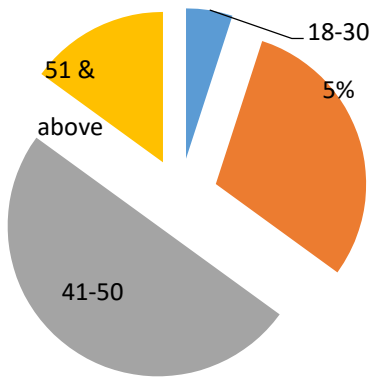
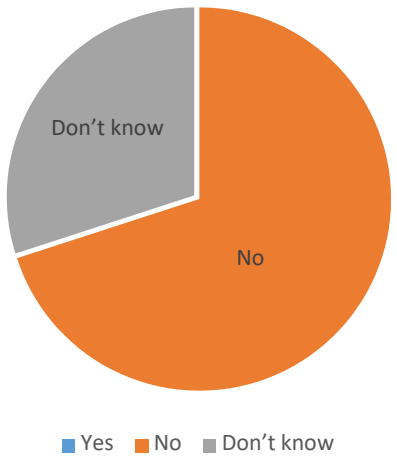


Fig.: Age (Years) of interviewed persons



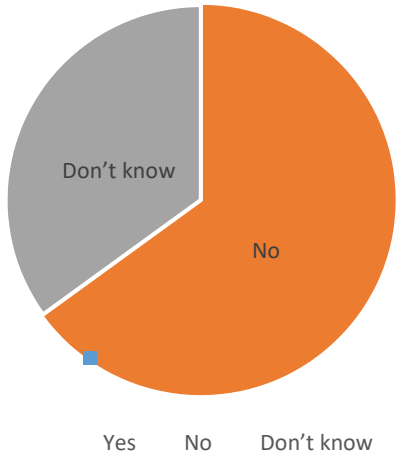


Fig.: Point of view of interviewed persons regarding impact on water quality & quantity due to proposed project.

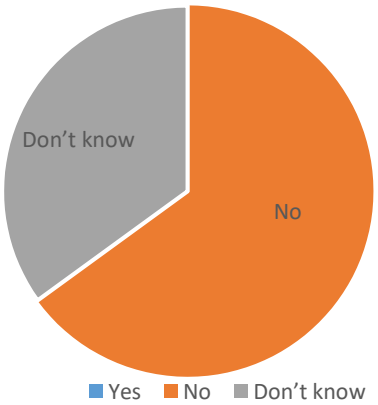


Fig.: Point of view of interviewed persons regarding impact on soil quality due to proposed project.

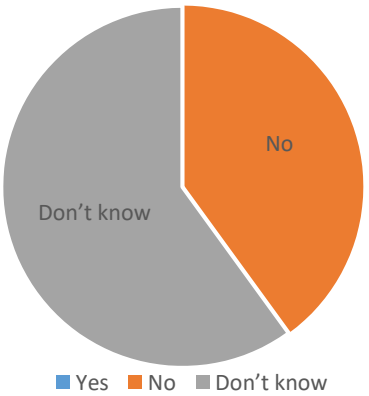


Fig.: Point of view of interviewed persons regarding wastewater issues due to proposed project.

Fig.: Point of view of interviewed persons regarding information of protected area in proposed project site.

5.3 Summary of Issues Raised by Stakeholders

A summary of the key issues raised by stakeholders and how these are being addressed by Project Proponent is provided in table below.

Table: Summary of issues and commitments by Proponent

Issue	Aspect/Concern raised by Stakeholders	Project Proponent Commitments
Employment Opportunities	Expectations of employment are very high. Job opportunities are less for herders as they generally have less skills and training.	Employment is the main priority of the industry. Mostly locally skill and unskilled labor will be prioritized and also there will be job at executive level. Max. persons according to the requirement will be employed by the industry.

Training Opportunities	People are keen to consult with the subject industry if the Project offers training and upgrading opportunities to enhance their trade or professional skills.	• Development of the Training Strategy, including commitment of allocation of budget investment for training infrastructure, delivery and design. • Installation of training facilities for workers of the company and students will also be accommodated. • The internship program will offer to the students to develop professional skills.
Health& safety	The area is away from population & surrounded by industrial facilities all around	• Extensive consultation on the road corridor and safety aspects, including on herder and animal crossings. • Development of Transport Management Plan including traffic safety training. • Traffic advisory signs will be installed along the project site and all nearby specific areas.
Local economy and business development	• Local service providers are keen to participate in providing services to provide raw material and expect to receive in order to adjust their businesses to meet specific needs. • Local businesses want to receive support in terms of	• Proponent has the main focus that they will buy all the material regarding construction and plant operation to buy from the local market. • This will help the local and small business and to people who are keen interested to become suppliers.

	finance and facilities to diversify their businesses. • Local/regional companies and entrepreneurs have limited understanding about meeting the high volumes required by the Project and the quality standard, but are keen to know these requirements so they can become suppliers.	
Environmental Issues	• Dust and noise impacts, particularly from the construction activities and in operation of mechanically unfit machines, are of concern to herders and other residents. • Environmental degradation during road construction and use. Loss and change of vegetation due to soil degradation. .	• Implementation of controls under the Environmental Management Plans, including on and off-site dust and noise monitoring. • A seed rehabilitation program has been established and initial work has been completed in the economic zone and along the boundary. • A Participatory Environmental Monitoring Program will be launched to spread awareness.

Water quantity and quality	Water quality and quantity, and impacts from the wastewater disposal are all key concerns for nearby herders.	• Implementation of consultation in relation to water use and development of the Participatory Environmental Monitoring Program. • Water treatment facility will be installed by the proponent that will help to safe disposal of the water.

7.4 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

7.5 Schedule of Consultations local people

Sr. No	Date	Mouza	Name of Respondent	Age (Years)
1.	JUNE 19, 2023	Mehmood Booti	Rashid Waheed	35
2.	JUNE 19, 2023	Mehmood Booti	Saif	31
3.	JUNE 19, 2023	Mehmood Booti	Bilal	62
4.	JUNE 19, 2023	Mehmood Booti	Ishaq	35

5.	JUNE 19, 2023	Mehmood Booti	Sadiq Ali	52
6.	JUNE 19, 2023	Saggian	Fiaz Ahmad	33
7.	JUNE 19, 2023	Saggian	Karim Ali	39
8.	JUNE 19, 2023	Saggian	Nasir Jamshed	28
9.	JUNE 19, 2023	Saggian	Mehmood Ali	27

7.6Issues 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.

MITIGATION AND IMPACT ASSESSMENT

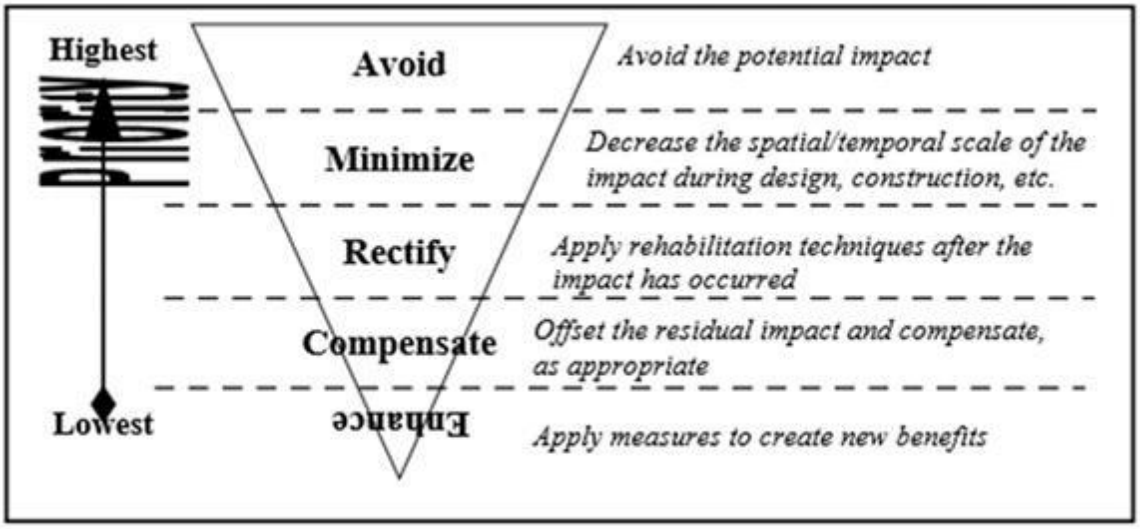
The impact assessment methodology is discussed below:

- **Screening of Potential Impacts**

Based on site visit, observation, brain storming, provided information and social interviews, significant impacts are anticipated and evaluated. Then qualitative and quantitative (where possible) assessment of these anticipated impacts is carried out.

- **Identification of Mitigation Measures**

After anticipation and screening of significant impacts, certain mitigation measures are provided in order to enhance benefits of project and reducing impacts. These measures can be classified as:



- **Evaluation of the Residual Impacts**

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

- **Identification of Monitoring Requirements**

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

1- What is the Problem

The project in question is of Aluminum & Copper Casting unit. All the impacts due to construction and operation of this project have been discussed in Chapter 5 of this report and mitigation measures are also suggested there. However, the main problems which can occur due to this activity are given below:

- Deterioration of Air Quality due to use of Construction Vehicles
- Health & Safety Issues for Workers in Construction Phase
- Deterioration of Environment due to Production of Wastewater in Operational Phase
- Deterioration of Environment due to Production of Solid Waste in Operational Phase.

2- When will problem will occur and when it should be addressed

Sr. No.	Problem	When Problem Will Occur	When Problem will be Addressed
1	Deterioration of Air Quality	Due to use of Construction Vehicles in Construction Phase	This problem will be addressed before start of construction activities by providing all the required measures
2	Health & Safety Issues for Workers	Construction Phase	This problem will be addressed during construction activities by providing PPE's
3	Deterioration of Environment	Production of Wastewater in Operational Phase	This problem will be addressed in operational phase of the project
		Due to Production of Solid Waste (Soil Contamination, effecting GW Quality etc.)	This problem will be addressed in operational phase of the project

3- Where problem should be addressed

The impacts associated with this project would be addressed at different stages of this project as mentioned below:

- **Planning Phase**

The impacts related to human resettlement (if any occurs) would be addressed in planning phase.

- **Design Phase**

At design phase special attention should be given to the design of the project in the sense that it has been designed in such a way as to cause minimum disruption and deterioration of environment and surroundings.

- **Construction Phase**

The impacts related to Health and Safety of Workers, Air Quality, Soil Quality etc. will be addressed in construction phase.

- **Operational Phase**

The impacts related to Water Quality, Air Quality, Traffic Management etc. would be addressed in operational phase.

4- How the problem should be addressed

All the problems arising in terms of environmental impacts would be addressed in different phases of the project as mentioned above.

4.2

- **Ways of achieving mitigation measures**

The potential negative impacts during construction and operational stage of the project should be mitigated to an acceptable level. Following environmental protection measures are adopted to eliminate adverse environmental impacts or to reduce them to an acceptable level within the legislative and regulatory framework. The proposed mitigation measures are listed below:

- Appropriate waste disposal mechanism should be followed during the construction phase. The construction waste would be disposed in a manner that does not contaminate surface or groundwater.
- Quantities of waste disposed, recycled, or reused will be logged on a Waste Tracking Register.
- Separation of recyclable material will be done.
- The solid waste produced in operational phase would be disposed off as per TMA procedures.
- The construction waste generated will be used for earth filling within the project site premises.

- **Changing in Planning and Design**

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

- **Improved Monitoring and Management Services**

The EMP will ensure that even all type of pollutants from project is within the prescribed limiting values of the NEQS. Thus the environment and human health around the project will be safeguarded.

Regular monitoring of all the significant environmental issues is essential to check the compliance status of EMP.

The main objective of the monitoring will be:

- To verify the results of the environmental study with respects to the proposed project.
- To estimate the trends of concentrated values of the issues.
- To assess the efficiency of pollution control mechanism
- To ensure that any additional parameters, other than those identified in the 1EE report, do not turn critical after the commissioning of proposed project.

Recommended Activities of Environmental Monitoring Protocol

Parameter/ Receptor	Location	Monitoring	Mechanism Monitoring and Reporting Frequency
Water Quality	• Ground Water • Surface Water	Discrete grab sampling and laboratory testing of water samples.	• Sampling and laboratory testing should be done on monthly basis during the construction and annually during the operational stage. • Discharges f r o m the construction sites should be tested for temperature, PH and turbidity.

			• Treated effluent discharges from the worker's camp to be tested for PH TSS and BOD.
Dust Emissions	• Tracks along the roads during construction period.	Ambient particulate matter monitoring.	• Sampling and laboratory testing should be done on monthly basis during the construction
Noise Levels	Camp sites and Selected Locations along the access.	Noise meter	Monthly during the construction Stage.
Air Quality	Silencers of heavy machinery, trucks and other vehicles.	Emissions monitoring system. Monitoring of ambient air quality.	• Monthly monitoring of air pollution parameters including PM_{10}, NO_X, SO_X; CO. Hydrocarbons during the construction period, and quarterly monitoring of PM_{10}, NO_X, SO_X; CO VOC_S during the operation stage.
Cutting of trees	In all project area during the construction stage and operation stage.	Periodic visits at site to ensure that trees cutting is prohibited.	Reported on monthly basis during the construction period, and once in a year monitoring and reporting during the operation period.
Socio-cultural Environment			

Inconvenienceto	All around the project area	Consultations with community to get feedback about inconvenience due to the construction activities to perform their daily routine chores.	Monthly monitoring and reporting during the construction periods.

- **Compensation in money terms**

The project will not include any activity due to which compensation to public will be required in money terms.

- **Replacement, Relocation and Rehabilitation**

There exists no human settlement on the selected project site to be displaced owing to the commencement of the Project. No structure of any significance stands at the site to be relocated or dismantled. Land is already under proponent's ownership, and no fresh land is to be occupied; hence, no relocation or restoration and rehabilitation is required

Reporting

Sr. No		**Detail**
5.1	Clear reporting style supported by maps or other descriptive details	The said instructions have been followed in this report.
5.2	Specific term of references should be present in report	This is attached with this report.
	Appendices Glossary	This is attached with this report.
	1- List of Abbreviations	This is attached with this report.
	2- List of individuals or organizations consulted along with their written feed back	This is attached with this report.
	3- Sources of data and full list of all reference material used	This is attached with this report.
	4- Terms of references for environmental reports	This is attached with this report.
	5- List of names, qualifications and roles of team members carrying out the IEE/EIA study	This is given at Page 15 of this report.

ANNEXURE

REFERENCES

- Zhang, Xun & Tang, Huiqing. (2017). Effect of Inner Shape on copper casting
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- Guidelines for Preparation and Review of Environmental Reports
- Guidelines for Public Consultation
- Meteo Blue
- Labor Laws
- Meteorology Department Data (from website)
- National Environmental Policy 2005
- National Environmental Quality Standards (Self-Monitoring and Reporting by Industries) Rules, 2001
- Pakistan Biosafety Rules 2005
- Pakistan Environmental Protection Act, 1997
- Pakistan Environmental Protection Agency (Review of IEE/EIA) Regulations, 2022.
- The Land Acquisition Act, 1894
- The Punjab Local Government Ordinance, 2001
- Punjab Environmental Protection (Amendment) Act, 2012

LIST OF ABBRIVIATIONS

CO	Carbon monoxide
CO_2	Carbon dioxide
DRI	Directly Reduced Iron
KW	Kilo Watt
OGRA	Oil & Gas Regulatory Pakistan
SO_2	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
NO_x	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
SO_x	Oxides of Sulphur
TMA	Town Municipal Authority
WAPDA	Water and Power Development Authority
WASA	Water and Sanitation Agency
WHO	World Health Organization

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
Anum Waheed	BS (Hons) Environmental Science (GCU Lahore)	Research Associate (Author of the Report)

SOCIAL SURVEY FORM

Questionnaire for the project of

M/s "Metal Plus Enterprises Pvt Ltd"

STAKE HOLDER'S INFORMATION:

1	Name	
2	Father's Name	
3	CNIC Number (Optional)	
4	Age	Years
5	Gender	Male Female
6	Qualification	Under matric Matriculation Graduate Post graduate
7	Marital status	Married Single
8	Employment status	Employed Unemployed
9	Income group	Below Rs: 25,000 / month Between 25,000- 35000 Above Rs: 35000 / month
10	Do you know about said proposed furnace installation	Yes No
11	Should it be done?	Yes No
12	What social change it will result?	Improvement No change Deterioration
13	What economical change it will result?	Improvement No change

			Deterioration
14	What environmental change it will result?	Without precautionary measures	Improvement No change Deterioration
		If adequate precautionary measures are adopted	Improvement No change Deterioration
15	Your suggestions to care for Environment		
16	Any other suggestion for benefit of the community?		

Signature:_____