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1 EXECUTIVE SUMMARY

This executive summary presents the main findings of Initial Environmental Examination (IEE) of Mutahir Metal Works (Pvt) Limited located 43-Km Multan Road, Mouza Nathay Khalsa, Tehsil Pattoki, District Kasur. The main objective of this proposed project is production of high quality and environment friendly products for the development.

1.1 Title & location of project

Mutahir Metal Works (Pvt) Limited located 43-Km Multan Road, Mouza Nathay Khalsa, Tehsil Pattoki, District Kasur.

1.2 Name of proponent

Mubashir Ahmed S/O Khawaja Abdul Hafeez

R/o House no. 43-A, Govt. Housing Society, Township, Lahore.

CNIC No: 35202-1107686-1

1.3 Name of organization preparing the report

Mutahir Metal Works (Pvt) Limited has engaged Environtech Consultants (Private) Limited at office no. 11, Second Floor, Centre Point Plaza, Main Boulevard, Gulberg-III, Lahore.

Table 1: Salient features of project

Salient features of project		
1.	Total Area	17 Kanal 3 Marla
2.	Total covered area	26718 SFT
3.	Cost of the project	Pkr/- 40 million approx.
4.	Capacity of project	Plastic 8000 MT/Month Steel Wires 1200 MT/Month Aluminum Wires 1000 MT/M Copper wires 1200 MT/M
5.	Location of project	31°15'39.1"N 74°01'47.7"E
6.	Nature of area	Self-Developed Industrial area
7.	Present status of land Use	Constructed Industrial Building.
8.	Land use in the surroundings of project site.	The surroundings are: North Road South Industry

		East Open/Vacant Plot West Industry
9.	Raw material	Copper rods, Aluminum rods, Steel Rods, Plastic Scrap, Zinc Ingot, Dop, Chlorinated Paraffin, Calcium Carbonate, Tribasic Lead Sulfate, Stearic Acid and Lead Stearate
10.	Product	Aluminum wires Copper wires Steel Wires Galvanized and Ungalvanized
11.	Description of proposed project	The proposed project is the capacity enhancement and expanding of business by adding aluminum and copper wire manufacturing to an already operational unit for plastic recycling and manufacturing steel wires. Moreover, Proponent also intends to enhance its capacity for Plastic recycling and steel wires which was 5000 MT/M for plastic recycling and 300 MT/M for steel wires earlier.
12.	Nearby emergency services i.e. Hospital, police station, rescue, fire brigade etc.	With in 3-4 km.
13.	Water Source	Ground Water
14.	Status of Project	Constructed and Operational for Plastic recycling and manufacturing of steel wires.
15.	Source of Power	*LESCO* *(Lahore Electric Supply Company)*

1.4 A brief outline of proposal (type, process, technology and land requirements)

As per Punjab Environmental Protection Act 1997 (amended 2012) and Initial Environmental

Examination (IEE) & Environmental Impact Assessment (EIA) Regulations, 2000 proposed project falls under **Category C (3) "Synthetic resins, plastics and man-made fibers"** mentioned in **Schedule-I**. Thus, requires an IEE.

The current project is about the expansion of business earlier the unit is constructed and operational for plastic recycling and manufacturing of galvanized/ungalvanized steel wires now Proponent intends to add manufacturing of aluminum and copper wires to their facility. Site selected for proposed installation is under the ownership of proponent. It is an environmentally friendly project which will produce quality Copper and Aluminum wires for development projects. The project under consideration of this IEE is the installation of machinery for Copper and Aluminum wires manufacturing unit which is located at 43-Km Multan Road, Mouza Nathay Khalsa, Tehsil Pattoki, District Kasur. Beyond this scope no other development activities have been covered in this IEE study.

1.5 The major impacts & recommendations for mitigation measures

The potential impacts associated with the proposed project Installation of machinery and operation activities

Included: increase in water consumption; surface water contamination, air pollution from vehicle; vehicle movement, noise and disturbance, soil contamination and waste generation.

Proposed installations are automated machineries to be laid on concrete fortifications. The machinery installation does not require water while only water use will be during washing and domestic activities. Water conservation practices will be utilized to reduce the overall water consumption during proposed project activities. Surface or groundwater quality may deteriorate if pollutants are mixed with surface runoff during rain and carried to water resources in the vicinity or seeped in the ground. The impermeable septic tank will prevent untreated sewage from polluting surface water.

The ambient air quality of the area can be affected by exhaust emissions, vehicles and combustion process in construction equipment. The pollutants can seriously impair human health and ecological environment and other materials. The emissions include sulphur dioxide, oxides of nitrogen, carbon monoxide, carbon dioxide, and particulates. The emission levels depend on the type and size of activity, the type and quality of fuel and the manner in which it is burned. A significant impact will be interpreted if the concentration of pollutants in the ambient air exceeds the PEQS or recognized international guidelines for ambient air quality.

The sources of emissions during construction activities will not be significantly enough to alter the ambient air quality at regional level. All vehicles, equipment and machinery

will be properly tuned and maintained to minimize emissions. Cleaner fuels if required (less 1% Sulphur content) will be preferred to procure. Monitoring of Ambient air parameters and emissions should be carried out on to ensure compliance with the PEQS.

Noise has the potential to cause an impact to nearby communities and working personnel. To avoid the impact of noise, it will be ensured that, vehicles and other potentially noisy equipment used are in good condition. The noise level monitoring results would be compared with Punjab Environmental Quality Standards (PEQS) for Noise to meet the permissible limits. All on-site personnel will use required personal protective equipment (PPE) in high noise areas that will be clearly marked.

All the waste generated during installation activities will be disposed-off through implementation of an effective waste management plan to ensure that any impact resulting from waste generation shall be minimal. The recyclable waste will be sold to waste contractors, as per waste management plan. No hazardous chemical will be uncontrollably discharged into the
Environment.

Table 2: Impacts and mitigation measures

Environmental Aspect	Potential Impacts	Mitigation Measures
Water Resources	Depletion in groundwater, contamination of water resources by surface runoff, spillage of fuel	▪ Water extraction will be kept at minimum and water conservation measures will be practiced. ▪ Sewerage Wastewater from project site will be directed to settling tanks. ▪ Fuels and lubricants will be stored in covered and with bund walls, underlain with impervious lining.

		▪ Spill prevention plan shall be followed to mitigate any kind of spill.
Air Quality	Dust, combustion emissions, vehicular emissions used for project- related activities.	▪ Water will be sprinkled daily on all exposed surfaces to suppress emission of dust. ▪ Regular maintenance of project vehicles and equipment to ensure that engines are in sound working condition to minimize air emissions. ▪ Use of cleaner fuels for combustion ▪ Ambient monitoring should be carried out to ensure compliance with the PEQS.
Noise	Disturbance to the site workers, Nuisance for surrounding communities and wildlife	▪ Proper maintenance of vehicles and potentially noisy equipment. ▪ Minimize/avoid unnecessary use of noisy machinery. ▪ Blowing of horn will be prohibited. ▪ Provision of Personal Protective Equipment (PPE) to the on-site personnel in high noise areas.

Solid Waste	Soil contamination, air pollution, odor, health hazards, aesthetic issues	▪ Recyclable material will be separated at source and will be used again in manufacturing process.
Worker's Health and Safety	Health problems or immediate risk may take place, Occupational health of workers and community may be affected.	▪ Compliance to emergency response plan for emergencies and accidents will be ensured to avoid health safety risks. ▪ Work safety measures and good workmanship practices are to be followed by the contractor to ensure no health risks for laborers. ▪ Protection devices (earmuffs) will be provided to the workers operating in the vicinity of high noise generating machines. ▪ Proper maintenance of facilities for workers will be monitored. ▪ Provision of protective clothing for laborers e.g. helmet, adequate footwear, protective goggles, gloves ▪ Ensure strict use of wearing PPE during work activities.

		▪ Provision of proper safety signage at sensitive/accident prone spots.

1.6 Proposed monitoring

To monitor actual impacts of the project on selected sensitive receptors so that impacts not anticipated in the IEE or impacts which exceed the levels anticipated in the IEE can be identified and appropriate mitigation measures can be adopted in time. This objective will be achieved through effects monitoring.

1 INTRODUCTION

This chapter of the report provides a brief description of nature, size and location of the project. A defined scope of study, the magnitude of efforts and concise description of project proponent is also included in this chapter. The project is being proposed with the objectives to meet the consumers' increased demand for high quality Plastic(flakes, granules and powder), Steel (Galvanized and ungalvanized), Copper and Aluminum and steel wires keeping in view the business sustainability and to maintain workplace safety. Project proponent aims to deliver sustainable, industry leading financial performance and earn trust through enhancing quality of life and contributing to a healthier future.

The study has been carried out to estimate the potential environmental impacts, both positive and negative, on the environment as well as socio-economic fabric of the surrounding environment during construction as well as operational phase. This report intends to provide satisfactory mitigation measures to avoid/eliminate any chance of adverse environmental impact on the socio-cultural, economic and environmental components. This report also intends to fulfill the regulatory requirements set under Punjab Environmental Protection Act, 1997 (Amended 2012) and its consequent legislative framework for IEE/EIA Regulations 2022 and the guidelines drafted for IEE and EIA under numerous sectorial heads. The entire set of legislative frameworks requires any new development project to undergo an IEE or EIA based on the categorization of the project under Schedule I and/or Schedule II.

1.1 Screening

According to the Section 12 of Punjab Environmental Protection Act, 1997 (amended 2012) which states;

"**No proponent of a project shall commence construction or operation unless he has filed with the Government Agency designated by Federal Environmental Protection Agency or Provincial. Environmental Protection Agencies, as the case may be or where the project is likely to cause an adverse environmental effect an Environmental Impact Assessment (IEE) and has obtained from the Government Agency approval in respect thereof**."

As per Punjab Environmental Protection Act 1997 (amended 2012) and Initial Environmental Examination (IEE) & Environmental Impact Assessment (EIA) Regulations, 2022 proposed project falls under **Category C (3) "Synthetic resins, plastics and man-made fibers"** mentioned in **Schedule-I**. Thus, requires an IEE

Report is being prepared for duly submission in EPA, Punjab.

1.2 Purpose of report

As per Punjab Environmental Protection Act, 1997 (Amended 2012) and the IEE/EIA Regulations, 2022 it is mandatory for the proponent of any development project to obtain Environmental Approval before commencing construction from EPA Punjab by filing an IEE or EIA as the case may be before the Agency. This IEE Study presents the findings of this subject unit. For this purpose, the proponent has engaged environmental consultants, M/s Environtech Consultants (Private) Limited. The purpose of this study is to identify the environmental baseline i.e. physical, biological and socio- economic/cultural conditions and assess all possible impacts arising during the construction and operation phase of the project with the aim to find out appropriate measures for their mitigation, to either eliminate those impacts or to bring them to acceptable level and formulate Environmental Management and Monitoring Plan (EMMP) for implementation of the project in environment-friendly manner. This IEE Report provides relevant information, as required under the officially approved format, to facilitate the decision makers i.e. EPA Punjab for the issuance of Environmental Approval/NOC.

1.3 Identification of project and proponent

1.3.1 Project

The proposed installation to which this Initial Environmental Examination (IEE) relates is entitled as “Mutahir Metal Works (Pvt) Limited located 43-Km Multan Road, Mouza Nathay Khalsa, Tehsil Pattoki, District Kasur.

1.3.2 Proponent

Name: Mubashir Ahmed S/O Khawaja Abdul Hafeez

R/o: House no. 43-A, Govt. Housing Society, Township, Lahore.

CNIC No: 35202-1107686-1

1.4 Details of consultant

The IEE study was carried out by team of Environtech Consultant Private Limited comprising of environment scientists and engineers, sociologist, environmental chemist and environmental auditors with diversified experience on local and international assignments. The detail of the project team deputed on this assignment is attached to this report.

1.5 Brief description of nature, size and location of project

The proposed project to which this Initial Environmental Examination (IEE) relates is entitled as Mutahir Metal Works (Pvt) Limited located 43-Km Multan Road, Mouza Nathay Khalsa, Tehsil Pattoki, District Kasur. The total area of proposed project is **17 kanal 3 marla** with total cost of Pkr 40 million approx. capacity of project will be Plastic 8000 MT/Month, Steel Wires 1200 MT/Month, Aluminium Wires 1000 MT/M and Copper wires 1200 MT/M. The project under consideration of this IEE is the production enchantment of plastic recycling and steel wires and expansion of products by manufacturing of Copper and Aluminium wires which is located at located 43-Km Multan Road, Mouza Nathay Khalsa, Tehsil Pattoki, District Kasur. Beyond this scope no other development activities have been covered under this IEE study.

2 DESCRIPTION OF PROJECT

This chapter provides the description of "Mutahir Metal Works (Pvt) Limited, type and category of project, location and layout, vegetation features of site, project schedule of implementation and complete description of proposed project related to its process and steps.

2.1 Type & category of project

As per Punjab Environmental Protection Act 1997 (amended 2012) and Initial Environmental

Examination (IEE) & Environmental Impact Assessment (EIA) Regulations, 2022 proposed project falls under **Category C (3) "Synthetic resins, plastics and man-made fibers""** mentioned in **Schedule-I**. Thus, requires an IEE Report is being prepared for duly submission in EPA, Punjab.

2.2 Objectives of project

The objective of this project is to make affordable and user-friendly products that have easy access in accordance with economic viability. To fulfill this, management of project will strive to provide with innovative, competitive and sustainable solutions, and in order to reduce the impacts on environment, while always taking patient needs into account. With technology, proponent will be able to assist customers at any and every stage of the development process to help ensure the product's success.

2.3 Consideration of Alternatives

This chapter will discuss alterative and their selection and rejection criteria.

2.4 Site alternatives (selection and rejection criteria)

For installation of machinery, it is important that site must be selected at suitable location.

- Selected site is located in non-negative and non-agricultural area.
- Transportation infrastructure (road network) is available.
- Safe distance from sensitive receptors (residential area & protected area)
- The selected site is under the ownership of the proponent.

2.5 Design/technology alternatives (selection and rejection criteria)

Up to date will be installed, also environment and eco-friendly. So, no other technology will be taken under consideration.

2.6 Environmental alternatives (selection and rejection criteria)

Environmental considerations are of utmost importance in selecting site. Being in a self-developed industrial zone there is no sensitivity in the area from environmental setting point of view. Thus, there is no ecologically sensitive or declared protected area such as territorial waters, forest, game reserve or biodiversity parks within a 10 km radius of the project site, requiring the proponent to look for site alternatives.

2.7 Economic alternatives (selection and rejection criteria)

The technology selected for establishment of above stated project will be economical viable than alternatives present as compared to majority of the other available production technologies, but it will be most efficient and convenient to use.

2.8 Location and site layout of project

The project site is located 43-Km Multan Road, Mouza Nathay Khalsa, Tehsil Pattoki, District Kasur. Google Earth map of site is given in **Fig-1**.

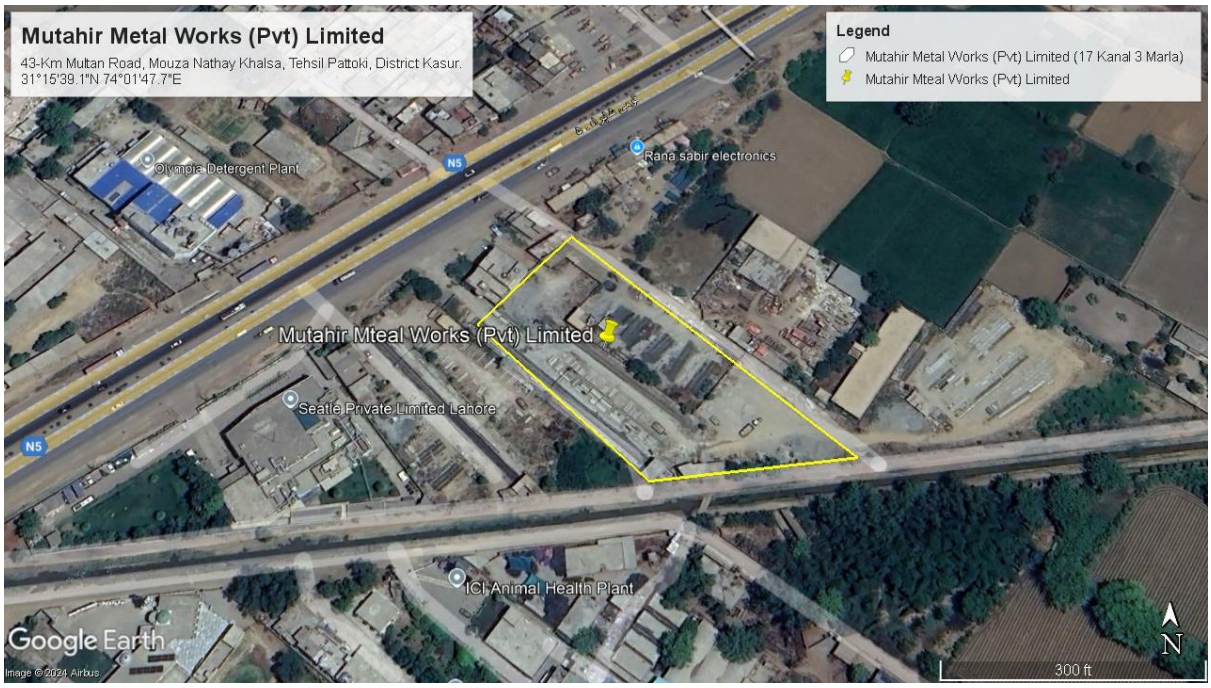

Figure 1: Location map of site

2.9 Land use on the site

The site is self-developed industrial area. Approved layout map is attached with report. Further, there are no mountains or hills of any kind of sensitive area could be seen in the area.

2.10 Road access

The site is accessible through main Multan Road access map is given in Fig-2

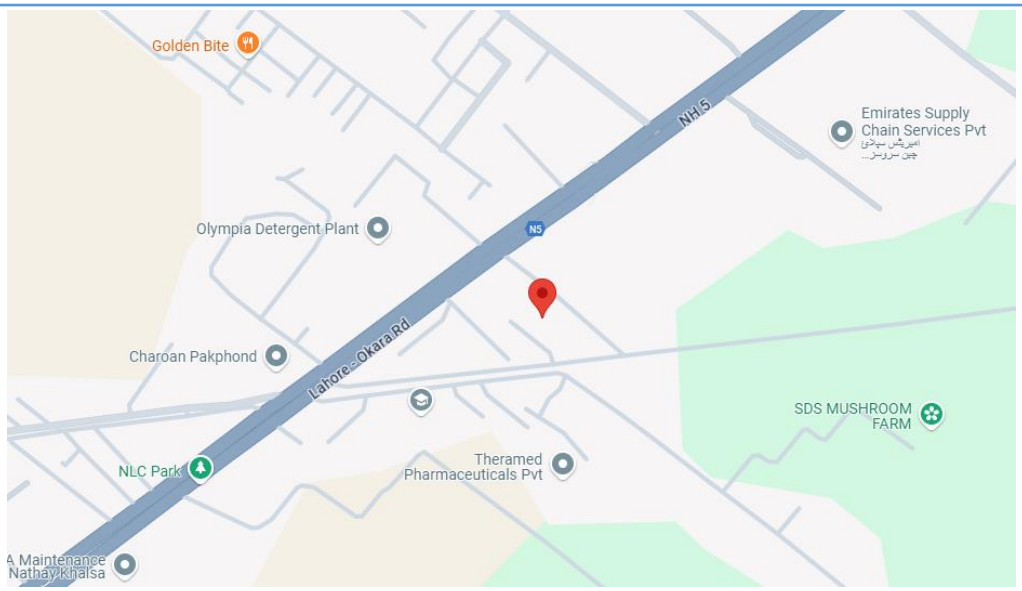

Figure 2: Road access map

2.11 Vegetation features of the site

There is no vegetation, as the current project site is a vacant plot. However, proponent will make arrangements to plant trees, building green belts, and garden and plant ornamental plants.

2.12 Cost and magnitude of operation

Total cost of the proposed project is estimated to be around **40 million PKR** which includes the provision of installation, associated amenities and cost for utilities and equipment/machinery. Production capacity of proposed Copper and Aluminum mill will be 200 T/M.

Table 3: Cost Breakup

Total Cost	40 million
Land development, Infrastructure and Amenities, Machinery	34 million
Monitoring and Salaries	4 million
Environmental Budget:	2 million

2.13 Schedule of implementation

It is projected that the construction phase of entire project will be started after getting environmental approval from EPA Punjab and complete in the period of 1-2 months. Activities involved are:

- Assessment of environmental impacts and its mitigation measures

- IEE approval, other local issues
- Implementation of recommended alteration in system, if required
- Commencement of operation

2.14 Description of the project (process flow chart/steps, technology, raw material and products, by-products)

The project will include installation of machinery in order to make Copper and Aluminium wires, also steel wires and plastic recycling.

2.14.1 Raw materials Product

Table 4: Raw materials

Description of raw material	Source	Quantity
Copper rods	Local purchase (import as per provision on local availability)	1300 MT/M
Aluminium rods	Local purchase (import as per provision on local availability)	1100 MT/M
Steel rods	Local purchase (import as per provision on local availability)	1100 MT/M
Plastic Scrap	Local purchase (imported/scrap yard)	6000 MT/M

Final Product:

1. **Aluminium Wires**
2. **Copper Wires**
3. **Steel Wires (Galvanized and Ungalvanized)**
4. **Plastic Granules, Flakes and Powder.**

2.14.2 Production process and by-products & technology

a) ALUMINIUM AND COPPER WIRES MANUFACTURING PROCESS

a. **Wire Drawing**:

Initially, the coiled wire rods are fed into a machine for wire drawing. They pass through a series of smaller dies in this machine, gradually reducing the diameter of the wire to reach the desired size. This helps improve its mechanical properties and ensures that it has consistent thickness throughout. Each time the wire passes through a die, it gets

compressed to enhance its mechanical properties and maintain uniform thickness. At times during the drawing process, the aluminium wire might undergo intermediate annealing, which involves heat treatment to soften the metal and relieve any internal stresses. Annealing increases the ductility and flexibility of the wire, making sure it doesn't become too brittle and can be drawn further without breaking. The wire goes through multiple passes in dies to achieve its final diameter and desired mechanical characteristics. The number of passes required depends on both its starting and ending diameters, ensuring that it meets specific standards for its intended use in terms of strength, flexibility, and conductivity.

b. Annealing Wires:

After the drawing process, the wire can undergo a full annealing procedure, where it is heated to a precise temperature and then slowly cooled. This method effectively softens the aluminium and copper, improving its flexibility, making it easier to bend and mold without breaking, and enhancing its ability to conduct electricity. This treatment enhances the strength and hardness, making them suitable for applications that require superior mechanical properties. Moreover, age hardening (or precipitation hardening) is employed to boost the strength of particular alloys. The wire is heated to a moderate temperature and maintained for a specific duration to facilitate the precipitation of alloying elements, thereby enhancing the mechanical strength of the wire and rendering it more appropriate for demanding applications such as automotive and aerospace components.

c. Stranding:

After wire drawing section process, next is stranding function which

is done only for Stay Wire strands preparation.

This machine can twist upto 7 wires in shape of rope. This flow can

be explained as follow:

- Obtain 6 + 1 spools of required diameter
- Place each spool in corresponding cradles
- Perform netting
- Adjust pre-forming as per required size.
- Start spooling

After stranding wires are then ready for further processing of insulation, bedding sheath process which totally mechanical and at last wires are tested and quality wires shall be ready to packed.

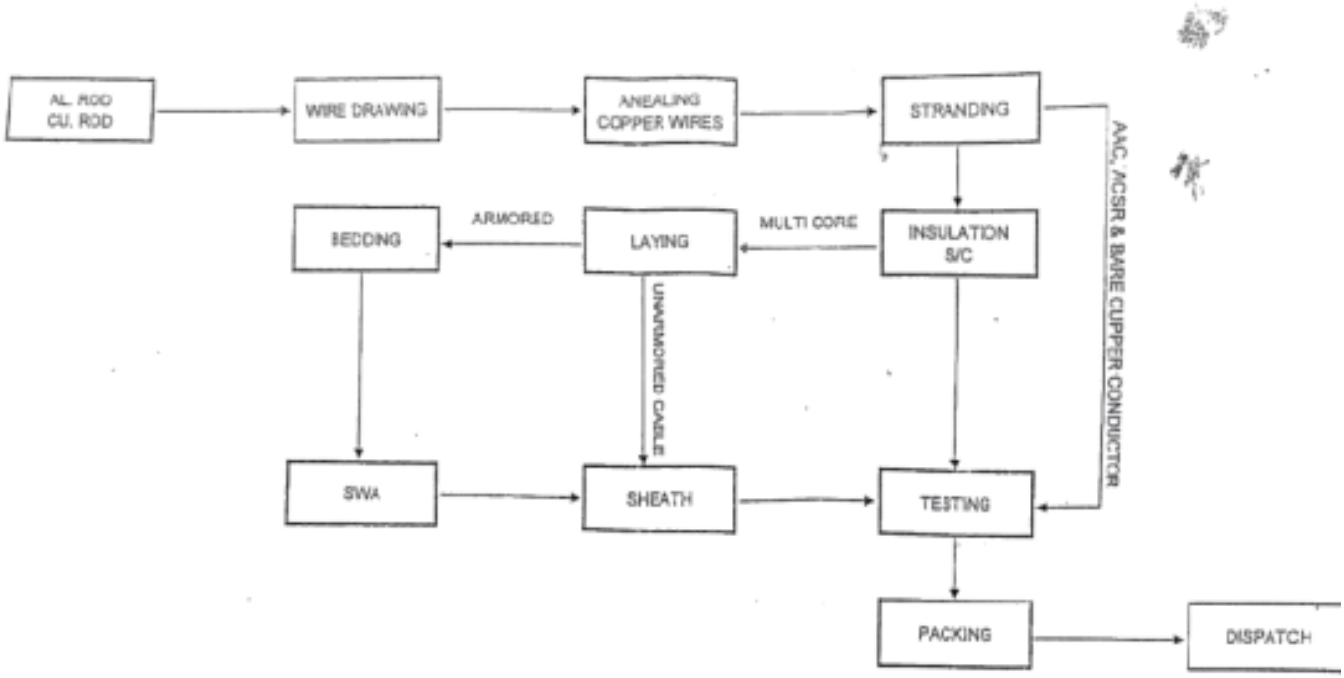

Figure 3: Process flow for Aluminum and Copper Wires

b) STEEL WIRES MANUFACTURING PROCESS

a) Pickling section

Before wire drawing process, the raw material de-rust with chemical (HCL). Raw material dipped in acid tank solution and then flushed with water to remove the acid, after that the same raw material dipped in phosphate tank at 70 to 80 degrees and water tank finally dipped in borax tank. The pickling process thoroughly examined during the visit.

b) Wire Drawing section

After Pickling process Drawing is a process of reduction of cross-sectional area stretching the wire through Tongston Carbide dies which are made of a specific shape and angle of reduction. The process is as follows:

Raw Material received from pickling section.

Required diameter of wire rod (raw material) is selected.

Selected wire rod is placed into die sets, for its reduction.

Lubricant added to die sets. Perform pointing and threading.

c) Stranding section

After wire drawing section process, next is stranding function which is done only for Stay Wire strands preparation. This machine can twist upto 7 wires in shape of rope. This flow can be explained as follow:

- Obtain 6+ 1 spools of required diameter
- Place each spool in corresponding cradles
- Perform netting
- Adjust pre-forming as per required size.
- Start spooling

d) Galvanizing Section

The process is required for coating of Zinc on Wires to resist against the weather of moister and rust. During this process Acid Strength temperature of Zinc Bath and weight of Zinc coating is checked repeatedly to keep it within range. After Galvanizing Section Process, next is stranding machine function which is done only for Stay Wire strands preparation.

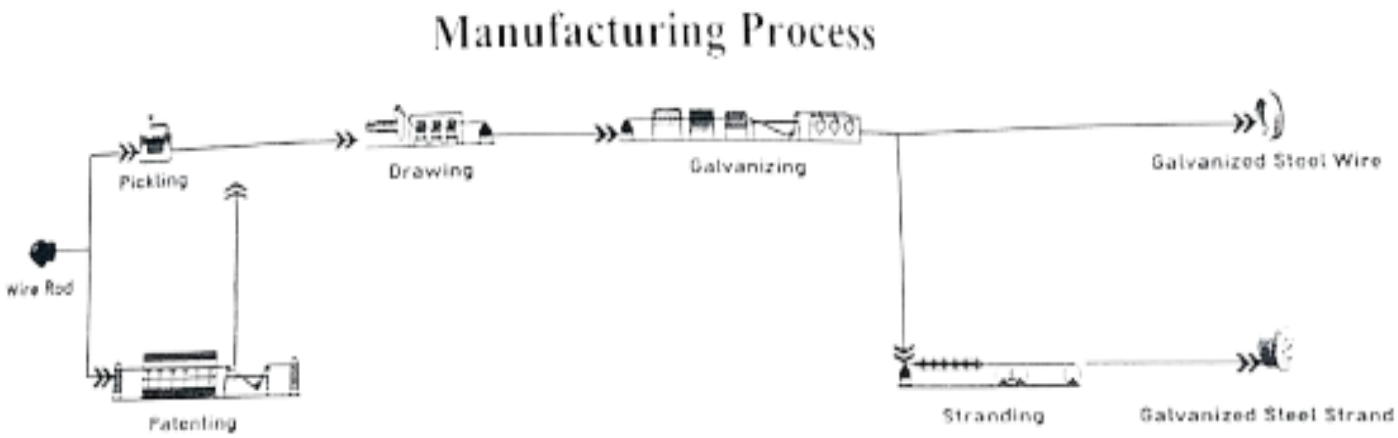

Figure 4: Steel Wire manufacturing process

c) PLASTIC RECYCLING

a) Collection + Distribution

The first step in the mechanical recycling process is the collection of post-consumer materials from homes, businesses, and institutions, This can be done by either local government or private companies, with the latter often a popular option for businesses. facilities. This may be as simple as a Another option is taking plastics to communal collection points such as designated recycling bins or bottle bank on a street corner or as complex as a local waste site with large areas for various recyclable and non-recyclable municipal solid waste (MSW).

b) Sorting +categorizing

The next step in the plastic recycling process is sorting. There are several different types of plastic (see below), which need to be separated from each other by recyclers. Further to that, plastics might be sorted by other properties such as color, thickness, and use. This is done by machines at the recycling plant and is an important step to increase the efficiency of plants and avoid the contamination of end products.

c) Washing

Washing is a crucial step in the plastic recycling process since it removes some of the impurities that can impede the operation, or completely ruin a batch of recycled plastic. The impurities targeted in this step commonly include things such as product labels and adhesives as well as dirt and food residue. While plastic is often washed at this stage, it is important to remember that this doesn't take away from the importance of ensuring plastics are as free from impurities as possible before disposal and collection.

d) Shredding

The plastic is then fed into shredders, which break it down into much smaller pieces. These smaller pieces, unlike formed plastic products, can be processed in the next stages for reuse. Additionally, the resized plastic pieces can be used for other applications without further processing, such as an additive within asphalt or simply sold as a raw material.

Breaking down the plastic into smaller pieces also allows for any remaining impurities to be found. This is especially true of contaminants such as metal, which may not have been removed by washing but can be easily collected with a magnet at this stage.

Figure 5: Plastic Recycling

2.15 Pollution control technologies

Pollution control technologies will be installed to reduce the pollution load on environment. Below are given pollution control techniques.

2.15.1.1 Emission control

Air emissions will be generated from some of the process activities. To control this, dry scrubber will be installed which will reduce up to 95% of emissions. Furthermore, the galvaniser and burners will work on electricity and no fuel will be used to gaseous emissions will be negligible. For dust control arising from combustion of raw material will be control via dry scrubbers. Moreover, for surface dust abatement, water showering will be practiced.

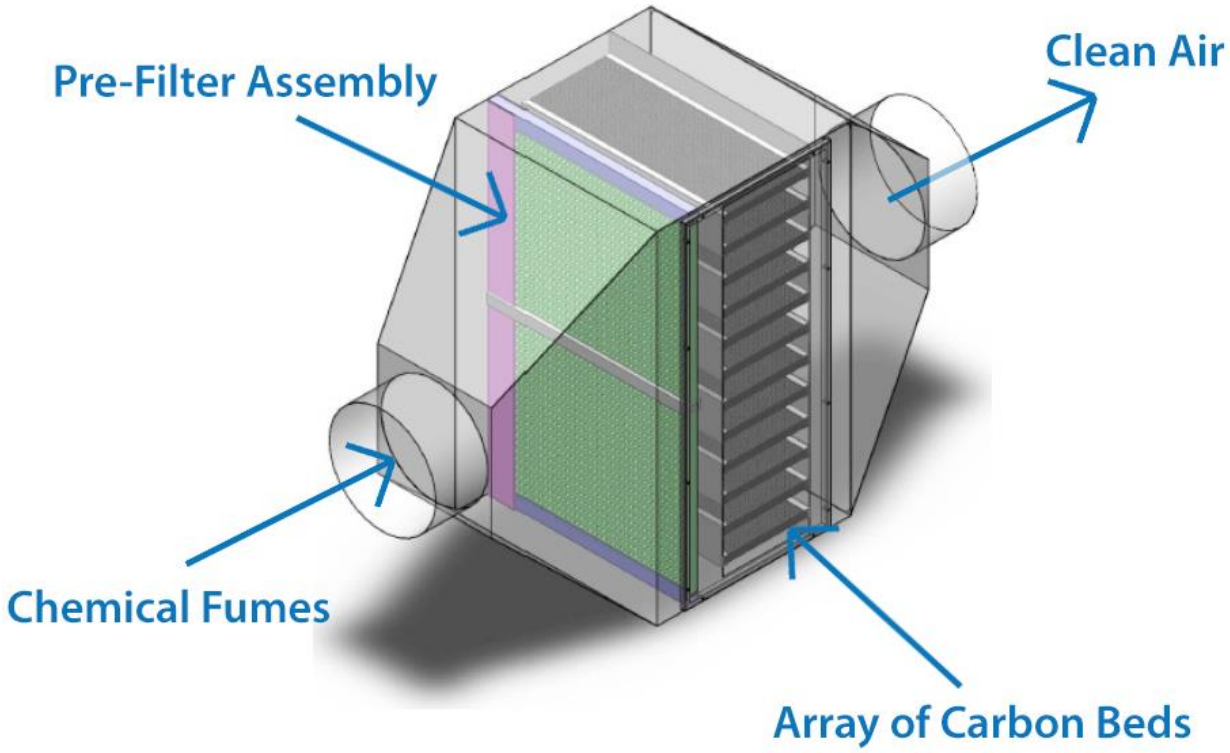

Figure 6: Dry Scrubber working principle

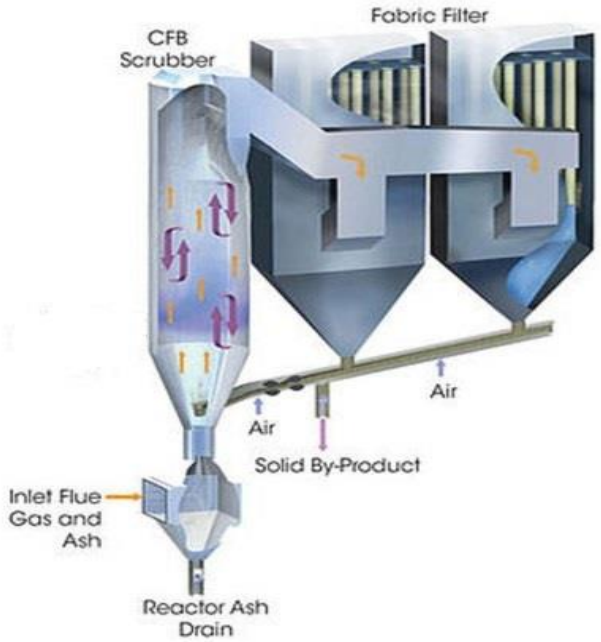

Figure 7: Dry scrubber preliminary design

2.15.1.2 Waste water

Only grey water will be produces from kitchen, staff offices and washrooms in the form of wastewater. This water will be treated in settling tanks prior to disposal. Wastewater from the process which will be used for washing will be reused for cooling under the burners and that water will evaporate so technically there will be no process wastewater will be generated.

2.15.1.3 Solid waste

The solid waste will be generated during the cooking in the worker's mess. The amount of the solid waste generated will be quite low, which will be disposed off by using sustainable practices of the compost manufacturing. The generated waste will be collected in the bins and at the end of the day it will be dumped in the ground. The generated compost will be used for the horticultural practices at site.

2.16 Restoration and rehabilitation plans

There will be no any matter of rehabilitation as the site is already owned by the project proponent. However, 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, Government rules and regulations as applicable to such activities will be strictly adhered. 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 demolishing 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 levelled. On the whole, the project site and the area in its near vicinity will be made neat and clean.

2.17 Government approvals

The environmental approval according to the Section 12 of Punjab Environmental Protection Act is the mandatory requirement of the project.

3 DESCRIPTION OF ENVIRONMENT

This section covenants with the prevailing environmental conditions of the project area. Information that has been collected from different sources, including public literature, reports of other studies conducted in this area, knowledge with the proponent and the concerned government departments and the first-hand surveys and field measurements has been presented in this section. This encompasses all the important aspects of local environment; such as biological resources, socioeconomic development and quality of living values.

3.1 Baseline physical environment

Baselines refers to existing physical, environmental and socio-economic status of the project are. On the basis of baseline information, the project interventions are assessed, and mitigation measure are proposed. The baseline information also helps to indicate the specific issues to be monitored during constructional and operational phases. The baseline data data (physical, biological and socio-economic parameters) related to the project area is described below. Information provided is based on primary and secondary data collected by site visits, desk studies and consultation with locals respectively. This section gives the overview of the topology, geology, seismology and meteorological conditions of whole city whereas, it gives detailed information about the surface water, ground water and air quality of the project area.

3.1.1 Topography

Kasur District lies between River Satluj which flows along its boundaries with India and River Ravi which flow its boundary with Sheikhupura District. The districts may be divided into two parts, a low lying or riverine area along the two bordering rivers and upland, away from the rivers. The riverine area is generally inundating during monsoon season. The water level in this area is higher than in the upland. The soil of the district is sandy. The upland is flat plains sloping from North-West to South-West. The general height of the area is from 150 to 200 meters above the sea level. The land of the project area is plain and highly fertile i.e. consists of sand silt and clay in equal ratios. The irrigation in most of the areas is through the canal system as well as by using water pumps. The topography of the proposed site is flat.

Project Site:

The proposed project site is located in District Kasur

3.1.2 Hydrology

Groundwater from depth of 100 ft can be used for drinking and other purpose. Groundwater is the major source of water in the study area, which is extracted with the help of pumps and motors. The groundwater extracted is used to fulfill various domestic, irrigation and industrial needs. Ground water quality report of area is annexed. No surface water body is present within 5 km radius of the project site.

3.1.3 Seismicity

According to Seismic Zoning of Pakistan, the project area lies in Zone 2A and represents minor to moderate damage due to earthquakes.

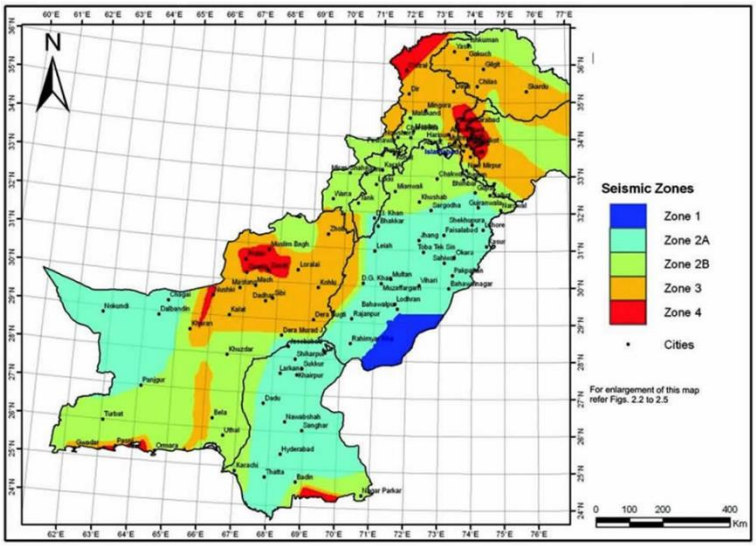

Figure 8: Seismic Zoning Map of Pakistan

3.1.4 Geography

The District Kasur is bounded by the Ravi River in the North-West and River Sutlej in the South-East whereas, the old course of Beas River bifurcates the district into two equal parts locally known as Hither and Uthar or Mithan Majh. Both of the areas have a height differential of approximately 5.5 meters. The natural surface elevation of the district is 198 meters above the sea level, having a general slope from North-East to South-West whereas, the East and West ends of the district comprise the flood plains of the rivers Satluj and Ravi, characterized by breaching of looping river Channels braided around meander bars.

Kasur District is attached with Lahore from east, attached with Nankana Sahib from North, attached with Faisalabad from West and attached with Okara and India from South. The geographical coordinates of the City are 31° 7'3.40" north and 74°26'59.82"east, whereas, the coordinates of the project site are 31°11'8.86"N 74°26'0.53"E.

3.1.5 Climate

Climate of District Kasur is very hot and dry in summer and cool in winter. The hottest months are April to September. The maximum and minimum temperatures are 46ºC and 28ºC respectively. The coldest months are December to February. During this period the temperature fluctuates between 16ºC and 6ºC as shown below. Temperature at the project site was 28°C.

Precipitation is the lowest in November, with an average of 3 mm. The greatest amount of precipitation occurs in July, with an average of 1150 mm.

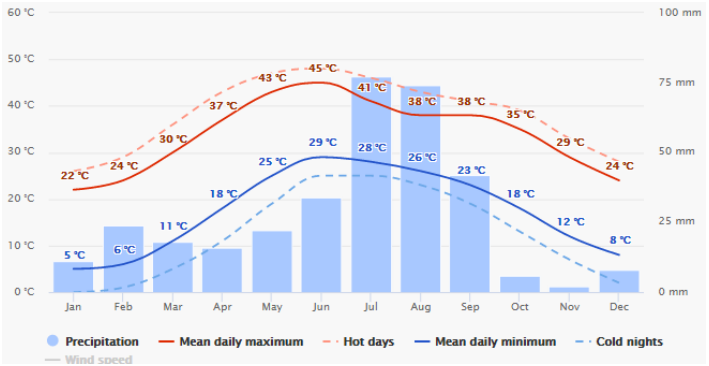

Figure 9: Average Annual Temperatures and precipitation in Kasur

The "mean daily maximum" (solid red line) shows the maximum temperature of an average day for every month for Kasur. Likewise, "mean daily minimum" (solid blue line) shows the average minimum temperature. Weather in Kasur is influenced by Subtropical Dry Semiarid Steppe climate. Low-latitude dry climate. Evaporation exceeds precipitation on average but is less than potential evaporation.

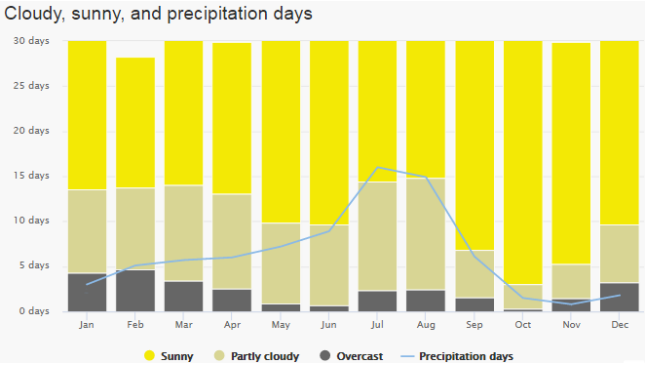

Figure 10: Maximum temperature ranges in Kasur

The graph shows the monthly number of sunny, partly cloudy, overcast and precipitation days. Days with less than 20% cloud cover are considered as sunny, with 20-80% cloud cover as partly cloudy and with more than 80% as overcast.

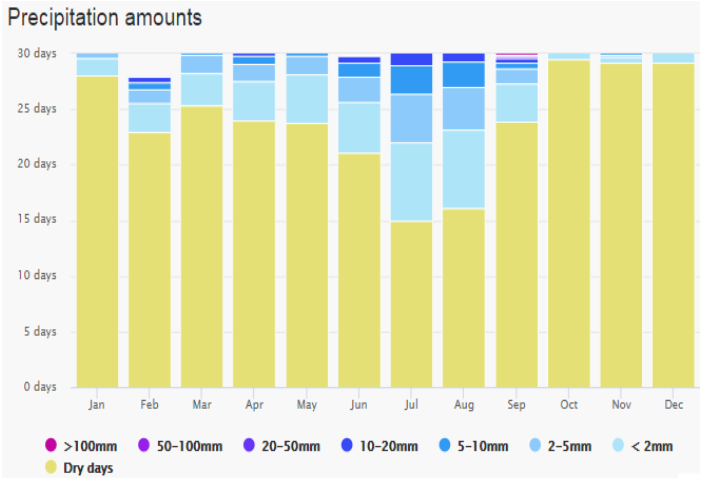

Figure 11: Annual Precipitation amounts in Kasur

3.1.6 Wind

The diagram for Kasur shows the Max and Average Wind speed and Wind Gust.

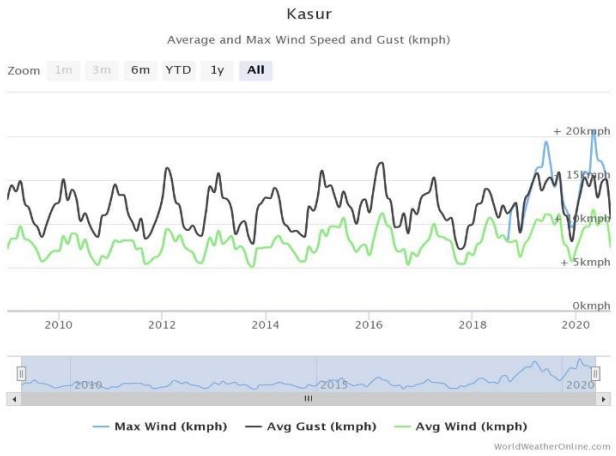

Figure 12: Annual average wind speed in Kasur

(https://www.worldweatheronline.com)

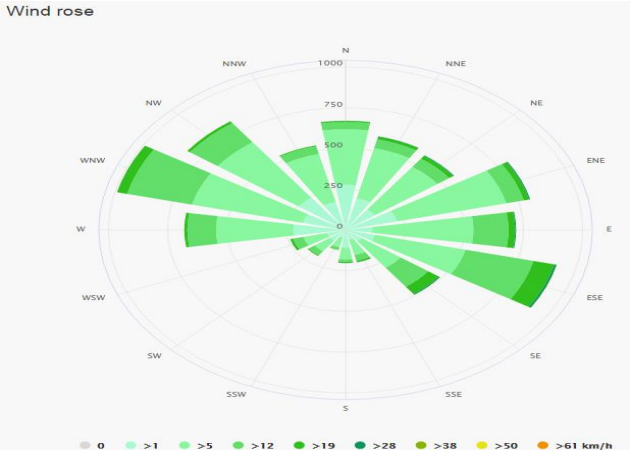

Figure 13: Wind Rose diagram of Kasur

The wind rose for Kasur shows how many hours per year the wind blows from the indicated direction. Example SW: Wind is blowing from South-West (SW) to North-East (NE).

3.2 Ecological Environment

Kasur is enriched with the presence of natural flora and fauna, although with the growing population and development activities, the presence of some has been somewhat affected. They are discussed in detail below

3.2.2 Flora

The project is located in industrial area. The project site has no vegetative cover, hence, no trees or vegetation will be removed. The dominant tree species in study area include; Eucalyptus, Neem, and Kikar. The crops present around project site include wheat, sugarcane and common grass. The nomenclature including common, English, local and botanical names of the flora found in the study area are presented in Table

3.2.3 Fauna

For study of fauna in the project area, field guides and books were consulted. On the other hand field observations were conducted along with the interviews of local community members about the fauna of the area. The equipment used in field included cameras, binoculars and GPS device (wherever required). It is important to note that there is a number of factors which can change the findings of such survey. It may be

pointed out that the pattern of seasonal migration of small birds varies depending upon each specie. During the construction activity in project area, no important biological feature will be damaged or disturbed as the project falls in industrial area. No endangered species are found at the site. The area has not been identified as ecologically sensitive area by wildlife department.

3.2.6 Water Resource

The main source of the water consumption is the ground water which is being pumped from 200 ft borehole and its being used in the study area for domestic purposes. To check the quality of the water in the area, ground water was collected and analyzed. The ground water was collected from bore hole adjacent to the project area.

3.3 Socio-Economic Resources

This section provides collective information about the existing socio-economic and environmental condition of the project area within the AOI. The different types of socio-economic aspects were covered such as demographic profile, occupation, education and health facilities. This data helped in identifying major interventions for the development of Environmental Management and Monitoring Plan (EMMP). The study also helped to assess the positive or adverse impacts on local community.

3.4 Socio-Economic Profile of Study Area

This topic provides an overview of the baseline information relating to the socio-economic environment of the project area and the AOI. The socio-economic study gives information about the demographic profile, occupation, education and health facilities in the project area.

3.5 Demographic Profile

The Demographic Studies are the major source of any city's Socio-Economic profile. Demographic Studies relate to population. Population studies are extremely important from Town Planning point of view. Until and unless we know about population in detail, we cannot do successful planning. All aspects of population, such as sex-age composition, trend of migration, social, cultural, political, economic and administrative works, values and facilities have to be related to planning considerations and decisions. Individuals are the raw material of society; therefore, society is directly affected by size, growth, composition and distribution of its individuals. The term

population refers to the number of individuals living within a geographical area at a given time.

Different community individuals in the vicinity of the project area have different family sizes depending upon their living setups. Average family size is however 5-7 individuals per family with 1-2 earning hands per family.

3.5.1 Health Facilities

As the project site is in an Industrial zone. DHQ Hospital Kasur is located at the distance of approx. 7.1 Km radius. Some other private health center is present as Villages area present in the vicinity of the project site.

3.6.2 Educational Facilities

As the project site is not located in any residential area. However, the villages located around project site have few governments primary schools.

3.6.3 Common Diseases

According to the survey the common disease recorded in the project area is Hepatitis.

3.6.4 Cultural, Religious & Other Structures

No cultural, religious and other structures are present in the close proximity of the project area that needs to be relocated. Villages present around the project site have mosques and imam bargah.

3.6 Lab Reports of Environmental Analysis

Testing of different parameters was done from a certified laboratory named SEAL to check the quality of different environmental parameters. The copy of the lab reports of these parameters (ambient air analysis, water quality analysis and noise) is attached at Annexure of this EIA Report.

3.7 Suitability of Site:

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

4 IMPACT ASSESSMENT

This section discusses the potential environmental impact of proposed project, methodologies for impact identifications and characteristics of impacts including nature, magnitude, extent and location, timing, duration, reversibility, risk the assessment carried out in this Section is based on potential impacts on overall environmental receptors within the project area.

4.1.1 Methodologies for impact identification

The potential impacts due to establishment of Copper and Aluminum manufacturing mill are mostly beneficial. During construction phase, adverse environmental & social impacts are depending on the resources and receptors involved along with other parameters such as; geographical scope (magnitude and extent), temporal scope (duration) and reversibility. It is anticipated that this project will have maximum positive impacts as it is environmentally friendly project to reduce pollution load.

Moreover, the project is expected to result in negative impacts of short-term duration and transient in nature. Having identified and characterized the potential significant impacts during design, construction and operation phase of project an Environmental Impact Severity Matrix & checklist to summarize all the identified impacts as mentioned below in tables.

Table 5: Impact significance criteria

Impact	Criteria
No Impact	When the proposed activity will have no impact
Long Term	When the impact is of high intensity with high spread and high duration or of high intensity with medium spread and medium duration
Moderate Term	When the impact is of moderate intensity with high spread and high duration or of high intensity with low/ moderate spread and low duration
Short Term	When the impact is of low intensity but with moderate spread and moderate duration or of moderate intensity
Insignificant	When the impact is of low intensity, low spread and low duration
Adverse	When the impact is of large intensity, spread easily and long-term
Beneficial	When the impacts are positive and improve the environmental conditions

4.1.2 Checklist

Table 6: Impact matrix checklist for installation phase

Environmental Sensitivities	Intensity of Impact						Impact Nature		Impact Significance				
	Low Intensity	Moderate Intensity	High Intensity	Local	Moderate	Regional	Beneficial	Adverse	Insignificant	No Impact	Short Term	Moderate	Long Term
Physical Parameters													
Air Quality		□		□									
Noise		□			□								
Water Quality		□			□								
Biological Parameters													
Land Environment													
Flora													
Fauna													
Physical Parameters													
Local Economy	□												
Social Impacts	□												
Health & Safety	□												

Table 7: Impact assessment checklist for operational phase

Environmental Sensitivities	Intensity of Impact						Impact Nature		Impact Significance				
	Low Intensity	Moderate Intensity	High Intensity	Local	Moderate	Regional	Beneficial	Adverse	Insignificant	No Impact	Short Term	Moderate	Long Term
Physical Parameters													
Noise													
Water Quality													
Odor													
Biological Parameters													
Land Environment													
Flora													
Fauna													
Physical Parameters													
Local Economy													
Social Impacts													
Health & Safety													

4.2 Characteristics of impacts (nature, magnitude, extent and location, timing, duration, reversibility and risk)

The impact characteristics are identified to screen out potentially insignificant environmental and social impacts from potentially significant adverse environmental and social impacts during planning & designing, construction and operational phases of the project. The objective of impact screening process is to assess the significance of issues related to the air, water, noise, soil, transportation, civil work, communication, the hazards and external constraints. The beneficial and adverse impacts of project during planning & designing, construction and operational phases are identified based on their duration, location, frequency, extent, significance and reversibility. The impact of each activity on various environmental parameters is given below:

Table 8: Impact assessment characteristics

Sr#	Environmental Component	Impact Characteristics												
		Duration		Location		Frequency		Extent		Significance			Reversibility	
		Long	Short	Direct	Indirect	Cont.	Intermittent	Wide	Local	Large	Moderate	Minor	Rev.	Irrev.
Beneficial Impacts														
1	Employment Opportunity	◙		◙		◙			◙		◙		◙	
2	Solid Waste Management	◙		◙		◙			◙		◙		◙	
3	Land Value	◙			◙	◙			◙			◙		◙
4	Tree Plantation	◙		◙		◙			◙		◙			◙

5	Wastewater		◙	◙		◙		◙			◙		◙	
Adverse Impacts														
1	Solid Waste	•		•		•			•		•		•	
2	Health and Safety		•		•		•		•			•		•
3	Physical Hazards		•	•			•		•			•		•
4	Security Risks		•		•		•		•		•		•	

5 SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

This Chapter identifies the potential impacts (positive and adverse) on the physical, biological

and socio-economic environment of project area due to proposed project. It also identifies measures that will help to mitigate the adverse environmental and social impacts (if any) and it will enhance positive impacts of the project. Impacts are assessed by analyzing their magnitude and sensitivity, which is a legal requirement.

5.1 Impacts associated with project activities

- Environmental Impact - Installation and Operation Activity
- Socioeconomic Impact - Operation Activity

5.2 Project location

There will be no impacts due to project location as the land is owned by project proponent and the building is already constructed. In the project area or its vicinity no ecologically, important area is present. However, no human settlement or infra-structure will be dislocated due to the establishment of project. So, no adverse impact is being envisaged. Hence, there is no need to change the design of project is required.

5.2.1 Compensation in money terms

There is no damage envisaged to fauna, flora or any other biological source due to the establishment proposed project.

5.3 Project design

The proponent has constructed the unit on modern lines, meeting international standards, with incorporation of imported 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.

The design of the proposed project will be sustainable and will follow the principles of energy conservation. The design of the main public buildings will follow the green building designs such as; maximum utilization of the sunlight, high roofs to keep the building cool, etc. Moreover, the building will be designed by keeping in consideration all the technical standards to avoid adverse impacts on the environment and society.

5.4 Construction phase

No such major impacts are expected as the unit is already constructed and only machinery will be installed for the extension.

5.5 Operational phase

The environmental and socio-economic impacts associated with the operation phase are had been studied in detail. Following is the detailed description:

5.5.1 Water consumption

The increased withdrawal of surface water for the proposed project may affect the water availability for the other users of the project area. A significant impact will be interpreted, if water extracted for the project directly affects the ability of the community and other users to meet their water needs. The water usage will be the water required for domestic use of workers, for floor cleaning.

5.5.2 Mitigation measures

Following mitigation measures will be adopted:

- Water conservation program will be initiated to prevent wastage of water
- The management will ensure maximum recycling of washing water, so that overall consumption could be reduced
- Reusing the water for sprinkling purpose after floor cleaning

5.5.3 Wastewater

The building operations will generate wastewater in the form of domestic wastewater. The wastewater can be a potential source of pollution to surface and groundwater resources of the area. Domestic wastewater generated during building operation is estimated to be approximately 1.4m^3/day. Implementation of the proposed mitigation measures and regular monitoring is not likely to leave any significant impact of the wastewater from the proposed facility.

5.5.4 Mitigation measures

Following mitigation measures will be adopted for effective management of wastewater:

- The grey water will be treated through settling tank which will be recycled to be re-used in irrigation purposes
- Waste segregation measures would be employed to minimize entry of solid waste into the wastewater stream

- Water conservation strategies will be employed to avoid wastage of water
- Periodic sampling and monitoring of key parameters for wastewater effluent into the receiving body (drain or sewerage system) and for this purpose samples will be collected at the discharge point to ensure effective treatment

5.5.5 Noise

Noise cause stressful effect on the ears, nervous system and heart; especially to people exposed to noise above 85 dB (A) for long period of time. Due to the operation of the proposed project heavy machines can serve as the potential noise sources. This noise will depend upon the machine efficiency, their maintenance level and the nature of room housing it, and the atmospheric conditions. No significant increase in noise level in the community is envisaged under normal operation. Moreover, implementation of the below-stated mitigation techniques will also keep the noise impacts at minimum to the workers as well as to the community.

5.5.6 Mitigation measures

Noise management and mitigation plan should follow the underlying strategy:

For people working in noisy installations, ear-protection aids like ear-plugs, ear-muffs, noise helmets, headphones etc. must be provided to reduce occupational exposure. This is possible if working methods are improved by:

- Proper designing and fabrication
- Proper lubrication and better maintenance of machines
- Covering noise-producing machine parts with sound-absorbing materials to check noise production
- Reducing the noise produced from a vibrating machine by vibration damping i.e. making a layer of damping material (rubber, neoprene, cork or plastic) beneath the machine
- Using silencers to control noise from automobiles, ducts, exhausts etc. and convey systems with ends opening into the atmosphere
- Using glass wool or mineral wool covered with a sheet of perforated metal for the purpose of mechanical protection

Noise can also be controlled with barriers by enclosing the source of the noise, by placing sound-reducing barriers between the worker and the source, or by increasing the distance between the worker and the source

- Tree plantation helps to block the propagation of sound. Proponent has planned tree plantation in and around the unit premises
- Sound-proof materials will also be used for construction
- During the project operation, it should be ensured that the noise level does not exceed prescribed limits as set by WHO or Pak-EPA; for which regular monitoring must be carried out.

5.5.7 Waste management

Improper disposal off the solid waste generated during the operational phase of proposed project can pose a health hazard; pollute soil, surface and ground water. Proper implementation of the mitigation measures will ensure that the residual impact from improper management and disposal of the waste is minimal. Monitoring and inspection will be undertaken to ensure compliance and minimize any residual impact.

Following mitigation measures will be adopted:

- Waste generation will be minimized by adopting waste management strategy of reduce, reuses and recycle
- A waste management plan will be prepared, implemented and monitored for the safe collection, storage and treatment/disposal of the building waste
- Quantities of waste disposed, recycled, or reused will be logged on a Waste Tracking Register
- Records of all waste generated will be maintained
- Training will be provided to personnel for identification, segregation, and management of waste
- Various waste containers for waste collection should be placed at appropriate locations in the building
- Waste management inspections will be undertaken on a regular basis of onsite waste management and of waste disposal contractors to ensure that the waste management procedures are being followed

Monitoring measures will include:

- Record of all waste generated
- Quantities of waste disposed, reused at site or sold should be logged on the waste tracking register
- Audit of waste management on annual basis

- The areas around the project boundary and access roads should be periodically inspected to verify that no project related waste is scattered in these areas

5.5.8 Air emissions

The air emissions will be generated during process activities and by the movement of vehicles dust and particulate matter will be emitted in the environment. If these emissions are not handled may damage the health of workers, may be the cause of public nuisances and the wear& tear of the shelling machinery is fast.

5.5.9 Mitigation measures

Following mitigation measures will be adopted:

- PPEs such as; dust mask will be provided to the workers
- Pre-cleaning will be carried out to reduce the dust emission
- Dry Scrubber will be installed
- Water sprinkling will be carried out as and when required

5.5.10 Emergency response

Incidents and accidents may take place unexpectedly during project operations no matter how effective, strong and efficient the mitigation measures for all adverse impacts; especially the safety issues may be adopted. These may include; fire hazard which may poses a serious threat.

5.5.11 Mitigation measures

Following mitigation measures will be adopted:

- Fire extinguishers should be properly maintained and checked periodically
- Adequate fire hydrant system should be installed
- Flammable materials should be prohibited in the premises
- Fire alarm systems should be maintained for detection and warning of fire
- Adequate training of workers on use of fire-fighting system to deal with the situation.
- Administration of the unit will make a proper evacuation plans for emergency escape from all halls
- Emergency call service must be made available
- Fire-fighting team must remain ready at all times

5.5.12 Occupational hazards

It includes occupational hazards like physical injuries arising from accidents such as being hit by falling weak structures, being overrun by heavy equipment. The major safety issues in operational phase are:

- Electrical Hazards
- Machine Guarding
- Eye, Head and Foot Protection
- Fire and Explosion Hazards
- House-Keeping Issues

5.5.13 Mitigation measures

Following mitigation measures will be suitable:

- Care will be taken to properly ground and insulate all equipment
- Proper machine guarding, which is critical for the prevention of injuries to workers by isolating them from moving machinery, will be provided
- Head, arms and foot PPE's will be provided
- Fire-fighting equipment will be available, and their locations will be clearly marked
- Exits from work places will be well marked and visible in dim light
- Fire water will be located throughout the plant in well-marked piping
- Housekeeping will be frequent and thorough to prevent slips, trips, and falls
- Workers will be told and encouraged to use PPEs as may be standardized
- Workers' awareness and safety wall chart showing safety symbols will be displayed.
- First Aid Box will be kept in easy approach of all in case of any injury or mishap.
- Basic medical and health facilities will be provided to all employees
- Safety and warning devices such as reflectors, lights, etc. shall be installed at designated spots
- Visual monitoring of hazards and accidents will be done in order to control the potential hazard

5.6 Potential environmental enhancement measures

Tree plantation within and outside the premises is a potential environmental enhancement measure. A large area will be reserved for tree plantation and among plants native flora like Peepal, Kikar and Amaltas will be planted in the specified green zone which will have the maximum capacity to reduce noise pollution and tolerance index of these species are more than 10. Some floral species like roses and other ornamental evergreen plants will also be introduced in the lawn which will enhance aesthetic beauty. In addition, trees like Amaltas will be planted as boundary wall inside the lawn which will look like green wall. The proponent will also make arrangements for protection and maintenance of trees

5.7 Building enhancement

The introduction of an ecologically effective and efficient design of a commercial building is the environmental enhancement measures planned by the proponent to be incorporated into the design of the intended project.

5.7.1 Social enhancement measures

Following measures will be adopted to improve the socio-economic condition of the area:

5.7.2 Employment/poverty alleviation

The employment opportunities in the project area will be increased due to the establishment of project at the proposed location. During establishment un-skilled workers will be required as labors, sanitary workers and sweepers as well as for the skilled workers such as; accounts and managers to run the administration office local community will be considered on the priority basis. In totality, the overall economic conditions of the area will be improved due to the establishment of the proposed project.

5.7.3 Local economy

The employment opportunities and/or income sources generated by the project construction and operation will be long term in nature. These will be enhanced once the construction phase is completed. The local economy will experience a slight boom during development and operational period.

6 ENVIRONMENTAL MANAGEMENT AND MONITORING PROGRAM

The potential environmental impacts are identified from the planning stage of proposed project through the Initial Environmental Examination (IEE) process. The IEE has identified potential impacts that are likely to arise during the project. The IEE has examined in detail both negative and positive impacts at each stage of the project covering both construction and operations phase. To minimize the effects of adverse impacts the IEE has recommended mitigation measures. The proposed mitigation measures have been based on the understanding of the sensitivity and behavior of environmental receptors in the project area, the legislative controls that apply to the project and a review of good industrial practices while operating in similar environments.

For effective implementation and management of the mitigation measures an Environmental Management Plan (EMP) has been prepared. The EMP satisfies the requirement of the Punjab Environmental Protection Department Review of Initial Environmental Examination and Environmental Impact Assessment Regulations, 2000.

The EMP is a tool that serves as to manage environmental impacts and specifically focuses on implementation of mitigation measures in its true sense against likely environmental impacts.

6.1 Purpose and objective of the EMP

The primary objectives of the EMP are to:

- Facilitate the implementation of the mitigation measures identified in the IEE.
- Define legislative requirements, guidelines and best practices that apply to the project.
- Define the responsibilities of the project proponent.
- Define a monitoring mechanism and identify monitoring parameters in order to:
    - Ensure the complete implementation of all mitigation measures.
    - Ensure the effectiveness of the mitigation measures.
- Define requirements for environmental monitoring and auditing.
- Provide a mechanism for taking timely action in the face of unanticipated environmental situations.
- Identify training requirements at various levels.

6.2 Components of the EMP

The EMP consists of the following:

- Legislation and guidelines
- Organizational structure; roles and responsibilities
- Monitoring/Management plan
- Environmental monitoring
- Communication and documentation
- Change management Plan
- Training program/schedule

6.3 Legislation and guidelines

The IEE has discussed national and international legislation and guidelines that are relevant to the project; proponent will ensure that the project is conducted in conformance to the project proponent corporate environmental policy, national legislation and relevant international conventions and that guidance is sought from national and international guidelines. Project proponent will also ensure that its key project management staff and all its assigned contractors are aware of these legislation and guidelines prior to the start of project activities

6.4 Description of proposed mitigation actions

It lists all the mitigation measures identified in the IEE and the associated environmental or social aspect in line during construction and operational phase with the administrative framework involving all the responsible implementing authorities who are required to take the planned actions/measures and monitor it accordingly. It enhances project benefits by reducing its impacts and making it environmentally friendly. The environmental management and monitoring plan is given below in table.

Table 9: Description of proposed mitigation actions

Sr. No.	Project Activity	Impacts	Mitigation Measures	Responsibility
1	Water Resources	▪ Depletion in groundwater aquifer ▪ Water contamination	▪ Water extraction will be kept at minimum and waste management plan will be developed. ▪ Fuel and chemicals will be stored in covered and with bund walls, underlain with impervious lining. ▪ Spill prevention plan shall be followed to mitigate any kind of spill.	Proponent & Contractor
2	Air Quality	▪ Dust emissions during construction activities. ▪ Combustion products from vehicles used for project-related activities.	▪ Water will be sprinkled daily on all exposed surfaces to suppress emission of dust. ▪ Regular maintenance of project vehicles to ensure that engines are in sound working condition and are not emitting smoke;	Proponent & Contractor
3	Noise	▪ Noise Pollution ▪ Disturbance to the site workers ▪ Nuisance for surrounding communities and wildlife	▪ Proper maintenance of vehicles and potentially noisy equipment. ▪ Minimize/avoid unnecessary use of noisy machinery. ▪ Blowing of horn will be prohibited. ▪ Provision of Personal Protective Equipment	Proponent & Contractor

			(PPE) to the on-site personnel in high noise areas.	
4	Solid Waste	▪ Surface and groundwater pollution ▪ Soil contamination	▪ Recyclable material will be separated at source and will be sold to waste contractor. ▪ Hazardous waste will be segregated and stored in closed	Proponent & Contractor
Sr. No.	Project Activity	Impacts	Mitigation Measures	Responsibility
		▪ Air pollution, odor ▪ Health hazards ▪ Aesthetic issues	containers in a fenced storage area with paved floor; ▪ On-site audits of the waste management will be undertaken on a regular basis during the period of project activity. ▪ Records of all waste generated during the project activity period will be maintained. Quantities of waste disposed, recycled, or reused will be logged on a waste tracking register. ▪ Training will be provided to personnel for identification, segregation, and management of waste. ▪ No waste will be dumped at any location.	

5	Traffic Control	▪ Disturbance to local community	▪ Movement of vehicles (trucks) will remain confined to defined access and limited to a specific duration. ▪ Regular maintenance of vehicles to reduce exhaust emissions. ▪ Parking at NO PARKING areas shall not be allowed.	Proponent & Contractor
6	Worker's Health and Safety	▪ Health problems or immediate risk may take place. ▪ Occupational health of workers and community may be affected.	▪ Compliance to emergency response plan for emergencies and accidents will be ensured to avoid health safety risks. ▪ Work safety measures and good workmanship practices are to be followed by the contractor to ensure no health risks for laborers. ▪ Protection devices (earmuffs) will be provided to the workers operating in the vicinity of high noise generating machines. ▪ Proper maintenance of facilities for workers will be monitored. ▪ Provision of protective clothing for labors e.g. helmet, adequate footwear, protective goggles, gloves ▪ Ensure strict use of wearing PPE during work	Proponent & Contractor

			activities. ▪ Provision of proper safety signage at sensitive/accident prone spots.	
			▪	
7	Socio-Economic / Local community	▪ Community disturbance ▪ Community awareness ▪ Skilled and un-skilled jobs for local community	▪ All community grievanceswill be recorded and maintained in a Community Complaint's Register. ▪ Maximum number of unskilled and semi-skilled jobs will be reserved for the local communities. ▪ An increase in the income of locals may occur due to employment during project activities. ▪ Communities will be informed about the project activities and possible disturbance in advance.	Proponent & Contractor

Table 10: Management and Monitoring Plan – Operation

Sr. No.	Project Activity	Impacts	Mitigation Measures	Responsibility	Environmental Budget
1	Water Use / Wastewater	▪ Surface water contamination ▪ Pollution risk from accidental spillage	▪ Wastewater from the proposed activities will be contained in settling tanks and will be reused. ▪ Compliance of effluent with PEQS will be ensured prior to discharge in water body. ▪ Water conservation practices will be followed to minimize the water usage. ▪ Water use will be monitored periodically to ensure that water is not wasted. ▪ In case of any accidental spillage, emergency plan should be implemented.	Proponent & Contractor	100,000/-
2	Air Emissions	▪ Compliance with prescribed PEQS for ambient air	▪ Proper ventilation and exhaust system for air passages; ▪ Control of processing exhaust emissions by proper maintenance of production unit/equipment; ▪ Proper maintenance of machinery is required to control emissions;	Proponent & Contractor	100,000/-

			▪ Daily maintenance of transport vehicles is required to control air emissions.		
3	Noise	▪ Noise Pollution ▪ Disturbance to the personnel handling the installations	▪ The noise generating area at the operations will be lined with boundary wall to reduce impact on the workers. ▪ Operators of proposed developments will wear ear protections while operating or working nearby high noise emission sources. ▪ Tree plantation to reduce the effect of noise pollution.	Proponent & Contractor	100,000/-
			▪ The proposed project will be placed such that the cumulative noise levels at walkways and worker locations will not exceed PEQS for noise.		
4	Waste Management	If not managed properly; ▪ Surface and groundwater pollution ▪ Soil contamination	Solid waste management plan will be implemented and following mitigation measures will be taken: ▪ Only municipal solid waste will be produced which will be segregated and disposed off using environment friendly techniques	Proponent & Contractor	100,000/-

		▪ Air pollution, odor ▪ Health hazards ▪ Aesthetic issues	▪ Area supervisor will mark the quantity/weight and nature of the material on the drums and logbook. ▪ Training will be provided to personnel for identification, segregation, and management of waste.		
5	Occupational Health and Safety	▪ Health problems or immediate risk may take place. ▪ Occupational health of workers and community may be affected.	▪ Providing basic medical training, safety training to work staff and basic medical service during operations. ▪ Firefighting equipment, safe storage of hazardous material, first aid, security, fencing, and contingency measures in case of accidents. ▪ Provision of adequate sanitation, washing, cooking and dormitory facilities including light up to satisfaction; ▪ Adequate signage, safety cones, lightning devices, barriers, yellow tape and persons with flags. ▪ Adequate signage, safety cones, lightning devices, barriers, yellow tape and persons with flags during operations.	Proponent & Contractor	100,000/-
6	Tree Plantation				200,000/-

6.5 Schedule of implementation and environmental budget

6.5.1 Schedule of implementation

This project will be completed in 05-06 months after getting Environmental Approval. The total cost of the project is **PKR 40 Million approx**. which includes; the cost of civil work, purchase of machinery and its installation, implementation of mitigation measures, site rehabilitation, etc.

6.5.2 Environmental budget

Environmental budget will be allocated for protection of environment. PKR 2.0 million will be allocated as environmental budget in both constructional and operational phase of project.

Table 11: Schedule for Implementation of Environmental Budget

Schedule for Implementation of Environmental Budget			
Operational Phase			
Parameter	**Frequency**	**Schedule for Implementation**	**Responsibility**
Air Quality	Quarterly	Ambient air quality and Scrubber Maintenance	Administration of project and Reporting to EPA
Noise	Quarterly	Noise by activities in the multi-purpose building	Administration
Surface and ground water	Bi-Annually	Monitoring of water and wastewater parameters defined by EPA	Administration and Reporting to EPA
Solid waste	Quarterly	Waste generation	Administration of the project

6.6 Environmental management team along with their roles and responsibilities

Proponent shall hire environmental management team in operational phase of project. The roles and responsibilities of environmental management team are given below in table.

Table 12: Roles & responsibilities of environmental management team

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

		▪ Ensuring that staff are appropriately trained and supervised
		▪ Identifying, assessing and managing health and safety risks
		▪ Consulting with workers (including staff, affiliates and contractors
		▪ Health and safety risk assessments
		▪ Decisions are made about the measures to be taken to eliminate or control these risks
		▪ Health and safety risk assessments
		▪ Implementing health and safety risk management programs relevant to their operations, teaching, research and consulting functions and work environment
		▪ Reporting investigating and responding to all hazards, accidents, incidents and taking action to control the risk
		▪ Assisting with the development, implementation and maintenance of a return to work program for injured staff.
		▪ Be fully conversant with the IEE and conditions of its approval
		▪ Be fully conversant with the EMMP
		▪ Be fully conversant with all relevant environmental legislation, policies and procedures, and ensure compliance
		▪ Convey the contents of this document to the contractor site staff and discuss the contents in detail with the Project Manager and Contractor
		  ▪ Undertake regular and comprehensive inspection of the site and surrounding areas in order to monitor compliance with the EMMP
		  ▪ Take appropriate action if the specifications contained in the EMMP are not followed

		▪ Monitor and verify that environmental impacts are kept to a minimum, as far as possible ▪ Review and approve construction methods, with input from the Site Manager, where necessary ▪ Ensure that activities on site comply with all relevant environmental legislation ▪ Compile progress reports on regular basis, with input from the Site Manager, for submission to the Project Manager, including a final post excavation audit ▪ Liaise with the Site Manager regarding the monitoring of the site ▪ Report any non-compliance or remedial measures that need to be applied ▪ All environmental problems arising on the construction area will be reported to the Site Manager by the Environmental Manager. Reports on such problems will be submitted to the Project Manager by the Site Manager

6.7 Proposed monitoring program to assess performance or output of EMP

For effective monitoring, management and documentation of the environmental performance during the construction and operational phase of the project, environmental matters will be discussed during meetings held on-site. Environmental concerns raised during the meetings will be mitigated after discussions between project proponent and the contractors. Any issues that require attention of project proponent higher management will communicate to them for action. Project proponent and its contractors will ensure that the communication and documentation requirements specified in the EMP are fulfilled during the project.

Environmental monitoring can be categorized into two types; 1) compliance monitoring and 2) effects monitoring. The environmental monitoring program is summarized in **Table 11** which identify the roles and responsibilities of project monitoring, further described in detail in following section

6.8 Compliance monitoring

Compliance monitoring will be carried out to ensure compliance with the requirements of the IEE. The objectives of the IEE compliance monitoring will be to:

- Systematically observe the activities undertaken by the contractors or any other person associated with the project.
- Verify that the activities are undertaken in compliance with the IEE and other conditions identified by project proponent.
- Document and communicate the observations to the concerned person(s) of project proponent so that any corrective measures, if required, can be taken timely.
- Maintain a record of all incidents of environmental significance and related actions and corrective measures.

Compliance monitoring will be the responsibility of all teams involved in the project activities i.e. project proponent and the contractors. Project proponent staff and contractors will carry out the inspections on a set frequency.

6.9 Effects monitoring

To monitor actual impacts of the project on selected sensitive receptors so that impacts not anticipated in the IEE or impacts which exceed the levels anticipated in the IEE can be identified and appropriate mitigation measures can be adopted in time. This objective will be achieved through effects monitoring.

Considering the environmental conditions of the project area and the assessment of potential impacts of the project made in the IEE, the following environmental parameters will be monitored at identified locations.

Table 13: Environmental monitoring plan

Component	Parameters	Monitoring Frequency	Responsibility	
		Operation	Installation	Operation
Ambient Air Quality	SOx , NOx, CO, PM_{10}, Smoke	As per EPA, Punjab Guidelines	Project Contractor	Proponent
Ground Water Quality	pH, TDS, Chloride, Fluoride, Colour, NO_3^-, Selenium, Residual chlorine, Lead, Total hardness, Turbidity, Zinc, Manganese, Aluminium, Chromium, Cadmium, Boron, Barium, Antimony, Aresenic, Cyanide, Mercury, Nickel, Total Coliform, E.Coli, Total count.	As per EPA, Punjab Guidelines	Project Contractor	Proponent
Surface & Waste Water Quality	pH, DO, TSS, Alkalinity, BOD_5, COD, Turbidity.	As per EPA, Punjab Guidelines	Project Contractor	Proponent
Noise Level	Using noise level meter (minimum dB and maximum dB)	As per EPA, Punjab Guidelines	Project Contractor	Proponent
Occupational Health & Safety	Proper provision of PPEs to workers	Daily	Project Contractor	Proponent

6.10 Proposed EMP reporting and reviewing procedures

During construction, EMP reporting and reviewing will be done by the contractor/HSE department. Regular monitoring will be done and reports will be submitted in EPA as per condition of Environmental Approval of construction phase.

- Monitoring reports will be reviewed by EMP team and HSE department
- Photographic records will also be maintained
- Recorded data will be reviewed by supervisory contractor/proponent so that it can be further improved if required.

6.11 Training needs

Environmental training will help to ensure that the requirements of the IEE and EMP are clearly understood and followed by all project personnel throughout the project period. Environmental training will form part of the environmental management system. The training will be directed towards all personnel for general environmental awareness

6.12 Objectives of the training program

The key objective of training program is to ensure that the requirements of the EMP are clearly understood and followed throughout the project. The trainings to the staff will help in communicating environmental related controls specified in the IEE and EMP.

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The key objective of training program is to ensure that the requirements of the EMP are clearly understood and followed throughout the project. The trainings to the staff will help in communicating environmental related controls specified in the IEE and EMP.

6.14 Training schedule

The training modules will include air, noise and water pollution monitoring, social awareness, Environmental Laws, Environmental Quality Standards usage of personal protection equipment, and health and safety related issues on the construction site.

The contractor will train all construction workers in basic sanitation and health care issues 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. A generic scope of the training which covers the requirements of the IEE and the EMP is discussed

below in **Table 12** while site contractor will prepare site specific training plan considering these training contents.

Table 14: Training needs

Target Audience	Contents	Schedule
Selected management staff of contractor and selected staff	▪ Introduction to project IEE and EMP. Key findings of IEE ▪ Mitigation measures ▪ EMP ▪ Social and cultural values of the area.	Prior to the start of project activities
All site personnel (including locally hired staff)	▪ Environmental sensitivity of the project area ▪ Waste disposal ▪ Community issues/ Social and cultural ▪ values	Prior to the start of project activities
Construction supervisor/ Installation crew	▪ EMP communication, documentation and monitoring requirements. ▪ Good construction & installation practices. ▪ Dust emissions control	Prior to the start of construction & installation activities
Drivers	▪ Safety provision ▪ Road access restrictions ▪ Dust reduction ▪ Waste disposal ▪ Emergency response preparedness	Before and during field operations
Selected staff o	Safety provision Hazardous waste disposal Emergency response preparedness	Prior to start of project operations

7 STAKEHOLDER'S CONSULTATION

Public consultation refers to the process by which the concerns of local affected persons and others who have plausible stake in impacts assessment of the project or activity are ascertained with a view to taking into account all the material concerns in the project or activity design as appropriate. According to the IEE and EIA Review Regulations, 2000 public consultation is mandatory for any socio-environmental study. For this purpose, assessment survey and public consultation sessions held with different stakeholder groups that may be impacted. The consultation process was carried out in accordance with the guidelines laid by EPA, Punjab. The objectives of this process were to:

- Share information with stakeholders on proposed project installation and operation.
- To access the impacts on the physical, biological, and socio-economic environment.
- Understand stakeholder concerns regarding various aspects of the project.
- Understand the perceptions, assessment of social impacts and concerns of the communities of the project area.
- Find out the awareness level and situation of acceptability to identify any issues for the implementation of said project.
- To invite people to express their views about the positive/negative impacts on their life styles and environment.

This report includes all the comments, which were taken into account in preparing the definitive development concept for the installation of the proposed unit.

7.1.1 Consultation mechanism

Primary stakeholders were consulted during informal and formal meetings. The consultation process was carried out in the Urdu language. During these meetings a simple, non-technical, description of the project was given, with an overview of the project's likely human and environmental impact. This was followed by an open discussion allowing participants to voice their concerns and opinions. In addition to providing communities with information on the proposed project, their feedback was documented during the primary stakeholder consultation. The issues and suggestions raised were recorded in field notes for analysis, and interpretation.

By reaching out to a wider segment of the population and using various communication tools such as participatory needs assessment, community consultation meetings, focus group discussions, in-depth interviews, and participatory rural appraisal IEE involved the community in active decision-making. This process will continue even after this IEE has been submitted, as well as during future IEE in which similar tools will be used to create consensus among stakeholders on specific environmental and social issues.

Secondary stakeholder consultations were more formal as they involved government representatives and local organizations, consulted during face-to-face meetings. They were briefed on the IEE process, the project design, and the potential negative and positive impact of the project on the area's environment and communities. It was important not to raise community expectations unnecessarily or unrealistically during the stakeholder consultation meetings in order to avoid undue conflict with community's leaders or local administrators. The issues recorded in the consultation process were examined, validated, and addressed in the IEE report. This section involves communication of possible impacts and concerns with

- Proponents Environmental Management Team
- The responsible authority
- Other departments and agencies
- Environmental Practitioners and experts
- Affected and wider community

7.2 Proponent's environmental management team

Consultation regarding establishment of Mutahir Metal Works (Pvt) Limited was done with stakeholders and anticipated impacts were discussed. Concerns of locals, Environmental Practitioners & experts and Government departments were discussed and asked to consider them while construction of above-said project. Locals will be preferred for employment after providing proper training. Mitigations measures mentioned in EMP will be truly implemented.

7.3 The responsible authority

Overall responsibility for implementation of EMP will be that of project proponent. He will appoint an HSE/Project Manager of relevant qualification. HSE/Project Manager will act as Environmental Manager and will manage the all HSE condition at the PEQS.

7.4 The other departments and agencies

Different Government departments were consulted regarding establishment of proposed project. Government officer were consulted by the socio-environmental team of the consultants and concerned details about the project were noted down through personal interviews, group meetings, etc., in their offices.

7.5 Environmental practitioners and exerts

Consultation with Environmental Practitioners and experts was done and following comments and suggestions were observed.

Table 15: Consultation with environmental practitioners and experts

Name	Qualification	Comments/suggestions
Dr. Sabiha Khurram	Ph.D. Environmental Sciences	Following comments are summarized: ▪ Latest technology must be preferred ▪ Regular monitoring should be conducted
Ms. Nusrat Ehsan	Ph.D. (scholar) Environmental Sciences	▪ She said that current project must be installed as : ▪ Quality Copper and Aluminum will be available ▪ Import cost will be reduced ▪ Good household practices must be practiced
Mr. Danial Zaib	BS Environmental Sciences	He said that: ▪ Locals should be preferred for employment. ▪ In case of outsider's residence must be provided ▪ Proper mitigation measures must be adopted while construction and operation of this project

7.6 Affected and wider community

Social survey was conducted to consult with local community. Their concerns were noticed and discussed with proponent and their team. Majority was in favor of project.

8 CONCLUSION AND RECOMMENDATION

Mutahir Metal Works (Pvt) Limited respects the environment, supports sustainable development and is committed to environmentally sound business practices. The proposed project will provide affordable and high-quality Copper and Aluminum to consumers. This study was carried out to assess the environmental and socioeconomic impacts of the proposed project. The assessment was carried out in keeping with the legislation of Pakistan, as well as national and international guidelines.

Baseline environmental and socioeconomic information was collected from a variety of sources, including reports of previous studies, published literature, and field surveys. The information collected was used to compose profiles of the natural, socioeconomic, and cultural environment likely to be affected by the project.

The proposed activities were reviewed, and an assessment was made of the potential impacts of these activities on the area's natural and socioeconomic environments, using both qualitative and quantitative assessment methods. Where appropriate, mitigation measures were recommended to keep the environmental impacts within acceptable limits.

It was analyzed that most of the aspects related with the proposed project have very minor impacts. It is therefore concluded that if the implementation of all mitigation measures is carried out as described in this report, the anticipated impact of the project on the area's natural and socioeconomic environment will be well within acceptable limits.

Proponent of subject project has expressed strong commitment to protection of the social and natural environment from any potential adverse impact of the project. A preventive maintenance philosophy supported by robust inspection plans and sound operational practices will be adopted to ensure sustainable and sound functioning of the proposed project. Therefore, it is recommended that the competent authority may please be issues Environmental Approval for the operation of this project.

9 APPENDICES

9.1 Glossary

Air Quality	Measurement of the pollutants in the air; a description of healthiness and safety of the atmosphere.
Consultation	Consultation refers to two-way transfer of information or joint discussion between project staff and the affected population. Systematic consultation implies a sustained and rigorous sharing of ideas. Bank experience shows that consultation often yields the best resettlement alternatives, fruitful procedures for continued participation, and independent information on actual conditions for implementation.
Closure	The action of making new or secret information known.
Env. Management	Attempt to control human impact on and interaction with the environment in order to preserve natural resources
Effluent	Wastewater - treated or untreated - that flows out of a treatment plant, sewer, or industrial outfall. Generally, refers to wastes discharged into surface waters.
Evaluation	The making of a judgment about the amount, number, or value of something; assessment.
Geology	A science that studies rocks, layers of soil, etc., in order to learn about the history of the Earth and its life.
Ground Water	Aquifers currently being used as a source of drinking water or those capable of supplying a public water system. They have a total dissolved solid content of 10,000 milligrams per liter or less and are not "exempted aquifers."
Hazardous	Substance or material, which could adversely affect the safety of the public, handlers or carriers during transportation.
Household	People residing under one roof, using the same hearth and operating as a single economic unit.
Impact	Effect on someone or something
Jurisdiction	The extent of the power to make legal decisions and judgments.

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Occupational Health	Maintenance of the highest degree of physical, mental and social wellbeing of workers in all occupations by preventing departures from health, controlling risks and the adaptation of work to people, and people to their jobs.
pH	pH is a measure of how acidic/basic water is.
Project Area	The area specified by the funding and/or implementing agency according to the Official Gazette Notification and includes the areas within the administrative limits of the Federal or a Provincial Government.
Proponent	A person who advocates a theory, proposal, or course of action.
Capacity	The volume of products or services that can be produced by an enterprise using current resources.
Quality Control	A system of maintaining standards in manufactured products by testing a sample of the output against the specification.
Rehabilitation	Include all compensatory measures to re-establish; at least lost incomes, livelihoods, living and social systems. It does not include the payment of compensation for required assets.
Scope	The extent of the area or subject matter that something deals with or to which it is relevant.
Social Environment	It includes the culture that the individual was educated or lives in, and the people and institutions with whom they interact.
Stakeholders	Include affected persons and communities, proponents, private and public businesses, NGOs, host communities and EPA.
Topography	Details of the surface features of land. It includes the mountains, hills, creeks, and other bumps and lumps on a particular hunk of earth.

9.2 LIST OF ABBREVIATIONS

EIA	Environmental Impact Assessment
EMMP	Environment Mitigation and Monitoring Plan
EMP	Environmental Management Plan
EPAs	Environmental Protection Agencies
PEPC	Pakistan Environmental Protection Council
NEP	National Environmental Policy
IEE	Initial Environmental Examination
NGO's	Non–Government Organizations
NOC	No Objection Certificate
O&M	Operation and Maintenance
PEPA	Pakistan Environmental Protection Act 1997
PEQS	Punjab Environmental Quality Standards
CBD	Convention on Biological Diversity
CITES	Convention on International Trade in Endangered Species
IUCN	International Union for Conservation of Nature
UNDP	United Nations Development Programme
DO	District Officer
PKR	Pak Rupees
hr	Hour
mg/l	Milligram per Litre
mg/m^3	Milligram per Cubic Meter
PPE	Personal Protective Equipment
MEPCO	Multan Electric Power Company
QC	Quality Control
SEO	Site Environment Officer
SH&E	Safety Health & Environment
APHA	American Public Health Association

BOD	Biochemical Oxygen Demand
COD	Chemical Oxygen Demand
SPM	Suspended Particulate Matter
WWTP	Wastewater Treatment Plant
SMART	Self-Monitoring and Reporting Tool
NOX	Oxides of Nitrogen
SOX	Oxides of Sulphur
NCS	National Conservation Strategy
PM	Particulate Matter

9.3 LIST OF INDIVIDUALS AND ORGANIZATIONS CONSULTED ALONG WITH THEIR WRITTEN FEEDBACK

Sr No.	Interviewer's Name	Contact
1.	MUHAMMAD IRFAN	34101-8754734-1
2.	AHMAD	34101-7035024-1
3.	BABAR BUTT	34601-3184932-1
4.	AZAM JAVED	34101-3118065-9
5.	MUHAMMAD IDREES	34101-2626672-1
6.	AHSAN IQBAL	34101-7304213-5
7.	MUHAMMAD DILAWAR	31201-7314614-9
8.	UMAR FAROOQ	14201-9275846-5
9.	HAMMAD WAHEED	36302-4205109-3
10.	JAMSHAID YOUSAF	34101-7683748-9
11.	MUHAMMAD JUNAID	34101-3402766-3
12.	MUZAMMAL AMIN	34101-2240239-9
13.	MUZAMMIL AKBAR	34101-8171975-5
14.	ISHTIAQ RASHEED	34101-6266509-9
15.	MUHAMMAD NOUMAN KHAN	34101-9621287-7
16.	MUHAMMAD SUFYAN	34101-0775011-5
17.	IFTIKHAR ALI	35404-7212533-9
18.	MUHAMMAD KHALID MAHMOOD	34101-1992191-3
19.	CH. MUHAMMAD YOUSAF	35401-6595576-7
20.	ZAKA ULLAH	34104-2235142-7

The survey in the study area following concerns of the local community were noted:

- Wastewater should be properly treated prior to final disposal in nearby drain.
- 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.
- Plantation should be carried out at extensive scale.
- Construction activity should be carried out during day hours.
- Noisy activities should be confined.
- Workers should be hired from local community.

21.	ZEESHAN MUJAHID	34101-4175822-3	▪ PPE's must be provided to workers ▪ Indigenous trees around the facility should be planted to control air pollution. ▪ Safeeda can be planted in the project area as the area in known to be affected by the logging and salinity. ▪ Removal of shrubs and bushes should be avoided to the extent possible.
22.	ALI RAZA	34101-1054833-1	
23.	SUFIAN AHMAD	34101-7432307-9	
24.	MUBASHAR KHALID	34101-2733211-5	
25.	FALAK SHER	34101-5490755-3	

9.4 SOURCES OF DATA AND FULL LIST OF ALL REFERENCE MATERIAL USED

Data was collected by:

- Field visits
- Published articles
- Stakeholder's consultation
- Client meetings'

9.5 TERMS OF REFERENCES

The consultants is required to carry out an environmental impact assessment study of the project under Section-12 of Pakistan Environmental Protection Act 1997/ Punjab Environmental Protection (Amendment) Act 2012.

The Study should be comprehensive and should cover all aspects which are envisaged under the relevant national and provincial laws & regulations including but not limited to:

- Identification and recommendation for suitable solution/treatment/mitigation measures for emissions and effluents such as wastewater and sludge etc. in accordance with Punjab Environmental Quality Standards (PEQS).
- Identification and recommendation for suitable solution/treatment/mitigation measures of solvents, oils (tar), hazardous waste, organic compounds, steam, flue gases, particulate matter and chemical compounds harmful for the environment and other substances leading to air, noise, water and soil pollution in accordance with PEQS.

The Study should be acceptable to the relevant national and/or provincial authorities (relevant authorities) in Punjab.

9.6 LIST OF NAME, QUALIFICATION AND ROLES OF TEAM MEMBERS CARRYING OUT IN IEE/EIA STUDY

Sr.No.	Name	Designation	Role and Responsibility
1.	Dr. Mateen Shafqat		Technical Peer Review
2.	Mr. Kamal Ahmed Cheema	Lead Environmentalist	Technical Peer review
3.	Ms. Maham Ayesha	Manager Operations	Legal framework review and Stakeholder consultation IEE/EIA Expert, Environmental & Social Baseline, Report Writing.
4.	Arslan Iqbal	Environmentalist	Project Coordination and management, Impact Assessment and Mitigation Measures, Environmental Management Plan, Technical Report Writing.
5.	Mr. Jawad Shafiqe	Zooligist	Legal framework review and Stakeholder consultation, IEE/EIA Expert, Environmental & Social Baseline, Report Writing.
6.	Ms. Amna Hafeez	Environmentalist & GIS Expert	Legal framework review and Stakeholder consultation, IEE/EIA Expert, Environmental & Social Baseline, Report Writing. Project GIS Mapping
7.	Ms. Rahma Butt	GIS Expert	Legal framework review and Stakeholder consultation, IEE/EIA Expert, Environmental & Social Baseline, Report Writing.