EIA REPORT 2026

Environmental Impact Assessment Report-Radiators Manufacturing Unit for Tractors, Auto Mobile & CNG Rickshaws by
M/s A & R Company
18-Km off Ferozpur Road, Lahore

PROPONENT

Mr. Mohammad Riaz Butt

CLIENT EARTH CONSULTANCY & COMPLIANCE
ENVIRONMENTAL LAWYERS & CONSULTANTS
236-Riwaz Garden Lahore. 042-37110339 - 0322-4798273
ceccpakistan@gmail.com

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

Approx.	Approximately
°C	Degree Celsius
dB (A)	A weighted Decibel Scale
EIA	Environmental Impact Assessment
EMMP	Environmental Management and Monitoring Plan
EMP	Environmental Management Program
Engr.	Engineer
EPA	Environmental Protection Agency
EPD	Environmental Protection Department
Hons.	Honors
Km	Kilometer
Ltd.	Limited
m^3/h	Cubic Meter per Hour
NEQS	National Environmental Quality Standards
No.	Number
NOC	No Objection Certificate
PEPA, 1997	Pakistan Environmental Protection Act, 1997
PEPA, 2012	Pakistan Environmental Protection (Amendment) Act, 2012
PKR	Pakistani Rupees
PM	Particulate Matter
PPEs	Personal Protective Equipments
Pvt.	Private
SOPs	Standard Operating Procedures
WAPDA	Water and Power Development Authority
WASA	Water and Sanitation Agency
CNG	Compressed Natural Gas

LIST OF ANNEXURES

ANNEXURE I	LIST OF INDIVIDUALS AND ORGANIZATIONS CONSULTED ALONG WITH THEIR WRITTEN FEEDBACK
ANNEXURE II	TERMS OF REFERENCE (TORS)
ANNEXURE III	APPROVALS FROM OTHER CONCERNED DEPARTMENTS
ANNEXURE IV	APPROVED BUILDING LAYOUT MAP

EXECUTIVE SUMMARY

1. Title and location of Project with GPS coordinates

This executive summary presents an overview of the main findings of Environmental Impact Assessment (EIA) Report for ***""Radiators Manufacturing Unit for Tractors, Automobiles & CNG Rickshaws by A&R Company"*** located at 18-Km Off Ferozpur Road, Lahore. As the Proponent's unit is operational, the EIA Study of the aforesaid project has been conducted to accord Environmental Approval/NOC from Environmental Protection Agency (EPA) under Punjab Environmental Protection (Amendment) Act, 2012 and IEE/EIA Regulations 2022. The main goal of this project is to focus on producing vehicles efficiently while meeting market demand, quality standards, and sustainability goals. The site coordinates are 31°25'26.7"N 74°21'14.2"E. The process for conducting environmental assessment and the results of EIA Study are described in detail in this document.

Introduction

The aforesaid project falls under ***Category B-20*** Schedule II i.e., "***Manufacturing and processing" i.e., "Automobile manufacturing and assembling unit"*** of review of IEE and EIA Regulations, 2022. Hence, it requires an EIA Study. Thus, an EIA Study has been conducted and report has been prepared for duly submission in EPA to accord Environmental Approval/NOC.

The estimated project cost is **PKR 106 Million approx** the breakdown of the project cost is given in **Chapter 05** of this EIA Report and the environmental budget allocated for the protection of environment is **PKR 0.5 Million approx.**

2. **Name of the Proponent along with contact number and email**

Project Proponent
Proponent: Mohammad Riaz Butt **Address:** 18-Km Off Ferozpur Road, Lahore **Contact num: 042 35401814** **Email: ar-company@yahoo.com**

3. Name and details of organization preparing report

Project Consultant
Client Earth Consultancy & Compliance (Rana Shafqat Hussain) **Environmental Lawyers & Consultants** **Office: 236, Rewaz Garden, Lahore** **Ph: 042-37110339 Cell: 0322-4798273** **Email: ceccpakistan@gmail.com**

4. A brief outline of Project including name of Proponent and organization preparing report

Project Name	EIA of "Radiators Manufacturing Unit for Tractors, Automobiles & CNG Rickshaws by A&R Company"
Location	18-Km off Ferozpur Road, Lahore
Proponent Name	Mr. Mohammad Riaz Butt
Project Cost	**PKR 106 Million Approx.**
Total Area	4 kanal 01 marla
Final Product	Auto parts for Tractors, Automobiles CNG Rickshaw
Production capacity	Radiator per month (Tractors =2000, Automobiles =1500, CNG Rickshaw =500)
Nature of the Area	Industrial
Waste Management	Managed as per standard practices of area
Source of Power	WAPDA and standby power generators
Site Coordinates	31°25'26.7"N 74°21'14.2"E.

5. Major Impacts and Recommended Mitigation Measures

Following impacts are likely to occur during operational phase of aforesaid project:

5.1 Construction

The building is already constructed.

5.2 Operational Phase

Proper ventilation of building has been ensured and currently, use of dust masks by workers has been adopted as a mitigation measure for safety of the worker. Domestic solid waste is being handled by the municipality practices of the area, so this is an insignificant issue while process waste is disposed of using standard practices. Empty Packaging waste is being sold out. All machinery is being regularly serviced and tuned to mitigate noise at source, noise barriers block noise propagation and receptors are protected by the use of PPEs. An Emergency Response Plan (ERP) is also in place and the workers are trained about it.

7. Proposed Monitoring

During operation, ambient air quality for dust level in particular, noise level, solid waste management and soil contamination, wastewater and community & workers safety need to be monitored on quarterly basis. Monitoring Plan has been included in **Chapter 09**.

1 SCREENING

For the prediction and mitigation of impacts associated with project implementation at an early stage of project development, it is pre-requisite under the environmental laws to undertake Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) Study as the case may be. Based on its nature, size and related impacts, the project under consideration has been categorized for EIA Study as stated in ***Regulation 03 of Statutory Notification (S.R.O 339(1)/2001).*** As per the statutory notification of Review of IEE and EIA Regulations, 2022 made under Section 12 of Punjab Environmental Protection Act, 1997 (Amended 2012), states;

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

The aforesaid project i.e., ***"EIA of Radiators Manufacturing Unit for Tractors, Automobiles & CNG Rickshaws by A&R Company"*** falls under **Category B-20(Manufacturing and Processing) *i.e., "****Automobile manufacturing and Assembling unit)* mentioned under Schedule II.

Thus, an EIA Study has been conducted and report has been prepared for duly submission in EPA to accord Environmental Approval/NOC.

2 SCOPING

2.1 Spatial and temporal boundaries of Environmental Assessment

Due to current project land use was changed from open land to industry however, operation is being carried out in environmental friendly manner. The said industry is located at Industrial area and surrounded by various other similar and different nature of industries. Current industry has installed by adopting proper mitigation measures. In current project no significant emissions have been observed because operation is being done in controlled environment and wastewater is being treated before disposal to ensure PEQS. PPE's are enforced to wear by workers and their implementation must be ensured. No environmental sensitive area is present within safe distance that could be impacted due to current project.

Figure 1: Google Earth Map of Project site

2.2 Important issues and concerns raised during consultation

In constructed building minor alteration was done and started operation. It is already located in industrial area and at safe distance from residential areas therefore, no disturbance to residents. Current project is being installed by adopting proper mitigation measures

- Main concern was about jobs, Locals are preferred for the job opportunities.

- Wastewater is being treated prior to final disposal.
- Solid waste is dispose off as per standard area practice
- 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.
- Noisy activities should be confined.

2.3 Significant impacts and factors to be determined

Main impacts and factors to be determined are

- Occupational Health and safety
- Traffic Management
- Hygiene management
- Community impacts
- Job opportunities for locals
- Confined noisy activities
- Resource conservation
- Avoid excessive water consumption
- Energy efficient techniques must be adopted
- Tree plantation at designated green areas
- Emergency preparedness

3 CONSIDERATION OF ALTERNATIVES

3.1 Site Alternative their selection and rejection criteria

The selected site for said project is located in industrial area specifically developed for the industries. The area selection was already done by considering the impacts of said project. The area is developed as an industrial and many industries are already in operation in project proximity. The selected project site is ideal from the point of view of compatibility with other land use of the area. Due to existing infrastructure and its strategic location, it is our considered view that the selected building is ideal and suitable for the aforesaid development. Additionally, the building is owned by Proponent.

3.2 Design/technology alternatives, their selection and rejection criteria

For Installation of current project state of art technology/machinery is being selected to avoid emissions. Proponent has done heavy investment for this project so latest/state of art technology was preferred to ensure good quality products. Good quality raw material is being used to ensure best product. Machinery was selected after consulting with already running units and their impacts.

3.3 Environmental Alternatives, their selection and rejection criteria

After project completion, proper landscaping was done. In future, more trees will also be planted at designated green areas. Moreover, the proponent is very concerned and conscious about the quality and equally about the environmental protection and resource conservation. State of art machinery was selected with minimum power consumptions and less emissions. Maintenance of machinery is being done on regular basis to avoid emissions and noise issues. Extensive Tree plantation has been done in surroundings to control air pollution at maximum level.

3.4 Economic Alternatives, their selection and rejection criteria

- Selected machinery technology is economically efficient.
- Tree plantation has been done at designated green areas, will also be done in future that will reduce temperature of the area and also act as noise barrier, also control particulate matter.
- Cost effective technology has adopted for operation of aforementioned unit.

4 DESCRIPTION OF THE PROJECT

4.1 Type and Category of Project

The aforesaid project i.e. "Radiators Manufacturing Unit for Tractors, Automobiles & CNG Rickshaws by A&R Company" falls under Category **B (20); Manufacturing and Processing** (*Automobile manufacturing and Assembling unit*) mentioned under Schedule II. Thus, an EIA Study has been conducted and report has been prepared for duly submission in EPA to accord Environmental Approval/NOC.

4.2 Objective of Project

The objective of aforesaid project i.e., EIA of Radiators Manufacturing Unit for Tractors, Automobiles & CNG Rickshaws by A&R Company is to forward integration and manufacture high quality products with good market potential. The project contains modern state-of-the-art facility with the objective of producing superior quality products. The project has following advantages:

- The project provides additional income and gainful employment to local people.
- It helps to produce superior quality products for end consumers.
- The said project is itself value addition project.
- Socio-economic up-lift of the proponent
- Creation of new job opportunities and promoting income prospects for those engaged in the allied activities associated with operation of project is considered as indirect objectives of the project.

4.3 Location and site Layout of Project

The project under consideration for the "EIA of Radiators Manufacturing Unit for Tractors, Automobiles & CNG Rickshaws by A&R Company located at 18 km, Off Ferozpur Road, Lahore. The coordinates of site are; 31°25'26.7"N 74°21'14.2"E. The location of aforesaid project is given below and the layout of aforesaid project is attached in file.

Figure 2: Google Map showing distance of various Receptors from Project Site

4.4 Site alternatives, their selection and rejection criteria

The selected site for said project is located in industrial area. The area is developed as an industrial and many industries are in operation in project proximity. The selected project site is ideal from the point of view of compatibility with other land use of the area. The site is also spacious enough to accommodate the proposed facility and its infrastructure. Due to existing infrastructure and its strategic location, it is our considered view that the selected site is ideal and suitable for the proposed development.

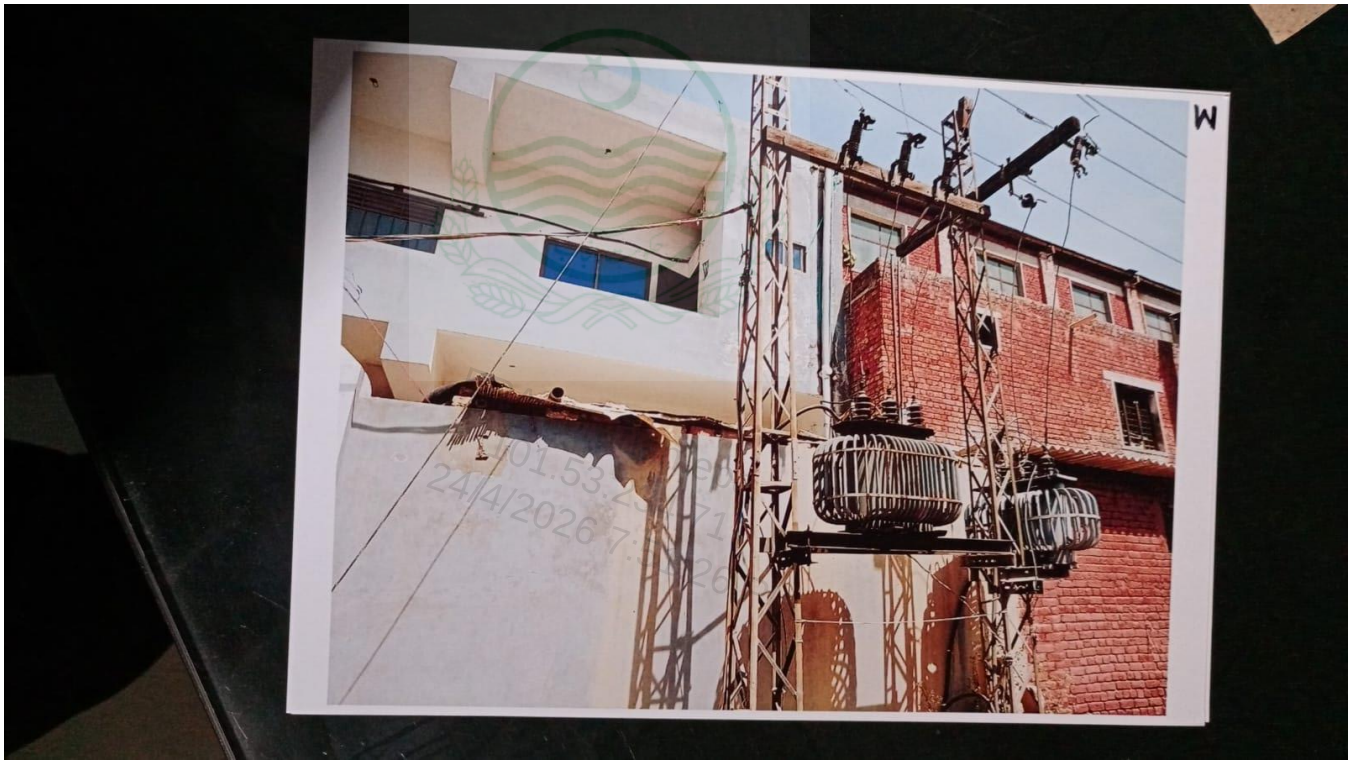
4.5 Design/Technology Alternatives, their selection and rejection criteria

For Installation of current project state of art technology has selected to avoid emissions. Proponent is doing heavy investment for this project so latest/state of art technology was preferred to ensure good quality products.

4.6 Process, raw material and product Alternatives

All details has mentioned in description of project.

4.7 Pictures of project surroundings (East, West, North South)



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4.8 Google Earth Map with coordinates

4.9 Land Use on the site

The land use of the project area is industrial, and the unit is already operational.

4.10 Road Access

The building is accessible through various main and connecting roads. The road access map of project is attached below:

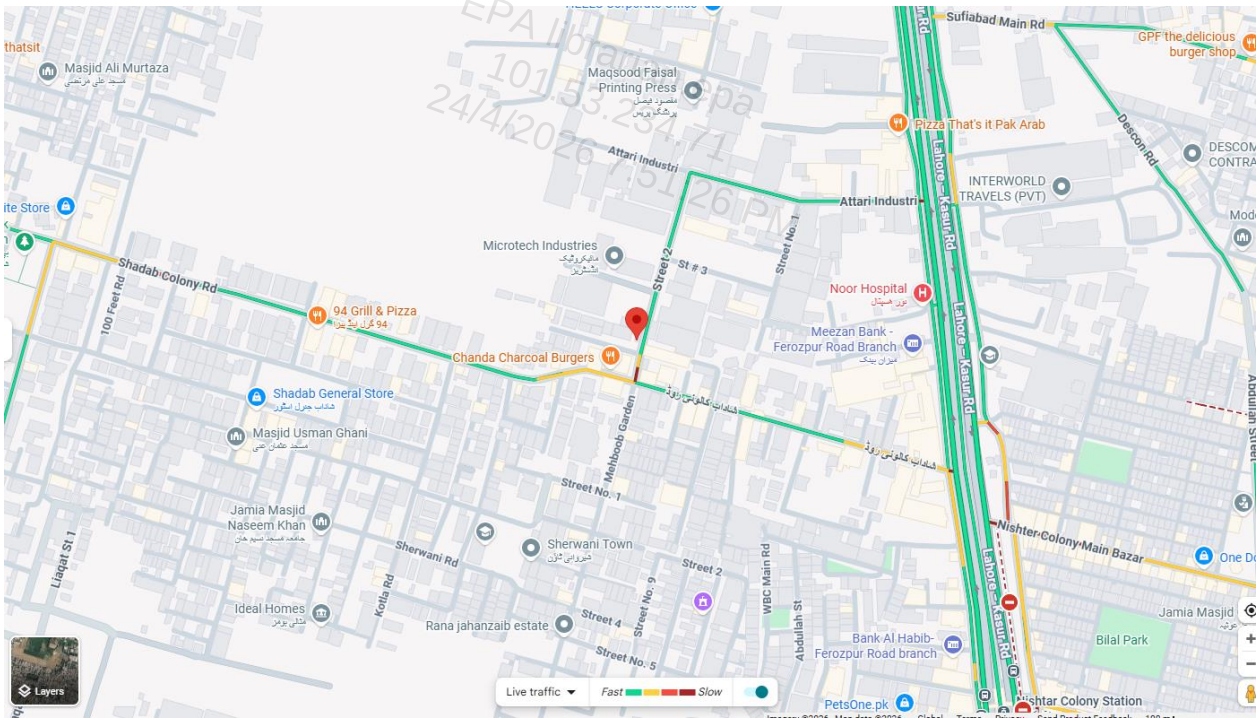

Figure 3: Road Access Map of Project Site

4.11 Vegetation Features

The building has already constructed. After completion of construction the proponent has planted several trees designated green areas and will also be planted later on.

4.12 Cost and Magnitude of Operation

The estimated initial capital cost of aforesaid project is **approximately PKR 106 Million.** Purchase of raw material, operation and maintenance of production machinery are the costly activities involved in the operation phase of said project. Equipment safety has been assured if these operations are carefully managed. No separate fund allocation is required.

Figure 4: Cost Breakup

Sr#	Components	Cost (PKR)
1	Land Cost	10.5 Million approx.
2	Construction cost	34.0 Million approx.
2	Equipment/Machinery	61.0 Million approx.
3	Environmental Budget	0.5 Million approx.
Total		**106 Million Approx.**

However, budget has been allocated for purchase and maintenance of standardized PPEs for workers and for waste management and environmental enhancement. Despite these costs, this project was found to be financially feasible in the feasibility report. Magnitude of operations includes:

- Applying for and getting all necessary approvals and contracts
- Installation of machinery
- Tree plantation and landscaping

The allocated environmental budget is **PKR 0.5 Million approx.** as mentioned in project cost breakup. The allocated environmental budget has been spent on landscape/green zone management and solid waste management. The proponent will plant indigenous and ornamental plants to increase the aesthetic value of the area. Thus, the project is also a source of employment for locals and would help in economic development activities of the area.

4.13 Schedule of Implementation

The project has already been implemented and the unit is operational.

4.14 Project Description

The proponent has established “Radiators Manufacturing Unit for Tractors, Automobiles & CNG Rickshaws by A&R Company”. Process flow and complete process description has mentioned below;

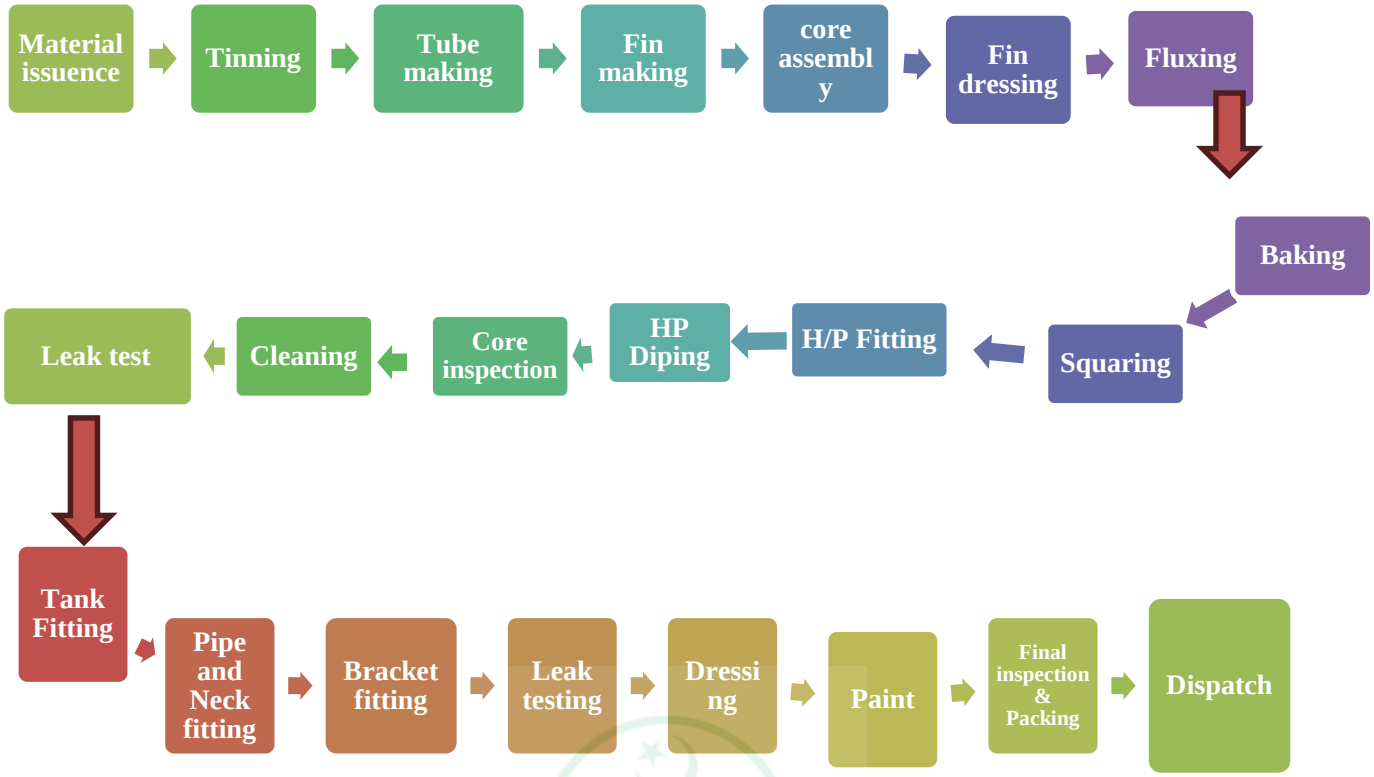

Figure 5: Process Flow

Production Process

The manufacturing process of radiators (commonly used in automobiles or heating systems) involves several well-defined steps. Below is a clear, practical breakdown of how most modern radiators especially automotive ones are made:

1. **Material Selection**

Radiators are typically made from following raw material:

Table 1: List of Raw Material

Sr. No.	Raw material	Average Annual Quantity (kgs)	Source of raw material
1.	Copper Foil	35000	China & Pakistan
2.	Brass Foil	40000	
3.	Brass Sheet	5000	
4.	Solder Ingot	5000	
5.	Allum Fin Foil	7000	
6.	Allum Tubes	8000	
7.	Allum Components (pcs)	20000	

2. **Core Manufacturing**

The core is the main heat-exchange part.

a. Tube Formation
- Thin metal sheets are rolled into flat or round tubes.
- These tubes carry the coolant.

b. Fin Production
- Metal sheets are formed into thin fins (zigzag or louvered shapes).
- Fins increase surface area for better heat dissipation.

c. Tube & Fin Assembly
- Tubes and fins are mechanically assembled into a core structure.
- This is often done using automated stacking machines.

3. Brazing Process

The assembled core is heated in a controlled furnace (called controlled atmosphere brazing – CAB).

A filler metal melts and bonds tubes and fins together.

This ensures:

- Strong joints
- Leak-proof structure

4. Header and Tank Manufacturing

Headers: Metal plates with holes for tubes.

Tanks: Plastic or metal containers on either side of the radiator.

Process:

- Headers are stamped from metal sheets.
- Plastic tanks are made via injection molding.

5. Assembly

Core is joined with headers.

Tanks are attached using:

- Crimping (for plastic tanks)
- Soldering or welding (for metal tanks)

6. Leak Testing

Radiators are tested using:

- Air pressure testing
- Water immersion testing
- Ensures no leakage under operating conditions.

7. Surface Treatment
- Coating or painting to prevent corrosion.
- Sometimes anodizing (for aluminum radiators).

8. Final Inspection & Packaging
- Dimensional checks
- Performance testing (heat dissipation efficiency)
- Packaging for shipment

Table 2: List of Machinery

Sr. No.	Machinery	Number
1.	Brass Foil Soldering Machine	2
2.	Tube formation Machine	3
3.	Fin Making Machine	2
4.	Airway Assly Jigs	4
5.	Flat Assly jigs	10
6.	Baking ovens	2
7.	Squaring Jig	1
8.	Flux Tanks	2
9.	Compressor	3
10.	Generator	1
11.	Hydrolic Press	1
12.	Power press	6
13.	Drill Machine	2
14.	Shearing Machine	2
15.	Punching Dies	7
16.	Tank & Headr Plate Dies	38
17.	Fly Press	2
18.	Packing Machine	2
19.	Wooden Cutter	1
20.	Testing Equipment	1
21.	Lathe Machine	1
22.	Aluminum Brazing oven	1
23.	Aluminum Fin Machine	1

24.	Aluminum Assly Jigs	2
25.	Argon Welding Plant	2
26.	Sharing Machine	1

Final Products with production capacity (Monthly average)

Table 3: Final products

Sr. No.	Final products	Quantity
1	Radiator Tractors	2000
2	Radiator Automobiles	1500
3	Radiator CNG Rickshaws	500

4.15 Water usage also mention quantity and source

The source of water for the project is WASA supply. The water is being consumed for cooling purpose and domestic activities.

4.16 Wastewater generation (Quantity and quality) disposal method

Domestic and process wastewater is being treated through septic tank prior to final disposal into the area sewerage system. The proponent is regularly paying the monthly WASA bill/charges for wastewater discharge.

4.17 Air Emissions and control measures

There's no significant source of air emissions. Generator has kept in proper enclosure to control noise and chimney of proper height to discharge of hot gases/smoke.

4.18 Solid Waste generation and disposal method

Estimated solid waste generated during operational phase comprise of rejected metal, packaging material, rejected rubber and plastic material, paints and pigments etc. Rejected foils, paper & packaging material, plastics can be recycled.

4.19 Operational hours of the facility

Operational hours of the facility depend on demand.

4.20 Energy requirement and sources

WAPDA is the main source of the power. Sui gas also consumed within industry. However, Standby power generator is used as backup source.

4.21 Fuel storage and handling

Fuel for machinery and generator has stored with proper mitigation measures. Oil & grease is being used in auto parts, stored at appropriate location.

4.22 Emergency response and safety measures

- **Emergency Response Procedure**

Step 1: Fire Detection

- Raise alarm immediately
- Activate Manual Call Point

Step 2: Inform

- Inform control room
- Call local fire brigade
- Inform plant head

Step 3: Isolate Utilities

- Shut main power
- Close gas valves

Step 4: Firefighting (If Small Fire)

- Use correct extinguisher
- Stand upwind
- Maintain safe exit behind

Step 5: Evacuation

- Follow marked escape routes
- No running
- Assemble at Assembly Point

Step 6: Head Count

- Supervisor counts employees
- Report missing persons
- **Emergency Evacuation Plan**
- Clearly marked exit routes
- Emergency lighting
- Assembly point away from building
- Evacuation map displayed in all sections

Electrical Panel Fire

- DO NOT use water

- Use CO_2 extinguisher

Personnel Protective Equipment

Following Personnel Protective equipment's has provided to the workers for their safety:

- Protective Goggles
- Protective leather/rubber shoes
- Gloves-leather, canvas, rubber and plastic
- Gas masks
- Protective shields
- Helmets
- Overcoats

4.23 Relocation and Rehabilitation Plans

There exists no human settlement within a safe radius of the selected project site. The site was restored after completion of construction. Now unit is in operation.

4.24 Any green or sustainable features planned

The proponent has installed rainwater harvesting system, rain water will be reuse for domestic activities and horticultural activities later on. Solar system will also be installed soon. Extensive vegetation/tree plantation of indigenous species was done during construction and operation within unit and surroundings.

5 DESCRIPTION OF THE ENVIRONMENT

This chapter provides baseline data (physical, biological and socio-economic parameters) related to the project and study area. The information has been compiled by using primary and secondary data resources. This chapter also refers to the theoretical analysis of the methodology adopted for collection of primary and secondary baseline data. The underlying principles and practices adopted in this regard are also discussed.

Methodology

The methodology employed to collect the baseline data and information regarding the social structure and various related parameters as discussed in sub-sections below:

Data Collection

The primary data was collected by visiting the project area and its nearby communities. The secondary data regarding physical parameters (topography, geology, seismology, and climate) was obtained by visiting relevant various government departments and their official websites. The biological parameters such as flora and fauna were studied by preparing a floristic list based on visual observation and fauna was studied by using opportunities approach. The species were recorded with reference to their existence in the project area. Information on wildlife fauna specie mammals, amphibians, reptiles, birds, etc.) in the assessment area was compiled based on opportunistic observation, gathering the existing information and consultation with local experts, community members and government and Non-Government Organizations (NGOs). The socio-economic aspects were studied and analyzed by conducting socio-economic surveys.

5.1 BASELINE PHYSICAL ENVIRONMENT

Baseline conditions refer to the existing physical, environmental and socio-economic status of the project and study area. On the basis of baseline information, the project interventions are assessed and mitigation measures are proposed accordingly. The baseline information also helps to indicate the specific issues to be monitored during operational phases of project development. The baseline data (physical, biological and socio-economic parameters) related to the project and study area is described in sub-sections 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 whereas, it gives detailed information about the surface water, ground water (if present in the project area vicinity) and air quality of project area. The detail of each parameter is discussed in sub-sections below:

5.1.1Geography

Lying between 31°15′—31°45′ N and 74°01′—74°39′ E, Lahore is bounded on the north and west by the Sheikhupura District, on the east by Wagah, and on the south by Kasur District. The Ravi River flows on the northern side of Lahore. Lahore city covers a total land area of 404 square kilometers (156 sq mi). Lahore is the capital city of the Pakistani province of Punjab. It is the second-most populous city in Pakistan after Karachi. [1] The city is located in the north-eastern end of Pakistan's Punjab province, near the border with the Indian state of Punjab. Lahore is

[1] POPULATION OF MAJOR CITIES CENSUS – 2017 [PDF]" (PDF). Pakistan Bureau of Statistics. Retrieved August 30, 2017

ranked as a beta-world city,[2] and is one of Pakistan's wealthiest cities with an estimated GDP of $58.14 billion (PPP) as of 2014.

5.1.2 Seismicity

Study area is located in the tectonic zone of down wrap and platform slop in the seismic zone of noticeable earthquake from 3.1 to 4.9 on Richter scale (Atlas for Pakistan). According to building code of Pakistan prepared by NESPAK recently, it is located in Seismic Zone 2A of Pakistan (Lower limit of moderate damage). Zone 2A represents peak ground acceleration (PGA) from 0.08 to 0.16g. Figure shows the seismic zoning map of Punjab with the Project Area falling under Seismic Zone-2A.[3]

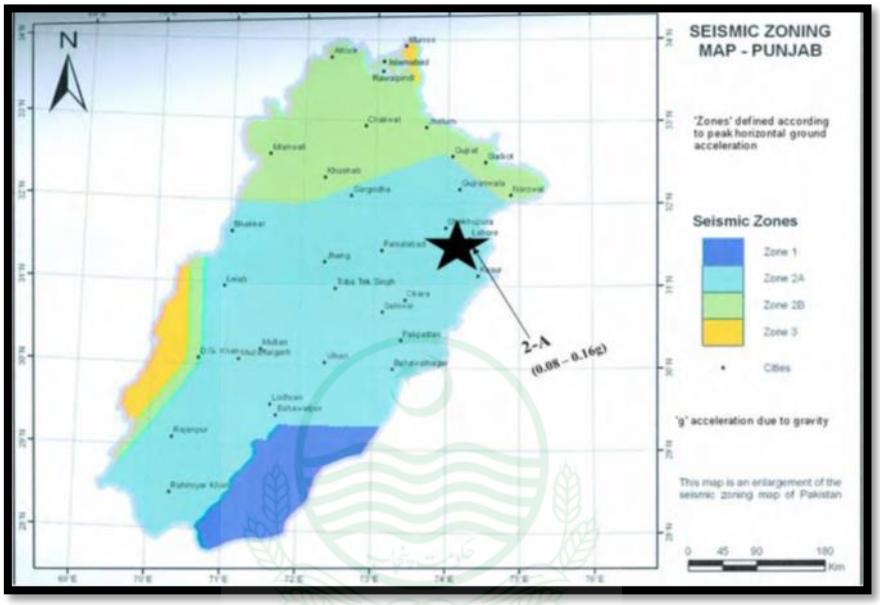

Figure 6: Seismic Map

[2] GaWC – The World According to GaWC 2016". lboro.ac.uk. 24 April 2017. Retrieved 30 April 2017

[3] "EIA of Construction of Lahore Orange Line Metro Train Project (Ali Town –Dera Gujran)" prepared and submitted by NESPAK

5.1.3 Regional Geology

The soil deposits at the project site belong to Chung Fun formation indicating the last glacial cycle. It was followed by the period of melting of glaciers, resulting in deposition of clay, silt and sand deposits in late Pleistocene to recent. With gradual with drawl of the sea during the late territory time, shallow water and possibly deltaic deposits were laid down. It became a vast flood plain on which debris of numerous streams have mingled to load it with huge thickness of alluvial material derived from the Himalaya. Though, there is no evidence of any glaciations in the area, the series of great climatic changes during the Pleistocene period had impact on the sedimentation in physiography of this region. The presence of old channels of Ravi River indicates conformity of the stream oscillation to terrestrial rotation in the deflection of streams. However, abrupt migration indicate period of excessive flooding during which earlier channels were choked with sediments and the streams were forced to create new channels (Kamzi 1964).

These alluvial deposits comprise earthy brown to brown silt, clay and sand. The beds are largely hard, laminated and sandy with inter-beds of clay and layers or lenses of sand. Geological map of the Study Area is given in Figure Project site is located in meander belt deposits.

The Project Area does not have any valuable minerals. Although, scientific in depth, investigations haven't been carried out, yet the surveys conducted have failed to discover any minerals worth the name till to- date.

The only minerals worth to value are kallar and kankar in the district Lahore. Kallar is the grey powdery substance collected and taken out from the old village sites and other deserted abodes in the district. It is used for the manufacture of crude saltpeter and also as manure for the top dressing of young cotton and tobacco plants (no longer in the line of extensive cultivation). With the passage of time the demand for Kallar diminished and its use as a trading commodity is on the decline. Kankar is used for metaling roads and its smaller particulars are burnt for lime. It is a kind of limestone gravel and is found, after being dug out at a depth varying from one to eight feet, in many parts of the district particularly the uplands.[4]

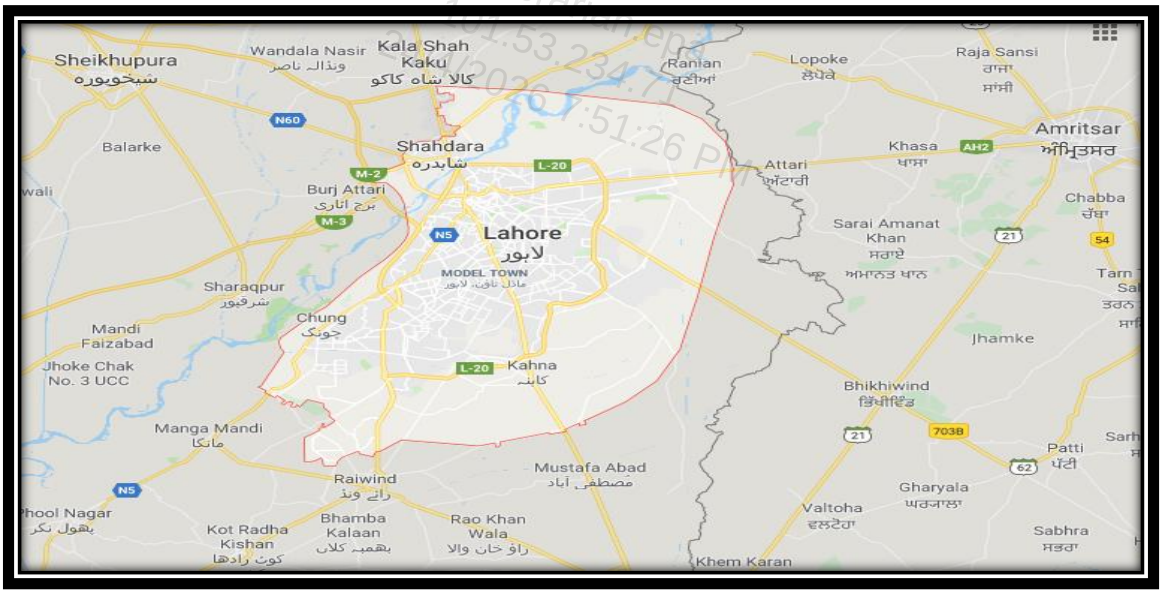

Figure 7: Location of the City

[4] "EIA of Construction of Lahore Orange Line Metro Train Project (Ali Town –Dera Gujran)" prepared and submitted by NESPAK

5.1.4 Topography

The topography of the project area is flat. The General height of the area is approximately 220 meters above the Mean Sea Level (MSL). The district Lahore is divided into two parts. The low-lying alluvial soil is along the Ravi River, and the upland in the east. Upland is a plain slope from north-east to south-west. The lowlands are generally inundated during the monsoon season by Ravi River, flowing in the west of district along its boundary with district Sheikhupura. [5]

5.1.5 Climate

Lahore has a semi-arid climate. The hottest month is June, when average highs routinely exceed 40 °C (104.0 °F). The monsoon season starts in late June, and the wettest month is July,[6] with heavy rain falls and evening thunderstorms with the possibility of cloudbursts. The coolest month is January with dense fog.

Table 4: Average Monthly Temperature, Precipitation and Relative humidity

Month	Mean Temperature		Precipitation (mm)	Relative Humidity at 0500 HRS (%)	Relative Humidity at 2000 HRS (%)
	Maximum	Minimum			
January	19.8	5.9	28.92	80.4	51.9
February	22.0	8.9	37.14	79.0	52.4
March	27.1	14.0	34.3	68.6	42.2
April	33.9	19.6	44.32	50.2	25.3
May	38.6	23.7	24.38	45.7	27.2
June	40.4	27.3	91.62	59.1	40.9
July	36.1	26.8	150.52	76.7	60
August	35.0	26.4	161.42	78.8	65.9
September	35.0	24.4	67.28	74.4	56.4
October	32.9	18.2	11.74	70.6	44.2
November	27.4	11.6	4.44	77.1	48.8
December	21.6	6.8	9.94	82.9	53.73
Average	**30.8**	**17.8**	**66.6**	**70.34**	**47.4**

The city's record high temperature was 48.3 °C (118.9 °F), recorded on 30 May 1944.[7] 48 °C (118 °F) was recorded on 10 June 2007. At the time the meteorological office recorded this official temperature in the shade, it reported a heat index in direct sunlight of 55 °C (131 °F). The record low is −1 °C (30 °F), recorded on 13 January 1967[8]. The highest rainfall in a 24-hour period is 221 millimeters (8.7 in), recorded on 13 August 2008.[9] On 26 February 2011[10], Lahore

[5] "EIA of Construction of Lahore Orange Line Metro Train Project (Ali Town –Dera Gujran)" prepared and submitted by NESPAK

[6] "Climatological Normals of Lahore". Hong Kong Observatory. Retrieved 6 May2010

[7] "QUETTA". Pakmet.com.pk. Retrieved 15 March 2011

[8] Archived 13 June 2010 at the Wayback Machine

[9] Archived 16 July 2011 at the Wayback Machine.‹The template Wayback is being considered for merging

[10] Highest temperature in 78 years: Four die as city sizzles at 48o C". Daily Times. 10 June 2007. Retrieved 15 March 2011

received heavy rain and hail measuring 4.5 mm (0.18 in), which carpeted roads and sidewalks with measurable hail for the first time in the city's recorded history.[11][12]

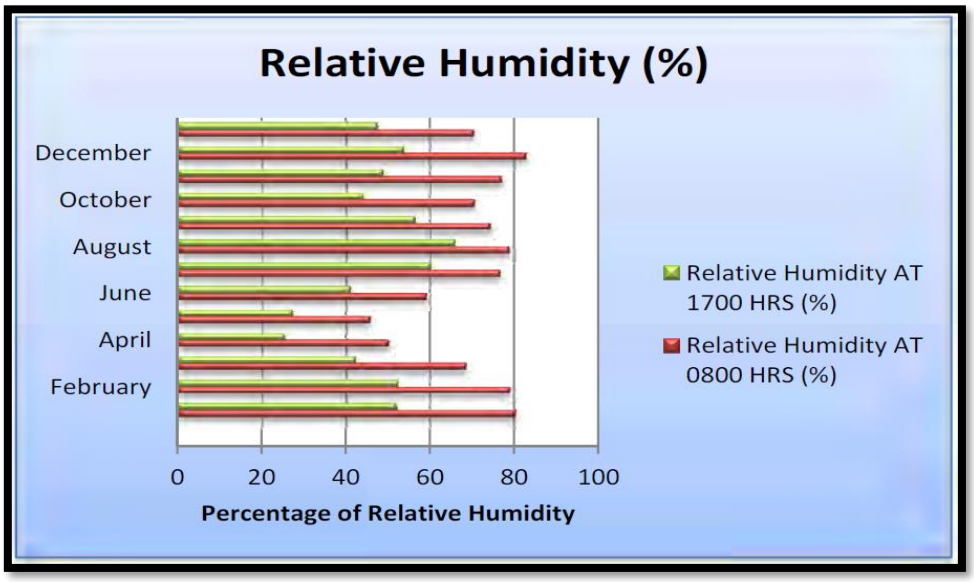

Figure 8: Relative humidity in project area

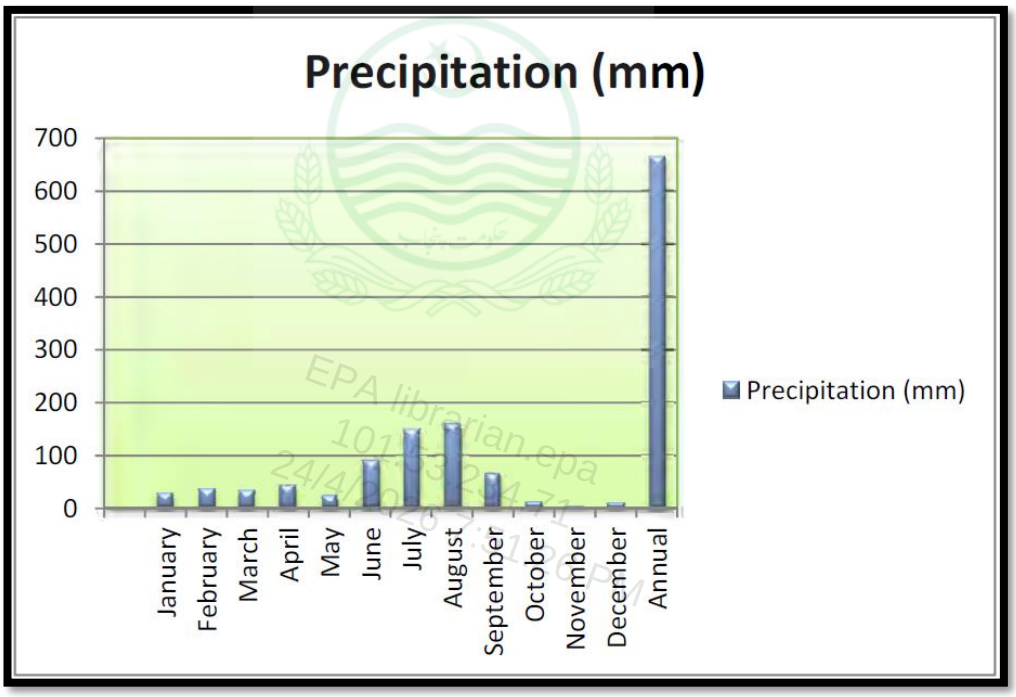

Figure 9: Average Rainfall in the Project Area (2004-2008)

Most of the time June, July and August are the months of maximum wind speed in project area whereas from November to January, wind speed is minimum. June is the month of highest wind speed in project area (8.26 km/h) whereas the minimum wind speed is recorded during the month of January when wind speed reaches to 1.52 km/h.

[11] Daily Times – Citizens cheer as hail turns city white
[12] "Lahore becomes Murree!". Youtube.com. Retrieved 15 March 2011

5.1.6 Wind study

Data about wind direction and wind speed for the year 2004, 2005, 2006, and 2007 is available on the format of average daily basis. While, on hourly basis it is available for the year 2008 0nly. Table[13] below shows the average wind speed and wind direction for the year 2004-2007.

Table 5: Average Wind Speed (m/sec) (2004-2007)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2004	0.57	0.93	0.77	0.98	0.98	1.13	1.08	0.82	0.72	0.72	0.21	0.46
2005	0.62	0.72	1.03	1.49	1.44	1.34	0.87	0.51	0.514	0.51	0.51	0.36
2006	0.67	0.67	1.03	1.08	1.23	1.13	0.72	0.57	0.668	0.62	0.51	0.57
2007	0.51	0.82	1.03	1.08	1.39	1.29	1.03	0.82	0.72	0.46	0.15	0.36

Table 6: Wind direction at 0800(2004-2007)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2004	N56W	N55W	N78W	N44W	S71W	S13E	S16E	N56E	S80W	N69W	S75W	W
2005	N80W	N62W	N44W	N67W	N63W	S52W	E	S71W	N54E	W	N68W	N68W
2006	N55W	N47W	N41W	N51W	S46W	S30W	S61E	N67E	N61W	N76W	N71W	N65W
2007	N77W	N55W	N70W	N82W	N39W	S47W	S36E	N67E	N32W	N61W	W	N65W

Table 7: Wind direction at 1700 (2004-2007)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2004	N56W	N55W	N78W	N44W	S71W	S13E	S16E	N56E	S80W	N69W	S75W	W
2005	N80W	N62W	N44W	N67W	N63W	S52W	E	S71W	N54E	W	N68W	N68W
2006	N55W	N47W	N41W	N51W	S46W	S30W	S61E	N67E	N61W	N76W	N71W	N65W
2007	N77W	N55W	N70W	N82W	N39W	S47W	S36E	N67E	N32W	N61W	W	N65W

Calm wind was observed 56 percent of the time and wind speed 3 meter per second was recorded 15 percent of the time. The predominant directions are South-East and North-West in the speed ranges of 3 to 6 m/sec. Wind rose[14] for the year 2008 for Lahore city is given in Figure.

[13] Meteorology Department Lahore
[14] Meteorology Department Lahore

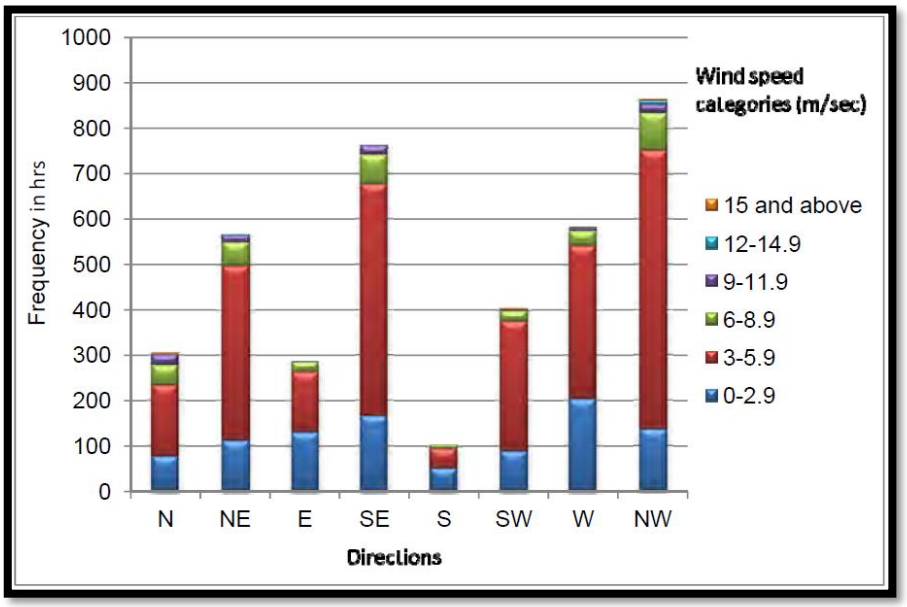

Figure 10: Wind Speed and wind direction in the city of Lahore 2008.

In winter (November-February) the predominant direction are West and North West, in summer (March-June) the predominant direction is South-East while in Moon soon/ summer season (July-October) the predominant direction is South East. Seasonal wise direction and wind speed is shown in Figure

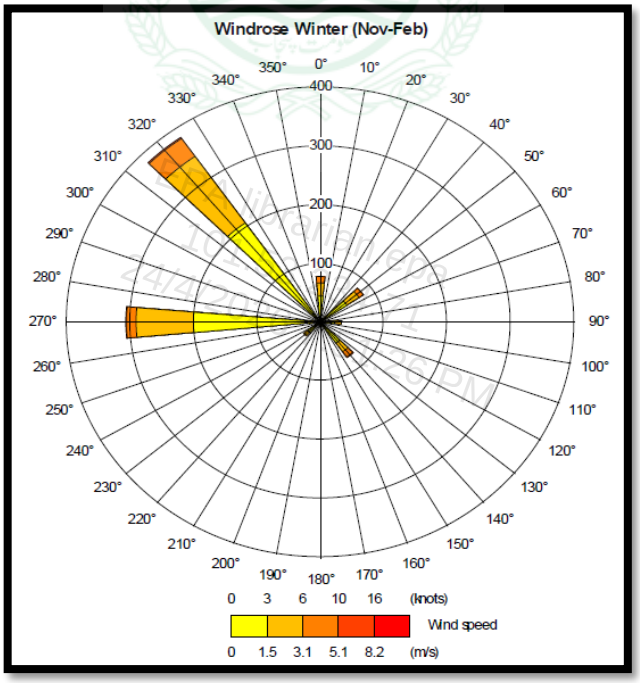

Figure 11: Wind Rose for the winter 2008, Lahore

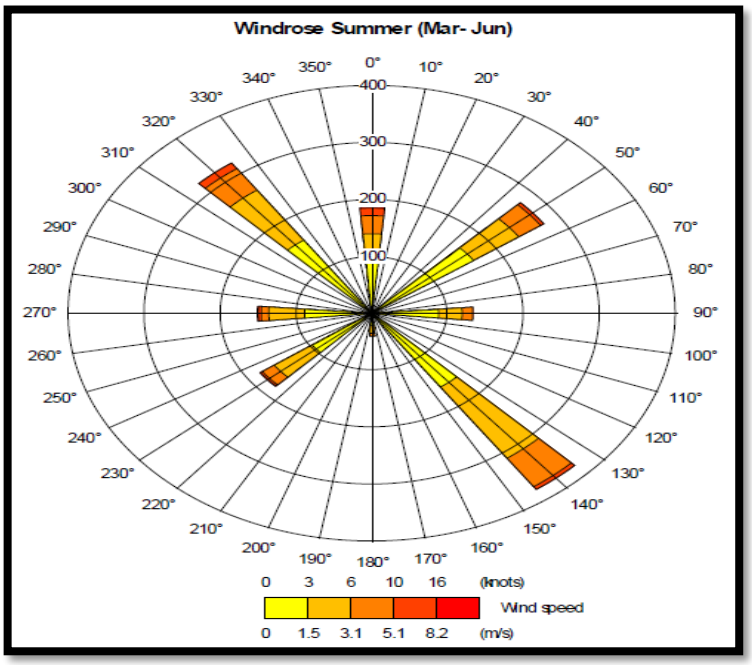

Figure 12: Wind Rose for the summer (MAR-JUNE) 2008, Lahore

5.2 BASELINE ECOLOGICAL ENVIRONMENT

Mainly a country's wilderness areas and scenic landscapes with their associated flora and fauna form natural capital of a country. Both collectively and within each level, the range or variety of the resources is referred to as the "Biological Diversity". The contribution of the "Natural capital" is recognized at three distinct levels including genera, species, and community -habitat and ecosystem.

Pakistan comprises of a total of nine major ecological zones and the term has relevance for each of Pakistan's administrative units—district, province, and particularly country. The greater the number of genera, species and habitats and ecosystems present within these units, the greater is the Biodiversity. It is in this background that the biodiversity of the area is discussed below:

City 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.

There are however no significant or well-shaped trees and shrubs on the project site. There are some trees only along the main roads.

5.2.1 Flora

Lahore, the city of gardens is heart of Pakistan. The city has seen the heydays of the Mughals, Sikhs and the British; all left their footprints on the history and cultural mosaic of the city. Resultantly Lahore is a treasure-trove of monuments, historical relics and remains which these nations have left in this historical metropolis of Punjab.

Though an ancient city; over the years Lahore has considerably expanded. However, along these modern additions, the ancient monuments, old gardens, trees, graveyards and traditional bungalows having attached gardens, large expanses of lawn and old roadside trees some of them can still be seen, are gradually disappearing. These green areas and old endemic trees of Lahore are home to many resident bird species as well as many summer, winter and transit migrants. So, Lahore is also very important due to its ecological conditions.

Several types of floral species are present in Lahore, however, some of the principal trees, shrubs (plants) and herbs (ground covering plants) are given below in Table, which illustrates their nomenclature including local names, English names and Botanical names.

Table 8: Inventory of Plants present in Lahore

No.	Common Names	Botanical Names
1	Arjun	*Terminaliaarjuna*
2	Dhak	*Buteafrondosa*
3	Mahwa	*Bassialatifolia*
4	Bahara	*Terminaliabellerica*
5	Amaltas	*Cassia fistula*
6	Gul-e-nishter	*Erytrinasubrosa*
7	Barringtonia	*Barringtoniaacutengula*
8	Nim	*Meliaindica*
9	Gab	*Diospyoresembryopteris*
10	Berna	*Cratevareligiosa*
11	Khark	*Celtusaustralis*
12	Putajan	*Putranjivaroxburgi*
13	Fiddle wood/Kashmir Lagotis	*Eithrxyllumruberratum*

5.2.2 Fauna

In urban Lahore, there are areas which can truly be classified as places of breeding, nesting and roosting for several bird species. The grounds of different habitats such as Lahore Zoo and the Lawrence Garden, Mayo and Jinnah Gardens, GOR, JalloPark, Kinnaird College, Aitcheson College and many others are home to various bird species.

Ornithologists of preceding times documented the number of bird species in Lahore. According to one study conducted in 1965 there were 240 bird species in Lahore. In another study (1992) only 101 bird species from the parks of Lahore were recorded.

However, with an increase in the rate of urbanization, the ecology of Lahore has been considerably affected and population of birds in Lahore has reduced to just 85 including the resident and migratory ones. The resident species of Lahore are Grey Hornbill, Yellow-footed Green Pigeon, Parakeet, Bulbuls, Doves, Spotted Owlet, Babblers, Flycatchers, Mynas, Woodpeckers, Crows, Kites, Ashy Prynia, Red Start, Warblers, Red Wattled Lapwing, Kingfishers, and the Oriental White Eye.

Three types of migratory birds are regular visitors of Punjab's provincial metropolis. These are winter visitors, summer visitors and transit migrants.

Not only the birds, but different other classes of the animal species also play an important role for the habitat of the area.

Table 9: List of Different Classes of Animals[15]

[15] WWF

Mammals	Reptiles	Amphibians	Insects
Stray dogs	Monitor Lizard	Indus valley bullfrog	Dragonfly
Feral cats	Geckos	Common frogs	Damselfly
Donkeys		Toads	Butterflies
Cows			Honey bees
Bats			Earthworms
Goats			Centipedes
Small Indian			
Indian palm squirrel			
Buffalo			
Mole			
Horse			
Sheep etc.			

Besides all these, as Lahore does not contain any of the wildlife species. If it was containing a time ago but it has become extinct now. The reason for extinction and the rising number of endangered species, according to the wildlife authorities are steady conversion of the forests into agricultural lands and urban areas to meet the food and housing requirements of the increasing population, reduction in the wetland areas due to the water shortage in rivers and canals, cutting of trees in forest areas and of course, unauthorized killing of birds and animals

PROJECT SITE:

With an increase in the rate of urbanization, the ecology of City has been considerably affected but there is no threatened or endangered species found in the project site. Similarly, no wildlife is present within the project corridor.

5.3 BASELINE SOCIOECONOMIC ENVIRONMENT

Socioeconomic environment is represented by the human and economic development and quality of life values. For the study of socio-economic environment of the project area, field surveys were conducted and interviews were held with the general public and neighbors.

6.3.1Political and Administrative Setup

The project area falls in Lahore City of the Lahore District. District Co-ordination Officer is the highest ranked administrator of the district. For the collection of revenue and administration, the districts are subdivided into Tehsils. Local governments also administer the area through Union Councils and Tehsils. The total area of the district Lahore is 2,300 square kilometers

5.3.2Demographic Profile

The total population of Lahore District was 6,318,745 as enumerated in March 1998 with an inter censal percentage increase of 78.3 since March 1981 when it was 3,544,942 souls. The average annual growth rate of population in the district during intercensal period 1981-1998 was 3.5 percent. The total area of the district is 1772 square kilometers, which gives population density of 3,566 persons per square kilometer as against 2000 persons observed in 1981 indicating a fast growth rate of the district.

The results of the 2017 Census determined the population to be at 11,126,285[16], with an annual growth rate of 4.07% since 1998[17]. Gender-wise, 52.35% of the population is male, while 47.64% is female and transgenders make only 0.01% of the population.

5.3.3 Health Facilities

Ample medical and health facilities are available in the Lahore Metropolitan Corporation area and its suburbs. Shaukat Khanam Hospital is the latest addition in the medical care facilities in Lahore for the most dangerous disease in the country i.e. Cancer. There are also other hospitals of voluntary organizations which provide health cover to the general public. King Zaid Bin Sultan Hospital is also a very advanced addition in the medical care for Lahore. Among the prominent hospitals are General Hospital, Lady Willington Hospital, Mayo Hospital, Fatima Jinnah Hospital, The Children Hospital, Services Hospital, and Ganga Ram Hospital etc. Besides, a number of private medical practitioners, Hakims and homeopathic doctors are also practicing in the city. Some famous Health facilities located in the Project vicinity are Hameed Latif Hospital, Wapda Hospital, and Lady Willington. Google map below shows the existing health facilities near project site.

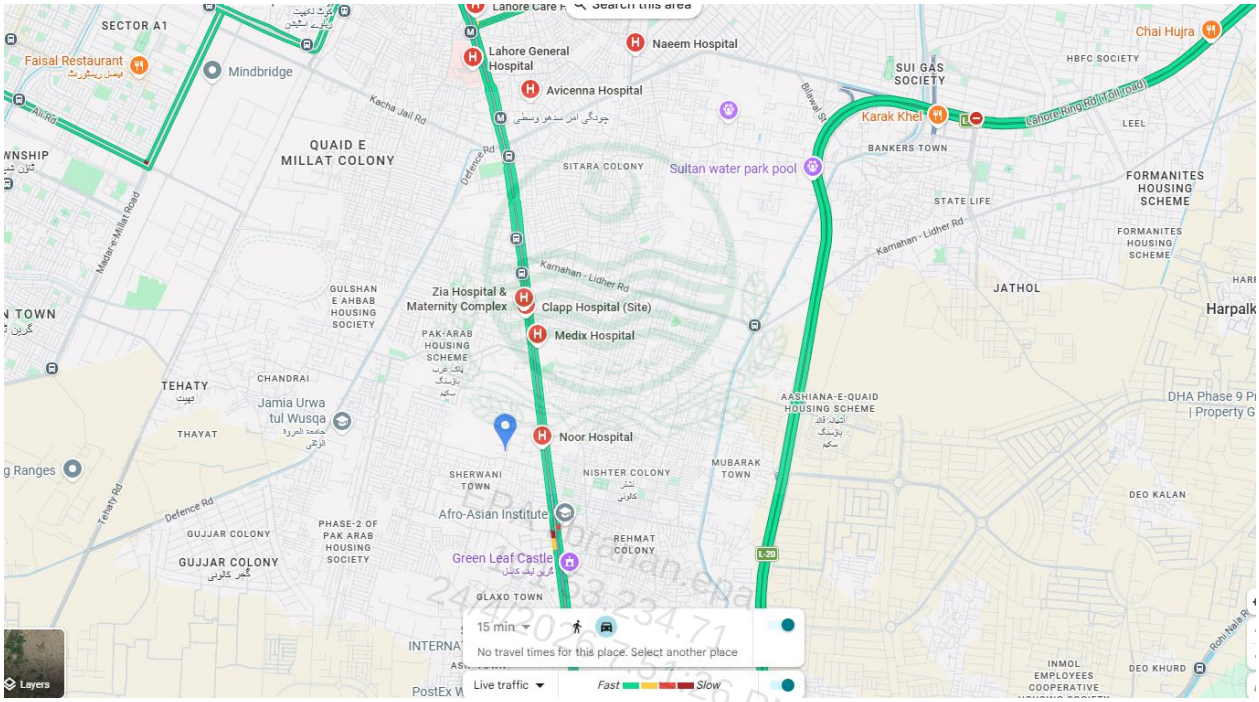

Figure 13: Health facilities nearby project site

5.3.4 Educational Facilities

Lahore is known as Pakistan's educational capital, with more colleges and universities than any other city in Pakistan. Lahore is Pakistan's largest producer of professionals in the fields of science, technology, IT, engineering, medicine, nuclear sciences, pharmacology, telecommunication, biotechnology and microelectronics, nanotechnology and the only future hyper high tech centre of Pakistan. Most of the reputable universities are public, but in recent years there has also been an upsurge in the number of private universities. The current literacy

[16] "POPULATION OF MAJOR CITIES CENSUS – 2017". Pakistan Bureau of Statistics. Retrieved August 30, 2017

[17] "DISTRICT WISE POPULATION BY SEX AND RURAL/URBAN – CENSUS 2017". Pakistan Bureau of Statistics. Retrieved August 30, 2017

rate of Lahore is 74%.[18]Google Map below shows the nearest schools, colleges and Universities near proposed site.

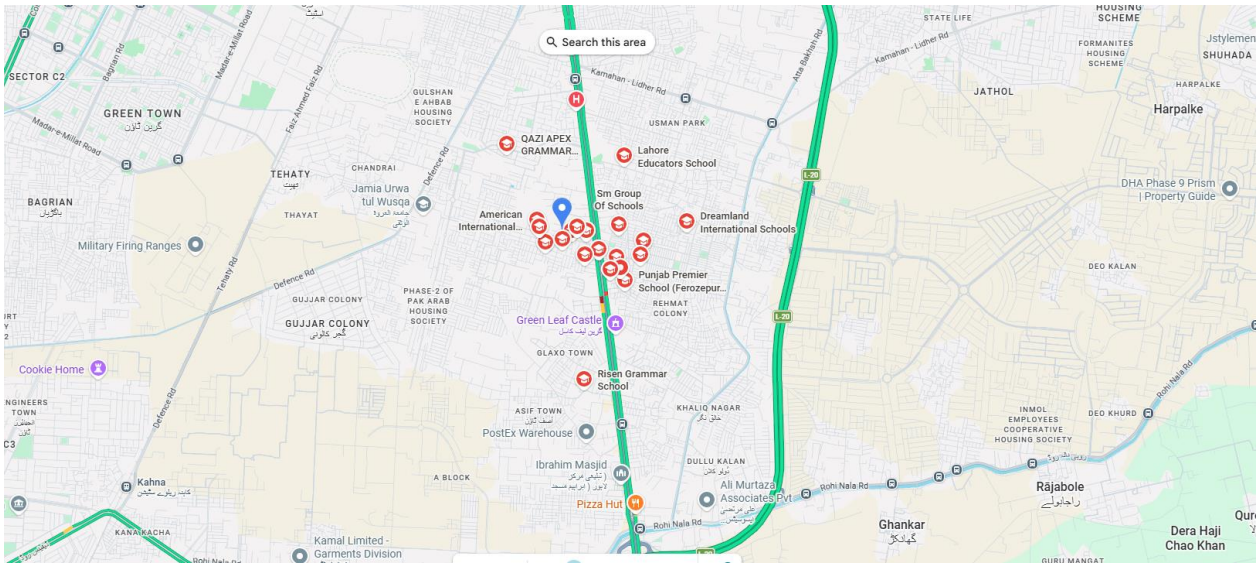

Figure 14: Educational facilities nearby project site

5.3.5 Industries

Lahore being an industrial area as well as the project site is located in industrial area. Many industries are present near the project site and are shown in map below.

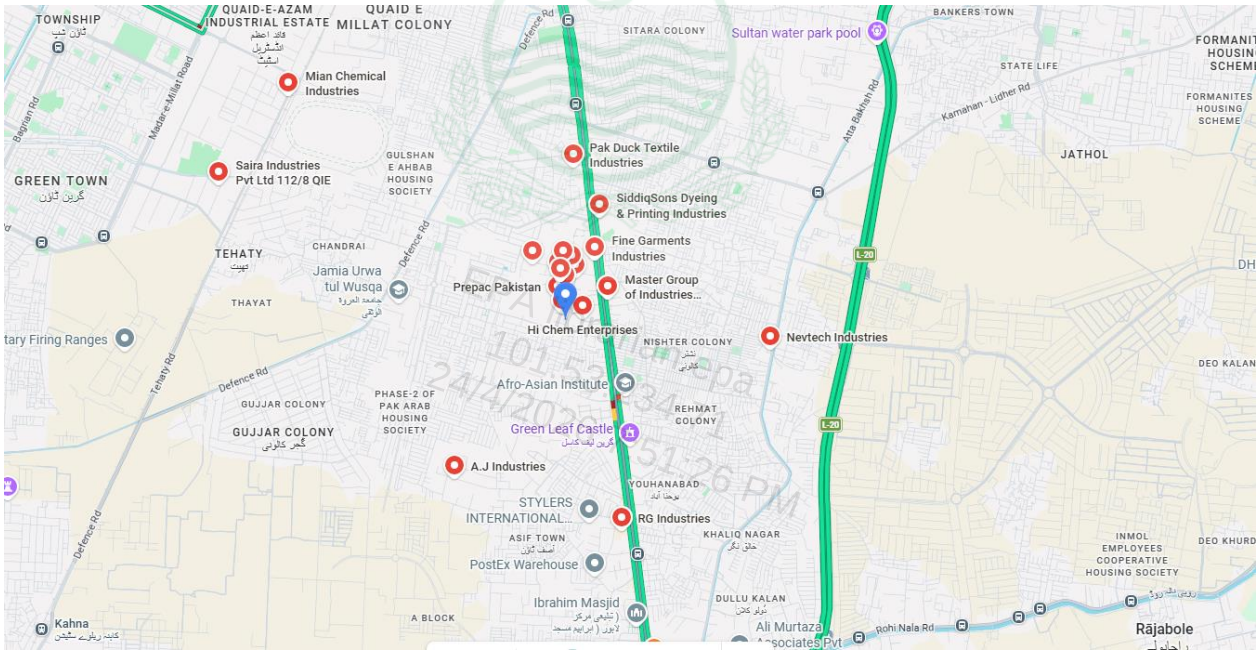

Figure 15: Industries nearby project site

5.3.6 Public Amenities

Nearby proposed project there are different public amenities like mosques and as the project is located at sunder industrial estate. Distances from sunder estate mosque is 130m from project location.

[18] en.wikipedia.org/wiki/Education_in_Lahore

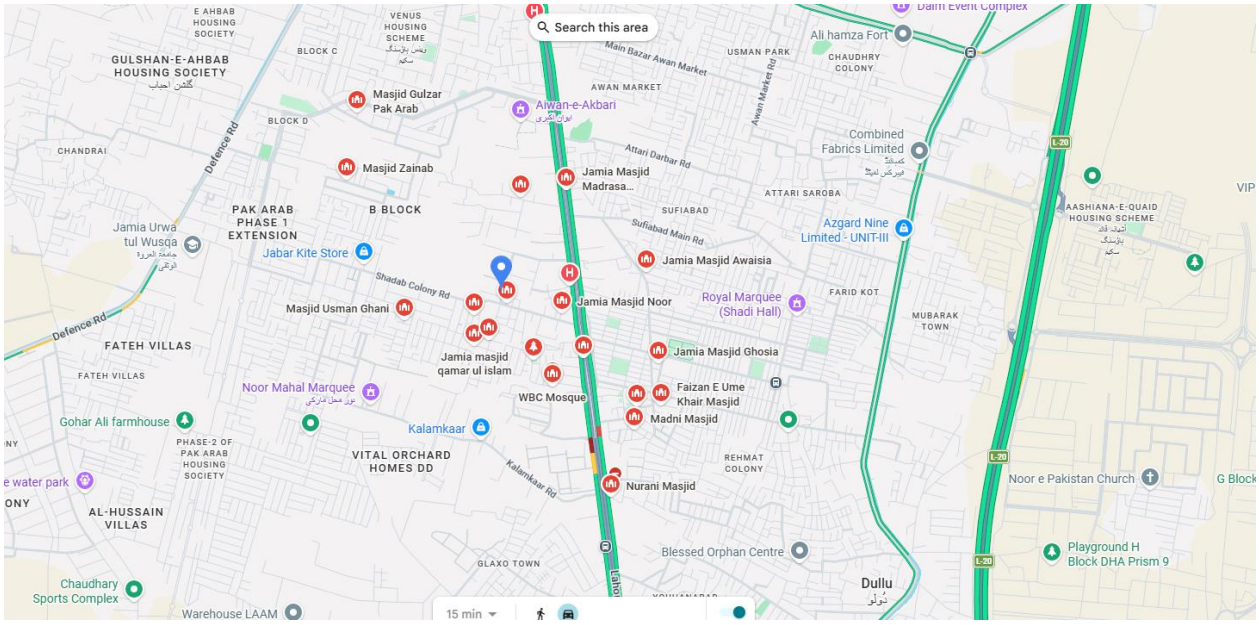

Figure 16: Public amenities near project location

QUALITY OF LIFE VALUES

Settlement Patterns

The field surveys have shown that the settlement pattern of the project area and its vicinity is mostly urban with some partially urban settlements exist at safe distance from the project site. The project site is located in industrial area surrounded by various other industries.

Social and Public Amenities Available

The social and public amenities present in the area are given below:

a. Physical structures

There is no population living in the project area but the study area is semi populated. The land use on the project site is industrial.

b. Cultural Heritage and Community Structure

As stated earlier that the project area has no population and physical structure that may be damaged due to the current project as it is located in designated and approved industrial area.

5.4 LAB REPORTS OF ENVIRONMENTAL ANALYSIS

Testing of different parameters was done from a certified laboratory to check the quality of different environmental parameters. The copy of the lab reports of these parameters (ambient air analysis, water quality analysis) is given in file.

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 chapter of Environmental Impact Assessment (EIA) encompasses all the important aspects of local environment; such as biological resources, socioeconomic development and quality of living values. A Social survey in the Project Area was also carried out through consultation with the various communities. Local residents living in the Project Area

were interviewed to obtain their feedback regarding the installation of the Project and its impacts on their daily life/future in the short and long term.

5.4.1 Noise Level

A common form of noise pollution is from transportation, principally motor vehicles. The source of most noise worldwide is transportation systems, motor vehicle noise, along with aircraft noise and rail noise. Poor urban planning may give rise to noise pollution, since side-by-side industrial and residential buildings can result in noise pollution in the residential area. Other sources are car alarms, office equipment, factory machinery, audio entertainment systems, loudspeaker etc. Noise monitoring of the project area is attached in file.

5.4.2 Ambient Air Quality

Atmospheric pollution, particularly in urban areas like Lahore, has a strong impact on daily life. Motor vehicles are a major source of air pollution. Factories and cottage industry inside the Lahore City are also contributing to air pollution. Sulphur dioxide (SO2), Nitrogen dioxide (NO_2), Carbon dioxide (CO_2), Carbon monoxide (CO), Ozone (O_3) and particulate matter (PM_{10}) are considered pollution indicators.

Air quality Monitoring was conducted its reports has attached within file.

5.4.3 Water Resources:

5.4.3.1 Hydrogeology

The Study Area forms the upper part of Punjab plain, which is a part of the Indo-Gangetic depression. This depression is of a synclinal nature. Synclinal depression is a fore deep downward of the Himalayan foreland of variable depth, converted into flat plains by simple process of alluvial deposition.

- The aquifer underlying the Study Area comprise unconfined alluvium with a thickness of about 1050 feet (rock has been encountered at depth 1050 ft in the deepest test bore hole drilled near Thokhar Niaz Bag in Punjab) as a part of regional groundwater investigation.

- It is part of the large inter alluvial upper Bari Doab, which is bounded by the Ravi River in northwest and the Sutlej River to the southeast. The Bari Doab along with other Doabs like Rechna, and Chaj form the vast alluvial plain of the upper Indus Plain in Punjab.

The alluvium is derived from the erosion of mountain ranges in north. It has been deposited and reworked by the large meandering rivers and tributaries of the Indus River and comprises a random distribution of fine to coarse sand with lenses of silty clay and clay of varying thickness and extension. Borehole logs for tube-wells shows that the lenses of less permeable material are neither thick nor continuous so, in spite of their heterogeneity, the alluvial sediments constitute an aquifer which on regional basis behaves as a single homogeneous unconfined water body.

PROJECT LOCATION:

Lab reports of water quality Analysis is attached in file.

5.5 SUITABILITY OF THE SITE

The proponent has already completed construction and unit is in operation now. The project area do no fall in environmental sensitive area and all commodities are at a suitable distance from project site as they will not impacted by the operation activities even locals will get more benefits and job opportunities. No replacement, relocation and rehabilitation is required for the development of above-said project.

6 IMPACT ASSESSMENT METHODOLOGY

This section discusses the potential environmental impact for the EIA of Radiators Manufacturing Unit for Tractors, Automobiles & CNG Rickshaws by A&R Company. The impacts may include; soil contamination, water resources depletion, biological resources disturbance and socio-economic impacts and, where applicable, identifies mitigation measures that will reduce significantly, if not eliminate, its adverse impact. The assessment carried out in this Section is based on potential impacts on overall environmental receptors within the project area.

Objectives

The objective of screening is identification of the adverse as well as beneficial impacts and then mitigating the effect of adverse impacts up to acceptable limits or within PEQS. Following are the objectives of screening out all significant environmental and social impacts:

- To find different alternatives and ways of carrying out the project activities, this may cause adverse environmental and social impacts on the surroundings.
- To enhance the Environmental and Social benefits of project.
- To avoid, minimize and remediate adverse impacts.
- To ensure that residual adverse impacts are kept within acceptable limits.

In the sub-sections below the impact's assessment methodology for the operation of above stated project has been defined. It includes the magnitude, the extent of the impact and the nature of the anticipated impact that is likely to be occurred from the said project activity.

Methodology

This Section discusses the project's potential environmental impact of aforementioned project. The adverse impact may occur on; the area's geomorphology, soil, water resources, air resource, biological resources and socio-economic condition and where applicable, identifies mitigation measures that will reduce significantly, if not eliminate, its adverse impact. The assessment carried out in the sub-sections below is based on potential impacts on overall environmental receptors within the project area. Impacts are evaluated on the basis of magnitude, immediacy and sustainability.

Evaluation of the Residual Impacts

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

It can be concluded in view of these reasons that the selected site is best suited for the project and the technology adopted for the production of passenger vehicles. The said project will not pose any adverse impact or threat on any component of the environment. The impact assessment criteria are given below along with their impacts:

Table 10: 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

Impact Matrix Checklist for Designing and construction Phase

The building is constructed.

Table 11: Impact Matrix 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													
Biological Parameters													
Land Environment													
Flora													
Fauna													
Physical Parameters													
Local Economy													
Social Impacts													
Health & Safety													

Identification of Monitoring Requirements

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

Methodology for Impact Evaluation

These tools have been used to identify the significance and magnitude of the impact as well as the nature, reversibility and extent:

- An Impact Screening Checklist
- Project Impact Evaluation Matrix

Following is given a brief description of assessment tools:

a. Impact Screening Checklist

The impact screening checklist is developed to screen out potentially insignificant environmental and social impacts from potentially significant adverse environmental and social impacts during 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, communication, the hazards and external constraints. The beneficial and adverse impacts of project during 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 12: Characteristics of Impacts

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	Export of finished goods	◙		◙		◙			◙		◙		◙	
3	Appreciation in Land Value	◙			◙	◙			◙			◙		◙
4	Tree Plantation	◙		◙		◙			◙		◙		◙	
Adverse Impacts														
1	Air Pollution		●	●			●		●			●	●	
2	Wastewater		●	●		●			●			●		●
3	Solid Waste and By-Products	●		●		●			●		●			●
4	Health and Safety		●		●		●		●			●		●
5	Physical Hazards		●	●			●		●			●		●
6	Security Risks		●		●		●		●		●		●	

b. Project Impact Evaluation Matrix

The Project Impact Evaluation Matrix was developed by placing different environmental parameters that are likely to be affected by the proposed project actions, grouped into categories i.e., physical, ecological, socio-economic environment and hazards. For assessment of associated impact risk assessment methodology was used. Moreover, the risk assessment was done on the basis of project phases (operation). A Project Impact Evaluation Matrix is attached as **Table 13** below:

Table 13: Impact Evaluation Matrix

Environmental Parameters	**Impact Assessment**
	Operational
A: Physical	
1. Land Resources	
i. Soil Erosion and Contamination	NA
ii. Transportation	-1t
iii. Solid Waste and By-Products	-2p
iv. Land Use	NA
2. Air Resources	
i. Noise Pollution	-1t
ii. Air Pollution	-1t
iii. Dust Emissions	NA
ii. Surface Water	NA
iii. Wastewater	-1p
i. Tree Cutting	+1p
Fauna	
ii. Terrestrial Fauna	NA
C: Socio-Economic	
i. Employment Opportunities	+3p
ii. Land Value Appreciation	+2t
iii. Economic Uplift of Study Area	+3p
D: Hazards	
i. Physical Hazards	-1p
ii. Health and Safety	-1p
Legends: 1= Low; 2= Medium; 3= High; 4= Extremely High; NA= Not Applicable; t= Temporary; p= Permanent; app= Applicable; 0= Negligible	

7 SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

General

This Chapter identifies the potential impacts (positive and adverse) on the physical, biological and socio-economic environment of project area due to the Radiators Manufacturing Unit for Tractors, Automobiles & CNG Rickshaws by A&R Company. It also identifies measures that will help to mitigate the adverse environmental and social impacts as well as it will enhance positive impacts of aforesaid project. Impacts are assessed by analyzing their magnitude and sensitivity, which is a legal requirement as discussed in **Chapter 0**6

Objectives

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

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

Impact and Mitigation Management

Purpose of mitigation is to evade, reduce or balance the expected antagonistic effects in suitable way and to integrate these for devising environmental management strategy or plan. At every stage of project, mitigation plan for all the adverse impacts should be predicted to find out the best alternative. The objectives of mitigation are to:

- Invent of best substitution, better alternatives and ways to reduce the adverse environmental and social impacts in immediate surroundings.
- To improve the environmental and societal payback of project.
- To prevaricate, remedy/reduce and pro-vocative impacts.
- To certify that remaining negative influences are kept within permissible limits.

In this part of the EIA Report, a number of complications including; cleanliness, environmental health and safety, societal and environmental managing and inspection, industrial vulnerability, tools and apparatuses and during operational activities, influx of workers and procurement of land have been deeply elaborated.

Approaches for Mitigation Measures

Following approaches may be used to mitigate the impacts of the project:

Table 14: Approaches for Mitigation Measures

Avoid: Change of route or site details, to avoid damage important ecological or archaeological features.
Replace: Regenerate similar habitat of equivalent ecological value in different location.
Reduce: noise barriers, dust, enclosures, visual screening, wildlife corridors and changed time of activities to reduce the impact.
Restore: Site restoration.
Compensate: Relocation of displaced communities, facilities for the affected communities, financial compensation for the affected individuals, etc.

Expected Positive Impacts

Following are the expected outcome for installation of above stated project:

a) Increase in Employment Opportunities

Due to installation of aforesaid project, the employment opportunity has been enhanced. During operation, 43 employees has been hired include; skilled and un-skilled workers. It includes hiring of technical and non-technical staff. Locals were preferred during hiring. Hence, there has been an increased employment opportunity for the local people which will have a positive impact on the socio-economic status of the area.

b) Tree Plantation

After completion of project different tree species has been planted at designated green areas, this will enhance the aesthetic beauty of the area.

c) Adverse Impacts and Mitigation Measures

This section identifies the potentially significant and in-significant adverse environmental and social impacts anticipated during the operation phase of said unit. Appropriate mitigation and management measures, where applicable, have also been suggested to reduce the severity of anticipated impact up to the extent possible.

7.1 Impacts and Mitigations due to Project Location and Design

The selected building has located within designated industrial area surrounded by various other industries of same and different nature. Building design has already done. There is no human settlement, heritage building, social structure, grassland or preserved area in the project vicinity that could be damaged, dislocated or dismantled due to the project activity in proposed area.

Hence, the impact of location is considered to be in-significant as the project site is away from the surface water body (within 2.0 km of project area), residential area (at safe distance) and no protected area (is reported in 5.0 km vicinity of the project area).

Nature of Impact

The nature of proposed impact is direct, low, short-term and hence in-significant.

Mitigation Measures

Following mitigation measures has been adopted to reduce the impact of said project location on sensitive receptors:

- The selected building located at adequate distance from the various sensitive receptors.
- The building is accessible through metaled road network.
- The building is located in industrial area and due to establishment of aforesaid project no change in the land use of area is being envisaged.
- The building is owned by the proponent and no dispute is associated.
- No significant air emissions from proposed project.
- The generated solid waste has been disposed off through the standard practices of area. Process waste can be recycled.

It is envisaged that no mitigation measures will be required as the said project had been constructed within designated area and no adverse impacts on its surroundings due to significant distances from all sensitive receptors.

7.3 Impacts and Mitigation during Construction Phase

The construction of unit has completed and operation has also started. Due to current project, a positive impact on the socio-economic culture for the people has been observed.

7.4 Impacts & Mitigation during Operational Phase

This section delineates the potential impacts during operation phase of the project and the mitigation measures to counteract these impacts. The summary of the impacts and possible mitigation measures are as follows:

i. Impact on Ecology

Currently, the building is located in designated area. Different native and ornamental plants species has been planted in designated green spaces and along boundary of project site. The overall aesthetic beauty of the area has been enhanced and it has significant impact on the overall ecology, aesthetic and landscape of the area.

Nature of Impact

The nature of proposed impact is direct, low, short-term and hence in-significant.

Mitigation Measures

This impact is considered to be positive, long-term and significant. Hence, it doesn't require any mitigation measure.

ii. Impact on Air Environment

Dust is being generated due to the frequent movement of vehicles carrying the raw-material and finished goods. During operational phase, suspended particulate matter and gaseous emissions are the main pollutant.

Due to increased vehicular movement increase in NOx, SO_X, VOC and CO concentrations has been observed at the project site. As the impacts is localized in nature, the areas outside the said project boundary are not likely to face any significant adverse impacts with respect to ambient air quality.

Nature of Impact

The nature of proposed impact is direct, low, short-term and hence in-significant.

Mitigation Measures

Following mitigation measures must be adopted:

- For dust suppression regular sprinkling of water is being carried out.
- Vehicles used for transportation of raw material as well as finished product and the utility vehicles are regularly serviced and maintained in order to keep the environmental impact on account of their exhaust emissions to its minimum level.
- Native tree were planted along the boundary of project area to keep environment healthy. Further tree plantation has been done in future in consultation with EPA.

iii. Noise Environment

Noise, an unwanted sound, affects human being. Excessive exposure to noise produces varying degree of damage to hearing system. It leads to headache, fatigue, etc. Continuous exposure of increased level of noise have an adverse impact on the health of workers as well as the people residing in surrounding area.

Nature of Impact

The nature of proposed impact is direct, low, short-term and hence in-significant.

Mitigation Measures

In general, the following methods have been adopted to control the noise pollution from the proposed units;

- Residential area is located at safe distance from project site.

- Proper encasement of noise generating sources have done to control the noise levels within prescribe PEQS limits.
- A thick greenbelt has been developed all around the plant, acting as noise barrier.
- The use of complete or partial enclosures, as and if required.
- Attenuation by use of sound absorbents on walls and fixed or suspended ceilings.
- The use of mufflers, sound attenuation and acoustic louvers in air flow paths, taking particular care to direct inlet and discharge an opening away from critical areas wherever possible, so as to take advantage of direct effects.
- All the workers enforced to wear ear plugs/ear muffs, masks, gloves and safety shoes.
- All the transporters are advised to carry out regular maintenance of their vehicles

iv. Solid Waste Management

The key solid wastes and by-products that is recyclable matter (such as; containers, waste papers, used materials, waste packaging materials, foam, plastic waste) can be recycled or reuse. The domestic solid waste handled as per practices of area.

Nature of Impact

The nature of impact is direct, low, long-term and significant.

Mitigation

Following mitigations should be adopted to manage generated solid waste:

- Waste bins has been placed in the facility at the strategic position for the collection of solid waste.
- The installed bins have been covered in order to reduce the chances of the disease vector production.
- Record of generated waste during the project activity should be maintained on the regular basis. Quantity of the waste disposed, recycled or reuse has been logged on a waste tracking register.
- Regular training has given to the workers dealing with the waste management it includes; identification, segregation and management of waste.

v. Water Environment

Wastewater is being generated only from process (cooling purpose) and domestic activities that is being treated through septic tank then disposed of in sewerage of area. This generated wastewater has no impact on surface & ground water quality.

Nature of Impact

The nature of impact is direct, low, long-term and significant.

Mitigation

Following mitigations should be adopted to manage generated wastewater:

- The domestic wastewater must be treated prior to disposing off
- Water conservation activities have been adopted for the preservation of water.
- Wastewater can be reuse for horticultural activities.
- Water conserving methods are being applied by placing taps and toilets.
- All faults have been monitored and fixed.
- Freshwater conservation techniques should be adopted to ensure sustainable development
- Monitoring of effluents shall be carried out as per requirement of Self-Monitoring and Reporting Tools (SMART) to ensure compliance with the PEQS.
- No addition of solid waste in the wastewater.

vi. Health & Safety of Workers

Improper handling of machinery may cause various health issues. It can cause of severe accidents. To ensure the safety of workers these impacts need to be managed effectively.

Nature of Impact

The nature of impact is direct, low, long-term and significant.

Mitigation

Following mitigations should be adopted to improve the health and safety:

- Regular inspection and maintenance of the plant has been carried out to eliminate the risk and associated hazards of any unfortunate incident.
- Workers are trained on the regular basis regarding personal safety, disaster management and physical hazards.
- Operators operating the plant are fully trained and equipped.
- Training regarding HSE must be given on the regular basis.
- Workers are enforced to use PPEs such as; helmets, mask, ear-plugs/muffs, safety boots, etc.
- It has been strictly enforced to wear PPEs while working.
- Incidents should be reported directly to the concerned authority.
- The effective use of hearing-protection devices is being ensured.
- Protective measures and emergency rescue procedures should be followed strictly.
- Only authorized persons are allowed in the processing areas.
- Unloading of the raw-material and loads of the final products are controlled, supervised, slow and smooth.

viii. Security Risks

A large number of workers has been hired including; skilled and un-skilled laborers. The increase in the number of the individuals residing in the area, may lead to an increase in crime and violence in surrounding areas. The nature of the impact is considered to be low as the locals has been preferred for hiring in future as well.

Nature of Impact

The nature of impact is direct, low, long-term and significant.

Mitigation Measures

Following mitigation measures must be adopted:

- Proper security has been provided to the workers working in the premises of current project.
- In future, before hiring any worker, his criminal record must be checked.
- CNIC of all the workers must kept by the proponent.
- Strict law must be enforced to control the crime at site.
- Security to the workers is being provided.

ix. Emergency Response

Emergency response preparedness committee has been formulated consisted of heads of all the departments. Emergency Response Leader is the head of the team assisted by safety team and safety supervisors. Emergency Response Leader along with his team ensure that in the case of emergency, team is prepared for fire-fighting and the first aid kits has been provided which may include; blankets, hot water bottles, stretchers, benches, sterilized dressing, snake bite kit, cotton and iodine (2% alcohol).

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; accident and natural disasters.

Nature of Impact

The nature of impact is direct, low, long-term and significant.

Mitigation

Following mitigation measure must be adopted:

- Site in-charge should be responsible to ensure that fire-fighting plan has been implemented with true spirit.
- Safety team is responsible to monitor the activities and to act on the approved firefighting plan in the case of fire.
- Workers should be given adequate training of handling machinery.
- Emergency call service must be made available.

- The drills to check the response of the workers against any emergency situation is being carried out on the regular basis.
- Safety and hazards signs must be displayed with the facility to avoid any unfortunate incident.
- Only authorized person is allowed for the handling of the machinery.

7.5 Environmental Enhancement Measures

The said project results in following benefits:

- Direct and indirect employment opportunities,
- Gains in the local and national economy,
- Industrial development in region
- Business spin-offs in the factory area,

Tree plantation along boundary of project act as environmental enhancement measure. Trees including; Shatoot, Jaman, Moor Pankh, Fish Paam, Trysenia, etc. has been grown on all open spaces and along boundary of project.

8 ENVIRONMENTAL MANAGEMENT AND MONITORING PROGRAM

This EIA Report provides the Environmental Management and Monitoring Plan (EMMP) for implementation of aforesaid project in order to keep anticipated environmental and social impacts in check by adopting suggested mitigation measures and monitoring of the certain parameters moreover, to ensure the compliance of EMMP. As per the environmental legislation in Pakistan, the EMMP for the operations phase, along with other documents, is to be submitted in EPA, Punjab to obtain confirmation for compliance and Environmental Approval/NOC for project execution. Even after implementation of the suggested mitigation measures, the impact may remain significant and require regular environmental monitoring. This section also underlines the monitoring framework for operation phase to check compliance of EMMP and to take timely actions for correction in case any negligence & accidence of significant criteria, requirements or goals is found.

Objectives of Environmental Management Program

The primary objectives of the EMP are to:

- Facilitate the implementation of the mitigation measures identified in this EIA Study.
- Define the responsibilities of the project proponent and contractor and provide a means of effective communication of environmental issues between them.
- Identify monitoring parameters in order to ensure the effectiveness of the mitigation measures.
- Provide a mechanism for taking timely action in the face of unanticipated environmental situations.
- Identify training requirements at various levels.

Components of EMMP

Components of EMP are as follows

- Management plan
- Monitoring Plan
- Communication and documentation
- Institutional capacity
- Environmental training

8.1 Proposed Mitigation actions

It lists all the mitigation measures identified in the EIA and the associated environmental or social aspect in line during 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 environmental friendly.

Table 15: Environmental Management Plan

Project Activities	Type of Impact	Potential Impacts on Environment	Extent / Magnitude	Proposed Mitigation actions	Institutional Responsibility	
					Implementing Body	Supervision
POST-CONSTRUCTION/OPERATION						
Wastewater management	Physical/ social	Degradation of water quality	Moderate/ local	• Wastewater generated from cooling purpose and domestic activities is being treated through septic tank and dispose off in sewerage system of area.	Environment officer	Proponent
Air quality management	Physical	Dust and PM	Moderate/ adjacent areas	• No waste should be burnt at the premises. • Regular monitoring of ambient air and maintenance of machinery should be done on regular interval.	Environment officer	Proponent
Noise generation	Physical, social, biological	Psychological and hearing problems	Moderate/ local	▪ There has been ban on the use of horn in the area. ▪ Proponent has planned a proper plantation plan in future as well	Environment officer	Proponent

				which will also act as barrier for noise. ▪ Regular maintenance of machinery is being done		
Solid Waste Generation	Physical, Biological, Social	Soil Contamination, effecting GW Quality, vectors production, odor, Health, Welfare	Severe/ local and global	• The solid waste from the project should not be allowed to pile up. • Solid waste should be disposed off properly as per local practice • Recyclable waste is being dispose off through certified contractor	Environment officer	Proponent
Health and safety	Biological	Injury may happen while handling machines	Severe	• First aid kits and other necessary equipment has been kept available at site. • COVID-19 SOP's must be implemented	HSE Manager	Proponent
DECOMISSIONING PHASE						
Solid waste	Physical, Biological, social	Soil Contamination, vectors production, odor, Health, Welfare	Local	• Used building materials and other waste from decommissioning must be transported and dumped in approved sites.	Contractor	Proponent
Dust emissions	Physical, Biological, social	Dust and PM	Local	• Ensure strict enforcement of on-site speed limit regulations. • Avoid demolition work in extremely dry weathers. • Sprinkle water on graded access	Contractor/HSE manager	Proponent

				routes when necessary to reduce dust generation by machines. • Personal Protective equipment to be worn. • Demolished materials on site to be covered to prevent to be blown off by wind.		
Exhaust emissions	Physical, Biological, social	Enhance air pollution	Moderate/at the site	• Sensitize truck drivers to avoid unnecessary racing of vehicle engines at loading/offloading points and parking areas, and to switch off or keep vehicle engines at these points, using mufflers. • Vehicle idling time shall be minimized.	Contractor/Engineer	Proponent
Noise and vibration	Biological, Social	Effect human health	Adjacent areas	• Sensitize machinery drivers and machinery operators to switch off engines of vehicles or machinery not being used.	HSE manager/contractor	Proponent
Rehabilitation of project site	Physical, Social, Aesthetical, Biological	Site clearance	Positive	• Average lifespan of a well-constructed building is about 80 years after that rehabilitation of site has been done if needed. • Implement an appropriate re-vegetation program to restore the site to its original status. • Consider use of indigenous plant	Contractor	Proponent

				species in re-vegetation. • Trees should be planted at suitable locations so as to interrupt slight lines (screen planting), between the adjacent area and the development.		

8.2 Schedule for Implementation of Environmental Budget

The allocated environmental budget is **PKR 0.5 Million approx.** as mentioned in project cost breakup. The allocated environmental budget will be spent on landscape/green zone management and solid waste management. The proponent will plant indigenous and ornamental plants to increase the aesthetic value of the area. Thus, the project is also a source of employment for locals and would help in economic development activities of the area. Cost breakup is,

Wastewater treatment=0.2 Million
Health and safety=0.1Million
Environmental monitoring=0.2 Million

8.3 Environmental Management Team along with their roles and responsibilities

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

Table 16: Environmental management team along with roles and responsibilities

Sr.#	Managers	Responsibilities
1.	**Contract Manager**	• Ensure EMP development. • Maintenance of EMP • Environmental issues identification at any stage. • Communication of EMP with other employees.
2.	**Contractor**	• Ensuring that the control measures identified from environmental surveys are implemented as they are relevant to their work/visit.

		• Ensuring that the project management team is notified of any non-conformance of control measures or environmental incident where the environment has been put at risk.
3.	**Site Manager**	• Ensure material is safe • Controlled access arrangement to avoid hazards • Emergency egress arrangements to avoid dangerous situation. • Provide first aid facilities.
4.	**Site HSE Advisor**	• Ensure work is carried out in safe manner • Ensure good standards of workmanship • Health and safety advisor to complete the site waste management plan to be followed. • Ensure EMP implementation • Daily checks • Weekly checks • Consultation with workers
5.	**Site Environment Advisor**	• According to legislation and consent develop EMP • Ensure application of EMP • Carry out area inspection
6.	**Public Contact Officer**	• First point of contact for members of the public • Arrange and manage public forums • Maintain relation with stakeholders • Door to door surveys as appropriate • Coordination with work

8.4 Proposed Monitoring Program to assess output of EMP

Proposed monitoring has been mentioned in Environmental Management Plan. Moreover, during monitoring of ambient air, noise and water quality is being done by EPA certified Lab as per requirement/condition of Environmental Approval/NOC. Health and safety is being monitored by HSE manager. The proponent will cross check all the parameters. Waste collection on daily basis and proper cleanliness must be ensured by the proponent.

8.5 Proposed EMP reporting and reviewing procedure

All relevant project personnel will be given information about the addition/change.

Monitoring will be done on regular basis as per requirement. Moreover, PEQS compliance of ambient air, noise and drinking water will be ensured.

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

Monitoring reports will be reviewed by EMP team and then will be shared by EPA.

Photographic records will also be maintained

Recorded data will be reviewed by supervisory contractor/proponent so that it can be further improved if required.

8.6 Environmental Training

Training is an integral part of a preventive strategy. Environmental and disaster management training will be required to ensure proper implementation of effective environmental management and monitoring plan; and disaster management plan. However, training could be organized by proponent involving relevant staff. As a trainer, competent Consultant can be outsourced. Important training under the spectrum needs to include:

- Training on fire fighting and safety management;
- Training on environmental safeguards and compliance;
- Staff training on environmental monitoring and reporting;
- Training on occupational health and safety measure.

Table 17: Training Schedule

Target Audience	Trainers	Contents	Schedule
Selected Management Staff	Subject Expert	Key finding of mitigation measure	After every five months

All Personnel	HSE Officer	Mitigation measures especially firefighting, safety, health and environment (emissions & discharges) etc.	Monthly
Technical Staff	HSE Officer	Waste disposal, vehicle movement restriction and other mitigation measures	After every three month
Other Staff	HSE Officer	Waste disposal, resource conservation and other mitigation workers	Monthly

9 PUBLIC CONSULTATION AND PUBLIC DISCLOSURE

Public consultation refers to the by which the concerns of various stakeholders and local community who have a plausible stake in the environmental management & associated impacts of the project or activity are ascertained with a view to considering all the material concerns in the project or activity design as appropriate. According to the Review of IEE and EIA Review Regulations, 2022 public consultation is mandatory for any socio-environmental study for the commencement of any project.

General

Impact assessment survey and public consultation sessions held with different stakeholder groups that may be impacted by the proposed project commencement were carried out. 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 establishment.
- Access the impacts on the physical, biological and socio-economic environment.
- Understand stakeholder concerns regarding various aspects of the project commencement.
- Note valuable suggestions of local stakeholders to improve the proposed project.
- Understand the perceptions, assessment of social impacts and concerns of the affected people/communities of the project area.
- Find out the awareness level and situation of acceptability to identify any issues for the implementation of the proposed project.
- Invite people to express their views about the positive/negative impacts on their lifestyles and environment.
- Disclose information about contact offices/officers for any complaints/queries.

It is envisaged, there will be no social impact being foreseen due to the commencement of aforesaid project at aforesaid location, the nearest community is located at safe distance from the project area. This EIA Report includes all the comments, which were considered during the social survey and preparing the definitive development concept for the installation and operation of proposed project. Public consultation performas is attached as **Annex-III** of this EIA Report.

Objectives of Consultation

Public consultation plays a vital role in studying the impacts of the proposed project on stakeholders in successful implementation and execution of project. It provides an opportunity to exchange knowledge with the beneficiaries and affected parties. Referring particularly to a project related to environmental assessment, involvement of the public is all the more essential,

as it leads to better and more acceptable decision-making. The overall objective of consultation with stakeholders is to help verify the environmental and social issues, besides technical ones, that have been presumed to arise and to identify those which are not known or are specific to project. In fact, discourse with many who have thoroughly observed the site conditions in the pre-development phase, goes a long way in updating the knowledge and understanding.

Consultation Process

Information disclosure, public consultation and discussion regarding the various aspects of project with the people of area are necessary. This process is intensified during the EIA Studies and separate rounds of public consultations were held with local community and various government departments as listed below. Surveys were carried out in order to investigate physical, biological and socio-economic resources falling within the immediate AOI of the project. Primary data collection included:

- Data collection regarding the socio-economic condition of study area.
- Pre-testing of socioeconomic survey tools in the field.
- To consult the locals for collection of information on biological environment.

Various meetings with the stakeholders were held the following objectives:

- Share information with stakeholders regarding said project and expected impacts on community in project vicinity.
- Understand stakeholders' concerns regarding various aspects of the project, including the existing condition of the upgrading requirements, and the likely impact of operation activities.
- Provide an opportunity to the public to influence the project in a positive manner.
- Obtain local and traditional knowledge, before decision making.
- Increase public confidence about the proponent, reviewers and decision makers.
- Reduce conflict through the early identification of controversial issues and work through them to find acceptable solutions.
- Dissemination of information through discussions, education and liaison.
- Documentation of information narrated by the stakeholders and mitigation measures proposed by the stakeholders.
- Incorporation of public concerns and their address in the EIA and eliciting their comments and feedback.
- Create a sense of ownership of the proposal in the mind of the stakeholders.

9.1 Proponent's Environmental Management Team

Consultation regarding "Radiators Manufacturing Unit for Tractors, Automobiles & CNG Rickshaws by A&R Company" was done with Proponent's Environmental management Team and anticipated impacts were discussed. Concerns of locals, Environmental Practitioners & experts and Government departments were discussed and asked to consider them while establishment of above-said project. Locals are preferred for employment after providing proper training. Mitigations measures mentioned in EMP will be truly implemented currently and in future as well.

EMP team of A&R company is mentioned below;

Table 18:EMP Team

Sr. no.	Names	Designations
1.	Mr. Asad	Sales Officer
2.	Mr. Jamal	Operational Manager
3.	Mr. Zaid	Quality Inspector

9.2 The responsible authority

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

9.3 Other department and agencies

Following officers of government departments 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, for instance, see **Table 19** below.

Table 19: Views of Participants of Public Sector Stakeholders

S#	Participant	CNIC/Designation	Concerns/Remarks
Environmental Protection Department			

1	Assistant Director Environment Lahore (Mr. Husnain)		Following comments are summarized to control the pollution generation during the operational phase of aforesaid project: • It should be ensured that the pollution abatement technique must be applied where needed • Process waste should be managed effectively. It should be recycled and reused. • Wastewater should be treated effectively before disposing off in the drain • Environmental friendly operation must be implemented
	Forest Department		
2	Rana Zahid Ali Khan	DFO Planning	Following recommendation were suggested by the forest department: • Lack of collaboration within the departments such as; environment, planning, industries, forest, etc. • CSR cells should be established • Payback the cost of loss to environment • 10 trees should be planted for the removal of 01 tree to compensate the loss. • Natives trees such as; Sheesham, kikar, popular, Neem, Dherak, Amaltas and Alostonia should be planted extensively.
	****SIE**		
3	Zainab Asghar	35202-8866582-8 Administration	Following are the remarks of SIE: • Environmental regulation should be complied and its mandatory • NOC from environment. Department should be obtained and it's necessary before commencing the installation. • It will help in boosting the economy of Pakistan. • End consumer will be benefited • Job opportunities will be created at the local scale. • Environmental friendly activities should
4	Rana Azeem	36501-3270250-1 HR Manager	

			be adopted. • Native trees should be planted at extensive scale. • Health and safety of the workers should be ensured. • Wastewater should be disposed off after necessary treatment.
Industries Department			
5	Farhan Ahmed	0332-4681862 AD Planning	Following measures should be adopted while designing the project: • Industries Department regulates establishment of industrial units according to Industrial location policy 2002 which states, "Services Industry (In Schedule B of that policy) can be established in positive areas specialized by Government. • The social concern should be addressed accordingly, if any. • It will help in obtaining the foreign investment.
**** HSE= Health, Safety and Environment, **SIE = Sundar Industrial Estate***			

9.4 Environmental Practitioners and experts

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

Sr. No	Name	Designation	Comments/Suggestions
1.	**Ms. Mehwish**	Environmentalist	• She said that Installation of aforementioned unit will have positive impact on economy but its installation should be done in Environmental Friendly way • During operation emissions must be controlled properly • Basic facilities should be provided to local community
2.	**Dr. Rabbia**	Ph.D. Environmental	Following mitigation measures should be adopted: • Tree plantation in designated green zones should

		Sciences	be carried out • Proper disposal of the solid waste • HSE management measures should be adopted and implemented effectively.
3.	**Mr. Taha Raheem**	Environmentalist	• He said that locals should be preferred for employment. • Value addition of area • In case of outsider's residence must be provided • Proper mitigation measures must be adopted while operation of this project

9.5 Consultation with Affected and wider community

In addition, to the use of direct methods to evince the response of the various stakeholders in targeted population residing in study area was ascertained by conducting a sample survey, through specially formatted questionnaires (attached in the **Annex-III** of this EIA Report). Questions posed to the public were related to creation of possible impacts, adverse impacts and beneficial impacts, including; employment opportunities, income generation activities, change in living standards and provision of the basic amenity.

Personal views of the respondents on the establishment of aforementioned unit possible disturbance to the residents near the AOI and infringement of their privacy were also recorded. The various rounds of public meetings and consultations were arranged in project and study area. The objectives of consultation with the affected persons are given in the table below:

- Disclose the proponent plan for the operation of said facility.
- To share information and specifications of project works.
- To analyze the expected impact on the socio-economic environment.
- To understand their concerns regarding various aspects of project commencement.

Views, Concerns and Suggestions of Various Stakeholders

The major socio-economic concerns and problems of the affected persons of various communities have been given in tabulated form below (**Table 20**) along with their main concerns and remarks. Community showed a lot of concerns; a few are being mentioned here:

- Removal of shrubs and trees should be avoided to the extent possible in the case of clearance green zones should be established within the facility.
- Indigenous tress around the facility should be planted to control air pollution and as the compensation of removed trees.
- The project will become the source of income for local to earn their livelihood easily and honorably, so locals should be preferred.

- The area will inhabit and will be used for the beneficial purposes.
- For the solid waste management and waste disposal, proper disposal techniques should be adopted.
- Water spraying/sprinkling should be done on the regular basis for dust suppression.
- Employment opportunities will be generated and locals should be hired on the priority basis.
- The air pollution is one of the major impact from which Punjab is being affected at the large scale. So, ambient air quality should be monitored regularly and air pollution expected to generate from the operation should be mitigated beforehand.
- Good relations with the local communities will be promoted by encouraging Contractor to provide opportunities for skilled and unskilled employment to the locals as well as on-job training.
- Noise generated activities should be carried out during day hours.

The views and the concerns of the local communities, direct and indirect stakeholders has been complied and are presented in the tabular form below:

Table 20: Views and Concerns of Stakeholders

Sr.No	Name	Father Name	CNIC
1	Safdar Ali	Muhammad Din	3510124973197
2	Ali Raza	Muhammad Saleem	3520155942207
3	Shakeel Sharif	Sharif Masih	3510250489109
4	Shahzad Ali	Anyat Ali	3520114713939
5	Salamat Ali	Sakhi Muhammad Sabir	3530111650313
6	Sheerin Khan	Umer Khan	1430119746753
7	Muhammed Ahmed	Muhammed Sharif	3520250559769
8	Zeeshan Sarwar	Muhammad Sarwar	3130449306319
9	Asan Masih Gill	Bashir Masih	3520171199421
10	Muhammad Shoaib Saleem	Saleem Akhtar	3520155213301

11	Asif Ali	Sarfraz Ahmad	3520189253779
12	Sajid Ali	Khalid Masood	3610346625695
13	Saif Ur Rehman	Abdul Rehman	3520178725215
14	Shoaib Zafar	Zafar Iqbal	3130271427287
15	Herish	Ghulam Mustafa	3520198593969

APPENDICES

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TEAM MEMBER LIST

Sr.	Member	Qualification	Duties
1.	Rana Shafqat Hussain	Environmental Lawyer & Consultant	Legal Affairs & Report Review
2.	Muhammad Farooq	MS (Forestry) USA Expert Environment & NRM International Union for Conservation of Nature (IUCN) Pakistan, Ecologist & Natural Resource Management Specialist	Report Review
3.	Dr. Muhammad Rafique	Ph. D (USA) Ecologist & Environment Specialist	Report Review
4.	Dr. Foqia Khalid	Ph.D. Environmental Sciences	Report Writing
5.	Muhammad Hannan Yousaf	M.Phil. Environmental Sciences	Report Writing
6.	Aqsa Rasheed	M.Phil. Environmental Sciences	Report Writing
7.	Zahra Afzal	BS Chemistry	Socio-economic Survey
8.	Kamran Iqbal	BS Environmental Sciences	Socio-economic Survey
9.	Mubashir Ahmed	Associate Engineer, Civil	Field Survey & Data Collection
10.	Asif Rafique		Administrator

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