ENVIROCARE

(Construction of Incinerator unit for Hazardous and Non- Hazardous Waste)

ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

Proponent:

Mr. ZAHID S/O ZARBAT KHAN

Prepared By

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EXECUTIVE SUMMARY

1. INTRODUCTION

This Executive Summary presents an overview of the main findings of the Environmental Impact Assessment (EIA) report for the **Envirocare (Construction of Incinerator unit for Hazardous and Non- Hazardous Waste)** located at Khasra No. 4320/4329, Mouza Khoda, Tehsil Hassan Abdal District Attock. The primary objective of an incinerator is to reduce the volume of Hazardous and Non- Hazardous waste by burning it at high temperatures, thereby minimizing the amount of material sent to landfills and managing waste in a controlled manner This is to be done in the most efficient manner possible, to keep costs low and prevent waste buildup. As with time, demand is increasing and to meet the demands in this area and also in the other cities, the construction of this project is a feasible option. the Environmental Impact Assessment (EIA) of the project has been conducted in accordance with the Punjab Environmental Protection (Amendment) Act 2012 and IEE/EIA Regulations 2022. Proponent has made plan to make the facility one of the most developed and latest.

2. SALIENT FEATURE OF PROJECT

- **Proponent**: Zahid S/O Zarbat Khan
- **Project Name:** Envirocare (Construction of Incinerator unit for Hazardous and Non- Hazardous Waste)
- **Plant Address:** Khasra No. 4320/4329, Mouza Khoda, Tehsil Hassan Abdal District Attock
- **Coordinate:** 33.775128,72.513336
- **Project Area**: 3 Kanal
- **Raw Material:** Municipal Solid Waste
  Organic Materials and Vegetation
  Medical and Infectious Waste
  Hazardous Waste
  Sewage Sludge
  Animal Waste
- **Capacity:** 500kg per hour, 12,000 kg/day of solid waste
- **Machinery**:
  - Primary Combustion Chamber
  - Secondary Combustion Chamber
  - Waste Loading System
  - Burners
  - Air Supply System
  - Grate Systems
  - Heat Recovery Boiler

- **Cost of the Project**: 50 Million
- **Process:**
  - Waste Collection and Preparation
  - Loading
  - Primary Combustion
  - Secondary Combustion
  - Heat Recovery (Optional)
  - Emission Control
  - Ash and Residue Management
  - Flue Gas Release
  - Monitoring and Control
- **Products:** ash (bottom ash and fly ash), flue gas, and heat.
- **Intended Use**: Incinerator unit for Hazardous and Non- Hazardous Waste)
- **Building Type** Incinerator Unit.
- **Source of Water:** Ground Water,22.8–46.8 m³/day of fresh water (reducible to 7.2–14.4 m³/day with recycling)
- **Wastewater:** 16.8–34.8 m³/day of wastewater (reducible to 4.8–9.6 m³/day post-treatment)
- **Solid Waste:** 1,440–1,920 kg/day of ash
- **Source of Power**: WAPDA , solar and 2 Generators

3. PROJECT OBJECTIVES

Envirocare (Construction of Incinerator unit for Hazardous and Non- Hazardous Waste) located at Khasra No. 4320/4329, Mouza Khoda, Tehsil Hassan Abdal District Attock. In this project the proponent has proposed Incinerator Unit. This is to be done in the most efficient manner possible, to keep costs low and prevent waste buildup. As with time, demand is increasing and to meet the demands in this area and also in the other cities, the construction of this project is a feasible option.

4. PURPOSE OF THE REPORT

The purpose of this EIA Report is to carry out environmental study of the project area; to assess impacts caused by the different activities of the proposed project and to address measures to mitigate adverse environmental impacts arising from the execution of the proposed project. The specific objectives of the EIA study are as follows:

- To determine pre-project state of affairs to assess post-project conditions if they have changed for better or worse;
- Documentation of all the resources likely to be affected due to the implementation

of the proposed project;

- To provide maximum information to the proponent about the existing environmental conditions and the implications of the proposed project;
- To minimize potential impacts of the proposed project on different environmental attributes such as physical environment, biological environment and socio-economic environment; and
- To facilitate decision makers to take informed decisions.

5. MAJOR IMPACTS AND RECOMMENDED MITIGATION MEASURES:

Key impacts related to the construction phase include:

- Construction Noise
- Solid Waste
- Soil Contamination
- Air Pollution
- Community and Workers' Safety

Mitigation measures recommended to be incorporated into the project include running the machines and vehicles on good quality (low-sulfur fuels) in good working order ensuring regular maintenance tuning and servicing, and providing them with emission control devices, such as mufflers and silencers, etc. Water suppression and covered transportation and storage of the construction materials and slow driving on unpaved roads will control dust emission. Regular testing for leakage detection will also be ensured. Solid waste of construction activities will be used for flooring, while the remaining solid waste will be managed as per practices in the area. For community safety, irrelevant persons will not be allowed inside. Safety of the workers will be ensured by discouraging any careless attitude of workers and providing the workers with, and encouraging them to use PPEs. Details analysis is given in **Chapter 6.**

Key impacts related to the operation phase include:

- Air Pollution & Noise
- Health and Safety of Workers
- Solid Waste

Most of the waste from the Incinerator Unit will be the raw material of many other industries and will be recycled. Wastewater after treatment and then discharged in the

drain near the project site. For dust regular sprinkling of water will be done and latest machinery will be used for the reduction of noise and proper mitigations will be taken for this purpose. High noise vehicles will not be allowed in the facility. Details analysis is given in **Chapter 6.**

6. ENVIRONMENTAL MANAGEMENT & MONITORING PLANS

The expected impacts from the project are mostly insignificant and others are of limited nature. In this regard possible improvements and mitigation measures have been taken. The study also shows that there will be no exploitation and consequential depletion of the local natural resources. The general approach to Environmental Management Plan for the Project, for the construction and operational phases of the Project has been presented, along with an outline plan for the Project Environmental Management Plans (EMPs). Site specific and practically suitable mitigation measures are recommended to mitigate the impacts. During construction, ambient air quality for dust level in particular, vehicle and equipment exhaust, noise level (tests), solid waste management and soil contamination, and community and workers' safety (visual) need to be monitored. Monitoring Plan has been included in

Chapter-7. During operation air pollution and solid waste will be monitored. Plan has been included in **Chapter-7.**

7. CONCLUSION

The Environmental Impact Assessment (EIA) contains description of the project, description of the environmental baselines, potential environmental impacts and suggested mitigation measures. An implementation mechanism for mitigation measures in the form of an Environmental Management Plan is included in the study. It is further concluded that all potential environmental concerns associated with the project have been adequately addressed, and no further study is required in this context. The objective of preparation of an environmental study is to identify how the environment is impacted and to suggest mitigating measures to reduce if not totally eliminate adverse effects of a project. It is accordingly recommended that Environmental Approval for the project should be issued by the Punjab Environmental Protection Agency, subject to payment of the requisite scrutiny fee by the proponents of the project.

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) OF
Envirocare

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CHAPTER 6: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

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LIST OF ABBREVIATIONS

BOD	Biological Oxygen Demand
^oC	Degree Centigrade
CO	Carbon Monoxide
COD	Chemical Oxygen Demand
CC	Construction Contractor
dBA	Decibel
DC	Design Consultant
DCR	District Census Report
DMD	Deputy Managing Director
DO	Dissolved Oxygen
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMMP	Environmental Management & Monitoring Plan
EPA	Environment Protection Agency
EPD	Environment Protection Department
GOP	Government of Pakistan
HSE	Health, Safety & Environment
IEE	Initial Environment Examination
Km	Kilometer
LTI	Lost Time Injury
LWI	Lost Work Injury
M3/h	Cubic Meter per Hour
Mg/L	Milligram Per Liter
PEQS	Punjab Environmental Quality Standards
NEQS	National Environmental Quality Standards
NOC	No Objection Certificate
NO_x	Nitrogen Oxides
OHS	Occupational Health and Safety
PEPA	Pakistan Environmental Protection Act

PEPO	Pakistan Environmental Protection Ordinance
PPE	Personal Protective Equipment
PM	Particulate Matter
SC	Supervision Consultant
SO_x	Sulfur Oxides
SWM	Solid Waste management
TDS	Total Dissolved Solids
TMA	Town Municipal Authority
TOR	Term of References
TSS	Total Suspended Solids
WHO	World Health Organization
WAPDA	Water and Power Development Authority

GLOSSARY

Agency	A business or organization providing a particular service on behalf of another business, person, or group.
Biodiversity	The variety of life in an area, including the number of different species, the genetic wealth within each species, and the natural areas where they are found.
Climate	The weather conditions prevailing in an area in general or over a long period.
Paper and other Scrap	A paper and other Scrap is a mechanical device that increases the pressure of a gas by reducing its volume.
Conservation	Official supervision of rivers, forests, and other natural resources in order to preserve and protect them through prudent management.
Consultant	A person who provides professional advice or services to companies for fee.
Construction Waste	Waste generated from the buildings and construction industry and includes material like bricks, concrete, tiles, debris, ceramics and more.
Cultural Heritage	Valued objects and qualities such as historic buildings and cultural traditions that have passed from previous generations.
Demographic	A single vital or social statistic of a human population, as the number of births or deaths.
Drainage	Natural or artificial removal of surface and sub-surface water from an area.
Ecology	The branch of biology that deals with the relations of organisms to one another and to their physical surroundings.
Endangered species	A species of animal or plant that is seriously at risk of extinction.
Environment	Relationship of natural world (human beings, animals and plants) with physical surroundings (air, land, water).
Environment Impact Assessment	Environmental Impact Assessment (EIA) is a process of evaluating the likely environmental impacts of a proposed project or development, taking into account inter-related socio-economic, cultural and human-health impacts, both beneficial and adverse.
Emission	The act of sending out gas, heat, light, etc.
Excavation	Excavation is the act or process of digging, especially when something specifics being removed from the ground.
Framework	A framework is a real or conceptual structure intended to serve as a support or guide for the building of something that expands the structure into something useful.
Fresh Water	Fresh water is any naturally occurring water except seawater and brackish water. Fresh water includes water in ice sheets, ice caps,

	glaciers, icebergs, bogs, ponds, lakes, rivers, streams, and even underground water called groundwater.
Groundwater	Subsurface water in the zone in which permeable rocks, and often the overlying soil, are saturated under pressure equal to or greater than atmospheric.
Impact	The action of one object coming forcibly into contact with another.
Monitoring	A systematic and objective observation of an organisation's activities and services conducted and reported on regularly.
Nature	The phenomena of the physical world collectively, including plants, animals, the landscape, and other features and products of the earth, as opposed to humans or human creations.
Preservation	Preservation is the strict setting aside of natural resources to prevent the use or contact by humans or by human intervention.
Proponent	A person who advocates a theory, proposal, or course of action.
Policy	A policy is a deliberate system of principles to guide decision and achieve rational outcomes.
Pollution	The result of the release into air, water or soil from any process or of any substance, which is capable of causing harm to man or other living organisms supported by the environment.
Regulation	Regulation is an abstract concept of management of complex systems according to a set of rules and trends.
Resource	A stock or supply of money, materials, staff, and other assets that can be drawn on by a person or organization in order to function effectively.
Seismic Hazards	A seismic hazard is the probability that an earthquake will occur in a given geographic area, within a given window of time, and with ground motion intensity exceeding a given threshold.
SWM	Solid waste management or waste disposal are all the activities and action required to manage waste from its inception to its final disposal. This includes amongst other things collection, transport, treatment and disposal of waste together with monitoring and regulation.
Stakeholder	A stakeholder is a party that has an interest in a company, and can either affect or be affected by the business.
Topography	Topography is the study of the shape and features of the surface of the Earth and other observable astronomical objects including planets,
Vegetation	Plants considered collectively, especially those found in a particular area or habitat.
Waste Water	Wastewater is any water that has been affected by human use. Wastewater is used water from any combination of domestic, industrial, commercial or agricultural activities, surface runoff or storm water, and any sewer inflow or sewer infiltration.

CHAPTER 1
INTRODUCTION

1.1 GENERAL

This Executive Summary presents an overview of the main findings of the the Environmental Impact Assessment (EIA) report for the **Envirocare (Construction of Incinerator unit for Hazardous and Non- Hazardous Waste)** `located at Khasra No. 4320/4329, Mouza Khoda, Tehsil Hassan Abdal District Attock. In this project the proponent has proposed Incinerator Unit. This is to be done in the most efficient manner possible, to keep costs low and prevent waste buildup. As with time, demand is increasing and to meet the demands in this area and also in the other cities, the construction of this project is a feasible option. the Environmental Impact Assessment (EIA) of the project has been conducted in accordance with the Punjab Environmental Protection (Amendment) Act 2012 and IEE/EIA Regulations 2022. Proponent has made plan to make the facility one of the most developed and latest.

For the Environmental Impact Assessment (EIA) Report of this project, the proponent has decided to engage environmental consultants, **M/S Bio Green Environmental Consultants** to conduct the Environmental Impact Assessment (EIA). This report is prepared by critical examine of the environmental factors which might be affected due to construction and operation of the proposed project. The purpose of this report is to analyze impacts of the project. This EIA provides the basis for a determination of the degree of the environmental impacts of the proposed project. The Scope of Work/TOR has been attached as **Annexure-III**.

The purpose of this study is to identify the environmental baseline i.e. physical, biological and socio-economic/cultural conditions and assess all possible impacts arising during the construction and operation phase of the project and to find out appropriate measures for their mitigation, to either eliminate those impacts or to bring them to acceptable level and formulation of Environmental Management Plan (EMP) for implementation of the project in environment friendly manner.

This report provides relevant information, as required under the officially approved format, to help the decision makers i.e. EPA Punjab before issuing for the Environmental Approval.

1.2 THE PROJECT

The Project under study is titled as Construction of **Envirocare**

located at Khasra No. 4320/4329, Mouza Khoda, Tehsil Hassan Abdal District Attock

1.3.1 NATURE OF PROJECT

This project is for Incinerator Unit.

1.3.2 SIZE OF PROJECT

The project has an area of 3 Kanal. The property documents are attached as **Annexure-II** with this report.

1.3.3 LOCATION OF PROJECT

This project is located at Khasra No. 4320/4329, Mouza Khoda, Tehsil Hassan Abdal District Attock Location Map of the area is given as **Annexure-IV**.

1.3.4 AREA OF PROJECT

The project is having total area of 3 Kanal The google earth view of the area is attached as **Annexure-V**.

1.3.5 COST OF THE PROJECT

Total cost of the project is PKR 50 Million.

1.3 THE PROPONENT AND CONSULTANT

a) Proponent Contact Address

Zahid S/O Zarbat Khan S/O Khawaja Ameer Khan

Position: C.E.O Envirocare
Address: Khasra No. 4320/4329, Mouza Khoda, Tehsil Hassan Abdal District Attock

Proponent CNIC is attached as **Annexure-I**.

b) Consultant Contact Address

M/S Bio Green Environmental Consultant
24B, Gulberg III
Attock, 54810, Punjab, Pakistan
Mail: hafsa_ali25@yahoo.com
Tel: +92332-4420886

c) Contact Person Detail:

- Name Hafsa Ali Asghar
- Contact Number 0332-4420886
- Address 24B Gulberg III,

1.4 STUDY TEAM

A multidisciplinary team was formulated to conduct the study. The team comprises the following persons:

- Dr. Abdul Shakoor : Project Manager/Team Leader
- Hafsa Ali Asghar : Senior Environmentalist
- Miss Ayesha : Environmental Sciences
- Lubna Shahzadi : Environmental Sciences

Team composition and tasks assigned list is attached as **Annexure-VI** with this report.

1.5 OBJECTIVES OF EIA

The main objective of this the Environmental Impact Assessment (EIA) is to identify the baseline environmental, physical and the socio-economic conditions and the potential impacts along with formulation of suitable mitigation measures of an environment friendly implementation of the proposed project. The objectives are as follow:

- To assess and establish the existing environmental and socio-economic conditions of the area.
- To assess and establish the potential environmental and socio-economic impacts of the project activities and identify the issue of concern.
- To implement and execute environmental safeguards.
- To propose mitigation and monitoring measures that can be incorporated into the operation of the project to remove or reduce any damaging effects as far as possible.
- Categorization of the significant impacts requiring further consideration.
- To describe the Environmental Management Plan for the project.
- To prepare an EIA Report as per the guidelines for submittal to EPA, Punjab.

1.6 PURPOSE OF THE REPORT

The purpose of this EIA Report is to carry out environmental study of the project area; to assess impacts caused by the different activities of the proposed project and to address measures to mitigate adverse environmental impacts arising from the execution of the proposed project. The specific objectives of the EIA study are as follows:

- To determine pre-project state of affairs to assess post-project conditions if they have

changed for better or worse;

- Documentation of all the resources likely to be affected due to the implementation of the proposed project;
- To provide maximum information to the proponent about the existing environmental conditions and the implications of the proposed project;
- To minimize potential impacts of the proposed project on different environmental attributes such as physical environment, biological environment and socio- economic environment; and
- To facilitate decision makers to take informed decisions.

1.7 SCOPE & METHODOLOGY

EIA is conducted under the legal framework of Environmental Protection Agency (EPA) Punjab. As per legal requirements, the proposed Project will be reviewed in light of the provisions of Punjab Environmental Protection (Amendment) Act-2012 and IEE/ EIA Regulations 2022, issued by Pakistan Environmental Protection Agency (Pak EPA) and adopted by the EPA Punjab.

Secondary information for this Study was collected from the relevant departments and literature to identify physical, socio-economic and environmental issues of the Project Area. Relevant information available with the proponent on the physical, technical and institutional aspects of the Project was also utilized.

Detailed methodology is as under:

1.8.1 Orientation Session

Meetings and discussions were held with all the partakers of the Project. Purpose of carrying this activity was to develop a common understanding of various issues related to study.

1.8.2 Planning for the Collection of Relevant Data

Following the concept illumination and understanding obtained in the first step, a detailed data acquisition plan was developed for the internal use of Consultant EIA team. The plan identified the type of data required and their sources, time scheduling for their collection and logistics and facilitation required for the execution of the data acquisition plan.

1.8.3 Data Collection

In this step, secondary information about physical, technical and environmental parameters available with the proponent was collected. For collecting the additional data, the concerned persons were also consulted.

1.8.4 Review of the Potential Environmental Impacts of the Proposed Project

EIA Consultants reviewed the Project with the aim to determine the likely impacts of the project on the environmental and socio-economic conditions of the area. Following elements of the project were reviewed can compared with the existing conditions in the vicinity of the Project Area and screening criteria was applied to identify significant (long/short term) environmental impacts.

- ✓ Impacts of the project on physical and ecological environment of the Project Area.
- ✓ Impacts of the project on Socio-economic environment.

1.8.5 Mitigation Measures and Implementation Arrangements

Mitigation measures and implementation mechanism were proposed so that the proponent could incorporate them during the Operation phase of the project.

1.8.6 Draft Report

Draft EIA Report was prepared under guidelines issued by the Punjab Environmental Protection Agency and submitted to the proponent for their comments.

1.8.7 Final Report

After incorporation of the comments from the Proponent on the Draft EIA Report final report is prepared and being presented to the proponent for further submission to the Punjab Environmental Protection Agency for necessary Review and Approval.

1.8 COMPONENTS OF THE REPORT

This EIA Report presents the screening of potential environmental impacts of the project and discusses the necessary mitigation measures to eliminate or reduce the negative impacts to an acceptable level. It also describes the institutional requirements and provides an Environmental Monitoring Plan (EMP). EIA Report comprises of following chapters.

Chapter 1: Introduction, A description of the project including the need for the project and how the project will be undertaken.

Chapter 2: Statutory Requirement & Standards, A description of the pertinent national legislation, regulations and policies that are relevant and applicable to the project and a demonstration of how the project conforms to these aspects.

Chapter 3: Project Description, Full description of the relevant parts of the project, implementation schedules, site plans and summary of project inputs and outputs.

Chapter 4: Description of the Environment, Information about the exiting baseline environmental conditions of the site.

Chapter 5: Public Consultation and Information Disclosure: stakeholders and local public consultation

Chapter 6: Potential Environmental Impacts and Mitigation, An assessment of the potential impacts during both construction and operational stages of the project and potential mitigation measures to prevent or reduce significant negative impacts during both construction and operation stages of the project.

Chapter 7: Environmental Management Plan, Details of the Environmental Monitoring Plan

Chapter 8: Recommendations and Conclusion, Recommendations made and the final conclusion of the EIA Report.

CHAPTER 2

STATUTORY REQUIREMENTS & STANDARDS

2.1 GENERAL

Sustainable development and green economy is a concept that has emerged over the past decades to describe a new framework aimed at economic and social development while maintaining the long term integrity of the ecological system. The principal of sustainable development is in the process of being incorporated in to the national policy and legislation through various statutory instruments. This chapter describes the current legal responsibilities of the proponent in context of environmental and sustainable development, and the institutions that exist in the country that may influence the environmental management of the project.

This section deals with the current policy as well as legal and administrative framework related to carrying out of the Environmental Impact Assessment (EIA) of the project. An efficient and effective organizational structure is essential for successful implementation of the mitigation measures identified for the project. Like other projects, the project, before its implementation, is required to go through an Environmental Assessment, in accordance with the provisions of the Punjab Environmental Protection (Amendment) Act 2012.

2.2 EXISTING LEGISLATION AND LEGAL FRAMEWORK

The Federal Ministry of Environment was responsible authority for policy making on environmental protection in Pakistan but after 18th Amendment in the Constitution, the Provincial Governments have taken over the subject of Environment. This EIA study has been carried out in the light of the policy guidelines of the Preparation of IEE/EIA Reports under the procedures and practices formulated by the Pak EPA and adopted by the Punjab Environmental Protection Agency (EPA).

2.3 INSTITUTIONAL SETUP

2.3.1 Environmental Protection Councils

The Punjab Environmental Protection Council (PEPC) is the apex decision-making body of Punjab. It has been developed under the provision of Punjab Environmental Protection (Amendment) Act 2012. It is headed by Chief Minister of Punjab with other members. The purpose of EIA is basically to obtain Environmental Approval from the

Environmental Protection Agency (EPA), Punjab in compliance with Pakistan Environmental Protection Act (PEPA) - 1997, now having been replaced by Punjab Environment Protection (Amendment) Act 2012.

2.3.2 Environmental Protection Agencies

Pak EPA has been established at the Federal level and EPAs are established at Provincial level also. In Punjab an independent Environmental Protection Agency is constituted headed by the Director General.

2.3.3 Environment Protection Department, Punjab

The Punjab Government has established Environment Protection Department (EPD) administratively controlled by the Secretary, Government of Punjab. The EPD has its independent Minister. According to the provisions of the Punjab Environmental Protection (Amendment) Act, 2012, EPD has a significant role in policy making and implementation of the environmental laws in the Punjab Province.

2.4 RELEVANT LEGAL / INSTITUTIONAL FRAMEWORK

The applicable laws for the environmental study of the project are briefly given below. The proponent of the project will abide by the applicable laws and regulations.

A number of laws have been promulgated by the Government of the Pakistan to deal with the environmental and social aspects related to the implementation of various development projects in the country. In 1983, the Government of Pakistan issued an Environmental Protection Ordinance (EPO) that was replaced by the PEPA, 1997, through an Act of Parliament. According to the 18th Amendment in Constitution, the PEPA 1997 has been confined to Federal Area and provinces have been allowed to formulate their own environmental legislation in the subject of environment.

Under the PEP Act, it is mandatory to carry out IEE or EIA for all development projects. The Pak EPA has also framed guidelines for environmental assessment of projects in various developmental sectors, according to PEPA 1997; the National Environmental Quality Standards (NEQS) were established for effluents discharges and gaseous emissions of various Municipal and Industrial sources.

Provincial Environmental Protection Departments are also working on the formulation and enforcement of environmental statutes and by-laws. The Pak EPA has issued several policies guidelines and adopted measures for streamlining the environmental assessment. Though, the need for environmental screening and assessment has

received some weight during the recent past, strict implementation of the PEQS is still a dream to be realized. The applicable laws for the environmental study of the Project are briefly described below:

2.4.1 Pakistan Environmental Protection Order (Pepo) 1983

In 1983, the Government of Pakistan issued an Environmental Protection Ordinance (EPO) 1983. It was the first legislation promulgated for the protection of environment. According to PEPO, 1983 it was necessary to carry out IEE / EIA for all development projects, but there were no IEE / EIA regulations under that ordinance.

2.4.2 Punjab Environmental Protection (Amendment) Act 2012

Section 12 of the Punjab Environmental Protection (Amendment) Act 2012 makes it mandatory for the proponent of a project to file with the Environmental Protection Agency either an Initial Environmental Examination (IEE) or Environmental Impact Assessment (EIA), as the case may be, in respect of the project.

As per definition given in the Punjab Environmental Protection (Amendment) Act 2012, Initial Environmental Examination (IEE) means an environmental study comprising collection of data, prediction of qualitative and quantitative impacts, comparison of alternatives, evaluation of preventive, mitigation and compensatory measures, formulation of environmental management & training plans & monitoring arrangements, and framing of recommendations and such other components as may be prescribed. The provision of Section 12 has been incorporated “as it is” in the new Punjab Environmental Protection (Amendment) Act, 2012.

2.4.3 National Environmental Policy 2005

Government of Pakistan has notified National Environmental Policy 2005, for different projects/aspects in which guidelines/priorities have been given to undertake/commence the projects having significant environmental impacts.

The National Environmental Policy (2005) provides a framework for addressing the environmental issues (particularly pollution of fresh water bodies and coastal waters, air pollution, lack of proper waste management, deforestation, loss of bio diversity, desertification etc.) confronting Pakistan. It recognizes the goals and objectives of the Pakistan National Conservation Strategy (PNCS, 1992), National Environmental Action Plans, and other existing environment related national policies, strategies, and action plans. It also provides broad guidelines to the Federal Government, Provincial Governments, federally administrated territories and local governments to address

their environmental concerns and to ensure effective management of their environmental resources.

2.4.4 Review of IEE / EIA Regulations 2022

The Pak EPA has issued Review of the Initial Environmental Examination and Environmental Impact Assessment Regulations 2022, to review the Initial Environmental Examination (IEE) / Environment Impact Assessment (EIA) reports. Categorization of the projects for IEE and EIA is one of the main components of the Regulations. Projects have been classified on the basis of expected degree of adverse environmental impacts. Projects type listed in Schedule I are designated as potentially less adverse effect, which require an IEE and projects given in schedule II require EIA to be conducted.

Salient features of the Regulations are listed below:

- Categories of project requiring IEE and EIA are issued through two schedules attached with the regulations.
- A fee depending on the cost of the project has been imposed for the review of IEE and EIA.
- The submittal is to be accompanied by an application in prescribed format included as Schedule IV of the Regulation.
- The EPA is required to issue conformation of compliance within 15 days of receipt of request and complete documentation.
- The Environmental Approval for construction of the project will be valid for three years from date of accord.

2.4.5 Punjab Environmental Quality Standards (PEQS), 2010

In order to control environmental pollution, PEQS furnishes information on the permissible limits for effluent parameters for municipal and industrial discharges. In this case, the standards for air quality, noise and wastewater quality are relevant. This information is available at the official website of Pak EPA.

2.4.6 Guidelines for the Preparation of IEE/EIA Reports

The Pak EPA has also framed Guidelines for the Preparation of IEE / EIA of projects in various developmental sectors.

2.4.7 The Punjab Local Government Ordinance, 2001

Schedules 4 and 8 of this Ordinance pertain to environmental pollution. There are not withstanding any specific provisions, every local government may perform functions

conferred by or under the Punjab Local Government Ordinance, 2001, and in performance of such functions may exercise such powers, which are necessary and appropriate. Under the ordinance, the local councils are authorized to restrict projects causing pollution to air, water or land. They may also initiate schemes for improving the environment.

2.4.8 Pakistan Penal Code, 1860

This defines the penalties for violations concerning pollution of air, water bodies and land. Sections 272 and 273 of this Act deal with the adulteration of food or drink. Noise pollution has been covered in section 268, which defines and recognizes noise as a public nuisance. "A person is guilty of a public nuisance who does any act or is guilty of an illegal omission which causes any common injury, danger of annoyance to the public or the people in general who dwell or occupy property in the vicinity, or which must necessarily cause injury, obstruction, danger or annoyance to persons who may have occasion to use any public right".

2.4.9 The Land Acquisition Act, 1894

The Land Acquisition Act (1894) deals with the acquisition of private properties for public purposes. There are 55 sections in this Act mainly dealing with area notification, surveys, acquisition, compensation, apportionment awards, disputes resolution, penalties and exemptions. Although quite old, this act laid out the legal basis for any property affected by a project and for compensating the effected owners of the land.

2.4.10 Factories Act, 1934

The clauses relevant to the project are those that concern the health, safety, and welfare of workers, disposal of solid waste and effluent and damage to private and public property. The Factories Act also provides regulations for handling and disposal of toxic and hazardous materials. Given that construction activity is classified as ‘industry’, these regulations will be applicable to the project contractors.

2.4.11 Labor Laws

Construction and operational activities during the course of construction may affect occupational health of workers. Employers are required to abide by labor laws in respect of their own employees and also to ensure that contractors to follow the relevant labor laws and rules relating to safety of the workforce and creating a healthy working environment. The proponents shall ensure that the labor force engaged at the project site is not exposed to any danger by monitoring the contractor’s work frequently.

CHAPTER 3

DESCRIPTION OF THE PROJECT

3.1 GENERAL

This section of the study renders a detailed account of the project and its salient features, such as location and various phases. Inputs and discharges relevant to different phases of the project, such as electricity & materials etc. have also been examined as a response to possible environmental concerns.

3.1 TYPE AND CATEGORY OF PROJECT

As per Review of Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) Regulations, 2022, the project falls in the project under Schedule –II B (9). Proponent is filing EIA report as per direction of EPA Punjab.

3.2 PROJECT OBJECTIVES

In this project the proponent has proposed Incinerator Unit to safely and efficiently dispose of waste materials by burning them at high temperatures, reducing their volume, and minimizing environmental impact. As with time, demand is increasing and to meet the demands in this area and also in the other cities, the construction of this project is a feasible option.

3.3 PROJECT BACKGROUND

Incinerators are furnaces designed to burn waste at high temperatures, reducing its volume and safely disposing of hazardous materials, often while recovering energy. Originating in the late 19th century with basic "destructors" in cities like Manchester (1876), incinerators evolved from polluting, rudimentary systems to advanced technologies with emission controls and energy recovery. Key developments include:

Early Use: Emerged during the Industrial Revolution to manage urban waste.

Modern Advancements: High-temperature combustion (850–1,200°C), pollution control (filters, scrubbers), and Waste-to-Energy (WtE) systems.

Types: Include municipal solid waste, medical, hazardous waste, and crematory incinerators, tailored for specific needs.

Global Use: Widely adopted in Europe (e.g., Sweden, Germany) and Asia (e.g., Japan, China) for WtE; less common in the U.S., where landfilling dominates.

Pros and Cons: Reduces landfill use and recovers energy but historically faced criticism for emissions, now mitigated by strict regulations and technology.

Current Trends: Focus on sustainability, integration with recycling, and innovations like carbon capture.

Incinerators are vital for modern waste management, balancing environmental protection, energy recovery, and public health needs.

3.4 PROJECT ALTERNATIVE

This section covers the project alternatives which were examined for the project. An analysis of the available alternatives is necessary to establish that the most suitable management and technology options will be adopted for the project, while minimizing environmental impacts. This evaluation explains the selection of appropriate option that was required to ensure optimal results within defined set of environmental, health and safety and economic constraints. In particular, it focuses on the following project options.

- The "Yes" or "No" Project Alternatives.
- Alternative Site Option.

3.4.1 The "No" Project Option

Incinerator Unit reduces waste volume by up to 90%, minimizing landfill use, and generates energy, contributing to sustainable resource recovery "No-project" option if undertaken will hinder the country from being self-reliant. From environmental point of view, this option will result in loss of opportunity in further improvement of the environmental management of the area through generation of environmental baseline data, and the mitigation and monitoring plans.

3.4.2 The "Yes" Project Option

This was considered to be a viable option. This option was considered viable as opposed to the "No" because the "Yes" project alternative implies that the project be implemented and once implemented it will lead to the efficient economical utilization of land & reduction in waste.

3.4.3 Site Alternatives

No site alternatives were considered as the project site is located in open land. No disturbance will be created in the vicinity of the project as it is located away from population. The land is under the ownership of the owner without any dispute. There is no protected or environmentally sensitive area present in the vicinity.

3.5 LOCATION AND LAYOUT OF PROJECT

3.5.1 Location of Project

This project is located at Khasra No. 4320/4329, Mouza Khoda, Tehsil Hassan Abdal District Attock Location Map is given **as Annexure-VI**.

3.5.2 Cost and Area of Project

Project will have total area of 3 Kanal, Total cost for the project will be around 50 Million PKR.

3.6 DESCRIPTION OF THE PROJECT

Incinerator Project Description

Project Overview

The incinerator project involves the design, construction, and operation of a state-of-the-art Waste-to-Energy (WtE) facility aimed at managing municipal solid waste Hazardous and Non-Hazardous in an environmentally sustainable manner. The facility will reduce waste volume, safely dispose of non-recyclable materials, and generate energy (electricity or heat) for local use, contributing to a circular economy and reducing landfill dependency.

Key Objectives

- **Waste Management**: Reduce volume by up to 90% through high-temperature combustion.
- **Energy Recovery**: Convert waste into usable energy, producing approximately 10-20 MW of electricity to power local communities or industries.
- **Environmental Compliance**: Meet stringent emission standards (e.g., EU Waste Incineration Directive or equivalent) using advanced pollution control systems.
- **Public Health and Safety**: Safely handle non-recyclable and hazardous waste to prevent environmental and health risks.
- **Sustainability**: Complement recycling and composting initiatives to support integrated waste management.

Project Components

1. **Combustion System**:

   - High-temperature incineration chamber operating at 850-1,200°C for complete waste breakdown.

   - Designed to handle 500-1,000 tons per day, depending on local waste generation rates.

2. **Energy Recovery System**:

   - Heat exchanger and turbine system to capture and convert combustion heat into electricity or steam for district heating.

   - Expected energy output: 500-700 kWh per ton of waste processed.

3. **Emission Control System**:

   - Equipped with electrostatic precipitators, baghouse filters, and wet scrubbers to remove particulates, dioxins, and acidic gases.

   - Continuous emission monitoring to ensure compliance with environmental regulations.

4. **Waste Handling and Storage**:

   - Secure waste reception and storage area to manage incoming, ensuring safe handling and segregation of non-combustible materials.

   - Automated feed systems to maintain consistent combustion.

5. **Ash Management**:

   - Collection and treatment of bottom ash and fly ash, with potential reuse in construction materials or safe disposal in designated landfills.

6. **Control and Monitoring Systems**:

   - Advanced control room with real-time monitoring of combustion, emissions, and energy output.

   - Automated safety protocols to prevent operational hazards.

Project Scope

- **Location**: it is situated in an industrial zone with access to waste collection networks and energy distribution infrastructure.
- **Capacity**: Designed to process 150,000-300,000 tons of waste annually, serving a population of approximately 500,000-1,000,000.
- **Timeline**:
  - Design and permitting: 12-18 months.
  - Construction: 24-36 months.
  - Commissioning and operation: 6-12 months post-construction.
- **Budget**: Estimated at 50 million.

Stakeholders

- **Local Government**: Oversees regulatory compliance and waste management integration.
- **Private Operators**: Manage facility operations and maintenance.
- **Community**: Engaged through public consultations to address concerns about emissions and safety.
- **Energy Consumers**: Local utilities or industries utilizing generated electricity or heat.

Expected Outcomes

- Reduction of landfill waste by 85-90%, extending landfill lifespan.
- Generation of renewable energy, offsetting fossil fuel use.
- Compliance with environmental standards, minimizing air and water pollution.
- Creation of 50-100 direct jobs during operation and 200-300 jobs during construction.
- Support for local sustainability goals and circular economy initiatives.

Environmental and Social Considerations

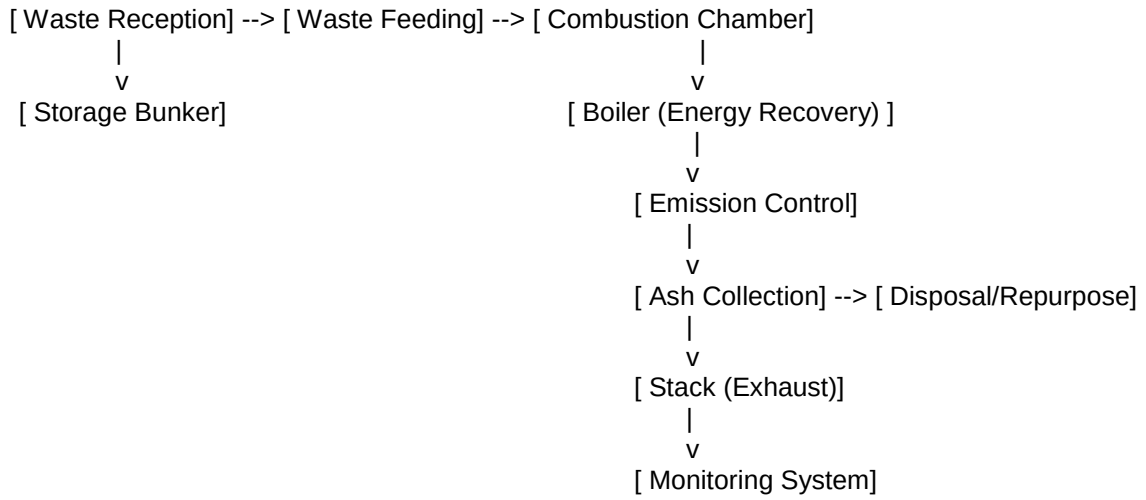
- **Mitigation Measures**: Installation of advanced emission control technologies to minimize pollutants like dioxins and particulate matter.
- **Community Engagement**: Transparent communication and public awareness campaigns to

address concerns about health and environmental impacts.

- **Sustainability Integration**: Coordination with recycling programs to ensure only non- recyclable waste is incinerated.

This incinerator project represents a modern approach to waste management, prioritizing efficiency, environmental responsibility, and energy recovery while addressing the challenges of urban waste growth.

3.7 Process Flow Chart:



3.8 Capacity Calculations

1. Solid Waste Capacity

- **Input Solid Waste**:
  - **Burning Rate**: 500 kg/hour, operating 24 hours/day (assuming continuous operation with one monthly maintenance stop, ~8,000 hours/year).
  - **Daily Capacity**: 500 kg/hour × 24 hours = **12,000 kg/day** (12 metric tons/day).
  - **Annual Capacity**: 500 kg/hour × 8,000 hours/year = **4,000,000 kg/year** (4,000 metric tons/year).
  - **Waste Composition**: Typical HAZARDOUS AND NON-HAZARDOUS includes 50–60% organic, 15–20% recyclables, 20–30% residuals (non-recyclable). Sorting removes ~20% recyclables, so ~400 kg/hour (80%) is incinerated.
- **Output Solid Waste (Ash)**:
  - **Volume Reduction**: Incineration reduces solid waste volume by 95–96%. For 400 kg/hour incinerated, residual volume is 4–5% (16–20 kg/hour).
  - **Mass Reduction**: Solid waste mass is reduced by 80–85%, yielding 15–20% ash (60–80 kg/hour, split as ~50–64 kg/hour bottom ash, ~10–16 kg/hour fly ash).
  - **Daily Ash Output**: 60–80 kg/hour × 24 hours = **1,440–1,920 kg/day** (1.44–1.92 metric tons/day).
  - **Annual Ash Output**: 60–80 kg/hour × 8,000 hours = **480,000–640,000 kg/year** (480–640 metric tons/year).
  - **Management**: Bottom ash may be repurposed for construction; fly ash, containing heavy metals, requires stabilization and secure landfilling.

2. Fresh Water Capacity

Fresh water is used for cooling (grate or boiler), ash quenching, wet scrubbers, and facility cleaning. Estimates are based on typical WtE incinerator requirements:

- **Cooling (Grate/Boiler)**: Water-cooled grates or boilers require ~0.5–1 m^3/ton of waste for cooling to maintain mechanical integrity. For 500 kg/hour (0.5 tons/hour), this is **0.25–0.5 m^3/hour**.
- **Ash Quenching**: Water cools bottom ash to prevent dust and facilitate handling, using ~0.2–0.5 m^3/ton of waste. For 0.5 tons/hour, this is **0.1–0.25 m^3/hour**.

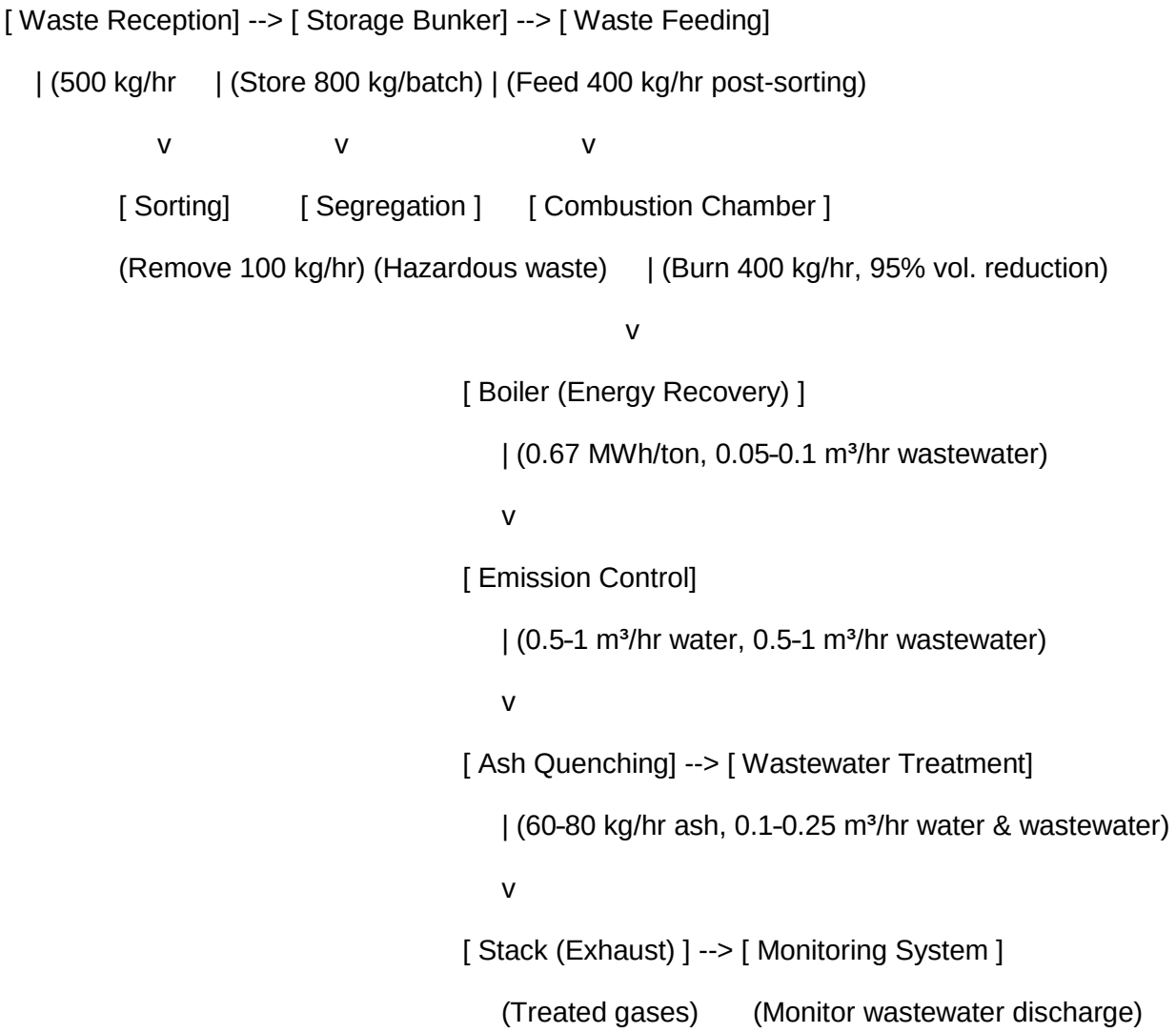
- **Wet Scrubbers**: Emission control systems use water to remove pollutants, requiring ~1–2 m³/ton of waste. For 0.5 tons/hour, this is **0.5–1 m³/hour**.
- **Cleaning and Miscellaneous**: Facility washdown and other uses require ~0.1–0.2 m³/hour.

- **Total Fresh Water**:
  - **Hourly**: 0.25–0.5 (cooling) + 0.1–0.25 (ash quenching) + 0.5–1 (scrubbers) + 0.1–0.2 (cleaning) = **0.95–1.95 m³/hour**.
  - **Daily**: 0.95–1.95 m³/hour × 24 hours = **22.8–46.8 m³/day**.
  - **Annual**: 0.95–1.95 m³/hour × 8,000 hours = **7,600–15,600 m³/year**.
- **Mitigation**: Closed-loop systems recycle ~50–70% of water (e.g., treated scrubber water reused for quenching), reducing fresh water demand to ~0.3–0.6 m³/hour (7.2–14.4 m³/day).

3. Wastewater Capacity

Wastewater is generated from wet scrubbers, ash quenching, boiler blowdown, and cleaning, containing pollutants like heavy metals, suspended solids, and acidic compounds.

- **Wet Scrubbers**: Produce ~0.5–1 m³/hour of wastewater with heavy metals and acidic compounds (pH 2–4).
- **Ash Quenching**: Generates ~0.1–0.25 m³/hour of wastewater with suspended solids and trace metals.
- **Boiler Blowdown**: Removes salts and impurities, producing ~0.05–0.1 m³/hour of wastewater.
- **Cleaning**: Washdown generates ~0.05–0.1 m³/hour of wastewater with low pollutant levels.
- **Total Wastewater**:
  - **Hourly**: 0.5–1 (scrubbers) + 0.1–0.25 (ash quenching) + 0.05–0.1 (blowdown) + 0.05–0.1 (cleaning) = **0.7–1.45 m³/hour**.
  - **Daily**: 0.7–1.45 m³/hour × 24 hours = **16.8–34.8 m³/day**.
  - **Annual**: 0.7–1.45 m³/hour × 8,000 hours = **5,600–11,600 m³/year**.
- **Treatment**: Wastewater is treated via neutralization (to pH 6–9), sedimentation, and filtration to remove solids and metals, ensuring compliance with discharge standards (e.g., COD <125 mg/L, heavy metals <1 mg/L). Treated water may be recycled, reducing discharge to ~0.2–0.4 m³/hour (4.8–9.6 m³/day).



3.9 Market for the Product

Attock is a mediocre city of Pakistan. The incinerator unit will collect waste from Attock as well as in the whole Punjab as there is a high demand of the project in the market.

3.10 Basic Infrastructure and Facilities

Basic infrastructure like water, roads, transport, repair and maintenance workshops and communication facilities like telephone, fax and e-mail are already available virtually at the doorsteps of the project site. This factor also goes in favor of selecting the present site.

3.11 Labor Availability

All categories of the labor required for the project operation are available conveniently

and plentifully at affordable cost at the present site. This factor too supports to select the present site for the said project.

3.12 Size or Magnitude of the Operation, Including Capital Cost

The project has an area of 3 Kanal. The said project comprises of one single story facility. The Capital cost of the project is 50 Million rupees. There are no other associated activities with regard to the project.

3.13 Uncovering the Environmental Impacts

3.13.1 Solid Waste

Incinerators reduce municipal solid waste (Hazardous and Non-Hazardous) volume by 90–95%, significantly decreasing the demand for landfill space, which helps preserve land resources and reduces soil and groundwater contamination risks from landfills.

3.13.2 Waste Water

Untreated wastewater may contain heavy metals (e.g., lead, cadmium), suspended solids, and acidic compounds, risking contamination of surface water or groundwater. Improperly treated wastewater from rendering (containing organic matter, fats, or chemicals) can pollute rivers and groundwater if discharged without treatment, a concern in areas like Punjab with weak waste management infrastructure.

3.13.3 Air Pollution:

Incinerators can emit pollutants like dioxins, furans, particulate matter (PM2.5), nitrogen oxides (NOx), and heavy metals, which may impact air quality and human health. Incineration releases CO2 (approximately 0.7–1.2 tons CO2/ton of Hazardous and Non-Hazardous), contributing to climate change, though less than landfill methane in many cases. Bottom ash (20–30% of input waste) and fly ash (1–5%) may contain heavy metals, requiring careful handling to prevent soil or water contamination.

3.13.4 Noise Pollution:

Incinerator operations and waste transport can generate noise and local traffic, impacting nearby ecosystems.

3.14 Energy

WAPDA and Solar will supply the electricity for the project. In order to meet the emergency as well a critical power requirement during WAPDA shut down the project

also standby generators will be used.

3.15 Availability of Water

Adequate quantity of underground water is available to meet even all the project requirement. The quality of water is also satisfactory. This factor also supports the decision regarding sitting of the project at the existing sites. However, the water for all project activity withdrawn from the underground water pumps already present at the project site.

3.16 Waste Water Discharge & Treatment

Wastewater will be disposed off after treatment. This wastewater will be disposed off in the trunk sewer present at the front road.

3.17 Ventilation

Proper ventilation, light will be provided. Ventilators are provided for ventilation of site.

3.18 Firefighting Plans

Fire extinguishers will be kept available to deal with any fire outbreak. Foam and water based fire extinguishers will be kept available.

3.19 Air Emissions & Noise

Air filters will be installed to control air pollution. Since residential area is not in close vicinity of the project site, human settlements are not going to be disturbed by the noise during operation. Further, trees and agricultural areas in vicinity of project site acts as noise absorbers.

3.20 Operational Arrangements

At operation stage, the project proponent is involved for the operation and maintenance of the cooperated facility.

3.21 Land Ownership

Land ownership and the details of land acquisition documents are attached as **Annexure-II.**

3.22 Layout Plan

Layout plan is attached with the report as **Annexure-VII**. The layout plan shows that total area of the site is 3 Kanal.

3.23 Land Use on Site

The land use on the site is open barren land. There is no residential area available within 01 km area of the project site. On the back and east right and left side there is

open land. So there will not be any disturbance after the successful implementation of this project. This project will be environmental friendly.

3.24 Man Power

During construction phase, 15 workers are required. Manpower, during operation will be required to look after the feeding, vaccination and cleaning operations. During operation, the manpower will be 10.

3.25 REALLOCATION AND REHABILITATION OF PROJECT SITE

None of the locals or residents will be relocated or infrastructure will be affected or destructed because land is already under the ownership of the project owner. There is no need for the relocation or dismantling of significant structure. Hence, no relocation and rehabilitation is required.

3.26 DESCRIPTION OF PROJECT SITE

The proposed project site is spread over area of 3 Kanal This will be developed into Incinerator Unit.

3.27 Vegetation Feature of Project Site

Vegetation of the area is dry deciduous scrub type. The stocking on the whole is poor. The southern slopes are often devoid of vegetation. While northern slopes carry some minor vegetation. With the shifting of capital and urbanization of the tract, the majority of original vegetation of the tract was removed and replaced by commercial and residential shrubs. Grasses are abundant, like Aristida depressa (Lamb), Cymbopogan Jawarnica (khawi) etc.

3.28 Current Status of the Project

As proponent tends to seek for environmental approval. Layout plan is attached in **Annexure Vii**.

3.29 Land Use on the Site

The land is under the ownership of the owner. The nearby area is agricultural in nature. There is no residential settlement in the close proximity of the project location. The land is suitable for setting up an environmentally controlled glass industry.

3.30 IMPLEMENTATION SCHEDULE

The implementation schedule for the proposed project is around 06 month for the construction phase and the details are given as below:

Sr. No.	Activities	06 Months					
		01 M	01 M	01 M	01 M	01 M	01 M
01	Detailed Design						
02	Purchase of Machinery						
03	Getting Approvals						
04	Installation of Machinery						
M = Man Months							

CHAPTER 4

DESCRIPTION OF ENVIRONMENT

4.1 GENERAL

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 Initial Environmental Examination (IEE) encompasses all the important aspects of local environment; such as biological resources, socioeconomic development and qualityof living values.

4.2 PHYSICAL ENVIRONMENT

This part examines the physical resources such as topography, soil, climate, surface and ground water resources and quality, ambient air quality and geology of not only the Project site but also the city as a whole to assess whether the project under assessment can or does have any impacts on any of these parameters. The descriptionof physical environment of Attock and the project site is presented in the following subsections.

4.2.1 GEOLOGICAL FORMATION

Attock District, located in the Pothohar Plateau of northern Punjab, Pakistan, lies within the Kohat-Potwar sedimentary basin, near the Main Boundary Thrust (MBT) and Khairabad Fault, making it geologically complex. The district spans 6,857 km² and is characterized by hills, plateaus, and dissected plains, with the Indus River forming its western boundary. The geology comprises Precambrian to Quaternary formations, influenced by tectonic activity from the collision of the Indian and Eurasian plates, resulting in folded and faulted sedimentary sequences.

The area boundary of Attock is shown in Fig. 4.1 below:

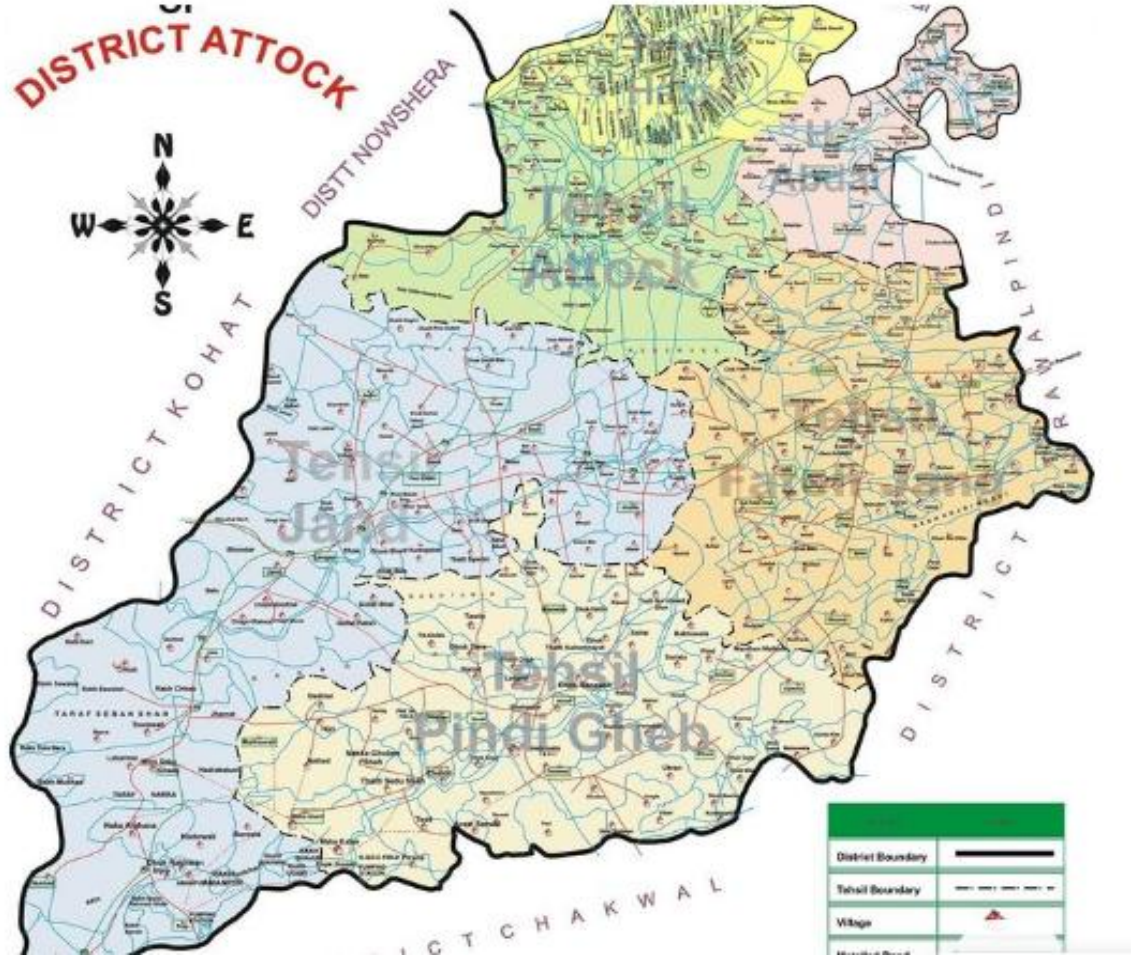


Fig. 4.1: Area Boundary of Attock

4.2.2 TOPOGRAPHY & PHYSIOGRAPHY

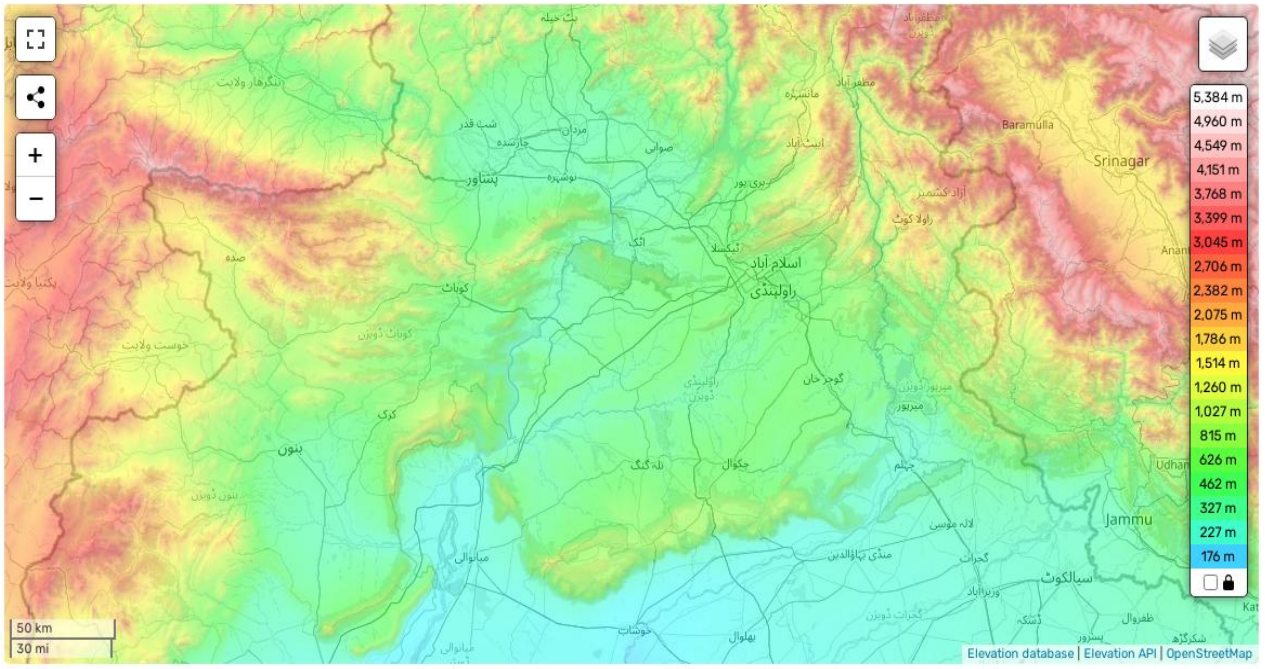


Fig. 4.2 Topographical Map of Attock C i t y including Project Area[1]

4.2.3 TEMPERATURE & RAINFALL

Attock, Pakistan, experiences a hot semi-arid climate with significant seasonal variations in temperature and rainfall, impacting projects like incinerators or mixed-use buildings. Temperatures range from 39°F (4°C) in winter to 104°F (40°C) in summer, with June being the hottest month (average high 40.4°C) and January the coldest (average high 17.2°C). Rainfall averages 432 mm annually, with the monsoon season (July-August) bringing heavy precipitation, peaking in August (up to 30 mm/day), while December is the driest month (4 mm). High humidity (up to 48% in February) and monsoon rains increase organic waste decomposition and leachate risks, requiring covered storage and drainage systems for waste management. Windier conditions from May to August (speeds above 4.7 mph) may necessitate secure waste containment. For infrastructure projects, these conditions demand robust designs to handle temperature extremes, humidity, and rainfall, ensuring efficient waste handling, water storage (e.g., 2,400-gallon UGWT, 1,800-gallon OHWT for 1,000-gallon daily demand), and compliance with environmental standards.

See Table 4.1 below:

Table-4.1: Monthly Climate Information of Attock

Parameters	Jan	Feb	Ma	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Avg. Temperature (°C)	12.7	15.5	20.8	26.8	31.8	34.8	33.2	32.4	30.7	26.2	19.4	14.1
Min. Temperature (°C)	5.1	8	13.3	18.8	23.7	28	28	27.4	24.6	18	10.7	6
Max. Temperature (°C)	20.3	23.1	28.4	34.8	39.9	41.7	38.5	37.4	36.8	34.5	28.2	22.3

[1] https://en-gb.topographic-map.com/maps/adaa/Lahore /

Precipitation / Rainfall (mm)	12	12	14	9	8	24	76	74	30	3	3	5

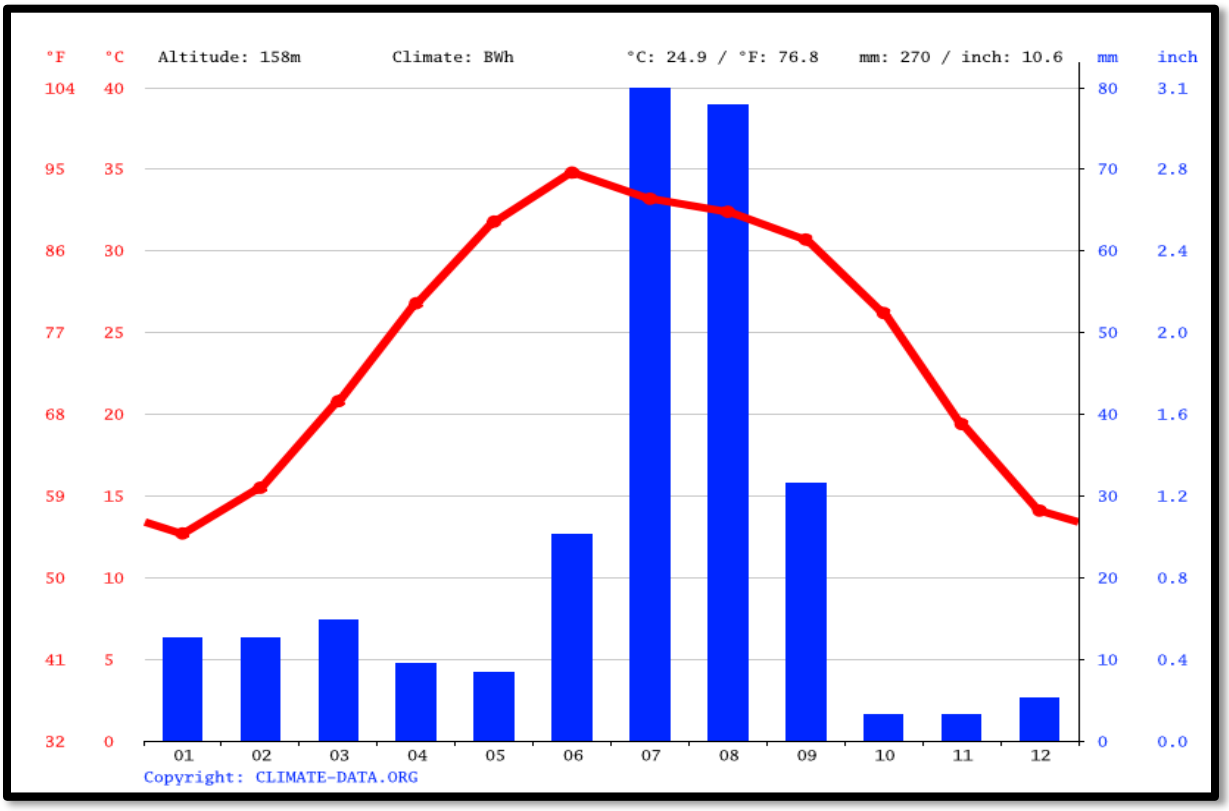


Fig. 4.3: Climatic Conditions of Attock including Project Area[2]

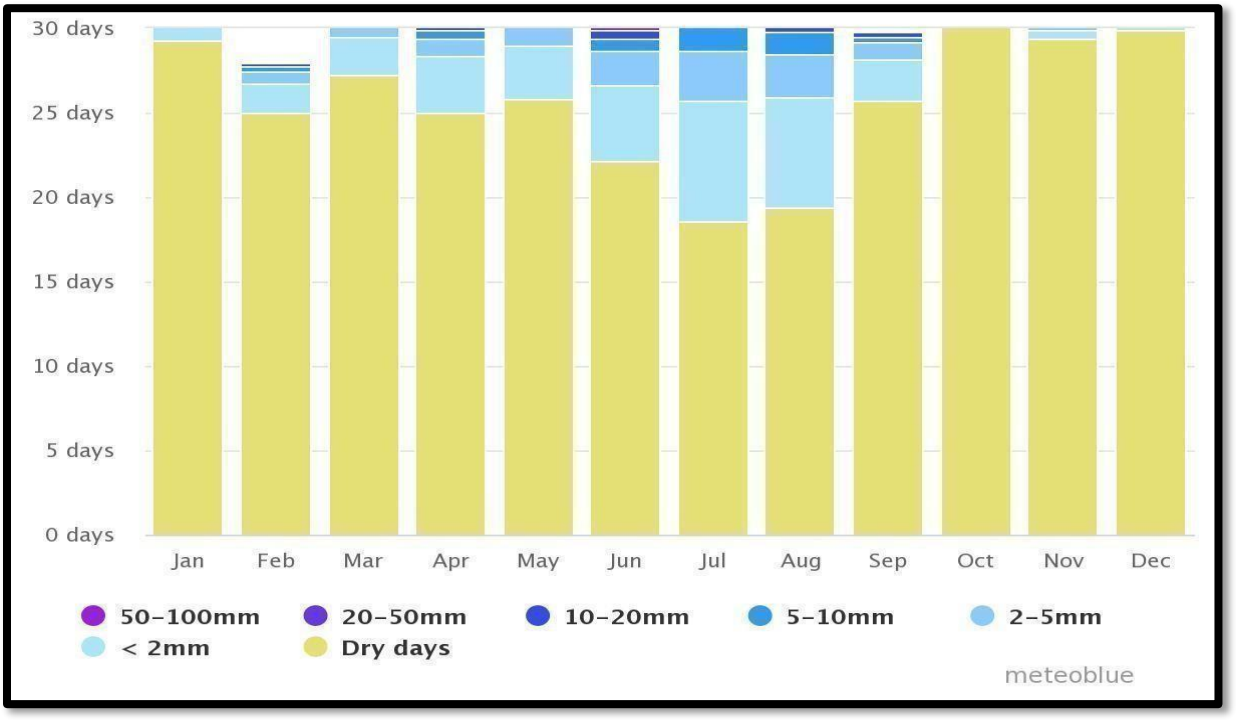


Fig. 4.4: Climatic Conditions (Monthly Precipitation Chart)

[2] https://en.climate-data.org/asia/pakistan/punjab/Attock -3520/

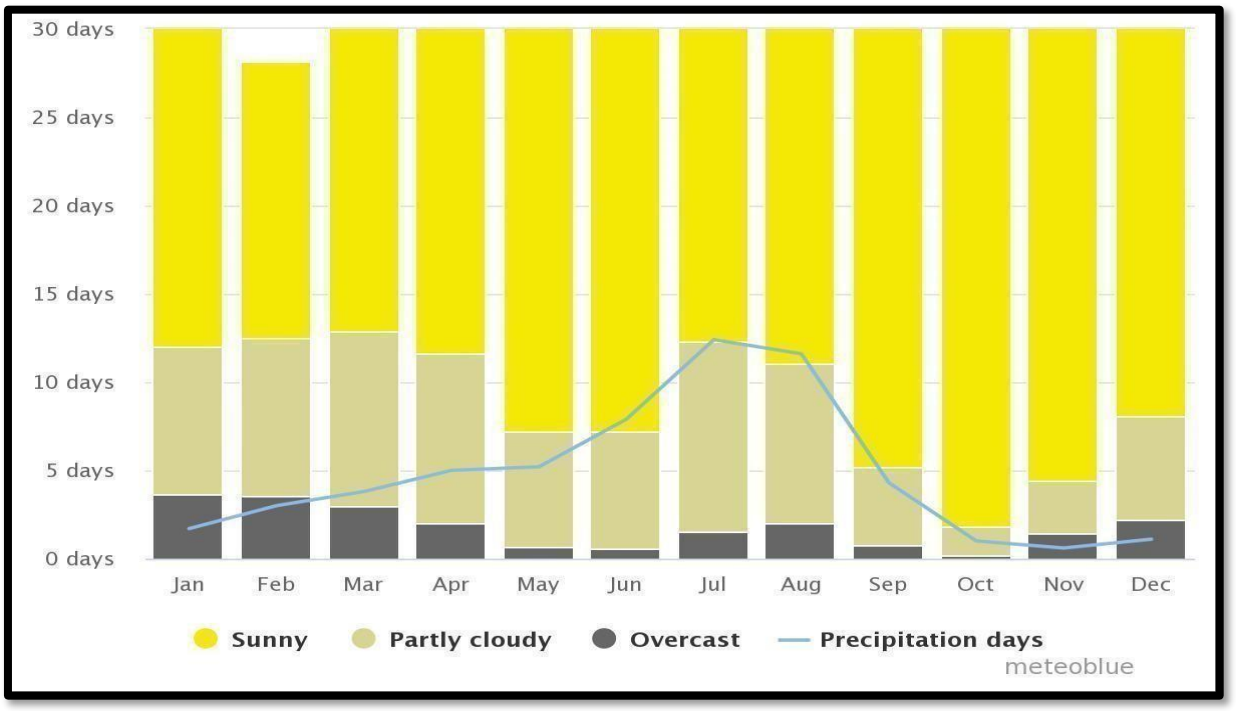


Fig. 4.5: Climatic Conditions (Cloudy, Sunny & Precipitation Chart of Attock)

4.2.4 WIND

The diagram for Attock shows the days per month, during which the wind reaches a certain speed. An interesting example is the Tibetan Plateau, where the monsoon creates steady strong winds from December to April, and calm winds from June to October.

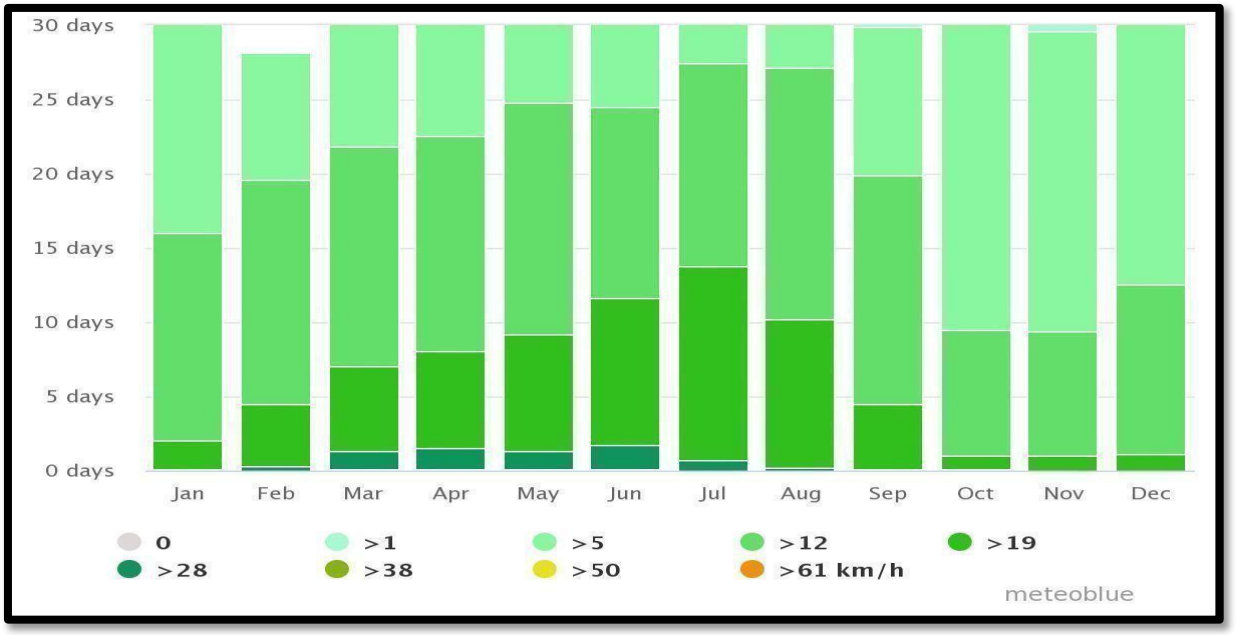


Fig. 4.6: Wind Speed Graph of Attock [3]

[3] https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/Attock__pakistan_1163272

4.2.5 HYDROLOGY

Surface Water Resources

The major surface water source in the area is Ravi River, flows right side of the District. In addition to that there are few other surface water sources, which are used for irrigation purposes for agricultural lands in the area.

Groundwater Resources

The major sources of the groundwater in the area are hand pumps, pressure pumps and tube wells. The main source of drinking water in the area is groundwater, which is pumped through hand pumps, pressure pumps and tube wells. The groundwater is also used for irrigation purposes.

4.2.6 SESMICITY

Pakistan lies in a seismically active zone. Seismic observations indicate that hundreds of shocks occur in the region every year. According to the seismic zoning map of Pakistan, included in Pakistan Building Code Seismic Provisions (2007), the project area falls under seismic zone 2B, with a peak horizontal ground acceleration of from 0.08 to 0.16. The seismic zoning map of Pakistan is given as Figure-4.2.

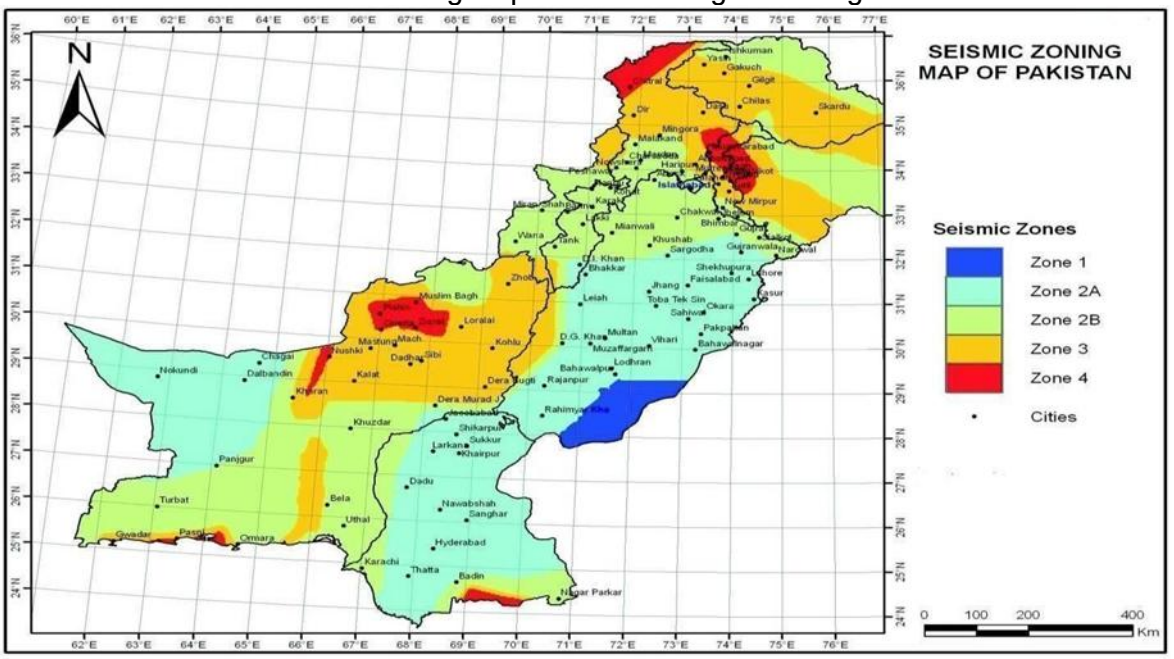


Fig. 4.7: Seismicity Map of Pakistan

4.2.7 ECOLOGICAL RESOURCES

Wildlife, Fisheries & Aquatic Biology

There is no wildlife except jackals, dogs and snakes etc. Common species of birds found in the project area are sparrows, crows, pigeon, dove, tiliar (starling), parrot, quail, pintail and humming bird etc,.

Vegetation cover and Trees

The district's trees consist of jand (Prosopis spicigera), karir (Capparis aphylla), beri (Zizyphus jujuba), van (Salvadora oleoides), kikar (Acacia nilotica), shisham (Dalbergia sissoo) and aak (Calotropois spp). Various herbs can also be found, including harmal, akrey and bathoo.

There is wild growth of Mesquite bushes and some Eucalyptus trees in the areas near the works but natural forest cover has been significantly reduced in the past. Some of the older stands of trees specially fruit trees, still survive the onslaught of urbanization on this previously natural and agricultural area. There is probably little natural vegetation in the project area.

Protected areas / National sanctuaries

In Pakistan there are several areas of land devoted to the preservation of biodiversity through the dedication of national parks and wildlife sanctuaries. There are no protected areas near proposed subproject sites.

4.2.8 ECONOMIC DEVELOPMENT

Agriculture

The agriculture is by far the main economic activity in the central/ southern Punjab. The main crops during Rabi are wheat, gram, rape, mustard, barley and oil seeds. In Kharif, cotton, jawar, sugarcane, bajra, maize and rice are grown. In addition, there are subsidiary crops known as Zaid Rabi like Kharbooza, tobacco and potatoes and Zaid Kharif like potatoes and chilies. The main fruits grown are mangoes,date, malta, orange, water and musk melon, guava, citrus, falsa, jaman and pomegranate. In the beginning of the cultivation era the inhabitants usedto eat Pilu and Bair, the only wild fruits that grows intermittently. With the introduction of canal irrigation mango and other fruits are being grown on commercial basis. Wheat, cotton,sugarcane and rice are the major crops, whereas mango and citrusare the major fruits of the area. As per cropping pattern, wheat and sugarcane arethe highest grown crops in the area. District Attock is one of the best producer of orange "locallyknown as kenno". It contributes towards export standard

quality of orange produced in all Pakistan. The majority of people living in this district have profession of agriculture and it produce several kind of agricultural and dairy products like meat, eggs, cotton, maize, several pulses, peach, guava, tomato, melon, water melon, mango, tobacco and onion.

Industries

Different types of industrial units are present in the district including cotton ginning & pressing, dairy products, rice and four mills, brick kilns etc. However, the agricultureis the main stream activities in the areas. These industries are contributing towards the Gross domestic product (GDP) of the country.

Transportation

The mode of transport in the local areas are through vans, motorbikes, ching chi rickshaws, buses etc., people of the areas used all mode of transport for theirpurposes.

4.2.9 AMBIENT AIR QUALITY

At present, major sources of air pollution are industrial and mobile sources. Other sources of ambient air pollution are the generators in industrial and commercial units for alternative power supply sources. Ambient air quality was monitored in accordance with PEQS at 01 location in order to access the overall air quality of project site. The ambient air monitoring was carried at identified locations for period of 24 hours in accordance with the PEQS. The result is attached as **Annexure-VIII** with this report.

4.2.10 Noise

Number of sources of noise emission has been detected in the study area. These sources are

- Vehicular Traffic in Project Area
- Due to Operation of Industrial Activities
- Due to operation of Generators in Commercial Activities
- Due to operation of pumping & disposal stations

The results shows that the noise levels on all major roads are much higher than PEQS but the noise levels are in compliance in villages and settlements. The result isattached as **Annexure-VIII** with this report.

4.2.11 Drinking Water Quality

The major sources of the groundwater in the area are hand pumps, pressure pumps and tube wells. The main source of drinking water in the area is groundwater, which is pumped through hand pumps, pressure pumps and tube wells. The groundwater is also used for irrigation purposes. It was found fit for use. The result is attached as **Annexure-VIII** with this report.

4.2.12 Socioeconomic Assessment

Socioeconomic Assessment 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 to complete the baseline information, which will in turn provide the basis for subsequent monitoring and evaluation studies.

4.2.13 Vegetation Features of the Project Area

The project area is barren land and it is barren land and will be used for the development of the equipment manufacturing facility.

4.2.14 Demographic Characteristics of the Population

The field survey (including interviews, focus group discussions, census, and area profile) was carried out to collect the socioeconomic data from the project affected people as well as other general population to accomplish the baseline information, which will provide the basis for subsequent monitoring and evaluation studies. The socioeconomic survey form is attached as **Annexure-IX** and list of respondents is as **Annexure-X.**

4.2.15 Survey Findings

a) Gender Ratio of Respondents

The respondents contacted were only males and some females as it is hard to interact with females due to local traditions.

b) Caste

The cast of peoples live in Project Area are Jat, Aryan, Mughal, Khan, Gujjars and others.

c) Religion

Almost whole of the population in the vicinity of the project area is Muslim.. Some Christians are also present in the area.

d) Age Group of Respondents

The survey was done from a vast age distribution of the community of the people aging between 18 years to 50 years.

e) Marital Status

Mostly respondents were married while the others were unmarried or bachelors.

f) Status of Education

Among respondents, the status of education was as below:

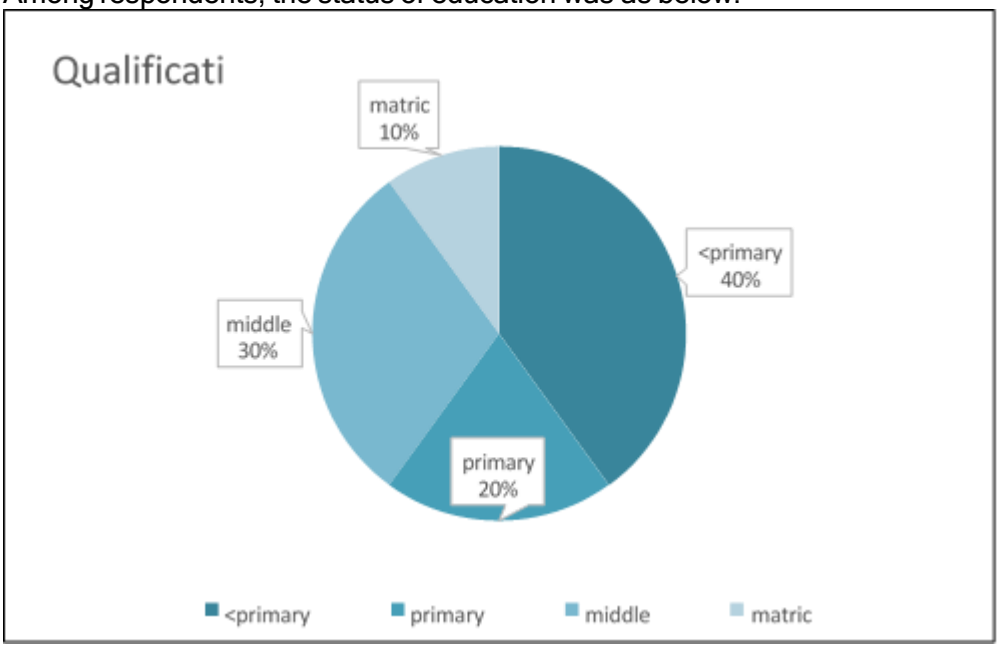


Figure 4.11: Status of Education

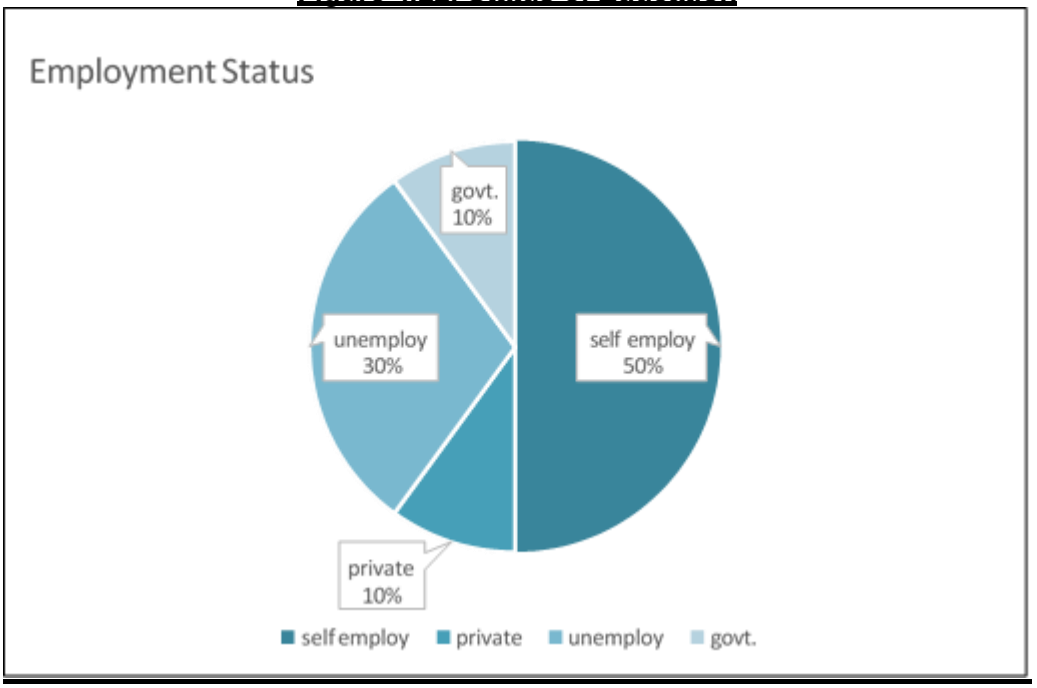


Figure 4.13: Employment Status

h) Awareness of the Project

75% of the respondents were aware of the project while the others have no idea about the project being implemented.

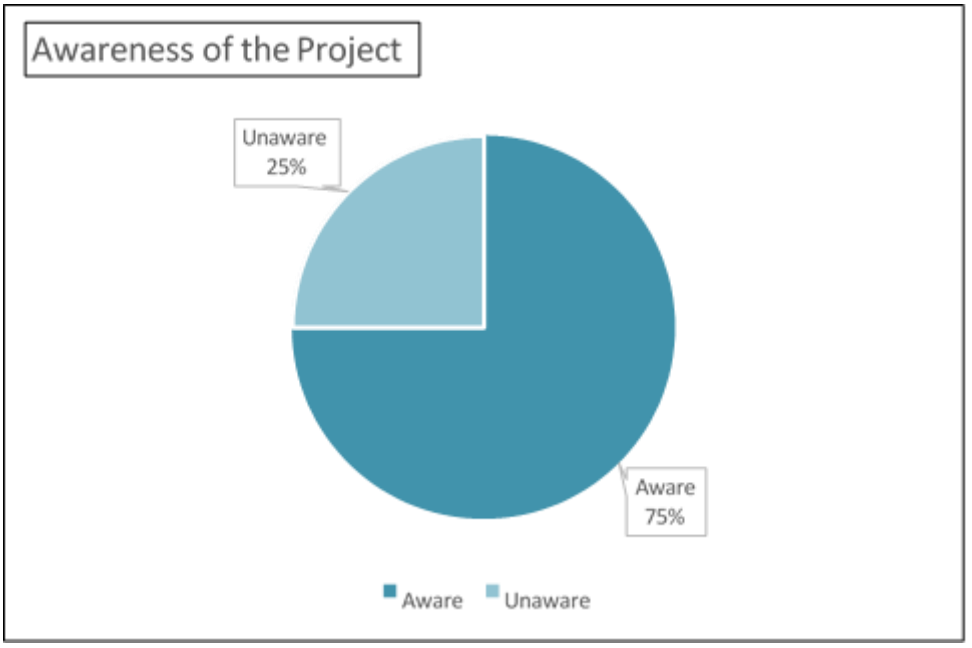


Figure 4.14: Awareness of the Project

i) Acceptance/ Opposition for the project

99% of the respondents were in favor of the project due to the employment opportunities.

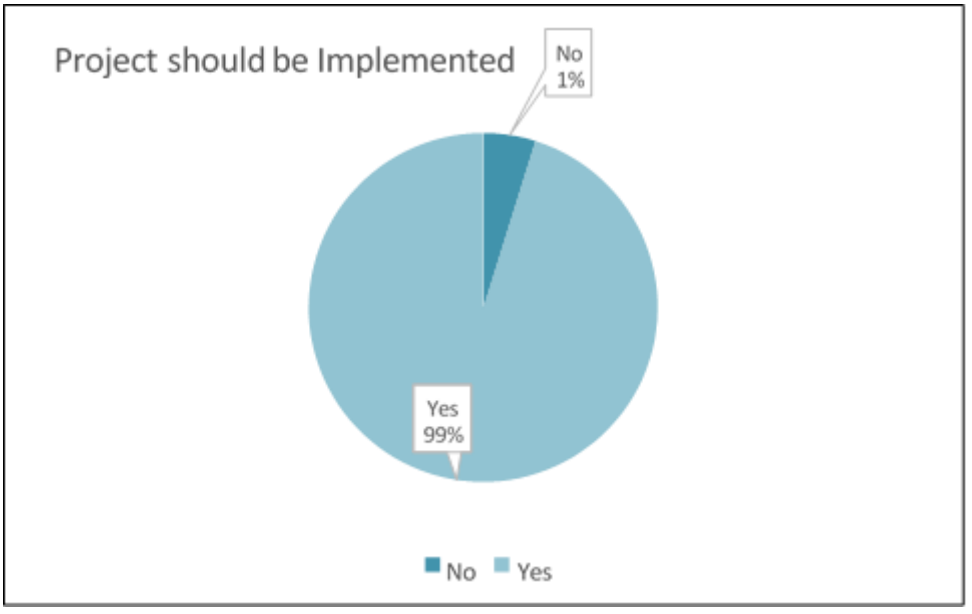


Figure 4.15: Percentages of Acceptance or Opposition

4.2.16 SUMMARY FINDINGS

Socio-economic baseline conditions and Socio-economic status of the people of the project area are described hereunder.

- The people whose interviews were recorded as a part of the public consultations were local inhabitants.
- Employment condition in the area were not satisfactory.
- In the project area, different sources of income are present and the locals rely on more than one source.

Comparison of potential adverse and beneficial impacts of the project shows that project will prove to be beneficial for the inhabitants of the area. The project will provide job opportunities for the local inhabitants. Hence improve their socio- economic status. Employment opportunities generated by the project include workers, helpers and guards. The overall socio-economic impact of the project is interpreted in relation to the existing environmental conditions.

CHAPTER 5

PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

5.1 GENERAL

This section describes the outcomes of the public consultation sessions held with different stakeholders that may be affected by the project. The objectives of this process were to:

- Share information with stakeholders on the construction of the proposed plant and expected impacts on the physical, biological and socio-economic environment of the project corridor;
- Understand stakeholders' concerns regarding various aspects of the project, including the construction of the proposed plant and the likely impacts of construction related activities and operation of the project;
- Understand the perceptions, assessment of social impacts and concerns of people/ communities.
- Provide an opportunity to the public to provide valuable suggestions in the project design in a positive manner; and
- Reduce the chances of conflict through the early identification of controversial issues, and consult them to find acceptable solutions.

5.2 IDENTIFICATION OF MAIN STAKEHOLDERS

During the field survey, significant efforts were made to identify the possible categories of stakeholders and their stakes. During the field survey, different stakeholders were identified villagers, local residents, government officials, shop owners, public representative, NGO's and general public. All the stakeholders had different types of stakes according to their professions.

5.3 FOCUS GROUP DISCUSSIONS AND SCOPING SESSIONS

A series of scoping sessions and informal focus group discussions were carried out with local communities and local government representatives. The meetings were held at various locations. Generally, people were found to be aware of the need of the proposed action. Local communities demand that

they must be part of a continuous consultation process with other stakeholders at different stages of the project including the design, construction, and operational periods. The consultation sessions were held according to the schedule indicated in **Table 5.1.**

5.4 METHODOLOGY

The methodology adopted for the purpose of socio-economic and health assessment was based on general observations, interviews, recording of health parameters.

During the field survey, significant efforts were made to identify the possible categories of stakeholders and their stakes. During the field survey, different stakeholders were identified villagers, local residents, government officials, shop owners, public representative, NGO's and general public. All the stakeholders had different types of stakes according to their professions.

After the identification of stakeholders, the next step was to conduct the meeting with identified stakeholders. Meetings have many uses in participatory development, including information sharing and group consultation, consensus building, prioritizing and sequencing of interventions and collaborative monitoring and evaluations. Meetings were held in two stages, i) Preliminary Survey, ii) Secondary Survey, to share the informationof about the proposed action and to note down their concerns.

i. Preliminary Survey:

In the initial stages of the project, Consultation with stakeholders such as District Government, Local Government, Environmental Department, Forest and Wildlife departments was carried out. In this regard, the rounds of public consultation and social assessment survey were held with selected persons including Government / Non-Government Officials, village notables and general community of Project area. The purpose of this survey was to achieve the objectives of the consultation, highlight the main issues in the implementation of the proposed project and finally propose mitigation measures. Open and close ended questionnaire was used to collect the views

concerning the assessment survey. Scoping sessions and informal group discussions were also carried out with local residents and local government representatives regarding the proposed project. The outcome of whole consultation process was very encouraging. The following issues were discussed during:

- Brief Description of the Project.
- Current environmental conditions in the area.
- Suggestions for improvement in the current environment of the village.
- Perceptions about the proposed Project.
- Perceived impacts of the proposed Project

a) Meeting with Environment Officer

Team of Bio Green Environmental Consultant visited the office of Pak- EPA office to seek help from official for project implementation. During the meeting, the Consultant talked about the complete description of the project, EPA representative inquired about the possible impacts of the project. They were contented with the mitigation measure currently adopted by the Pak Lamps Limited and stated that no impact will occur if Environmental Management Plan is implemented properly.

b) Meeting with Forest Officer

During the meeting with Forest Officer, the Consultant inquired about the local and endangered species in the working Domain. According to the Divisional Forest Officer, Shisham, Kikar, Phulari, Sukh Chain and Sirris are the local species of the area whereas no endangered species is present in the working domain.

c) Meeting with Wildlife Officer

A detailed discussion was carried out with representative of Wildlife Management Board Trail 5 who explained that wild boar, Jackal, fox, deer, rabbit, tettar and hawk, House sparrow, hose crow, Koel, Mynah are commonly available whereas Chakor and Patrifge are

endangered therefore hunting licenses are banned in this area. Leopard and Barking deer are endangered.

ii. Secondary Survey

In the Second phase of the project general public and local residents were consulted. Specific area was marked near the project which is considered to be a sensitive zone for the impacts of the project. This gave not only the idea about the social and cultural norms of the area but also the view point of the inhabitants about the project. Different areas of these five cities were visited regarding collecting the data and also to provide the public information about the project and to note down their suggestion and concerns. The Socioeconomic Survey Proforma & list of the Respondents are attached as **Annexure IX & X** respectively.

Table 5.1: Stakeholders and their Concerns

Sr. No.	Agency/ Department /Stakeholder	Representative	Major Concerns	Suggestions
1	**Proponent**	CEO Enviro Care	Issues related Design of the project, HSE of workers, Tree plantation, Water treatment, Solid waste management were discussed.	• A feasible design after much consideration for the project has been proposed for the said project. This design is environmentally feasible as well as sustainable. • A detailed HSE plan has been in place for workers. • No trees will have to be cut during the construction phase but a lot of trees will be planted after the construction works. Tree plantation plan may be shared with the EPA. • Solid waste produced will be properly managed and disposed of in identified designated areas by EPA approved Collector.
2	**Responsible Authority- EPA**		• EMP should be specific and detailed regarding the current project. • Dust issues are the utmost concern during construction period of theproject. • Health and safety issues may occur to local community and the workers during the construction period.	• Detailed EMP related to this proposed site has been developed for construction & operation phase of the project. • Dust issues can be resolved by sprinkling of water on daily basis in the project area. • HSE Plan should be implemented to avoid health and safety issues occurring during construction period of the project.

			• Solid waste produced during construction period is a major concern. • Tree cutting should not be involved in the project. • Monitoring should be done on regular basis to ensure the NEQS.	• Solid waste produced will be properly managed and disposed of in identified designated areas by EPA approved Collector. • No tree will have to be cut during the construction phase but a lot of trees will be planted after the construction works. Tree plantation plan may be shared with the EPA. • Monitoring will be carried out on regular basis and the reports will be shared with the EPA.
3	**Environmental Practitioners & Experts**	Muhammad Amin (Environmental and Sustainability Expert)	• In the origination of the proposed project local residents will suffer from physical and economical disturbance • During construction period, local residents and road users may feel difficulty to Move /t ravel from one place to another. • The construction activities will result in heavy load of traffic. • Air pollution will be	• Significant efforts including change in design should be made to minimize physical and economical disturbance • All the construction activities will be done in the night. so no traffic will be disturbed during the construction process. If necessary, alternative routes will be used. • All activities will be done in the night. traffic will be disturbed during the construction process. • Heavy machinery should

			created throughout the construction stage due to the movement of heavy machinery. • Health and safety issues may occur to the local community and the workers during the construction period. • Will local community be benefited? • Exposure of noise and dust particles will cause disturbance and health issues to the local residents.	be properly monitored so that their emissions can be controlled which further do not become the cause of diseases. • A proper HSE plan will be developed and all the safety measures shall be taken during the construction process. • This project will create a lot of skilled and unskilled job opportunities for locals • The effects of noise and dust pollution on the local residents should be minimized by making necessary arrangements. Dust pollution should be controlled by water smattering on daily basis.
4	**Wider Community of Project Area**	Local Community	• transportation activities might cause disturbances to the local people. • The community people are hopeful that the Project will help the locals to improve their livelihood and socioeconomic conditions. • Noise pollution is caused from the buildings. • It is expected that the life standard of the community would be improved • Locals will be ignored during the project	• transportation should be completed in short duration. And special measures should be taken to cause minimum or no disturbance. • This project will cause job opportunism for the locals. 336 skilled and unskilled job opportunities will be created after the construction and implementation of this project. • Special measures should be taken to reduce and control noise pollution. • Life standards of the community will improve after thefulfillment of the project. • Job opportunities will be created for locals.

			• Dust and noise pollution, privacy / safety issues, disturbance of utilities, traffic and lightening associated with construction activities on the residents living near the project area that can cause disturbances and stress. • Construction activities might cause disturbancesto the local people. • Road traffic will increase due to movement of heavy machinery. • Due to deforestation, the diseases may increase, the drizzling system is minimized and the level of groundwater is depleting.	• The effects of noise and dust pollution on the local residents will be minimized by making necessary arrangements. Dust pollution will be controlled by water sprinkling on daily basis. • Special measures should be taken to reduce and control noise pollution. • Heavy machinery should be allowed only during night time. • Proper laws must follow to avoid the deforestation. • No deforestation will be done.\

5.5 SUMMARY FINDINGS

Socio-economic baseline conditions and Socio-economic status of the people of the project area are described hereunder.

- The people whose interviews were recorded as a part of the public consultations were local inhabitants.
- Most of the people are educated and the literacy rate is increasing rapidly.
- There are a lot of industries available in the project area and the locals are in favor of this project.
- People were satisfied with the job creation of 336 vacancies for the skilled and un-skilled labor as the un-employment will be eradicated.

- Sewerage, drinking water availability, educational and medical facilities inthe area under reference of this study were adequate and satisfactory.
- In the project area, different sources of income are present and the locals rely on more than one source.
- Elders are very much respected and they have great say in decision making.
- most of the women are restricted to housekeeping.
- Traditional type of society and for locals, socio-cultural values are important in every walk of life with the touch of modernism. Print, electronic media and technology bringing change in the overall pattern of life style.

Generally, people were found to be aware & convinced of the development of Pak Lamps Limited, and indicated remarkably their support for the implementation of project. Local communities demanded that they should be the part of meaningful consultation activities along with other stakeholders at different stages of the Project including the design, construction, and operational periods. Public Consultation pictorial presentation is show in Figure-5.4.

Figure 5.4: Public Consultation

Figure 5.4: Public Consultation

Figure 5.4: Public Consultation

CHAPTER 6
ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

6.1 GENERAL

This chapter discourses the potential environmental and social impacts of the project activities, predicts the magnitude of the impact, assesses significance, identifies the mitigation measures to minimize the adverse environmental impacts and evaluates the residual impact of the project, if any. Environmental impacts of a project are driven out using numerous factors and parameters, due to which it is necessary to evolve Environmental Management Plan (EMP) to develop the mitigation measures. The assessment via these parameters is necessary in the study area for comparative analysis in comparison with that area where there is no activity has been introduced.

6.2 IMPACT ASSESSMENT METHODOLOGY

The consequences of the project activity are evaluated by comparing it with recognized significance criteria. The criteria are of following type:

- Institutional recognition- law, standards, government policies and plans
- Technicalrecognition- guidelines, scientific or technical knowledge.
- Public recognition- social and cultural values and opinion of a segment of the public, especially the community directly affected by the project.
- Professional interpretation of evaluator.
- Prediction of magnitude of the potential impacts

This step refers to the description, quantitatively (where possible) or qualitatively, of the anticipated impacts of the project

i. Identification of mitigation measures

It is determined that the predicted impact is significant when compared with the criteria for determining the significance, suitable mitigations measures are then accordingly identified. These measures can be classified into following categories:

- Avoiding the impacts altogether by not taking certain project activity or part of an activity.

- Minimizing impacts by limiting the degree or magnitude of the activities. For example, minimizing dust emission by reducing the vehicular traffic.
- Rectifying the impacts by repairing, rehabilitating, or restoring the affected environment.

ii. Evaluation of the residual impacts

Incorporation of suggested mitigation measures reduce the environmental impacts of the project and bring it within the acceptable limits. This step refers to the identification of the anticipated remaining impacts after mitigation measures have been applied.

iii. Identification of monitoring requirements

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

6.3 IMPACT DUE TO PROJECT LOCATION

6.3.1 Displacement of Existing Land Use

The existing land use of the project site is already in use since decades. So this land will be used for the development of this project.

6.3.2 Loss of Vegetation

This is machinery installation only. Considering the scale of the project and commonly found flora and fauna within the project influence area, no significant adverse effects are envisaged on the ecology of the area.

6.3.3 Shifting of Utilities

There will not be any shifting of existing utilities such as water supply pipelines, sewers, electrical lines, etc. due to the proposed project.

6.3.4 Relocation of People

Currently, there are no infringements on the project site that may be affected therefore relocation exercises are not required.

6.3.5 Destruction of EnvironmentallySensitive and Critical Areas

The project does not involve in destruction of any environmentally sensitive and critical area such as forests, wetlands, major water bodies etc.

6.3.6 Destruction of Archaeological/Religious/Cultural Property

There are no archeological sites, monuments, religious sites, tombs or any other type of cultural places within the project area. Therefore, impacts of the project on such sensitive sites will not occur.

6.4 IMPACTS DUE TO PROJECT DESIGN

Design of the proposed project can have impacts on the environment if it is not prepared according to sustainable design approach. Sustainability is an important issue to consider in design, not only due to environmental concerns but also due to economic and social matters, promoting architectural quality and economic advantages. At pre-construction phase a management system should be provided at design level so impacts can be reduced. Design of the proposed building will adhere to all standard technical requirements in order to avoid adverse impacts on environment and human health.

6.5 IMPACTS ASSOCIATED WITH THE CONSTRUCTION PHASE

Construction phase of this project of Construction of Envirocare (Construction of Incinerator unit for Hazardous and Non- Hazardous Waste) is likely to cast a few adverse environmental impacts (temporary in nature), and are hence discussed in this section to see how they can be effectively and practicably mitigated. The impacts that are discussed are as following:

- **Environmental Impact**

  - Construction Noise
  - Emission of Air Pollutants during Construction
  - Vegetation Loss
  - Soil Contamination

- **Socio-economic Impact**

  - Community Safety
  - Health and Safety of Workers

6.5.1 Construction Noise

Depending upon the equipment used and its distance from the receptor, the community may typically be exposed to intermittent and variable noise level. Noise level is measured as ambient noise which is defined as background noise that is always present. In such areas most noise comes from transportation, and human sources. Road traffic noise is generally known to be the major source of noise.

Potential Issues

The potential noise related issues during the construction may cause disturbance to the surrounding communities of the project due to movement of machinery and vehicles operation on or near the project site. The impacts regarding noise will be minimal and temporary on the community. The workers will however be exposed to high noise during ground clearing, excavation, foundation and paving works.

Impact Analysis

The potential sources of significant noise during the construction period include the construction machinery and construction related traffic. Precise prediction of noise due to construction activities at given location at given time requires the list of all equipment that is operational at the time and the following information regarding each piece of equipment:

- The maximum and minimum noise level, measured at reference distance from the equipment, during a work cycle
- Fraction of time it operates at maximum level during a work cycle
- The usage factor, i.e. the number of hours during the day when the equipment is operational
- Distance of equipment from the receptor
- Potential noise barrier and other topographical features that attenuate the sound
- Atmospheric condition, the wind speed and direction, humidity and barometric pressure, also affect the propagation of sound. However for short distances the effect of these is insufficient compared to other variables.

Mitigation

The strategy to minimize the noise in the community within acceptable limits should be based on the followings:

- Reduce equipment noise at source
- Minimize construction related vehicular noise
- Make sure the movement of transportation vehicles should be confined only in the night. The movement of vehicle should be restricted during day time.
- It will conform that construction equipment and vehicles should be equipped with mufflers to effectively decrease generation of noise
- Providing construction workers with suitable hearing protection like ear cap, orear muffs and training them in their use.

- The proposed strategy should be implemented through the following specific measure:

➢ **Reduce Equipment Noise at source**

Based on the above survey, equipment emitting excessive noise in comparison to other similar equipment should not be allowed to operate. Equipment underuse should be regularly maintained, tuned and provided with mufflers to minimize noise level. Equipment in poor state of maintenance, particularly without noise control should be checked to determine if it can be improved, replaced with less noisy equipment as soon as practicable.

➢ **Traffic noise**

- The construction related traffic would enter into thesite through construction gate.
- Blowing of horns will be prohibited on the access road to the plant site and inside the site.
- It will be ensured that all such vehicles are properly tuned and maintained in good working conditions and have quality mufflers installed in order to reduce vehicular noise.

6.5.2 Emission of Air Pollutants during Construction

Different exhaust gases may release from construction equipment and vehicles depending upon the fuel used and the maintenance and tuning condition of vehicles. Dust emission from construction sites is however a major concern with regards to air quality; particularly for the settlement that is found near the construction site. Dust

generated during the construction activities can be substantial. Dust or the equivalent technical term 'particulate matter' (PM) is generally defined as any airborne finely divided solid and liquid material up to the size of about 100 microns. Large particles tend to settle rapidly and often do not reach the receptor. In case where they reach the receptor, the dust is considered as a nuisance, as it may disturb soil property and affect the visibility besides causing breathing difficulties.

Potential Issues

Particulate matter emitted during construction activities can result in deterioration of ambient air quality in the vicinity, and may cause the nuisance for the community and workers.

Impact Analysis

Potential sources of particulate matter emission during construction activities include earthwork, exposed surfaces, exposed storage piles, truck dumping, halting vehicle movement on unpaved roads, combination of liquid fuel in equipment and vehicles, and concrete mixing and batching.

Mitigation

The following mitigation measures will be implemented at the proposed project site during construction to control the emission of particulate matter and other exhaust:

- Water will be sprinkled daily or when there is obvious dust problem on all exposed surfaces to suppress emission of dust.
- Dust emission from soil piles and aggregate storage stockpiles will be reduced by covering the piles, for example with tarpaulin or thick plastic sheet, to prevent emission.
- Construction material that is susceptible to dust generation will be transported only in securely covered trucks to prevent dust emission.

6.5.3 Vegetation Loss

There is no vegetation within 1 km radius of the project site, likely to be damaged in any way as a result of the commencement of this project.

6.5.4 Soil Contamination

During construction phase, the soil quality may be affected due to spills during refueling and discharges from vehicle and equipment. Contamination of soil may occur due to clearance of construction waste in the surrounding area. There will be minor work on the construction of the site which will cause insignificant amount of excavation soil, construction debris and other waste. But if mitigation measures will be applied the overall impact on soil during construction phase will be minimum.

Impact Analysis

- During the construction of theproject spills of fuels, lubricants and chemicals can take place:
    - During transfer from one container to another
    - During maintenance of equipment and vehicles
    - Due to leakage from the containers and equipment

Depending on nature of material, location of spill and quantity of spill, soil can get contaminated.

Mitigation

The following control measures are proposed to mitigate the impact on the soil resources:

- Spills prevention trays should be provided and used at refueling locations
- During on the site maintenance of vehicles and equipment, tarpaulin or other impermeable material should be spread on the ground to prevent the contamination of the soil.
- Regular inspection should be carried out to detect the leakage in construction vehicles and equipment
- Fuels, lubricants and chemicals should be stored in covered banded areas
- Appropriate arrangement, including shovels, plastic bags and absorbent material, should be available near the fuel or oil storage area

6.5.5 Community Safety Potential Impacts

The construction activity can potentially be a safety hazard for the community; in particular, owing to the increase in the construction related traffic on the project access road.

Impact Analysis

Project related traffic; particularly on the section of the access roads and the stockpiles of construction materials outside the boundary of the project site (if any); especially the steel bars will be major sources of concern for the community safety. The construction activities near the residential areas will also create several potential safety hazards.

Mitigation

The following are the mitigation measures:

- A public safety plan should be developed
- Community complaints register and other means should be adopted for the community to complain.
- Fence surrounding the site should be put in on during the construction to prevent public access to construction site.
- All entry points into the construction area should be staffed 24 hours a day. People who are not related to the project should not be allowed inside.
- No machinery should be left unattended, particularly in the running condition.

6.5.6 Health and Safety of Workers

Health and safety impacts of the project on workers and communities in the area of influence of the project will be reasonably managed. During construction phase, minor and severe injuries to workers due to machine operation and earthwork may occur but if managed properly, this impact can be mitigated.

Mitigation

- All reasonable precautions will be taken for the safety of employees
- Construction activities would be carried out under the supervision of a suitably experienced person.
- Necessary safety gear will be provided to all employees and proper supervision will ensure that the gears are worn at all times.

- First aid kits and other necessary equipment are kept available at Project Site along with a list of emergency phone numbers to be contacted in case of any emergency or accidents.
- All workers will be required to wear protective gear and equipment that conforms to safety standards. Security of the project site will be imposed at all times.

6.6 ENVIRONMENTAL IMPACTS ASSOCIATED WITH OPERATIONAL ACTIVITIES

The environmental and socio-economic impacts related with the operation phase of the Proposed Project are discussed in this section. The impacts that are discussed arethe following:

- Noise
- Land and Soil
- Air pollution
- Solid Waste Management
- Socio economic impacts
- Emergency response

6.6.1 Noise

Potential Issues

Waste handling and incinerator operations generate noise (e.g., from machinery or trucks) and potential odors, particularly in Attock's humid monsoon season when organic waste decomposition is accelerated

Mitigation

- Measure: Use enclosed waste storage areas, odor-neutralizing systems (e.g., biofilters), and soundproofing for machinery. Schedule waste deliveries to avoid peak hours.
- Outcome: Reduces disturbances for the 36 residents and 9 shops in the mixed-use building.
- Attock Context: Odor control is vital in humid conditions (e.g., 76–87% humidity in July) to prevent complaints.

6.6.2 Land and Soil

Incinerator facilities require land and may alter the aesthetic of the area, potentially affecting property values or community perception in urban Attock.

Nature of Impact

This impact is considered to be positive, long-term and significant.

6.6.3 Air Pollution

Incinerators emit pollutants such as particulate matter (PM), dioxins, furans, nitrogen oxides (NOx), sulfur dioxide (SO2), and carbon monoxide (CO). In Attock's hot and humid climate (e.g., 33–40°C, 76–87% humidity in July), emissions may contribute to air quality degradation, especially during monsoon-related temperature inversions.

Combustion of waste releases carbon dioxide (CO2) and potentially methane (CH4) if incomplete combustion occurs. For 216 kg/day of waste, CO2 emissions could be approximately 100–200 kg/day, depending on waste composition (e.g., organic vs. plastic content).

Nature of Impact

The nature of impact will be direct, medium, long-term and significant.

Mitigation

- **Air Emissions Control**:
  - **Measure**: Install advanced emission control systems, including electrostatic precipitators, baghouse filters, and wet/dry scrubbers to capture PM, dioxins, and acidic gases. Use activated carbon injection to adsorb dioxins and mercury.
  - **Outcome**: Reduces emissions to meet standards like the EU Waste Incineration Directive (e.g., dioxin emissions <0.1 ng/m³). Continuous emission monitoring ensures compliance.
  - **Attock Context**: Regular maintenance is critical during humid monsoons to prevent system inefficiencies.

- **Greenhouse Gas Reduction**:
  - **Measure**: Optimize combustion to ensure complete burning, minimizing CH4 and CO emissions. Use energy recovery systems to generate electricity (e.g., 500–700 kWh/ton of waste), offsetting fossil fuel use.
  - **Outcome**: Reduces net CO2 emissions by displacing coal or gas-based power. Potential integration of carbon capture technology for future scalability.

- **Attock Context**: Energy recovery aligns with local needs, given high summer energy demands for cooling.

6.6.4 Solid Waste Management Impact Analysis

Incineration produces bottom ash (15-20% of waste volume) and fly ash (1-5%), which may contain heavy metals or toxic residues. For 216 kg/day, this could yield 30-40 kg/day of ash, requiring safe disposal or reuse.

Nature of Impact

The nature of impact will be positive and significant.

Mitigation

Ash Management:

- **Measure**: Treat and test bottom ash for reuse in construction (e.g., road base or cement) and stabilize fly ash with chemical agents before disposal in lined landfills.
- **Outcome**: Minimizes landfill use (e.g., 30–40 kg/day ash from 216 kg/day waste) and prevents leaching of heavy metals.
- **Attock Context**: Secure ash storage is essential during monsoons to prevent runoff into local water bodies. Groundwater Consumption Impact Analysis

Prolonged water consumption may in the long run lower/deplete the underground water table. This will be a moderate negative impact.

Mitigation

Following operational measures will be adopted for water conservation:

- Repair Any leaking or dripping faucet, pump or toilet will be reported immediately; and
- Use of water-saving equipment will be practiced both in houses and green areas.

6.6.5 Wastewater Impact Analysis

Wet scrubbers used in emission control systems consume water and generate wastewater with pollutants. In Attock, with 432 mm annual rainfall and high monsoon precipitation, effluent management is critical to prevent water contamination.

Mitigation:

Measure: Implement wastewater treatment systems (e.g., neutralization and filtration)

for scrubber effluents. Use rainwater harvesting to supplement water needs, reducing reliance on Attock's municipal supply (e.g., supporting 1,000-gallon daily demand).

Outcome: Prevents contamination of local water sources and supports sustainable water use.

Attock Context: Critical during heavy rainfall (e.g., 30 mm/day in August) to manage effluent and leachate.

6.6.6 Socio-Economic Impacts

This project boosts up the socio-economic conditions by providing the people with different economic opportunities. The operation of this project will bring for the locals, besides job opportunities for unskilled and semiskilled labor.

The socio-economic impacts like employment, life, style and cultural uplift are the direct benefits during this stage for the people of the Project Area. Local people will be hired for different jobs, i.e. gardening, housekeeping, cooking, waiters, driving etc. Operation of the project will also result in the increase land values. All the Project related job opportunities will ultimately improve per capita income of the population in the area. This is a major positive impact.

Mitigation

As this is a positive impact so it doesn't need mitigation measures.

6.6.7 Emergency Response

Incidents and accidents may take place unexpectedly during project operations. These may include;

Fire Hazard

Operation of project will be manageable but negligence in operations may cause risk of safety and health problems. Mismanagement may lead to fire hazard, which poses a serious threat.

Mitigation

- Thefirefighting system will include water and gas devices / extinguishers.
- Oilstorage tank area will be provided with foam devices / extinguishers.
- Fire extinguishers should be properly maintained and checked periodically.
- Flammable materials in the premises should be prohibited.
- Pressure gauges should be checked monthly.
- Adequate training of workers on use of firefighting system to deal with emergency

situation.

6.7 POTENTIAL ENVIRONMENTAL ENHANCEMENT MEASURES

Following are the positive impacts of the Proposed Project that will enhance the overall socio- economic and ecological condition of the Project Area.

6.7.1 Local Economy

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

6.7.2 Employment/Poverty Alleviation

The employment opportunities in the Project Area will be increased due to the development and operation of the proposed project. During development and operation of the proposed project unskilled workers will be required as labors,

sanitary workers and sweepers as well as for the skilled workers such as; accounts and managers to run the administration office. In totality, the overall economic conditions of the area will be improved.

6.7.3 Increased Business Opportunities

For a construction of the project, a number of raw- material will be required. Many venders can supply the required stuff to the on daily and weekly basis. This will serve as a new business opportunity and it will enhance the socio-economic status of the people direct linked with it.

6.8 SUMMARY OF THE ENVIRONMENTAL IMPACTS

Key impacts related to the construction phase include:

- Construction Noise
- Solid Waste
- Soil Contamination
- Air Pollution
- Community and Workers' Safety

Mitigation measures recommended to be incorporated into the project include running the machines and vehicles on good quality (low-sulfur fuels) in good working order ensuring regular maintenance tuning and servicing, and providing them with emission control devices, such as mufflers and silencers, etc. Water suppression and covered transportation and storage of the construction materials and slow driving on unpaved

roads will control dust emission. Solid waste of construction activities will be used for flooring, while the remaining solid waste will be managed as per practices in the area. For community safety, irrelevant persons will not be allowed inside. Safety of the workers will be ensured by discouraging any careless attitude of workers and providing the workers with, and encouraging them to use PPEs.

Key impacts related to the operation phase include:

- Air pollution
- Waste Water
- Odor

waste water will be reused & will be recycled. For or air pollution air control device will be installed, for odor unit is already away from residential area.

CHAPTER-7

ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

7.1 GENERAL

This section provides brief description of environmental issues, mitigation measures to eliminate and/ or reduce environmental and social impacts to an acceptable level, institutional arrangement for the implementation of the mitigation measures and also carrying out environmental monitoring for air quality, water quality, and noise pollution related parameters. A budgetary plan is also to be developed indicating estimated costs to be incurred to mitigate potential negative impacts of the proposed Project.

7.2 OBJECTIVES OF THE ENVIRONMENTAL MANAGEMENT PLAN

The Environmental Management Plan (EMP) will help the proponent to address the future likely negative impacts of the proposed Project, enhance the Project's overall benefits and introduce standards of good environmental practice. The primary objectives of the EMP are:

- Define the responsibilities of the Project Proponent and other role players during the design, construction and the operational phases;
- Facilitate the implementation of the mitigation measures by providing technical details of each Project impact, and proposing an implementation schedule of the proposed mitigation measures;
- Develop a monitoring mechanism and identify monitoring parameters to ensure that all the proposed mitigation measures are completely and effectively implemented;
- Identify training requirements at various levels and provide a plan for the implementation of training sessions;
- Identify the resources required to implement the EMP and outline corresponding financing arrangements; and
- Providing a cost estimate for all the proposed EMP actions.

7.3 MANAGEMENT APPROACH

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

7.3.1 Proponent

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

7.3.2 Role of Contractor in EMP

The Contractor will be responsible for the implementation of the proposed Project under the supervision of the Proponent. The Contractor will be bound to follow the provisions of the contract documents especially about environmental protection and apply good construction techniques and methodology without damaging the environment. Obligation of the contractor, to safeguard, mitigate adverse impacts and rehabilitate the environment should be addressed through environmental provisions in the contract document and through adequate implementation at site.

7.4 STAFF AND TRAINING

7.4.1 Environmental Committee and its Responsibilities

Proponent will form up an Environmental Committee (EC), which will be responsible for the environmental management and supervisory affairs during the construction phase of the proposed Project.

The responsibilities of the Environmental Committee (EC) are as follows:

- To ensure implementation of all the proposed mitigation measures during and after the proposed Project;
- To organize routine monitoring of motor vehicle emissions, air quality, traffic, noise and vibration; etc. In case, the noise and emission levels exceed the acceptable levels;a penalty or ban must be enforced;
- To develop operational guidelines and implementation schedule;

- To ensure that the proposed Project is implemented in an environmentally friendly manner, causing least harm to the existing environment including flora and fauna, sites of religious and cultural significance etc.

7.4.2 Technical Training Programs

In order to raise the level of professional and managerial staff, they need to upgrade their knowledge in the related areas. The Environmental Committee should play a key role in this respect and arrange the trainings.

Contractor's environmental awareness and appropriate knowledge of environmental protection is critical to the successful implementation of the EMP because without appropriate environmental awareness, knowledge and skills required for the implementation of the mitigation measures.

7.5 SPECIFIC IMPLEMENTATION RESPONSIBILITIES

This section describes the responsibilities of different functionaries during the design, construction and operational phases of the proposed Project.

7.5.1 Design Phase/ Pre-Construction Phase

Project Manager and his staff are responsible for ensuring that the proposed Project design and specifications adequately reflect the EMP. The responsibilities of Project Manager and his support staff would be as follows:

- To get EIA approved by EPA Punjab;
- Setting up systems for environmental management; and
- Incorporating environmental mitigation measures in the design/ tender document.

7,5,2 Construction Phase

The Contractor(s) will be responsible for compliance of environmental mitigation measures for the proposed Project, while SEO will monitor the compliance.

7.5.2 Operational Phase

Proponent will be responsible for the following:

- Coordinating with the operations staff working to monitor environmental compliance during the Plant's operation;

- Reporting on the progress of environmental compliance to EPA Punjab;
- Assessing the long-term environmental impacts of the Plant's operation; and
- Report to Managing Director about the progress of work.

7.6 ENVIRONMENTAL MANAGEMENT PLAN

The Environmental Management Plan (EMP) is developed to eliminate and/ or mitigate the impacts envisaged at the design, construction and the operational stages and provide specific guidelines for long-term monitoring by identifying the roles and responsibilities of the Proponent, Design Consultant, and Contractor(s).

7.6.1 Environmental Monitoring Plan for Construction Phase

Environmental monitoring is a vital component of the Environmental Management Plan. It is the mechanism through which the effectiveness of the environmental management Plan in protecting the environment is measured. The main objectives of the environmental monitoring during the construction phase will be:

- To provide a mechanism to determine whether the project construction contractors are carrying out the project in conformity with the EMP.
- To identify areas where the impacts of the project are exceeding the criteria of significance and, therefore, require corrective actions.
- To document the actual project impacts on physical, biological, and socio- economic receptors, quantitatively where possible, in order to design better and more effective mitigation measures.

Following environmental record should be maintained:

- Periodic inspection reports of the site
- Description of any damage to vegetation, water resource, or community asset.
- Corrective measures taken, if any
- Waste Tracking Register that will hold records of waste generated during the construction period. This will include quantities of waste disposed, recycled, or reused.
- Records of water consumption with use wise breakdown

Table 7.1: Environmental Management Plan (Construction Phase)

Aspect	Impacts	Mitigation Measure	Responsibility	
			Implementation	Supervision
Soil	Due to the construction activities, soil erosion and contamination may occur	▪ All spoils will be disposed off as desired and the site will be restored back to its original conditions before handing over; ▪ Non-bituminous wastes from construction activities will be dumped in approved sites, in line with the legal prescriptions for dumpsites, and covered.	CC	EC
Air Pollution	Health impacts (dryness, roughness of throat, coughing etc.) on the workers associated with fugitive and point emissions as a result of different activities such as transportation,	▪ Water sprinkling; ▪ Provision of dust masks to workers; ▪ Use of well-maintained machinery and equipment; ▪ Vehicles carrying machinery will use	CC	EC
Noise Pollution	Health impacts (increase in blood pressure, hypertension etc.) due to the operation of construction machinery and equipment	▪ Providing ear plugs/ear muffs to workers; and ▪ Use of well-maintained machinery and equipment with reduced noise levels ensured by suitable in-built muffling devices. ▪ No use of heavy noisy equipment during prayer timings	CC	EC
Solid Waste	Health impacts on the workers due to different construction activities	▪ Reuse of solid waste (surplus excavated material, construction and demolition material) in construction work where possible or dispose of to officially designate dumping site ▪ Provision of Bins and containers at the camp site and active construction sites ▪ Daily collection of solid waste by the contractor	CC	EC

Health and Safety of Workers	Minor and severe injuries due to the operation of construction machinery and equipment	▪ Implementation of HSE plan for construction purpose already developed and attached as **Annexure-XI.** ▪ Use of well-maintained machinery and equipment; ▪ Training of workers in the construction safety; ▪ A contingency plan in case of major accidents; ▪ Provision of protective clothing for laborers handling hazardous materials, e.g. safety helmet, adequate footwear, protective goggles, gloves etc.	CC	EC
Groundwater	Groundwater may get contaminated due to the disposal of construction waste generated during the project activity. Also the water for construction and consumption may come in conflict with local water demand.	▪ The solid waste will be disposed off in designated landfill sites (if any) to sustain the water quality for domestic requirements; ▪ Water required for construction may be obtained in such a way that the water availability and supply to nearby communities remain unaffected; and ▪ Protection of groundwater reserves from any source of contamination such as the construction and oily waste that will degrade its potable quality.	CC	EC
Traffic Management	This may result in traffic jams and cause inconvenience to the people travelling, due to movement of vehicles carrying construction materials.	▪ Movement of vehicles carrying construction materials should be restricted during the daytime to reduce traffic load. ▪ Liaison between the Traffic Police, Executing Agency and the Contractor to facilitate traffic movement during construction stage.	CC, Traffic Police	Traffic Police
Community Safety Plan	Problems for the residents of the area due to increased construction activity.	▪ Fence surrounding the site will be put in on during the construction to prevent assesses. All entry points into the site will be staffed 24 hours a day with guards. No machinery will be left unattended, particularly in the running condition.	CC	EC

7.6.2 Environment Management Plan for Operation Phase

This section outlines the aspects that will be covered in the EMP for the operational phase of the project, but also to enhance project benefits, and to introduce standards of good practice to be adopted for all project activities.

Table 7.2: Environmental Management Plan (Operational Phase)

Aspect	Impacts	Mitigation Measures	Implementation
Overall environmental impacts	To reduce overall negative impact of the project on the environment and conserve natural resources.	Should take all possible measures to ensure that operation of the project does not harm any component of the environment.	Proponent/ Management
Noise Pollution	To ensure that the noise levels do not exceed the limits and that the vibrations may not cause irreversible loss	▪ Proponent has planned a proper plantation plan which will also act as barrier for noise. ▪ Provision of noise barriers towards receptors. ▪ Use of Latest Machinery	Proponent/ Management
Water Conservation	To conserve the water	▪ Water Conservation techniques will be implemented ▪ Water balance should be tracked and recorded ▪ Water leakages should be repaired on immediate actions	Proponent/ Management
Wastewater Management	To avoid pollution of the water body to which the domestic wastewater is to be drained and its after-effects	▪ Wastewater will be flushed into the main trunk sewer after treatment.	Proponent/ Management
Air Pollution	The quantity of air pollutants may increase due to the operation of Generators.	▪ air qualitymonitoring, air control device and improvement plan will be developed to keep the air pollution levels to minimum; ▪ Plantation of trees inside and outside the boundary of the plant to minimize the effect of air pollution;	Proponent/ Management
Solid Waste Management	To manage waste in an environment friendly manner.	▪ Most of the operational waste will be reused by the other industries ▪ Solid waste will be disposed of by the regulations of TMA. ▪ Proper waste management plan will be implemented.	Proponent/ Management
Energy Conservation	Conservation of energy and use of environmental-friendly energy sources	▪ Efforts should be made to ensure that energy is conserved and that environment-friendly techniques are adopted too. ▪ Plans should be made to bring renewable energy resources into use	Proponent/ Management

		▪ Energy audits should be conducted	
Emergency Response	To deal with any emergency efficiently	▪ An Emergency Response Plan for earthquakes and manmade disasters will be developed by the Management. Emergency Response Plan will be implemented in close consultation with the Fire Fighting Department. Firefighting plan will also be in place.	Proponent/ Management
Environmental Monitoring	To ensure that periodic reports on environment at the project site are furnished to EPA in pursuance of conditions of the environmental approval.	A mechanism should be employed for Environmental Monitoring at the project when it comes into operation	Proponent/ Management

7.7 ENVIRONMENTAL MONITORING

This section provides environmental monitoring plan that identifies the roles and responsibilities of project staff involved in environmental monitoring and list the parameters that will be used in the monitoring process.

7.7.1 Objectives

The main objectives of the pre-construction and construction phase monitoring plans will be to:

- Monitor the actual impact of the works on the project site physical, biological and socio-economic receptors. This will indicate the adequacy of the EIA;
- Recommend mitigation measures for any unexpected impact or where the impact level exceeds the anticipated impact;
- Ensure compliance with legal obligations including safety on construction site; and
- Ensure the safe disposal of excess construction materials.

- The main objectives of monitoring during the operational phase will be to:

  - Appraise the adequacy of the EIA with respect to the project's predicted long- term impacts of operation of the Project on physical, biological and socio- economic environment;
  - Evaluate the effectiveness of the mitigation measures proposed in the EMP and recommend improvements, if and when necessary; and
  - Compile periodic Environmental Monitoring reports on the basis of recommendations in EMP.

Table 7.3: Environmental Monitoring Plan at the Construction and the Operational Stages

Components	Parameters	Location	No. of Samples	Frequency	Responsibility	Duration	Budget (Rs)
Construction Phase							
Air Quality	CO, NO_x, SO_x, PM_{10}	From the Project site	1	Quarterly	CC	24 hours	60,000
Noise Level	-	From the Project site	5	Monthly	CC	24 hours	9,000
Water Quality	For parameters given in PEQs	Tube well / hand pump	1	Quarterly	CC		20,000
Operation Phase							
Air Quality	O3, CO2, CO, NO_x, SO_x, PM_{10}, $PM_{2.5}$	Stack Emissions from Generators	1	Bi-annually	EC	24 hours	80,000
Ground Water Quality	All Parameters in PEQS i.e. Total Coliforms, Fecal E. Coli, Total Colonial Count, Arsenic, Chloride, Fluoride, Manganese, Iron, Nitrates, Nitrites, pH, TDS, , DO etc.	Tube well	3	Annually	EC	-	60,000
Wastewater Quality	All Parameters in PEQS	Liquid Effluent	2	Bi-annually	EC	-	60,000
Noise Level	-	Inside plant	10	Bi-annually	EC	24 hours	5,000

7.8 COMMUNICATIONS AND DOCUMENTATION

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

7.8.1 Meetings

Two kinds of environmental meetings will take place during the project:

- Kick-off meetings
- Weekly meetings

The purpose of the kick-off meeting will be to present the EMP to project staff and discuss its implementation and to discuss any event of environmental significance that has happened in the under-discussion industry or a similar industrial unit to investigate its route causes and develop its solutions.

7.8.2 Changes-Record Register

A change-record register will be maintained at the site, in order to document any changes in project design. These changes will be handled through the change management mechanism.

7.9 ENVIRONMENTAL TRAINING

Environmental training will help to ensure that the requirements of the EIA and EMP are clearly understood and followed by all project personnel in the course of the project.

7.10 TREE PLANTATION PLAN

Tree planting is recognized as one of the most engaging, environmentally friendly activities that can reduce the negative impacts on the environment due to construction activities. Trees provide numerous long-term and short-term benefits. A comprehensive tree plantation plan has been proposed for the project site. These trees will work as buffer zone and they will enhance the aesthetics of the project site. Ten times more plants will be planted against cutting of each tree. Almost total 2500 number of trees as well as flower and plants will be planted after the installation of Machinery. Comprehensive tree plantation Plan is attached as ***Annexure-XII.***

7.11 ENVIRONMENTAL BUDGET

For an effective implementation of environmental mitigation measures, it is very important to provide sufficient funds for implementation of environmental mitigation

measures, monitoring and training. The total cost of these items has been worked out and provided as below during construction:

Monitoring Cost (Laboratory +Transportation):		Rs. 750,000
Training Cost	:	Rs.150,000 Lumpsum
Total	:	**Rs. 900,000**
	:	**Rs. 0.9 Million**

CHAPTER 8

CONCLUSIONS

This report presents the Environmental Impact Assessment (EIA) for the Envirocare (Construction of Incinerator unit for Hazardous and Non- Hazardous Waste), Attock **located at** Khasra No. 4320/4329, Mouza Khoda, Tehsil Hassan Abdal District Attock. In this project the proponent Incinerator Unit. This is to be done in the most efficient manner possible, to keep costs low and prevent waste buildup. As with time, demand is increasing and to meet the demands in this area and also in the other cities,

The Project is beneficial for the Locals. The Proposed Project will create Job opportunities for the locals, moreover business opportunities would be created by distribution of products, transportation of products, sales of products and maintenance work at Plant like electrical /sanitation/security etc.

The overall objective of this EIA is to assess impacts caused by the different activities of the proposed project and to address measures to mitigate adverse environmental impacts arising from the execution of the proposed project.

The conclusions mentioned below are based on the findings of EIA Report, which has been carried out as per requirement of EPA Punjab.

It is accordingly recommended that Environmental Approval for the project may be issued by the Punjab Environmental Protection Agency, subject to payment of the requisite scrutiny fee by the proponent of the project.

8.1 Main Issues and Concerns

During the field surveys, significant efforts were made to identify the main environmental, ecological and social issues related to the implementation of the proposed project. Following temporary issues may occur during construction of proposed project: **TABLE 8.1**

SUMMARY OF ENVIRONMENTAL IMPACTS

Sr. No.	Resources		Envisaged Impacts	Construction Phase	Operational Phase
1.	Physical Resources	i)	Land Acquisition	No Impact	-
		ii)	Dismantling of Structures	N/A	-
		iii)	Relocation of Existing Utilities	N/A	-
		iv)	Change of Land use	Minor Negative	-
		v)	Induced Roadside Development	-	-
		vi)	Soil Erosion & Contamination	N/A	-
		vii)	Disposal of Spoil	Minor Negative	-
		viii)	Surface and Groundwater	Minor Negative	Minor Negative
		ix)	Flooding	-	-
		x)	Air Pollution	Minor Negative	Insignificant
		xi)	Dust	Moderate Negative	-
		xii)	Noise	Moderate negative	Minor Negative
		xiii)	Degradation of Canal Bed	Insignificant	-
		xiv)	Topography	Moderate Negative	-
		x)	Disposal of Mucking Material	Minor negative	-
		xi)	Borrow/Open Pits	-	-
		xii)	Excavation of Earth	N/A	-
2.	Ecological Resources	i)	Loss of vegetation	NO IMPACT	-
3.	Social & Cultural	i)	Relocation of Population	No Impact	-
		ii)	Disturbance to People	Minor Negative	-

	Resources	iii)	Disruption of Existing Utilities	Insignificant	-

		iv)	Traffic Management	Minor Negative	-
		v)	Health & Safety of workers and Public	Moderate Negative	
		vi)	Economic Activity	Minor Positive	Major Positive

- Noise and air pollution due to the operation of construction machinery during construction phase of the project may occur;
- Health and safety problems of the workers may also arise during the construction and operation phases of the project.

All the adverse impacts of the proposed project have properly been mitigated and a comprehensive EMP has been formulated. The implementation of EMP will help to eliminate the impacts of the project.

8.2 Recommendations

❖ The Environmental Impact Assessment (EIA) study and survey results are finally evaluated to recommend the following:

- Implementation of EMP must be given top priority.
- Use of equipment with low operating noise levels within PEQS limits and regular monitoring of machines used during construction phase.
- The construction activities shall be phased to confine the disruption of traffic. Traffic diversion/re-routing plans, if found necessary, shall be made with the help of traffic police for smooth flow of traffic. The vehicles carrying the construction materials will not be allowed to enter into the town during rush hours which could be possible at night hours;
- Noise measurements shall be carried out at locations and schedule specified to ensure the effectiveness of mitigation measures; and
- Health and safety problems of the workers shall be ensured during the construction and operation phases of the project.

As a conclusion of the study, the proposed project will not cause potentially significant environmental and social adverse impacts on the local environment after implementation of the mitigation measures. Results of the EIA study have shown that overall the project is environmentally feasible. Most of the environmental impacts are low adverse in nature. However, these impacts can be mitigated by the implementation of Environmental Management Plan.

Annexure-I

Proponent CNIC

TERMS OF REFERENCE (TOR) OF EIA
OF ENVIROCARE

1. Title

EIA of **ENVIROCARE**

2. Project Proponent

ZAHID S/O ZARBAT KHAN S/O KHAWAJA Ameer Khan

Position: C.E.O Envirocare (Construction of Incinerator unit for Hazardous and Non-Hazardous Waste) Incinerator Unit.

Address: Khasra No. 4320/4329, Mouza Khoda, Tehsil Hassan Abdal District Attock

3. Consultant Contact Address

M/S Bio Green Environmental Consultant

24B, Gulberg III

Attock, 54810, Punjab, Pakistan

Mail: hafsa_ali25@yahoo.com

Tel: +92332-4420886

4. Project Overview

This project presents an overview of the main findings of *Environmental Impact Assessment* report for the**Envirocare (Construction of Incinerator unit for Hazardous and Non- Hazardous Waste)Incinerator Unit Attock** located at Khasra No. 4320/4329, Mouza Khoda, Tehsil Hassan Abdal District Attock. In this project the proponent Incinerator Unit. This is to be done in the most efficient manner possible, to keep costs low and prevent waste buildup. As with time, demand is increasing and to meet the demands in this area and also in the other cities.

5. IEE/EIA Legal Requirement

IEE/EIA is mandatory according to the Punjab Environmental Protection Amended Act (PEPA-2012). Section 12 (1) of the PEPA-2012 which states that:

"No proponent of a Project shall commence construction or operation unless he has filed with the Federal Agency an the Environmental Impact Assessment (EIA)or, where the Project is likely to cause an adverse environmental effect, an environmental impact assessment, and has obtained approval from the Federal Agency in respect thereof."

According to Pakistan Environmental protection Agency (Review of IEE and EIA) Regulations 2022, the proposed project falls under Category B(9) of Schedule II, which requires EIA before commencement of construction.

6. Scope of Work

The Scope of Work as envisaged by the consultant to carry out EIA for the captioned project is elaborated as under:

- Reconnaissance survey of the proposed site of the Project.
- Collection of available data, drawings and all relevant information about the proposed Project.
- Review of applicable existing Environmental Legislation and Standards.

- Review of the available data, drawings and reports to ascertain its adequacy and need for collection of additional data (if any).
- Establishment of baseline environmental conditions.
- Evaluation of potentially positive and negative impacts due to the proposed Project.
- Propose mitigation measures to eliminate or reduce the negative impacts to an acceptable level due to proposed plant construction/operation.
- Preparation of Environmental Management Plan (EMP)
- Prepare the Environmental Impact Assessment (EIA) Report

7. Components of EIAReport

Chapter 1: Introduction

Chapter 2: Statutory Requirements & Standards

Chapter 3: Description of the Project
Chapter 4: Description of the Environment
Chapter 5: Public Consultation

Chapter 6: Environmental Impacts and Mitigation Measures

Chapter 7: Environmental Management Plan

Chapter 8: Conclusions

8. Compliance of Guidelines

The consultancy firm shall be responsible to prepare EIA Report in compliance of following guidelines;

- Guidelines for preparing and reviewing environmental reports
- Guidelines for policy and procedures for the filing, review and approval of IEE
- Guidelines for sensitive and critical areas
- Punjab Environmental Quality Standards (PEQS).

9. Deliverables

Draft EIA Report and Final EIA Report

10. Time Schedule – Four (04) months

Annexure-IV

BIO GREEN ENVIRONMENTAL CONSULTANT

EIA FOR ENVIROCARE

Socio-Economic Baseline Survey of the Project Area

Name of Interviewer: _____ Date: -03-2024

5a) Settlement: _____ (b) Union Council: _____

c) Tehsil: _____ (d) District: Attock

1. Name of Respondent _____
2. Father's name _____
3. Contact Number: _____
4. CNIC: _____
5. Age

   15 - 25

   25 - 35

   35 - 45

   Above 45

6. Marital Status.

   Married Unmarried

7. Caste /ethnic group _____
8. Mother tongue? _____
9. Qualification?

   Below Primary Primary

   Middle Matric

   Intermediate Above Inter

10. Profession _____

11. What is type of your family system?

Joint Nuclear

12. What is employment status of your family members

Govt. Employee Private Employee

Self Employed Unemploye

13. What is your average monthly income?

Less than 5,000

5,001 - 10,000

10,001 - 15000

15,001 - 20,000

Above 20,000

14. How much is your average monthly expenditure

Less than 5000

5,001 - 10,000

10,001 - 15,000

15,001 -20,000

Above 20,000

15. How Many dependents do you have?

16. What is type of ownership of your house

Self Owned Rented

17. Which of the following facilities are available in your house

Electricity Water Supply

Gas Telephone

Sewerage

18. What are the sources of water for your domestic use

Hand Pumps Public Water Supply

Channel Any othe

19. Do you own any Land?

Yes No

What are the common diseases in this area?

20. Is there any health institution in this locality?

Yes No

If yes, then what is that _____

21. Is there any educational institution in this locality

Yes No

If yes, then what is that _____

22. Is there any shrine /mosque /graveyard/historical/archeological site in this locality,

If yes than what is that,

23.

Historical/Archeological Site _____

Shrine _____

Mosque _____

Graveyard _____

24. In your opinion, should this Project be implemented here

Yes No

If yes, then reasons If no, then reasons

25. Remarks (if Any): _____

List of Respondents			
Sr. No.	**Name**	**Father Name**	**Area**
1	Muhammad Ahman	Muhammad Toqueer	ATTOCK
2	Muhammad	MuhammadImran	ATTOCK
3	Moveed Rafi	Rafi Javeed	ATTOCK
4	Javad Umer	Zahid Umner	ATTOCK
5	Nazeer Hamayum	Aftab Liaqat	ATTOCK
6	Naseer Ahmed	Salman Shahbaz	ATTOCK
7	Sajid Latif	M Latif	ATTOCK
8	Rizwan Ali	Manzoor Ijaz	ATTOCK
9	Tanzeel Alam	Shabaz Saeed	ATTOCK
10	Sh M Iqbal	M Ijaz	ATTOCK

HEALTH, SAFETY & ENVIRONMENT PLAN

1. Underground Obstruction

Underground services that have the potential to affect the construction include:

- Underground electricity cables
- Gas mains
- Communication cables
- Water mains
- Sewer mains
- Council drains
- Traffic signal cables

Search would be undertaken to check for major services at least 30 m both upstream and downstream of the proposed works.

2. TRENCHING & EXCAVATION SAFETY

Excavation and trenching are among the most hazardous construction operations.

Dangers of Trenching and Excavation

Cave-ins pose the greatest risk and are much more likely than other excavation related accidents to result in worker fatalities. Other potential hazards include falls, falling loads, hazardous atmosphere and incident involving mobile equipment.

Key issues are:

a) Collapse of Excavations

- **Temporary support**-Before digging any trench pit, tunnel or other excavations, decide what temporary support will be required and plan the precautions to be taken. Make sure the equipment and precautions needed (trench, sheets, props, baulks etc.) are available on site before work starts.
- **Battering the excavation sides**-Battering the excavation sides to a safe angle of repose make also save the excavation safer .In granular soils , the angle of slope should be less than the natural angle of repose of the material being excavated. In wet ground, a considerably flatter slope will be required.

b) Falling or Dislodging Material

- **Loose materials**-may fall from spoil heaps into the excavation. Edge protection should include toe boards or other means, such as projecting trench sheets or box sides to protect against falling materials. Head protection should be worn.

- **Undermining other structures**-Check that excavations do not undermine scaffold footings. Buried services or the foundations of nearby buildings or walls. Decide if extra support for the structure is needed before you start. Surveys of the foundations and the advice of the structural engineer may be required.
- **Effect of plant and vehicles**-Do not park plant and vehicles close to the sides of excavations. The extra loadings can make the sides of excavations more likely to collapse.

c) Falling into Excavations

- **Present people from falling**- Edges of excavations should be protected with substantial barriers where people are liable to fall into them achieve this, use: Guard rails and toe boards inserted into the ground immediately next to the supported excavation side, or fabricated guard rails assemblies that connect to the sides of the trench box the support system itself, e.g. using trench box extensions or trench sheets longer than the trench depth.

3. Protect Yourself

Do not enter an unprotected trench! Trenches 5 feet (1.5 meters) deep or greater require a protective system unless the excavation is made entirely in the stable rock. Trenches (6.1 meters) deep or greater require that the protective system be de-signed by a registered professional engineer or be bases on tabulated data prepared and/or approved by a registered professional engineer.

4. Protective Systems

There are different types of protective systems. Sloping involves cutting back the trench wall at an angle inclined away from the excavation. Shoring requires installing aluminum hydraulic or other supports to prevent soil movements and cave-ins. Shielding protects workers by using trenches or other types of supports to prevent soil cave-ins.

Designing a protective system can be complex because you must consider many factors: soil classification, depth of cut, water content of soil, changes due to weather or climate, surcharge loads (e.g., spoil, other materials to be used in the trench) and other operations in the vicinity.

a) General Trenching and Excavation Rules

- Keep heavy equipment away from trench edges.
- Keep surcharge loads at least 2 feet (0.6 meters) from trench edges.
- Know where underground utilities are located.
- Test for low oxygen, hazardous fumes and toxic gasses.
- Inspect trenches at the start of each shift.
- Inspect trenches following a rainstorm.
- Do not work under raised loads.

5. Excavated Materials

All excavated material must be set back at least 2 feet from the excavation area to prevent possible cave-ins. When the proper setback cannot be provided, materials should be hauled away. Excavation equipment should not be operated or stored where it can create a potential cave-in problem.

6. Construction of signposts, barricades and fencing

Barricades that are impenetrable shall be used to separate pedestrians from hazards on all sides of excavations that may be exposed to pedestrians. Use material and methods suitable to site conditions. Signs and fencing material shall not protrude into the clear pathways.

- A-frames used for defining path of travel (not barricading trenches) shall be placed end to end without spacing, shall be connected and maintained to ensure stability to help a person who is blind negotiate the safe path using a cane.
- Caution tape shall not be used by itself to delineate the path of travel or create a barricade.
- Signposts, scaffolding and fencing supports shall be entirely outside the pedestrian path of travel, minimum 4 feet wide and 80" high without obstruction.
- Construction barriers shall be maintained in a sound, neat and clean conditions.

7. Stockpiles

A stockpile must be planned, constructed, used and maintained so that no person working at the workplace is endangered by any instability of the stockpiled material.

The height of an unstable face of a stock pile must not exceed the maximum safe reach of equipment being used to remove material from stockpile.

8. Walkways

A worker must not walk upon the surfaces of structural members that have shear connectors, dowels or other protrusions unless suitable walkways and runways are provided to eliminate the tripping hazard.

9. Water Accumulation

Water must not be allowed to accumulate in excavation if it might affect the stability of the excavation or might endanger workers. Erosion of slopes by surface water must be prevented if workers maybe endangered.