ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

CONSTRUCTION OF M/S MURTAZA AND BROTHERS

A CHEMICAL FORMULATION AND SCRUBBER PRODUCTION UNIT

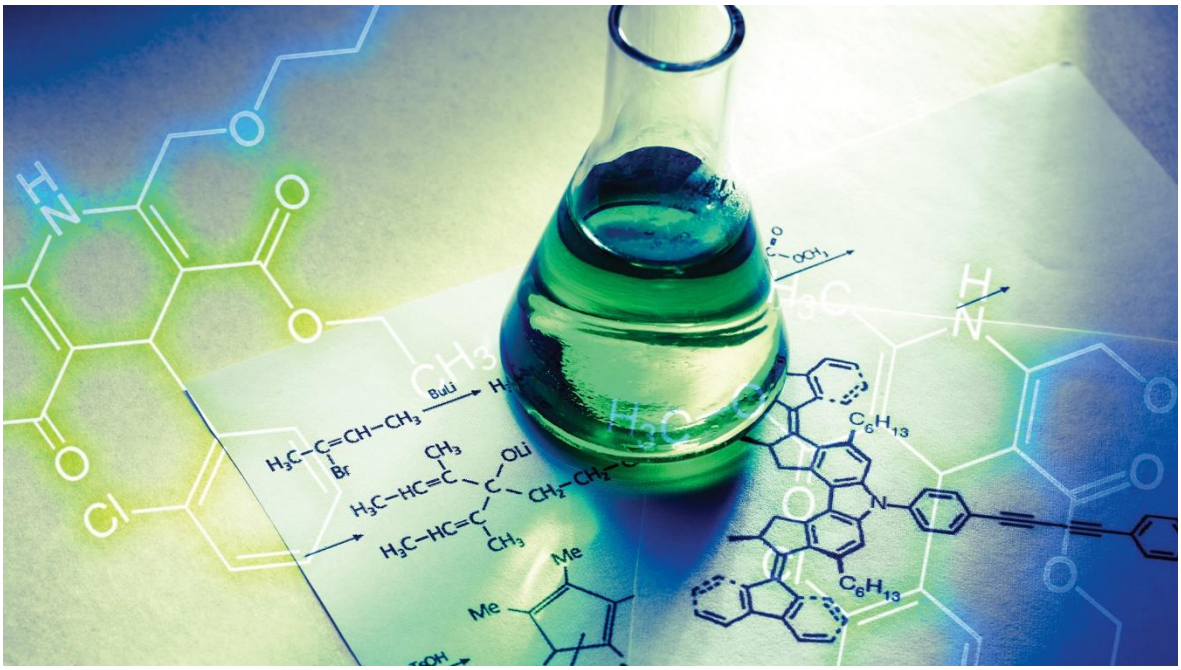

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TABLE OF CONTENTS

TABLE OF ANNEXURE:

LIST OF ABBREVIATIONS

EIA	Environmental Impact Assessment
IEE	Initial Environmental Examination
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
EPD	Environmental Protection Department
PEQS	Punjab Environment Quality Standards
NOC	No Objection Certificate
PEPA	Punjab Environmental Protection Act 1997 (Amended 2012)
PTCL	Pakistan Telecommunication Company Limited
SNGPL	Sui Northern Gas Pipeline Limited
STP	Sewerage Treatment Plant
TMA	Tehsil Municipal Administration
WAPDA	Water and Power Development Authority
IMC	Implementation and management committee
EMMP	Environmental management and monitoring plan

EXECUTIVE SUMMARY

Mr. Ghulam Murtaza is planning to establish a manufacturing facility, M/S Murtaza and Brothers, in the Bhelwal Industrial Estate, Sargodha. The facility will be involved in formulation and mixing of different chemicals to manufacture various cleaning products, including bathroom cleaners, toilet cleaners and floor cleaners. Besides that, steel wire scrubbers for dish washing will also be manufactured.

To fulfill the desired need, an environmental approval is required from the EPA Punjab, for this the proponent has entrusted A+ consultants to conduct complete environmental study of the project.

As, the project falls under Schedule II (B)(2) (Chemical Projects requiring EIA), according to the Environmental protection agency, Government of Punjab Lahore and EIA / EIA Regulations 2000 made under section 12 of Punjab Environment Protection Act 1997 (Amended 2012). So, an Environmental Impact Assessment (EIA) is mandatory for getting Environmental Approval. The Director General, EPA Punjab is the authority to issue the requisite Environmental Approval after proper review of the project.

1. **Title and Location of the Project:**

Title: "M/S Murtaza and Brothers"

Location: Plot number 7 and 8, Bhelwal Industrial Estate, District Sargodha.

2. **Name of the Proponent:**

Mr. Ghulam Murtaza

3. **Name of the Consultants:**

A+ Consultants

4. A Brief Outline of the Proposal:

M/S Murtaza and Brothers is a manufacturing unit in which different chemicals will be mixed according to a specific formula to make the desired product. The final product of this unit will be bathroom, toilet and floor cleaners. Furthermore, steel wire scrubbers will also be manufactured for dish washing purpose. The unit will be constructed at an area of 1 acre in Bhelwal Industrial estate, district Sargodha. The total cost of the project is **400 million**, including 10 Lac Environmental Budget. A transformer of **250 KVA** will be installed to get electricity from the industrial estate. Generators will also be installed as a backup. Ground water will be used to fulfill water requirements. A septic tank will be constructed to treat wastewater before the discharge.

5. The Major Impacts & their Mitigation Measures:

- **Construction Phase:**

Environmental Aspects	Environmental Impacts	Mitigation Measures
Land Disturbance	• Top soil degradation by excavation. • Dislocation of soils. • Land instability. • Contamination of soil.	• The cutting and leveling activities will be restricted to the designated plot boundaries. • Pitching of soil will be done. • All possible chemicals, lubricants, adhesives, paints etc. must be stored at an impermeable area where leakage or leaching in soil is completely ruled out.
Air Quality	• Gaseous and dust emissions from machinery and heavy vehicles. • Chronic respiratory diseases.	• Use of standard construction equipment and vehicles. • Scheduled maintenance of equipment and vehicles including engine tuning, filter cleaning, etc. • Water spraying will be done to reduce dust emissions.

		• The vehicle speeds on graded roads will be limited in order to minimize dust emissions.
Noise Level	• Noise from construction equipment/vehicles. • Negative health effects. • Disturbance to the social environment.	• Noise control policies will be implemented. • Noise levels as per PEQS i.e. 80 dB (A) during day-time and 75dB (A) during night-time. • Construction equipment/machineries will be provided with suitable noise dampening devices. • Vehicles must be tuned and maintained to reduce their noise levels. • Workers on site will be provided with adequate PPEs. • Noise level will be monitored periodically to meet the requirements of PEQS.
Solid Waste	• Health hazards • Unaesthetic conditions	• The solid waste will be collected from the site by the workers of TMA. • The site will be always assessed for any extra wastage of material and reported daily to the supervisor. • Waste should be segregated at the construction site for recycling purpose.

		• No waste will be dumped at any location outside the proposed site boundary.
Water Pollution	• Ponding of water will serve as breeding ground for mosquitoes. • Accidental discharge of material and leachate and other additives can alter the soil and ground water quality.	• Water used for wetting purpose should be reduced to the required extent. • Water conservation practices will be adopted to reduce waste water discharges during construction. • Grey water will be first stored in a holding tank to allow settling of silt and other suspended solid particles and the cleared water will be used for sprinkling and constructional purposes. • Ensure no water remains stagnant at any proposed project area. • In case of spill, immediate action must be taken to prevent leaching. Careful use of machineries and equipment to prevent leakages and spills.
Terrestrial Ecology	• Removal of shrubs at the proposed project site.	• Construction of the proposed project will not involve any flora cutting. • Green areas will be developed in vacant portions of proposed project areas.
Health and Safety	• Lack of awareness among general laborers about health and safety.	• Only skilled workers will be allowed to work at the construction sites.

	• Unskilled and untrained workers Probability of risks and hazards	• Safe for Hot Work procedures should be implemented to avoid accidents. • Provision of first aid facilities for workers at site for meeting the emergency needs of workers. Workers should be facilitated by providing appropriate work specific PPE's. • Construction area will be fenced to avoid accidents and will be properly drained to avoid ponding of water that could harbor mosquitoes and other disease vectors. • Accidents records will be maintained. • Use of signage must be implemented.
Local Economy	• The proposed project will have positive impacts on local economy	• Employment preference will be given to the locals. • People from neighboring areas will be considered for unskilled employment. • Suppliers and Vendors of neighboring areas will be given priority.

- **Operational Phase:**

Environmental Aspects	**Environmental Impacts**	**Mitigation Measures**
Air Quality	• Chronic Respiratory health effects	• The unit will perform no such activities that will pollute or harm air quality.
Noise Pollution	• Eye, nose and throat irritations. • Nausea • Headaches	• No heavy machinery will be installed in the unit that will cause noise pollution.
Solid waste	• Health hazards • Property loss • Unaesthetic conditions	• The waste will include hazardous material which will be properly incinerated. • Contract will be signed for the incineration of the waste with relevant authority during the operational phase • Municipal solid waste like papers, wrappers etc. will be properly dumped in the bins. • The solid waste management plan will be developed and facilities for collection, storage and transportation will be established and organized. • The solid waste generated will be collected from the plant by the TMA. • Dumping of solid waste will be prohibited around the facilities.

Wastewater	• Water borne diseases • Water scarcity • Water pollution	• The wastewater that will be generated in the unit will mostly be from cleaning and sanitary purposes. • Septic tank will be constructed for the primary treatment of wastewater generated from these activities as well as for domestic wastewater. • The treated water will be discharged into the neaby nullah. • Before the final discharge it will make sure that the qualities remain within PEQS. • Water conservation strategies will be employed to avoid wastage of water.
Local Economy	The proposed project will have positive impacts on local economy	• Possibility of recruitment of local workers having pertinent education skills will be explored. • Local businesses such as maintenance service providers, food suppliers, transporters, etc., will likely to have business opportunities associated with the operation of the plant.
Chemical Handling and spillage	• Land pollution • Health hazard	• Regular training will be given to the workers on regular basis. • PPE's box and spillage kit will be provided at different locations. • Chemical Spillage Plan will be prepared and shared at all organizational levels. • Eye wash showers will be installed at different locations.

Health and Safety	• Lack of awareness among general laborers about health and safety. • Unskilled and untrained workers Probability of risks and hazards	• The safety of the public at all stages of the operational phase will be ensured through appropriate public education and safety measures. • All staff within the facility will be in protective gears at all times. • Reporting of all incidents and accidents to include details of: -The nature of the accident or incident; The place and time of the accident or incident; The staff who were directly involved; Any other relevant circumstances will be done. • Fire hydrants will be installed preferably near the main entrances. • All workers will be trained in firefighting. • All windows will be fitted with openable grills

6. Proposed Monitoring:

The EMP is prepared to ensure that the activities are undertaken in a responsible & non detrimental manner with the objectives of:

(i) Providing a pro-active, feasible and practical working tool to enable the measurement and monitoring of environmental performance.

(ii) Guiding and controlling the implementation of findings and recommendations of the Environmental assessment

(iii) Detailing specific actions deemed necessary to assist in mitigating the environmental impact

(iv) Ensuring that safety recommendations.

7. Conclusion

On the basis of findings of this EIA study, it is concluded that operation of quarries will not have any significant adverse impacts on the local population or any segment of environment and by implementation of above provided recommendations and mitigation measures the environmental conditions will further improve the environment.

CHAPTER 1
INTRODUCTION

1.1 Background:

Mr. Ghulam Murtaza is planning to establish a manufacturing facility, M/S Murtaza and Brothers, in the Bhelwal Industrial Estate, Sargodha. The facility will be involved in formulation and mixing of different chemicals to manufacture various cleaning products, including bathroom cleaners, toilet cleaners and floor cleaners. Besides that, steel wire scrubbers for dish washing will also be manufactured.

To fulfill the desired need, an environmental approval is required from the EPA Punjab, for this the proponent has entrusted A+ consultants to conduct complete environmental study of the project.

As, the project falls under Schedule II (B)(2) (Chemical Projects requiring EIA), according to the Environmental protection agency, Government of Punjab Lahore and EIA / EIA Regulations 2000 made under section 12 of Punjab Environment Protection Act 1997 (Amended 2012). So, an Environmental Impact Assessment (EIA) is mandatory for getting Environmental Approval. The Director General, EPA Punjab is the authority to issue the requisite Environmental Approval after proper review of the project.

1.2 Purpose of the Report:

Environmental Impact Assessment (EIA) report is being submitted to the Environmental Protection Agency (EPA), Government of the Punjab, Lahore in compliance with the legal requirements for Punjab Environmental Protection Act-1997 (amended 2012), section-12 for obtaining the Environmental Approval (EA) before starting the operation of the object activity at the project site. The other relevant regulations and guidelines considered while preparing this EIA report will include:

- Policy and procedures for filling, review and approval of environmental assessments.
- Guidelines for the preparation and review of environmental reports.
- Guidelines for public participation.

- Guidelines for sensitive and critical areas.

Different environmental aspects like social, physical, biological etc. and other related features of the project are highlighted in this EIA report. Measures necessary to be adopted to mitigate any environmental impacts on any part of the environment around are also described. All the important information is also provided as described under the format used to help decision makers, EPA Punjab in the present case, before issuing the desired Environmental Approval.

1.3 Detail of the Proponent:

Name: Mr. Ghulam Murtaza

1.4 Detail of Consultants:

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Shumaila Irfan	CEO/Legal /Environmental Advisor	LLM/Environmental Law
Sidra Shahid	Social and Resettlement Expert	M.Sc(Sociology)
Sabah Iqbal	Environmentalist/Social/Resettlement Expert	MS(Environmental Engineering)/M.Sc Sustainable development
Ibrahim Shah	Finance Expert	MBA(Finance)
M.Hashar Ashfaq	Environmental Scientist	MS. (Environmental sciences)
Muneeb Hassan	Environmental Scientist	MS. (Environmental sciences)

1.5 Brief description of nature, size, and location of project:

M/S Murtaza and Brothers is a manufacturing unit in which different chemicals will be mixed according to a specific formula to make the desired product. The final product of this unit will be bathroom, toilet and floor cleaners. Furthermore, steel wire scrubbers will also be manufactured for dish washing purpose. The unit will be constructed at an area of 1 acre in Bhelwal Industrial estate, district Sargodha. The total cost of the project is **400 million**, including 10 Lac Environmental Budget. A transformer of **250 KVA** will be installed to get electricity from the industrial estate. Generators will also be installed as a backup. Ground water will be used to fulfill water requirements. A septic tank will be constructed to treat wastewater before the discharge.

Also, there is no environmentally sensitive area in the macro environment. No trees or greenery would be removed and no significant impact would occur on the demographic pattern or on the social and cultural values of the settled population.

1.6 Objective of the report:

Objectives to conduct EIA are as following:

- ✓ A legal binding in accordance to Punjab Environmental Protection Act (PEPA 1997).
- ✓ To identify the potential environmental issues pertaining to the proposed site.
- ✓ To evaluate the ability of the site in view of social acceptance and environmental soundness.
- ✓ To provide the maximum information to the proponent and other stakeholders about the existing environmental conditions and the implications of the proposed project.
- ✓ Collection of available data, reports, drawings and other relevant information about area of proposed project.
- ✓ Review of applicable existing environmental legislation and Punjab environmental quality standards (PEQS).
- ✓ Propose mitigation measure to eliminate or to reduce the negative impact to an acceptable level.
- ✓ Development of well-resourced environmental management and monitoring plans to identify mitigation strategies targeted towards avoidance, minimization and rehabilitation of the impacts.

CHAPTER 2
NATIONAL ENVIRONMENTAL POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

2.1 General:

This section deals with the policy and legal framework which apply for protection, conservation, restoration, rehabilitation and also related to sustainable development in context of project implementation and its operation. The project is expected to comply with all the legislation related to the environmental aspects as regards of Pakistan.

2.2 National Policy Framework:

Following elements of national policy framework are considered the most relevant to this project

2.2.1 National Conservation Strategy

The Pakistan National Conservation Strategy (NCS), which was approved by the federal cabinet in March 1992, is the principle policy document on environmental issues in the country (EUAD/IUCN, 1992). The NCS outlines the country's primary approach towards encouraging sustainable development, conserving natural resources, and improving efficiency in the use and management of resources.

The NCS has 68 specific programs in 14 core areas in which policies intervention is considered crucial for the preservation of Pakistan's natural and physical environment. The core areas that are relevant in the context of the proposed project are:

- Pollution prevention and abatement,
- Restoration of rangelands,
- Increasing energy efficiency,
- Conserving biodiversity,
- Supporting forestry and plantations, and
- The preservation of natural heritage.

2.2.2 National Environmental Policy 2005

The National Environmental Policy act 2005 aims to protect, conserve, and restore the environment in order to improve quality of the life of citizens through sustainable development and resource conservation.

The main objectives of the policy are:

- Conservation, restoration and efficient management of natural resources.
- Integration of the environmental considerations in policy making and planning process.
- Capacity building of government agencies and other stakeholders at all levels for the better environmental management
- Meeting international obligations effectively in line with the national aspirations.
- Creation of a demand for environment through mass awareness and community mobilization.

2.2.3 The National Forest Policy 2001 of Pakistan

This policy covers the Renewable Natural Resources (RNR) of Pakistan i.e. Forests, Rangelands, Watersheds, Wildlife, Biodiversity and their habitats. The policy seeks to launch a process for eliminating the fundamental causes of the depletion of RNR through the active participation of all the concerned agencies and stakeholders, to realize the sustainable development of natural resources. It is an umbrella policy providing guidelines to the federal Government, Provincial Governments and territories for the management of their RNR. In consonance with it, the provincial and district governments may devise their own policies in accordance with their circumstances.

The goal of this policy is to foster the sustainable development of RNR of Pakistan, for the maintenance and rehabilitation of its environment and the enhancement of sustainable livelihoods of its rural masses especially women, children and other deprived groups.

The elements of the policy are as follow:

- Population planning in critical eco system
- Providing substitutes to firewood in the wooded mountains
- Reducing the impact of socio economic causes

- Reducing Poverty, poverty of opportunity, and powerlessness
- Renovating and invigorating the institutions of RNR
- Supporting local government in the sustainable development of their RNR
- Policies for fragile natural ecosystem
- River rain forests
- Integrated Plantations
- Preservation of relict and unique ecosystem
- Wildlife
- Rangelands and desert ecosystem
- Planting of trees and fodders on farmlands

2.3 Punjab Environmental Protection Act (PEPA), 1997 and Administrative Framework:

2.3.1 General

PEPA 1997 is a fairly comprehensive legislation and provides legislative framework for Protection, Conservation, rehabilitation and improvement of the environment. It contains concrete action plans and programs for the preservation of pollution and promotes sustainable development.

The silent features of this law are:

- No proponent of a project shall commence construction or operation unless he has filed with the Government Agency designed by Federal Environment Protection Agency (EPA) Provincial EPAs an EIA, and has obtained a No objection certificate (NOC) Environmental Approval (EA).
- Establishment and Formation of the Punjab Environmental Protection Council.
- Powers and Functions of the federal and Provincial Environmental Protection Agencies.
- Prohibition of certain discharges or emissions.
- Punjab Environmental Quality Standards (PEQS) for wastewater, air emissions and noise.
- This act also empowers Federal Government to issue notices and to enforce them for the protection of the environment and resource conservation.

For the effective implementation of the provisions of PEPA 1997, Pak-EPA headed by a Director General has been constituted. On the same pattern, EPAs/EPDs have been created in all provinces. The capability of regulatory institutions for environmental management largely achieves the

success of environmental assessment for ensuring that development projects are environmentally sound and sustainable. For decision-making and policy formulation in the environmental and conservation issues, the institutional framework is described in following paragraphs.

2.3.2 Federal Government Institutions

With the approval of the 18th Amendment in the Constitution of 1973 of The Islamic Republic of Pakistan, the subject of environment has largely ben delegated to the provinces. The federal Ministry of Environment has been abolished and instead the Ministry of National Disaster Management has been shaped under which Punjab Environmental Protection Council; Pakistan Environmental Protection Agency; Pakistan Environmental Planning and Architectural Consultants Limited; Global environmental impact study center, Islamabad policy, Legislation plans, strategies and programs with regard to disaster management including environmental protection and preservation, coordination, monitoring and implementation of environmental agreements with other countries, international agencies and forums have been put. Now the new ministry namely Climate Change Division has been established.

The Pakistan Environmental Protection Agency (PEPA) looks after the environment related issues for the federally controlled areas territories. Lacking laws at the provincial levels; the laws, rules, regulations those already available at the federal level and operational at the provincial levels will continue as such.

Hereunder, the major legal framework is given:

Two organizations, The Punjab Protection Council (PEPC) and the EPA, are primarily responsible for administrating the provisions of PEPA 1997.The PEPC oversees the functioning of the EPA. Its members include representatives of the government, industry and non-governmental organizations. The EPA is required to ensure compliance with the PEQS, established monitoring and evaluation system, and both identify the need as well as initiate legislation whenever necessary. It is thus the primary implementing agency in the hierarchy. The provincial EPAs/EPDs are the provincial arms of federal EPA.

2.4 Pakistan Environmental Protection Agency Regulations, 2000 for Review of Initial Environmental Examination (IEE)/Environmental Impact Assessment (EIA)

Under section 12 of the 1997 act, a proposed falling under any category specified in schedule 1 and 2 requires the proponent to file an IEE OR EIA, as the case may be, with the federal agency. Within ten working days of the EIA OR IEE having been submitted, the federal agency will conform that the documents submitted are complete for the purpose of review. During this time should the federal agency requires the proponent to submit any additional information; the IEE or EIA will be returned to the proponent for revision , clearly listing those aspects that need further discussion. Subsequently, the federal agency shall make every effort to complete an IEE review within 45 days and EIA review within 90 days of filling of the complete information of report. After the successful review, the EPA will issue the NOC/EA according to the rules and regulations as prescribed in regulation 2000.

During the project execution the proponents are required to comply with the recommendations of the IEE/EIA and also the conditions of the NOC/EA set forth by the relevant EPA, in present case, EPA, Lahore, Punjab. During the construction or post EIA monitoring and reporting is mandatory according to clause 19 of regulation -2000. These regulations requires proponent of all projects to submit environment monitoring reports during and on completion of construction, and regular operation of the project. Any additional requirements of the report as desired by the EPA are also necessary for the proponent, however, the format and contents of such reports are not specified in the laws.

2.5 Pakistan Environmental Impact Assessment Procedures

These guidelines are descriptive documents describing the format and content of IEE/EIA reports to be submitted to federal and provincial EPA/EPD for obtaining NOC. Following are the major areas, which are covered by these guidelines:

- The Environmental Assessment report formation (scoping, type and category of project, description of project, alternatives, site selection, baseline data).
- Assessing impacts (identification, analysis and significance).
- Mitigation and impact management and preparing an environmental management plan.
- Reporting (format, main features, shortcomings, other forms of presentation).
- Review and decision making (role, steps, remedial options, checks and balances).

- Monitoring and auditing (systematic follow up, effective data management).
- Project Management (inter-disciplinary teams, programming and budgeting).

2.6 Guidelines for Public Consultation

The Federal EPA provides these guidelines to deal with possible approaches to public consultation and techniques for designing an effective program of consultation that reaches out to all major stakeholders and ensures the incorporation of their concerns in any impact assessment study. These guidelines cover:

- Consultation, involvement and participation of stakeholders
- Effective public consultation (planning, stages of EIA where consultation is appropriate)
- Facilitation involvement (including the poor, women and Non-Governmental organizations (NGOs).

2.7 Punjab Environmental Quality Standards (PEQS), 2000

The PEQS 2000 specify the following standards:

- Maximum allowable concentration of pollutants (32 parameters) in municipal and liquid industrial effluents discharged to inland waters, sewage treatment facilities, and the sea (three separate sets of numbers)
- Maximum allowable concentration of pollutants (16 parameters) in gaseous emissions from industrial sources
- Maximum allowable concentration of pollutants (two pollutants) in gaseous emissions from vehicle exhaust
- Maximum allowable noise levels from vehicles

These standards apply to the gaseous emissions and liquid effluents. Standards for ambient air quality have not been prescribed as yet.

2.7.1 Punjab Ambient Air Quality Standards (PAAQSs)

The Ministry of Environment, Government of Pakistan vide its Notification, Islamabad, the 18th October, 2010 under S.R.O. 102 (1)/2010 established standards which provide the maximum allowable limits, in the ambient air, of Sulphur Dioxide (SO2), Oxides of Nitrogen, Suspended Particulate Matter-(SPM), Respirable Particulate Matter-PM10, Respirable Particulate Matter-PM25, Lead and Carbon Monoxide (CO).

Table 2.1: Punjab Environmental Quality Standards Ambient Air

Pollutants	**Time-weighted Average**	**Concentration in** Effective from 1st July 2010	**Ambient Air** Effective from 1st January 2013	**Method of Measurement**
Sulphur Dioxide (SO2)	Annual Average	80 g/m3	80 g/m3	Ultraviolet Fluorescence
	24 hours	120 g/m3	120 g/m3	
	Annual Average	40 g/m3	40 g/m3	Gas phase Chemiluminescence

Oxides of Nitrogen as (NO)	24 hours	40 g/m3	40 g/m3	
Oxides of Nitrogen as (NO2)	Annual Average	40 g/m3	40 g/m3	Gas phase Chemiluminescence
	24 hours	80 g/m3	80 g/m3	

Suspended Particulate Matter (SPM)	Annual Average	400 g/m3	360 g/m3	High Volume Sampling (Average Flow rate not less than 1.1 m3/minute
	24 hours	550 g/m3	500 g/m3	
Respirable Particulate Matter PM10	Annual Average	200 g/m3	120 g/m3	Beta ray absorption
	24 hours	250 g/m3	150 g/m3	
Respirable Particulate Matter PM 2.5	Annual Average	25 g/m3	15 g/m3	Beta ray absorption
	24 hours	40 g/m3	35 g/m3	
		25 g/m3	15 g/m3	
Lead (Pb)	Annual Average	1.5 g/m3	1.0 g/m3	ASS Method after Sampling using EPM 2000 or equivalent Filter paper
	24 hours	2.0 g/m3	1.5 g/m3	

*Annual arithmetic mean of minimum 104 measurements in a year taken twice a week 24 hourly at uniform interval.

*** 24 hourly/8 hourly values should be met 98% of the in a year, 2% of the time, it may exceed but not on two consecutive days.

2.7.2 Punjab Standards for Drinking Water Quality (NDWS)

The Ministry of Climate change, Government of Pakistan vide its Notification, Islamabad, the 18th October, 2010 under S.R.O, 102(1)/2010 established standards for drinking water quality. The major quality parameters fixed depend upon Bacteria, Chemical and Physical ones.

Table 2.2: Punjab Standards for Drinking Water Quality

Properties/Parameters	**Standard Values**
All water intended for drinking (E.Coli or Thermo tolerant Coliform Bacteria)	Must not be detectable in any 100ml samples
Treated water entering the distribution system (E.Coli or Thermo tolerant Coliform and total Coliform Bacteria)	Must not be detectable in any 100ml samples
Treated water in the distribution system (E.Coli or Thermo tolerant or Coliform or total Coliform Bacteria)	Must not be detectible in any 100ml samples. In case of large supplies, where sufficient samples are examined, must not be present in 95% of the samples taken throughout any 12-month period.
Physical	
Color	Non objectionable/Acceptable
Taste	Non objectionable/Acceptable
Odor	Non objectionable/Acceptable
Turbidity	< 5 NTU
Total hardness as CaCO3	< 500 mg/l
TDS	< 1000
Ph	6.5 – 8.5

Chemical	
Essential Inorganics	Mg/Litre
Aluminum (Al)	< 0.2
Antimony (Sb)	< 0.005 (P)
Arsenic (As)	< 0.05 (P)
Barium (Ba)	0.7

Properties/Parameters	**Standard values**
Boron (B)	0.3
Cadmium (Cd)	0.01
Chloride (Cl)	<250
Chromium (Cr)	<0.05
Copper (Cu)	2
Toxic Inorganic	**Mg/L**
Cyanide (Cn)	≤ 0.05
Fluoride (F)	≤ 1.5
Lead (Pb)	≤ 0.05
Manganese (Mn)	≤ 0.5
Mercury (Hg)	≤ 0.001
Nickel (Ni)	≤ 0.02
Nitrate (*NO3)**	≤ 50

Properties/parameters	**Standard Values**
Organic	
Pesticides mgl	PSQCA No. 4639-2004, Page No. 4 Table No.3 Serial No. 20-58 may be continued.
Phenolic compound (as phenols) mgl	≤ WHO standards: 0.002
Polynuclear Aromatic hydrocarbon (as PAH) g/l	≤ WHO standards 0.01v (by GC/MS Method)
Radioactive	
Alpha Emitters bq/L or pCi	**0.1**
Beta Emitters	**1**

2.7.3 Punjab Environmental Quality Standards-Noise

The Ministry of Climate Change, Government of Pakistan vide its Notification, Islamabad, and the 18th October, 2010 under S.R.O 102 (1) / 2010 established standards for Noise. These standards are based on Category/zone i.e. Residential area, Commercial area, Industrial area and Silence zone. The limiting values for day and night have also been fixed for all categories/zones.

Table 2.3: Punjab Environmental Quality Standards - Noise

Category of Area/Zone	**Day time**	**Night time**
Residential area	55	45
Commercial area	65	55
Industrial area	75	65
Silence Zone	50	45

Limit in Db (A) Leq*

Notes:

1. Day time hours 6.00 a.m. to 10.00 p.m.
2. Night time hours 10.00 p.m. to 6.00 p.m.
3. Silence zone: Zones that are declared as such by the competent authority.
   An area comprising not less than 100m around the hospitals, educational institutions and courts.
4. Mixed categories of areas may be declared as one of the four above-listed categories by the competent authority.

- Db (A) Leq: Time weighted average of the level of sound in decibels on Scale A which is relateable to human hearing.

2.8 National Resettlement Policy and Ordinance

As referred above, at present the only legislation relating to land acquisition and compensation in the Land Acquisition Act (LAA) of 1894. Experience with large-scale infrastructure development projects implemented by institutions such as WAPDA has demonstrated the need for a cohesive national policy resettlement for resettlement. Following a national consultative process, a national resettlement policy and a related ordinance were drafted known as Draft Resettlement Policy, 2002 which still has to be approved by the government.

The salient applicable features of the Draft Resettlement Policy are given below:

- ✓ The Pak-EPA will be responsible for both environment- related as well as resettlement-related matters.
- ✓ The responsibilities for implementation at a provincial level are to be delegated to the concerned provincial EPAs with overall control of the provincial Planning and Development (P & D) Departments.
- ✓ All categories of 'loss' arising from development projects that entail resettlement, need to be addressed; these include not only loss of land, built-up property, other infrastructure, and crops and trees, but also loss of income, job opportunities, and access to natural resources etc.
- ✓ Vulnerable groups whose issues need to be addressed in particular include: women, children, destitute persons, tribal communities, squatters, those with usurper rights, and landless groups.
- ✓ There should be a special emphasis on consultation with affected groups when preparing a Resettlement Action Plan.

2.9 Other Environment Related Statues

This section outlines the other statues apart from Punjab Protection Act, 1997, which are relevant to project.

2.9.1 The Land Acquisition Act (LA-A) -1894

At this point, the only legislation relating to land acquisition and compensation is the LAA OF 1894. The LAA is however, limited to a cash compensation policy for the acquisition of land and built up property, and damage to other assets, such as crops, trees, and infrastructure. The LAA does not consider there habitation and resettlement of disrupted populations and the restoration of their livelihoods. The project will involve acquisition of propriety land. The land will be acquired under the LAA 1894. In the act there are provisions for normal acquisition of land under Section 6 (4) or emergency acquisition under Section 17 (4).

2.9.2 Pakistan Explosives Act, 1884

Under the Explosives Act, the project contractors are bound by regulations on handling, transportation and using explosives during quarrying, blasting, and other purposes.

2.9.3 The Forest Act, 1927

The Forest Act empowers provincial governments to prohibit the clearing of forest for cultivation, grazing, hunting, removing forest produce; quarrying and felling, lopping and toping of trees, branches in reserved or protected areas.

2.9.4 Pakistan Penal Code, 1860

The Pakistan Penal Code deals with offences where public or private property and/or human lives are affected due to the intentional or accidental misconduct of an individual or body of people. In the context of environment, the Penal Code empowers the local authorities to control noise, noxious, emissions and disposal of effluents. The PEQS enforced by the EPAs supersede the application of this legislation on industries and municipalities.

2.9.5 Provincial Wildlife Act, 1974

In addition to empowering the provincial wildlife departments to establish game reserves, parks, and wildlife sanctuaries, this Act regulates the hunting and disturbance of wildlife**.**

2.10 International and National Non-Governmental Organizations.

International and national Non-Government Organization (NGOs), such as the International Union for Conservation of Nature and Natural Resources (IUCN) and the World Wide Fund for Nature (WWF), have been active in Pakistan for some time. Both of these NGOs have worked closely with the governments at the federal as well provincial levels and have positively contributed to the cause of environment. They have played significant role with regard to the formulation of environment and conservation policies and last but not least, another the most prominent NGO namely "Sustainable Development Policy Institute (SDPI)" has also played very significant role in upholding the cause of environmental protection in Pakistan. Environmental NGOs have been particularly active in the governments environmental and conservation policies, even at the provincial and federal levels, have been formulated in consultation with leading NGOs, who have also been involved in drafting new legislation on conservation

2.11 Explosive Act, 1884

This act deals with explosives in prohibiting either absolutely of subject to conditions, the manufacture, possession or importation of any explosive which is so dangerous in character that, in the opinion of the appropriate Government, it is expedient for public safety to issue the notification.

2.12 Punjab Local Government Ordinance, 2001

Schedules 4 and 8 of this Ordinance pertain to environmental pollution. 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.

2.13 Pakistan Penal Code, 1860

This defines the penalties for violations concerning pollution of air, water bodies and land. Sections 268 to 291 are about offences affecting public health. The offences relating to public health safety and environment are as under;

- Sec 268: Public Nuisance
- Sec 269: Negligent act likely to spread infection of disease dangerous to life:
- Sec 270: Malignant act likely to spread infection of disease dangerous to life:
- Sec 278: Making atmosphere noxious to health:
- Sec 284: Negligent conduct with respect to poisonous substance:
- Sec. 290. Punishment for public nuisance in cases not otherwise provided for:
- Sec. 291. Continuance of nuisance after injunction to discontinue

2.14 Punjab Land Use Rules 2009

In January 2009 the Punjab Government notified "Punjab Land Use Rules 2009" for the clarification of Lahore Master Plan. In these rules permissible land use according to area type is define2.18 Antiquities Act 1975

The law relates to protection of Antiquities / monuments / National / International heritage. The compliance of this Act is mandatory for the Installation of Generators. Under section 22 of the Act no development plan or scheme or new construction can be done within distance of 200ft from the boundary of the monuments/ National Heritage. There is no Historical Site / Monuments in the proximity of the project.

CHAPTER 3
SCREENING AND SCOPING

3.1 Need of the IEE/EIA study:

According to the section 12 of the Punjab Environmental Protection Act 2012, no proponent of a project shall commence construction or operation unless he has filed an initial environmental examination or where the project is likely to cause an adverse environmental effect, an environmental impact assessment, and has obtained NOC from the EPA Punjab.

Subject to the provision of this Act, Proponent Mr. Ghulam Murtaza must get an NOC for construction of proposed project under section 12 of PEPA-2012 from Provincial Agency in order to start construction, for which an Environmental Impact Assessment (EIA) Report is mandatory for getting Environmental Approval as this project comes under the Schedule II II (B)(2) (Chemical Projects requiring EIA).

The Director General, EPA Punjab is the authority to issue the requisite Environmental Approval after proper review of the project. The EIA report has been prepared under the format of guidelines issued by EPA.

The applicable laws for the environmental study of the project are briefly given below

- Punjab Environment Protection Act, 2012
- National Environmental Policy, 2005
- Review of EIA and EIA Regulations, 2000
- Guidelines for Preparation and Review of Environmental Reports, 1997.
- Solid Waste Management Rules 2005
- National Environmental Quality Standards 2000
- Punjab Land Use Rules 2009

3.2 Scope of the study

Scoping identifies the key issues of concern at an early stage of planning process to assess range of impacts and need for EIA. Scoping is a process of interaction. Scoping identifies boundaries of the EIA study, important issues of concern

- It identifies concerns, evaluates them, organizes and presents them to assist analysis and decision making. For achieving the above objective, the study is mainly divided into the following sub tasks.
- Identification of the various legal/statutory requirements as set forth by the Punjab Environmental Protection Act, 2012 and the guidelines for preparation of EIA Reports and Review of existing regulatory framework in the country with reference to the development projects
- Collection of data related to physical, ecological and socio-economic resources of the project area
- Review the available data, drawings and report to ascertain their adequacy and need for collection of additional data
- Identification and evaluation of salient environmental impacts
- Identification of necessary mitigation measures to minimize the adverse impacts.
- Preparation of Environmental Management Plan (EMP)
- Review of applicable existing environmental Legislation and National Environmental Quality Standards (NEQS)

3.3 Spatial and temporal boundaries adopted for the various aspects of the study

The natural environmental settings, present land status and its future trends around the project site covering fairly large distances have been taken into consideration while taking stock of the existing and expected conditions. Socio economic conditions, availability of basic infrastructure, availability of water, labor, raw materials, transport and means of communication, electricity and approach to the project site were the major considerations and spatial and temporal boundaries considered during this study.

3.4 Issues discussed during consultation

Following issues were discussed during the stakeholder's consultation:

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

General

Majority of stakeholders appreciated the project and taken it as a necessary step towards the current situation of basic needs.

Socio Economic

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

3.5 Significant Impacts and Factors:

Following factors have been taken in the account to assess the Environmental Impacts of the proposed project:

- Environmental impacts due to land use, location, waste generation, utility services consumption and emergency spillage etc.
- Environmental impacts on physical resources i.e. soil, topography, geology, climate, air quality etc. ecological resources i.e. flora and fauna as well as health and safety of workers

CHAPTER 4
CONSIDERATION OF ALTERNATIVES

This section covers the project alternatives which were examined for the proposed 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 economic, environmental, health and safety constraints. In particular, it outlines the following project options:

1. The ―No Development Option‖.
2. Alternative Site Option.
3. Design/Technology Alternatives
4. Environmental Alternatives
5. Economic Alternatives

4.1 No Development Option

No Development option means there would be no project at all. The No-Project option, if taken, would stop the community from an important and necessary project which is the need for local residents as it will generate the employment opportunities.

4.2 Alternative Site Option – Site Selection Criteria

No alternate site was considered for the proposed project. As, the project is already located in an industrial estate, providing all the necessities. Some other positive points of the selected site are:

- An accessible permanent road to allow ready transport.
- Good Soil conditions for civil structure
- Availability of basic requirements like electricity, gas etc.
- Neat and clean surroundings.

4.3 Design/Technology Alternatives

During the operational phase, it will make sure to install the latest and improved technologies with high efficiencies and accuracy. Also, it will make sure to have the most environmental friendly equipment. The decision will be made at the time of operational phase.

4.4 Environment Alternatives

No environment alternatives were considered as the project site is already located in an industrial zone where there are no environmental sensitive points like wetlands, national parks etc. Also, there are no endangered flora and fauna at the surroundings.

4.5 Economic Alternatives

For success of a project, major siting considerations include demand for the project; availability of funds; procurement of technology, equipment; availability of manpower, raw materials, power, and other utilities and equally important are environmental aspects. As the site is located in an industrial zone, it covers all the requirements to make a project successful. Hence, no alternatives were considered.

CHAPTER 5
DESCRIPTION OF THE PROJECT

5.1 General:

This section deals with project components. It describes the category of the project, cost & magnitude of the project, operation equipment's etc. The information presented in this section is based on project site survey.

5.2 Type and category:

The project involves the construction of a manufacturing unit involving chemical formulation and mixing to produce cleaning products. Therefore, the proposed project falls in the schedule II (B)(2) of Punjab Environmental Protection Agency's (Review of IEE and EIA) Regulations, 2000. According to the Guidelines for the Preparation and Review of Environmental Reports, an Environment Impact Assessment (EIA) for the construction phase of " M/S Murtaza and Brothers" is required. Proponent of the project has engaged A+ consultants to undertake Environment Impact Assessment (EIA) study.

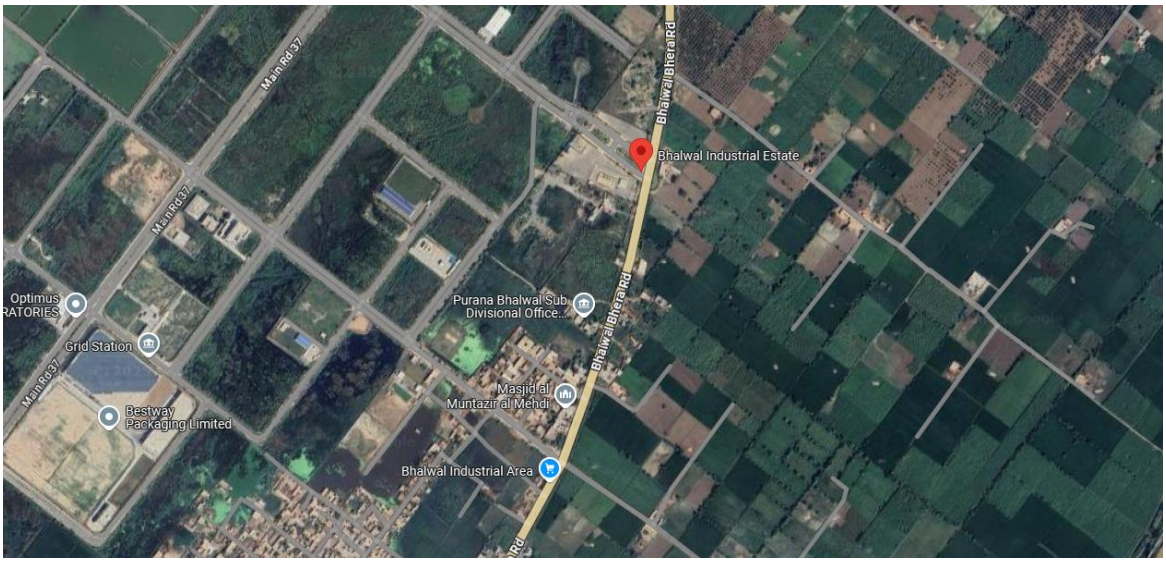
5.3 Objectives of the Project:

The ultimate goals for the project remain:

- To demonstrate the commercial viability of the project.
- To provide customers with high quality product along with the high standard of service.
- To engage the processes with environment in such a way that its quality will not be impaired due to the construction and operational phase of the project.
- To create more economic activities in the project area
- To demonstrate practical example of sustainable development.

5.4 Location of the Project:

The location of the project is plot # 7 & 8, Bhelwal Industrial Estate, District Sargodha. Google map is shown below:



Google Map of the project site

5.5 Land use:

Proposed project is going to build on the land which is feasible for this project as it is present in an industrial estate. The total area of the project is 1 acre. The following picture is showing the land where the unit will be constructed.

Proposed Site

5.6 Road Access:

The main access towards the project is through Bhelwal Bhera road.

5.7 Vegetation Features of the site:

Tree species found in the Project Area include Acacia modesta and Olea ferruginea. However, no fruit trees are found in the Project Area except those planted in nearby area. The construction of the unit will involve no cutting of trees, as there is no such vegetation on the proposed land except some thorny bushes.

5.8 Cost and Magnitude of operation:

Total cost of the project is **400 million PKR.** The breakdown of the cost is given below:

Breakdown:

Land Cost	200 million
Construction Cost	200 million
Environmental Budget	10 Lac

5.9 Description of the Project:

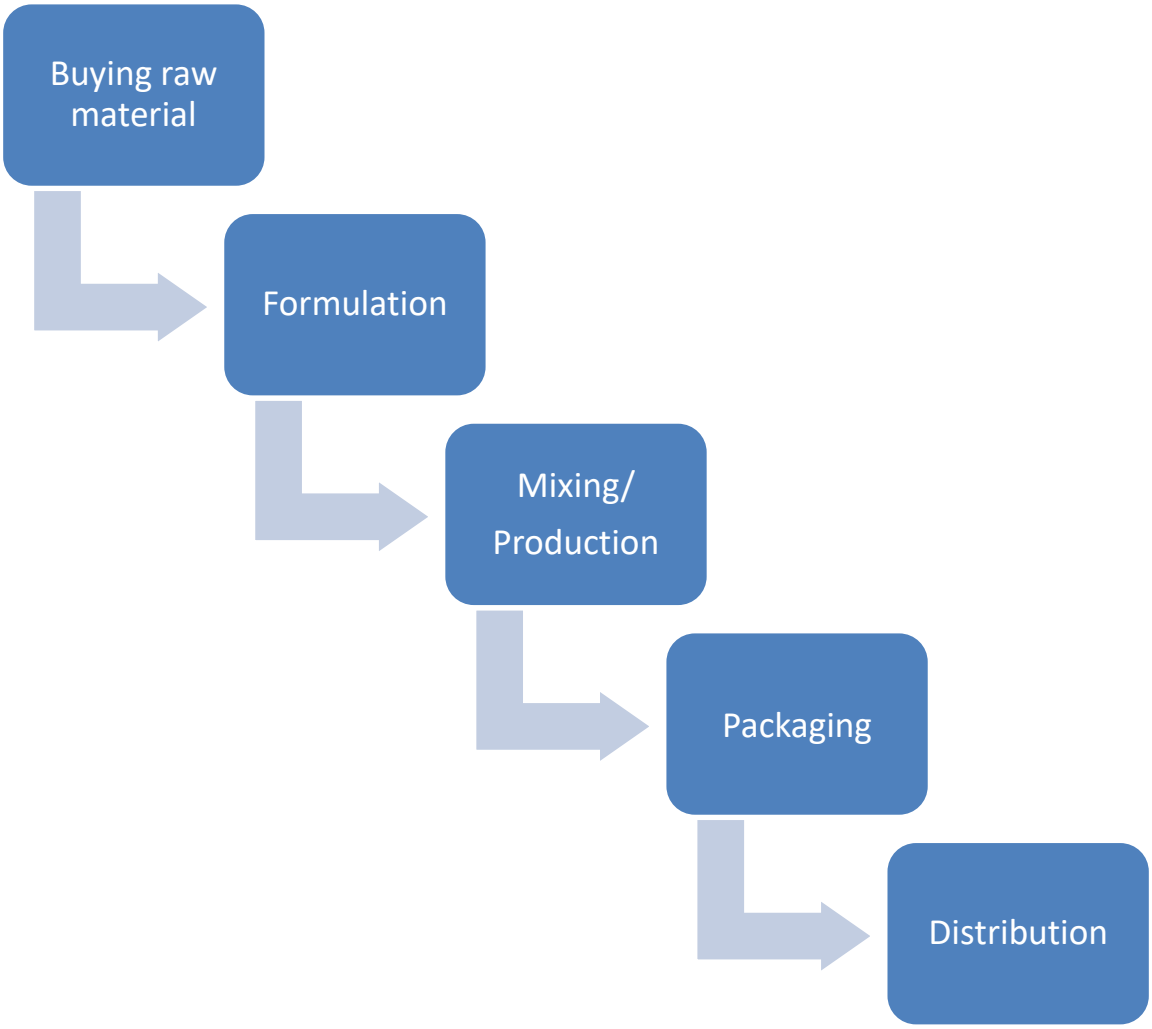
M/S Murtaza and Brothers is a manufacturing unit in which different chemicals will be mixed according to a specific formula to make the desired product. The final product of this unit will be bathroom, toilet and floor cleaners. Besides that, steel wire scrubbers for dishwashing will also be manufactured.

- **Total Production/Capacity**

The total capacity of the unit to produce cleaning products will be 1000 Ltrs/day. While the capacity for manufacturing the steel wire scrubbers will be 1000 Kgs/day.

- **Process Flow:**

As this is a formulation/mixing unit so no manufacturing will take place. The steps will include buying of chemicals from local vendors, formulation and mixing of those chemicals, packaging and distribution. Process flow is given below:



Process Flow

- **List of Chemicals:**

Following is the list of chemicals that will be bought by local vendors for the production of cleaning products.

Ingredients/Chemicals	Quantity for 1000 L	Suppliers
Water (Deionized or Treated)	650 kg	MJS Traders
Sodium Lauryl Ether Sulfate (SLES, 70% active)	140 kg	Humayun Chemicals
Cocamidopropyl Betaine (CAPB, 30% active)	40 kg	Iris International
Sodium Chloride (NaCl)	15 kg	Humayun Wellchem
Citric Acid	2 kg	Shah Chemicals
Sodium Benzoate	1.5 kg	M.H. Enterprises L.L.C.
Fragrance (Lemon)	3 kg	PCDPK.COM Suppliers
Food-Grade Dye (Green)	0.2 kg	Humayun Chemicals

- **List of Raw Materials for Steel Scrubbers:**

Following is the list of raw materials that will be bought by local vendors for the production of steel scrubbers.

Ingredients/Chemicals	Quantity for 1000 Kg	Suppliers
Stainless Steel Wire (Grade 430)	980 kg	Humayun Chemicals
Polypropylene (PP) Packaging Film	15 kg	MJS Traders
Cardboard (for outer packaging)	5 kg	Humayun Wellchem

- **Energy Supply:**

A transformer of **250 KVA** will be installed to get electricity from industrial estate.

- **Water Supply:**

Ground water will be used to fulfill water requirements. Approximately 1000-1500 gallons of water will be used on daily basis during construction phase. While, during operational phase, the consumption will be reduced to 200-400 gallons per day, approximately.

- **Man Power Requirement:**

Approximately 120 workers will be employed including all kind of staff.

- **Solid waste:**

The unit waste will include hazardous material which will be properly incinerated. Contract will be signed for the incineration of the waste with relevant authority during the operational phase. Municipal solid waste like papers, wrappers etc. will be properly dumped in the bins. The solid waste generated will be collected from the plant by the TMA. Dumping of solid waste will be prohibited around the facilities.

- **Wastewater Treatment:**

Only municipal wastewater will be generated during operational phase, for its treatment septic tank will be installed.

- **Septic Tank & its Retention Time.**

Septic tanks are suitable for conditions where the wastewater can drain away and be absorbed into the soil without contaminating ground water where it is extracted. A septic tank takes raw sewage in, allows the solids to settle (sludge) and allows the remaining liquid to flow into the surrounding soil by means of a soak away. Scum on the surface is also prevented from leaving the tank. Microorganisms in the anaerobic environment in the tank digest the sludge and scum. The system consists of several stages, supply to the tank, the tank itself and the soak field. Septic tanks take sewage (grey water - washing and household waste and black water - sewage from latrines,) but not rainwater. Sludge volume is reduced by microbial action but still needs periodic emptying. Septic tanks provide partial treatment of wastewater and this will be collected by WASA vehicle for safe Disposal. Retention time of Septic time is 2 -3 days for this unit. Drawing of septic tank is shown below:

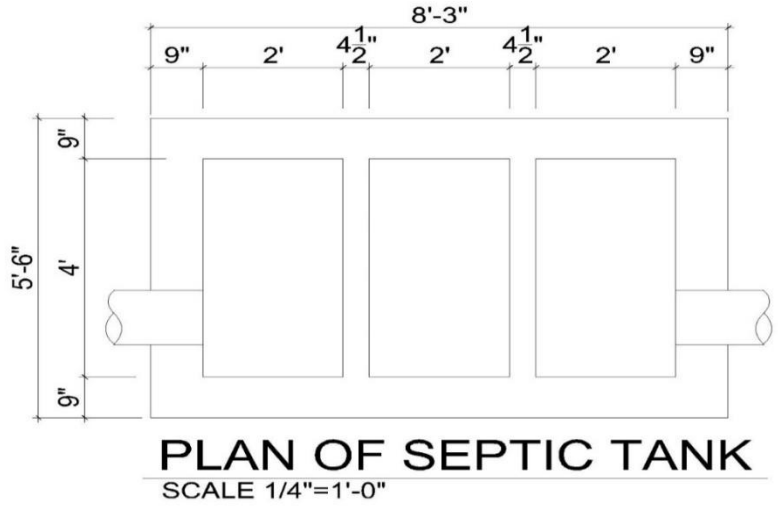


Figure. Drawing of septic tank

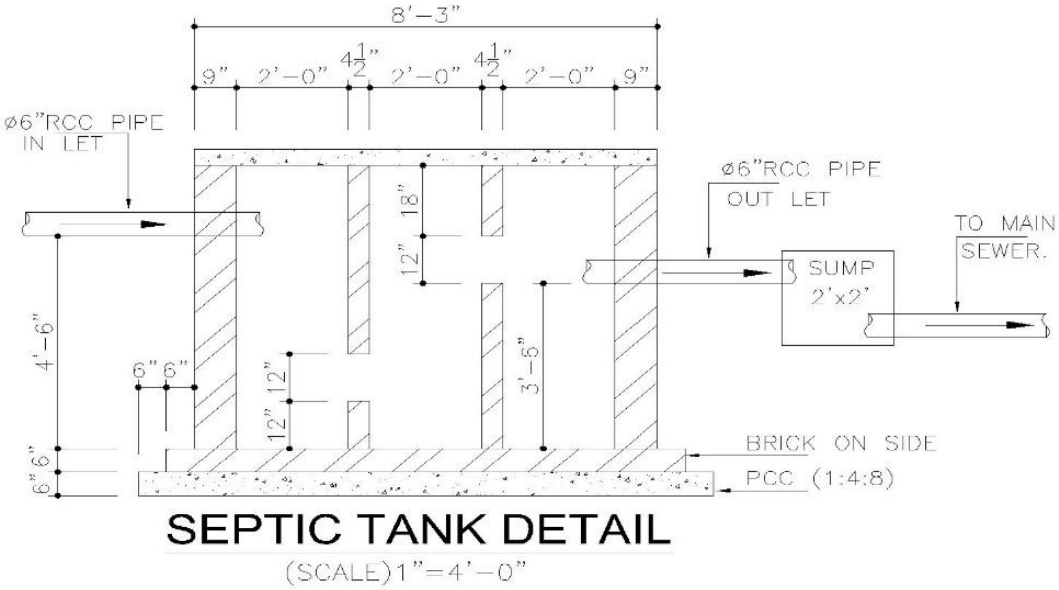


Figure. Drawing of septic tank Detail

5.10 Restoration and rehabilitation plans:

At the end of the life of the project, it will be bully dismantle with special precautions to avoid/minimize pollution and at the same time taking all safety precautions to protect human life and property around the project site. Debris or any other wastes resulting from demolishing will be disposed of in environmentally sustainable session. The material capable of recycling/reuse will be either sold in the market or be re-used for other suitable purposes. While dismantling all government rules and regulations as applicable to such activities will be strictly adhere to. During entire construction period, nesseccary precautions will be taken to ensure that no damage is done to the basic infrastructure like several systems, power transmission lines road, private or public property and daily human life as well. Safety measures as desired under the cod of demolition will be adopted to avoid any harm to human, property around, or the environment in the project area. After completion; all construction matrix, debris and garbage will be remove off immediately from site within the minimum possible time under safe conditions. Any minus pill over of these material will be cleared adequately, the land, if and where pitted will be adequately leveled. On the hole, the project site and the area in its near vicinity will be made neat and clean.

5.11 Government Approval by Project

The Environmental Approval According to section-12 of Punjab Environmental Protection Act-1997 is the mandatory requirement of the project.

CHAPTER 6
DESCRIPTION OF ENVIRONMENT

6.1 General:

The existing environment in the Project Area has been studied with respect to the physical, biological and socio-economic resources.

6.2 Physical Environment:

The physical environment includes topography, geology and soils, seismology, climate, surface water, groundwater, ambient air quality and noise levels.

6.2.1 Topography:

Sargodha's topography is characterized by flat fertile plains, making it an agricultural hub. The city is situated at an elevation of approximately 190 meters above sea level. The landscape is generally level, with a few small hills, including the Kirana Hills. Sargodha is surrounded by two major rivers, the Jhelum River to the west and north, and the Chenab River to the east. The fertile plains and favorable climate support the growth of various crops, earning Sargodha its reputation as a major agricultural region.

6.2.2 Regional Geology:

The regional geology of Sargodha is characterized by extensive alluvial deposits, comprising sand, silt, and clay, which are sediments deposited by the Indus River system over thousands of years. These deposits form a thick sequence of unconsolidated to semi-consolidated sediments, dominating the geology of the area as Quaternary alluvium. The alluvial deposits have weathered to form fertile soils, making the region highly suitable for agriculture and supporting a wide range of crops. Furthermore, these deposits also form productive groundwater aquifers, which are crucial for irrigation and drinking water supply in the area, thereby sustaining the agricultural productivity and livelihoods of the local population.

The nearby Salt Range, a fossil-rich sedimentary sequence, also influences the regional geology, adding complexity to the area's geological framework. The Salt Range's rocks, dating back to the Precambrian era, provide valuable insights into the region's tectonic history and geological

evolution. Overall, the geology of Sargodha plays a vital role in shaping the region's hydrology, agriculture, and ecosystem, making it an important agricultural hub and supporting the local economy. The region's geological characteristics have significant implications for land use planning, water resource management, and environmental sustainability, highlighting the need for careful management and conservation of these resources.

Clay soils in Sargodha exhibit five distinct strata, from bottom to top:

(i) Course pebbles with sand or clay;

(ii) An alluvial stratum deposited by an older river system in the Soan Basin;

(iii) Alluvial deposits of the present river system;

(iv) An air-borne top layer of silt or clay (loess); and

(v) Conglomerate and loose gravel deposits.

6.2.3 Soil:

The soil in the Project Area is cohesion less and is of alluvial type. Various soil layers below the ground level includes: silt, silty clay, silty sand, poorly graded sand with silt, lean clay etc.

The soil is different in character and generally inclined to be dry. However, it is rich in potential plant nutrients. Rainfall is low and groundwater is saline and brackish at the shallow depth and irrigation is largely dependent on the canals. Tube wells have also been sunk at the greater depths in the Project Area where fresh water is available.

6.2.4 Climate:

The climate of Sargodha is sub humid to subtropical continental, receiving rainfall from both monsoon and western disturbances. The maximum rainfall occurs during the monsoon season from July to September.

The climate of Sargodha is generally pleasant for major part of the year. The winter season is considerably longer than the summer season. However, the period of severe hot and cold are usually short. Sargodha shows no prevailing wind direction in the mornings. The wind direction is evenly distributed throughout the year. In the late afternoons winds are mainly from South-West,

except in July and August when South-Eastern winds dominate. The general wind direction in the area is mostly towards West and sometimes in the East.

The temperature ranges between -1 °C to 46 °C. The coldest month is January when the mean maximum temperatures are 17.7 °C and mean minimum 2.6 °C. From February to May the temperature rises at the rate of 5.06 °C per month. The highest temperature is reached in June when the temperature may touch the 46 °C.

The average daily wind speed is 1.6 Km/h while average relative humidity remains 59.5%. Sargodha receives 94.29mm rain on average monthly basis.

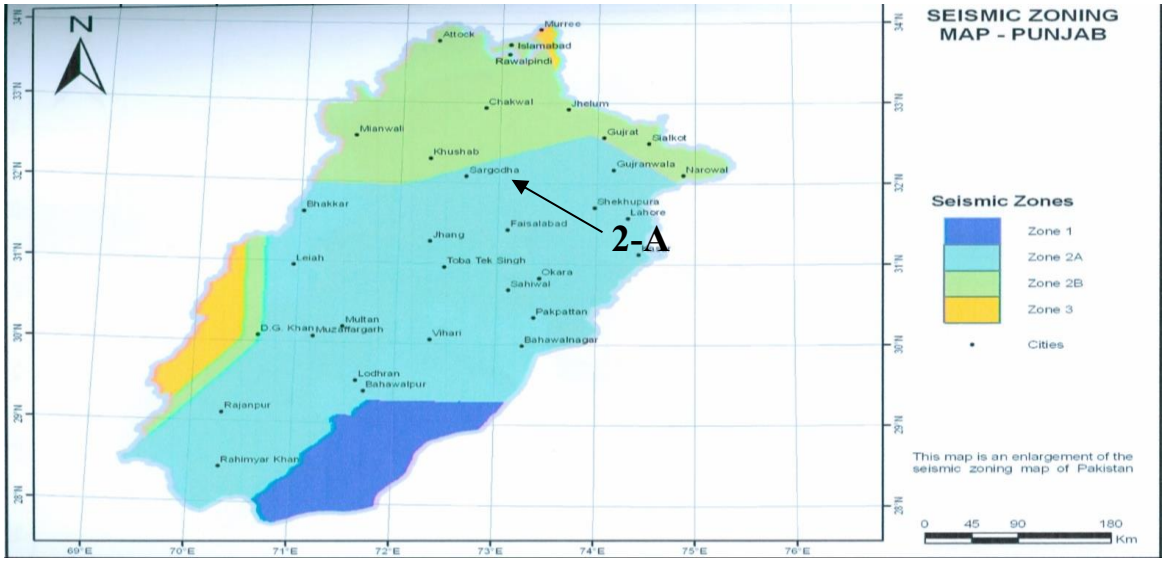
Metrological data of Sargodha including mean relative humidity, rainfall, wind direction and mean wind speed (24 hours) is quoted below in table 5.1

Table 6.1; Mean monthly meteorological data of District Sargodha

Month	**Rainfall (mm)**	**Mean R. Humidity %**	**Mean Temp. (°C)**		**Mean Wind Speed (Km/h)**	**Wind Direction**
			Max.	**Min.**		
January	39.3	78	16.0	**2.0**	1.4	S-W
February	172.8	70	16.3	5.0	1.9	w
March	82.8	73	23.7	9.8	1.5	w
April	20.7	45	30.0	13.2	**1.8**	w
May	**22.8**	42	33.2	17.4	**2.2**	N
June	14.0	36	39.6	23.1	2.4	N-NW
July	151.7	**68**	34.0	22.5	**1.6**	SE
August	171.9	67	34.2	23.1	**1.1**	SE
September	33.6	61	34.0	22.4	**1.0**	S-SE
October	54.3	58	31.5	14.8	**1.1**	NW
November	59.1	57	26.1	7.9	1.7	NW
December	64.5	59	**20.2**	3.6	1.3	NW

6.2.5 Seismology

The Project Area is located in Seismic Zone 2B according to building code map of Pakistan (Lower limit of moderate damage). **Figure 6.1** shows the seismic zoning map of Punjab with the Project Area falling under Seismic Zone-2B.



6.1: Map showing Seismic Zone of the Project Area

6.3 Biological Environment

6.3.1 Flora

In the project area and in the plains, the trees most frequent are Shisham (Dalbargia sissoo), Toot (Morus alba), Bauhinia variegate, Celtis eriocapra, Pyrus pashia, Punica granatum, woodfordia floribunda, Zizyphus mauritiana, Carissa spinarum, Hetropogon contortus, Aristada cyantha, Drek (Molia simper virens), Phulai, (Acacia modesta), Ber (Zizyphus jujaba), and Kikar (Acacia arabica) etc. A conspicuous species of grass is Dab (Amuricatus). There is scattered vegetation of bushes. These bushes are ever green and have deep roots, as the soils are mostly poor in humus and thus relatively desiccated and dry, at least in the upper layer. The roots go deep for moisture.

The other vegetation that grows scattered is Myrsine African, Carissa opaca and Acasia modesta. The shrubs that also grow in lesser density are Ziziphus nurnmufaria, Sagrettia brandrethiana, Adhatoda vasica. Grasses layer, which usually grows in depressions or on relatively moist soil under shade comprises of Chrysopogon aucheri, and Andropogon.

6.3.2 Fauna

Common species in Sargodhainclude birds like pheasants, partridges, and waterfowl, while mammals like jackals, foxes, and rabbits inhabit the area. The region's rivers and canals support aquatic life, including fish species like mahseer and catla. Additionally, Sargodha's citrus orchards attract various insects, birds, and other wildlife. The area's fauna plays a vital role in maintaining ecological balance and supporting biodiversity.

6.3.3 Rare and Threatened Species

No rare and threatened species recognized at national or international level found in the whole project area. No threat can be expected to any species due to the development/operation of the project.

6.4 Socio-economic Environment

6.4.1 Demographic Profile

The total population of Sargodha district is 8,174,304 with an average growth rate of 2.7 percent. The total area of the district is 5,285 square kilometers with population density of 636 persons per square kilometer. The urban population is 4348730 or 53.2 per cent with growth rate of 3.4per cent. The details are as under:

Total Population of District Sargodha	**8,174,304**	**% of District**
Rural	3825574	46.8
Urban	4348730	53.2

6.4.2 Dress

Majority of the people wear Qameez and Shalwar. English dress, shirt and Trousers are also common in Lahore as well like other big cities of Pakistan.

6.4.3 Electric Supply

WAPDA power supply will be available at the site.

6.4.4 Telephone Facilities

Both Landline and Cellular telephone facilities are present in the project area.

6.4.5 Income Status

Most of the respondents (75 %) had income above Rs. 35,000. Only twenty five per cent (25%) were in the income group of Rs. 21,000 to Rs.35,000.

Table 6.4: Income Status

#	Monthly Income (Rs.)	Number	Percentage (%)
1.	10,000-20,000	0	0
2.	21,000-35,000	5	25
3.	>36,000	15	75
Total		**20**	**100**

6.4.6 Public Utilities

All the public utilities such as water supply, sewerage system, electricity, Sui gas and telephone are available in the Project Area.

6.4.7 Health Facilities

Sargodha offers a range of healthcare services through various public and private sector hospitals, including Sargodha Medical College and teaching hospitals like Sargodha Teaching Hospital. Additional facilities include the District Headquarters Hospital, Civil Hospital, and several private clinics and hospitals, such as Allied Hospital and Sughra Shafi Medical Complex. These healthcare facilities provide medical services, emergency care, specialized treatments, and diagnostic testing, catering to the healthcare needs of the local population.

6.4.8 Educational Facilities

Many educational facilities are present in Sargodha district such as government primary schools, colleges, universities, madrassas for boys & girls both,

6.5 Suitability of the site:

The site is located in an industrial estate, which makes it most suitable for the projection of the project. There are no environmental sensitive areas like wetlands, agricultural land etc. near the site. No harm to the biodiversity will be done as the project site is a barren land. There are no documented or protected sites of archaeological, cultural, historical & religious significance in the project area.

CHAPTER 7
ASSESSING IMPACTS

In the sections below the impact assessment methodology for the construction of manufacturing unit has been defined in detail. It includes the magnitude, the extent of the impact and the nature of the anticipated impact being foreseen due the installation and operation of the proposed project.

7.1 Methodology:

The methodology adopted to carry out the EIA study of the proposed project was as follow:

- Orientation
- Planning of Data Collection
- Data Collection
- Site Reconnaissance
- Analysis of Maps
- Literature Review
- Desk Top Research
- Public Consultations
- Field Studies
- Laboratory Analysis
- Checklist for the evaluation of impacts and their analysis
- Categorization of impacts based on their potential environmental significance and prescription of preventive / mitigation measure.

In addition to the evaluation and review of the available records, data and the facts for the previous project, detailed discussion were held with the concerned members of the project management as well as other project stakeholders. Notes and proposals for measures to be taken to mitigate and compensate for any determined / detrimental environmental impacts are contained in the Environmental Management Plan (EMP) as well as monitoring plan, including all parameters that need to be measured, and the frequency of monitoring actions. A comprehensive qualitative and quantitative methodology was adopted to conduct this study inter-alia in due compliance with EIA

requirements. The study included collection of both primary and secondary data regarding environmental status and other relevant factors. This EIA report has been accomplished after carrying out thorough visit to the proposed site and detailed investigation to identify the following environmental areas of concern:

- To achieve the desired environmental compliance standards; as per the Pakistan environmental regulatory requirements; as applicable to the project.
- Plans and activities to prevent/mitigate any potential impacts and the gaps that could probably remain after implementation.
- Any other points/steps to be taken which could be beneficial to mitigate environmental adverse impacts that may accrue both during construction and regular operation of the project. A view methodology for environmental assessment is given in following table 7.1:

Table 7.1: Environmental and Social Assessment Process

Phase	**Activities**	**Status**	**Responsibility**
Screening and scoping	Reconnaissance and initial site visit and consultation, identification of environmental and social issues & applicable safeguard environment policy, categorization and working out an action plan.	Carried out during the present EIA	Project Manager (PM) Consultants
Impact Assessment	Identification of potential environmental and social impacts through site visits, stakeholders		

	consultations, review of drawings alternatives etc.		
Impact categorization	The significant potential impacts were tabulated and mitigation measures were prescribed.	During the present EIA.	PM Consultants
EMP Preparation	Stakeholders/Women consultation EMP	Carried out during as part of the present EIA	PM Consultants
Final EMP	Final version of EMP produced	Included in present EIA.	PM Consultants

7.1.1 Project constraints:

Overall collation of information and impact assessment has been undertaken to a high standard, the project has been subject to a number of constraints. Of these the two most important are as follows:

- Baseline studies: baseline studies have been carried out to characterize the natural and socio-economic environment in the areas affected by the various project elements. Although every effort has been made to research seasonal variations the studies are based on less than 12 month's data and therefore assumptions have had to be made regarding seasonal factors.
- Cumulative Impacts: Cumulative impacts occur when two or more projects are found in the same location at the same time. Impacts can be particularly severing during the construction phase, and careful scheduling may be required

7.1.2 Inception procedures:

In order to complete the study within the time span desired by the proponents, a team was assembled to carry out the study and specific assignments were entrusted to each member of the team, each of whom were armed with the resources, tasks, instructions and checklists to carry out nominated tasks.

7.1.3 Document resources

The purpose of discussions with the proponents was to collect documentation and background information on the project. The reliability of a study depends on authenticity and depth of baseline information to assess possible impacts on existing environment.

7.1.4 Public consultation:

The object of identification of stakeholders and affected persons was basically to pave the ground for public consultation in order to enlist the views of all concerned with, or about the project.

7.2 Characteristics of Impacts

7.2.1 Magnitude

The magnitude of the impact includes the type of impact project will cause such as; direct, indirect and cumulative. Direct impact means the impact being caused in the immediate environment within the same time frame. Indirect impact is the impact being caused as a result of the other impact or may result as the reaction of the other parameters. Cumulative includes both.

7.2.2 Immediacy

Immediacy focus on the following parameters:

- Temporal Extent (during construction and after construction)
- Spatial Extent (local or may be widespread)

7.2.3 Sustainability and Reversibility

It focused on the following parameters:

- Mitigability (Fully/Partially)
- Monitoring (Fully/Partially)

7.3 Objectives

Following are the objectives of screening out all significant environmental and social impacts as well as mitigation measures need to reduce the severity of the impact up to the extent possible:

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

7.4 Impact Identification with Checklist

The method of checklist has the advantage of being simple to understand and use good for site selection and priority setting but has the disadvantage of not to distinguish between direct and indirect impacts and they do not link actions and impacts.

A Checklist of environmental parameters has been developed on experience basis to evaluate the impacts of various actions affecting the Environmental Resources and values with the recommended feasible protection measures.

Checklist:

Actions Affecting Environment Resources & Values	Damage To Environment	Recommended Mitigation Measures	Significance of Impact			
			None	Small	Medium	Major
A. Environmental Problems due to Project Location						
1. Changes in topography and land-use affecting existing property values of the land	Alteration of land due to erosion and / or accretion	Consider geology of the site	x			
2. Change in biotic environment	Ecological disturbance	No cutting of trees will be done.	x			
3. Displacement of population/Resettlement	Social inequities/inad	Site is in existing facility	x			

	equate compensation					
4. Historical/ monuments /cultural values	Loss of precious values	Site is of no archeological importance	x			
5. Aesthetic Environment	Loss of environmental aesthetics	Careful planning & design.		X		
B. Environmental Problems due to Inadequate Design						
1. Unrealistic assumptions on available O & M skills	Unnecessary damages because O & M requirements too high	Realistic O & M assumptions	x			
2. Pollution Control Equipment Selection	Assumed pollution removals not realized	Appropriate equipment selection	x			
3. Environmental pollution control operations	Possible loss in overall regional welfare	Careful planning/ designing/monitoring and use of appropriate standards		x		
3(a). Water	Impairment of beneficial water uses	Analysis of consumption and resource availability		x		
3(b). Air	Impairment of air quality	Careful planning & monitoring	x			
3(c). Noise	Environmental degradation & health hazard	Selective noise abatement technique		x		
4. Occupational health & Safety hazards	Hazards to workers health & safety	Careful planning to prevent and secure an offset problem		x		

C. Environmental Problems During Construction Stage						
1. Problems due to uncontrolled construction practices	Problems of Environmental Degradation	Careful Planning and Implementation such as ILO safety regulations		x		
a) Run off erosion	Soil degradation	Pitching of trench and containment of runoff for reuse		x		
b) Worker accidents	Occupational Health & Safety	EHS Rules and Procedures			x	
c) Dust/odors/fume	Air pollution and health hazards	Sprinkling of water at intervals/ use less gas emitting technology for work		x		
d) Noise/vibration hazards	Problems of Environmental Degradation	Selective noise abatement technique		x		
e) Water	Problems of Environmental Degradation	Careful Planning of passage, containment and Implementation		x		
2. Solid Waste	Health and environmental hazards	Training of contractor staff, hazardous material will be segregated in labeled containers		x		
3. Hauling routes in/out areas	Traffic congestion and nuisances	Traffic management plan according	x			

	along access routes	to current traffic movement				
a. Machinery & Equipment mobilization	Occupational Health and Safety Issues	Careful Planning with technology assessment and Implementation	X			
D. Environmental Hazards Relating to Operations						
1. Inadequate O & M	Variety of environmental degradation similar to items mentioned above in section "B", #1-4	Adequate O&M		x		
2. Inadequate operations phase/ environmental monitoring	Opportunity loss for feedback connections to project design and O&M	Adequate monitoring according to PEQS		x		
3. Occupational Health & Safety Programs including accidents	Hazards to workers health & safety	Careful O&M including readiness for emergency		x		
E. Critical Environmental Review Criteria						
1. Loss of irreplaceable resources (such as gas, etc.)	Long-term national environmental and economic losses	Planning required to be consistent with government policies; Sustainable use of resources according to need basis of operation			x	

2. Accelerated use of resources for short term gain	Long-term national environmental and economic losses	Planning required to be consistent with policies; Compensate at later stages of operation with less use			x	
Overall Significance of Impact of Different Activities				x		

- O & M: Operation and Maintenance

CHAPTER 8
SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

8.1 Environmental impacts due to project and mitigation measures

This section identifies the potential impacts related with design, construction and operation of project on the physical, ecological and socio-economic domains of the environment. Accordingly, mitigation measures have also been proposed to manage the environment and for sustainable development.

Strict environmental management will be observed during the project operation phase. Legal requirements of the PEPA and PEQS will be rating standard for the activities.

The project proponent is filling with the EPA Punjab, written affidavit and undertaking on judicial papers, that project throughout life will operate under environmental orders. The project activities will neither adversely affect the population nor the environment around the project site.

Evaluation of the anticipated impacts from the project activity and their mitigation measures are described below:

8.2 Environmental Screening of the Proposed Project

For the proposed project, an Environmental Screening matrix was developed as part of the present EIA study focusing on the potential Environmental impacts of the project during construction and operation phases. The matrix examines the interaction of project activities with various components of the Environment. The impacts are broadly classified as physical, biological and social, and then each of these broad categories further divided into different aspects. The potential impacts thus predicted are characterized as follows:

- High Negative (adverse) Impact,
- Low Negative Impact,
- Insignificant Impact,

- High Positive (beneficial) Impact,
- Low Positive Impact, and No Impact.

The negative impacts predicted in this manner are the "unmitigated" impacts. Appropriate mitigation measures have been recommended as part of this EIA. The occurrence and severity of the potentially adverse impacts will be reduced as a consequence of the incorporation of these mitigation measures into the project design/management.

8.3 Objectives

- To find different alternatives and ways of carrying out the project activities.
- To enhance the Environmental and Social benefits of proposal.
- To avoid, minimize and remediate adverse impacts.

8.4 Environmental Impact Characterization

During the Environmental Impact Assessment, the predicted impacts were characterized. Various aspects of the impact characterization include:

- Nature (direct/indirect)
- Duration of Impact (short term, medium term, long term)
- Geographical Extent (local/regional)
- Timing (project phase)
- Reversibility of Impact (reversible/irreversible)
- Likelihood of the impact (certain/likely/unlikely/rare)
- Impact consequence severity (severe/moderate and mild)
- Significance of Impact (High/Medium/Low)

Subsequent to the characterization, appropriate mitigation measures were identified in order to minimize if not completely eliminate the adverse impact associated with project activities, finally, residual impacts were identified.

The impact characterization of the predicted impacts, mitigation measures and residual impacts are discussed below.

8.5 Environmental problems due to installation of project at present location:

While selecting a site, care should be taken to minimize the adverse impact of the facility on immediate neighborhood as well as distant places. The application of good and sound citing criteria is often the best and first strategy to minimize the environmental and social impacts that can be caused by project activities. The proposed site is away from population and so impacts to community are negligible. Easy road and rail access, no settlements in close vicinity, no archeological or cultural resources to be dismantled or relocated, and no ecologically sensitive or declared protected area existing on proposed site that favors the point of no impact due to project location.

A detailed explanation of each potential impact is given hereunder in tabulated form:

Table 8.1: Environmental Problems/Mitigation Measures Due to Project Location

Potential Impacts	**Mitigation Measures**
1.Change in Land Use Pattern	
Any new intervention has its first and foremost impact of changing the land use pattern of the area. The impact of this nature is irreversible therefore site selection needs to have careful consideration of the impacts that may arise due to the changes in land use patterns.	Prior to selection of site, many factors were considered like current land use nature, price, and comparatively less environmental impacts. Another factor adding to the feasibility of the proposed site was that it involved no displacement of local community.
2. Pressure of Resources	
Yet another impact to be considered prior to site identification is the availability of already existing resources e.g. water, gas, electricity, etc. any new intervention can exert pressure and marginalize the existing community. This	Considering this very important factor, the site identification was done after evaluating the extent of provision of resources. The water requirements, energy requirement, social services (identified in the previous

could eventually create a sense of deprivation among the already existing community and may eventually result in social unrest.	chapters) was done and based on the availability of resources to meet the present and future demand, the mentioned site was identified.
3. Natural Hazards	
It is very important to assess the extent of damage any natural hazard e.g. earthquake, floods, landslides may cause. The geological formation of the capital territory is such that it is has been categorized into earthquake zones.	The proposed site identified within environmentally /geologically safe and does not fall in any of the earthquake zones in which the capital territory is divided.
4. Displacement of Local Community	
Displacement of local community can tend to create social issues and aggravate negative feelings from the existing population towards the project.	The proposed project is planned on a site after going through its socio-culture, environmental and economic considerations.
4 Accessibility Issues to the Local Community	
Another important impact considered was obstruction or changes in the patterns of transportation and increase travel time/distance for the local community.	The proposed project site is a vacant land does not involve damage to any roads. Nature, size and scope of work also limit the extent of activities during construction as well as operational phases.
5 Presence of Sensitive Areas	
Development interventions can degrade the quality and life expectancy of ecologically, socially and historically sensitive areas.	There are not sensitive areas of any nature be it ecological, social or historical in the proposed area

8.6 Project design related environmental problem

Environmental issues may also arise during project design phase which may cause potential threats to the overall project life is not considered timely. The potential problems associated with project design phase are identified in the table 8.2 hereunder:

Table 8.2: Environmental Problems/Mitigation Measures Due to Project Design

Potential Impacts	**Mitigation Measures**
1. Increased Energy Consumption	
The design of process plays a vital role in determining the energy demand. Unplanned process may lead to overall rise in energy demand.	The design of the project is in such way that it allows adequate energy consumption.
2. Traffic Congestion	
Unplanned traffic management and traffic infrastructure development may lead to traffic related issues such as accidents and traffic congestion.	The project has included traffic management as integral part of its overall design. The project construction activities are planned within the project area. Transportation of heavy construction materials will be done during less traffic hours.
3. Fire Exits/Emergency Evacuation Plan	
Emergency evacuation plans is necessary. Fire issues due to electric short circuit, gas leakages etc.	The project proposes Emergency Evacuation Plans in events of fire hazards. The site will be equipped with proper firefighting materials to ensure increased safety.
4. Accessibility to Public Utility/Service	
Inaccessibility to public utilities will render the project uninhabitable.	Resolving the issues of accessibility to public utilities / services will be resolved through proper design planning of infrastructure.

8.7 Development phase related impacts:

The potential impacts of the proposed project and allied activities, which could cause significant environmental concerns, are identified and discussed. This discussion will form the basis for environmental management planning and will lead to designing of an EMP for the project.

Implementation of the proposed Environmental Management Plan and Environmental Monitoring Plan will further ensure protection of the environment around. Legal compliance of environmental monitoring with PEQS standards will further guarantee environmental protection of all the segments of the environment.

Table 8.3: Environmental Impacts/Mitigation Measures during Development Phase

Potential Impacts	Mitigation Measures
1. Loss of Vegetation Cover/Biodiversity	
Construction activity will involve excavation and removal of top soil. This may also lead to clearing of land for development purpose which ultimately would mean that the respective area will be cleared of any sort of flora/fauna.	The proposed site has been selected after careful consideration of the land use, presence of biodiversity and other environmental parameters. Currently, there are no trees on the said location rather it is a vacant plot devoid of flora and or fauna.
2. Gaseous Emissions	
Gaseous emissions including SOx, NOx, CO2, lead and CO during development phase. These gases are ozone depleting reagents. Besides, they also pose threat to human health.	EURO II quality fuel shall be used in the machineries, generators to avoid emission of lead. Vehicles, machineries with good conditions which fall on the quality standards shall be used to control the exhaust emission.
3. Dust Emissions	
Generation of dust and particulate matters is an issue that could arise due to construction activities.	The excavated materials e.g. soil, clay would be covered appropriately. Instead of open and dry dumping, sprinkling of water in a quantity that reduces the chances of dust generation

	would be done. The workers would be provided safety gloves, masks and ear buds and wherever necessary goggles to avoid health complications.
4. Noise Generation	
Noise emissions due to transportation, movement of heavy materials, excavation, generators may create health nuisance for the workers and local community.	The working hours shall be limited to 8 am till 5 pm to avoid noise during night shift. Vehicle maintenance would be ensured so that emissions of any sort, be it gaseous emissions of noise generation, would be controlled. The workers will be provided with ear plugs and other personal safety equipment to avoid invoking of any health issues.
5. Solid Waste Generation	
Unplanned dumping of solid waste generation during development phase can lead to blockage of roads, waterways and also create unaesthetic sight of the proposed location.	All solids wastes shall be disposed off according to a set procedure. The contractors will be bound by contractual obligations to take care of the waste generated from the construction activities
6. Wastewater Generation	
Unplanned wastewater disposal may contaminate the surface water channels, surface soil and depending upon the quantity of wastewater generated, it has a potential to contaminate the ground water aquifers.	Wastewater generation during development phase shall be reused again for material making for construction phase and sprinkling of dust on soil.
7. Accidental Spills	
Accidental spills of oil, fuel and lubricants can cause surface water contamination and surface soil contamination. It may also lead to fire	Accidental spills shall be avoided by providing spill kits at different places and also ensure the safe transportation of different raw material that may be in liquid state.

hazards depending upon the quantity and nature of spills.	
8. Equipment Breakdown/Accidents	
Accidents and/or emergency breakdown of the equipment/machineries/vehicles involved may create environmental, health and safety hazards.	This situation can be avoided by regular maintenance of the vehicles for quality assurance. Besides, equipment will be checked prior to operation to avoid accidents and human health danger due to such accidents.
9. Soil Erosion	
Loss of vegetation cover and trees may lead to soil erosion hence resulting in dust emission and loss of fertile land cover.	The development activities shall be planned in a way that reduces the chances of vegetation cover loss and its consequent soil erosion issues. Soil erosions are due to wind and water. The proposed project is planned for development during the coming months after Environmental Approval, which are dry and sunny. Hence, the probability of soil erosion due to natural factor will be negligible to none.
10. Social Impacts	
Problems regarding privacy of local community may arise due to invasion of construction workers.	Improper social behaviors e.g. staring and teasing shall be discouraged and any such incident will be reported to the site in-charge, proponents directly. Workers will be hired from the local community to avoid social issues.
11. Training and Awareness	
Unskilled workers may create issues in attaining the overall health environment and safety policy.	Regular onsite and offsite training of the workers shall be conducted. Impromptu meetings and discussions with the site in-charge and daily wages workers will be done

	to resolve any issues that may create health safety and environmental problems during construction phase.

8.8 Operation Phase Impacts

Table 8.4 provides a detailed overview of the environmental aspects and subsequent environmental impacts that may arise during project operational phase. Appropriate mitigation measures are also proposed for the remedy of any such potential impacts.

Table 8.4: Environmental Impacts/Mitigation Measures during Operational Phase

Potential Impacts	Mitigation Measures
1. Solid Waste Management	
Improper and unplanned solid waste dumping can cause environment, health and safety issues. It also can potentially deteriorate the living quality of the residents besides reducing the aesthetic quality of the plant.	The unit waste will include hazardous material which will be properly incinerated. Contract will be signed for the incineration of the waste with relevant authority during the operational phase Municipal solid waste like papers, wrappers etc. will be properly dumped in the bins. The solid waste generated will be collected from the plant by the TMA. Dumping of solid waste will be prohibited around the facilities.
2. Wastewater Disposal	
Wastewater generated due to domestic/commercial activities will result in the spread of vector borne diseases like dengue, malaria, as well as spread the nuisance of foul smell.	The wastewater that will be generated in the unit will mostly be from cleaning and sanitary purposes. Septic tank will be installed for the treatment of wastewater generated from these activities as well as for domestic wastewater.

3.Energy Conservation	
Excessive use of energy will exert more pressure on the already dwindling energy resources of the city/country.	The workers/employees will be encouraged to follow energy conservation strategies developed during operational phase. Machineries and equipment will be kept in good maintained shape to avoid extra fuel consumption.
4. Noise Generation	
Noise emissions during operational phase will create issues to the residents.	In the unit, no noisy devices or machinery will be used. So, there will be no such noise pollution.
5. Emergency/Fire Hazards	
Emergencies e.g. fire incidents may lead to environmental, health and safety issues to the local residents.	Emergency exits will be planned. Firefighting equipment will be provided and adequate trainings will be provided to tackle any situation of fire hazards. Call points at suitable locations will be installed.
6. Training of Staff	
Unskilled personnel will not be able to tackle environmental, health and safety related situations which may further aggravate any such issues and cause loss of human life and property.	Regular training of the staff will be conducted. Proper monitoring and reporting mechanism will be developed where the team will be responsible to communicate/report any illegal or hazardous situation to the team leader.

8.9 Potential Environmental Enhancement Measures

The proposed project has a number of positive impacts, which include:

- No residential and commercial structures will be affected.
- The project will help in economy growth of Pakistan.
- The land use will be done in an away that it will not create any threat to the privacy of adjoining buildings.
- It will increase the employment ratio of the area.

CHAPTER 9

ENVIRONMENTAL MANAGEMENT AND MONITORING PROGRAM

9.1 General

This section provides brief description of environmental issues, mitigation measures to eliminate and reduce environmental and social impacts to an acceptable level. Institutional arrangements for the implementation of the mitigation measures are also provided.

9.2 Objectives of EMP:

The objectives of EMP are:

- The outline functions and responsibilities of responsible persons.
- To state standards and guidelines, which are required to be achieved in term of environmental legislation.
- To outline mitigation measures and environmental specifications which are required to be implemented for all phases of the project.
- To prevent long term or permanent environmental degradation.
- To identify training requirement at various levels.

9.3 Summary of Impacts and their mitigation measures:

- **Construction phase:**

Following are some impacts during construction phase:

Environmental Aspects	Environmental Impacts	Mitigation Measures
Land Disturbance	• Top soil degradation by excavation. • Dislocation of soils. • Land instability. • Contamination of soil.	• The cutting and leveling activities will be restricted to the designated plot boundaries. • Pitching of soil will be done. • All possible chemicals, lubricants, adhesives, paints etc. must be stored at an impermeable area where leakage or leaching in soil is completely ruled out.
Air Quality	• Gaseous and dust emissions from machinery and heavy vehicles. • Chronic respiratory diseases.	• Use of standard construction equipment and vehicles. • Scheduled maintenance of equipment and vehicles including engine tuning, filter cleaning, etc. • Water spraying will be done to reduce dust emissions. • The vehicle speeds on graded roads will be limited in order to minimize dust emissions.
Noise Level	• Noise from construction equipment/vehicles. • Negative health effects. • Disturbance to the social environment.	• Noise control policies will be implemented. • Noise levels as per PEQS i.e. 80 dB (A) during day-time and 75dB (A) during night-time.

		• Construction equipment/machineries will be provided with suitable noise dampening devices. • Vehicles must be tuned and maintained to reduce their noise levels. • Workers on site will be provided with adequate PPEs. • Noise level will be monitored periodically to meet the requirements of PEQS.
Solid Waste	• Health hazards • Unaesthetic conditions	• The solid waste will be collected from the site by the workers of TMA. • The site will be always assessed for any extra wastage of material and reported daily to the supervisor. • Waste should be segregated at the construction site for recycling purpose. • No waste will be dumped at any location outside the proposed site boundary.
Water Pollution	• Ponding of water will serve as breeding ground for mosquitoes. • Accidental discharge of material and leachate and	• Water used for wetting purpose should be reduced to the required extent. • Water conservation practices will be adopted to reduce waste water discharges during construction.

	other additives can alter the soil and ground water quality.	• Grey water will be first stored in a holding tank to allow settling of silt and other suspended solid particles and the cleared water will be used for sprinkling and constructional purposes. • Ensure no water remains stagnant at any proposed project area. • In case of spill, immediate action must be taken to prevent leaching. Careful use of machineries and equipment to prevent leakages and spills.
Terrestrial Ecology	• Removal of shrubs at the proposed project site.	• Construction of the proposed project will not involve any flora cutting. • Green areas will be developed in vacant portions of proposed project areas.
Health and Safety	• Lack of awareness among general laborers about health and safety. • Unskilled and untrained workers Probability of risks and hazards	• Only skilled workers will be allowed to work at the construction sites. • Safe for Hot Work procedures should be implemented to avoid accidents. • Provision of first aid facilities for workers at site for meeting the emergency needs of workers. Workers should be facilitated by providing appropriate work specific PPE's.

		• Construction area will be fenced to avoid accidents and will be properly drained to avoid ponding of water that could harbor mosquitoes and other disease vectors. • Accidents records will be maintained. • Use of signage must be implemented.
Local Economy	• The proposed project will have positive impacts on local economy	• Employment preference will be given to the locals. • People from neighboring areas will be considered for unskilled employment. • Suppliers and Vendors of neighboring areas will be given priority.

- **Operational Phase:**

Environmental Aspects	**Environmental Impacts**	**Mitigation Measures**
Air Quality	• Chronic Respiratory health effects	• The unit will perform no such activities that will pollute or harm air quality.
Noise Pollution	• Eye, nose and throat irritations. • Nausea • Headaches	• No heavy machinery will be installed in the unit that will cause noise pollution.
Solid waste	• Health hazards • Property loss • Unaesthetic conditions	• The waste will include hazardous material which will be properly incinerated. • Contract will be signed for the incineration of the waste with relevant authority during the operational phase • Municipal solid waste like papers, wrappers etc. will be properly dumped in the bins. • The solid waste management plan will be developed and facilities for collection, storage and transportation will be established and organized. • The solid waste generated will be collected from the plant by the TMA. • Dumping of solid waste will be prohibited around the facilities.
Wastewater	• Water borne diseases • Water scarcity • Water pollution	• The wastewater that will be generated in the unit will mostly be from cleaning and sanitary purposes.

		• Septic tank will be constructed for the primary treatment of wastewater generated from these activities as well as for domestic wastewater. • The treated water will be discharged into the neaby nullah. • Before the final discharge it will make sure that the qualities remain within PEQS. • Water conservation strategies will be employed to avoid wastage of water.
Local Economy	The proposed project will have positive impacts on local economy	• Possibility of recruitment of local workers having pertinent education skills will be explored. • Local businesses such as maintenance service providers, food suppliers, transporters, etc., will likely to have business opportunities associated with the operation of the plant.
Chemical Handling and spillage	• Land pollution • Health hazard	• Regular training will be given to the workers on regular basis. • PPE's box and spillage kit will be provided at different locations. • Chemical Spillage Plan will be prepared and shared at all organizational levels. • Eye wash showers will be installed at different locations.
Health and Safety	• Lack of awareness among general laborers about health and safety.	• The safety of the public at all stages of the operational phase will be ensured

	• Unskilled and untrained workers Probability of risks and hazards	through appropriate public education and safety measures. • All staff within the facility will be in protective gears at all times. • Reporting of all incidents and accidents to include details of: -The nature of the accident or incident; The place and time of the accident or incident; The staff who were directly involved; Any other relevant circumstances will be done. • Fire hydrants will be installed preferably near the main entrances. • All workers will be trained in firefighting. • All windows will be fitted with openable grills

9.4 Schedule of Implementation and Environmental Budget:

Currently, the proponent and the management of the project seeking for the NOC from the environment department. The estimated completion period of the project would 10-12 months after obtaining all permits and NOCs. The total cost of the project is 400 million, which includes 10 lacs Pak Rupees for the environmental management which include the following parameters.

Environmental Component	Quantity	Amount PKR
Tree Plantation	2500	100,000
Health & Safety measures and provision of PPE's	L.S.	400,000

Air and water Quality & noise monitoring	L.S.	200,000
Environmental Trainings	L.S.	300,000
Total Environmental Management and Monitoring Cost.		1,000,000

9.5 Roles and Responsibilities of Environmental Management Team:

This section provides an organizational structure for the environmental management during the proposed project implementation and defines the roles and responsibilities of the various stakeholders for the duration of the project. The organizational roles and responsibilities are summarized below:

9.5.1 Primary Responsibilities

The primary responsibility to ensure compliance of the emp will rest with the project owner and the contractor will he assumed by their respective senior personnel involved in execution and Operation of the project.

Responsibilities will be assumed by the proponent during construction and Operation. He will be assisted by the Health, Safety and Environment (HSE) Officer with support from HSE Manager. Proponent will coordinate with relevant government department through its HSE Manager.

9.5.2 Field Management and Quality Control

Carrying out construction of the facility in an environmentally sound manner will be the responsibility of the contractor, appropriate provision ensuring compliance will be incorporated in the construction contract.

HSE Officer of project proponent will be responsible for environmental soundness during both construction and operational phases.

9.5.3 Independent Monitoring Consultant

The project proponent will hire an independent monitoring consultant (IMC), in consultation with the Punjab EPD, to monitor the environmental performance of the contractors and the environmental impact of project activities.

9.5.4 On-the-Job Supervision and Monitoring

A dedicated HSE Officer engaged by the contractor will be responsible for ensuring compliance with the environmental management plan. He will also be responsible for communication and training of construction crews, in all aspects of the environmental management plan.

9.6 Monitoring Plan

Effective implementation of the mitigation measures to mitigate or minimize the environmental impacts would require the project to undertake a comprehensive monitoring program. The objective of the monitoring program is to ensure that the construction and operation activities are carried out in an environmentally sensitive and responsible manner, and in accordance with the recommendations of EIA.

Constructional Phase

Monitoring Category	**Type of Monitoring**	**Monitoring Responsibility**
Air/Noise Pollution		
Dust emission during site preparation, excavation	Monitoring adequacy of dust suppression measures undertaken	Contractor/Proponent
Storage and transport of construction materials	Monitoring adequacy of measures undertaken to prevent fugitive dust	Contractor/Proponent
Noise and emission from construction vehicles	Monitor maintenance of construction vehicles	Contractor/Proponent
Noise and emission from construction activities	Monitor preventive measures being implemented to curb noise	Contractor/Proponent
Solid Waste		
Disposal of solid waste	Monitor to ensure solid waste segregation and proper disposal	Contractor/Proponent
Health and safety of Construction work force		
Health and safety requirements	Monitor adherence to all occupational and safety requirements	Contractor/Proponent
Provision of health and safety equipment	Monitor availability of adequate number of protective gear	Contractor/Proponent
Sanitary condition of construction	Monitor provision of shelter, water supply and solid waste management at camp sites	Contractor/Proponent

Community life and Economic Activities		
Access to public and private properties	Monitoring impact of project on dwelling and business in the project area	Contractor/Proponent
Damage to public and private properties	Monitoring construction activities to ensure public and private property is not damaged	Contractor/Proponent
Hardship and inconvenience to public and business	Monitoring to ensure that communities and business face minimal hardship and inconvenience due to construction activities	Contractor/Proponent

Operational Phase:

Monitoring Category	**Type of Monitoring**	**Monitoring Responsibility**
Operation and Maintenance of the System		
Noise and air emissions due to generators and vehicles	Monitor proper maintenance of the equipment	Proponent
Solid waste segregation, recycling and final disposal	Monitor adequacy of measures undertaken to collect and dispose off solid waste	Proponent
Sewage and wastewater disposal	Monitor disposal of wastewater according to the proposed mitigation measures	Proponent
Environment and Landscape		
On site wastage material's minimization	Monitor waste minimization activities	Proponent
Creation of landscape by tree planting, appropriated to local conditions	Monitor and implement site restoration and landscaping	Proponent

9.7 EMP Reporting and Reviewing Procedure

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

9.7.1 Communication and Documentation

This activity will be done by an Independent Monitoring Consultant, the key features of such a mechanism are;

- Precise recording and maintenance of all information generated during the monitoring in a predetermined format
- Communicating the information to a central location
- Storing raw information in a central database
- Processing the information to produce periodic reports

Item	**Description**
Date recording and maintenance	All forms will be numbered and a tracking system will be developed for each. Whenever a form is released for use in the field. Its number will be recorded. The monitors will be required to account for each from after completion. In this manner, it will be ensured that all forms are returned to the office, be they filled, unused, or discarded
Storage of information	A database for information collected during the project will be prepared. The database may include information on: • Training programs • Staff deployment • Non-compliance • Corrective actions • Water Resources

	• Quality • Results of effects monitoring • Water usage • Fuel usage
Meeting	For effective monitoring, management and document of the environmental performance during the operation, environmental matters will be discussed during daily meetings held on-site. Environmental concerns raised during the meeting will be mitigated after discussions between the project site representatives

9.7.2 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 root causes and develop its solutions.

The purpose of the weekly meetings will be to discuss the conduct of the operation and environmental issues and their management. The proceedings of the meeting will be recorded in the form of weekly schedule.

9.7.3 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.

9.8 Staff and Training:

9.8.1 Environmental Committee and its Responsibilities:

The management will form up an environmental committee (EC), which will be responsible for the environmental management and supervisory affairs during the operational phase of the project. The responsibilities of the environmental committee (EC) are as follows:

- To ensure implementation of all the proposed mitigation measures during and after the operational phase of the project.
- To organize routine monitoring of motor vehicle emissions, air quality, noise and vibration; etc. In case, the noise levels exceed the acceptable levels, a penalty or ban must be enforced.
- To develop operational guidelines and implementation schedule.
- Receiving complaints from residents and institutions and assisting the local environmental authority including Punjab EPA.
- 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.

9.8.2 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 would play a key role in this respect and arrange the trainings. A training program is proposed to train the staff who will be involved in the operational phase.

9.8.3 Environmental Technical Assistance and Training Plan:

An environmental and social training and Technical Assistance (TA) program will be carried out to implement the EMP, as well as to facilitate the improved environmental management of future projects by increasing the environmental and social awareness of staff in general. The objective of the TA will be to help establish appropriate systems, and to train senior staff responsible for managing environment, operations, and planning, who can then impart training at a broader level within and outside the project site (i.e., the training of trainers). The TA consultant will organize training courses for the staff, train the staff in specialized areas such as air and noise pollution monitoring; develop environment operation manuals in consultation with the EPA.

9.8.4 Environmental Training schedule:

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.

The primary responsibility for providing training to all the project personnel will be that of the IMC (implementation and management committee) to formulate indicative environmental training program, which will be finalized before the commencement of the project. The IMC will train the project proponent's staff and other staff engaged for the project. Training will cover all staff levels, ranging from the management and supervisory to the skilled and unskilled categories. The scope of the training will cover the requirements of the EIA and the EMP, with special emphasis on sensitizing the project staff to environmental, ethnic, and social context of the area.

Environmental Training Schedule

Staff	Trainer	Contents	Schedule
Selected Management staff from the project proponents.	IMC	• Environmental sensitivity of project area • Key findings of the EIA Mitigation measures • EMP • Social and cultural Values of area	Prior to the start to the project activities
All Employees	IMC	• Environmental sensitivity of project area • Mitigation measures Contingency plan • Community issues • Social and cultural values	Prior to the start of the Project activities
Drivers	IMC	• Road safety • Defensive driving	Before and during the project activities.

9.9 Emergency Preparedness Plan

In order to cope with emergency due to major fire hazards a proper fire escape plan will be designed. A proper **emergency escape** will be planned with **fire extinguishers** at each floor.

- **Fire Alarm and detection System**

Fire alarm system is also installed. The occupants'/security guards who detect the fire must inform the others in the shortest possible time. They may operate fire alarms, shout and use telephone (line and cellular)

- **The system comprises the following.**
- Smoke detector
- Call points
- Control panel in security room
- Fire signs
- Calling the Fire Brigades

The contacts (telephones, call and fax numbers) of local fire brigades will be boldly written at prominent place and on the notice boards so that any person may call them for immediate assistance.

- **Medical Aid**

Information be immediately passed to the nearby medical hospitals and centers for recovery of the wounded persons. Also first aid boxes should be kept in the factory area.

9.10 Equipment maintenance detail:

All the machinery and other equipment at work place will be properly tuned, oiled and monitored after a specific intervals of time to ensure the efficiency of equipment.

CHAPTER 10
STAKEHOLDER CONSULTATION

10.1 Objectives of Consultation:

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

10.2 Consultative Aspects:

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

The consultations aimed specifically at:

• Exchange of information related to the Project and its possible utilization in the Project planning and execution.

• Dissemination of information through discussions, education and liaison.

• Collaboratively solving the problems.

• Eliciting the comments and feedback on the proposed Project.

• Documentation of information narrated by the stakeholders.

• Documentation of mitigation measures proposed by the stakeholders.

• Incorporation of public concerns and their addresses in the EIA

10.3 Stakeholder's Consultations:

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

Major Stakeholders identified

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

• Local residents Teachers

• Shop owners

• Office Workers Laborers

• Pedestrians

• Mosque users.

• Transport users

10.4 Public Consultations:

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

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

Methods for public consultation:

- Campaigns
- Exhibition
- Local press
- Surveys
- Public meetings
- Conferences
- workshops

Community Awareness and Perception about the project:

- Some people of the project area are aware of sitting the project. Among the people consulted as a part of the Public Consultations, all of them welcome the project. The people have clear perception that the project in the area is beneficial for the community especially and the area in general.
- The people foresee positive impacts like employment opportunities, business, development of the area etc.
- Study findings depict that the people of the study area perceive overall positive impacts as a result of project. Therefore, their attitude towards the project installation is quite positive.
- As far as the Social Impact Assessment (SIA) is concerned, positive social impacts are dominant over hardly conceived any negative social impacts observed during the study.
- The people have high expectations and hope from the plant activity and its management.
- They correlate their positive attitude towards the plant with many socio-economic opportunities and benefits.
- They also perceive accelerated economic activity due to the business opportunities likely to emerge in the area. Directly or indirectly, many people local people will get employment and

business from the project e.g.: shop keepers, traders, suppliers, contractors, transporters, technicians etc.

- People foresee many socio-cultural and psychological positive impacts on their lives and the community.
- They feel that the project its related activities will provide a strong base for social change.
- They reckon that invasion of the people and technology in the area will improve the quality of life of the people. It will also improve the level of general awareness of the people about different aspects of life.

From the above facts one can conclude that many positive economic and social impacts will appear in the quality of the lives of the people of the Study Area due to the plant installation. These positive impacts include employment and business opportunities, infrastructure development, generating income resources and improving quality of life.

10.5 Schedule of Consultations

The consultation was carried out on **18th April, 2025.**

Consultation was carried out with:

- Industrial estate management
- District Officer
- Proponent
- Nearby community

Performas and pictures of consultation are attached in **annexure IV.**

10.6 Issues Discussed

Following issues were discussed during the stakeholder's consultation:

• Overall activities of the project and their possible impacts.

• Possible impacts on natural vegetation, flora and fauna

• Possible mitigation measures;

• Beneficial factors and involvement opportunities of the local people in the set of activities of Project.

General

Majority of stakeholders appreciated the project and taken it as a necessary step towards the current situation of food.

Socio Economic

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

10.7 Proposed Mitigation Measures for Key Issues of Project

10.7.1 General

Project activities shall be confined to the designated project site, minimizing any damage to the macro environment.

The road network is well established within the area of the proposed project. Moreover, if needed, it can be improved.

Project will be completed in time.

10.7.2 Environmental

There is no removal of trees and habitat destruction due to project activities as there exist no any trees or habitat at the proposed site.

Tree plantation is the part of project to improve the environmental conditions of the site. Tree plantation activities are carried out by the project proponent on regular intervals.

Waste produced during the project activities would be properly managed and disposed off.

10.7.3 Socioeconomic

All unskilled jobs (watchmen, laborers) would be given to local people through local contractors. People directly affected by the project would be given priority.

Appropriate measures for safety and control of pollution during project activities would be ensured to avoid risk and hazard to the community.

CHAPTER 11
CONCLUSION AND RECOMMENDATIONS

11.1 Conclusion and Recommendations

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

- Plantation as far as permissible and within the scope of the project be carried out.
- Sustainable development approach through conservation of natural environment be followed.
- Environmental aspects of the project should be well taken care through implementation of the Environmental Management Plan as recommended in this report.
- The project management may adopt "cleaner and greener environment" as its motto and this will make the project more environment friendly.

On the basis of the findings of EIA, it is concluded that the project will not pose any adverse impact on the local population and the environment. Therefore, it is recommended that the competent authority may please be issues Environmental Approval for the construction and operation of this project.