



ENVIRONMENTAL IMPACT ASSESSMENT REPORT

INSTALLATION OF ASPHALT PLANT BY WAJID & CONSTRUCTION (PVT). LTD, OPPOSITE RANA PETROL PUMP, NEAR LIAQAT ALI KHAN GATE OF DHA, MATTI TAL ROAD DISTRICT MULTAN



Project proponent: Wajid Sharif

Environment Friends of Environment and Economic

**Consultant: Development (FEED), Garden Tower Plaza,
Barkat Market, Lahore**



LIST OF ABBREVIATIONS

CO₂	Carbon Dioxide
°C	Degree Celsius
dB(A)	Decibel (Unit of Noise)
IEE	Initial Environmental Examination
EMMP	Environmental Mitigation and Monitoring Plan
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
EP&CC	Environmental Protection and Climate Change Department
HSE	Health, Safety & Environment
m³/h	Cubic meter per hour
NOC	No Objection Certificate
NO_x	Oxides of Nitrogen
PM	Particulate Matter
PPEs	Personal Protective Equipment
PEPA 1997	Punjab Environmental Protection Act 1997
SOPs	Standard Operating Procedures
So_x	Oxides of Sulfur



EXECUTIVE SUMMARY

The name of project is “**Installation of Asphalt Plant by Wajid & Construction Pvt. Ltd, District Multan**”. The project site is a vacant area and management of the project intends to start Installation of Asphalt Plant after obtaining environmental approval from EPA under section 12 of PEPA 1997. The salient features of the project are as under:

Sr. No	<u>Salient Features</u>	
i.	Title of Project	Installation of Asphalt Plant by Wajid & Construction Pvt.Ltd,
ii.	Location of Project	Opposite Rana Petrol Pump, Near Liaqat Ali Khan Gate of DHA, Matti Tal Road, District Multan”
iii.	Nature of Project	Asphalt Plant produces Hot Mix Asphalt by combining cold aggregate (crushed stone) and sand with asphalt cement (bitumen) at high temperature. The hot mix asphalt is used for road construction and other similar projects
iv.	Coordinates	Latitude:30.3000041° Longitude:71.616716°
v.	Name of Project Proponent	Wajid Sharif
vi.	Name of Organization/ Environment Consultant	<i>Friends of Environment and Economic Development(FEED), Garden Tower Plaza, Barkat Market, Lahore</i>
Brief Outline of Project		
I	Area of project	8.5 Acers
ii	Nature of Area	Asphalt plant are normally installed near the project site, where the asphalt material is supposed to deliver for the construction of roads



ENVIRONMENTAL IMPACT ASSESMENT

		<p>etc. This asphalt plant has to provide its material for the construction of roads of DHA Multan, hence its location is near DHA Multan. There is no any kind of agriculture, vegetation, trees etc.</p>
iii	Quantity of Wastewater	<p>The project is not likely to generate any kind of Wastewater. All the processes and operations are dry ones.</p>
iv	Quantity of Gaseous Emissions	<p>The applicant plans to install state of the art Asphalt plant equipped with necessary dust control system. The Asphalt plant will keep its level of dust within Punjab Environmental Quality Standard (PEQS).</p>
v	Environmental Impacts Anticipated during Construction Phase of Project	<p>The anticipated impacts during construction phase may include dust, noise, vehicle emissions, workers' safety and employment issues. Chapter 4 of the EIA Report describes all possible environmental impacts and mitigation measures.</p>
vi	Environmental Impacts anticipated during Operation Phase of the Project	<p>The operations/processes of this project may generate dust emissions but management of DHA Multan as has forced the project proponent to install state of the art Asphalt Plant in ordered to avoid degradation of air quality of DHA. The project proponent has therefore decided to install high quality Asphalt Plant whose working does not affect the surrounding environment</p>
vii	Mitigation Measures	<p>Environmental impacts during the construction phase may include noise, dust, solid waste and workers' safety. Mitigation measures have been included in Chapter 4 of the EIA report. Construction-related noise will be mitigated by regular servicing and tuning of the machinery and vehicles. Dust (the only significant air emission) will be controlled by water sprinkling and covering the construction material. The use of adequate PPEs and adherence to the SOPs will ensure the safety of the workers. The contractor will hire local labor for construction work to avoid employment conflicts.</p>



ENVIRONMENTAL IMPACT ASSESMENT

Viii	Proposed Environmental Monitoring	The plan of Environmental Monitoring has been prepared and made the part of EIA Report.
-------------	--	---



Table of Contents

List of Abbreviations.....

Executive Summary.....

 Chapter 1: Introduction.....

 Chapter 2: Legislative Framework.....

 Chapter 3: Screening and Scoping.....

 Chapter 4: Project Description.....

 Chapter 5: Description of Environment.....

 Chapter 6: Potential Environmental Impacts and Mitigation Measures.

 Chapter 7: Stakeholders Consultation.....

 Chapter 8: Environmental Management & Monitoring Plan.....

 Chapter 9: Conclusion and Recommendations.....



CHAPTER .1

INTRODUCTION



Chapter 1: INTRODUCTION

The Project Proponent has planned construction of **Installation of Asphalt Plat by Wajid & Construction Pvt. Ltd, Opposite Rana Petrol Pump, Near Liaqat Ali Khan Gate of DHA, Matti Tal Road District Multan**” and this document is the Environmental Impact Assessment Report (EIA) of said Project. The main objective of the study is to keep the project in compliance with prevailing Environmental Laws, Rules, and Regulations. The report indicates potential environmental impacts of the project and suggests mitigation measures to enhance the environmental performance of the proposed project. The report is comprehensive and presents the Environmental Impact Assessment of the project during its construction and operational phase along with a monitoring framework to keep the project in compliance with Environmental Laws and Punjab Environmental Quality Standard (PEQS).

1. Objectives of EIA

The main purpose of this report is to meet legal requirements prescribed in Punjab Environmental Protection Act, 1997. Section 12 of Punjab Environmental Protection Act, 1997 states as under:

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

The Punjab Environmental Protection Agency (Review of IEE and EIA Regulations, 2000) provides the details regarding categories of Projects.

The following are the main objectives of EIA Report: -

- i. To determine and document the state of the environment of the project area to establish an environment baseline for assessing the suitability of the Project site.
- ii. To identify construction and operational activities of project and assess their impacts on the environment.



- iii. To assist the proponent in planning, designing, and implementing the project in a way that eliminates or minimizes the negative impacts on the biophysical and socio- economic environment and maximizes the benefits for all parties/stakeholders.
- iv. To present an Environmental Mitigation and Monitoring Plan to smoothly implement the mitigation measures and supervise their efficiency and effectiveness.
- v. Eliminate or minimize the negative impacts on the biophysical and socio-economic environment and maximize the benefits to all parties in cost cost-effective manner
- vi. To present a Mitigation and Monitoring Plan to smoothly implement the suggested mitigation measures and supervise their efficiency and effectiveness.

To provide an opportunity for the public to understand the project and its impacts on the community and their environment in the context of sustainable development.

1.2 Brief Introduction to Environment Consultant

The project proponent has hired the services of Environmental Consultant i.e. *Friends of Environment and Economic Development (FEED)*. A team consisting of professionals from three important disciplines i.e. Environmental Science and Environmental Engineering have worked for the collection of requisite data information and monitoring of baseline environmental conditions of the project site/area.

The Environment Consultant; *Friends of Environment and Economic Development (FEED)* consists of well-trained professionals who provide the following services as per Guidelines, Rules and Regulations notified by EPA Punjab

EPA NOC/ Environmental Approval for Construction Phase/ Environmental Approval for Operation Phase

- i. Initial Environmental Examination
- ii. Environmental Impacts Assessment



ENVIRONMENTAL IMPACT ASSESMENT

- iii. Socio-Environmental Impacts Assessment
- iv. EPA NOC for the Construction Phase of existing industrial units /new industrial units
- v. EPA NOC for the Operational Phase of industrial units
- vi. Renewal of EPA NOC after every 3-years

1.3 Details of Environment Consultant

The contact details of Environment Consultant are in the following Table 1.

Table 1.1 Contact Details of Environment Consultant

Name of Environment Consulting Firm	<i>Friends of Environment and Economic Development (FEED)</i>
Address	Garden Tower Plaza , Barkat Market ,Lahore
Contact Person	Ms. Aqsa Tabbasam, Assistant Manager (Environment) (03237843076)

1.4 Details of Project Team

The following Team of qualified professionals has conducted environmental assessments and contributed for preparation of the EIA report.

Table 1.2 Contact Details of Environment Consultants

Sr.#	Name	Qualification	Roles
i.	Mr. Muhammad Tahir	MSc Environmental Sciences MSc Agricultural Engineering	<ul style="list-style-type: none">• Team Head



ii	Ms. Aqsa Tabbasam	BS Environmental Sciences MS Textile Engineering	<ul style="list-style-type: none">• Social Survey• Data Collection• Report Writing
iii	Mr. Mehroz Khan	BS Environmental Sciences MS Environmental Sciences	<ul style="list-style-type: none">• Data Collection• Report Writing
Iv	Ms. Amina Ramzan	BS Environmental	<ul style="list-style-type: none">• Social Survey• Data Collection• Report Writing

1.5 Scoping and Data Collection

During this phase, all necessary information on the project was collected and reviewed.

A list of potential environmental impacts as well as social issues was prepared. Relevant data was collected and compiled, to develop a baseline of the project area's physical, biological, and human environment. Field visits to the site were also carried out. The secondary resources included the reports of the studies carried out earlier, published books and data, and relevant websites. With the help of these resources, a generic profile of the project area was developed. During these field visits, information on environmental and social parameters was collected. The environmental and social hot spots falling at or near the project site were identified, and most importantly, the project's environmental effects were determined.

1.6 Environmental Impacts of Project

The Team determined the potential environmental impacts of the proposed project during the study. Subsequently, the potential environmental impacts were characterized to determine their significance. Mitigation measures have been identified to minimize the significant environmental effects. A management framework has also been developed in the form of an EMP for the implementation of the mitigation measures identified during the study.



1.7 Structure of Report

This EIA reviews information on existing environmental attributes of the project Area. All-important ecological features, air quality, noise, water quality, soils, social and economic aspects are included. The report predicts the probable impacts on the environment due to the said project. This EIA also proposes various environmental management measures. Details of all background environmental quality, environmental impacts/pollutant generating activities, pollution sources, predicted environmental quality and related aspects have been provided in this report.

The structure of this assessment report is as follows:

- i. Introduction
- ii. Legislative Framework
- iii. Screen & Scoping of the project
- iv. Description of the Project
- v. Description of Environment
- vi. Screening of Potential Environmental Impacts and Mitigation Measures
- vii. Stakeholders Consultations
- viii. Environmental Mitigation and Monitoring Plan (EMMP)
- ix. Conclusion and Recommendations



CHAPTER NO.2

LEGISLATIVE

FRAMEWORK



Chapter 2: LEGISLATIVE FRAMEWORK

Pakistan is a signatory of Multilateral Environmental Agreements and different international treaties. Pakistan has a comprehensive set of environmental legislation covering multiple environmental issues facing Pakistan like pollution of freshwater bodies, gaseous emissions from Industrial Units degradation of ambient air quality, deforestation, loss of biodiversity, lack of proper waste management, and adverse impacts of climate change. The basic policy and legislative framework along with detailed rules, regulations, and guidelines required for implementing the policies and enforcement of legislation for the protection of the environment and biodiversity are in place, in Pakistan.

2.1 Punjab Environmental Protection Act 1997

After the 18th Amendment in the Constitution of Pakistan, the Federal Ministry of Environment has been dissolved and the subject of Environment and Ecology was devolved to provinces of Pakistan. The province of Punjab has made its own Environment Act titled Punjab Environmental Protection Act, 1997. The Punjab Environmental Protection Act (PEPA), 1997 covers the following important topics /subjects.

- i. Establishment of the Punjab Environmental Protection Council.
- ii. Functions and Powers of the Council.
- iii. Establishment of the Provincial Environmental Protection Agency.
- iv. Functions of the Provincial Agency.
- v. Powers of the Provincial Agency.
- vi. Establishment of the Provincial Sustainable Development Fund.
- vii. Management of the Provincial Sustainable Development Fund.
- viii. Prohibition of certain discharges or emissions.
- ix. Initial environmental examination and environmental impact assessment
- x. Prohibition of import of hazardous waste.
- xi. Handling of hazardous substances.
- xii. Regulation of motor vehicles.
- xiii. Environmental Protection Order.



- xiv. Penalties.
- xv. Offences by bodies corporate.
- xvi. Offences by Government Agencies, local authorities or local councils.
- xvii. Environmental Tribunals.
- xviii. Jurisdiction and powers of Environmental Tribunals.
- xix. Appeals to the Environmental Tribunal.
- xx. Appeals from orders of the Environmental Tribunal.
- xxi. Jurisdiction of Environmental Magistrates.
- xxii. Appeals from orders of Environmental Magistrates.

2.2 Review of IEE/EIA Regulations of 2022

Review of IEE/EIA Regulations provide clear mechanism for processing the NOC application. The said regulation provides the list of project requiring IEE through schedule I AND the list of project requiring EIA through schedule. The routes further provides details regarding review fee in its schedule III. The procedure for conducting preliminary scrutiny of project documents and public hearing/ public participation in addition to above, The Regulations describes condition of approval as well. Validity period of approval, mechanism regarding entry and inspection, monitoring and cancellation of approval. The Rules further provides composition of Environmental assessment advisory committee and its mandate.



2.3 Punjab Environmental Quality Standards (PEQS)

The Govt. of Punjab has notified Punjab Environmental Quality Standards for different kinds of pollutants, as described in the following tables: -

Table 2.1 Punjab Environmental Quality Standards for Ambient Air

Sr. No	Pollutant	Time-Weighted Average	Concentration in Ambient Air	Method of Measurement
1.	Sulfur Dioxide (SO ₂)	Annual Average	80 µg/m ³	Ultraviolet Fluorescence Method
		24 hours	120 µg/m ³	
2.	Oxides of Nitrogen as (NO)	Annual Average	40 µg/m ³	Gas phase chemiluminescence
		24 hours	40 µg/m ³	
3.	Oxides of Nitrogen as (NO)	Annual Average	40 µg/m ³	Gas phase chemiluminescence
		24 hours	80 µg/m ³	
4.	Ozone (o ₃)	1 hour	130 µg/m ³	Non-Dispersive UV Absorption Method
5.	Suspended particulate matter (SPM)	Annual Average	360 µg/m ³	High volume sampling (average flow rate not less than 1.1 m ³ /min)
		24 hours	500 µg/m ³	
6.	Respirable Particulate Matter PM ₁₀	Annual Average	120 µg/m ³	Preferably β-Ray absorption method
		24 hours	150 µg/m ³	
7.	Respirable Particulate Matter PM _{2.5}	Annual Average	15 µg/m ³	Preferably β-Ray absorption method
		24 hours	35 µg/m ³	

	Pollutant	Time-weighted	Concentration	Method Of Measurement
--	-----------	---------------	---------------	-----------------------



ENVIRONMENTAL IMPACT ASSESMENT

		Average	in Ambient AIR	
		1 hour	15 µg/m ³	
8.	Lead (Pb)	Annual Average	1 µg/m ³	Ass method after sampling using EPM2000 or equivalent Filter paper
		24 hours	1.5 µg/m ³	
9.	Carbon Monoxide (CO)	8 hours	5 µg/m ³	Non-Dispersive Infra-Red (NDIR) method
		1 hours	10 µg/m ³	

2.2 Punjab Environmental Quality Standards for Drinking Water

Sr. No.	Properties /Parameters	Standard Values	WHO Standards	Remarks
1.	All water intended for drinking (E. Coil or Thermo-tolerant Coliform bacteria)	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml sample	Most Asian countries also follow WHO standards.
2.	Treated water entering the distribution system (E. Coil or thermo-tolerant coliform and total coliform bacteria)	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml sample	Most Asian countries also follow WHO standards.
3.	Treated water in the distribution system (E. Coil or thermo-tolerant coliform and total coliform bacteria)	Must not be detectable in any 100 ml sample In the case of large supplies, where sufficient samples are examined, must not be present in 95 % of the sample taken throughout any 12-month period.	Must not be detectable in any 100 ml sample In the case of large supplies, where sufficient samples are examined, must not be present in 95 % of the sample taken throughout any	Most Asian countries also follow WHO standards



ENVIRONMENTAL IMPACT ASSESMENT

			12- month period.	
4.	Color	≤15 TCU	≤15 TCU	
5.	Taste	Non objectionable/ acceptable	Non objectionable/ acceptable	
6.	Odour	Non objectionable/ acceptable	Non objectionable/ acceptable	
7.	Turbidity	<5 NTU	<5 NTU	
8.	Total hardness as CaCO ₃	< 500 mg/l	–	
9.	TDS	< 1000	< 1000	

10.	Ph	6.5 – 8.5	6.5 – 8.5	
11.	Essential Inorganic	mg/Liter	mg/Liter	
12.	Aluminum (Al) mg/l	≤0.2	0.2	
13.	Antimony (Sb)	≤0.005 (P)	0.02	
14.	Barium (Ba)	0.7	0.7	
15.	Arsenic	≤0.05 (P)	0.01	Standard for Pakistan similar to most Asian developing countries
16.	Boron (B)	0.3	0.3	
17.	Cadmium (Cd)	0.01	0.003	Standard for Pakistan similar to most Asian developing countries
18.	Chloride (Cl)	<250	250	
19.	Chromium (Cr)	≤0.05	0.05	



ENVIRONMENTAL IMPACT ASSESMENT

20.	Copper (Cu)	2	2	
21.	Toxic Inorganic	mg/l	mg/l	
22.	Cyanide (CN)	≤0.05	0.07	Standard for Pakistan similar to most Asian developing countries
23.	Fluoride (F)*	≤1.5	1.5	
24.	Lead (Pb)	≤0.05	0.01	Standard for Pakistan similar to most Asian developing countries
25.	Manganese (Mn)	≤0.5	0.5	
26.	Mercury (Hg)	≤0.001	0.001	
27.	Nickel (Ni)	≤0.02	0.02	
28.	Nitrate (NO ₃)	≤50	50	
29.	Nitrite (NO ₃)	≤3 (P)	3	
30.	Selenium (Se)	0.01 (P)	0.01	
31.	Residual chlorine	0.2-0.5 at consumer end 0.5-1.5 at source		
32.	Zinc (Zn)	5.0	3	The standard for Pakistan similar to most Asian developing countries

33.	Organic			
34.	Pesticides mg/l			PSQCA No. 4639 – 2004, page No. 4 Table No. 3 Serial No. 20 – 58 may be consulted
35.	Phenolic compound (as Phenols) mg/l			



ENVIRONMENTAL IMPACT ASSESMENT

36.	Poly-nuclear aromatic hydrocarbons (as PAHs) g/l		0.01 (By GC/MS method)	
37.	Alpha Emitters bq/L	0.1	0.1	
38.	Beta emitters	1	1	

*Indicates priority health-related inorganic constituents, which need regular monitoring.

*PSQCA: Pakistan Standards Quality Control Authority.

2.2 Punjab Environmental Quality Standards for Municipal and Liquid Industrial Effluents (mg/l, unless otherwise defined)

Sr. No	Parameters	Into Inland Waters	Into Sewage Treatment
1	Temperature or Temperature Increase	≤3°C	≤3°C
2	pH value (H)	6-9	6-9
3	Biochemical Oxygen Demand (BOD) at 20 °C	80	250
4	Chemical Oxygen Demand (COD)"	150	250
5	Total suspended solids (TSS)	200	400
6	Total dissolved solids (TDS)	3500	3500
7	Grease and Oil	10	10
8	Phenolic compounds (as phenol)	0.1	0.3
9	Chloride (as Cl").	1000	1000
10	Cyanide (as CN)	1.0	1.0
11	An-ionic detergents (as MBAs) (2	20	20
12	Sulfate (SO4)	600	1000
13	Fluoride (as F)	10	10



ENVIRONMENTAL IMPACT ASSESMENT

14	Sulfide (S ⁻²)	1.0	1.0
15	Ammonia (NH ₃)	40	40
16	Pesticides ⁽³⁾	0.15	0.15
17	Cadmium (Cd) ⁽⁴⁾	0.1	0.1
18	Chromium (trivalent and hexavalent)	1.0	1.0
19	Copper (Cu) ⁽⁴⁾	1.0	1.0
20	Lead (Pb) ⁽⁴⁾	0.5	0.5
21	Mercury (Hg) ⁽⁴⁾	0.01	0.01
22	Selenium (Se) ⁽⁴⁾	05	0.5
23	Nickel(Ni) ⁽⁴⁾	1.0	1.0
24	Silver(Ag) ⁽⁴⁾	1.0	1.0
25	Total Toxic metals	2.0	2.0
26	Zinc (Zn)	5.0	5.0
27	Arsenic (As) ⁽⁴⁾	1.0	10
28	Barium (Ba) ⁽⁴⁾	1.5	15
29	Iron (Fe)	8.0	8.0
30	Manganese (Mn)	1.5	1.5
31	Boron (Ba) ⁽⁴⁾	6.0	6.0
32	Chlorine (Cl ₂)	1.0	1:0

Explanation:

1. Assuming minimum dilution 1:10 on discharge, lower ratio would attract progressively stringent standards to be determined by the Provincial Environmental Protection Agency. By 1:50 dilution means, for example that for each one cubic meter of treated effluent, the recipient water body should have 10 cubic meter of water for dilution



of this effluent.

2. Methylene Blue Active Substances; assuming surfactant as biodegradable.
3. Pesticides include herbicides, fungicides and insecticides.
4. Subject to total toxic metals, discharge should not exceed level given at S.N. 25.
5. Applicable only when and where sewage treatment is operational and BOD5-80 mg/l is achieved by the sewage treatment system.
6. The effluent should not result in temperature increase of more than 30°C at the edge of the zone where initial mixing and dilution take place in the receiving body. In case zone is not defined, use 100 meters from the point of discharge.

Note:

1. Dilution of liquid effluents to meet to the PEQS limiting value is not permissible through fresh water mixing with the effluent before discharging into the environment
2. The concentration of pollutants in water being used will be subtracted from the effluent for calculating the PEQS limits.

Table 2.3 Punjab Environmental Quality Standards for Industrial Gaseous Emissions (Mg/Nm³)

Sr. No.	Parameter	Source of Emissions	Stander
1	Smoke	Smoke opacity not exceed	40% or 2 Ringelmann Scale or equivalent Smoke number
2	Particulate matter	Boilers and furnaces	
		Oil fired	300
		Coal-fired	500
		Cement Kilns	300
		Grinding, crushing, clinkers coolers and related processes, metallurgical processes, converters, blast furnaces and cupolas	500
3	Hydrogen chloride (HCL)	Any	400
4	Chlorine	Any	150



ENVIRONMENTAL IMPACT ASSESMENT

5	Hydrogen fluoride	Any	150
6	Hydrogen Sulphide	Any	10
7	Sulphur Oxides	Sulfuric acid/Sulfonic acid plants	5000
		Other plants expect power plant operating on oil and coal	1700
8	Carbon Monoxide Parameter	Any	800
		Source of Emission	Stander
9	Lead (PB)	Any	50
10	Mercury (Hg)	Any	10
11	Cadmium (Cd)	Any	20
12	Arsenic (Ar)	Any	20
131	Copper (Cu)	Any	50
14	Antinomy (Sb)	Any	20
15	Zinc (Zn)	Any	200
16	Oxides of Nitrogen	Nitric acid manufacturing unit	3000
		Other plants expect power operating on oil or coal	
		Gas Fired	400

Table 2.4 Punjab Environmental Quality Standards for Noise

Sr. No	Category of Area Zone	Effective from 1 st July, 2010		Effective from 1 st July, 2013	
		Limits in Db(A) Leq			
		Day Time	Night Time	Day Time	Night Time
1	Residential Area (A)	65	50	55	45
2	Commercial Area (B)	70	60	65	55
3	Industrial Area (C)	80	70	75	65/45
4		55	45	50	



ENVIRONMENTAL IMPACT ASSESMENT

Silence Zone (D)				
------------------	--	--	--	--

Note:

1. Day time hours; 6:00am to 10:00pm.

2. Night Time hours; 10:00 pm to 6:00 am.

3. Silence Zone: Zones which are declared as such by the competent authority. An area comprising not less than 100 meters around hospital, educational institutions and courts

4. Mixed categories of areas may be declared as one of the four above mentioned categories by the competent authority

dB(A) Leq: Time weighted average of the level of sound in decibel on scale A which is relatable to human hearing.

Table 2.5 Punjab Environmental Quality Standards for Industrial Gaseous Emissions (Mg/Nm³)

Sr. No.	Parameter	Source of Emissions	Stander
1	Smoke	Smoke opacity not exceed	40% or 2 Ringelmann Scale or equivalent Smoke number
2	Particulate matter	Boilers and furnaces	
		Oil fired	300
		Coal-fired	500
		Cement Kilns	300
		Grinding, crushing, clinkers coolers and related processes, metallurgical processes, converters, blast furnaces and cupolas	500
3	Hydrogen chloride (HCL)	Any	400
4	Chlorine	Any	150



ENVIRONMENTAL IMPACT ASSESMENT

5	Hydrogen fluoride	Any	150
6	Hydrogen Sulphide	Any	10
7	Sulphur Oxides	Sulfuric acid/Sulfonic acid plants	5000
		Other plants expect power plant operating on oil and coal	1700
8	Carbon Monoxide Parameter	Any	800
		Source of Emission	Stander
9	Lead (PB)	Any	50
10	Mercury (Hg)	Any	10
11	Cadmium (Cd)	Any	20
12	Arsenic (Ar)	Any	20

13	Copper (Cu)	Any	50
14	Antimony (Sb)	Any	20
15	Zinc (Zn)	Any	200
16	Oxides of Nitrogen	Nitric acid manufacturing unit	3000
		Other plants expect power operating on oil or coal	
		Gas fired	400



CHAPTER NO.3

SCREENING AND SCOPING



Chapter 3: SCREENING AND SCOPING

This section of the study focuses on the details of project screening, scoping, and the selection of alternatives.

Type and Category of Project

According to Section 12 of Punjab Environment Protection Act, 1997. "No proponent of a project shall commence construction or operation unless he has filed with the Provisional Agency an initial environmental examination or where the project is likely to cause an adverse environmental effect, an environmental impact assessment (EIA) and has obtained from the Provisional Agency approval in respect thereof.

The IEE/EIA Regulation 2022, classifies the projects under two schedules called Schedule-I and Schedule-II. The Regulations read that a proponent of a project falling in any category specified in Schedule II shall file an EIA with the Provincial Agency and the provisions of section 12 shall apply to such project. According to the said regulations, the proposed project falls under Schedule II.

Scoping

The scoping exercise helps identify key environmental issues that should be highlighted and further investigated in the EIA. Effective scoping is essential in terms of the following:-

- i. Defining the spatial and temporal boundaries.
- ii. Consulting with stakeholders to identify a full range of concerns.
- iii. Focusing on key issues that have been characteristic of the existing environment in the baseline study.
- iv. Reviewing the types of alternatives to be considered.
- v. Making logical decisions that have been more significant and need to be prioritized in the EIA.

3.1 Objectives of the Project

Asphalt Plant produces Hot Mix Asphalt by combining cold aggregate (crushed stone) and sand with



asphalt cement (bitumen) at high temperature. The hot mix asphalt is used for road construction and other similar projects

Alternatives

3.1.1 Environmental alternatives

The surrounding environmental conditions are congenial for the project. Both the construction as well as operation phases will not adversely affect the environment. All of the aspects will be kept strictly within the limits defined under Punjab Environmental Quality Standards (PEQS) and the project shall comply with requirements prescribed in Punjab Environmental Protection Act 1997.

3.1.2 Site alternative

The site selected for the project is highly suitable as it is located adjacent to an area where the Hot asphalt mix will be used. **Asphalt Plant** produces **Hot Mix Asphalt** by combining cold aggregate (crushed stone) and sand with asphalt cement (bitumen) at high temperature. The hot mix asphalt is used for road construction and other similar projects. The project proponent has considered other sites in the nearby areas but sites are not feasible as their acquisition as well as existence of villages in their surroundings do not favor those sites.



CHAPTER .4

PROJECT DESCRIPTION



Chapter 4: PROJECT DESCRIPTION

This section of the study concentrates on details of the project and its salient features, such as location, Site layout, objectives, selection of alternatives, and magnitude of the operations. Inputs and discharges relevant to different phases of the project, such as electricity, vehicles & materials, etc. have been examined to ascertain the potential environmental impacts and to suggest necessary corrective measures required during the construction and operational phase of project to safeguard the environment.

4.1 Project Objectives

The objective of this project is Installation of Asphalt Plant by Wajid & Construction Pvt. Ltd, its products that are functional, comfortable, and durable. The development program can help to standardize the quality and create more business opportunities in the area.

4.2 Site Alternatives

The project site is located Opposite Rana Petrol Pump, Near Liaqat Ali Khan Gate of DHA, Matti Tal Road District Multan”. As project **Asphalt Plant** produces **Hot Mix Asphalt** by combining cold aggregate (crushed stone) and sand with asphalt cement (bitumen) at high temperature. The hot mix asphalt is used for road construction and other similar projects. There are no settlements in close vicinity and the area is environmental friendly. So, the selected site is best suited for the project, and will not pose any adverse impact or threat on any component of the environment.

4.3 Location of the Project

The Project site is located at Opposite Rana Petrol Pump, Near Liaqat Ali Khan Gate of DHA,



Matti Tal Road District Multan. A Google map showing the location of the project is attached:

Table 4.1 Geographical Coordinates of Project Site

1. Coordinates		
2.	North	Agricultural Land/ Field
3.	South	Agricultural Land/ Field
4.	East	Agricultural Land/ Field
5.	West	Matti Tal Road

The following documents are at annexed with the report

- i. Copy of Lease Agreement
- ii. Copy of CNIC of Project Proponent

4.4 Road Access

Matti Tal Road, District Multan. All the roads accessing the project site are metaled. The map showing the road network of area is annexed.

4.5 Vegetation Features of the Site

Land is clear and no significant plants or vegetation of ecological importance are present at the site. The Project Proponent will develop greenery at the project site after construction work and this greenery will serve as a useful buffer zone to lessen the effects of pollution from different sources. So, the project will not cause any harm to vegetation and environment of the area.

4.6 Relocation and Rehabilitation Plans

No any kind of structural settlement exists at the site to be relocated or dismantled. The land is



a vacant plot and hence, no relocation and rehabilitation are required.

4.7 Description of Project

The description of the selected Project is as under in Table 3.2.

Table 4.2 Brief Description of Project

Sr. #	Brief Description of Project	
1.	Project Title	Installation of Asphalt Plant by Wajid & Construction Pvt. Ltd, Opposite Rana Petrol Pump, Near Liaqat Ali Khan Gate of DHA, Matti Tal Road Multan
2.	Total Area	8.5 Acers
3.	Purpose of Project	The main objective of the project is Installation of Asphalt Plant

4.8 Schedule of Implementation

The project construction work will almost 6 months, because this type pf projects do not involve civil work, only installation of machinery is required. The schedule of Construction/ Installation of machinery/ Project implementations is as under in **Table 4.3**

Table 4.3 Schedule of Implementation

Sr. No	Activities	First 2 Months	Second 2 Months	Third 2 Months
1.	Construction of boundary wall			
2.	Installation of Machinery			



3.	Trial operation			
----	-----------------	--	--	--

4.10 Road Access

Matti Tal Road, Multan, allows easy access to the Asphalt Plant. All the roads accessing the project site are metaled. The map showing the road network of area is Annex A.

4.11 Vegetation Features of the Site

Land is clear and no significant plants or vegetation of ecological importance are present. The green belt within the project site will serve as a useful buffer zone to lessen the effects of pollution from different sources. So, the project will not cause any harm to vegetation of the area.

4.12 Manpower

Almost 50 workers will be required during construction phase of the proposed project whereas 20-30 will be engaged during operational phase. Technical staff will be hired to carry out smooth operations of the proposed unit.

4.13 Water and Wastewater Details

Sources of water

Water requirement will be met from groundwater through installation of pumps during construction phase as well as during operation phase. There is very little requirement of water during construction as well as operational phase of the project.

Solid Waste

There is no likelihood of solid waste from the operations of the proposed Project.

All kinds of raw materials and finished products, scattered here and there during loading and unloading operations are always useable, hence no solid waste.

Restoration and Rehabilitation Plan

After completion of the construction work, all the disturbed sites will be changed into conditions as they were prior to the commencement of the project or even far better than that. For improving the environmental and aesthetic value or visual quality of the site,



the proponent will carry out landscaping and tree planting within premises of factory.

Cost of Project

Total estimated cost of the Project is **Rs.125 .00 Million** excluding cost of land. The land required for project has been taken on lease basis. The total area of Project site **8.5 Acers**. An asphalt plant typically uses a variety of specialized machinery and equipment to produce hot mix asphalt (HMA) for road construction. Here's a detailed list of the main machinery:

Major Machinery at an Asphalt Plant

1. Cold Aggregate Feeder Bins

Purpose: Store and regulate the flow of different sizes of cold aggregates.

Components: Bins with conveyor belts and feeders.

2. Conveyor Belts.

Purpose: Transport aggregates from feeder bins to the drying drum.

Types: Inclined conveyors, gathering conveyors.

3. Drying Drum / Rotary Dryer

Purpose: Dries the cold aggregates by heating them to the desired temperature.

Fuel Used: Diesel, natural gas, or coal.

Equipped with: Burners and flight paddles for efficient heat transfer.

4. Burner

Purpose: Supplies heat for drying drum.

Types: Oil-fired, gas-fired, or coal-fired burners.

5. Dust Collection System

Purpose: Collects dust and fine particles released during drying.

Types: Cyclone separator

Baghouse filter (fabric filter)

Wet scrubber (less common)

6. Hot Aggregate Elevator

Purpose: Transports hot aggregates from dryer to the screening unit or hot bins.



7. Vibrating Screen

Purpose: Sorts hot aggregates into different sizes before mixing.

8. Hot Aggregate Storage Bins

Purpose: Temporary storage of hot aggregates by size before mixing.

9. Bitumen Storage Tanks

Purpose: Store and heat bitumen (asphalt binder).

Features: Electric or thermal oil heaters, level indicators.

10. Mineral Filler Unit (optional)

Purpose: Add fine materials like stone dust, lime, or fly ash to improve mix properties.

11. Weighing and Mixing Unit (Pugmill Mixer)

Purpose: Weighs ingredients and mixes them to produce hot mix asphalt.

Can be:

Batch-type: Mixes in cycles

Drum-type: Continuous mixing

12. Control Cabin

Purpose: Central control room with computerized system to manage temperature, material flow, mix ratios, etc.

13. Finished Product Storage Silo / Load-out Conveyor

Purpose: Temporarily stores hot mix before loading into trucks.

Ensures: No interruption in plant operations during truck loading.

14. Asphalt Re-claimer (optional)

Purpose: Reclaims and reuses old asphalt pavement (RAP – Reclaimed Asphalt Pavement).

15. Pollution Control Equipment

Includes: Bag filters for air pollution control

- Spill containment trays
- Oil-water separators for runoff

Supporting Equipment

- Wheel loaders (for feeding aggregate bins)
- Diesel generators (if grid power is unavailable)
- Asphalt paver and compactor (used at construction site)



CHAPTER .5

DESCRIPTION OF

ENVIRONMENT



Chapter 5: DESCRIPTION OF ENVIRONMENT

This chapter describes the baseline conditions, which cover the existing physical, ecological, and socio-economic environment of the Project Area. Information on these aspects has been derived from the desk study of available data, field visits to the project area as well as information obtained through visits to the Government departments and other relevant agencies.

5.1 Data Collection

The primary data was collected by surveying the project area and its nearby vicinity. The secondary data regarding physical parameters (topography, geology, seismology, hydrology, and climatology) was obtained by visiting relevant departments and their official websites. The biological parameters (flora and fauna) were also studied in the project area. The vegetation of the project area was studied by preparing a floristic list based on visual observation. The species were recorded in terms of their historical existence in the project area.

Information on wildlife/fauna species (mammals, amphibians, reptiles, birds, etc.) in the assessment area is based on opportunistic observation, gathering the existing information, and consultation with local experts, community members, government, and Non-Government Organizations (NGOs).

5.2 Physical Environment

Multan, located in southern Punjab, Pakistan, covers an area of approximately 3,721 km². The district has flat terrain, with slight elevations in the northwest. The Chenab River flows near Multan, supporting agriculture and irrigation. The soil is sandy to clayey, with high fertility due to alluvial deposits. The region is rich in groundwater resources, but excessive extraction and salinity issues pose challenges.

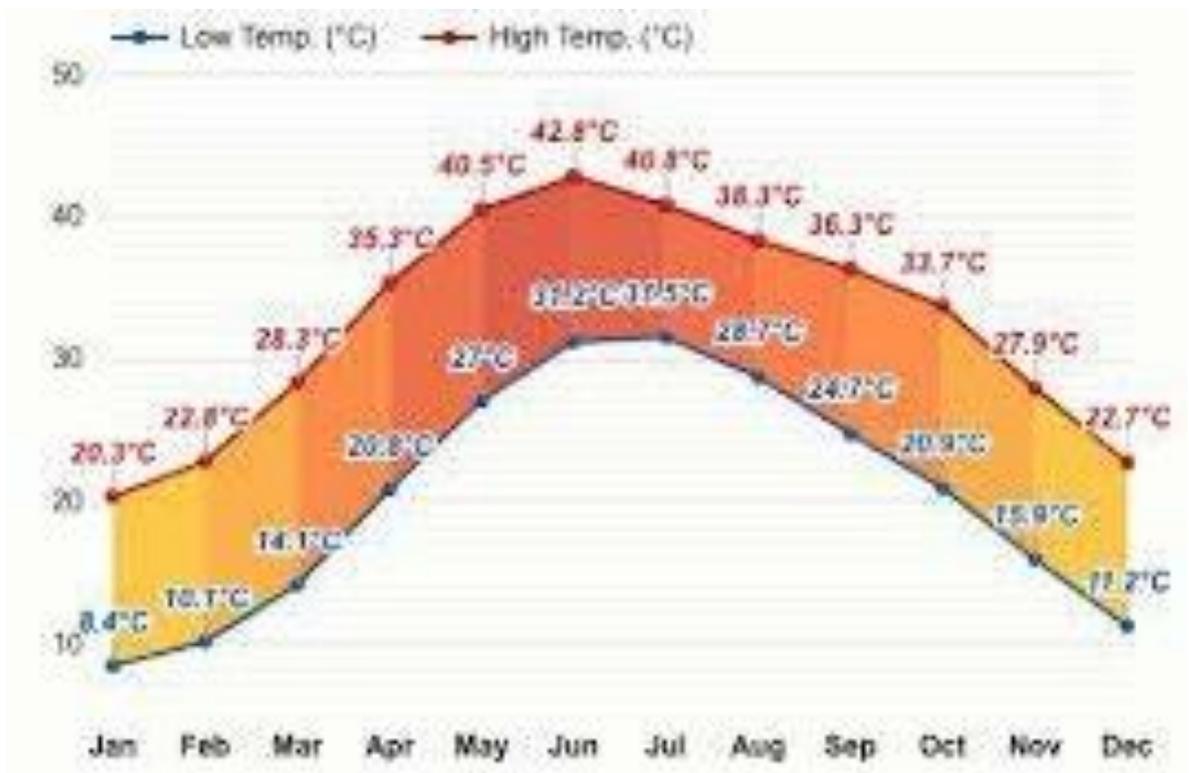
5.3 Geography and Geology

Multan lies in the Indus River floodplain, with a hot semi-arid climate. The land is primarily flat, with some low-lying areas prone to seasonal flooding. The Chenab River and its tributaries supply irrigation water, supporting extensive agricultural activities. The geology consists of alluvial deposits from the Indus River system, with sand, silt, and clay forming the soil. Multan is located in a low-seismic zone, with minimal earthquake activity.



5.5 Temperature

Multan has an extremely hot summer and a mild winter. During May to September, temperatures can soar up to 50°C (122°F), with June being the hottest month. Winters (December to February) are mild, with temperatures dropping to around 3-5°C (37-41°F). Spring and autumn offer pleasant weather, but heatwaves and dust storms are common in the summer.

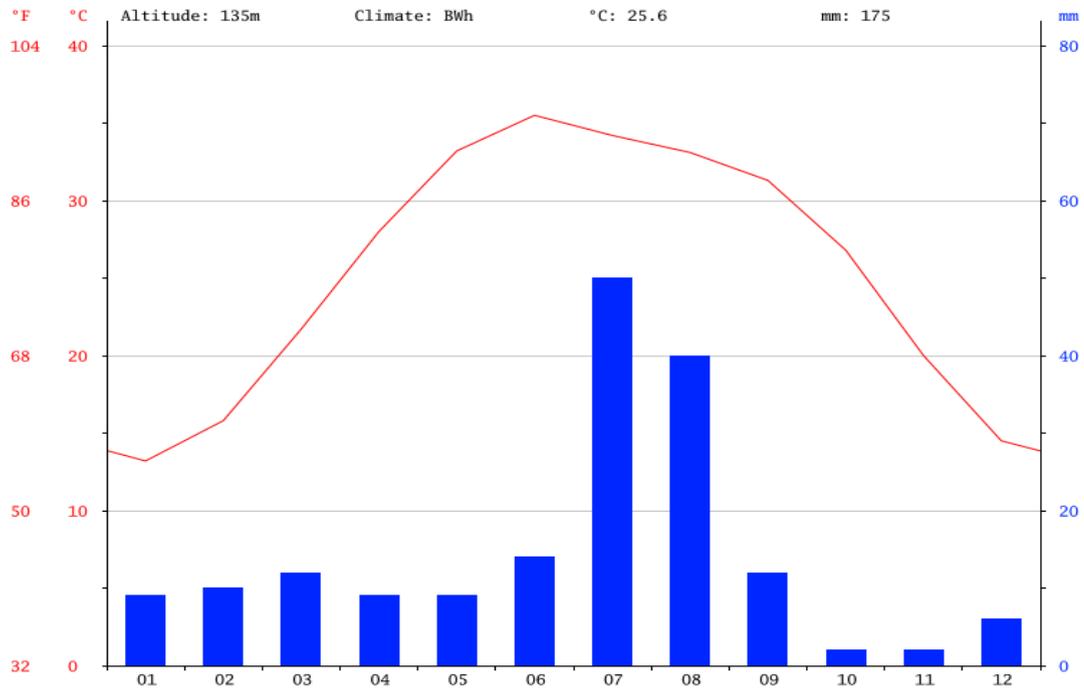


5.6 Rainfall

Multan receives low to moderate rainfall, averaging 127-200 mm per year. Most of the rainfall occurs during the monsoon season (July-September), while winters receive minimal precipitation. The district often experiences drought conditions due to limited rainfall and high evaporation rates. Canal irrigation plays a crucial role in supplementing water for crops.



ENVIRONMENTAL IMPACT ASSESMENT





5.7 Ecological Environment

Multan's environment is influenced by agriculture, rapid urbanization, and industrial activities. The natural vegetation includes thorny bushes, acacia trees, date palms, and mesquite plants, adapted to the dry climate. Wildlife species such as jackals, wild boars, foxes, and desert hares inhabit the region. Air and water pollution from industries, vehicle emissions, and waste disposal are growing concerns. Soil erosion, desertification, and deforestation are also impacting the ecological balance.

5.8 Flora and Fauna

The flora of District Multan consists of drought-resistant and riverine plant species due to its semi-arid climate. Common tree species include Acacia (Kikar), Dalbergia Sissoo (Sheesham), Eucalyptus, and Date Palm, which thrive in the region. The Chenab River and canal areas support wetland vegetation such as Typha (cattails) and aquatic grasses. In agricultural fields, wheat, sugarcane, cotton, and mango orchards dominate the landscape, with wild shrubs and thorny bushes commonly found in uncultivated areas.

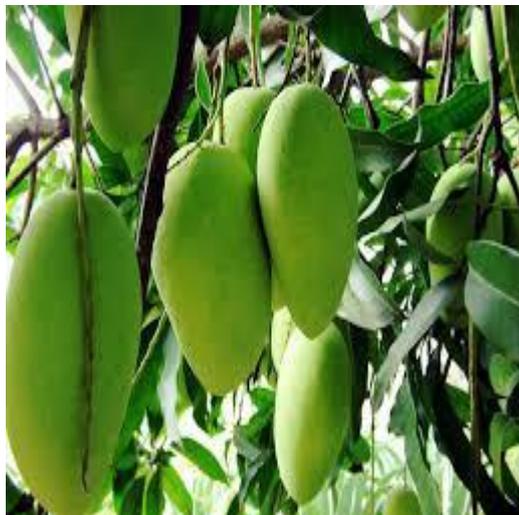




Figure 2 Flora Species of District Multan

5.5 Fauna

The fauna of District Multan includes a variety of mammals, birds, reptiles, and aquatic species, adapted to its semi-arid and riverine environments. Common mammals found in the region include jackals, wild boars, foxes, and desert hares. Bird species such as partridges, pigeons, kites, falcons, and egrets are commonly seen, especially near agricultural fields and water bodies. The Chenab River and canal system support fish species like rohu, catla, and tilapia, along with amphibians like frogs and turtles. Reptiles such as snakes, monitor lizards, and geckos are also found in both urban and rural areas.



Figure 3 Different Species of Fauna of District Multan



5.6 SOCIO-ECONOMIC RESOURCES

Multan District's socio-economic resources are diverse, driven by its agricultural, industrial, and trade-based economy. Key resources include:

i. **Agriculture:**

Multan is a major agricultural center, producing wheat, sugarcane, cotton, and citrus fruits, particularly famous for its mango orchards. The Chenab River and an extensive canal system support irrigation.

ii. **Industry:**

The district has a strong industrial base, including textiles, ceramics, fertilizer production, and food processing, playing a crucial role in exports and local employment. Handicrafts like blue pottery and camel skin lamps are also significant.

iii. **Labor Force:**

A large portion of the population is engaged in agriculture, factory work, skilled crafts, and trading. Urban areas have a growing middle class, while rural areas rely heavily on agricultural labor.

iv. **Education and Health:**

Multan has several universities, colleges, and hospitals, such as Bahauddin Zakariya University (BZU) and Nishtar Medical University. However, rural areas still face challenges in access to quality education and healthcare services.

v. **Trade and Commerce:**

As a major commercial and trade hub in southern Punjab, Multan benefits from wholesale markets and strong transport links. Its proximity to major cities like Lahore and Karachi enhances trade in agriculture and manufactured goods.



5.7 Nearby Residential Areas

Multan has a mix of old and modern residential areas, catering to different income groups.

Major residential areas include:

- **Cantonment Area** – A secure and well-developed locality.
- **Gulgasht Colony & Shalimar Colony** – Prime residential and commercial hubs.
- **Shah Rukn-e-Alam Colony** – A densely populated area with a mix of old and new houses.
- **Bosan Road & Vehari Road** – Growing residential and commercial zones with modern housing societies.

5.8 Social and Public Amenities Available

Multan has hospitals, educational institutions, shopping malls, parks, and public transport. Major hospitals include Nishtar Hospital, DHQ Hospital, and Multan Institute of Cardiology. Educational institutions such as Bahauddin Zakariya University (BZU) and Nishtar Medical University offer higher education. Parks like Shah Shams Park and Fort Kohna Qasim Park provide recreational spaces.

5.9 Quality of Life Values

Multan offers a moderate quality of life, with access to education, healthcare, and business opportunities. However, traffic congestion, pollution, and inadequate water supply affect daily life. Urban expansion and improved infrastructure are enhancing living conditions, but further improvements in public services and environmental management are needed.

5.10 Occupations

The main occupations in Multan include farming, textile manufacturing, handicrafts, and trade. Many residents work in agriculture, government jobs, retail, and the transport sector. The mango and cotton industries provide seasonal employment.

5.11 Literacy Rate

Multan has a moderate literacy rate, improving due to institutions like BZU and Nishtar Medical



University. While urban literacy rates are higher, rural areas struggle with access to quality education. Government programs focus on increasing literacy and technical skills.

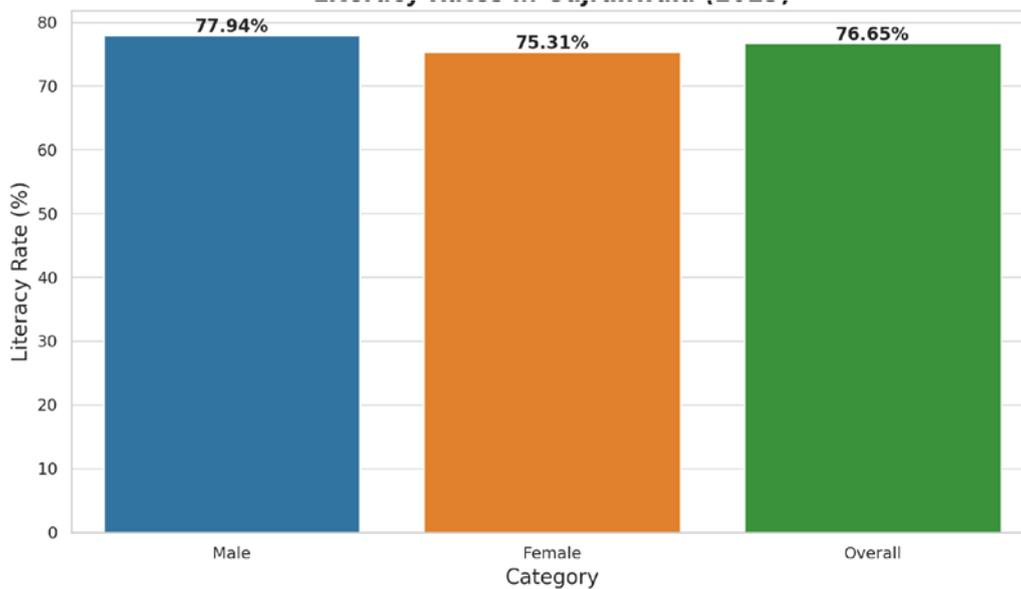


Figure 4 Literacy Rate of Multan

5.12 Industries

Multan has a diverse industrial sector, contributing significantly to the local and national economy. Major industries include textiles, fertilizers, ceramics, and food processing, with cotton ginning and mango processing being particularly important. The district is also known for its handicrafts, such as blue pottery and camel skin lamps, which have both local and international demand. Industrial zones and small manufacturing units support employment and trade, while the export of textiles and agricultural products strengthens Multan's economic position.

5.5 Educational facilities

Multan has a well-developed educational infrastructure, offering primary to higher education through public and private institutions. It is home to prestigious universities like Bahauddin Zakariya University (BZU), Nishtar Medical University, and NFC Institute of Engineering. Several colleges and



technical institutes provide vocational training and higher education opportunities. While urban areas have access to quality education, rural regions still face challenges in terms of infrastructure and educational resources. Collectively cater to a wide range of academic and professional pursuits.

Health facilities

Multan has a well-established healthcare system, with major hospitals such as Nishtar Hospital, Multan Institute of Cardiology, and DHQ Hospital, providing advanced medical care. Several private hospitals, clinics, and dispensaries cater to the growing population. Rural areas rely on Basic Health Units (BHUs) and Rural Health Centers (RHCs), but access to specialized medical services remains limited. The district also has pharmaceutical industries and medical research centers, contributing to healthcare development.

Major Parks in Multan

i. Shah Shams Park

- Location: Near Shah Shams Tabrez Shrine
- Features: Green spaces, walkways, family sitting areas
- Importance: Provides recreational space in a religious and historical part of the city.

ii. Qasim Fort Park (Qila Kohna Qasim Bagh)

- Location: Near Multan Cricket Stadium
- Features: Historical setting, gardens, panoramic views of the city
- Importance: Blends tourism with green space.

iii. Jinnah Park

- Location: Near Cantt area
- Features: Jogging tracks, children's play area, water fountains
- Importance: Popular with families for evening leisure.

iv. Chaman Zar Askari Lake Park

- Importance: Major recreational attraction.



v. Ladies and Children Park

- Location: Gulgasht Colony
- Features: Designed specifically for women and children, with dedicated play areas.
- Importance: Provides safe leisure space for families.

vi. Green Land Park

- Location: Bosan Road
- Features: Family picnic spots, rides
- Importance: Private park popular for outings.
- Location: Cantt Area

Major Shopping Malls in Multan

i. The United Mall

- Location: Abdali Road, Cantt
- Features: Branded outlets, restaurants, children's play area, supermarket
- Importance: One of the first modern malls in Multan.

ii. Mall of Multan

- Location: Bosan Road near Bahauddin Zakariya University
- Features: Multi-level shopping, cinema, food court
- Importance: The largest and most upscale mall in Multan.

iii. Chase Up Mall

- Location: Bosan Road
- Features: Departmental store, clothing, grocery
- Importance: Budget-friendly shopping option for all demographics.

iv. City Centre Mall

- Location: Near High Court
- Features: Local and international outlets



- Importance: Mid-size mall with food and fashion brands.

v. **The Centaurus Mall (Under construction / planning)**

- Future development expected to boost commercial activity and urban expansion.

Major Universities in Multan

i. **Bahauddin Zakariya University (BZU)**

- Location: Bosan Road
- Type: Public Sector
- Programs: Undergraduate to Ph.D. in sciences, engineering, social sciences, agriculture, and management.
- Importance: Largest University in South Punjab; major research hub.

ii. **Nishtar Medical University**

- Location: Nishtar Road
- Type: Public Medical University
- Programs: MBBS, BDS, Nursing, Allied Health Sciences
- Importance: Oldest and most reputed medical institution in the region.

iii. **Women University Multan**

- Location: Mattital Road & Kutchery Campus
- Type: Public Sector (Women-only)
- Programs: Sciences, Arts, IT, Management
- Importance: Expanding access to higher education for women.

iv. **Air University – Multan Campus**

- Location: Khanewal Road
- Type: Public Sector (affiliated with Pakistan Air Force)
- Programs: Business Administration, IT, Engineering
- Importance: Quality education with technical focus.



v. **Institute of Southern Punjab (ISP)**

- Location: Gulgasht Colony
- Type: Private Sector
- Programs: Business, Education, Computer Science, Engineering
- Importance: One of the prominent private universities in South Punjab.

Colleges in Multan

i. **Government Emerson College**

- One of the oldest colleges in the region offering FA/FSc and BA/BSc programs.

ii. **Government College of Technology, Multan**

- Offers diplomas and degrees in engineering technologies and technical disciplines.

iii. **Multan Medical & Dental College**

- Private sector medical college affiliated with PMDC.

iv. **Punjab College Multan**

- A popular chain college offering intermediate and bachelor-level education.

v. **Superior College Multan**

- Private college offering business, IT, and intermediate education.



ENVIRONMENTAL IMPACT ASSESMENT



CHAPTER .6

POTENTIAL

ENVIRONMENTAL IMPACTS

AND MITIGATION MEASURES



Chapter 6: POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Assessment of impacts depends on the nature and magnitude of the project/ activity being undertaken, as well as the type of environmental control measures that are envisaged as part of the project proposal. The potential impacts of the project have been identified and assessed based on the type and scale of the various activities associated with this project. This section discusses the project's potential environmental impacts on the area's geomorphology, soil, water resources, air, biological resources, and socioeconomic conditions and, where applicable, identifies mitigation measures that will reduce, the adverse impacts.

6.1 Identification of Potential Environmental Impacts

In the first step, potential environmental impacts of the project are identified by desktop work using checklists, professional judgment, and published literature on environmental impacts of similar projects, and standard environmental guidelines. Potential impacts are also identified through discussion with project proponent, and consultation with stakeholders and community to identify their concerns. The main aspects associated with potential environmental impacts are as follows: -

- i. Ambient Air Quality
- ii. Waste water and Solid waste
- iii. Noise pollution
- iv. Ecology of the area, including flora and fauna
- v. Soil Contamination and Erosion
- vi. Air Emissions (Dust and Particulate Matter)
- vii. Solid Waste Generation

6.2 Scoping Criteria for Impacts

The potential impacts of the Project/ (Installation of Asphalt Plant) are evaluated based on the following criteria:

The current baseline conditions and the anticipated changes in environmental parameters are likely to



be affected by Project. Whether any impact will violate applicable Punjab Environmental Quality Standards (PEQS).

6.3 Methodology for Impact Assessment

The impact assessment methodology defines three levels of consequences (or severity) and likelihood (chance of occurrence) i.e. Low, Moderate/Medium, or High. The significance of an impact is determined based on the level of consequence and likelihood of the impacts.

Table 6.1 Methodology for Impacts Assessment

Sr. No	Level	Severity of Impact (Results)	Likelihood
1.	High	Significant or catastrophic harm to the local and regional environment. A serious threat to the company’s reputation, profitability, and overall ability to operate.	Measurable harm to the environment. Potential impact on reputation and costs. Decreased operational efficiency
2.	Moderate	Measurable damage to the environment Potential to affect reputation/cost Reduced efficiency	Moderate likelihood of occurrence throughout the operational lifetime. Periodic or occasional aspects of the operations.
3.	Low	Negligible damage to the environment No risk to business	Unlikely to occur during lifetime of operation.

6.4 Impacts Assessment

The impacts are classified based on their spatial distribution, i.e. local when impacting an area of approximately 1 km radius from the project area, moderate spread, when impacting an area of 1 to 2 km radius, and regional beyond 2 km.

The impacts are classified as short-term, moderate-term, and long-term in terms of their existence on a temporal scale. Impacts with less than 1 year of existence as short-term term, while those with 1 to 3 years as moderate term and more than 3 years as long term.



The negative impacts are termed as adverse impacts while positive impacts as beneficial. The significance of the environmental impacts of various involved activities has been evaluated based on the following criteria.

Table 6.2: Impacts Significance Area

Sr. No	Impacts Significance	Criteria
1.	Long Term	When the impact is of high intensity with high spread and high duration.
2.	Moderate Term	When the impact is of moderate intensity with high moderate spread and high-moderate duration.
3.	Short Term	When the impact is of low intensity but with moderate spread and moderate duration.
4.	Insignificant	When the impact is of low intensity, low spread, and low duration.
5.	Beneficial	When the Impacts are Positive.

6.5 Environmental Mitigation Measures

6.5.1 Change in Project Site

The said project has been **Asphalt Plant** produces **Hot Mix Asphalt** by combining cold aggregate (crushed stone) and sand with asphalt cement (bitumen) at high temperature. The hot mix asphalt is used for road construction and other similar projects. on nor near the project site. Hence, there is no need to change the site of the project. Further, the project proponent has planned his project in the vacant area of low fertile land to save the expensive and precious fertile land of district Multan.

6.6 Improved Management and Monitoring Practices

Improved management practices will be done to keep the project's surrounding



environment within safe limits in terms of air and water quality. Environmental monitoring will be conducted as per requirements of environmental law and EPA directions.

6.7 Compensation in Money Terms

There is no damage to flora, fauna, or any other resource, hence compensation in money terms is not needed.

6.8 Replacement/ Relocation/ Rehabilitation

The said project is planned in a vacant area and there is no sensitive area, population, or natural resource. So, replacement, relocation, and rehabilitation are not required.

6.9 Potential Environmental Impacts associated with Project Location

- i. The proponent has selected a site for his project which exists in the vacant area.
- ii. There is no community or human settlement within the safe radius of the site.
- iii. There is no flora & fauna (particularly belonging to an endangered species) within a 2 km radius of the site.
- iv. There is a good road network in the area of the project.
- v. There is no ecologically sensitive or declared protected area (PA) like forest, fish hatcheries, Territorial Waters, wildlife or game reserves, or any structure of socio-cultural significance (historical or archaeological site or religious structures).

It can be safely concluded that the selected site is best suited for the project, and will not pose any adverse environmental impacts.

6.10 Methodology for Impact Assessment

The environmental aspects of the project during all stages namely construction and operation have been selected from a master list of environmental items which is widely used world over for this purpose. The extent of qualitative and quantitative impacts has been described and mitigation measures have been proposed to keep them within permissible limits



6.11 Impacts due to Project Location

The project envisages the Installation of Asphalt Plant. The establishment of this unit is not expected to cause any negative impacts at the location of the project because all the environmental aspects shall be kept under strict control with the help of stringent mitigation measures.

6.12 Impacts associated with Construction Phase and Mitigation Measures

The Environmental and Socio-Economic Impacts associated with the construction phase of project, are the following:

- i. Air Pollution
- ii. Waste water and Solid waste
- iii. Noise pollution
- iv. Ecology of the area, including flora and fauna
- v. Soil Contamination and Erosion
- vi. Air Emissions (Dust and Particulate Matter)
- vii. Solid Waste Generation

6.13 Impacts of Air Pollution

Dust emissions from land clearing, construction activities, and movement of machinery and vehicles may degrade local air quality.

Mitigation Measures:

- Water sprinkling on unpaved roads and active construction sites.
- Covering of construction material during transport and storage.
- Regular maintenance of vehicles and machinery to minimize exhaust emissions.

6.14 Impacts of Noise Pollution

Increased noise levels from construction machinery and equipment may disturb nearby residents and workers.

Mitigation Measures:



- Use of noise-suppressing equipment and proper mufflers.
- Limiting construction activities to daytime hours.
- Provision of personal protective equipment (PPE) like earplugs to workers

6.15 Impacts of Occupational Health and Safety

Workers are exposed to dust, noise, and mechanical hazards, posing health and safety risks.

A comprehensive occupational health and safety plan is as under.

Mitigation Measures

- i. Adequate shuttering should be established and used for all kinds of construction activities
- ii. Comprehensive occupational health and safety plan.
- iii. Regular training programs for workers.
- iv. Provision of PPE (masks, gloves, goggles, etc.).
- v. Emergency response and first aid arrangements on-site.
- vi. Work at height should be performed only after permit to work by HSE staff who shall issue such permit to work at height after taking all appropriate measures.
- vii. Safety signage should be adequately displayed,
- viii. Clean drinking water availability should be ensured for use by all construction staff.
- ix. Emergence response plan should be made, communicated to all and maintained during all construction activities.
- x. First aid facility should be readily available for workers at the site.
- xi. Good house-keeping should be practiced to prevent the events of slips.
- xii. Personal protective equipment like helmets, masks gloves and helmets should be strictly used by the labor according to their assignments at the work site.
- xiii. Fire and any other emergency shall be managed with the help of emergency services.
- xiv. Proper fire safety arrangements will be provided at site. A part form installation of fire hydrant, smoke detectors, fire alarm, safety sign, emergency exits, trained staff from rescue 1122.
- xv. During hot season, outdoor work timing may be changed. Only indoor construction activities may be performed during sunny part of the day. In case of inevitable circumstances, workers should be given adequate breaks.



- xvi. Workers should be given proper fluids during hot season to balance electrolytes in their body.
- xvii. Painting activity should be performed with all occupational health and safety precautions.

6.16 Environmental Enhancement Measures

The following steps shall be taken for environmental enhancement:

- i. Daily sweeping and dusting/cleaning shall be ensured.
- ii. Vacuum cleaning shall be done daily where required.
- iii. The perimeter and lawns of the plot shall be vegetated with flowering plants and fruit trees for environmental enhancement
- iv. Adequate firefighting system will be established and maintained at all times according to the requirements of respective Regulatory Authority.
- v. Visual impacts of the unit and its surroundings shall be given due consideration. Visual impacts shall be improved through landscaping and tree plantation.

The potential environmental impacts of the project and respective mitigation measures are summarized below: -

6.3 Environmental Impact & Mitigation Measures	
Potential Impact	Mitigation Measures
CONSTRUCTION PHASE	
Solid Waste	
<ul style="list-style-type: none"> • Solid waste shall be generated in the form of excavation waste, broken 	<ul style="list-style-type: none"> • All types of waste shall be kept segregated. The waste shall be managed regularly.
<ul style="list-style-type: none"> bricks, waste concrete material, steel trimmings, etc. 	<ul style="list-style-type: none"> • The construction waste shall be disposed of through construction waste contractors. The recyclable part of the waste shall be sold to the recyclers.
Air Pollution	



ENVIRONMENTAL IMPACT ASSESMENT

<ul style="list-style-type: none"> • Particulate matter may arise due to excavation and movement of off-road and on-road vehicles during transport of construction materials such as sand, aggregate, etc. • Cutting, grinding and welding may cause noise pollution. • Off-road or on-road vehicles may also cause exhaust pollution. 	<ul style="list-style-type: none"> • Construction contractor shall be directed to ensure using well-conditioned and well-tuned vehicles and equipment. • Contractor will ensure Sprinkling of water on the exposed surfaces. • Contractor will Cover all trucks loaded with sand and other such lose construction materials. • Regular sweeping of roads and parking areas shall be ensured to avoid deposition of dirt /dust. • Contractor will ensure use of appropriate masks by workers to prevent entry of dust in their breathing system.
<p>Noise Pollution</p>	
<ul style="list-style-type: none"> • Operation of construction machinery and equipment may be a source of noise pollution. • Cutters grinders and welding activities may also cause noise. • Movement of off-road or on-road vehicles may generate noise 	<ul style="list-style-type: none"> • The Project proponent and contractor will ensure that all vehicles are well maintained. • Contractor will ensure use of ear plugs by workers to prevent entry of noise in their ears.
<p>Occupational Health & Safety</p>	
<ul style="list-style-type: none"> • Cutting, grinding, welding operations may operate metal dust 	<p>Contractor will ensure use of personal protective equipment by respective workers.</p>
<p>Socioeconomic</p>	
<ul style="list-style-type: none"> • Disturbance of local population • Jobs for locals 	<ul style="list-style-type: none"> • The construction labor shall be advised to respect the local culture and moral values. • Locals shall be preferred for job as far as possible according to their competence/ education/ skills.



Operational Phase	
Solid Waste	
<ul style="list-style-type: none"> Project does not involve any such operation /activity during operational phase which may generate Solid Waste, hence no any kind of solid waste issue /problem. 	<ul style="list-style-type: none"> Not Applicable
Air Pollution	
<ul style="list-style-type: none"> There are such operations /activity during operational phase of project which may generate air pollution. 	<p>Installation of Dust Control System</p>
Occupational Health & Safety	
<ul style="list-style-type: none"> Fire incident may occur if proper precautionary measures are not taken Minor and major injuries during Loading and unloading of equipment are possible. 	<ul style="list-style-type: none"> Training about OHS aspects will assist in managing the risks. Workers shall be provided with all necessary personal protective equipment to prevent any harm. Fire extinguishers, fire hydrants and smoke detectors shall be installed.
Socioeconomic	
<ul style="list-style-type: none"> Disturbance to local population Jobs for the locals 	<ul style="list-style-type: none"> The construction labor shall be advised to respect the local culture and moral values. Locals shall be preferred for job as far as possible according to their competence/ education/ skills.



CHAPTER .7

STAKEHOLDERS

CONSULTATION



CHAPTER NO 7: STAKEHOLDERS CONSULTATION

Stakeholders' consultation refers to the process by which the concerns of relevant persons/ departments who have a plausible stake in the environmental impacts of the project or activity are ascertained to consider all the material concerns in the project or activity design as appropriate.

Impact assessment surveys and stakeholders consultation sessions were held with different stakeholder's groups to take their comments/views proposals. The objectives of this process were to:

- i. Share information with Stakeholders on said project installation and operation
- ii. Share the impacts on the physical, biological, and socioeconomic environment
- iii. Understand stakeholders concerns regarding various aspects of the project
- iv. Collect valuable suggestions from the stakeholders to improve the said project design
- v. Understand the perceptions, assess social impacts, and concerns of the people/communities of the project area
- vi. Raise the awareness level and identify any issues for the implementation of the said project
- vii. Invite people to express their views about the positive/negative impacts on their lifestyles and environment
- viii. Disclose information of contact offices/officers for any complaints/queries

7.1 Objectives of Consultation

Stakeholders' consultation plays a vital role in ascertaining the impacts of the said project on stakeholders in the successful implementation and execution of the project. It provides an opportunity to exchange knowledge with the beneficiaries and affected parties. The involvement of stakeholders is 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 that are not known or are specific to the project. Discourse from many who have thoroughly observed the site conditions in the pre-development phase goes a long way in updating knowledge and understanding.

7.2 Identification of Stakeholders

All the people who are directly or indirectly affected or concerned with the project are the stakeholders. Besides the living population of the surrounding areas, some other stakeholders were



identified and contacted. They are the key players including; shops, public and government offices, schools, hospitals, hotels, and NGOs. Not only published material and other literature was obtained but also the views and concerns of stakeholders were noted.

7.2.1 Direct Stakeholders

No disturbance in the local community is being foreseen due to the installation of the said project as the project is located in open land area. No property loss is being envisaged due to the construction of Asphalt Plant.

7.2.2 Indirect Stakeholders

The indirect impact will occur on those who are living or doing business within a Project Area of Influence (AOI). In the case of the said project, the residents around the project area will get an opportunity to be employed. So, in the early development stages and during the operational phase, people of surrounding communities will be benefited. Indirect respondents include;

- i. Government agencies responsible for dealing with the project-related activities.
- ii. Government Agencies directly or indirectly involved in the execution and monitoring of the said project.
- iii. Government departments such as TMA and the Planning & Development Department, working on other development activities are considered indirect stakeholders.

7.3 Consultation Process

Information disclosure, public consultation, and discussion regarding the various aspects of the project with the people of the area are necessary. This process is intensified during the EIA Studies. Surveys were carried out to investigate physical, biological, and socioeconomic resources falling within the immediate AOI of the project. Primary data collection included:

- i. Data collection regarding the socio-economic conditions of the study area.
- ii. Collection of information on the biological environment from the locals.

7.4 Objectives of Meetings with the Stakeholders

- i. Share information with stakeholders on the said project and expected impacts on the community in the vicinity of the project.
- ii. Understand stakeholders' concerns regarding various aspects of the project, including existing conditions, and the likely impacts of construction and operation activities.
- iii. Provide an opportunity to the public to influence the project design positively.



- iv. Obtain local and traditional knowledge, before decision making.
- v. Increase public confidence in the proponent, reviewers, and decision-makers.
- vi. Reduce conflict through the early identification of controversial issues, and work through them to find acceptable solutions.
- vii. Dissemination of information through discussions, education, and liaison with stakeholders.
- viii. Documentation of information narrated by the stakeholders and mitigation measures proposed by the stakeholders.
- ix. Incorporation of public concerns and their solutions in the EIA; and eliciting their comments and feedback.
- x. Create a sense of ownership of the project proposal in the minds of the stakeholders.

7.5 Consultation with Local Community

The response of various stakeholders in the population of the study area was ascertained by conducting a sample survey, through specially formatted questionnaires. Questions posed to the public were related to the creation of possible impacts, adverse impacts, and beneficial impacts, including; employment opportunities, income generation activities, change in living standards, and provision of the amenity. The various rounds of public meetings and consultations were arranged in the project and study area.

7.6 Summary of Views, Concerns, and Suggestions

The summary of socioeconomic concerns and problems highlighted by different persons have been mentioned here:

- i. No any tree located inside the project area or in the surrounding area should be removed.
- ii. The project will become a source of income for locals to earn their livelihood easily and honorably.
- iii. Employment opportunities should be provided to the locals.
- iv. Water sprinkling should be done regularly during the construction phase to avoid dust emissions.
- v. Good relations with the local communities should be promoted by encouraging the Contractor to provide opportunities to the locals against skilled and unskilled positions.
- vi. The contractor should prefer hiring local labor from adjacent nearby villages.
- vii. Indigenous trees around the facility should be planted to control air pollution and improve the aesthetic conditions of the area.



ENVIRONMENTAL IMPACT ASSESMENT



CHAPTER. 8

ENVIRONMENT MANAGEMENT **& MONITORING PLAN**



CHAPTER 8: ENVIRONMENT MANAGEMENT & MONITORING PLAN

This chapter provides the Environmental Management and Monitoring Plan (EMMP) of the project for its construction and operation phases to keep its environment benign and to ensure compliance of Punjab Environmental Quality Standard (PEQS). This section underline the monitoring framework for both construction and operational phases to check compliance of Monitoring Plan and to take timely actions for correction.

8.1 Components of Environmental Management and Monitoring Plan

The EMMP consists of the following:

- i. Environmental Management Plan
- ii. Environmental Monitoring Plan
- iii. Communication and Documentation
- iv. Institutional Capacity
- v. Environmental Training

8.2 Environmental Monitoring Plan

Environmental Monitoring is a vital component of Environmental Management Plan. It is the mechanism through which the effectiveness of the environmental management Plan in protecting the environment is measured. The feedback provided by the environmental monitoring is instrumental in identifying any problem or lapse in the system under implementation and planning corrective actions.

Table 8.1 Environmental Monitoring Plan

Environmental Component	Standards	Monitoring Frequency	Responsibility
CONSTRUCTION PHASE			
Ambient Air Quality	PEQS	Quarterly	Project proponent
Noise Level	PEQS	-do-	-do-
Health and Safety	OSHA	-do-	-do-
OPERATIONAL PHASE			



ENVIRONMENTAL IMPACT ASSESMENT

Ambient Air Quality	PEQS	Quarterly	Project Proponent
Noise Level	PEQS	-do-	-do-
Health and Safety	OSHA	-do-	-do-

8.3 Supervision & Monitoring

The Environmental Manager will be responsible for all environmental issues and the implementation of EMMP.

8.4 Communications & Documentation

An effective mechanism will be developed to store and communicate environmental information to the responsible persons.

8.5 Environmental Training

Environmental Training will help to ensure that the requirements of the EIA and EMMP are clearly understood and followed by all project personnel in the course of construction and operational phase of project.

Table 8.2 Training Schedule

Target Personal	Topic	Schedule
Selected management staff	HSE Management	Quarterly
All personnel of project	Fire Fighting	-do-

Table 8.3 Annual Environmental Budget

Sr. No	Components	Estimated Cost
1	Environmental Monitoring	Rs. 3,00,000/-
2	Training	Rs. 200,000/-
3	Land preparation and Tree Plantation	Rs. 500,000/-
4	Watering and maintenance of trees/landscape	Rs. 5,00,000/-
	Total	Rs.15,00,000/-



CHAPTER.9
CONCLUSION AND
RECOMMENDATION



Chapter 9: CONCLUSION & RECOMMENDATIONS

Conclusion:

The EIA findings showed that the project design is the most suitable based on the current best practices and the available technology. The project is feasible and desirable from the perspective of environmental and social-economic evaluation undertaken in this study. The overall benefits of the proposed development are far higher than the potential cost of the marginal negative environmental changes which are likely to occur. The proposed project is desirable because it will improve the socio-economic status of the people in the area. It will create employment and deliver a wide range of other socioeconomic benefits.

The baseline environmental assessment of the proposed project site indicates that the site selected for the project does not contain any sensitive area. The EIA establishes that the proposed project design is far more suitable than the No project option.

The project proponent shall shoulder the responsibility of environmental protection and safety of workers. It will also fulfill the requirements of Regulatory Authority i.e. EPA. Employment opportunities shall be provided to skilled, unskilled, and high qualified persons.

Based on an overall assessment of the environmental impacts of the project, it is concluded that the project is not likely to cause any significant adverse impacts on the social, physical, and biological environment of the area.

9.1 Recommendations

Following are recommendations to make this project more environment friendly.

- i. Implementation of EMP must be given priority.
- ii. Proper PPEs including gloves should be provided to workers during Construction and Operational phase of project.
- iii. Workers must be directed to follow SOPs.
- iv. Installation of fire extinguishers in the premises and their regular



INITIAL ENVIRONMENTAL EXAMINATION (2024)

maintenance must be ensured.

- v. Equipment maintenance and efficiency must be checked regularly.
- vi. No compromise on public health and the environment should be allowed during Construction and Operational phase of project.
- vii. A proper tree plantation plan should be developed to support the environment and air quality of the area.
- viii. Waste storage bins should be installed at different points for proper waste collection and disposal.
- ix. Smoking should be avoided within the premises of the project site and near chemicals/fuel storage areas.
- x. The Security Guards shall be trained to provide necessary support in case of any emergency situations.
- xi. The fire alarms should be installed to signal the evacuation.
- xii. Proper, communication systems in an effective manner shall be made with hospitals, emergency services, and police for urgent support.

In view of the findings of the IEE, the proposed project is considered an environmentally safe project.

It is recommended that Environmental Approval for the project may be issued by the Punjab Environmental Protection Agency, in favor of this project.



GLOSSARY

- i. **Biodiversity:** The variety of all life forms on earth – different plants, animals, microorganisms, their genes, and the ecosystems they form.
- ii. **Carbon Footprint:** The total amount of greenhouse gases emitted directly or indirectly by human activities, usually measured in carbon dioxide equivalents (CO₂e).
- iii. **Climate Change:** A long-term change in the average weather patterns of the Earth, primarily caused by increased levels of greenhouse gases.
- iv. **Conservation:** The sustainable use and management of natural resources to prevent exploitation, degradation, and destruction.
- v. **Deforestation:** The clearing or thinning of forests by humans, often for agriculture, logging, or development.
- vi. **Ecosystem:** A community of living organisms interacting with their physical environment (e.g., forest, desert, coral reef).
- vii. **Emissions:** Substances released into the air, especially harmful gases such as CO₂, methane, and nitrogen oxides from industrial and vehicular sources.
- viii. **Endangered Species:** Species that are at risk of extinction due to loss of habitat, environmental changes, or human activities.
- ix. **Environmental Impact Assessment (EIA):** A process to evaluate the environmental effects of a proposed project or development.
- x. **Fossil Fuels:** Natural resources like coal, oil, and natural gas formed from ancient organic matter, which release greenhouse gases when burned.
- xi. **Global Warming:** An increase in Earth's average surface temperature due to the buildup of greenhouse gases in the atmosphere.
- xii. **Green Energy / Renewable Energy:** Energy sources that are naturally replenished, like solar, wind, hydro, and geothermal power.
- xiii. **Greenhouse Gases (GHGs):** Gases that trap heat in the atmosphere, including carbon dioxide, methane, nitrous oxide, and fluorinated gases.
- xiv. **Habitat Loss:** Destruction or alteration of the natural environment where wildlife lives, often due to human activity.
- xv. **Pollution:** Contamination of air, water, or soil by harmful substances or waste.



INITIAL ENVIRONMENTAL EXAMINATION (2024)

- xvi. **Recycling:** The process of converting waste materials into new products to reduce resource consumption and pollution.
- xvii. **Renewable Resources:** Resources that can be replenished naturally over time, such as sunlight, wind, and biomass.
- xviii. **Sustainability:** Meeting the needs of the present without compromising the ability of future generations to meet their own needs.
- xix. **Urbanization:** The process of increasing population in cities and towns, often leading to environmental stress and loss of natural spaces.
- xx. **Zero Waste:** A philosophy that encourages the redesign of resource life cycles so that all products are reused, and no trash is sent to landfills or incinerators.
- xxi. Environmental Protection & Industrial Pollution Control
- xxii. **Afforestation / Reforestation:** Planting trees to create forests (afforestation) or restore degraded forest lands (reforestation), used as a pollution mitigation measure and carbon sink.
- xxiii. **Air Pollution Control Devices:** Equipment used to reduce or remove pollutants from industrial exhaust gases. Examples include electrostatic precipitators, baghouse filters, and scrubbers.
- xxiv. **Ambient Air Quality Standards (AAQS):** Limits set for the concentration of pollutants in outdoor air to protect human health and the environment. Enforced by national or regional regulatory bodies.
- xxv. **Best Available Techniques (BAT):** The most effective and advanced stage in industrial technology and methods used to limit emissions and impacts on the environment.
- xxvi. **Bio-remediation:** The use of microorganisms or plants to detoxify and restore polluted industrial sites (soil and water).
- xxvii. **Continuous Emission Monitoring System (CEMS):** An automated system that provides real-time data on the pollutants released from an industrial source, helping ensure regulatory compliance.
- xxviii. **Effluent:** Liquid waste or sewage discharged from an industrial facility into the environment, often treated before disposal.
- xxix. **Effluent Treatment Plant (ETP):** A facility to treat industrial wastewater and remove harmful contaminants before it's discharged into water bodies or reused.



INITIAL ENVIRONMENTAL EXAMINATION (2024)

- xxx. **Environmental Compliance:** The act of adhering to environmental laws, regulations, standards, and permits applicable to an industrial operation.
- xxxii. **Environmental Management System (EMS):** A framework that helps an organization achieve its environmental goals through consistent control of its operations, often ISO 14001 certified.
- xxxiii. **Hazardous Waste:** Waste materials from industrial processes that are dangerous to health or the environment and require special handling and disposal.
- xxxiiii. **Noise Pollution:** Unwanted or harmful industrial sound that disrupts the surrounding environment or human well-being, controlled through barriers, enclosures, or silencers.
- xxxv. **Particulate Matter (PM):** Fine dust or tiny particles released from industries that can cause respiratory and cardiovascular problems; controlled using filters and scrubbers.
- xxxvi. **Pollution Control Board (PCB):** Statutory authorities (like State Pollution Control Boards or CPCB in India) responsible for monitoring and enforcing environmental regulations in industries.
- xxxvii. **Resource Recovery:** The process of reclaiming usable substances or energy from industrial waste streams, such as waste-to-energy or metal recovery from slag.
- xxxviii. **Scrubber:** A device used in industries to remove particulates and/or gases (e.g., SO₂) from industrial exhaust using water or chemical solutions.
- xxxix. **Solid Waste Management:** Systematic control of the collection, treatment, and disposal of industrial solid waste, including recycling and landfilling.
- xl. **Stack Emissions:** Pollutants released into the atmosphere through chimneys or stacks of industrial plants; subject to regular monitoring and standards.
- xli. **Sustainable Industrial Practices:** Approaches that reduce environmental impact by using energy-efficient processes, clean technology, waste reduction, and closed-loop systems.
- xlii. **Water Pollution Control:** Measures taken to prevent or reduce contamination of water bodies from industrial discharges, including effluent treatment and zero liquid discharge (ZLD) systems.
- xliii. **Zero Liquid Discharge (ZLD):** A wastewater treatment approach in which all industrial wastewater is purified and reused, eliminating any discharge into the Environment.