TABLE OF CONTENTS

EXECUTIVE SUMMARY 7

Project Title and Location 7

Project Proponent 7

The EIA Study Consultant 7

Positioning of the Project 7

Brief Description of the Project 8

Brief Outline of the Proposal 8

Location 9

Major Impacts & their Mitigations 10

Proposed Environmental Monitoring 16

- Ambient Air 16
- Noise 16
- Water Quality 16

Schedules of Proposed Monitoring: 16

CHAPTER # 1 17

INTRODUCTION 17

Purpose of the report 17

Identification Of the Project 17

The Proponent 18

The Consultant 18

Brief Description of Project 19

Nature & Size of Project 19

Location 19

Significant impacts and factors to be determined 23

Methodology of EIA Report 23

CHAPTER # 2 25

DESCRIPTION OF PROJECT 25

Type & Category of The Project 25

Objective of Project 25

Location & Site Layout of Project 25

Land Use & Vegetation Features on Site 27

Road Access 27
Cost & Magnitude of the Project 27
Schedule of Implementation 27
Project Description 28
Raw Materials 28
Resin, pigment and additive agents are generally major components of paint. 28
Project Process 28
PROCESS OF PRODUCTION OF POWDER COATING 28
Water Consumption & Wastewater Disposal 30
Solid Waste 30
Health and Safety 31
Safety Signs/ Safety Boards 32
Plantation 32
Fire Protection System 32
Restoration and Rehabilitation Plans 32
Details of Restoration and Rehabilitation at the End of the Project Life 32
Government & Local Approvals: 33
CHAPTER # 3 34
DESCRIPTION OF ENVIRONMENTAL & SOCIAL BASELINE CONDITIONS 34
Physical Environment: 34
Topography 34
Land Use 34
Geology and Soils 34
Socioeconomic Environment: 39
General 39
Demographics 39
Religion 39
Public Transport 39
Railways 40
Industrial Importance 40
CHAPTER # 4 42
POTENTIAL ENVIRONMENTAL IMPACTS & MITIGATION MEASURES 42
Methodology for Impact Evaluation: 42

Leopold Matrix 42
Impact Analysis and Prediction: 46
Consultations/ Case Studies: 46
Meetings: 46
Characteristics of Impacts: 46
Impact Assessment Criteria: 46
Analysis Of Impacts And Recommended Mitigations 47
Impacts during Operational Phase: 47
Solid Waste/ Sludge Management: 47
Mitigation measures: 48
Wastewater 48
Gaseous Emissions 49
Energy Requirement 50
Noise Level: 50
Health and Safety 50
Impact on Biological Environment 51
Natural Vegetation 51
Potential Environmental Enhancement Measures 52
What is the problem i.e. In terms of “major environmental impacts” which may arise by the subject project activity? 53
When the problem will occur and when it should be addressed? 53
Where and how the problem should be addressed? 53
Whys of Achieving Mitigation Measures? 53
By changing in planning and design 53
Improved monitoring and management practices: 53
Replacement, relocation and rehabilitation: 54
CHAPTER # 5 55
ENVIRONMENTAL MANAGEMENT AND MONITORING PROGRAM 55
Institutional Capacity 55
Training Schedule 55
Training of Building Contractor 57
Summary of Impacts and their mitigation measures: 58
Equipment Maintenance Detail 65

Environmental Budget 66
Environmental Management Plan for Paint manufacturing unit by Khawaja Amjad Gull (Proprietor). 67
Proposed Environmental Monitoring 75
CHAPTER # 6 76
STAKEHOLDERS AND PUBLIC CONSULTATION 76
Objectives of Consultation 76
Consultative Aspect 76
Identification of Main Stakeholders 77
Meetings with Stakeholders 77
Analysis of Stakeholder Consultation 82
Sample Size 82
Statistical Analysis 82
Result and Discussion 82
Summary of Issues Raised by Stakeholders 84
CHAPTER # 7 86
ANALYSIS OF ALTERNATIVES 86
The No Project Alternative 86
Location Alternatives 86
Modified Construction Technology Alternatives 86
Technology Alternatives 86
CHAPTER # 8 87
CONCLUSION & RECOMMENDATIONS 87
Conclusion 87
Recommendations 87
REFERENCES: 88
GLOSSARY 89

LIST OF ABBREVIATIONS

PEPA	Punjab Environmental Protection Act
NEQS	National Environmental Quality Standards
PEQS	Punjab Environmental Quality Standards
WAPDA	Water and Power Development Authority
EMP	Environmental Management plan
WWTF	Waste Water Treatment Facility
Pak-EPA	Pakistan Environmental Protection Agency
W.H.O	World Health Organization
PET	Punjab Environmental Tribunal
SWM	Solid Waste Management
CSR	Corporate Social Responsibility
MSWs	Municipal Solid Wastes
TMA	Town Municipal Authority
KVA	Kilo Volt Ampere
PPEs	Personal protective equipment's
PM	Particulate matter

LIST OF ANNEXURES

ANNEXURE-A	Term of References
ANNEXURE-B	Layout Map
ANNEXURE-C	Google Map
ANNEXURE-D	CNIC of Proponent
ANNEXURE-E	Land Ownership Documents
ANNEXURE-F	Firefighting System
ANNEXURE-G	Lab Reports
ANNEXURE-H	Emergency Evacuation Plan
ANNEXURE-I	Sewerage Layout Plan
ANNEXURE-J	Stakeholder Survey Form with CNIC
ANNEXURE-K	Master Plan of Small Industrial Estate, Faisalabad
ANNEXURE-L	Waste water Treatment Plant Details

EXECUTIVE SUMMARY

Project Title and Location

The proposed project is construction and installation of paint manufacturing unit by Khawaja Amjad Gull (Proprietor). Proposed project site is located at Plot # 74 Phase-1A, M3 Industrial City, FIEDMC. Total area of the project is 08 Acres.

Project Proponent

Khawaja Amjad Gull, the proponent of project, is intended to get Environmental approval for the said unit installation of paint manufacturing unit by Khawaja Amjad Gull (Proprietor) by submitting the Environmental Impact Assessment Report for the compliance of section 12, PEPA, 1997 (Amended 2012).

Table 1: Details of Project Proponent

Name	Khawaja Amjad Gull
CNIC	33100-6579499-7
Mailing Address	House No. 32-C, Muhallah People's Colony No.1, Faisalabad, Tehsil Faisalabad City.

The EIA Study Consultant

Environmental Services Pakistan (ESPAK), as independent consultants, has been appointed by the proponent to conduct Environmental Impact Assessment (EIA).

Company office address is Office No. 731, Block 2, Sector D1, Shahjilani Road Township Lahore, Pakistan

Contact: 042-35154012, 0312-0849999

For the detail company profile see the *Chapter # 1 "Introduction"*

Positioning of the Project

According to the IEE and EIA Regulations, 2000 the proposed project falls under Schedule II (List of projects requiring an EIA), Category B (Manufacturing and Process), Clause 9 (Synthetic resins, plastics and man-made fibers, paper and paperboard, paper pulping, plastic products, textiles (except apparel), printing and publishing, PAINTS and dyes, oils and fats and vegetable ghee projects, with total cost more than Rs. 10 million)".

Brief Description of the Project

The proposed project is the construction and installation of paint manufacturing unit by Khawaja Amjad Gull.

Brief Outline of the Proposal

Name of the proposed project	**Paint manufacturing unit by Khawaja Amjad Gull (Proprietor)**
Purpose of the Project	To provide paint to the markets all over the Pakistan and to make it accessible to everyone
Process Details	
Manufacturing Process	Raw materials used to manufacture paints come as liquids, solids, powders, pastes and slurries. These are manually weighed out and premixed.
Finished Products	Paints are the finished product of this manufacturing process
Production Capacity	15 million kilogram of water-based paint per annum
Land Requirement	
Total Area of Industry	Total area of the unit is 8 Acres.
Status and location	
Location of the proposed site	Plot # 74 Phase-1A, M3 Industrial City, FIEDMC.
Description of project	Construction and installation of paint manufacturing unit by Khawaja Amjad Gull (Proprietor)
Water Requirement	
Water consumption for the project	1000 Liter/ day during construction phase
Ways of extraction	Motor pump
Source of Water consumption	Underground.
Amount of waste water	20% of total used water. 80% water will be recycled within company.
Source of waste water	Constructional and Domestic Waste
Mode of treatment	During land development waste water treatment plant will be installed for the safe disposal of domestic and constructional wastewater.
Solid Waste	
Source of solid waste generation	Construction and Domestic sources
Mode of disposal	Construction waste will be reuse in construction. Domestic waste will be handed over to local contractors.

Solid waste during operation of unit	Waste only from offices and Process.
Manpower	
Labor Force	About 25 persons during construction
Labor Force	About 20 persons during operations
Power requirements	
Source of power	Power requirements at the project site will be fulfilled by WAPDA.

Location

Land coordinates are given below:

North……Pakistan Aluminium Beverage Cans Ltd

South……Health Capsule Pakistan (Pvt)

East……..Vivo Mobile Assembly Plant

West…… Drain 1km away from project

For further details, layout of the project is attached as Annexure-B, Google earth map and aerial view of the project site.

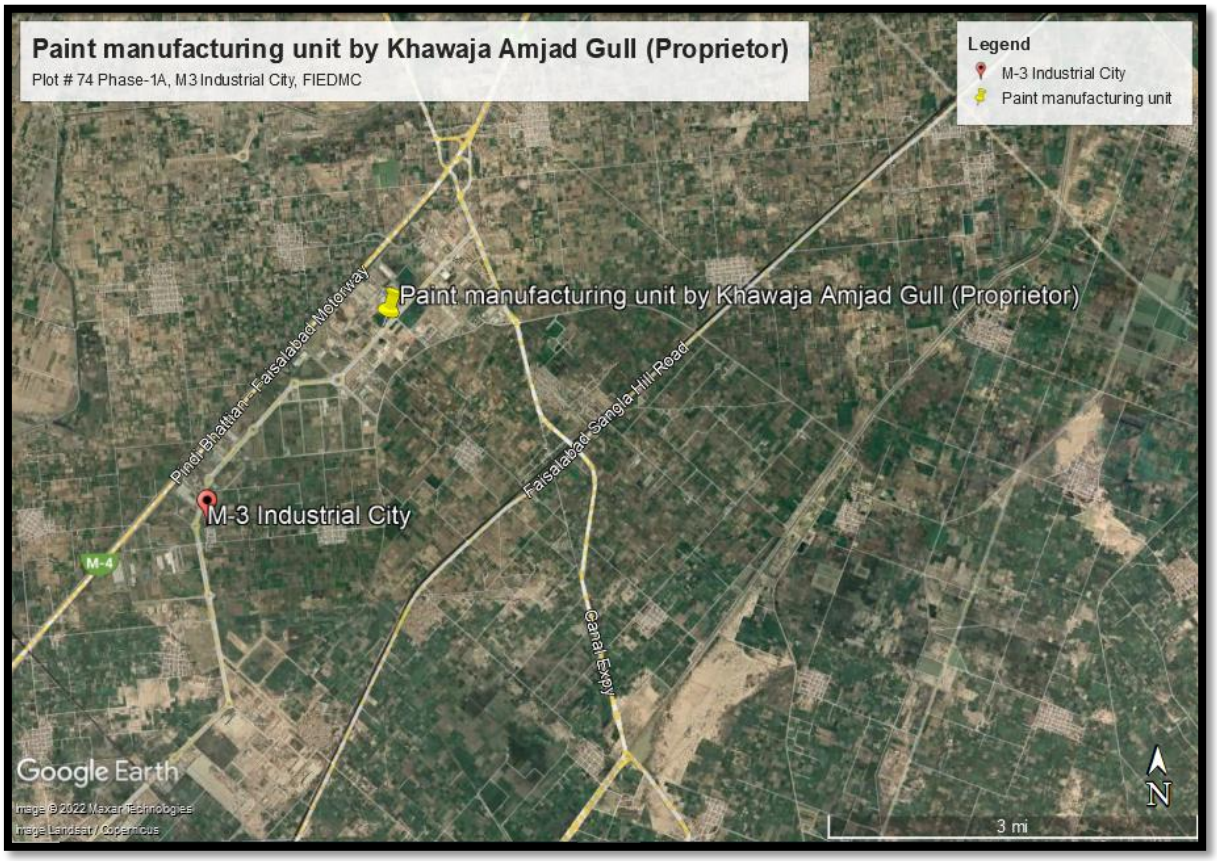


Figure 1: Google Map of Project Site

Google Coordinates: 31.647376, 73.209346

Major Impacts & their Mitigations

In order to identify all the activities associated with the project during construction & operation phase with potential to cause significant environmental impacts and harm a thorough review has been conducted. Project will not have significant negative impacts on the nearby community and on environment. And, the project will have positive impacts on the local population and country as a whole. Moreover, area for plantation is also reserved for environmental enhancement measures.

Table 2: Summary of Major Impacts and Proposed Mitigation Measures during Construction Phase

Potential Impact	Criteria for determining Significance	Key Mitigation Measures
Dust Emissions-Dust and PM may be generated during road construction and excavation activities. Gaseous emissions from site generators and transportation vehicles may affect ambient air quality in the vicinity of the project site.	An increase in visible dust beyond the boundaries of the construction site or Concentration of PM10 in excess of 150 J.lg/m3 PEQS for Ambient Air	Sprinkling of water on dusty roads, tracks and surfaces is recommended; During excavation works drop heights will be minimized to control the fall of materials reducing dust escape; Use of wind shield around stockpiles is recommended; Vehicle speed restrictions should be applied in the project area; Raw materials should be transported in covered trucks;
Solid waste Management-If solid waste will not be managed properly, it may cause negative impacts	Generation of excessive waste; Recyclable waste and reusable waste is discarded, Littering, Improper disposal.	Constructional waste should be utilized for road filling and maintenance purposes; Domestic waste should be disposed of properly, handed over to contractors, placed in bins; Proper solid waste management plan should be devised and implemented.
Waste water - water used in construction process and excessive water generate as wastewater and it also produced from campsite domestic activities	PEQS parameters	Wastewater after treatment should be drain out in industrial drain

Construction Noise- Noise may be generated during landscaping activities and from generators and transportation	OSHA standards	Activities generating high levels of noise should be minimized at the project site.
Vehicles at the project site; which may be a nuisance for the workers.		If the noise level will exceed the permissible limits with reference to national and OSHA standards, following recommendations are suggested to take action against the high noise levels: • Proper tuning of construction machinery and vehicles is recommended. • Ear muffs and ear plugs are recommended in case of high noise levels. • Rubber wounds should be placed underneath the generator to avoid the vibration.
Vegetation Loss/ Soil erosion-Minor negative impact may arise as only some weeds and grasses are present at the project site which will be cleared for the purpose of construction.	Unnecessary or excessive removal of trees and shrubs.	No tree cutting/ vegetation loss issue will be involved in the subject project as project site is free of any dense vegetation and trees. Preparation of a Reinstatement Plan to restore the land after the constructional activities is recommended.
Soil Contamination-Oil and Chemical spills can contaminate the soil.	Presence of visible amount of hydrocarbon in soil	Provision of spill prevention and control kits; Use of impermeable surfaces in workshops, and storage areas; Contaminated soil will be collected and incinerated.

Traffic issues- Traffic issues may arise due to the constructional activities at the project site if traffic will not be managed properly.	TEPA rules	Speed limit of 10 km/h should be maintained on the access road; Ample parking area must be allocated at the project site. Guards should be hired to manage the traffic at the project site.
Socioeconomic impacts-Inter-from other areas and the local community may arise due to the Project. Positive socioeconomic impacts due to increased infrastructure, employment opportunities and economic growth.	No community complaints. Increased employment facilities area; Increased infrastructure	Training of the non-local project staff on local culture and norms; Avoidance of unnecessary interaction of local population with the local project staff. Employment opportunities should be provided to the local people.

Table 3: Summary of Major Impacts and Proposed Mitigation Measures during Operational Phase

Potential Impact	Criteria for determining Significance	Key Mitigation Measures
Impact due to Location	Seismic Region and flood Zone Specification	There are no significant negative impacts on the environment due to the project location/ selected site, because the project is present in Industrial Estate which is already approved by the EPA.

Gaseous Emissions- During the operational phase of the project, gaseous emissions from project site generator may affect the air quality of the project area.	PEQS for Ambient Air	Industry should ensure the PEQS compliance and should not be allowed to emit hazardous pollutants. Proper tuning of generator should be done to avoid the excessive gaseous emission from the generator. Vehicle emissions inspection should be done on regular basis. Sprinkling should be done on the unpaved area to avoid dust pollution/ particulate matter.
Noise- Noise due to industrial activity, machinery and generators can be a nuisance for the workers in the working area.	OSHA Standards	Activities generating high levels of noise should be minimized at the project site. Personal Protective Equipment PPEs including Ear muffs, Ear plugs and other noise abating equipment will be provided to the workers and other staff in case of noise at the project site. Generator should be covered with canopy. Proper maintenance and tuning of the vehicles should be done. Sound proof rooms should be built for generators to be installed at the project site to control the noise.
Discharge of wastewater- The discharge of untreated municipal wastewater may be a negative impact of the subject project.	PEQS for Municipal Effluents (mg/1, unless otherwise defined)	Wastewater must be treated before its discharge. Compliance of PEQS for effluents should be ensured. Monitoring should be conducted as per PEQS and reports should be submitted to EPA.

Health & Safety Issues- different constructional and operational activities at the project site may cause health and safety issues for workers if precautionary measures will not be adopted.	OSHA Standards	Proper training of workers and staff should be conducted to avoid the accidents. Use of PPEs should be implemented at workplace. First aid measures/medical facility should be provided at the project site. Safe drinking water must be provided to workers, staff, and poor people ofthe area. Safety signs & boards should be placed
Solid waste management- If solid waste will not be managed properly, it may cause negative impacts.	Exposure to potentially hazardous waste; Generation of excessive waste; Recyclable waste and reusable waste is discarded; Littering; Improper disposal.	A solid waste management division should be formulated to deal with the proper disposal of solid waste, supervised by HSE Manager, SW Manager, and other related personnel.

Proposed Environmental Monitoring

To oversee the environmental performance of the project through its lifecycle enforcing the PEQS an Environmental Monitoring Program should be formulated which ensures effective surveillance of the environmental parameters at various stages of the project development and compliances with PEQS and legal obligations. Monitoring for following Environmental Parameters is recommended:

- **Ambient Air**

Regular monitoring for ambient air should be conducted during construction & operational activities of the project and report should be submitted to EPA Punjab.

- **Noise**

Regular monitoring for noise level should be maintained periodically during construction & operational phases of the project and report should be submitted to EPA Punjab.

- **Water Quality**

Regular monitoring of water quality should be conducted during construction & operational phases of the project and report should be submitted to EPA Punjab.

Schedules of Proposed Monitoring:

Sr. No.	Parameters	Monitoring Schedules
1	Ambient Air Monitoring (NO_x, CO_x, SO_x, VOCs, PM_{10})	Monthly
2	Noise Level	Monthly
3	Water quality	Monthly

Note: Environmental Monitoring data log book should be maintained by the project proponent.

CHAPTER # 1
INTRODUCTION

The development of any Project brings about changes, both positive and negative, in the environmental and social settings of the Project Area. The intensity and the level of change, however, depend upon the nature of the project and the baseline environmental conditions of the area.

Purpose of the report

Environmental Impact Assessment (EIA) report is being submitted to the Environmental Protection Agency (EPA), Government of the Punjab, Lahore for the compliance of Section 12 of Punjab Environment Protection Act-1997 (Amended 2012) for obtaining No Objection Certificate (NOC) before starting the construction activity at the project site. The other relevant regulations and guidelines considered while preparing this EIA report include:

- Policy and procedures for filing, review and approval of environmental assessments.
- Guidelines for the preparation and review of environmental reports.
- Guidelines for public participation writer
- Guidelines for sensitive and critical areas.
- Detailed sectorial guidelines

Various aspects like environmental, social, physical and other aspects of the project both during construction and its regular occupancy 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), before issuing the desired Environmental Approval.

Identification Of the Project

According to the IEE and EIA Regulations, 2000 the proposed project falls under Schedule II (List of projects requiring an EIA), Category B (Manufacturing and Process), Clause 9 (Synthetic resins, plastics and man-made fibers, paper and paperboard, paper pulping, plastic products, textiles (except apparel), printing and publishing, PAINTS and dyes, oils and fats and vegetable ghee projects, with total cost more than Rs. 10 million)".

The Proponent

Khawaja Amjad Gull, the proponent of project, is intended to get Environmental approval of said unit by submitting the Environmental Impact Assessment Report for the compliance of section 12, PEPA, 1997 (Amended 2012).

Table 3: Details of Project Proponent

Name	Khawaja Amjad Gull
CNIC	33100-6579499-7
Mailing Address	House No. 32-C, Muhallah People's Colony No.1, Faisalabad, Tehsil Faisalabad City.

TORs of the study between Proponent & Consultant under clause 5 (f) of policy and procedure for the filing, review and approval of environmental assessment are annexed as ANNEXURE-A.

The Consultant

Environmental Services Pakistan (ESPAK) as independent consultants has been appointed by the proponent to conduct Environmental Impact Assessment (EIA).

Company office address is Office No. 731, Block 2, Sector D1, Shah Jilani Road, Township, Lahore, Pakistan
Contact: 042-35154012, 0312-0849999

The current work has been carried out by the following professionals:

EIA TEAM & QUALIFICATION EMPLOYEES			
Sr. No	**Names**	**Designation**	**Qualification**
1.	Ayesha Khalid Bajwa	Environmentalist	BS Environmental Sciences
2.	Syed Shahzaib Ali	Senior Field Officer	B.Sc. Environmental Engineering
3.	Ms. Mamoona Kanwal	Environmentalist	BS Environmental Sciences, M. Phil Environmental Sciences (Continue)
4.	Shahzad Ahmad Khan	Business Development Manager / Project Coordinator	MBA Marketing

Brief Description of Project

Nature & Size of Project

The project, for which this Environmental Impact Assessment (EIA) Study has been conducted, is the construction and installation of paint manufacturing unit by Khawaja Amjad Gull (Proprietor). Proposed project site is located at Plot # 74 Phase-1A, M3 Industrial City, FIEDMC and total cost of the project is 44 Million.

Location

Land coordinates are given below:

North……Pakistan Aluminium Beverage Cans Ltd

South……Health Capsule Pakistan (Pvt)

East……..Vivo Mobile Assembly Plant

West…… Drain 1km away from project

For further details layout map of the project is attached as Annexure-B, Google earth map and aerial view of the project site.

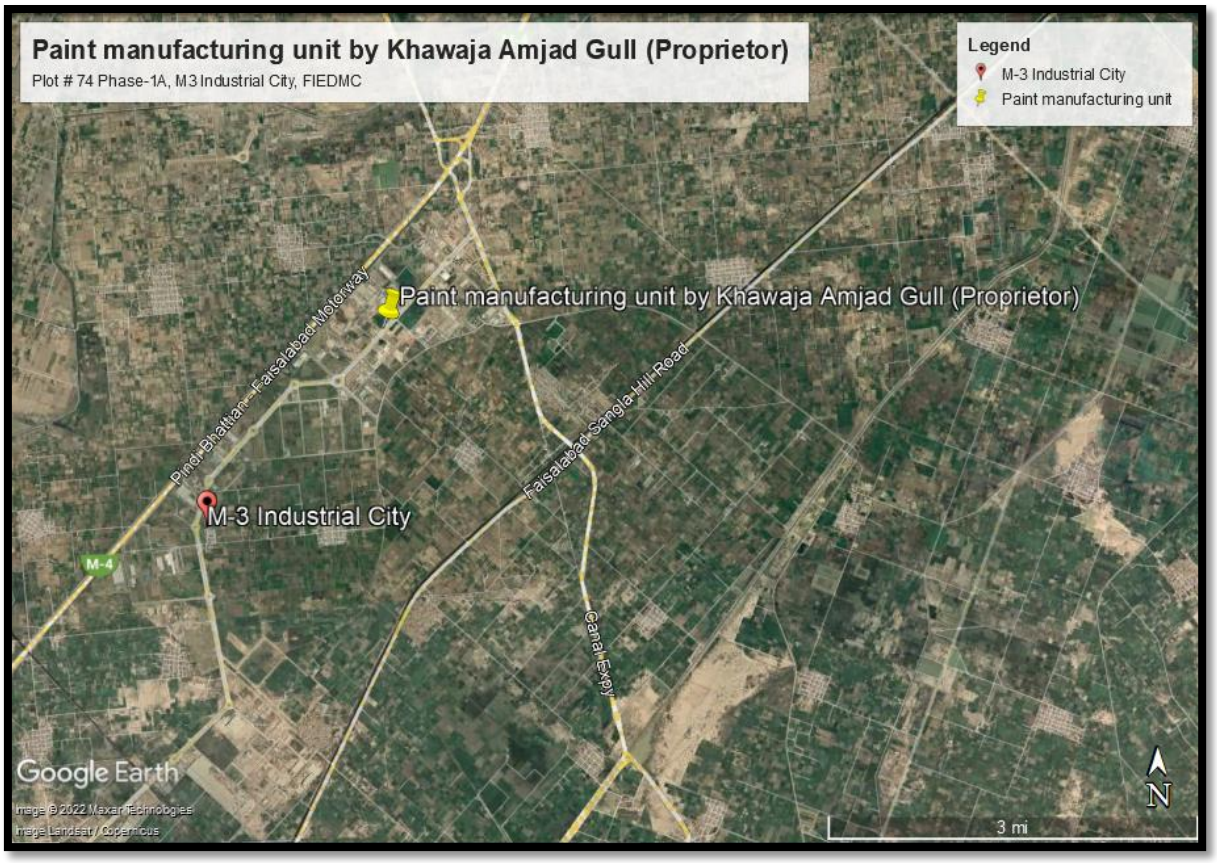


Figure 2: Google Map of Project Site

Google Coordinates: 31.647376, 73.209346

Screening/ Type and Category of Project:

EIA is mandatory according to Section 12 clause (1) of the Pakistan Environmental Protection Act (PEPA, 1997) (Amended 2012) for all developmental interventions. As the project falls under Schedule II (List of projects requiring an EIA), Category B (Manufacturing and Process), Clause 9 (Synthetic resins, plastics and man-made fibers, paper and paperboard, paper pulping, plastic products, textiles (except apparel), printing and publishing, PAINTS and dyes, oils and fats and vegetable ghee projects, with total cost more than Rs. 10 million)"of Punjab Environmental Protection Agency's Review of EIA & EIA Regulations, 2000, the guidelines for the preparation and review of environmental reports, an Environmental Impact Assessment (EIA) of the project is required.

Objective of the Report

Objectives to conduct EIA are as following:

- It is mandatory according to Punjab Environmental Protection Act-PEPA 1997 (Amended 2012).
- 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 operational project.
- Collection of available data, reports, drawings and other relevant information about area of operational project.
- Review of applicable existing environmental legislation and Punjab environmental quality standards (PEQS).
- Propose mitigation measures to eliminate or to reduce the negative impacts 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.

Scoping

The key activities of this phase include:

Project Data Compilation: A generic description of the activities relevant to environmental assessment is compiled with the help of the proponent.

Published Literature Review: Secondary data on weather, water resources and vegetation, and other relevant environmental features of the project area and the similar projects, is reviewed and compiled.

Legislative Review: Information on relevant legislations, regulations, guidelines, and standards is reviewed and compiled.

Identification of Potential Impacts: The information collected is reviewed and potential environmental issues are identified.

Identification of Mitigation Measures: Mitigation measures are identified for all the likely impacts in order of preference for avoiding the impacts altogether, minimizing their frequency or extent and compensating or rectifying the losses; as may be found practicable in the project.

Selection of Alternatives: Based on the potential impacts and the cost required to mitigate them, most crucial project employing the best available technology at the most feasible site is selected.

Scoping Meeting: A scoping meeting was held to share this basic level of project information with all the project stakeholders before the information is incorporated into the report, so that some improvement can be sought out in the data as may be necessary, better or more friendly alternatives can be selected, and better and more practicable mitigation measures can be suggested.

Spatial and Temporal boundaries

The project, for which this Environmental Impact Assessment (EIA) Study has been conducted, is the construction and installation of paint manufacturing unit by Khawaja Amjad Gull (Proprietor). Proposed

project site is located at Plot # 74 Phase-1A, M3 Industrial City, FIEDMC. The project is already in industrial area. Devices are installed to control pollutant concentrations. It will make sure to maintain emissions level according to the limits of Punjab Environment Quality Standards, and so there are minimal chances of gaseous emission with respect to time, space and location.

Important Issues and Concerns Raised during Consultation:

Issue	Aspect/ Concern raised by Stakeholders	Project Proponent Commitments
Employment Opportunities	Expectations of employment are very high. Job opportunities are less for herders as they generally have less skills and training.	Employment is the main priority of the industry. Mostly locally skill and unskilled labor will be prioritized and also there will be job in executive level. Max. Persons according to the requirement will be employed by the industry.
Training Opportunities	People are keen to consult with subject industry if the Project offers training and upgrading opportunities to enhance their trade or professional skills.	Development of the Training Strategy, including commitment of allocation of budget investment for training infrastructure, delivery and design. Installation of training facilities in for worker of the company and students will also be accommodate. The internship program will offer to the students to develop professional skills.
Health & safety	Health and safety issues may be arising due to industrial and constructional activity.	All possible safety measures will be taken during operation and construction phase. The proponent has designated teams for HSE concern a.k.a. Emergency Response Teams (ERTs) and emergency equipment like fire extinguishers, spill kits, water hydrant system, effective use of PPEs and first aid are already well managed.
Local economy and business development	Local service providers are keen to participate in providing services to provide raw material and expect to receive in order to adjust their businesses to meet specific needs.	Proponent has main focus that they will all the material regarding construction to buy from the local market. This will help the local and small business and to people who are keen interested to become

		suppliers.
Environmental Issues	Dust and noise impacts, particularly from the construction activities and in operation of mechanically unfit machines, are of concern to nearby residents. Environmental degradation during construction.	Implementation of controls under the Environmental Management Plans, including on and off-site dust and noise monitoring. A Participatory Environmental Monitoring Program will be launched to spread awareness. Company also have certification of Environmental Management System (ISO-14001:2015).
Water quantity and quality	Water quality and quantity, and impacts from the wastewater disposal are all key concerns for nearby community.	Implementation of consultation in relation to water use, recycle and development of the Participatory Environmental Monitoring Program.

Significant impacts and factors to be determined

Significant Issues Considered during EIA Study It was unanimously agreed by almost all the consultation participants that the project is necessary to establish the paint manufacturing unit to reduce the import and to take a part in improvement of the GDP of Pakistan However, most of the participants are of the view that Strategic Level Environmental Impacts and their mitigations should be added in the project during EIA study.

Methodology of EIA Report

EIA Study comprises of Executive Summary following eight chapters as detailed below;

Chapter 1, Introduction; gives rational and overview of the Project, need for Environmental Impact Assessment study, its objectives and finally structure of the report.

Chapter 2, Description of Project; gives a rather detailed account of the Project particularly emphasizing those Project components which are of importance in relation with environmental and social aspects.

Chapter 3, Description of Environmental and Social Baseline Conditions; provides information about the environmental and social settings of the Project Area including geology, climate, flora, fauna, water resources, socioeconomic conditions etc.

Chapter 4, Potential Environmental Impacts and their Mitigation Measures; identifies the potential impacts due to the implementation of Project on the physical, biological and social environment of the Project Area.

Chapter 5, Environmental Management and Monitoring Plan; outlines the environmental management plan, identifies the roles and responsibilities to implement EMMP, suggest monitoring frequencies of various parameters and EMMP costs etc.

Chapter 6, Stakeholders and Public Consultations; deals with the outcome of the consultation carried out with the local communities, knowledgeable people, public representatives, etc. It discusses the concern of various types of the people and provides an outline how these have been addressed within the study of the Project.

Chapter 7, Analysis of Alternatives; describes the analysis of alternatives, which could be site alternative, design or technology alternatives.

Chapter 8, Conclusion and Recommendations; sums up the report and conclusions and recommendations resulting from the study

CHAPTER # 2

DESCRIPTION OF PROJECT

This chapter presents all aspects of the project. It describes the nature of the project, its location, designs and site layout/ plan. It presents the activities that will be involved during all stages of project; how product will form, detail of process and machinery as well as details on supportive resources i.e. man power and utility requirements.

Type & Category of The Project

According to the IEE and EIA Regulations, 2000 the proposed project falls under Schedule II (List of projects requiring an EIA), Category B (Manufacturing and Process), Clause 9 (Synthetic resins, plastics and man-made fibers, paper and paperboard, paper pulping, plastic products, textiles (except apparel), printing and publishing, PAINTS and dyes, oils and fats and vegetable ghee projects, with total cost more than Rs. 10 million)".

Objective of Project

Following are the main objectives of the project:

- Established business for the proponent
- Provide the paint all over the Pakistan markets
- Reduce the import
- Take a part in improvement of the GDP of Pakistan.

Location & Site Layout of Project

To fulfill the Industrial aspects of the project under reference of this EIA Report, it must also meet the legal requirements of the Punjab Environmental Protection Act, 1997 (Amended 2012). Availability of land at the best convenient place is equally important among other considerations for the site selection. Availability of access roads, communication facilities, electricity, basic infrastructure, sewerage etc. is yet the other necessary requirements. Master Plan Showing Industrial Nature of project Site Attached as ANNEXURE-K.

Obviously, environmentally sound, neat and clean environment are the other considerations for site selection. The project will also facilitate the people of the area with increasing the opportunity of employment, and other related facilities.

The site selected on the following reasons:

- Easy access to road

- Site is safe from any kind of flood
- Site is away from residential areas
- Area of land availability was enough.

Land coordinates are given below:

North……Pakistan Aluminium Beverage Cans Ltd

South……Health Capsule Pakistan (Pvt)

East……..Vivo Mobile Assembly Plant

West…… Drain 1km away from project

For further details layout map of the project is attached as Annexure-B, Google earth map and aerial view of the project site.

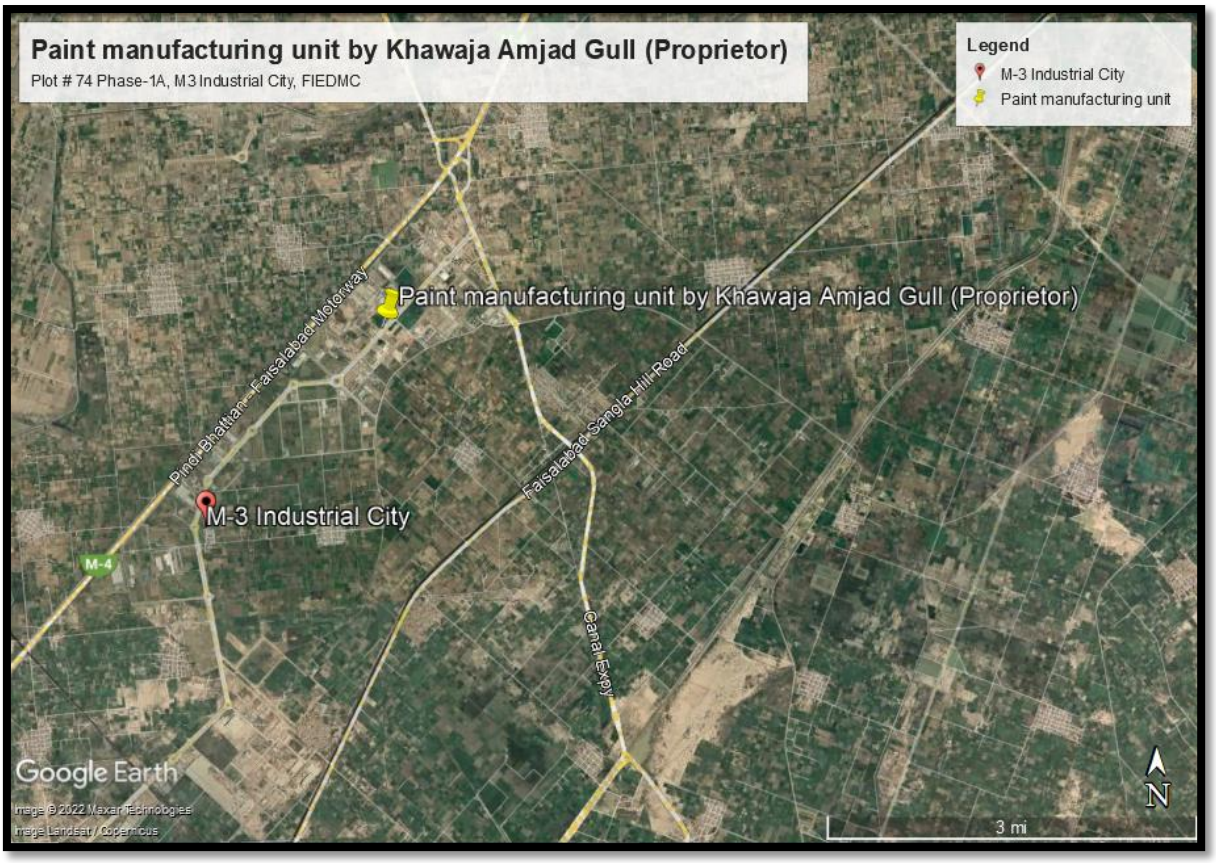


Figure 3: Google Map of Project Site

Google Coordinates: 31.647376, 73.209346

Land Use & Vegetation Features on Site

The land is fall in industrial area. The site is open land. The land is free from any type of vegetation. Small grasses and weeds are present in small amount at the site and there is no need to clear any vegetation because they are out of vicinity of the project.

Road Access

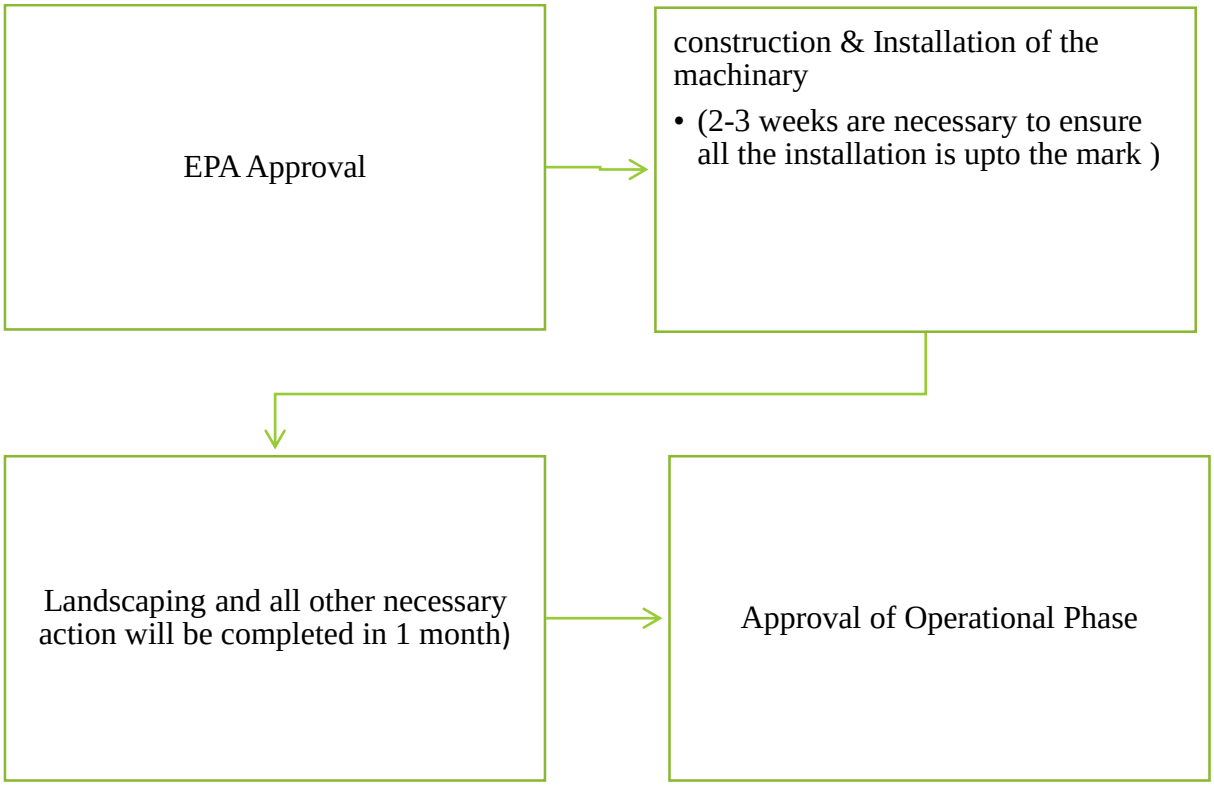
Main Road is present at east of project site.

Cost & Magnitude of the Project

Total cost of the project is 44 Million. Cost includes the entire thing regarding this project. The production capacity of the unit is 15 million kilogram of water-based paint per annum.

Schedule of Implementation

Detailed feasibility studies and designing of the project have been completed. Necessary legal, administrative and financial formalities have been also completed. The project is expected to be completed within 3 months from the date of environmental approval. Subsequently the construction, operational and maintenance aspects of the project will be undertaken by the proponent.



Schedule of implementation

Project Description

Subject project, is the construction and installation of paint manufacturing unit by Khawaja Amjad Gull (Proprietor). Total area for the subject project is 8 Acres. Production capacity could be varied according to the demand (15 million kilogram of water-based paint per annum) and total cost of the project is 44 Million.

Raw Materials

Resin, pigment and additive agents are generally major components of paint.

Project Process

Step 1: Receiving of Raw Materials -water based only (powders, liquid extenders)

Step 2: Storage of Raw materials - All raw materials stored in covered raw material warehouse

Step 3: Production I Mixing of Raw materials - Special mixing machines are used to combine powders, liquid extenders and water to produce a mixture/paint.

Step 4: Filling- Mixture/paint is filled in containers of 25 liters, 10 liters and gallons.

Step 5: Storage of Paint Cans - Storage of cans in finished goods warehouse

Step 6: Logistics distribution- Paint is distributed via small trucks to various customers.

Step 7: Waste production consists of;

- Empty cartons and plastic packaging (hazardous and non-hazardous waste)
- Waste water (1% of total product) is chemically pre-treated before disposal according to Punjab Environmental Standards for water.

PROCESS OF PRODUCTION OF POWDER COATING

Paint is one major segment of the surface coatings, which also includes varnishes, enamels, printing inks and polishes. The paint industry produces a huge variety of products that protect, preserve, and also beautify the objects to which they are applied. Typical products include architectural coatings (e.g. house paints), industrial coatings (e.g. automotive finishes, wood furniture and fixture finishes), and special purpose coatings (e. g. traffic paints, roof coatings).

Basic Composition of paints

Solvents (Liquids)

Pigments

Additives Resins

(Binder) Prime

Prime Pigments

• Titanium Dioxide (TiO2)

- Provides excellent hiding power and whiteness.

- Available as a solid (powder) or liquid (slurry).
- Titanium dioxide is the world's primary pigment for providing whiteness, brightness and opacity.

Zinc Oxide

- Controls mildew
- Resists ultra-violet light
- Resists yellowing

Resins

- Binds or glues ingredients (pigments and additives) of paint together.
- Resin provides adhesion to the substrate.
- Resin provides durability & resistance properties

Fillers

- Fillers are a special type of pigment that serve to thicken the film, support its structure and simply increase the volume of the paint.
- Fillers are usually comprised of cheap and inert materials, such as talc, lime, clay, etc.

Solvents

- The main purpose of the solvent is to adjust the viscosity of the paint.
- Water is the main vehicle for water-based paints.
- Solvent-based paints can have various combinations of solvents as the vehicle, including aliphatic, alcohols, etc.
- These include organic solvents such as petroleum distillate, esters, glycol ethers, and the like.

Additives

Additives are mixed in very small amounts and yet give a very significant effect on the product.

Additives are used because:

- Modify surface tension.
- Improve flow properties.
- Improve the finished appearance.
- Improve pigment stability.
- Control foaming.
- Control skinning.

The manufacturing process

Raw material

Resin, pigment and additive agents are generally major components of paint.

Mixing:

Resin, pigment and solvent are mixed to produce an even mill base.

Milling:

Mill base produced at the pre-mixing process is sent to the disperser to finely disperse the pigment particles.

Blending:

Resin, additive agents and so on are added to the mill base, the dispersion of which is completed. Also, the color phase is adjusted with color materials.

Filtering:

Blended and toned paint is filtrated.

Packing:

Filtrated paint is packed into a container.

Water Consumption & Wastewater Disposal

The Breakup of water requirement and wastewater generation during construction phase of project are given in Table 2.2

Table 2.2: Water Requirement and Wastewater Generation during construction

Sr. No.	Description	Water Consumption (gallons/day)	Wastewater Generation (gallons/day)	Mode of Disposal
1	Domestic	1690	1352	Will be disposed off in Main Drain after proper treatment through waste water treatment plant.
2	Construction and sprinkling	2000	-	-

Solid Waste

In constructional phase all waste materials such as landscape and land clearing debris, gravel and aggregate products, concrete, masonry scrap and rubble (brick, concrete masonry, stone), and plastics and paper from cement bags will be recycled during the construction activities as road filling and maintenance purposes. Solid waste generated during construction phase will be placed in separate bins.

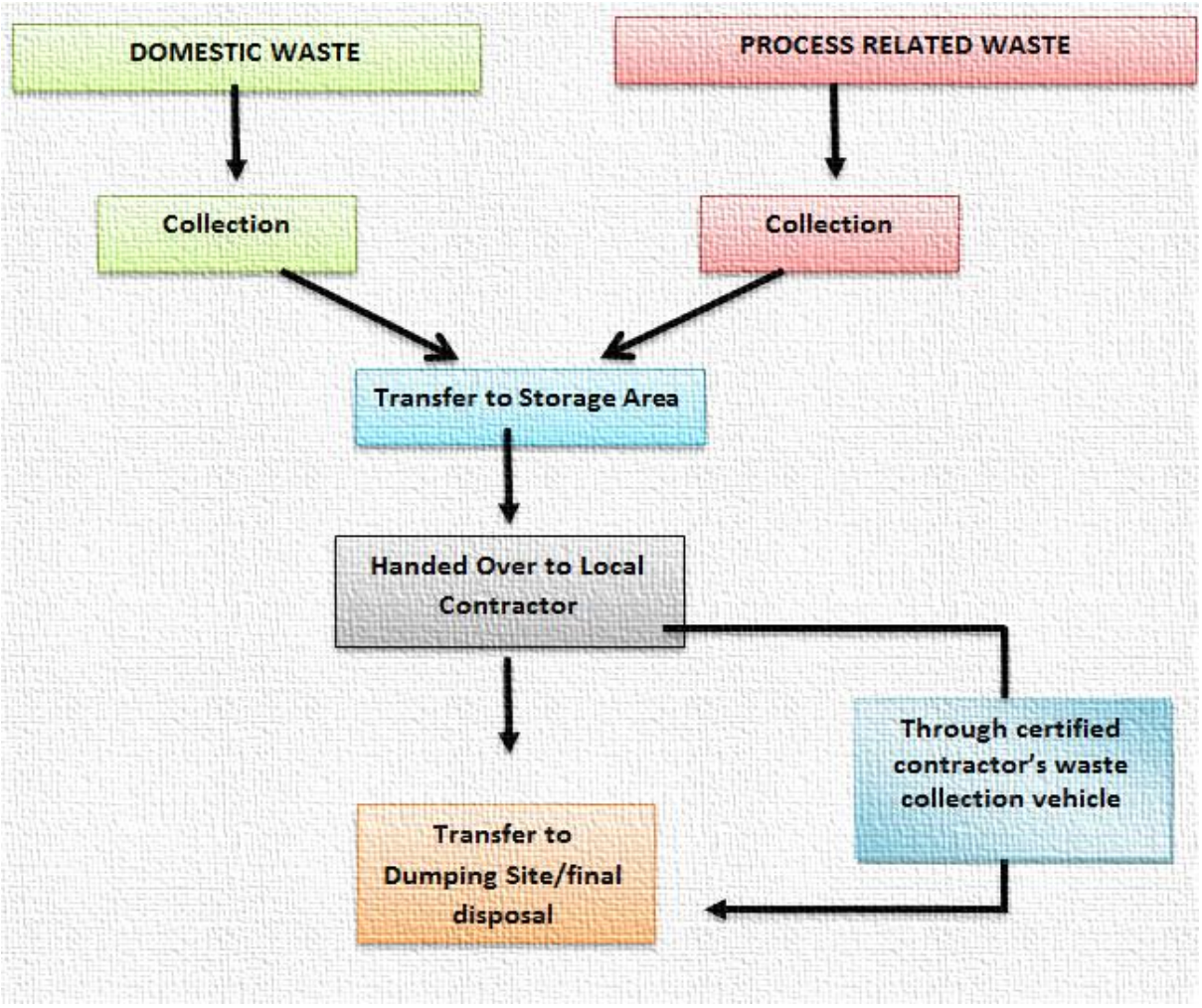


Figure 4: Solid Waste Detail

Health and Safety

A well-maintained health and safety plan will be established. It will assure the contractor will maintain all the safety measures in operational phase. In operation no activity is involved because 98% system is automated. Beside this safety mats, shoes, gloves all will be part of the work's dress.

Table 4: Details of PPEs

Protection	Occupational Hazards	PPEs
Hand protection	Hazardous material, cuts or lacerations, vibrations, extreme temperatures	Synthetic or Rubber gloves, leather, insulating material etc.

Hearing protection	Noise, High sound	Hearing protectors like ear plugs, ear muffs
Respiratory protection	Dust, fogs, fumes, gases, smokes, vapors, oxygen deficiency	Facemasks or air supply
Body protection	Extreme temperatures, hazardous materials, biological agents, cutting and laceration	Aprons, insulating clothing etc. of appropriate materials

Safety Signs/ Safety Boards

At any workplace Safety signs and symbols are very important to avoid many accidents. They must be in easy and understandable language to all the workers. Workers should have the knowledge of sign wordings and they must be trained and aware about them. Safety signs, symbols and boards must be provided by every site to protect the workers and employees from the risks of hazards that has not been controlled by other means. Safety signs and boards give safety message and they must be of different colors that workers could understand their meanings easily. At the subject project, safety signs and boards will be placed to avoid the workers and staff from any risk.

Plantation

Area for plantation will be reserved. Proper plantation will be done to control the suffocation and for the esthetic purpose.

Fire Protection System

An addressable fire protection system with detection and alarm annunciation and other installations etc. are provided to protect against any fire hazards in the project. Fire buckets and fire extinguishers will be installed at all sensitive places within the working area of project.

Restoration and Rehabilitation Plans

All possible precautions will be taken to prevent an untoward incident in terms of life and property losses. On completion of the project, solid waste will be removed from the site in order to maintain aesthetics of the area. All measures will be undertaken for ensuring occupational safety, security and clean environment during the working hours. Vegetation and landscaping will be done by the proponent after the completion of project.

Details of Restoration and Rehabilitation at the End of the Project Life

There will be no matter of rehabilitation as the site is already owned by the project proponent.

At the end of the life of the project, it will be duly dismantled with special precautions to avoid/ minimize pollution and at the same time taking all safety precautions to protect human life and property around the building. The materials capable of recycling/reuse will be either sold in the market or to be reused for other suitable purposes.

Government & Local Approvals:

The proponent is very purposive about the approval from all local and government bodies but NOC from EPA is prerequisite for approval from all these bodies.

CHAPTER # 3
DESCRIPTION OF ENVIRONMENTAL & SOCIAL BASELINE CONDITIONS

This section provides the description of baseline conditions of the Project as well as the area of influence. The existing environmental conditions of the proposed area of influence will also be a benchmark to be used for a comparison of before and after installation and operation of pesticide formulation. This baseline will also provide the datum for assessing the impacts and suggesting the mitigation measures, which will be implemented effectively at various phases of the Project activities.

Physical Environment:

Topography

Faisalabad is situated at the center of the lower Rechna Doab, the area is located between the Chenab and Ravi rivers. There is a mild slope from the northeast to the southwest with an average fall of 0.2–0.3 meters per kilometer (1.1–1.6 feet per mile). The city is situated at an elevation of about 183 meters (600 ft.). The topography is marked by valleys, local depression and high ground.

The soil of the area is fertile. Being situated about 91 km from Chenab River, the soil in the project area is rich alluvial loam (Punjab Agriculture Department). The sand extracted from the river bed is superior and is commonly used for building purposes.

Land Use

The land use of the Project Area is mainly industrial i.e. 90%.

Geology and Soils

The surface soil are grey to brown in color and medium textured i.e. silty clay/ clay loamy or sandy loam at the site, at all the locations and generally continues up to depth of 3-10 feet. This sub stratum contains fine sand. Topographically the area is almost plain.

The district of Faisalabad is part of the alluvial plains between the Himalayan foothills and the central core of the Indian subcontinent. The alluvial deposits are typically over a thousand feet thick. The interfluves are believed to have been formed during the Late Pleistocene and feature river terraces. These were later identified as old and young floodplains of the Ravi River on the Kamalia and Chenab Plains. The old floodplains consist of Holocene deposits from the Ravi and Chenab rivers.

The soil consists of young stratified silt loam or very fine sandy loam which makes the subsoil weak in structure with common kankers at only five feet. The course of the rivers within Faisalabad is winding and often subject to frequent alternations. In the rainy season, the currents are very strong. This leads to high floods in certain areas which do last for a number of days. The Rakh and Gogera canals have encouraged the water levels in the district however the belt on the Ravi River has remained narrow. The river bed does include the river channels which have shifted the sand bars and low sandy levees leading to river erosion.

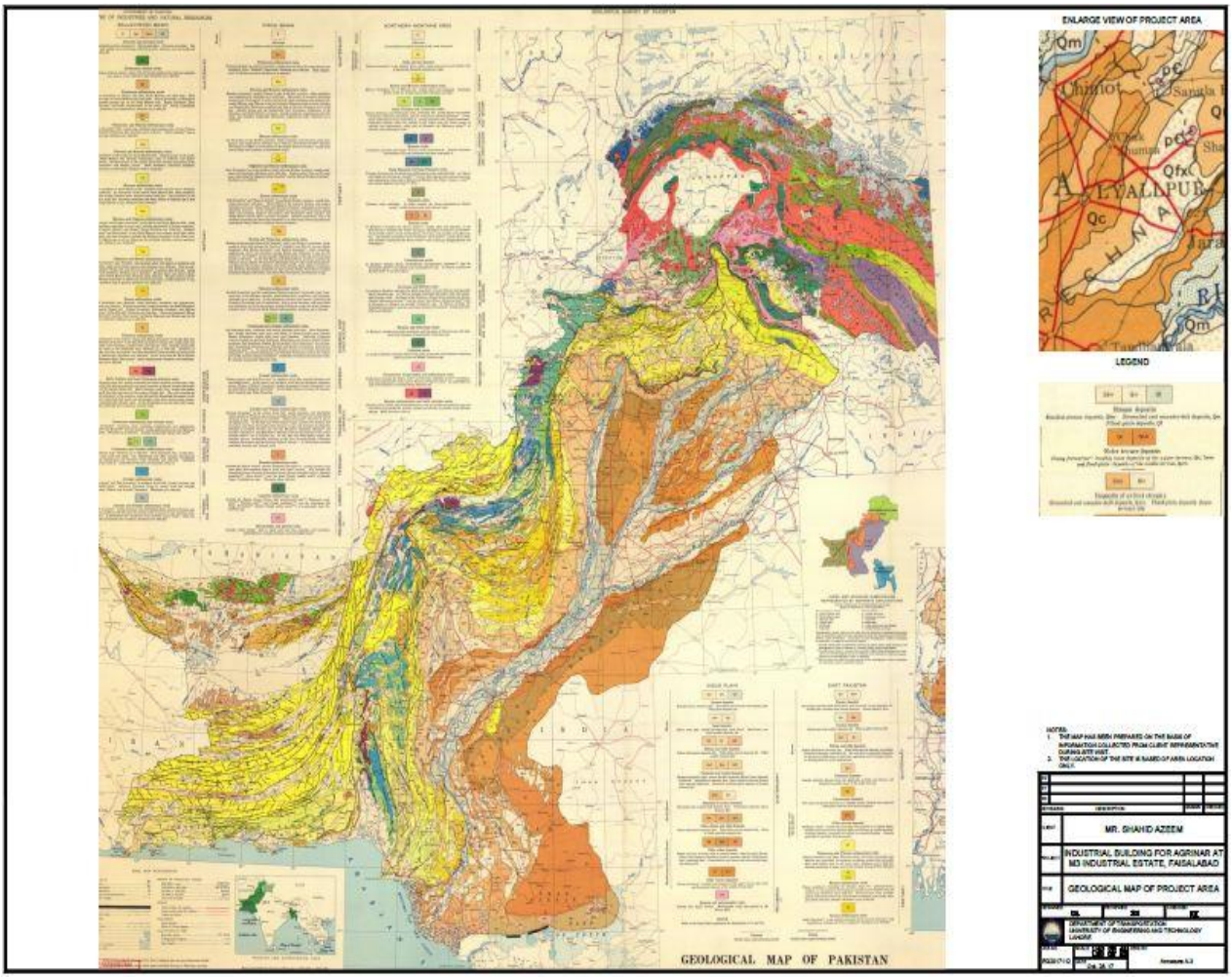


Fig 4.1: *Geological Map of Project Site*

Seismology

Earthquake is generated by tectonic process in the upper part of the earth called lithosphere, which is divided into several rigid parts called “Plates”. Due to the movements of these plates, stress build up takes place and result in the deformation of the crustal mass.

On the basis of Peak Ground Acceleration (PGA) values obtained through Pakistan Seismic Hazard Assessment (PSHA), Pakistan is divided into 5 seismic zones in line with the Uniform Building Code (UBC) 1997.

The boundaries of these zones are defined on the basis as shown in Table 4.1.

Table 4.1: Probabilistic Ground Acceleration (PGA) Values of Seismic Zones of Pakistan

Horizontal Zone	PGA (g)
1	0.05-0.08
2A	0.08-0.16
2B	0.16-0.24
3	0.24-0.32
4	>0.32

As per Building Code of Pakistan (BCP) 2007 (Seismic Provisions), the proposed Project falls entirely in the zone 2A, which is the regions of moderate seismic risk (Figure). Hence all the applicable provisions related to Soil and Foundations, Structural Design Requirements and with the Structural Concrete of BCP should be considered in the design of the structures.

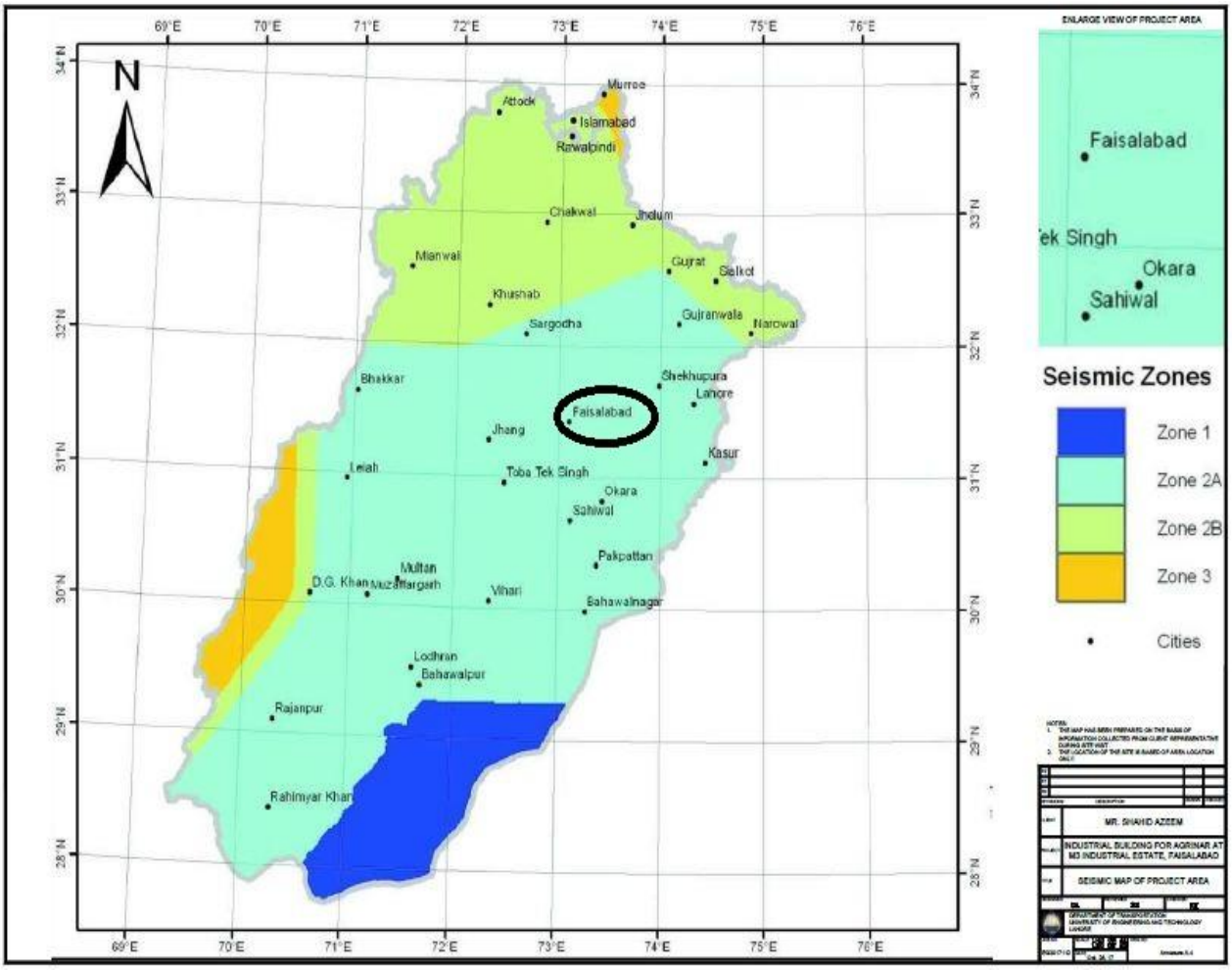


Fig 4.1: Seismic Map of Pakistan highlighting Project Site

Climate

The climate of the district is hot and dry during summer and cold and dry in winter. The mean maximum and mean minimum temperatures during summer are about 40oC and 28oC respectively. The mean maximum and mean minimum temperatures during winters are about 27oC and 6oC respectively. The highest mean temperature (39oC) from 1961 to 1990 was recorded in the month of May. Likewise the minimum mean temperature (8oC) was recorded in the month of January. The annual rainfall of the district is approx. 288.8 mm

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Record high °C (°F)	26.6 (79.9)	30.8 (87.4)	37 (99)	44 (111)	47.5 (117.5)	48 (118)	46.1 (115)	42 (108)	41.1 (106)	40 (104)	36.1 (97)	29.2 (84.6)	48 (118)
Average high °C (°F)	19.4 (66.9)	22.2 (72)	27.4 (81.3)	34.2 (93.6)	39.7 (103.5)	41.0 (105.8)	37.7 (99.9)	36.5 (97.7)	36.6 (97.9)	33.9 (93)	28.2 (82.8)	22.1 (71.8)	31.6 (88.9)
Average low °C (°F)	4.8 (40.6)	7.6 (45.7)	12.6 (54.7)	18.3 (64.9)	24.1 (75.4)	27.6 (81.7)	27.9 (82.2)	27.2 (81)	24.5 (76.1)	17.7 (63.9)	10.4 (50.7)	6.1 (43)	17.4 (63.3)
Record low °C (°F)	-2.9 (26.8)	-1.4 (29.5)	1 (34)	7 (45)	13 (55)	17 (63)	19 (66)	18.6 (65.5)	15.6 (60.1)	9 (48)	2 (36)	-1.3 (29.7)	-4 (25)
Average precipitation mm (inches)	16 (0.63)	18 (0.71)	23 (0.91)	14 (0.55)	9 (0.35)	29 (1.14)	96 (3.78)	97 (3.82)	20 (0.79)	5 (0.2)	2 (0.08)	8 (0.31)	346 (13.62)

Water Resources

Surface Water

River Chenab and related canals are the major surface water source of project area. It is perennial and flows throughout the year. It also causes floods in the monsoon season, when it receives excessive rainfall water from upstream.

Ground Water

Irrigation is largely dependent on the canals, but tube wells have also been sunk in the areas where water is fit for irrigation. The chemical quality of ground water in the district varies area wise and depth wise. Irrigation supplies are perennial and tube wells have been installed to make up the deficiencies. The strata near project site is water bearing and alluvial deposits, giving groundwater potential throughout the project

area and the water table is fairly near the surface at 13 feet. The water table is not seasonal and dug wells do not generally run dry, because the ground water aquifer is recharged by Chenab River and canals (flowing about 91 km western side of project site). The local population is generally reliant on installed hand pumps, electric motors and supply from tube wells. Near the current project site hand pump water was tested in the laboratory, the results reveal that the water quality of the area is under permissible limits with respect to biological and chemical parameters.

Ecological Environment

This section describes the biodiversity existing ecosystem and existing ecological conditions in the project area of influence. This section also enlists the fruit and non-fruit trees (forest trees), wildlife species and identifies those that need protection.

Flora

The area is located in alluvial plain which is highly fertile. Naturally grown shrubs are also present on the land. Jungli Kikar (Wild Acacia niloica), Sufaida (Eucalyptus), Aak (Calotropis), Sheesam (Dilbergia Sisso) and Jandh (Prosopis cineraria) were seen on the project land. Orchards of Citrus, Guava and Mango fruits are found in abundance in the surroundings of the project area. Besides Dates, Pomegranate and Bananas are also grown in minor quantities in the district.

Fauna

Fauna within the Project area includes following:

(i) **Mammals**

Jackels (Canisaureus)
Foxes (SSP. Vulpes)
Field rats (Rattusnorvegitus)

(ii) **Reptiles**

House Lizard

(iii) **Amphibians**

Common Toads

(iv) Birds

Shikra (Accipiter badius)
Crow (Corvussplendens)
Common kite (Milbusmigrans)
Sparrow (Passer domesticus)
Pigeons (Columba livia)
Dove (Stratopielia SSP.)
Parrot (Psittaculakramerl)

(v) Others

Spiders

There are no migratory birds reported in or around the project area. Domestic animals of significance include cows/ bulls, buffaloes, goats, donkeys and sheep.

There is no endangered species reported in the project area by the Wildlife Department of Punjab.

Socioeconomic Environment:

General

This section deals with the social conditions of the Project Area. During the desk/ office study, available reports/ documents were comprehensively studied. During the field survey interviews with the residents, shopkeepers, students, pedestrians, drivers, and hospital employees were held and observations were taken after giving due consideration to the desk/ office study results.

Demographics

Faisalabad was established as one of the first planned towns of British India covering an area of 3 square kilometres (1.2 sq mi). It was initially designed to accommodate 20,000 people. The city's population increased from 69,930 in 1941 to 179,000 in 1951 (152.2% increase). Much of the increase is attributed to the settlement of Muslim refugees from East Punjab and Haryana, India. In 1961, the population rose to 425,248, an increase of 137.4%. Faisalabad set a record in the demographic history of Pakistan by registering an overall population increase of 508.1% between 1941 and 1961. The industrial revolution of the 1960s contributed to population growth. In 1961, the population was 425,248. A 1972 census ranked Faisalabad as the 3rd largest city of Pakistan with a population of 864,000. In a 1981 census, the population was 1,092,000; however, the Faisalabad Development Authority estimated the number to be 1,232,000.[69] In the 2017 consensus, the total population of the city was 3,203,846.

Religion

Islam is the common heritage in the region with a 97.22% Muslim majority according to the 1998 Pakistan census report and 2001 population data sheet. Islamic influences are evident in the fundamental values of various inhabitants including cultural traditions, marriage, education, diet, ceremonies and policies with may reflect stark differences in rural villages as compared to urban areas. People live in tight-knit joint families, although a nuclear family system is emerging due to changing socio-economic conditions. Ancient Pakistani culture prevails in most marriage practices in the region, as do certain restrictions related to ethnicity and caste. Prevalent minorities, particularly Hindu and Christian, feel a sense of vulnerability because of their religious beliefs.

Public Transport

Faisalabad is well-connected by rail, road and air. Public transportation in Faisalabad includes auto-rickshaws, buses and railways. Faisalabad International Airport is located on the outskirts of the city, and operates flights to the Middle East.

Railways

The Faisalabad railway station is the central railway station in the city. The railway line forms part of the Khanewal–Wazirabad railway line. Rail services are operated by Pakistan Railways, owned and operated by the Ministry of Railways.

Cargo Express services are operated by Pakistan Railways which runs from Karachi to Faisalabad via Multan. Twenty-seven bogies comprise the goods train, and are handled respectively by private contractors at the station. The station has a special cargo facility operated by the Ministry of Railways (Pakistan) for handling various goods from the city to other regions of the country. An express parcel service runs from Karachi to Lahore via Faisalabad.

Industrial Importance

The Faisalabad Chamber of Commerce and Industry monitors industrial activity in the city and reports their findings to the Federation of Pakistan Chamber of Commerce and Industry and provincial government. The city has a major dry port and international airport.

Faisalabad is recognised as the centre of the textile industry in Pakistan, contributing to half of Pakistans total textile shipments. At the end of June 2012, textile mills employed 20% of the nation's workforce, and generated 1.3 trillion rupees ($13.8 billion) in textile products, most of which were exported to the US and Europe. While Punjab's economy is driven primarily by agriculture, the textile industry along with leather products and light engineering goods play an important role, with more than 48,000 industrial units spread across Punjab. In an effort to boost bilateral trade, Romania and Turkey have honorary-consulates in Faisalabad which enable trade links with the city.

The Faisalabad clock tower and its eight bazaars (markets) remain a major trading zone in the city. Each of the eight bazaars has a special name and is known for selling certain goods as follows:

- Katchery Bazaar, named for the court (Katchery) is known for its mobile phone and accessory market.
- Rail Bazar is a gold and cloth market.
- Bhawana Bazaar supplies electrical and electronic goods.
- Jhang Bazaar supplies fish, meat, vegetables and fruits.
- Aminpur Bazaar supplies stationery and interior décor.
- Kharkhana Bazaar is known for herbal medicines.
- Gol Bazaar contains dry fruit, as well as wholesale soap, oil, and ghee shops.

- Chiniot Bazaar is known for allopathic and homoeopathic medicinal stores, cloth, blankets, sofa cloth, and curtains. It also has poultry feed wholesale shops.
- Montgomery Bazaar (also known as Sutar Mandi) is known for yarn and raw cloth trading.

CHAPTER # 4
POTENTIAL ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

The following chapter describes the overall possible impacts of project on the physical, biological and socioeconomic environment because of construction & operation phases and mitigation measures to minimize the significance of the possible impacts up to an acceptable level. The anticipated impacts related to location, design, construction and operation of the project have been assessed and mitigation measures have been suggested in this report.

Impacts are assessed by analyzing their magnitude and sensitivity. The sensitivity and magnitude of the impact are described with reference to legal requirements, accepted scientific standards or accepted impact assessment practice, and/or social acceptability; where possible.

But where no known published 'standard' criteria exist for determining the magnitude of effects, established professional criteria and best practice techniques are used.

Methodology for Impact Evaluation:

The methodology adopted for impact evaluation includes the Modified Leopold Matrix.

Leopold Matrix

The analysis is performed with the Leopold Matrix (LM). This matrix has:

1) On the horizontal axis, the actions which cause environmental impact, and
2) On the vertical axis, the existing environmental conditions which may be affected by those actions.

This provides a format for comprehensive review of the interactions between proposed actions and environmental factors.

The most important blocks marked are evaluated individually, and a number between 1 and 10 is placed in the upper left-hand corner to indicate the relative magnitude of the impact (1 represents the least magnitude, and 10 the greatest). Likewise, a number between 1 and 10 is placed in the lower right-hand corner to indicate the relative importance of the impact (again, 1 represents the least magnitude and 10 the greatest).

Table 5: Scale Table of Importance & Magnitude

Sr. No.	Type of Impact	Scale of Magnitude (0 – 10)	Scale of Importance (0 – 10)
1	No Impact	0	0
2	Low Impact	1 – 4	1 – 4
3	Medium Impact	5 – 6	5 – 6
4	High Impact	7 – 10	7 – 10

For the evaluation of this project, each action checked was evaluated in terms of magnitude of effect on environment characteristics and conditions [on the vertical axis]. From upper right to lower left across each block where significant interaction is expected slash \was placed diagonally. The most important blocks marked are evaluated individually, and a number between 0 to10 is placed in the upper left-hand corner to indicate the relative magnitude of the impact 1is the best magnitude, and 10 the greatest magnitude. In the same way, a number between 0 and 10 in the lower right-hand corner to indicate the relative importance of the impact again, 0 is the magnitude, and 10 the greatest.

The next step is to evaluate the numbers which have been in the slashed boxes. The high or low numbers on any one box indicates the degree of impact of the appropriate action on the given characteristic of the environment. The assignment of magnitude and importance numbers is based, to the extent possible, on factual data rather than on the evaluator's preference.

For the rating design regarding the probable impacts requires the evaluator to quantify his\her judgment. The rating scheme\scheme allows the reviewers to thoroughly follow the evaluator's line of reasoning, to aid in identifying points of agreement and disagreement. In fact, matrix is the abstract for the text of the environmental impact assessment

Table 6: Leopold Matrix

Magnitude / Importance			Transportation of raw material	Operation of generators	Water consumption	Wastewater generation	Storage of raw materials	Social activities	Public welfare	Economic activities	Employment	Infrastructure improvement	Total Score of Impact	Average Score of Impact
PHYSICAL	Soil	Soil Quality	2 / 1	0 / 0	1 / 1	5 / 2	4 / 2	1 / 1	0 / 0	1 / 1	0 / 0	4 / 5	18 / 13	1.8 / 1.3
		Erosion	2 / 1	0 / 0	1 / 1	3 / 2	2 / 2	2 / 1	0 / 0	0 / 0	1 / 1	3 / 4	14 / 12	1.4 / 1.2
		Geomorphology	0 / 0	0 / 0	0 / 0	3 / 3	2 / 1	0 / 0	0 / 0	2 / 1	3 / 2	4 / 6	14 / 13	1.4 / 1.3
	Water	Surface Water	0 / 0	0 / 0	2 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	2 / 0	0.2 / 0
		Subsurface Water	1 / 2	0 / 0	1 / 1	6 / 7	1 / 1	0 / 0	0 / 0	0 / 0	0 / 0	3 / 3	12 / 14	1.2 / 1.4
	Air	Air Quality	2	4	0	2	1	2	0	0	1	7	19	1.9

			1 /	4 /	0 /	3 /	1 /	1 /	0 /	0 /	1 /	7 /	18 /	1.8 /
		Odors	1 / 1	1 / 1	0 / 0	5 / 7	2 / 3	1 / 1	0 / 0	0 / 0	1 / 1	0 / 0	11 / 14	1.1 / 1.4
		Noise	5 / 6	7 / 8	0 / 0	2 / 2	4 / 3	5 / 0	0 / 0	6 / 8	4 / 6	4 / 7	37 / 40	3.7 / 4.0
BIOLOGICAL	**Fauna & Flora**	**Crops**	1 / 2	3 / 2	2 / 3	4 / 6	2 / 2	2 / 3	4 / 3	4 / 3	3 / 3	3 / 3	28 / 30	2.8 / 3.0
		Birds	1 / 2	6 / 5	0 / 0	4 / 4	1 / 1	7 / 6	0 / 0	4 / 3	3 / 4	4 / 4	30 / 29	3.0 / 2.9
		Mammals	2 / 3	1 / 2	2 / 1	4 / 3	0 / 0	2 / 1	0 / 0	3 / 3	2 / 1	1 / 2	17 / 16	1.7 / 1.6
SOCIO-ECONOMIC	**Social**	**Industrial**	4 / 4	4 / 5	4 / 6	6 / 7	4 / 5	6 / 6	5 / 6	7 / 7	9 / 9	7 / 7	55 / 61	5.5 / 6.1
		Recreational Use	2 / 1	2 / 3	3 / 3	3 / 3	1 / 1	3 / 4	4 / 4	2 / 3	2 / 1	4 / 3	26 / 26	2.6 / 2.6
		Historical / Cultural	2 / 2	2 / 2	2 / 1	4 / 4	0 / 0	3 / 2	1 / 1	2 / 2	3 / 4	2 / 2	19 / 19	1.9 / 1.9

Impact Analysis and Prediction:

In order to evaluate the socioeconomic and environmental impacts, field surveys are extremely essential. In addition to the surveys at the preliminary stage, consultation with the community and their active participation plays a vital role in successful implementation of the project. For the impact analysis and predictions following methods were adopted.

Consultations/ Case Studies:

To study the impacts of the project on physical and biological environment, site visits were conducted by the environmental practitioners and experts and possible physical and biological impacts which may arise due to the subject project were identified through consultations and case studies and their mitigation measures were suggested accordingly.

Meetings:

For the identification of the social impacts of the project, meetings and group discussions were held with the local people, stakeholders, nearby residents and passerby because social acceptability of the project and the area is a key to success. Consultation with the stakeholders is a tool for managing two-way communication between the project proponent and the affected public. Its goal is to improve decision making and built understanding by actively involving individuals, groups and organizations, which have stake in the project. This involvement increases project's long-term viability and enhances its benefits to locally affected people and other stakeholders.

To identity the different types of stakeholders and ascertain their perceptions about the project, an environmental examination was conducted. Informal group discussions were also held as an additional tool for obtaining feedback from the stakeholders that are being discussed in the following.

The EIA team carried out public consultations at various locations around the Project Site. The stakeholder's consultation during this phase of the work targeted the project area, administrative and private offices, Govt. offices, shops, etc. near the Project area:

- Selection of the stakeholders for consultation, reconnaissance of the project site and initial discussions with the neighboring factory workers, villagers, shopkeepers, drivers etc.
- Environmental consultants and social specialists and documenting the opinions of the stakeholders expressed during the meetings etc.

Characteristics of Impacts:

Impact Assessment Criteria:

The impacts were assessed in the light of criteria given as under: -

- Magnitude or degree of impact
- Time and duration of impact
- Likelihood of impact occurrence
- Sensitivity of impact
- Risk related to impact

Table 7: Impact Assessment criteria

Rating of Consequence of Effect on Environment	Rating of Frequency of Occurrence				
	A. Very low: Not heard of but could occur	B. Low: Has occurred in other industry	C. Medium Has occurred in oil and gas industry	D. High: Occurs several times a year in oil and gas industry	E. Very high: Occurs several times a year in PDO
Slight effect: Local environmental damage. Within the fence and within systems. Negligible financial consequences	LOW RISK				
Minor effect: Contamination. Damage sufficiently large to attack the environment. Single exceedence of statutory or prescribed criterion. Single complaint. No permanent effect on the environment.		MEDIUM RISK			
Localized effect: Limited loss of discharges of known toxicity. Repeated exceedence of statutory or prescribed limit. Affecting neighborhood.					
Major effect: Severe environmental damage. The company is required to take extensive measures to restore the contaminated environment to its original state. Extended exceedence of statutory limits		HIGH RISK			
Massive effect: Persistent severe environmental damage or severe nuisance or nature conservancy extending over a large area. In terms of commercial or recreational use, a major economic loss for the company. Constant, high exceedence of statutory or prescribed limits				EXTREME RISK	

Analysis Of Impacts And Recommended Mitigations

The proponent aims to a establishing a manufacturing plant for production of pharmaceuticals. If the project proponent maintains HSE conditions and comply with the PEQS limits than, there will not be any significant impacts of the project on the environment. If the mitigation measures are effectively implemented, the residual impact of the Subject project activities on the area's geophysical environment is expected to be insignificant.

Impacts during Operational Phase:

The positive and negative impacts of subject project, during its operation are discussed below:

Solid Waste/ Sludge Management:

Due to construction activities waste will be generated at construction and contractors camp site. The construction waste will include wastewater, oil spillage from machinery, domestic waste and solid waste etc. The handling and storage of oil, asphalt/bitumen may be a source of environmental pollution as a hazardous waste. This will result in unhygienic conditions, health risk to work force and public at the camp site.

Impact

- Insecure and unhygienic disposal of the solid wastes generated at the worksite, particularly garbage and trash may cause degradation of soil and land
- Insecurely disposed off heaps of wastes containing kitchen garbage and food waste can serve as breeding grounds for the disease spreading vectors and rodents
- Throwing away of solid wastes into water channels and the wastewater network can result into choking of the latter.

Nature of impact: Direct
Duration: Short term
Timing: Constructional phase
Reversibility: Not applicable
Likelihood: Moderate
Consequences: Moderate
Impact significance: Low, based upon low likelihood and mild to moderate consequence.

Mitigation measures:

- An efficient and responsive solid waste management system should be devised for the entire duration of the construction phase. Such a system should provide for separate collection of different categories of constructional wastes. The wastes which will be reusable/recyclable (iron bars, aluminum) should be sold to waste vendors and those which cannot be sold out (brick pieces) may be used as a filling material for leveling the depressions, subject to technical feasibility
- Training of working force in the storage and handling of materials and chemicals that can potentially cause soil contamination
- Solid waste generated during construction and camp sites will be safely disposed in demarcated waste disposal sites or handed over to the contractor

Wastewater

Impact:

Waste water will be produced only from construction activities

Nature of impact: Direct
Duration: Short term
Timing: Constructional phase

Reversibility: Not applicable

Likelihood: Low

Consequences: Mild

Impact significance: Low.

Mitigation measure

- Wastewater generated during construction and domestic activities will be stored temporarily in septic systems comprising of septic tanks from where it will be routed to local drain.
- Waste segregation measures will be employed to minimize entry of solid waste into the wastewater stream.
- An appropriately designed septic tank will be used to treat sewage/waste water to achieve PEQS.
- Periodic cleaning of the septic tank is recommended.

Gaseous Emissions

Emissions will be produced by generators, and vehicles will similar to those produced by generators in terms of the resulting pollutants (SO2, NOX, PM, etc.). However, the extent to which they can produce would keep considerably lower, since much smaller engines will use in vehicles and construction machinery.

Nature of impact: Direct

Duration: long term

Timing: operation

Reversibility: irreversible

Likelihood: moderate if mitigation measures will be ensured.

Consequences: moderate, if pollutant levels in the ambient air will be control within acceptable limits by adopting proper mitigations.

Impact significance: moderate, based upon low likelihood and mild to moderate consequence.

Mitigation Measures

None of the potential effects discussed above will be exceeded to acceptable limits.

The mitigation measures given below used to reduce their impact, and ensure that they remain within acceptable limits.

- All equipment and vehicles during the operation of project will be properly tuned and maintained in good working condition in order to minimize exhaust emissions.
- Vehicle speed will be reduced on track passing through or close to shops
- Speed limits will be imposed and encourage more efficient journey management worked to reduce the dust emissions produce by vehicular traffic. Water sprinkling will be done where necessary.
- Management make sure process will be environment friendly

- Pollution abatement technologies regarding air pollution will be adopted in case of any air emission.

Energy Requirement

Energy consumption in industry is usually very high. Machinery work runs all day in different industries. Energy conservation technique should be in mind.

Mitigation measures

- Do not waste the energy/electricity when there is no need of it.
- Use energy efficient machinery and equipment
- Use energy saving products
- Do not leave the machinery in running form when there is no working being done
- Machinery must never be left unattended

It is recommended to save and conserve the energy and adopt energy efficient technologies during the construction phase

Noise Level:

Noise is the major concern during the operation phase. It can be generated from the traffic on the road and from the machinery used for operations.

Nature of impact: Direct

Duration: long term

Timing: operation

Reversibility: Not applicable

Likelihood: low

Consequences: slightly significant

Impact significance: moderate, based upon low likelihood and mild to moderate consequence.

Mitigation measures:

- Machinery and vehicles will be tuned and maintained
- Limits will impose on unnecessary use of horns
- Safety signs will be displayed. public & drivers will be aware of them
- Sound proof wall will be constructed for generator.
- PPEs will be provided to workers where required.

Health and Safety

Workers should be provided with safe and healthy working environment taking into account risks inherent to the particular sector and specific classes of hazards in area. Mitigation measures will include:

Impact significance: Low to Moderate

Nature of impact: Direct

Duration: Short-term

Timing: Construction & operation

Reversibility: NA

Likelihood: moderate

Consequences: Moderate

Mitigation:

- Layout plan for site, indicating safety measures, e.g. firefighting equipment, safe storage of hazardous material, first aid, security, fencing, and contingency measures in case of accidents. Industry is taking all measures emergency evacuation Plan is attached as ANNEXURE-H.
- Protection devices (ear muffs) should be provided to the workers doing job in the vicinity of high noise generating machines
- Provision of protective clothing for laborers handling hazardous materials, e.g. helmet.
- Adequate signage, lightning devices, barriers, yellow tape and persons with flags during construction to manage traffic at construction sites, haulage and access roads.

Impact on Biological Environment

Natural Vegetation

Project activities will not impose any potential impact on the area's natural vegetation and plantation.

A significant impact can be caused due to the unnecessary or excessive removal and burning of plants for fuel wood.

Nature of impact: Direct

Duration: long term

Timing: construction phase

Reversibility: irreversible

Likelihood: moderate

Consequences: Mild, as no rare plant species were present in the areas.

Impact significance: significant

Mitigation Measures:

The following mitigation measures will reduce the impact on vegetation:

- Prohibition to park vehicles on green belts/ grass;
- Unnecessary damage to vegetation is strictly avoided;
- Proponent planted trees and other species after construction phase.

Potential Environmental Enhancement Measures

The project will be installed with all precautionary measures to enhance and safe the environment. Following necessary measures will be adopted during Operational phase of the project:

- Sprinkling of water will be done on dusty roads and tracks.
- PPEs will be provided during construction & operational activity.
- Constructional waste and domestic solid waste will be disposed-off or utilized properly.
- Local people will be informed in advance when work is about to start in an area.
- Machinery will never be left unattended.
- Efforts should also be made to discuss traffic conditions so that regular traffic is not disturbed. Transporters engaged for the project would be forced to adhere to the load specifications of the access road. No overloading would be allowed in any case.
- Safety signs and boards will be placed during construction.
- Air pollution controlling devices will be installed (If required) within the project during operation.
- Machinery will be kept maintained.
- Proper SOPs will be followed with proper schedule along with the HSE conditions.
- Solid waste will be handed over to contractors and agreement will be made.
- Noise will be controlled by adopting proper measures.
- PPEs will be provided to workers during working.
- Firefighting equipment's and system will be installed.
- Safety signs will be placed at all locations where required.
- Hygienic conditions will be ensured and proper quality will be maintained by quality control testing.
- First aid facilities will be made available.

What is the problem i.e. In terms of "major environmental impacts" which may arise by the subject project activity?

The major impacts which may arise by the subject project are air, water and noise pollution. Other impacts are of minor importance. These impacts may arise during Construction & operational phase of the project so they will not cause any major harmful impacts on the environment and during the operational phase of the subject project, they may cause the issues of air, water and noise pollution if proper precautionary measures to avoid this pollution will not be taken but it will be ensured that precautionary measures will be adopted prior to start the activity, during the activity and post activity to cause minimum impacts to the environment.

When the problem will occur and when it should be addressed?

Negative impacts may arise during the constructional and operational phase of the project if proper precautionary measures and procedures will not be followed. If proper precautionary measures and procedures will be implemented, there will not be any major problem. If any impact would arise due to the subject project activity, it will be addressed on site. Trainings will be conducted on site prior to start work while other precautionary measures will also be adopted to make the project safe and environment friendly.

Where and how the problem should be addressed?

The problem should be address at the site and immediate response should be provided to address the problem which may arise. HSE team for the implementation of EMP will be responsible for addressing such problems if arise. They will assess any impact that could be arisen during both phases and they would also be responsible to address the problem and to mitigate it.

Whys of Achieving Mitigation Measures?

By changing in planning and design

By adopting proper mitigation measures, any anticipated major or minor environmental impacts could be controlled or mitigated. The details of impacts and mitigation measures have been discussed in previous chapters.

Improved monitoring and management practices:

Management shall take appropriate measures to provide pollution free and safe environment during the project activity by implementing improved management practices and monitoring techniques suggested in EMP.

Replacement, relocation and rehabilitation:

Subject project site is not the property of the government, there is no need of replacement or relocation of a single person or economic activity. Management has developed Restoration/ reclamation or tree plantation plan to restore the project area after the construction phase of the project. Maximum Plantation will be done with native species within and outside the premises of the industrial estate, along the boundary wall and road side if directed.

CHAPTER # 5
ENVIRONMENTAL MANAGEMENT AND MONITORING PROGRAM

The primary objectives of the EMMP are to:

1) Facilitate the implementation of the mitigation measures identified in the EIA.
2) Define the responsibilities of the project proponent.
3) Define a monitoring mechanism and identify monitoring parameters in order to:
    a. Ensure the complete implementation of all mitigation measures.
    b. Ensure the effectiveness of the mitigation measures.
    c. Provide a mechanism for taking timely action in the face of unanticipated environmental situations.
    d. Identify training requirements at various levels.

Institutional Capacity

The overall responsibility for compliance with the environmental management plan rests with the project proponent. He will appoint HSE/ Quality Manager of relevant qualification. HSE/ Quality Manager will act as Environmental Manager and will manage all HSE conditions at the PEQS.

A certain degree of redundancy is inevitable across all management levels, but this is in order to ensure that compliance with the environmental management plan is crosschecked.

Following functionaries will be involved in the implementation of EMP:

- Project Proponent
- HSE Officer
- In-Charge Administration
- Supervisor of project

Training Schedule

Training for the management/contractors/engineers and workers on environmental aspects of the project will be arranged during the constructional phase of the project. It will be imparted by a team of experienced trainers.

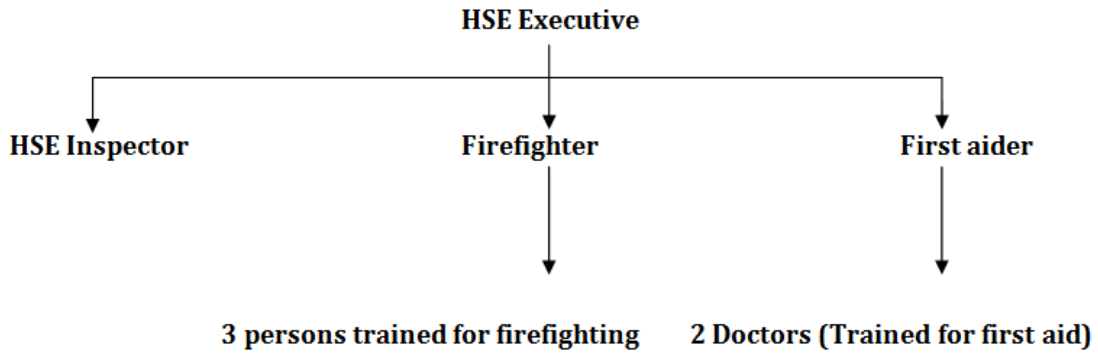


Figure 8: Institutional Capacity for the implementation of EMP

Management have an appoint HSE officer to initiation of constructional work at the project site. HSE officer is responsible for conducting the training of the labor, which will be organized either by the management of industry or by the contractor. Following schedules of training will be implemented:

Table 8: Training Program

Sr. No.	Description of program	Labor/ Personnel involved	Time/ duration
1)	General HSE Training	Trainers and whole labor	Quarterly for 1 hour
2)	Instrument use/ workplace specific items	Trainers and whole labor	Quarterly for 1 hour
3)	PPEs use and safe work practices at work site.	Trainers and whole labor	Quarterly for 1 hour
4)	Reporting and investigating accidents/ incidents	Trainers and whole labor	Quarterly for 1 hour
5)	Emergency procedures	Trainers and whole labor	Quarterly for 1 hour
6)	Medical and first aid	Trainers and whole labor	Quarterly for 1 hour

In order to raise the level of professional and managerial staff, there is a need to upgrade their knowledge in the related areas. HSE/Quality Manager should play a key role in this respect and arrange the training programs. HSE/Quality Manager will provide training to staff and workers about the best environmental management practices at the construction site and affective implementation of the EMMP. The training modules will include air, noise and water pollution monitoring, social awareness, Environmental Laws, Punjab Environmental Quality Standards (PEQS), Usage of personal protection equipments, and health and safety related issues on the construction site.

The HSE/Quality Manager will train all workers & staff in basic sanitation and health care issues (e.g., how to avoid malaria and transmission of Sexually Transmitted Infections (STI) HIV/AIDS and in general health

and safety matters, and on the specific hazards of their work). Training should also consist of basic hazard awareness, site specific hazards, safe work practices, and emergency procedures for fire, evacuation.

HSE/Quality Manager will conduct Training on monthly or quarterly basis regarding health & safety, hygiene, firefighting and first aid.

Training of Building Contractor

Training of building contractor & workers will be the part of the TORs regarding the construction of the scheme.

TORs will be including the training and submission of reports in the following area:

1) Handling of Machineries in a safe way
2) Use of PPEs
3) Maintenance of vehicles and submission of Environmental Monitoring Reports
4) Maintenance of Water Consumption records
5) Testing of water and waste water and submission of Environmental Monitoring Reports
6) Placement of safety signs/boards during construction
7) Sprinkling of water on the roads and dusty tracks
8) Monitoring of generator emissions

Training regarding all other aspects of HSE will be ensured by the contractor during the construction phase.

Summary of Impacts and their mitigation measures:

SERIAL	ENVIRONMENTAL ISSUES/ IMPACTS	MITIGATION MEASURES
PLANNING, SITE SELECTION AND DESIGN STAGE		
1	Observance of administrative and legal formalities	• It is recommended to obtain the approvals from all other relevant departments.
2	Acquisition of land	• Land is the property of the project proponent.
3	Loss of environmentally sensitive areas	• There is no sensitive area near the project site as the project is located in industrial area.
4	Changes in traffic pattern	• There is no need to change the traffic pattern due the development of the subject project because only few vehicles will visit the project on daily basis.
5	Potential conflicts with stakeholders	• There is no conflict at the current stage of the project. People of the surrounding area have no objection regarding development of the subject project. • It is recommended to Settle the issues through scoping and specific group discussions.
6	Resettlement issues	• No resettlement issues
7	Project Design	• Provision of Emergency Exits, Assembly Points, firefighting arrangements, water storage for firefighting should be incorporated in the design. • Installation of Dust/flue gases/odor controlling devices should be incorporated in the design (If required).

SITE DEVELOPMENT STAGE		
1	Generation of dust	• Careful loading and unloading of construction materials is recommended. • Sprinkling of water on construction site and surrounding areas is recommended.
2	Generation of noise	• Avoid suing forbidden horns at the site. • Do not throw heavy equipment and construction materials in haphazard manner.
3	Local flooding/ponding	• Immediate repair and maintenance of water supply pipes and sewers in case of any defect will be undertaken.
4	Outbreak of fire	• Firefighting equipment must be maintained at the site in good working condition.
5	Safety	• Safety of the workers and others must be ensured. • Privacy of the neighbors must not be disturbed.
6	Labor issues	• Employ the local labor as far as possible • Wages of the labor should be as per Government policy

CONSTRUCTION STAGE		
1	Minor erosion of land	• Restore the land by more plantations. • Sprinkling of water on dusty tracks is recommended.
2	Contamination of land and water	• Essential services like water supply, sewerage disposal and solid waste management must be in working condition.
3	Air Pollution (PM)	• Sprinkling of water on dusty tracks is recommended • Do not throw heavy equipment and construction materials in haphazard manner • Prohibit idling of vehicles • Workers on the site should be issued with dust masks during dry and windy conditions
4	Noise pollution	• Construction should be carried out only during daytime • Workers to wear ear muffs if working in noisy section
5	Traffic density	• Presence of boards directing patrons to the site • Strict adherence to traffic rules. • Provide adequate parking and driveways • Control and management of traffic through enforcement of speed limits • Provide bill boards at the site/entrance to notify motorists about the development
6	Ecological considerations (flora & fauna)	• The flora and fauna should be restored after construction by landscaping and maintaining the introduced plants
7.	Solid Waste	• Excavation waste should be re-used or backfilled. • Waste generated should be collected by a privately contracted waste collection company

		• The site should have waste receptacles with bulk storage facilities at convenient points to prevent littering • Unusable construction waste, such as damaged pipes, formwork and other construction material is handed over to the local contractor
8	First Aid	• A well-stocked first aid kit shall be maintained by qualified personnel
9.	Occupational Health and Safety	• Train workers on personal safety and how to handle equipment and machines • Report any accidents / incidences and treat and compensate affected sanitary workers • To reduce health and safety risks, effective emergency response plans will be observed during construction. • Proper personal protective equipment i.e. safety shoes, helmet, goggles, respiratory equipment and gloves shall be used at all times on site • Provide first aid kits and contact points in case of injury and accidents • From a safety and health committee to coordinate safety and health issues at workplace • Provide regular safety awareness talks and trainings

OPERATION STAGE		
1	Contamination of land and water sources	• Continuous vigilance on maintenance of services • Concreted area must be prepared to avoid leaching of oil into ground • Plantation to avoid land erosion
2.	Noise Pollution	• Maintain industry equipment. • Workers to wear ear muffs if working in noisy section. • There should not be unnecessary horning of the involved machinery • Trainings for safe driving practices & HSE trainings of the employees and workers is recommended.
3	Fire breakouts	• Training of workers regarding flammable substances will be ensured. SOPs of fire prevention will be adopted like forbidden of smoking, regular testing of electricity infrastructures and regular testing of gas supply system to the industry. • Firefighting drills carried out regularly. • Firefighting emergency response plan. • Ensure all firefighting equipment is regularly maintained, serviced and inspected. • Fire hazard signs and directions to emergency exit, route to follow and assembly point in case of any fire incidence
4	Air Emission	• All equipment, generators, and vehicles used during the project will be properly tuned and maintained in good working condition in order to minimize exhaust emissions. • Imposing speed limits and encouraging more efficient journey management will reduce the dust emissions produced by vehicular traffic. • All project vehicles will be checked regularly to ensure that engines are in sound working condition and are not

		emitting smoke.
5	Safety/security concerns	• Safety of the workers and others will be ensured. • Privacy of the neighbors will not be disturbed.
6	Malfunction of utilities	• It is proposed to appoint maintenance engineer with technicians like plumber and electrician for smooth operation of utility services.
7	Occupational Health, Safety and Environment	• Relevant safety devices like ear muffles, gloves and mask must be strictly used by the operators at the work site. • Safety of management, workers and visitors must be ensured. • Observance of construction and safety codes must be ensured. • Provision of emergency exits must be ensured. • Equipment's should be marked and tagged properly • Client is already providing health facility to its employees.
8	Ecological considerations (flora & fauna)	• The flora and fauna should be restored after construction by landscaping and maintaining the introduced plants
9	Solid Waste	• Separate waste bins will be placed for different type of wastes - plastic, paper, metal, glass, wood, and cotton. • Recyclable material will be separated at source. • Non-hazardous non-recyclable wastes will be disposed off on designated site. • No waste will be dumped at any location outside the plant boundary. • All containers of waste will be appropriately labeled. • Area for solid waste must be reserved within the subject project. • The solid waste must be managed on regular basis. • The domestic waste will be disposed-off in environment friendly way.

10	Traffic Management	• Vehicles will remain confined to defined access. • Speed limit of 10 km/h will be maintained on the section of the access road that is adjacent to the village.
10	House Keeping	• Sites shall be properly managed with a good standard of housekeeping to reduce the risks of accidental injury.
11	Energy use	• Install electricity meters and monitor them regularly to measure efficiency. • Turn Off Lights, Machines and other equipment when not in use.
12	Water consumption	• Avoid unnecessary toilet flushing • Promptly detect leaking taps and repair them • Turn off taps when not in use • Install water conserving taps that turn of immediately when water is not in use • Install a discharge water meter in the premises to check on total water use and for billing purposes
13	Electricity use	• Erect a meter in the premises to check on total kilowatts used and for billing purposes • Switch off light that are not in use • Use of energy conserving bulbs/ tubes • Use of natural light for lighting purposes • Use natural ventilation from windows and doors and avoid using Air Con that use electricity • Provide a standby generator in the premises in cases power goes out
14	Wastewater disposal	• Proper sewerage system will be design for wastewater. • Conduct inspections for sewer pipe blockages or damages and fix them • Water is disposed of having value within PEQS limits.

Equipment Maintenance Detail

The proponent of the subject project will maintain records for Health, Safety & Environment and hired HSE coordinator to check and deal with the environmental issues.

All mobile equipment is to be inspected and maintained according to the following Equipment Inspection Schedule as a minimum. Records of all inspections and maintenance are completed and maintained for review and approval.

Table 9: Machinery Details

Type of Equipment	Type of Inspection	Schedule
Cranes - Crawler, Truck, Hydraulic, etc.	Complete inspection and certification	Before put to work and annually
	Critical items, controls, overall functioning	Daily
	Safety device, hooks, cables, electrical	Monthly
	Complete inspection	Every 3 months
	Repair	When failure occurs
	Preventative maintenance	Manufacturers recommendation
Heavy Equipment	Complete inspection	Before put to work
Dozers, Backhoes	Complete inspection	Every 3 months
Compactors, Trucks	Repair	When failure occurs
	Preventative maintenance	Manufacturer recommendatio
	Operator's checklist	Daily
Miscellaneous	Complete inspection	Before put to work
Compressors, Welding Machines, Generators	Complete inspection	Every 3 months
	Repair	When failure occurs
	Preventative maintenance	Manufacturer's recommendation

Environmental Budget

The cost which is required to effectively implement the mitigation measures is important for the sustainability of the Project in operation stage of the Project. Management will allocate 10% of total cost i.e. 4,400,000 of the project as Environmental Budget for meeting the following purposes:

Table 10: Allocation of Environmental Budget

HSE training	On quarterly basis
For Emissions control	As per requirement
Maintenance and management of environment	On regular basis
Maintenance of equipment	On regular basis
Restoration	As per requirement
Plantation	During the operation phase
Availability of PPEs	During construction and operation
Strategic planning to cope with any emergency	As per policy
Formulate the disaster management plan to cope with natural disaster	As per policy

Table 13: Cost Breakup for Project

Cost Breakup for Project/Year			
Sr. No.	**Description**	**Cost Estimated (PKR)**	**Comments**
1	Land	25.5 Million Rupees	Owned by Proponent
2	Construction + Machinery + Civil Work	18.5 Million Rupees	Owned by Proponent
Total Cost =		44 Million Rupees	

Environmental Management Plan for Paint manufacturing unit by Khawaja Amjad Gull (Proprietor).

Sr. #	Aspects	Impact & Mitigations to be taken			
		Impacts	Mitigation measures Construction/Operation	Responsibility	Monitoring
Land acquisition for the proposed project					
1	Land acquired for the subject proposed project	Nil	The site proposed for the subject project is the property of the proponent.	Proponent	Environmental Consultant/ EPA PUNJAB
Land use & soil erosion					
2	Land Use & Soil	Particulate Matters (PM) pollution, Clearing of the vegetation Scarring of the landscape and aesthetic beauty. Clearing of native plants will disturb the complexity of the ecosystem of the proposed area. Dust emissions will be generated during the construction. Flue gases will be generated due to the involvement of generators and other machinery.	Measures will be taken to avoid soil erosion and dust pollution. Restoration and reclamation plan will be developed to restore the natural landscape of the area. Plant nursery, garden will be developed to rehabilitate the native plants of the area. Project proponent will make all possible efforts to limit the impact on flora and fauna. The Management has serious concern and will take measures to preserve the environment and natural aesthetic beauty of the site.	HSE Department	Environmental Consultant/ EPA PUNJAB

Ambient Air Quality					
3	Air Quality	Particulate matter and fugitive dust emissions. Dust emission due to vehicles on un-metaled roads. Dust due to Construction. Dust raised on dirty tracks by project-related vehicles. Dust emission during earthwork Gaseous emissions from the vehicles & generators Air pollution due to site visiting vehicles/ transporting trucks, hauled trucks, machinery.	Sprinkling of water is recommended on dusty roads and unpaved tracks to control the generation of dust and PM. Air emissions control devices must be installed to control the air pollution. Water the construction site periodically to minimize fugitive dust generation while laying foundation. During excavation works drop heights will be minimized to control the fall of materials reducing dust escape: Temporary cover may be provided for earthwork if necessary. Vehicle emissions inspection should be done on regular basis. Sprinkling should be done on the unpaved area to avoid dust pollution/ particulate matter. Vehicles/ trucks should be serviced regularly. All project vehicles will be checked regularly to ensure that engines are in sound working condition and are not emitting smoke.	HSE Department	Environmental Consultant/EPA PUNJAB

Noise & Vibration					
4	Noise	The major sources of the noise at site are project related machinery. High noise level cause hearing loss, deafness, high blood pressure, headache, depression and mental disturbance. Noise level will not exceed 75 dB (A) at the distance of 2 km radius, project site is located at a safe distance from the nearest human settlements. Noise from construction activities from site preparation, earth works, foundation and plant equipment installation.	Personal Protective Equipment PPEs including Ear muffs, Ear plugs and other noise abating equipment will be provided to the workers and other staff of the subject project. Proper maintenance and tuning of the vehicles should be done. Sound proof room should be built for generator (if any) to control the noise. A speed restriction of 40 km/h will be imposed on all construction vehicles. Monthly monitoring is recommended by EPA certified lab to check the compliance with PEQS as per EPA PEQS Rules 2001. Noise level monitoring was conducted at different location and results are attached as Annexure-G with the report.	HSE department	Environmental Consultant/ EPA PUNJAB

Soil Contamination					
5	Soil contamination	Contamination of soil due to oil and other chemicals leakage or spillage Soil contamination due to waste water generated from the project activities	SOPs will be developed for the storage of oil and other chemicals handling and transportations. Soil contamination must be controlled by adopting mitigation measures such as storage of oil, fuels etc. under paved area, by maintaining leakage record of construction vehicles, and by regular inspection (admitted by proponent). Waste water treatment facilities should be installed during construction and operational phases of the project to treat the wastewater. Water from the treatment facility must not be injected into the sub soil. Tarpaulin sheets should be placed under generators and other leaching substances Treated water will be used for plantation. Proper storage of oil, fuel etc. is recommended under paved area.	HSE Department	Environmental Consultant/ EPA PUNJAB

Health and safety					
6	Health and safety	Health & safety issues of workers and nearby community	Trainings of the workers is recommended for health & safety, first aid and firefighting. Proponent must provide First aid facilities to workers in case of any injury or accident. Safe drinking water must be provided to workers, staff, and poor people of the area. Water consumption records should be maintained. Provision of Proper PPEs must be ensured at workplace. Assembly point and exit points must be available at workplace. Electric wires, D.Bs must be kept covered & closed to avoid any electric hazards. Smoking or any drugs should be prohibited during working hours or performing work. Safety signs & boards will be placed at the time of construction activity. Security guards will be appointed at the construction site. At the time of construction and earthwork, fencing will be ensured for the area under the exploration. Further proper housekeeping and safety arrangements must be ensured at the subject project.	HSE Department	Environmental Consultant/ EPA

Waste Water					
7	Waste water	Minor generation of waste water from construction activity. Water Contamination due to improper storage of construction material, Water contamination due to improper debris disposal, Waste water pollution, Spread of diseases, underground water contamination	Waste water generated from the constructional activity will be used as sprinkling on the dusty tracks or for restoration of the land. Waste water monitoring is recommended on monthly basis. Waste water treatment facility is recommended. After the treatment in wastewater treatment facility, water will be disposed off in the wastewater drain present near the project site. Waste water treatment plant details are attached as Annexure-L.	HSE department	Environmental Consultant
Solid waste generation					
8	Solid Waste Generation	Land & soil contamination, aesthetic degradation, foul smell etc. Solid waste generation from the construction activity, domestic and project process sources	A solid waste management division will be formulated to deal with the proper disposal of solid waste, supervised by HSE Manager, SW Manager, and other related personnel. Constructional waste must be utilized for road filling or maintenance purposes. Project related solid waste should be handed over to contractors. It is recommended to adopt proper waste management system. Industrial ecology practice will be adopted wherever applicable and possible. 7 R's of sustainability is recommended. Solid waste	HSE Department	Environmental Consultant/ EPA PUNJAB

			Agreement is attached as Annexure-M.		
Odor					
9	Odor	There will be no source of odor from the both construction and operation of the project	Nil	NA	
Energy requirement					
10	Energy requirement	Resource depletion	Use energy efficient machinery and equipment Use energy saving products Conduct and maintain records for energy audits Do not leave the machinery in running form when there is no working being done Machinery must never be left unattended It is recommended to save and conserve the energy and adopt energy efficient technologies during the construction phase	HSE Department	Environmental Consultant/ EPA PUNJAB
Socio economic impacts					
11	Resettlement	Resettlement issues	The proposed area under the investigation is devoid-off any human settlement and it is the property of the government.	NA	NA
12	Language	Change in cultural language	Maximum employment of Local people is recommended to preserve the local cultural language. It will help in communication with the local people to	Proponent	NA

			resolve any emerging issue near the project area		
13	Education	Change in social behavior and economic gains	School and colleges exist in the area. The project proponent will initiate an educational awareness program with the coordinator of the local people.	Proponent	NGO survey
14	Health	Social performance of the individuals in the area	The project proponent will assist the local impacted community for the improvement of health services	Proponent	Proponent
15	Culture and norms of the area	Change in culture by the influx of nomadic people	Maximum local employment should be ensured to preserve the culture of the area	Proponent	NGO survey/Environmental Consultant
16	Sewage and waste disposal	Diseases caused by improper sanitation	Subject project will uplift the economic status of the nearest human settlements. Awareness program will be initiated regarding the disposal of waste.	Proponent/ local NGO	NGO survey/ Environmental Consultant

Proposed Environmental Monitoring

To oversee the environmental performance of the project through its lifecycle enforcing the PEQS an Environmental Monitoring Program should be formulated which ensures effective surveillance of the environmental parameters at various stages of the project development and compliances with PEQS and legal obligations. Monitoring for following Environmental Parameters is recommended:

Table 11: Environmental Monitoring

Sr. No.	Parameters	Monitoring Schedules	Monitoring Duration
1	Ambient Air Monitoring	Regularly	As per requirement
2	Noise Level	Regularly	As per requirement
3	Water quality	Regularly	As per requirement

CHAPTER # 6

STAKEHOLDERS AND PUBLIC CONSULTATION

The consultation process with various stakeholders of ESPAK has been carried out to involve community and other stakeholders at earlier stages. Information dissemination during public consultation is fundamental to successful conclusion of the Project. This chapter describes the objectives and details of the consultative process adopted; its outcome and the conclusions drawn thereafter.

Public consultation has been done during the planning and design phases of the Project with Government departments, line agencies, NGOs and affected persons of the Project area; concerns and suggestions thereafter have been taken into account and included where appropriate. The consultative process to date has been effective in addressing the concerns over the Project Operational impacts.

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 objectives of the stakeholder and Public consultation conducted in Project Area were;

- To apprise the Project community and stakeholders about Project interventions and potential impacts,
- To record the community concerns and recommendations regarding the project;
- To address/incorporate those recommendations in the Project design to the extent possible and;
- To share the mitigation measures with the local communities.

Consultative Aspect

The project involves stakeholders from various segments of the society, who have direct or indirect interest in the developmental activity. The Environment and Social team have endeavored to hold consultative sessions with a number of prominent stakeholders (Project Proponent, Government departments, line agencies, NGOs and affected persons of the Project Area) to evince their views on the project and their opinions, suggestions, understanding on various issues and concerns. The consultations aimed specifically at:

- Dissemination of Project information through discussions, education and liaison.
- Eliciting the comments and feedback on the 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/ EMMP.

Identification of Main Stakeholders

There are two types of stakeholders related to the project i.e. primary and secondary stakeholders. Primary stakeholders are those which are directly affected by the Project activities and secondary stakeholders are those which are affected indirectly.

The project does not have direct impacts on any individual; therefore, no primary stakeholders are identified. Secondary stakeholders are institutional stakeholders, which includes Project Proponent, local Government representatives, and Government officials of the relevant departments, NGO, general public, local residents, shop keepers, vendors, hospital owners/staff, teachers, pedestrians, and businessmen/traders of the city. The categories of the stakeholders who provided useful feedback, included:

- Project Proponent
- Government officials
- Environmental practitioners and experts
- Teachers/students
- Shopkeepers

All those stakeholders have different types of stakes according to their involvements in various aspects of the Project. The consultant tried to contact all the stakeholders and shared their views and concerns and also interacted with the community-based organizations that can support the community.

Meetings with Stakeholders

A series of consultation was carried out with stakeholders and general public in Sundar Industrial Estate and nearby areas.

The purpose of this survey was to achieve the objectives of the consultation, highlight the main issues in the implementation of the project and finally propose mitigation measures. Open and close ended questionnaire was used to collect the views concerning the assessment survey. Scoping sessions and informal group discussions were also carried out with local residents and local government representatives regarding the project. The outcome of whole consultation process was very encouraging. The following issues were discussed during Informal Meetings with local representatives:

a. Brief Description of the Project
b. Current economic condition in the area
c. Suggestions for improvement in the current industrial system and all activities related to industry
d. Perceptions about the project
e. Perceived impacts of the project

The local poor people predominantly requested for unskilled and semi-skilled jobs during implementation of the Project. On the basis of the consultations so far, it appears that the Project will have no insurmountable environmental and social impact. The community generally supported the project

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Sr. No.	Agency / Department / Stakeholder	Date	Time	Representative	Apprehensions Raised	Suggestions
1.	Environmental Experts	15-02-2022	1:50 PM	Mr. Abdul Sattar Site Inspector Environmental	• The proposed Project is a good initiative taken by Proponent; as it will provide job opportunities to the local residents. • Dust emissions due to the construction activities such as deep excavations, transportation of construction materials and use of construction machinery. • Health and safety issues may arise for local community and workers due to construction activities. • If tree cutting is involved then it should be avoided as much as possible.	• Proponent shall ensure construction of Wastewater Treatment Plant for treating effluents • Proponent shall use wet scrubbers and electrostatic precipitator (ESP) to remove fine particles, like dust and smoke, from a flowing gas to combat air pollution. • Ensure continuous sprinkling of water on daily basis in the Project area to reduce emission of dust particles. • Health and Safety Management Plan should be prepared and implemented to avoid health and safety issues occurring during construction period of the Project. • SOPs related to COVID-19 issued by Government of Punjab should be implemented during construction period to avoid outbreak of COVID-19 among workers and local community. • Solid waste produced should be properly managed and disposed of in

						identified designated areas. • Construction material should be removed as early as possible on the construction sites. • Proper barricading shall be provided along excavation sites to avoid accidents and casualties. • Community Development Programs shall be initiated by proponent to uplift social living standard of the local residents.
2.	The Responsible Authority	15-02-2022	2:45 PM	Mr. Syed Usman Ul Hassan, Assistant Director Wildlife	• The proposed Project is a good initiative taken by proponent as it will provide job opportunities to the local residents. • No Wildlife Sanctuary and game reserve falls in the study area. Therefore; there is no threat to wildlife species.	• Ensure that the staff and workers hired for construction activities shall avoid illegal hunting of wildlife species present in the study area. • Ensure continuous sprinkling of water on daily basis in the Project area to reduce emission of dust particles. • SOPs related to COVID-19 issued by Government of Punjab should be implemented during construction period to avoid outbreak of COVID-19.
3.	Other Departments	15-02-2022	3:25 PM	Mr. Sardar Javed Iftikhar, Assistant Director Fisheries	• The proposed Project is a good initiative taken by Packages Limited; as it will provide job opportunities to the local residents. • No fisheries are present in the area	• Proponent shall ensure construction of Wastewater Treatment Plant for treating effluents • SOPs related to COVID-19 issued by Government of Punjab should be

						implemented during construction period to avoid outbreak of COVID-19.
4.	Proponent Environment Management Team	15-02-2022	4:15 PM	Mr. Sadheer Ahmed Mughal,	• The proposed Project is a good initiative taken by proponent; as it will provide job opportunities to the local residents. • No reserve forest is present in and around the study area.	• Provision in Client budget for tree plantation and its maintenance cost for three (03) years, for the trees that will be planted in and around the study area, as a compensation for the trees that will be bowdlerized and as an absorbent for air pollutants due to the implementation of the proposed Project. • Sheesham and Eucalyptus shall be suggested in the tree plantation plan for plantation with three (03) rows. • Ensure continuous sprinkling of water on daily basis in the Project area to reduce emission of dust particles. • SOPs related to COVID-19 issued by Government of Punjab should be implemented during construction period to avoid outbreak of COVID-19.

Analysis of Stakeholder Consultation

Sample Size

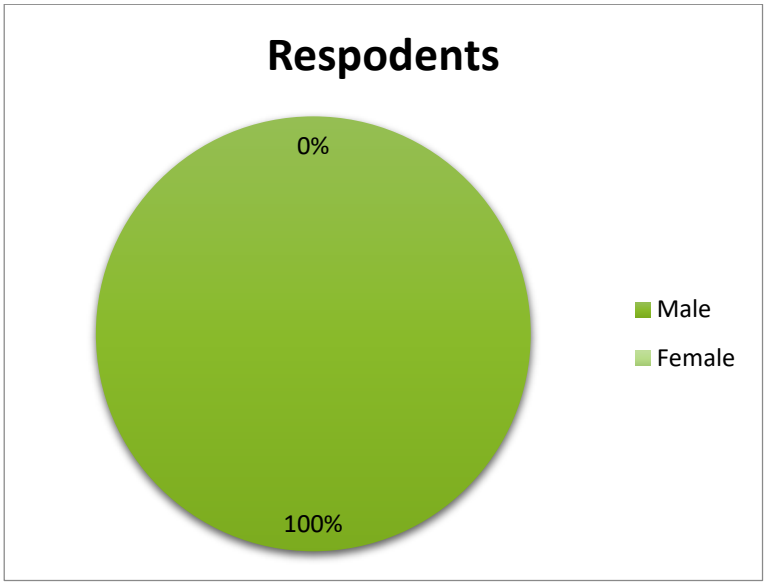
Sample size was selected by the Team of consultants for conducting the socioeconomic survey. Women were also consulted for the said survey; some of their names are mentioned in the respondents while most of them were not willing to give personal information.

Statistical Analysis

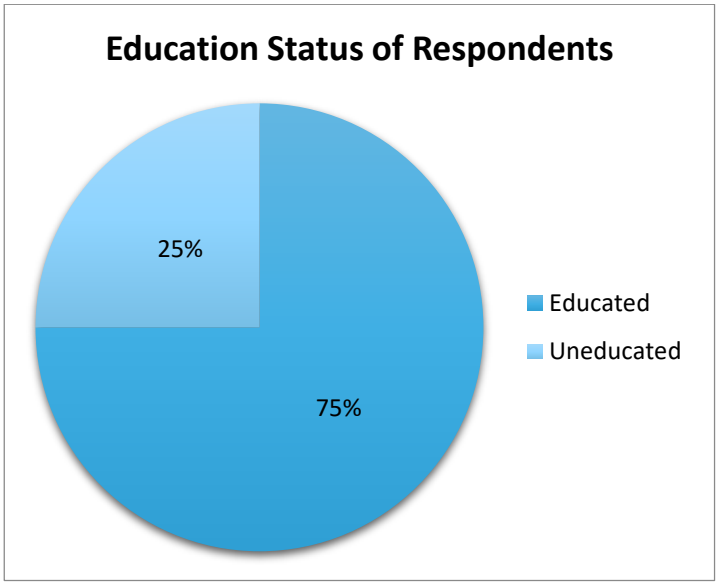
Statistical analysis of the data collected during the visit of study site villages through questionnaires.

These questionnaires (Stakeholder Survey Form with CNIC) are attached as ANNEXURE-J.

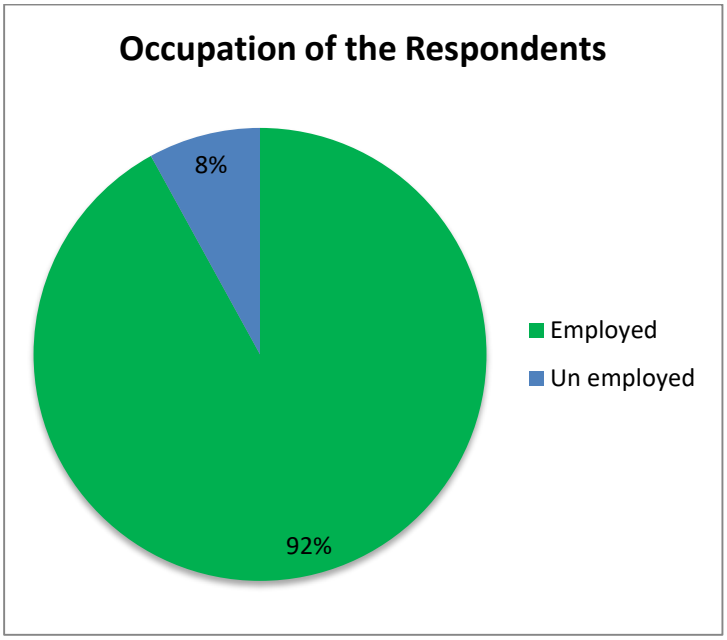
Result and Discussion



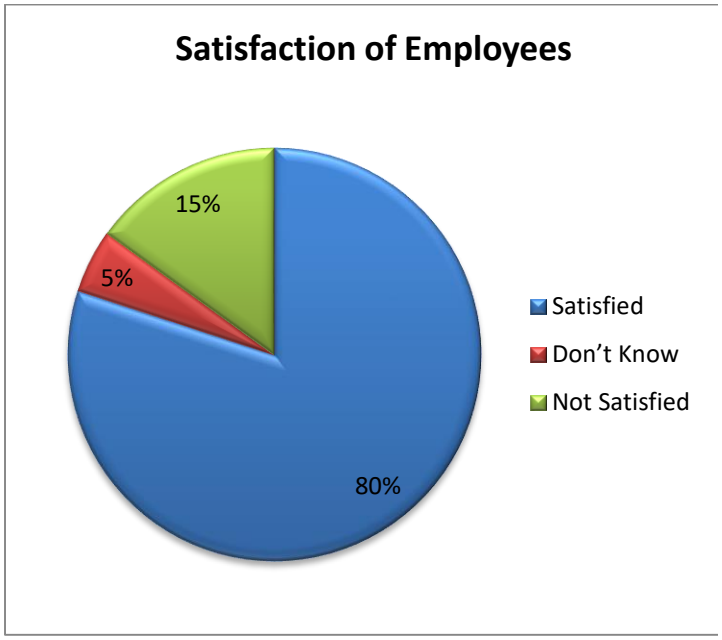
Gender Ratio of Respondents



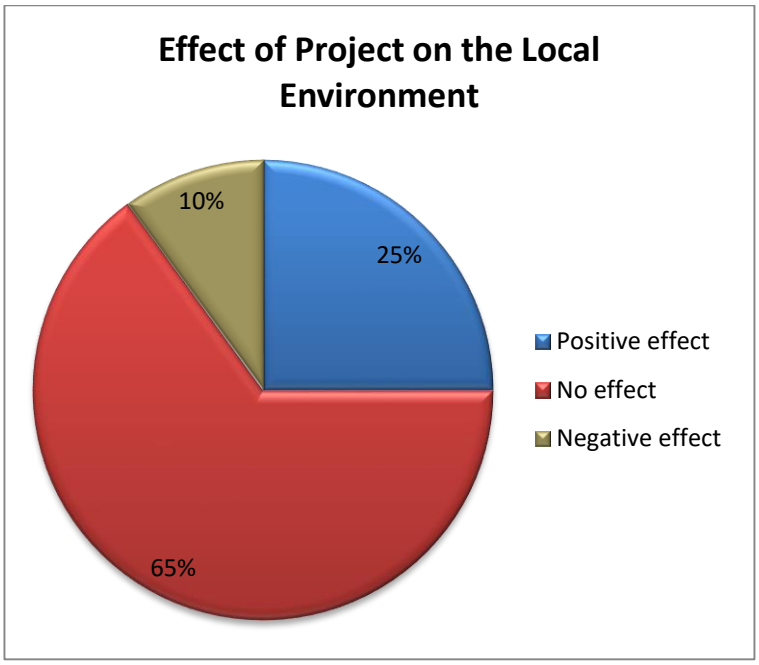
Education status of respondents



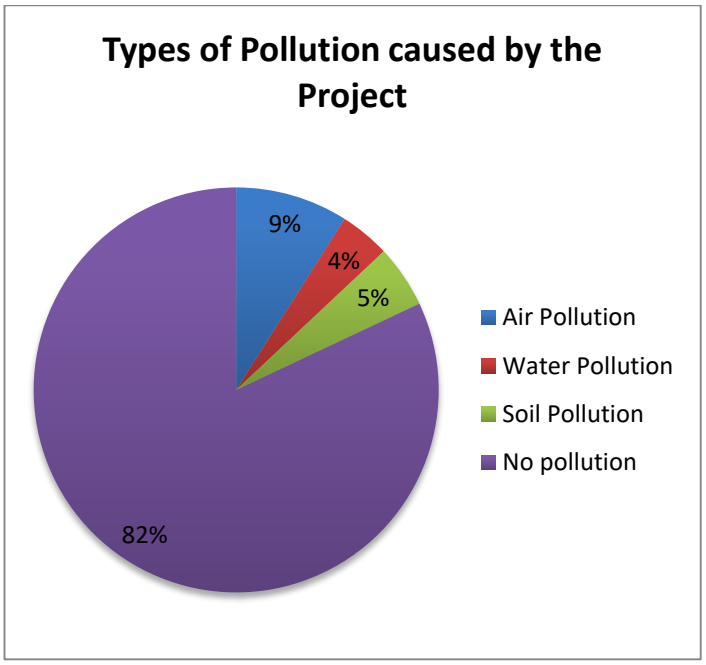
Occupation of respondents



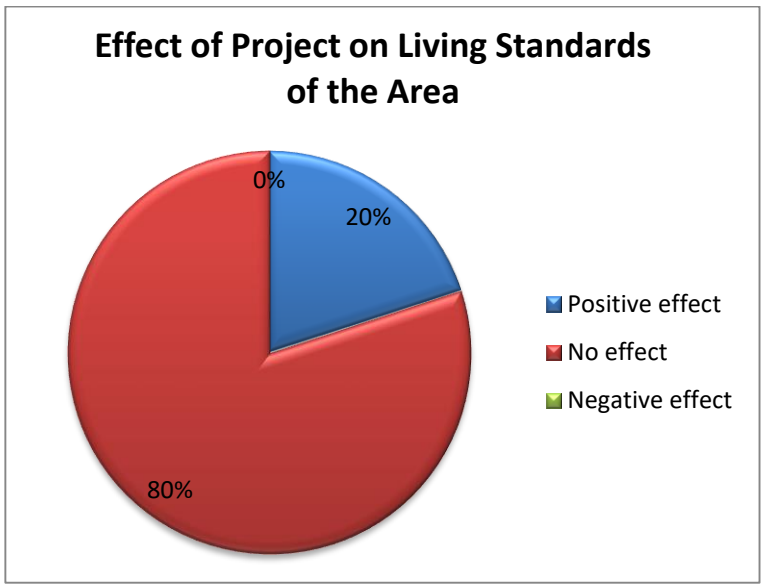
Satisfaction of respondents



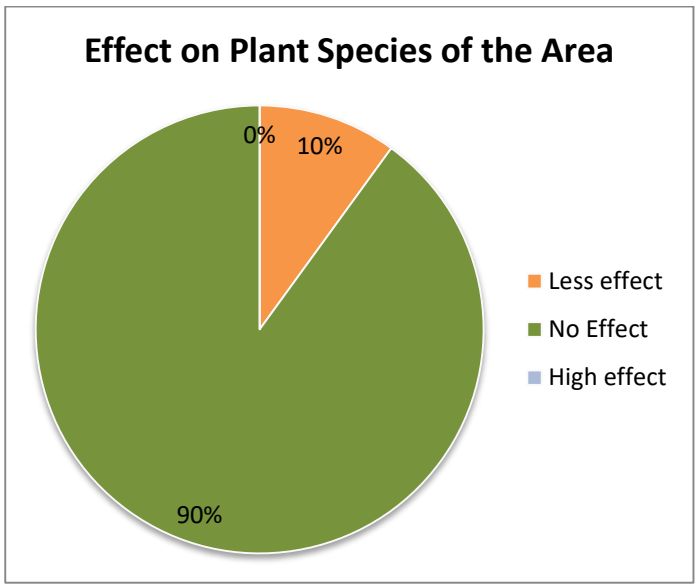
Effect of project on local environment



What type of pollution caused by project



Effect of project on the living standard of area



Effect on plant species of area

According to graphical representation, 100 percent respondents were male while the numbers of females were 0 because the project area is industrial and no female is available on that site. 75 % respondents were educated while 25% were uneducated. So, according to the survey overall education status of the area is good.

As per survey, 80% people were satisfied with the project and they gave positive remarks regarding the existing unit and project as they got job over there, their living standard raise over working there. While 5% respondents were have no opinion regarding the project and 15% respondents were not satisfied with the production unit due to their concern regarding the aesthetic degradation and no preference to local people for jobs. Majority were in favor that no effect will produce by this project.

Summary of Issues Raised by Stakeholders

A summary of the key issues raised by stakeholders and how these are being addressed by Project Proponent is provided in Table below.

Table 12: Summary of issues and commitments by Proponent

Issue	Aspect/ Concern raised by Stakeholders	Project Proponent Commitments
Employment Opportunities	Expectations of employment are very high. Job opportunities are less for herders as they generally have less skills and training.	Employment is the main priority of the industry. Mostly locally skill and unskilled labor will be prioritized and also there will be job in executive level.

		Max. persons according to the requirement will be employed by the industry.
Training Opportunities	People are keen to consult with subject industry if the Project offers training and upgrading opportunities to enhance their trade or professional skills.	Development of the Training Strategy, including commitment of allocation of budget investment for training infrastructure, delivery and design. Installation of training facilities in for worker of the company and students will also be accommodate. The internship program will offer to the students to develop professional skills.
Health & safety	Health and safety issues may be arising due to industrial and constructional activity.	All possible safety measures will be taken during operation and construction phase. Proponent has designated teams for HSE concern a.k.a. Emergency Response Teams (ERTs) and emergency equipment like fire extinguishers, spill kits, water hydrant system, effective use of PPEs and first aid are already well managed.
Local economy and business development	Local service providers are keen to participate in providing services to provide raw material and expect to receive in order to adjust their businesses to meet specific needs.	Proponent has main focus that they will all the material regarding construction to buy from the local market. This will help the local and small business and to people who are keen interested to become suppliers.
Environmental Issues	Dust and noise impacts, particularly from the construction activities and in operation of mechanically unfit machines, are of concern to nearby residents. Environmental degradation during construction.	Implementation of controls under the Environmental Management Plans, including on and off-site dust and noise monitoring. A Participatory Environmental Monitoring Program will be launched to spread awareness. Company also have certification of Environmental Management System (ISO-14001:2015).
Water quantity and quality	Water quality and quantity, and impacts from the wastewater disposal are all key concerns for nearby community.	Implementation of consultation in relation to water use, recycle and development of the Participatory Environmental Monitoring Program.

CHAPTER # 7

ANALYSIS OF ALTERNATIVES

This Chapter deals with the analytical overview of different alternatives that have been considered. The analysis has been carried out critically so as to justify the need of the Project and to select the most feasible alternative. Besides the economic viability; environmental sustainability and social soundness of the project has also been considered while analyzing different alternatives.

The No Project Alternative

A zero-alternative entail maintaining existing use to which the project site has previously been put to. This alternative would eventually evade any short-term potential negative impacts from project execution. To this end, any potential positive impacts envisaged during midterm and long-term project implementation will be missed.

Adopting zero alternatives would mean abandoning all the potential that the site offers to investor(s), contribution to government revenue and even local community livelihoods improvement.

Location Alternatives

To fulfill the industrial aspects of the project under reference of this EIA Report, it is to be sited at a place where processing activity is either already going on or there are bright prospects of the same. Concurrently, it must also meet the legal requirements of the Punjab Environmental Protection Act.

Modified Construction Technology Alternatives

The development will be constructed using modern, locally and internationally accepted technology and materials to achieve public health, safety, security and environmental aesthetic requirements. Equipment that saves energy and water will be given first priority without compromising on cost or availability factors. The concrete pillars and walls will be made using locally sourced stones, cement, sand (washed and clean), metal bars and fittings that meet the quality standards requirements.

Technology Alternatives

There is local machinery available that is environmental friendly. Final design of industry and Machinery is based on latest available technology to produce high quality. These machines have pollution remove technologies built in. Therefore, it the best option to use that technology.

CHAPTER # 8

CONCLUSION & RECOMMENDATIONS

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

Conclusion

The EIA study reveals that the project is economically viable and socially acceptable and the proponent will implement the project in the environment friendly manner. He will adopt all the necessary measures to control any impact if resulting from the project. He will provide the safe drinking water, safe working environment, proper training and first aid facility to all workers and staff. The project will generate additional jobs during construction and operation phases.

Recommendations

In view of the comprehensive screening process and findings of the present study there is no need of conducting further investigations.

- Tree plantation inside and near the project area is recommended.
- The Management of will continue to assist the local communities as a corporate social responsibility (CSR).
- Any seepage and leakage will be controlled through proper mitigation measures.
- Sound proof room should be constructed for generator to control its sound (If required).
- Use of narcotics and smoking must be prohibited during working, filling or handling of fuel.
- PPEs must be provided to workers such as gloves, masks, ear muffs /etc.
- Proper solid waste management system must be adopted.
- Safety signs, safety board's etc. must be placed on site during various developmental stages.
- Machinery will never be left in running condition.
- First Aid measures, health & safety Equipment (PPEs) will be provided to workers.
- Fire Fighting station & system will be installed.
- The management of subject project will assist the local communities as a corporate social responsibility.
- Jobs and employment will be provided to the local area.

The present EIA report is enough to meet the administrative and legal framework. After the complete study of the project, it is concluded that project will not have significant adverse impacts on the nearby community and on environment. Overall, the project will have positive impacts on the local population and country as a whole. Therefore, it is requested for the environmental approval for the subject project.

REFERENCES:

- https://www.epa.gov/sites/production/files/2015-10/documents/njmc-wpp-2.pdf
- Schedule I of Punjab Environmental Protection Act 1997 (Amended 2012)
- *section 12 of Punjab Environmental Protection Act 1997 (Amended 2012)*
- Pakistan Environmental protection act 1997
- Punjab Environmental Protection Act 1997 (Amended 2012)
- Guideline for the Environmental Assessment
- Regulations of Environmental Assessment, Regulations 2000
- National Conservation Strategy- Pakistan
- Guideline for the public consultation
- National Resettlement Policy and Ordinance
- National Environmental Quality Standards (Self-monitoring and reporting by the industry)
- Labor laws
- Canal and Drainage Act, 1873
- National Environmental Policy 2005.
- The Land Acquisition act, 1894
- The Punjab local Governmental ordinance, 2001.
- Meteorological data from meteorological department and website
- Pakistan Biosafety rules 2005
- Pakistan Environmental agency (review of IEE/EIA) regulation 2000.
- Punjab Portal (http://www.punjab.gov.pk/attock)
- Attock Chamber of Commerce Industries (http://www.acci.org.pk/Attock.html)
- Sectorial Guideline for environmental reports, industrial states
- Pakistan Environmental Protection ordinance (PEPO), 1983
- OSHAS 1800 for health and safety

GLOSSARY

Words	Dictionary
Mitigation	The action of lessening in severity or intensity
Legislation	law enacted by a legislative body
Compliance	Acting according to certain accepted standards
Flora	All the plant life in a particular region or period
Fauna	All the animal life in a particular region or period
Demarcated	Separate clearly, as if by boundaries
Screening	The display of a motion picture
Substitutions	An event in which one thing is substituted for another
Regulations	An authoritative rule
Stakeholders	A person or organization with an interest or concern in something
Vulnerable	Susceptible to attack