

# Environmental Impact Assessment (EIA) Report

## **Sufi Chemicals**

23Km, G.T Road, Muridke, District Sheikhupura



*Prepared By;*

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**CHECKLIST (EIA)****PAK EPA GUIDELINES FOR PREPARATION AND REVIEW OF ENVIRONMENTAL REPORTS, 1997**

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## **EXECUTIVE SUMMARY**

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

This Environmental Impact Assessment (EIA) Report is for the establishment of unit for Purchase, Transportation, Handling, Processing, and Sale of Used/New Alumina (Aluminum Oxide) all Over Pakistan “Sufi Chemicals”. The location of the project is 23Km, G.T Road, Muridke, District Sheikhpura. The co-ordinates of the site are 31.7766420, 74.2602330.

### **2. Name of the Proponent**

The proponent of the proposed project is Mr. Ali Haider who is Chief Executive Officer of the proposed unit.

### **3. Name of the Organization Preparing the Report**

In order to comply with IEE/EIA regulations, 2000 as per Punjab Environmental Protection Act (PEPA), 1997 (Amended in 2017), the proponent has entrusted ETAC to carry out Environmental Impact Assessment Study for the proposed project named Sufi Chemicals.

### **4. A Brief Outline of the Proposal (Type, Process, Technology and Land Requirement)**

The Proponent intends to establish an industrial unit for Purchase, Transportation, Handling, Processing, and Sale of Used/New Alumina (Aluminum Oxide) all Over Pakistan at 23Km, G.T Road, Muridke, District Sheikhpura over an area of 16 Kanal. Estimated cost of the proposed project is PKR 92 million. The capacity of the project is approximately 500 tons of purified Alumina (Aluminum Oxide) per month. Thus, the proposed Project will greatly contribute towards the industrial development in the country and national GDP.

### **5. The Major Impacts**

The development of the proposed project will have both positive and negative impacts during construction and operational phases; appropriate mitigation measures are proposed for negative impacts. Following are the major concerns and potential impacts;

- Ambient air quality can get deteriorated both during pre-construction (site clearing) and construction phases of the proposed industrial unit. The major contributing factors will

be generation, suspension and deposition of particulate matter and gaseous emission due to vehicular movement

- Noise levels can rise around the project site due to operation of machinery and equipment and transportation of construction materials etc.
- Construction waste, if not managed properly, can have negative impacts on the site and surrounding area
- Poor maintenance of vehicles, machinery and generator can cause increased noise levels as well as gaseous emissions
- The proposed project lies in industrial area so there are no plants or trees existing on the project site. Hence, no negative impact on ecological environment will take place
- Wastewater, if disposed of without any prior treatment, can cause surface and groundwater contamination
- Oil spillages from construction machinery can result into soil and water contamination
- There will always be the possibility regarding hazard to health and safety of workers to occur during construction and operational phases of the proposed project
- Local residents will be preferred for employment in the proposed unit and thus it will have a positive impact on the local economy and regional unemployment

## **6. Criteria for Impacts Characterization**

Potential environmental impacts are characterized based upon the following criteria;

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Table 0-1: Criteria for Characterization of Impacts

Sr. No.	Impacts Characteristics	Categories
1	Nature of the Impact	<b>Direct:</b> The environmental parameter is directly changed by the project.
		<b>Indirect:</b> The environmental parameter changes as a result of change in another parameter.
2	Duration of the impact	<b>Short Term:</b> Lasting only till the duration of the project such as noise from the construction activities.
		<b>Medium Term:</b> Lasting for a period of few months to a year after the project before naturally reverting to the original condition.
		<b>Long Term:</b> Lasting for a period much greater than medium term impacts before naturally reverting to the original condition.
3	Geographical location of the impact	<b>Local:</b> Within the area of project i.e. operation site and access road.
		<b>Regional:</b> Within the boundaries of the project area.
		<b>National:</b> Within the boundaries of the country.
		<b>Global:</b> Trans-boundary impacts
4	Timing	Construction and Operation
5	Likelihood of the impact	<b>High:</b> High likelihood of occurrence during lifetime of operation, Regular/continuous part of operations.
		<b>Moderate:</b> Moderate possibility of occurrence during lifetime of operation, Periodic/occasional part of operations.
		<b>Low:</b> Unlikely to occur during lifetime of operation.
6	Reversibility of the impact	<b>Reversible:</b> When a receptor resumes its pre-project condition.
		<b>Irreversible:</b> When a receptor does not or cannot resume its pre-project condition.
7	Significance of the impact	<b>Major, Moderate, Minor, Negligible and Beneficial;</b> Based on the consequence, likelihood, reversibility, geographical extent, duration, level of public concern and conformance with legislative or statutory requirements.
8	Consequence severity of impact	<b>High:</b> Serious/catastrophic damage to environment
		<b>Medium:</b> Measurable damage to the environment, potential to reduced efficiency
		<b>Low:</b> Negligible damage to the environment or no risk to business

## **7. Recommendations for Mitigation Measures**

All the potential impacts of the proposed project should be prevented through appropriate measures and if happen, they should be properly mitigated. Appropriate mitigation measures have been suggested after this EIA study and a comprehensive Environmental Management and Monitoring Plan (EMMP) has been formulated and given in this EIA study. The execution of EMP will help to reduce the adverse impacts of the proposed project. Thus, the project should be made environment friendly by implementing this Environmental Management & Monitoring Plan (EMMP) with fidelity.

## **8. Proposed Monitoring**

The environmental performance of the proposed project should be overseen through proper monitoring during its construction and operational phases. The Environmental Monitoring Plan should be enforced during the project lifecycle to ensure effective surveillance of the environmental parameters at various stages of the project development and compliances with NEQS and legal obligations. Following parameters should be monitored;

- Ambient air quality should be monitored as per EPA NEQS Rules 2001
- Monitoring for noise levels should be conducted as per EPA NEQS Rules 2001
- Monitoring for waste water & drinking water quality should be conducted as per EPA NEQS Rules 2001

The proponent shall be responsible for environmental monitoring and reporting throughout project life and assure proper implementation of mitigation measures, where needed, through adequate monitoring.

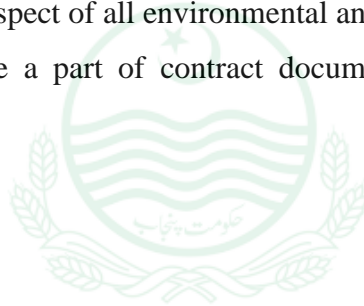
## **9. Conclusions and Recommendations**

The development of the proposed manufacturing industry in the region will not only help in availability of Alumina (aluminium Oxide) at cheaper rates but it will also contribute towards Resource Recovery. Also, industrialization generates employment opportunities, provides educational opportunities, encourages advancement and innovation, and better utilizes resources. All of these benefits and more make industrial development extremely valuable to a population and the local economy.

Apart from the beneficial impacts of the project, the proposed project can also have adverse environmental impacts during all phases. Most of the impacts during construction are of a temporary nature. These potential impacts can be avoided or mitigated by adopting suitable mitigation or remedial measures as mentioned in this EIA Report.

Following are the recommendations based upon this EIA Study:

- Proposed mitigation measures for potential environmental impacts should be implemented to avoid/ minimize those impacts
- Tree plantation plan should be followed
- Proper implementation of EMMP should be ensured during all three phases of the proposed project.
- Training programs should be arranged and all working personnel and contractors should be given appropriate training prior to construction to ensure they are aware of the on-site responsibilities in respect of all environmental and social issues.
- EMMP should be made a part of contract document of Contractor and executed properly.



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# 1. INTRODUCTION

## 1.1. Purpose of the Report

This EIA report has been prepared to conform to the requirements of the Punjab Environmental Protection Act, 1997 2012(Amended 2012) which states that;

*“No proponent of a project shall commence construction or operation unless he has filed with the Provincial Agency an initial environmental examination or where the project is likely to cause an adverse environmental effect, an environmental impact assessment, and has obtained from the Provincial Agency approval in respect thereof.”*

The proponent feels its social, moral and legal obligation to protect environment. It is in this context that he initiated the process of gaining Environmental Approval from the EPA, Government of Punjab and entrusted AAT Consulting (Pvt.) Ltd. to carry out EIA Study for this project. Accordingly, this EIA Report is being submitted for issuance of the said Environmental Approval in compliance with Section 12 of Punjab Environmental Protection Act, 1997 (Amended 2012).

This EIA report has been prepared following the format conforming to the "Guidelines for the preparation and review of Environmental Reports, October 1997" approved by the Government of Pakistan. The other relevant regulations and guidelines considered while preparing this IEE report include:

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

The EIA study ensures that environmental consequences are considered at all stages of the project. In addition, it will assist the proponent to minimize the potential adverse impacts of the project. This EIA report considers socio economic, physical, and environmental, land use, forestry, crops, water bodies, biodiversity (flora and fauna), heritage, and other relevant aspects associated with the project itself and the area around the project. The report also describes mitigation measures that shall be adopted to undo environmental impacts on any segment of the environment i.e. human health and environmental health around the project site both during

construction and operation of the project. The report provides relevant information, as required under the officially approved format, to help the decision makers (EPA, Punjab in the Present case) before issuing the desired environmental approval.

## 1.2. Identification of the Project and Proponent

The proposed project is development unit for Purchase, Transportation, Handling, Processing, and Sale of Used/New Alumina (Aluminum Oxide) all over Pakistan by the name “Sufi Chemicals to be located at 23Km, G.T Road, Muridke, District Sheikhupura .

The proponent of the proposed project is Mr. Ali Haider who is Chief Executive Officer of the proposed industrial unit.

### Contact Details

Contact No: 0302-7086764

## 1.3. Details of the Consultant

ETAC has carried out the Environmental Impact Assessment (EIA) study for the proposed project

### Contact Details

Contact No. 0324-9483913

Address: P-77, I.T Tower, Hali Road, Lahore

### Study Team

This EIA study was carried out by the qualified team of AAT Consulting comprising of environmental engineers, environmentalist, sociologists and sector experts with diversified experience of local and international assignments. The details of the project team are as follows;

Umer Mirza	Bachelors in Sociology
Mehvish Majeed	BSC. Environmental Engineering
Mudassir Abbas	BSC. Environmental Engineering
Syed Umer	Master’s in Business Administration

#### **1.4. Brief Description of Nature, Size and Location of the Project**

The proposed project is establishment of industrial unit for Purchase, Transportation, Handling, Processing, and Sale of Used/New Alumina (Aluminum Oxide) all Over Pakistan with production capacity of approximate 500 tons of Alumina (Aluminum Oxide) per month. The capital cost of the project is PKR 92 MILLION. The project will spread over an area of 16 Kanal. The project will provide employment opportunities to around 20-25 persons during construction phase and 25-30 during operational phase of the project.

The project site is located at 23Km, G.T Road, Muridke, District Sheikhupura. There are no places of historical importance such as ancient monuments, forts, sculpture, etc. or other sensitive land/area uses such as archeological sites, national parks or wildlife reserves are found in or around the project site.

#### **1.5. Study Approach & Methodology**

The study was conducted in accordance with Environmental Protection Agency (EPA), Government of Pakistan (GOP) Guidelines, 2000. The study was based upon both primary and secondary data and information. Discussions were held with stakeholders including government officials, community representatives and a wide range of local residents. The main purpose of this approach was to obtain a fair impression on the people's perceptions of the project and its environmental impacts.

Following methodology was adopted to carry out EIA study for the proposed Project:

- Meetings and discussions were held among study team to achieve a common ground of understanding regarding various concerns of the study.
- Data acquiring plan having data requirement and their sources, set time schedules and identified responsible person, was developed.
- Primary and secondary data was collected through field observations, environmental monitoring in the field, from concerned departments and published materials to establish baseline profile for physical, biological and socio-economic conditions.
- The impacts of the proposed project on the physical, biological and socio-economic environment prevailing in the project area were visualized at the design, construction and operational phases of the project.

- Adequate mitigation measures were proposed to the proponent to incorporate them beforehand in the design phase.

## 1.6. Structure of the Report

This EIA study has been accomplished following the requirements serial 2.3 of the "Guidelines for the preparation and review of Environmental Reports, October 1997".

Section 1: **Introduction** briefly presents the project background, objectives, methodology and need of the EIA study.

Section 2: **Screening:** Whether the project requires IEE or EIA as per Regulations

Section 3: **Scoping**

Section 4: **Consideration of Alternatives** presents the details of alternatives considered and reasons of their rejection

Section 5: **Policy, Legal and Administrative Framework** comprise policy guidelines, statutory obligations and roles of institutions concerning EIA study of the proposed Project.

Section 6: **Description of the Project** furnishes information about the location of the proposed Project, cost and size of the project, its major components and alternatives considered for the proposed project to select at the preferred alternative for detailed environmental assessment.

Section 7: **Description of the Environment** establishes baseline conditions for physical, biological and socio-economic conditions prevalent in the project area.

Section 8: **Impact Assessment** presents the methodologies used for assessment and identification of the impacts

Section 9: **Screening of Potential Environmental Impacts and Mitigation Measures** identifies, predicts and evaluates impacts of the project activities during the construction and operational stages and deals with the measures proposed to mitigate potential environmental impacts of the proposed project.

Section 10: **Environmental Management and Monitoring Plan** outlines institutional arrangements for the implementation of the proposed mitigation measures, training needs of the staff for implementation of the mitigation measures, monitoring requirements and monitoring cost.

Section 11: **Stakeholder Consultation** identifies the main stakeholders and their concerns rose through scoping sessions, and deals with the measures to mitigate the social impacts.

Section 12: **Conclusions and Recommendations** provide the outcome of the study and major observations of EIA and suggestions for environmental management and pollution control.



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## 2. SCREENING

The subject proposal is development of processing Unit namely Sufi Chemicals to be located at 23Km, G.T Road, Muridke, District Sheikhpura. The production capacity of the proposed unit is approximately 500 tons of Alumina (Aluminum Oxide) per month and estimated total cost is PKR 92 MILLION.

Screening was performed at the first stage of the EIA process which resulted in a key EIA decision, namely to either conduct the assessment (based on the likely significant impacts) or not conduct it (in the anticipated absence of such impacts). Screening was done as early as possible in the development of the proposal in order for the proponent and other stakeholders to be aware of possible EIA obligations.

The standardized approach i.e. defined in applicable regulations was applied. The proposed project was assessed based upon a set of criteria determined by Environmental Protection Department (EPD) i.e. Review of IEE/EIA Regulations, 2000 provided by Government of Pakistan, Ministry of Environment, Local Government and Rural Development were considered for the purpose of screening mainly. Accordingly, the project falls under the category of Resource Recovery Unit of the IEE / EIA Regulations 2022, made under section 12 of Punjab Environment Protection Act 1997 (Amended 2012) under which the Environmental Impact Assessment (EIA) study is mandatory for getting Environmental Approval. The Director General, EPA Punjab is the authority to issue the requisite Environmental Approval after proper review of the project.

Moreover, following factors were also considered at the earlier stage;

- Magnitude of change in environmental conditions
- Diversity of new features with the existing environment
- Potential for trans-boundary or over large area impact
- Number of people effected
- Likelihood of effecting receptors of other types (fauna and flora, businesses, facilities) be affected?
- Probability of affecting valuable or scarce features or resources
- Risk of breached environmental standards
- Risk of affected protected sites, areas, features

- High/low probability of the effect occurring
- Long/short duration of effect
- Either effect is permanent or temporary
- Is the impact continuous rather than intermittent
- If it is intermittent will it be frequent rather than rare
- Reversibility of impacts
- The likelihoods to avoid, or reduce or repair or compensate for the effect

After detailed analysis on the basis of these factors; the proposed project was found suitable for Environmental Impact Assessment (EIA) Study rather than Initial Environmental Examination (IEE) Study.



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### 3. SCOPING

Scoping is the process of identifying the key environmental issues and is perhaps the most important step in an EIA. It occurred early in the project cycle at the same time as outline planning and pre-feasibility studies. Several groups, particularly decision makers, the local population and the scientific community contributed in helping deliberate the issues which should be considered, and scoping is designed to canvass their views. At this stage the option exists for cancelling or drastically revising the project; equally it may be the end of the EIA process if the impacts be found to be insignificant. Once this stage has passed, the opportunity for major changes to the project is restricted.

Scoping for this particular proposal was carried out with two main objectives;

- i. To pinpoint the problems early allowing mitigating design changes to be made before expensive detailed work is carried out.
- ii. To ensure that detailed prediction work is carried out for important issues. So that after identifying the key issues, a full scale EIA is considered and it incorporates terms of reference for further studies.

#### 3.1. Methodology

Before the scoping exercise can be fully started, the remit of the study was defined and agreed by the relevant parties depending on the institutional structure. At a minimum, those who contributed to determining the remit included those who decide whether a policy or project is implemented, those carrying out the EIA (AAT Consulting (Pvt.) Ltd.) and those carrying out parallel engineering studies relating to the proposal. Following is the step-wise methodology adopted for the scoping of subject proposal.

- ✓ The key interest groups, both governmental and non-governmental, were identified – they include EPA, FIEDMC, surrounding community and workers & management of adjacent industries
- ✓ Since, the people who can be effected by the project need to hear about it as soon as possible; so, scoping session was held inviting the representatives from identified groups and briefing them about the proposal while establishing good lines of communication. Their concerns are discussed in the coming sections.

- ✓ The main EIA techniques used in scoping were baseline studies, checklists and matrices. These techniques collected and presented knowledge and information in a straightforward way so that logical decisions can be made about which impacts are most significant.
- ✓ The concerns of the stakeholders were listened to and noted down. If possible, negative ones were resolved at the spot whereas others area incorporated in the EIA study and decisions are made accordingly.

### 3.2. Spatial and Temporal Boundaries of Environmental Assessment

Temporal and spatial boundaries for the effects assessment are defined by the characteristics of the project and the Valued Environmental and Cultural Components (VECC) being assessed. These boundaries encompass time periods and areas during and within which the VECCs are likely to interact with or be influenced by the project.

Spatial boundaries vary according to the nature of the VECC but generally are defined in terms of:

- A local study area (LSA), where project effects can be predicted with a reasonable degree of accuracy and confidence and impacts are likely to be most concentrated – most of the subject project impacts are local e.g. air emissions, increased noise levels, wastewater and solid waste management etc.
- A regional study area (RSA) where, depending on conditions (e.g., seasonal conditions, habitat use, more intermittent and dispersed project activities) – subject proposal does not impose any regional impacts

Following table represents the characterization of potential impacts of subject proposal based upon the spatial boundaries;

Table 3-1: Characterization of potential impacts based upon the spatial boundaries

Sr. No.	Potential Impacts	Spatial Boundaries	
		LSA	RSA
1	Air Quality	✓	✓ (if beyond limits)
2	Increased noise levels	✓	
3	Groundwater degradation	✓	
4	Surface water deterioration	✓	

5	Soil quality	✓	
6	Working personnel's Health & Safety	✓	
7	Lowering of groundwater table		✓
8	Flora & fauna	✓	✓

Temporal boundaries for project-related effects are defined in terms of the project phases:

- **Baseline** – covers ecological, physical and human-related characteristics of the environment, prior to the initiation of the construction phase;
- **Construction** – includes all activities associated with project construction and before commencement of operational phase such as:
  - Infrastructure development;
  - mobilization of equipment and supplies to the site by road and air;
  - Construction of site facilities including camp, infrastructure, stockpile, waste rock storage dump, water management facilities (diversions, settling ponds, seepage collectors) etc.
- **Camp operations** and personnel transport during construction;
- **Operations** – includes ongoing industrial processing, effluent disposal, waste management, noise levels, transport of raw materials, end products and personnel;
- **Decommissioning** – includes all activities to decommission industry and remove equipment and materials from the site, re-contour the site and restore drainage patterns to stable long-term conditions, and implement the final site reclamation procedures to prevent erosion and restore vegetation cover where feasible;
- **Closure** – refers to conditions that will exist on the site after the site is abandoned and re-vegetation is complete.

Temporal boundaries are also defined for the cumulative effects assessment, spanning baseline to a point in the future, within which project effects on VECCs are predicted to overlap with effects of other projects or activities.

### 3.3. Issues and Concerns Raised during Consultation

The representatives from FIEDMC, EPA, surrounding industries and community attended the scoping session. They were briefed about the objective of session, the proposal and its type, applicable regulations and potential environmental and socioeconomic impacts that can be anticipated. Following is a list of concerns raised during the session;

What are checks and balances that exist to make sure mitigation is implemented correctly and how will follow-up happen?

- Will the locals be preferred for every sort of employment – skilled or un-skilled?
- How health & safety of workers will be ensured throughout the construction and operational phase?
- What arrangements will be made for firefighting?
- How water will be conserved?
- How process solid waste and wastewater will be disposed of to not harm the environment?
- How noise levels will not be let increased?

All of these issues were sorted out during the session and recommendations are incorporated in the EIA study. However, most of the concerns were positive as the proposed industry is believed to provide employment to a lot of local people thus contributing to national GDP. Also, it will bring industrial development in the country at the time when it is already trying to cope up with economic challenges.

### 3.4. Significant Impacts and Factors to be Determined

Substantial impacts that can be caused by the establishment of subject unit were identified and discussed with the key stakeholders. Recommendations for appropriate mitigation measures were also exchanged to be incorporated well in EIA study. Following is a summary of the determined impacts and recommended mitigations for them.

Impact	Mitigation Measure
Owing to construction activities; generation, suspension and deposition of particulate matter, dust, SO <sub>2</sub> , NO <sub>x</sub> and CO emissions can cause health issues to workers	Spray by water trucks to minimize the dust. Maintenance of construction machinery shall be made mandatory. Haul-trucks carrying earth, sand, aggregate and other materials will be kept covered with tarpaulin to reduce dust pollution.
Noise generated during construction and installation of construction machinery can cause interference with speech, hearing impairment, and sleep disturbance	Engines of vehicles visiting project site will be kept properly tuned-up. Temporary noise barriers will be installed. The green zone of plants will also help reduce sound levels.
There will always be the possibility regarding hazard to health and safety of	To handle emergency medical situation, first aid facilities will be made readily available at the site and the

Impact	Mitigation Measure
workers to occur during construction phase	contractor will ensure availability of transport to handle any emergency condition. Safety equipment such as belts, gloves, masks and helmet will be provided to working personnel and wearing them will be made mandatory for them. Also, Health & Safety trainings will be conducted time to time.
The construction phase of the project will produce solid waste; disposal of which if not managed properly can have negative impacts on the site and surrounding area	A site waste management plan will be made the responsibility of the contractor. The Construction and Demolition (C & D) waste will be properly segregated to encourage recycling of useful waste materials. The involved stakeholders will be trained about the importance and means of waste management and its proper handling.
Lack of proper disposal system of solid waste may lead to different disease	Arrangements will be made for regular garbage collection and removal from the construction site.
Ground water quality can be contaminated when the pollutants, such as diesel and oil, paint, solvents, cleaners and other harmful chemicals, on construction sites soak into the groundwater	Effective management will be ensured during construction activities and any sort of accidental spillage will be avoided.
No negative impact on ecological environment will take place on account of cutting of trees in the project area and clearing of vegetation from the site.	Currently there is no flora and fauna are present a project site. Landscaping is deemed to be a powerful mitigation activity with a positive impact. Trees and ornamental plants will be planted along the project boundary to increase the aesthetic value of the site and combat pollution.
A number of categories of employees will be required during the construction phase which will have positive impact on the local economy and regional unemployment	Socially responsible attitude of the project management towards local people and resources will make project people friendly. Awareness and educational program introduced in the area by project management will reduce the fear among the people regarding non-local people.
There will be slight increase in traffic due to transportation of raw material and final product. As a result, concentrations of emissions of flue gases will increase. Also, diesel fired generator may cause emissions.	Proper maintenance and tuning of the vehicles will be done by proponent. Proposed Site is in load shedding free zone area, so, generator only use to handle emergency condition. Generators will be maintained well in time to avoid emission of black smoke. Plantation will be done along the boundary walls will help protecting the environment.
The movement of transportation vehicles and running of generator can cause slight increase in noise levels.	The machinery to be used in the plant is noise-free. However, the vehicles and generator will be kept well-

Impact	Mitigation Measure
Operation of machinery e.g. cutting, and welding of sheets will cause noise emission.	maintained and Strict rules will be made by the project administration to control speeds of vehicles. Use of Personal Protective Equipment's will be used to reduce the noise impact on surrounding environment.
There will always be the possibility regarding hazard to health and safety of workers to occur during operational phase of the project.	The workers working near operating machines or high noise zone will be made sure to wear personal protection equipment. Irrelevant workers and visitors shall also be directed to wear personal protective equipment. Noise absorbing paint will be used on indoor walls to minimize its impacts on outer environment. To handle emergency medical situation, first aid facilities will be made readily available at the site and the contractor will ensure availability of transport to handle any emergency condition.
The improperly managed solid waste may impact the factory surrounding aesthetically, occupationally as well as from health, safety and environment point of view.	BIE approved vendors shall collect the solid waste on daily basis. Domestic waste will be handle properly by industrial management.
The wastewater of the proposed unit, if disposed of without any treatment, can cause water pollution and soil contamination if seeped through.	The major usage of water during operational phase is for the domestic use only. There is not any water used in during the process. So, there is no wastewater generated during the process. The domestic wastewater produced will be disposed to internal drain after treated by septic tank.
Operational phase impacts are likely to be restricted to maintenance activities within the Site such as vegetation clearing through brush cutting from the internal road network.	The process of plantation should be kept sustainable throughout project life. Proponent ensure the plantation around the project vicinity and in surrounding of project site.
A number of employees will be required in operational phase and it will have a positive impact on the local economy and regional unemployment.	The management of the project can capitalize positive attitude of people of study area towards this project by offering them maximum employment opportunities. Measurements and steps should be taken to keep undisturbed the privacy of adjoining workplaces.

Following is the criteria adopted for determining significance of the potential impacts such as acceptability and mitigation measures requirement in relation to Ecological importance, Social importance, and Environmental standards;

Table 3-2: Criteria for Significance of Impacts

Categories	Impact	Characteristics
Nature	Direct (D)	The environmental parameters are directly affected by the project construction or operation.
	Indirect (ID)	The environmental factor changes as a result of alteration in another parameter.
Duration of Impact	Short Term (ST)	The impacts that last only during the construction of the Impact proposed Project e.g., noise from the construction activities.
	Medium Term (MT)	Lasting for a period of few months to a year; the project before naturally returning to the original condition such as loss of vegetation due to clearing of campsite, contamination of soil or water by fuels or oil.
	Long Term (LT)	Lasting for period much greater than medium term impact before naturally reverting to the original condition such as loss of soil due to erosion.
Geographical Extent	-	The geographical extent may be local or regional.
Project Phases	-	Pre-construction Phases (designing), Construction Phases, Operational Phases
Reversibility of Impact	Temporary (T)	The impacts that don't cross ecosystem threshold value of resilience.
	Permanent (P)	The impacts that exceed ecosystem threshold value of resilience.
Likelihood of the Impact	Likely (L)	Impact will probably occur under most circumstances.
	Unlikely (UL)	Impact could occur at some time
	Possibly (P)	Impact may possibly occur at some time
	Rare (R)	Impact may occur but only under exceptional circumstances.
Impact Consequence Severity	Major (M)	When an activity causes irreversible damage to a unique Environmental feature; causes a decline in abundance or change in distribution over more than one generation of an entire population of species of flora or fauna; has long-term effects (period of years) on socio-economic activities of significance or regional level.
	Moderate (Mo)	When an activity causes long-term (period of years), reversible damage to a unique environmental feature; causes reversible damage or change in abundance or distribution over one generation of a population of flora or fauna; has short-term effects (period of months) on socio-economic activities of significance on regional level.
		When an activity causes short-term reversible damage to

Minor (Mi)	an environmental feature; slight reversible damage to a few species of flora or fauna within a population over a short period; has short term effects on socio- economic activities of local significance.
Negligible (N)	When no measurable damage to physical, socio-economic, or biological environment above the existing level of public concern; and conformance with legislative of statutory requirements.

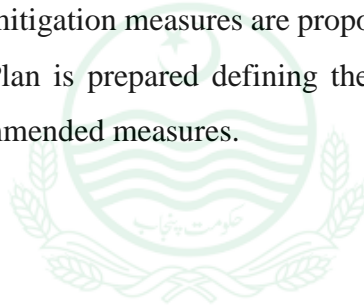
Following table represents the significance of determined impacts based upon above given criterion;

**Table 3-3: Significance of the Potential Impacts**

Category	Impact Significance	Potential Impacts						
		Air Quality Deterioration	Increased Noise Levels	Lowering of Groundwater Table	Surface water Degradation	Soil Quality	Health & Safety	Flora & Fauna
Nature	Direct (D)	✓	✓			✓	✓	✓
	Indirect (ID)			✓	✓			✓
Duration of Impact	Short Term (ST)		✓				✓	
	Medium Term (MT)	✓				✓		✓
	Long Term (LT)			✓	✓			
Geographical Extent Project Phases	Local	✓	✓			✓	✓	✓
	Regional			✓	✓			
Reversibility of Impact	Temporary (T)	✓	✓		✓	✓	✓	✓
	Permanent (P)			✓				
Likelihood of the	Likely (L)	✓					✓	

<b>Impact</b>	Unlikely (UL)							
	Possibly (P)		✓					✓
	Rare (R)			✓	✓	✓		
<b>Impact Consequence Severity</b>	Major (M)							
	Moderate (Mo)		✓				✓	
	Minor (Mi)	✓		✓				✓
	Negligible (N)				✓	✓		

Based upon this identification; mitigation measures are proposed in EIA study. Environmental Management and Monitoring Plan is prepared defining the monitoring program as well to effectively implement the recommended measures.



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## 4. CONSIDERATION OF ALTERNATIVES

This section covers the project alternatives considered for establishment of the proposed industrial unit. An analysis of the available alternatives is necessary to establish that the most suitable management and technology options are adopted for the project, while minimizing environmental impacts. This evaluation explains the selection of the most feasible alternative in terms of economics, environment and health & safety. In particular, it outlines the following options that were considered for this project;

### 4.1. Site alternatives, their Selection and Rejection Criteria

Selection of the site for the proposed industrial plant was governed by many considerations, both the economic analysis of the estimated costs as well as judgment as to the modifying effects of other factors which are more the matter of judgment rather than mathematical calculations, and have considerable effect on the smooth working of the business unit.

The sites were considered for the establishment of proposed unit in and around the Sheikhpura as it has become an industrial hub of the country. In the light of general discussion of the factors influencing the industrial location; the sites were evaluated based upon the following criteria;

- **Land:** Suitability, adequacy, and comparable cost of the sites to install the plant and to expand it whenever feasible.
- **Labor:** Availability and affordable wage rates – taking cost to benefit analysis into consideration – of the skilled, semi-skilled, un-skilled person is required.
- **Transportation:** Regular and sufficient transportation facilities for delivery of materials, dispatch of finished products and for the use of the employees.
- **Market:** Size of the local market and the cost of transporting to central markets vis-a-vis the extent of demand.
- **Auxiliary Facilities:** Character of community regarding taxes, legal regulations, public up lift services, financial facilities, educational opportunities, etc.

In the light of this criteria; it was found most feasible to establish the proposed unit at the current site – owing to the availability of all the facilities under one roof and minimized hassle of management. The decision was made based upon the following merits;

## **Roads and other Basic Infrastructure**

Basic infrastructures such as roads, water, electricity, telephone, internet etc. are available in the area. The project site is well connected to the rest of the country by a network of roads and railway lines for transportation of raw materials and final product at cheaper cost.

## **Availability of Manpower**

Technical, skilled and unskilled labor is required for construction and operation of the proposed unit. All categories of the labor required for the subject project are available conveniently and plentifully at affordable cost at the present site. This factor also supports the selection of present site for establishment of the unit.

## **Environment**

The proposed project is located at 23Km, G.T Road, Muridke, District Sheikhpura. Environmental considerations are extremely important for project sitting. Baseline Environmental Study was carried out in and around the project site to develop an idea about the physical and biological receptors of the area. Settings around the project area do not show any sensitivity of environment.

There is no worth mentioning forestry, biodiversity, fishery, flora, fauna and heritage that can get affected due to proposed project. Also, the project site is situated in the area where population centers are away from the project site. These factor also supported selection of the present site.

- Proposed project is located at 23Km, G.T Road, Muridke, District Sheikhpura
- World class industrial infrastructure and safe & secure work environment is available here

Some of the contributing key features of selecting the site for proposed project;

- Uninterrupted supply of gas, water, and electricity
- Solid-Waste Management System to eradicate hazardous waste
- Water Treatment Plant to ensure the supply of clean water
- One-window service center, emergency services, and centralized security systems to further ensure the security and the needs of employees and employers
- Public transport for convenience and accessibility
- Commercial areas with warehouses and dry ports

- Banks, post offices, petrol pumps, and expo centers to facilitate industries and businesses
- Labor colonies and skill development centers to facilitate employees and job hunters
- Restaurants and hospitals within the vicinity

The project will be regulated according to Punjab Environmental Protection Act 1997 (Amended 2012) and in compliance with the National Environmental Quality Standards (NEQS). Even Environmental Management Plan (EMP) and Environmental Monitoring Plan (EMP) will be operational. Taking into consideration all the above described factors, the selected site is most suited for development of the proposed project.

#### **4.2. Design/Technology Alternatives, their Selection and Rejection Criteria**

The subject unit prevents landfilling of waste material and promotes Material Recovery which is the need of the hour. The process to be used in the unit to convert impure Alumina (Aluminum Oxide) into useful pure Alumina (Aluminum Oxide) involves heating to burn out the impurities and addition of additives to increase its purity. The process is the simplest in its own.

Such machinery will be used that produces fewer waste to ensure more efficient production processes.

#### **4.3. Environmental Alternatives, their Selection and Rejection Criteria**

Every development project causes alteration in the existing environment inevitably that can be positive as well as negative. The 'no-go' alternative, also referred as the 'no-action' alternative or 'zero-alternative', can be a consideration in this case. It assumes that the activity does not go ahead, implying a continuation of the current situation or the status quo. It is basically a consideration of the original and undisturbed environment without any development. This option is considered to ensure that all possibilities have been taken into consideration before deciding on a final course of action and also to provide a baseline situation against which the other suggested alternatives can be measured.

For that reason; establishment of the proposed unit will greatly contribute towards the availability of good quality Alumina locally; whereas, its absence can deprive certain other developers and local and commercial suppliers of the opportunity to benefit from industry. Also, this industry will have minimal impacts on the environment. What is more, Pakistan is a developing country with a major portion of its economy dependent on developmental projects which contributes towards the country's GDP greatly.

#### **4.4. Economic Alternatives, their Selection and Rejection Criteria**

Economic alternatives were considered taking into consideration the capital and operational costs for the proposed unit. Land cost, infrastructure cost and machinery cost were taken into account as the deciding economic factor.

Also, state of the art machinery will be employed considering it as one-time investment and thus minimizing the maintenance cost during the operational phase. Additionally, it will contribute towards uninterrupted production during operational phase.



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## **5. POLICY, LEGISLATION, LEGAL & ADMINISTRATIVE FRAMEWORK**

### **5.1. General**

This section deals with the current policy as well as legal and administrative framework related to carrying out impact assessment study of various projects. A number of laws exist in Pakistan, containing a number of clauses concerning protection of the environment. Like other Projects, this project is also required to go through an Environmental Assessment for getting a NOC under Section 12 of the Punjab Environmental Protection Act – 1997 (Amended 2012).

According to environmental laws of the country development projects have to undergo the process of Environmental Impact Assessment (EIA) or Initial Environmental Examination (IEE) in order to predict and mitigate the impacts of the development at an early stage. Based on nature, size, cost and associated impacts, the project under consideration has been categorized for EIA study according to the regulation 3 of Statutory Notification issued on June 13, 2000 (S.R.O.339 (1) /2001).

The project is the establishment of a Purchase, Transportation, Handling, Processing, and Sale of Used/New Alumina (Aluminum Oxide) all Over Pakistan processing Unit with the name Sufi Chemicals falls under schedule II (List of projects requiring an EIA), Category Resource Recovery Units of the IEE / EIA Regulations 2000, made under section 12 of Punjab Environment Protection Act 1997 (Amended 2012) under which the Environmental Impact Assessment (EIA) study is mandatory for getting Environmental Approval. The Director General, EPA Punjab is the authority to issue the requisite Environmental Approval after proper review of the project. The Director General, EPA Punjab is the authority to issue the requisite Environmental Approval after proper review of the project.

### **5.2. Existing Administrative Framework**

This EIA study has been carried out in the light of the policy guidelines for the preparation of IEE/EIA Reports under the procedure and practices formulated by the Provincial Environmental Protection Agency (EPA).

#### **5.2.1. Environmental Protection Department (EPD), Punjab**

The Government of Punjab promulgated “Punjab Environmental Protection (Amendment) Act 2012. Two organizations, the Punjab Environmental Protection Council (PEPC) and the

Environmental Protection Agency (EPA), Punjab are primarily responsible for administering the provisions of the Act. The council oversees the functioning of the EPA. Its members include representatives of the government, industry, non-governmental organizations and the private sector. The Punjab EPA is required to ensure compliance with the Punjab Environmental Quality Standards (PEQS) and establish monitoring and evaluation systems. As the primary implementing agency in the hierarchy, it is responsible for identifying the need for, as well as initiating legislation whenever necessary. One of the functions of the EPA/EPD is the review and approval of environmental assessment reports of projects undertaken in its jurisdiction.

The proponent shall be responsible for providing the complete environmental documentation required by EPA, Punjab and remain committed to the approved project design. No deviation is permitted during the project implementation without the prior and explicit permission of the EPA, Punjab.

### **5.2.2. Procedure for EIA Approval**

This section describes the procedures required for obtaining NOCs for EIA from concerned authorities. The following general stages have to be followed in the application and approval process for obtaining an “Environmental Approval” for the Sufi Chemicals

- Classification of the Project;
- Submission of EIA; and
- Issuance of NOC

The proposed project requires an EIA in accordance with Schedule-II of PEPA-1997. According to the TOR/ Scope of Work of the Sufi Chemicals ; Consultants are required to prepare the EIA and assist Proponent in obtaining NOC from Punjab EPA. Detailed process for obtaining NOC according to PEPA-1997 (Amended, 2012) is shown below as figure: 2-1.

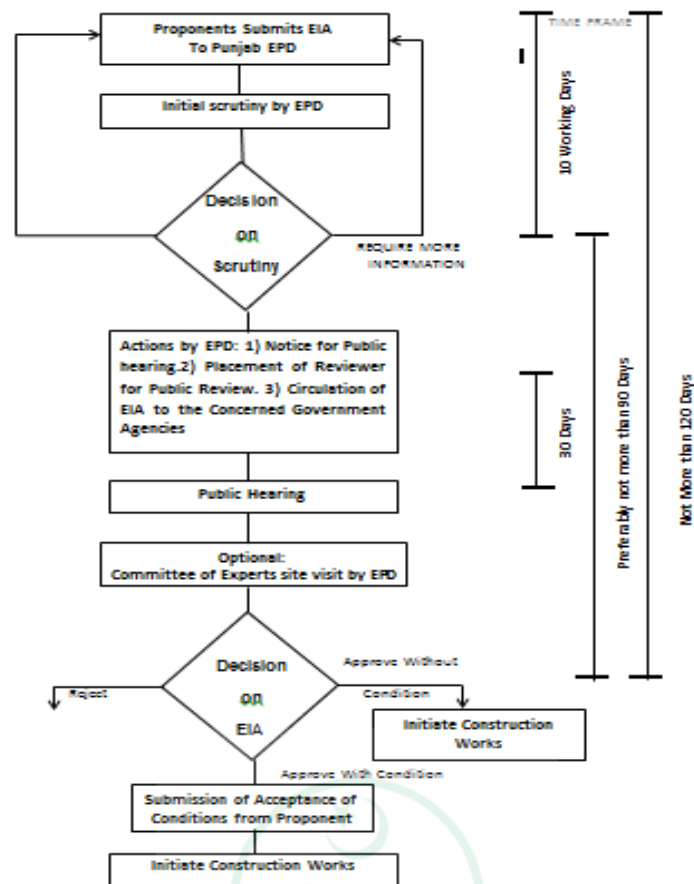


Figure 5-1: Flowchart for EIA Approval Process

### 5.3. Relevant Legal / Institutional Framework

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

#### 5.3.1. National Conservation Strategy, 1992

On March 1, 1992, the Cabinet of Pakistan approved the National Conservation Strategy. It describes the stark reality of the country's deteriorating resource base and its implications for what is still largely a natural resource-based economy. It sets forth the beginnings of a plan to integrate environmental concerns into virtually every aspect of Pakistani economic life. The strategy has three overriding objectives: conservation of natural resources, sustainable development, and improved efficiency in the use and management of resources.

#### 5.3.2. PEPO, 1983 and PEPA, 1997 (Amended 2012)

In 1983, the Government of Pakistan issued an Environmental Protection Ordinance (EPO), which was replaced by the Pakistan Environmental Protection Act (PEPA) 1997, through an

Act of Parliament. Now the PEPA 1997 has been replaced by Punjab Environmental Protection Act 1997 (Amended 2012) on 18<sup>th</sup> April 2012. Under Sec. 8 of Environment Protection Ordinance (EPO) 1983, it was necessary to carry out EIA/IEE for all development projects, but there were no IEE /IEE regulations under that ordinance.

Under section 12 of the Punjab Environmental Protection Act, 1997 (Amended 2012) it is mandatory to take an Environmental Approval Environmental Protection Agency for commencement of any construction of project.

### **5.3.3. National Environmental Policy 2005**

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

### **5.3.4. Review of IEE and IEE Regulations, 2000**

The GOP has issued Review of Initial Environmental Examination and Environmental Impact Assessment Regulations 2000, to review the Initial Environmental Examination (IEE)/Environmental Impact Assessment (EIA) Reports.

### **5.3.5. Guidelines for the Preparation and Review of Environmental Reports, 1997**

The GOP has also framed guidelines for the preparation and review of IEE/EIA of projects in various developmental sectors.

### **5.3.6. National Environmental Quality Standards (NEQS)**

According to Punjab Environmental Protection Act, 1997 (Amended 2012), National Environmental Quality Standards (NEQS) were established for municipal and industrial effluents and air emissions.

### **5.3.7. Guidelines for Sensitive and Critical Areas**

GOP has issued Guidelines for Sensitive and Critical Areas in October 1997. The objective of the guideline is to provide guidance to project proponents and other stakeholders in the environmental assessment process, so that the projects are planned and sited in way that protects the values of sensitive and critical areas.

### **5.3.8. Policy and procedures for the Filing, Review and Approval of Environmental Assessments, November-1997**

Environmental Assessment is the Primary means of managing the approval of new development proposals in Pakistan. Environmental Assessment allows for the systematic examination of proposals, clear procedures which provide for the interests of relevant Government Departments and other stakeholders to carefully consider.

### **5.3.9. Guidelines for Public Consultation, Pakistan Environmental Protection Agency October 1997**

This guideline is part of a package of regulations and guidelines which include:

- Punjab Environmental Protection Act, 1997 (Amended 2012)
- Policy and Procedures for filing, review and approval of environmental assessments
- Guidelines for the preparation and review of Environmental Reports
- Guidelines for sensitive and critical areas
- National Environmental Quality Standards (NEQS)
- Detailed sectorial guidelines

### **5.3.10. Punjab Wildlife Protection Act, 1974**

This act was framed in 1974 by the Province Punjab and is about of protection and conservation of Wildlife.

### **5.3.11. Forest Act, 1927**

This act was framed in 1927. The Forest Act, 1927 is still the basic charter for the forest departments in Pakistan. This law empowers provincial governments to manage forest areas.

### **5.3.12. Explosive Act, 1884**

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

### **5.3.13. Punjab Local Government Ordinance, 2001**

Schedules 4 and 8 of this Ordinance pertain to environmental pollution. Under the Ordinance, the local councils are authorized to restrict projects causing pollution to air, water or land. They may also initiate schemes for improving the environment.

### **5.3.14. Pakistan Penal Code, 1860**

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

**Sec 268:** Public Nuisance

**Sec 269:** Negligent act likely to spread infection of disease dangerous to life:

**Sec 270:** Malignant act likely to spread infection of disease dangerous to life:

**Sec 278:** Making atmosphere noxious to health:

**Sec 284:** Negligent conduct with respect to poisonous substance:

**Sec. 290:** Punishment for public nuisance in cases not otherwise provided for:

**Sec. 291:** Continuance of nuisance after injunction to discontinue

### **5.3.15. Punjab Land Use Rules 2009**

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

### **5.3.16. Antiquities Act 1975**

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

### **5.3.17. Solid Waste Management Rules 2005**

The Solid Waste Management Department, CDGF has notified these rules for proper waste management.

### 5.3.18. Labor Laws

The labor laws apply on child labor and measuring instruments.

### 5.3.19. Safety & Civil Defense Laws

The civil defense laws provide details about safety, fire protection and civil defense.

### 5.3.20. Guidelines for Critical and Sensitive Area

These guidelines have been prepared under section 12 of Punjab Environmental **Protection Act 1997 (Amended 2012)** for protection and safety of critical and sensitive localities.



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## **6. DESCRIPTION OF THE PROJECT**

### **6.1. Objectives of the Project**

The overall objective of the proposed project is establishment of industrial unit for Purchase, Transportation, Handling, Processing, and Sale of Used/New Alumina (Aluminum Oxide) all Over Pakistan namely Sufi Chemicals. Development of the project is envisaged having the following objectives;

- ✓ To establish an industrial unit for Purchase, Transportation, Handling, Processing, and Sale of Used/New Alumina (Aluminum Oxide) all Over Pakistan
- ✓ To contribute towards resource recovery
- ✓ To contribute towards industrial development in the country and national GDP
- ✓ To provide employment opportunities to laborers and semi-skilled staff
- ✓ To upgrade the socio-economic conditions of the area

### **6.2. Location and Site Layout of the Project**

The project site is located at 23Km, G.T Road, Muridke, District Sheikhpura developed and managed by Sheikhpura Industrial Estate Development & Management Company (FIEDMC). The building layout plan and site layout plan are provided in the document file submitted with the report.

### **6.3. Land Use on Site**

The project site is available for industrial development. So, there exists no vegetation. The site is no use currently, it is vacant.

### **6.4. Vegetation Features of the Site**

The project site lies in industrial area and is available for industrial development. The site is no use currently, it is vacant.

### **6.5. Road Access**

The G.T road will be used for transportation.

### **6.6. Cost and Magnitude of Operation**

The project will spread over an area of 16 Kanal. The production capacity of the proposed industrial unit is approximately 500 tons of Alumina (Aluminum Oxide) per month. As a result

of the project, around 20-25 persons will get jobs during construction phase and around 25-30 persons will be engaged during production phase of the project. The total cost of the project is PKR 92 MILLION.

## **6.7. Schedule of Implementation (Tentative)**

The various phases involved in the implementation of the project at different levels are given below:

### **Preliminary Phase**

The project is to be established over an area of 16 Kanal. 23Km, G.T Road, Muridke, District Sheikhpura has been allotted for the industry by FIEDMC. The land has been acquired on rental basis.

### **Design Phase**

During this phase, the proponent hired the services of an Architect Engineering Firm to design the complete structural designs for the building of proposed industry. It took almost 2 months to complete. A copy of the design in the form of layout plan is attached in the document file provided with the report.

### **Legal Phase**

In order to comply with Pakistan Environmental Protection Act, 1997 (amended 2012) and get electricity connection from FIEDMC; the proponent had to obtain No Objection Certificate (NOC) from Environmental Protection Agency (EPA). The proponent hired the services of AAT Consulting for this. This Environmental Impact Assessment (EIA) Study is carried out and report is submitted in this regard.

### **Construction Phase**

After getting NOC from EPA, proper construction work will be started. The NOC is expected to be issued till July, 2026 and thus construction activities will be started soon after that.

### **Machinery Purchasing, Transportation & Installation Phase**

The machinery to be employed in the proposed industrial unit is both local and imported. The vendors will be contacted and agreements will be made for machinery purchasing after developing infrastructure. All legal work will also be done to import the machinery. The machinery will be transported to the project site through access roads and installation will be

done. The safety equipment shall also be installed as per layout plan. Also, the power supply system will be done.

This whole process will take almost next 6 months and can be expected to get completed by October 2026.

### **Commissioning Phase**

After machinery installation, commissioning phase will start. During this phase, all machinery and associated sections will be operated on trial basis. The machinery and operational procedures will be evaluated for the purpose of quality and efficiency assurance before entering into regular project operations. This phase will take about 1 week to complete.

### **Wrap-up Phase**

This phase will be started side-by-side the Commissioning phase. During this phase, all the required steps shall be taken to get regulatory approvals and licensing from the related bodies. At the end of wrap up stage, the project will be available for commercial purposes. Thereafter, EPA shall be approached for obtaining NOC for regular operations of the industry.

### **Operational Phase**

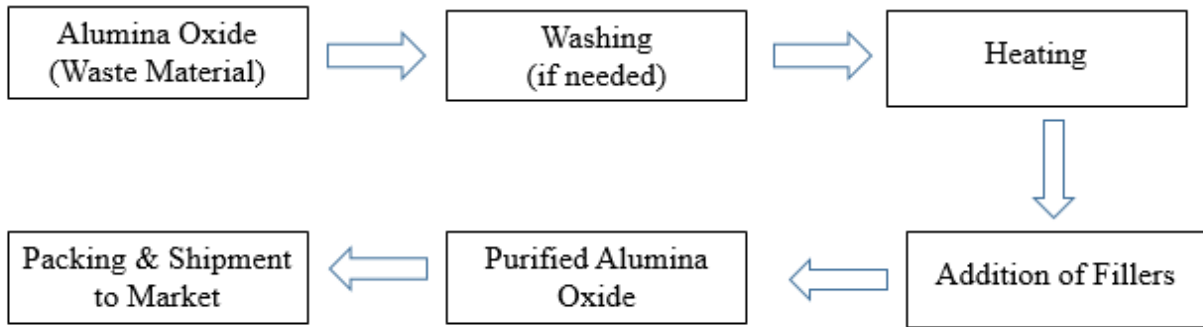
After completing wrap-up & commissioning phases and getting NOC for operational phase of the project from EPA; the operational phase of the project will be started. Processing of Alumina will be started out. This phase will continue throughout the project life with modifications and enhancements as per requirement.

## **6.8. Description of the project**

The proposed project is establishment an industrial unit for Purchase, Transportation, Handling, Processing, and Sale of Used/New Alumina (Aluminum Oxide) all Over Pakistan namely Sufi Chemicals. Approximately 500 tons of Alumina (Aluminum Oxide) per day are to be produced per year to meet the growing market demand of them. Total cost of the project is estimated to be PKR 92 MILLION.

### **6.8.1. Manufacturing Process**

Wasted Alumina (Aluminum Oxide) (used previously as catalyst) from water filter plants mostly having left with 50% impurity is purchased from the industrial units and brought to the subject unit. It is washed, if needed. Then heated in the kiln at temperature of about 1400°C. All the impurities get burned. After that the fillers are added to increase its purity up to 95%.



Then the purified Alumina (Aluminum Oxide) is supplied to Ceramic industries and paint industries.

The detailed production process is shown in the following process flow diagram;

### 6.8.2. Details of Final Product

The final products in the proposed project will be Purified Alumina (Aluminum Oxide).

### 6.8.3. Transportation Details

The end products are to be transported to local market through trucks.

## 6.9. Manpower

**Figure 2: Process Flow Diagram**

The working personnel required for construction of the proposed unit is 20-25. Staff required during operational phase is about 25-30 persons.

### 6.10. Plantation Plan

No trees are to be cut or vegetation to be removed for project development. However, proponent will ensure proper landscaping after completion of construction of the project; flowering plants and grass will be planted inside / outside the premises of the project for beautification purpose. A plantation plan will be developed and implemented during

construction as well as operation phases of the project. Approximately 500-1000 plants will be planted in and around the project vicinity on area especially of indigenous species in consultation with District Officer (Environment) & Management of FIEDMC during every plantation season to enhance the landscape beauty and make the ambient air quality better. These plants will include ornamental plants as well. The funds allocated to the plantation is about PKR 100,000/- and is included in the environmental budget.

### **6.11. Fire Fighting Plan**

Fire hazards can erupt during operational phase of the project. There will be proper arrangements for firefighting events. CO<sub>2</sub> fire extinguishers will be installed inside the workshop/assembling unit to cope up with firefighting events. In addition to fire extinguishers, fire safety alarms, smoke detectors etc. will also be installed in the industry. The firefighting system with detection and alarms, as NFPA (National Fire Protection Association) Standards will be provided in the areas including Parking area, Offices, Workshop, Kitchen, Main Building, Production hall and along boundary wall. In addition to the these areas; portable fire-fighting equipment will also be located at places in the building where there is any possibility of fire hazard and that too in accordance with NFPA Standards.

### **6.12. Restoration and Rehabilitation Plans**

At the end of the life of the project, adequate repair and maintenance of the machinery will be done. Attached basic infrastructure will be updated. New machinery will be installed and old one will be recycled/ reused, when and where required – for the project to run successfully during its new lifetime.

All activities will be carried out in accordance with prevailing environmental management laws and controls so as to avoid any damage to any segment of environment or human health around the project site. Rehabilitation would not be required as such at current project site, however, restoration plans to be practiced during different phases of the project at various levels are illustrated hereunder:

#### **Pre-construction Phase**

The proponent of the project either will take necessary measures himself or shall pay charges to the concerned line departments regarding the restoration of the relevant areas disturbed during clearing of the site and its preparation prior to the construction of building parts and development of infrastructure.

## Construction Phase

The project proponent shall keep eye on the construction operations while the FIEDMC management, through its authorized officer, will exercise continuous vigilance and inspection any time during execution of work or any time after completion. Only approved structural designs shall be erected. Also, at the completion of building, the owner will intimate to the FIEDMC accordingly for the issuance of certificate regarding completion.

### 6.13. Government approvals

The project site is located in Sheikhpura Industrial Estate. Accordingly, applicable approvals have been obtained are provided in the document file submitted with EIA Report.

Furthermore, Environmental Approval in the form of No Objection Certificate (NOC) is required from Environmental Protection Agency (EPA), Punjab as it is mandatory before the start of construction of the unit in compliance of Section 12 of the Punjab Environmental Protection Act 1997, (amended 2012); this EIA report is submitted in this regard.



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## 7. DESCRIPTION OF THE ENVIRONMENT

### 7.1. General

An environmental baseline study is intended to establish a data base against which potential impacts can be predicted and managed subsequently. The EIA of the proposed project covers a comprehensive description of the project area, including regional resources which are expected to be affected by the project, as well as, those which are not expected to be directly affected by the construction and operation of the project.

A site visit was conducted to survey the field area for collection of relevant data. Interviews were conducted with the general public and stakeholders of the project area in order to seek the public opinion on the implementation of the proposed project. Various Governmental and Non-Governmental Organizations (NGOs) were also visited for the collection of relevant data and their views on the proposed project were recorded for incorporation into the EIA report. The environmental impacts of any activity or process will be assessed on the basis of deviation from baseline or normal situation. The following components form part of the environmental baseline:

- Physical Environment
- Ecological Environment
- Socioeconomic Environment

### 7.2. Baseline Physical Environment

#### 7.2.1. Physical features around the project area

The project lies in district Sheikhpura - the third-most-populous city in Pakistan and second largest in the eastern province of Punjab. It has become industrial hub of the country Sheikhpura is located 30 kilometers from Lahore.

#### 7.2.2. Demographic profile of Sheikhpura

The demographical profile of Sheikhpura shows that the total area of the district is 5856 square kilometers. The division with respect to gender and urbanization is given below;

According to census report of 2017, total population of District Sheikhpura is 78, 73,910 out of which males are 40, 34, 515; females are 38, 38,854 and She-male / transgender are 541 in numbers. Average annual growth rate is 1.97 from 1998 to 2017 (District Census Report, 2017).

Based on geography, topography and geology, the project area is briefly described below:

### 7.2.3. Geography, Topography and Geology

On the basis of geography, topography and geology, the project area is briefly described below:

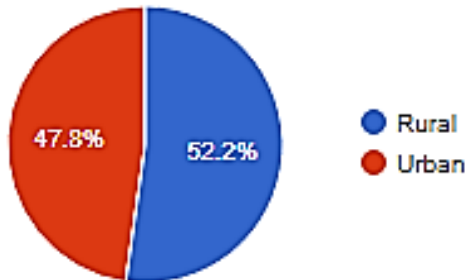


Figure 7-1 Sheikhupura Population Division by Urbanization

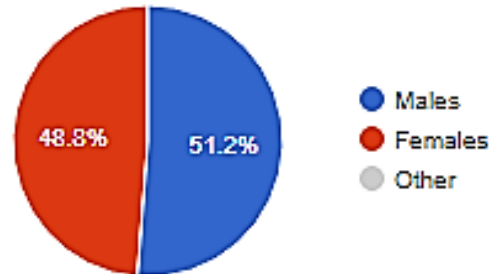


Figure 4-7-2: Sheikhupura Population Division by Gender

- The city of Sheikhupura with latitude 31°-24' N and longitude 73°-05'E, at an elevation 605 feet above sea level. It lies on the Western side of Lahore (the Provincial Capital of Punjab). Hafizabad lies in the North, Sheikhupura in northeast, Okara in East and Sahiwal lies toward south-east of Sheikhupura. It is situated in the middle of the lower part of the Doab with the Chenab River flowing at a distance of about 32.0 Kilometers (20 miles) to its west and the Ravi River at a distance of about 138.0 kilometers (86 miles) to its East. The Sheikhupura Urban area covers nearly 90.65 square kilometers (35 square Miles). The city is linked with major urban centers by Roads, Rail and Airway 46.
- Sheikhupura city is situated in the center of the lower Rachana Doab, the area between Chenab and Ravi rivers, which has a mild slope from North-East to South-West with an average of about 0.2 to 0.3 meter drop per kilometer (about 1 to 1.5 feet per mile). The city is situated at an elevation of about 183.35 meters or 612 feet above the Sea level. The topography is however marked by valleys, local depression and relatively high ground 47.
- The city is located on the "Bar Upland" which is relatively older alluvium deposit as found in the central part of the Doad. Because of its elevation above the bordering flood plains, the upland is generally beyond the reach of flood spills, which is the significant physiographic feature of the alluvial plan. Like other Punjab plains, the alluvium is quaternary and has been deposited on semi consolidated tertiary rocks or on a basement of metamorphic and igneous rocks of Precambrian age. It originates from the mountain ranges of the north and has been deposited by the present and ancestral streams. The deposition is predominantly fluviatilo sediments. The town is the part of river Indus plains therefore the land is composed of an

alluvial soil mixed with sand. On the whole, the area is flat. Its fertility is through extensive canal irrigation system.

#### **7.2.4. Tehsils and administrative towns**

Since 2005, Sheikhupura was re-organized as a City-District, and composes of eight Tehsil Municipal Administrations (TMA) (or towns), as follows;

- Sheikhupura
- Madina Town
- Jinnah Town
- Iqbal Town
- Chak Jhumra Town
- Jaranwala Town
- Samundri Town
- Tandlianwala Town

#### **7.2.5. Seismic Zone**

Pakistan lies on an active seismic belt of earth. Seismic observations indicate that hundreds of shocks originate every year. Mostly, these seismic waves are of low intensity and do not have significant effect. According to seismic zones of UN- Habitat the project area falls under Zone 2A. The seismic zoning is shown in the figure 4-3.

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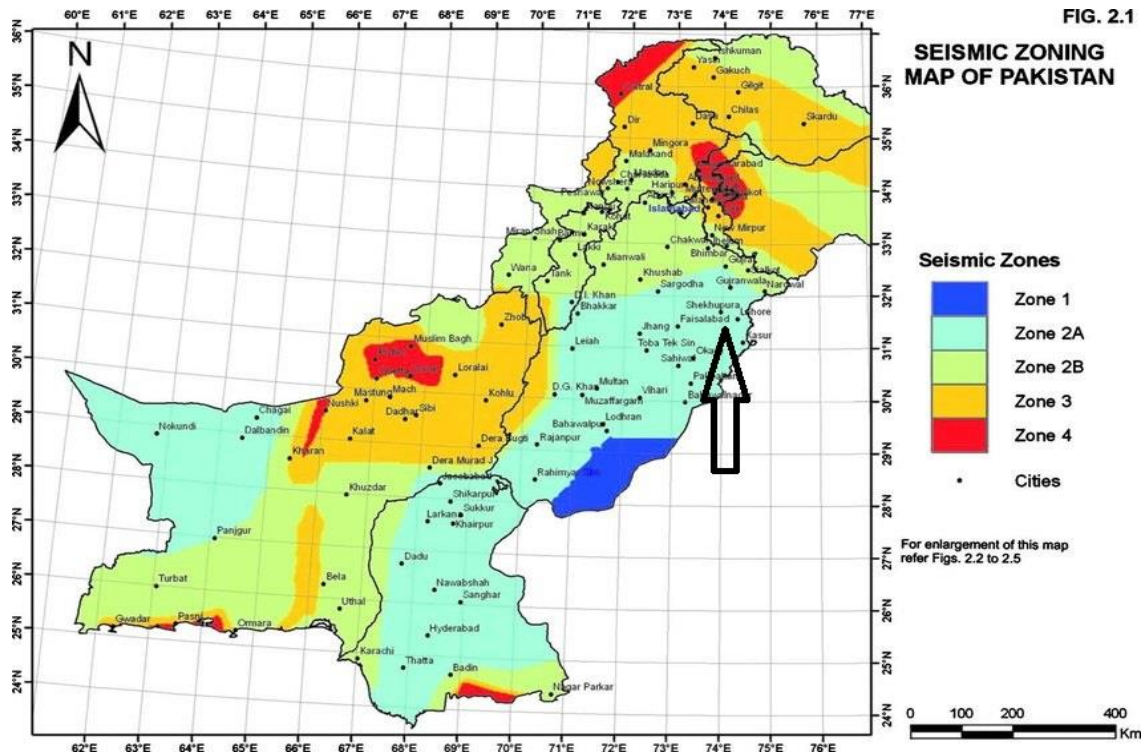
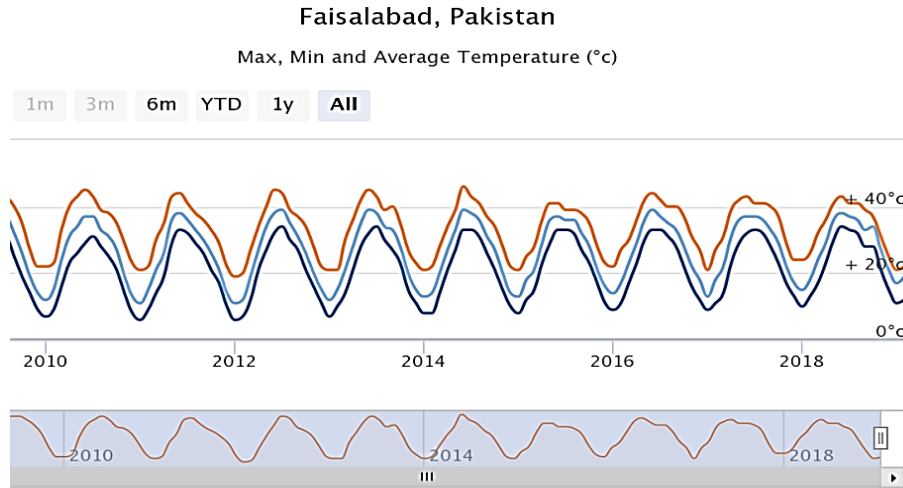


Figure 7-3: Seismic Zone Map

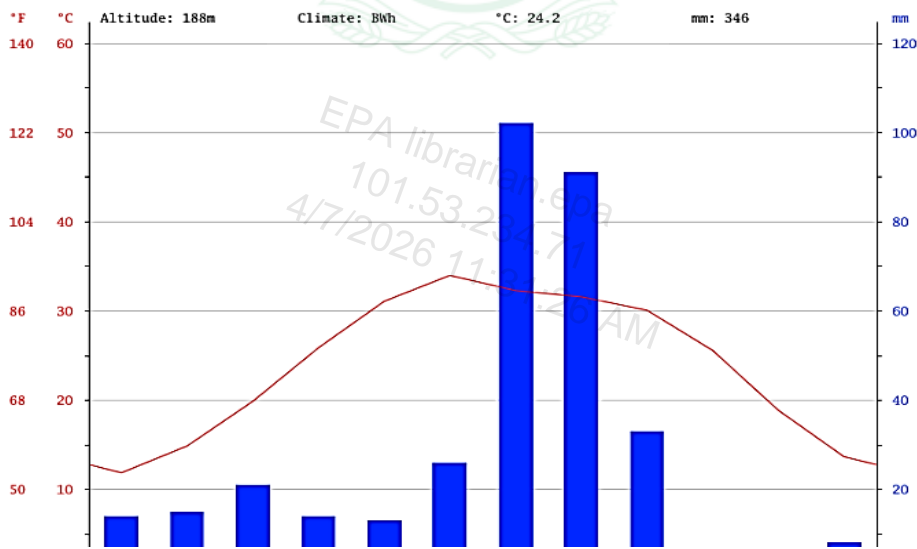
### 7.2.6. Meteorology and Climate

**Temperature:** The project area is semi-arid and characterized by large seasonal variations of temperature. The summer season lasts from April to September with an average temperature of 31.25°C (88.25°F). The extreme maximum and minimum temperature in Summer being 48.0°C (118.4°F) and 9.0°C (48.5°F) respectively. During the winter months, the daytime temperature generally ranges between 19.4°C (67.02°F) to 33.9°C (93.02°F) and night temperatures are generally in the range of 4.8°C (40.64°F) to 17.7°C (63.96°F). Extreme minimum temperature sometimes reaches to -2°C (28.4°F). The Western disturbances frequently affect the weather in the cold season also. It generally begins to be active from mid-December and has a tendency to concentrate over this region. In the fold of these disturbances sometimes well marked cold fronts are formed.



**Figure 7-4: Yearly Variation in Temperature of Sheikhupura**

Summer starts early in Sheikhupura, in April, and lasts until October. Average daily highs in April are 33°C but by June the average high is 41°C - and that's an average, don't forget, meaning that it can be much hotter than that. In contrast to the scorching intensity of summer, winters in Sheikhupura can be harsh. Temperatures start to fall rapidly from November, and by January the average daily high is only 11°C. With an average of 34.0 °C, June is the warmest month. January is the coldest month, with temperatures averaging 11.9 °C.



**Figure 7-5: Monthly Variation in Temperature of Sheikhupura**

**Rainfall:** Rainfall also varies markedly and it's predictably is not certain from year to year. A wet year may be followed by a dry year. Rainfall in the regions mainly occurs in July and August when the monsoon depression travels westward. Precipitation has marked seasonal

fluctuation. The average annual rainfall based on the 32 years observation is 384.683 mm (15.145 inches), almost all of which occurs in the two months of July and August<sup>2</sup>. 50.

The climate in Sheikhpura is called a desert climate. In Sheikhpura, there is virtually no rainfall during the year. The climate here is classified as BWh by the Köppen-Geiger system. In a year, the average rainfall is 346 mm.

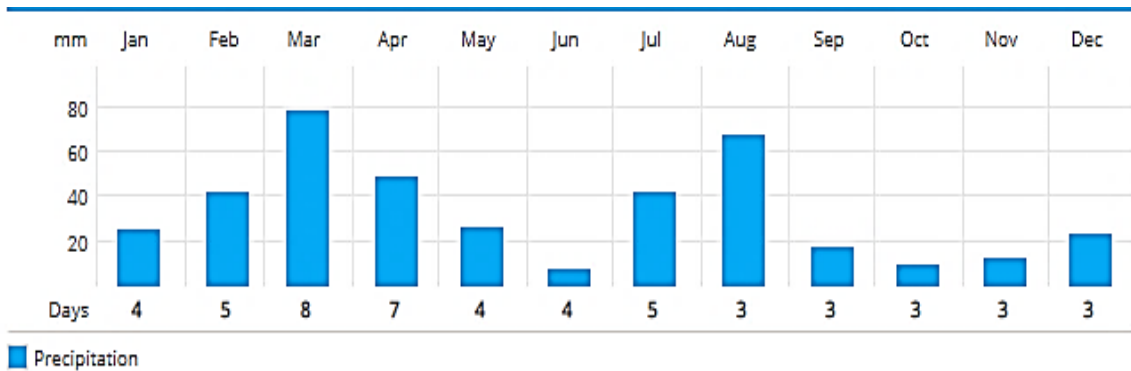


Figure 7-6: Mean Monthly Precipitation

**Humidity:** July, August and September are the most humid months in the area, whereas May and June are the least humid months. Average monthly relative humidity values at various locations in the project area are 55% (EPD, Punjab November 2008). The relative humidity in project region varies from 19 to 70 %. The highest humidity in the area was recorded 70 %, which was in the month of August 2010. The humidity data from 2009 to 2013 is summarized in the following Figure.

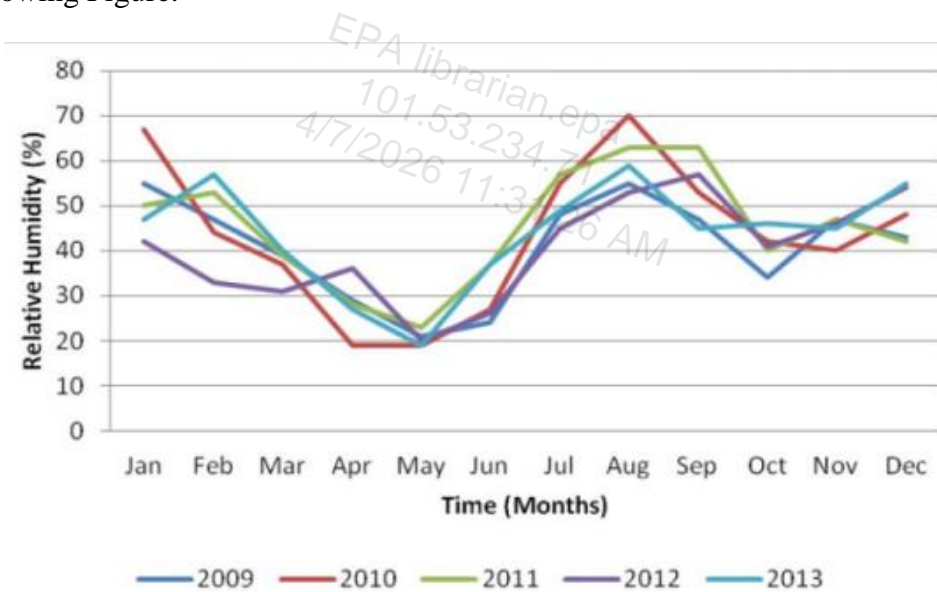
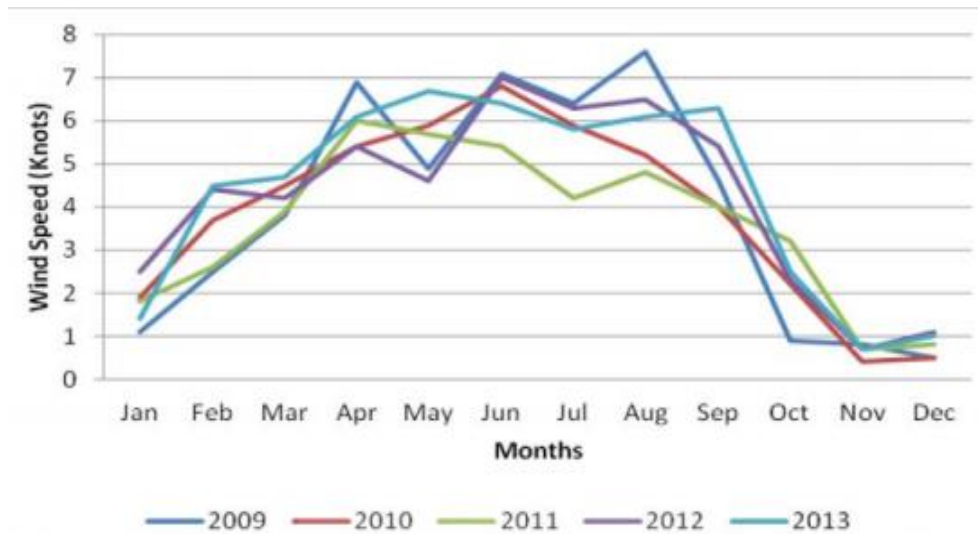


Figure 7-7: Relative Humidity of Sheikhpura

**Wind Speed:** The dust storms and hot winds blow continuously during the months of March to August. Wind speeds and seasonal patterns vary considerably in the project area. The monthly average of wind speed is ranging from 0.4 to 7.6 Knots. The data for the wind speed from 2009 to 2013 is summarized as Figure



**Figure 7-8: Average Wind Speed**

### 7.2.7. Water Resources

Water Resources of the area are discussed under two broad headings, surface water resources and groundwater resources.

- **Surface Water Resources**

The opening of Lower Chenab Canal in 1892 and its extension to the area in the form of Rakh Branch, Jhang Branch and Gogerah Branch coupled with the introduction of a Canal Irrigation system, brought the whole area under regular cultivation. Among surface waters, district & near the project extremities there is a distributor canal of Rakh Branch. Moreover, around 4.5 MGD water is produced through the surface water treatment at “Jhal Khanuana Water Works” and “Millat Town Water Works” by WASA Sheikhupura.

The Rakh Branch is a canal in the Punjab province of Pakistan. The canal was dug in 1892 during colonial rule. The Rakh Branch originates from canal Lower Chenab. And Lower Chenab comes out from Head Khanki at the river Chenab. It passes and produces tributaries in three districts such as Hafizabad, Nankana Sahib and Sheikhupura. Many famous towns are situated at near the Rakh Branch such as Safdarabad, Sangla Hill, Salarwala, Chak Jhumra,

Gutwala, Abdullahpur and Sheikhpura. The canal ends at Samundri. Rakh branch is passing about 3.5 Km away from the M-3 Industrial Estate Sheikhpura.

- **Ground Water Resources**

The ground water of the city Sheikhpura is quite saline, hence, not acceptable for human intake. A limited quantity of potable water is accessible to the citizens from different scarce resources. In the absence of proper sweet water sources, the WASA Sheikhpura pumps and brings the sweet water from the city district (Chiniot) where ample quantity of drinking water is available. Another sweet water source is positioned at a distance of nearby 13KM from terminal reservoir at Jhang Branch Canal which provides 20 MGD through 25 tube wells installed at Jhang branch Well-Field area. In addition to this, about 8 MGD water is being served to the city through 8 tube wells installed at Rakh Branch Canal which passes through the city.

### 7.3. Baseline Ecological Environment

In this section, the baseline environmental conditions pertaining to biological environment are described. These conditions have subsequently been used to identify the potential impacts on the biological environment that are likely to arise from the project activities. This Environment involves:

- Flora
- Fauna
- Endangered species

#### 7.3.1. Flora

Based upon observations during the field visit, various types of floral species were directly observed in the project area as described below;

- **Trees**

A list of small and tall trees observed is given hereunder:

**Table 7-1: List of Trees of Study Area**

Sr. #	Species	Family	English Name	Urdu Name	Life Span
1.	Acacia nilotica	Mimosaceae	Gum Arabic Tree	Keekar	Perennial
2.	Dalbergia sissoo Roxb.	Fabaceae	Rose Wood	Sheesham	Perennial

3.	Albizia lebeck	Fabaceae	Lebeck	Shirin	Perennial
4.	Cordia myxa	Boraginaceae	Assyrian Deciduous	Lesura	Perennial
5.	Azadirahcta indica (L.) Adelb.	Meliaceae	Indian Lilica	Neem	Perennial

- **Shrubs**

The table below depicts complete scenario of shrubs and sub-shrubs in the study area.

**Table 7-2: List of Shrubs of Study Area**

Sr. #	Species	Family	English Name	Local Name	Life Span
1.	Calotropis procera	Apocynaceae	Milk Weed	Ak	Perennial
2.	Tamarix indica	Tamaricaceae	Tamarisk	Kai	Perennial
3.	Zizyphus jujube	Rhamnaceae	Jujube	Jhangoori Ber	Perennial
4.	Helianthus annuus	Asteraceae	Sun Flower	Sooraj Mukhi	Perennial
5.	Lycopersicum sesculeupum	Solanaceae	Tomato	Tamator	Annual
6.	Salsola imbricata Forssk.	Amaranthaceae	Spiny Amaranth	Cholai	Annual

- **Herbs**

As far as herbs of the area are concerned, these were observed as under:

**Table 7-3: List of Herbs of Study Area**

Sr. #	Species	Family	English Name	Local Name	Life Span
1.	Conyza Canadensis	Asteraceae	Horse Weed	Booti	Annual
2.	Eclipta alba	Asteraceae	False Daisy	Daryai Booti	Annual
3.	Allium cepa	Amryllidaceae	Onion	Gandda	Annual
4.	Cressa cretica Linn.	Convolvulaceae	Rosin Weed	Rudrava-nti	Perennial
5.	Euphorbia thymifolia Linn.	Euphorbiaceae	Gulf Sandmat	Kheera wal	Annual

### 7.3.2. Fauna

A field study related to the identification of terrestrial and aquatic fauna was conducted in the study area. For the purpose of such biodiversity study, the area was divided into three distinct zones as has been done in case of flora.

As part of terrestrial fauna, various types of animals were observed in the fields and residential parts. A short description is as under:

#### ➤ Mammals

A list of mammals noticed in residential parts, agricultural fields, etc. is given in the following table:

**Table 7-4: List of Mammals of Study Area**

Sr. #	Scientific Name	Family	English Name	Local Name
1.	Canis aureus	Canidae	Asiatic Jackal	Giddharh
2.	Funambulus pennantii	Sciuridae	Stripped PalmSquirrel	Gaallarh
3.	Meriones hurrianae	<u>Muridae</u>	Indian Desert Jird	Chuwa
4.	Tatera indica	Muridae	Indian Gerbil	Chuwa
5.	Lepus capensis	Leporidae	Cape Hare	Saya
6.	Herpestes auropunctatus	Herpestidae	Indian Mongoose	Nevla

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**Figure 7-9: Mammals in the Project Area**

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### ➤ Reptiles

Reptiles of the study area as identified in residential parts and farmlands during field survey in study area as well as those known from secondary data include:



Brilliant Agama



Common Indian Monitor

**Figure 7-10: Reptiles in the Project Area**

**Table 7-5: List of Reptiles of Study Area**

Sr. #	Scientific Name	Family	English Name	Local Name
1.	Trapelus (Agama) agilis Isolepis	Agamidae	Brilliant Agama	Kor Kirla
2.	Naja naja	Elapidae	Indian Cobra	Kala Nag
3.	Psammophis leithii	Colubridae	Pakistan Ribbon Snake	Sindhi Teer Mar
4.	Calotes versicolor	Agamidae	Garden Lizard	Kor Kirla
5.	Echis carinatus	Viperidae	Saw Scaled Viper	Khappa
6.	Bungarus caeruleus	Elapidae	Indian Krait	Sangchoor
7.	Varanus bengalensis	Varanidae	Common Indian Monitor	Goh

### ➤ Birds

Most common species of birds observed included;

**Table 7-6:** List of Birds of Study Area

Sr. #	Scientific Name	Family Name	English Name	Local Name
1.	Acridotheres ginginianus	Sturnidae	Bank Myna	Myna
2.	Lanius vittatus	Laniidae	Bay-backed Shrike	Latora
3.	Dicrurus macrocercus	Dicruridae	King Crow	Bhujanga
4.	Columba livia	Columbidae	Rock Pigeon	Jangli Kabootar
5.	Turdoides caudatus	Leiothrichidae	Common Babbler	Chiria
6.	Acridotheres tristis	Sturnidae	Indian Myna	Myna
7.	Upupa epops	Upupidae	Hoopoe	Hudhud
8.	Corvus Splendens	Corvidae	House Crow	Kaan
9.	Passer Domesticus	Passeridae	House Sparrow	Chiri
10.	Egretta Garzetta	Ardeidae	Little Egret	Bagla



Little Egret



House Crow



Common Babbler



Hoopoe

**Figure 7-11: Birds in the Project Area**

### ➤ Amphibians

The amphibians most common in the area like other parts of the district are:

**Table 7-7: List of Amphibians of Study Area**

Sr. #	Scientific Name	Family Name	English Name	Local Name
1.	Bufo bufo	<u>Bufo</u> idae	Toad	Daddi
2.	Hoplobatrachus tigerinus	<u>Dicrogloss</u> idae	Frog	Daddu



Toad



Frog

**Figure 7-12: Amphibians in the Project Area**

## 7.4. Baseline Socio-Economic Environment

### 7.4.1. Methodology

This section describes the key socio-economic features of the study area, including the administrative setup, population, education, health, infrastructure, occupations, and other cultural resources. Primary and secondary data sources were used to develop the socioeconomic baseline of the area. The basic aim of the study is to update local communities about project activities and obtain their views and concerns. Moreover, an in-depth socio-economic analysis to develop socio-economic baseline of project area was one of prime objective of this study.

A field visit was conducted for public consultation. A survey Performa was used as a survey tool prepared for this purpose and is attached below. The project site is located within the

industrial city; hence direct disturbance to communities from the project activities will be minimum. However, the physical extent of the study area extends surrounding the industrial city (referred as project area) considering the physical, ecological and socioeconomic boundaries beyond which the project is not likely to significantly influence local communities, and also with a view of covering a substantial sample size for collection of reliable and authentic socio-economic data.

Data was collected from published sources such as census reports, previous studies and data from government departments as well as from field survey carried out in the surroundings of the project area.

Our field survey methodology included transacts walks through villages, group interviews and focus on group discussions with the local communities. The use of a semi-structured interview guide helped in the carrying out of the questioning process and recording of information. This activity was carried out with the objective of obtaining a clear and complete understanding of the social and economic conditions of the local communities; assessing the vulnerability of the local communities; identifying marginalized strata of the community; and gathering local concerns and inhibitions.

#### **7.4.2. Study objectives**

The socio-economic study undertaken for the Environmental Impact Assessment (EIA) was designed and conducted to meet the following objectives:

- To assess the human environment of the area i.e. to determine the quality of life of communities within the region of influence.
- To have an insight into the day to day activities of people especially focusing on their income generating activities, agriculture and labor.
- To access the vulnerabilities of the local communities and the effects of project activities on their quality of life.
- Consultation with communities regarding the proposed project activities and to find out their concerns and aspirations.

#### **7.5. Quality of life values**

This section covers the social structure around the project area. The team of AAT Consulting carried out a detailed survey around the project area and collected the desired information.

Socioeconomic questionnaire was used as survey tools by the survey team to collect desired information. The quality of life values around the project area has been discussed below.

### 7.5.1. Geographical Location and Surrounding Settlements

The proposed project is located in M-3 Industrial City, Sheikhpura Industrial Estate Development & Management Company (FIEDMC), District Sheikhpura.. The surrounding settlements include Gojra, Sahianwala, Chak Jhumra and Sheikhpura. As the unit lies in an industrial city, so there are no settlements in the vicinity of the proposed unit.

### 7.5.2. Demography

The Demographic Study is done to assess the Socio-Economic profile of proposed project site as population studies are extremely important from Town Planning point of view. The analysis of socio-economic survey presented the following conclusions;

**Gender:** The gender ratio (male to female ratio) around the project area is 3:2. Most of the females are house care takers.

**Age Group & Marital Status:** About 50% of the people lie in the age group of 18-25 years, 25% in the age group of 25-30 years and 25% of the people are above 30 years. Also, 40% of the people were single and 60 % were married.

**Educational Level:** Most of the population has educational level of Primary to Middle. Some have obtained to Higher Secondary education also, however, education up to graduation, at least, is trending now.

**Employment Status & Income:** It is found that 10% of the surrounding inhabitants are students, 20% are housewives and others were employed people. The employment sources include small industries, business, agriculture and other private sectors. Average monthly income of the inhabitants lies between PKR 20,000 to 30,000. 25% of the stakeholders were earning above PKR 30,000 also.

**Settlement Patterns:** Various types of houses were observed around the project area during survey including katcha, pakka, semi pakka etc. having poor drainage system. Majority of people live in their farmhouses (Deras) while some have developed their homes at their agricultural land. So, there is no formal pattern of settlements. Family composition is dominantly joint family system, but a few nuclear families also exist in the area. The facilities of electricity and Sui-gas are also present in the area. Generally, people rely on ground water for drinking purposes.

**Indigenous people:** People inhabiting the project area are of different castes and races. Most of the families have been living here from 20 to 25 years which has led to homogeneity of culture. There is no danger of damage or elimination of indigenous community as the locals are steeped in their customs and have no intention of relocating.

**Culture and Customs:** The people are conservative in their lifestyle. They practice their traditional social and cultural and moral values strictly in all walks of life. Marriages are arranged and they are very successful. Free mixing of male and female is not liked. This tendency shows that the people are “Change Resistant” in their behavior

The citizens of Sheikhpura celebrate a variety of cultural and religious festivals throughout the year, such as arts and craft, music, local events, and religious celebrations. Festivals that are celebrated include Rang-e-Bahar, Kissan Mela and Canal Mela etc.

**Health Facilities:** The nearby health facilities existing around FIEDMC area include United Hospital, Rehman Free Dialysis Center, Prime Care Hospital, Mujahid Hospital and Punjab Social Security Hospital. Inhabitants have access to private hospitals of the city also and sometimes to nearby private dispensaries. Fever, malaria and chest congestion were reported as the common diseases of the project area.

**Infrastructure:** Basic facilities such as electricity, gas and sewerage system etc. are readily available around the project site. Moreover, PTCL telephone facility and mobile service is available in all parts of the industrial area – to be used as a mode of communication. Internet connection, post office service and Police station also exist in the project area.

Also, there is a fine network of metaled roads in the district. The majority of roads are under the control of the National Highway Authority, linking Sheikhpura with other cities in the country. Sheikhpura – Sahianwala Expressway is the main road passing by M3-IC FIEDMC area i.e. the site of proposed Project.

**Archeological and Cultural Sites:** There is no archaeological site in the vicinity of the project area though nearby residential areas do have mosques and graveyards.

**Economy of the Area:** District Sheikhpura is an industrial and commercial city having multi-occupations. The main occupation of the people is business and jobs in different industries. The remaining small portion of the population is having different occupation including government and private services as well as agriculture. The women also assist their men in the economic activity in different fields of business, service, education and other institutions. Women mostly serve in schools, colleges and hospitals. Sheikhpura is generating large

number of employment opportunities for its locals and outsiders. Industrial areas are using manpower, while nearby towns are providing business opportunities to the residents. In this semi urban area, people are involved in daily wages jobs, while some are involved in small business. They normally travel to adjacent areas for work. Some work in the industrial area and in the surrounding universities and colleges. People are also involved in agriculture. Area having access to irrigation water is another source of income. Similarly, livestock is a secondary source of income. It is safe to assume that livestock farming is practiced uniformly in both types of areas.

Livestock ownership is also developed in the project area; especially among poor families who sell animals during emergency days as mostly unemployed people depend on livestock and sometimes agriculture. The people have livestock which include cows, goats, sheep and donkeys. All the animals are of native breed and thus they can survive the local harsh environment and drought. Milk and butter from the livestock are consumed by the household and are not sold in the market. Good breeds of buffaloes and cows are found in the project area. Sheep, goats, camels, horses, asses and mules are also part of the livestock in the district.

#### **7.6. Suitability of the Site (not Prohibited, Environmentally Sensitive, Incompatible to Surroundings and Unsuitable)**

Selection of the site for the proposed industrial plant was governed by many considerations, both the economic analysis of the estimated costs as well as modifying effects of other factors which are more the matter of judgment rather than mathematical calculations, and have considerable effect on the smooth working of the proposed business unit.

The sites were considered for the establishment of proposed unit in and around the Sheikhpura as it has become an industrial hub of the country. In the light of general discussion of the factors influencing the industrial location; the sites were evaluated based upon the following criteria;

- **Land:** Suitability, adequacy, and comparable cost of the sites to install the plant and to expand it whenever feasible.
- **Labor:** Availability and affordable wage rates – taking cost to benefit analysis into consideration – of the skilled, semi-skilled, un-skilled person is required.
- **Transportation:** Regular and sufficient transportation facilities for delivery of materials, dispatch of finished products and for the use of the employees.
- **Market:** Size of the local market and the cost of transporting to central markets vis-a-vis the extent of demand.

- **Auxiliary Facilities:** Character of community regarding taxes, legal regulations, public up lift services, financial facilities, educational opportunities, etc.
- **Environmental considerations:** They are extremely important for project sitting. Baseline Environmental Study was carried out in and around the project site to develop an idea about the physical and biological receptors of the area. Settings around the project area do not show any sensitivity of environment. There is no worth mentioning forestry, biodiversity, fishery, flora, fauna and heritage that can get affected due to proposed project.

The proposed project is located at 23Km, G.T Road, Muridke, District Sheikhupura - an EPA approved Industrial estate. Environmental considerations are extremely important for project sitting. Baseline Environmental Study was carried out in and around the project site to develop an idea about the physical and biological receptors of the area. Settings around the project area do not show any sensitivity of environment.

There is no worth mentioning forestry, biodiversity, fishery, flora, fauna and heritage that can get affected due to proposed project. Also, the project site is situated in the area where population centers are away from the project site. These factor also supported selection of the present site. What is more; value addition city is a massive project comprising the industrial units relating Textile, Pharmaceuticals, Information Technology, Chemicals, etc. Special zones are reserved for the foreign investors with liberal government fiscal incentives and policies in this industrial city. It has been conceptualized and planned in great detail as a state-of-the-art industrial estate providing the industrialist is with an excellent environment for competing in the global market.

The project will be regulated according to Punjab Environmental Protection Act 1997 (Amended 2012) and in compliance with the National Environmental Quality Standards (NEQS). Even Environmental Management Plan (EMP) and Environmental Monitoring Plan (EMP) will be operational. Taking into consideration all the above described factors, the selected site is most suited for development of the proposed project.

## 7.7. Environmental Baseline Monitoring

Following environmental components were monitored to assess the baseline condition of the project area:

- Ambient air quality monitoring,
- Noise monitoring

- Water quality monitoring

Environmental baseline monitoring was conducted at different locations. The details are as follows;

### **7.7.1. Ambient air quality monitoring**

Pakistan lacks a comprehensive and effective air quality monitoring system that can be used to track and address specific instances of air pollution and air quality degradation. At present, monitoring of urban air pollution in Pakistan is limited to isolated instances where air pollutants are measured for brief periods at selected locations. Urban locality, city, region, or countrywide continuous or repeated air quality monitoring data does not exist. Similarly, there is no formal system of air quality data storage and reporting.

The proposed project is located in fairly open and clean air. As part of the study, ambient air quality monitoring was carried out during the EIA field visit as the part of the supplement study. Ambient air quality monitoring was carried out to observe the present condition of the project area.

Ambient air quality was measured with monitoring devices which have the capability to capture & analyze criteria air borne pollutants including SO<sub>2</sub>, NO<sub>2</sub>, NO, NO<sub>x</sub>, CO, PM<sub>10</sub>, PM<sub>2.5</sub>, Ozone and suspended particulate matter at micro levels.

NEQS for air quality standards have been introduced in Pakistan since 2010 and were recently revised as PEQS in August 2016; therefore, the monitoring values of Carbon monoxide (CO), Sulphur dioxide (SO<sub>2</sub>), Nitrogen dioxide (NO<sub>2</sub>), and Particulate Matter (PM<sub>10</sub>) were compared with standards set by PEQS. Overall air monitoring indicates that average 24 hours concentrations of CO, NO<sub>2</sub> and SO<sub>2</sub> were found below the permissible limits regulated by PEQS, 2016. The lab monitoring report of air quality is provided in the document file submitted with EIA Report.

### **7.7.2. Noise monitoring**

As per NEQS, permissible noise level is up to 65dBA when measured with a sound meter at a distance of 7.5m from the source. At proposed subprojects the main source of noise emission are the construction activities. Noise from vehicles and other powered mechanical equipment is intermittent. Use of power equipment's at proposed subprojects are just once during unloading of material and is being of temporary nature. Maintenance vehicle came only on requirement basis.

As such there is no noise threat at the proposed subproject sites, where construction activities are being proposed. The noise level measurements showed that the values are much below the 85 dBA limit prescribed under the NEQs established by the EPA or the 75dBA used by DISCOs/NTDC/PEPCO in the equipment specifications. The lab monitoring report of noise levels is provided in the document file submitted with EIA Report.

### **7.7.3. Water Quality**

To assess the water quality of the project area the physical, chemical and biological parameters of ground and surface water were analyzed. The primary objective of the survey was to identify the key problems and issues in the water supply schemes hindering the supply of safe drinking water to the communities. This involved identification of the institutional, operational, technological, financial problems and reasons of non-operation of water supply schemes. In addition, the survey helped to point out the non-functional status of the water supply schemes. The lab monitoring report of water quality is provided in the document file submitted with EIA Report.



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## 8. IMPACT ASSESMENT

### 8.1. Methodologies for Impact Identification

Potential impacts from the proposed project activities were identified by a thorough review of the project activities, study of surrounding environment, review of literature and expert judgment.

#### 8.1.1. Checklist Methodology

The checklist methodology has been adopted for screening/ identification of impacts (Table 6.1). In addition, professional judgment has been used to additionally identify the residual impact that may persist after adoption of mitigation measures.

**Table 8-1: Checklist of Environmental Impacts**

Potential Environmental Impacts	Significance of Impact				Recommended Mitigation Measures
	None	Small	Medium	Large	
<b>A. Due to Project Location</b>					
Changes in hydrology affecting existing property values of land		✓ ST			Careful design and planning to minimize /offset problem
Changes in drainage pattern/ water flow obstruction		✓ ST			Appropriate design to minimize/offset problem
Changes in land uses		✓ LT			Appropriate design and careful planning
Loss of ecology		✓ ST			Careful planning and design to avoid cutting of large trees
Displacement of population/Resettlement	✓				Project lies in an approved Industrial Estate
Loss of Historical/monuments/cultural values	✓				Project lies in an approved Industrial Estate

Potential Environmental Impacts	Significance of Impact				Recommended Mitigation Measures
	None	Small	Medium	Large	
Endangering of species	✓				There do not exist any endangered species at the site
Environmental aesthetics		✓ ST			Ensure minimum loss of vegetation and do excessive plantation
<b>B. Due to Project Design</b>					
Unnecessary damages because Operation & Maintenance (O&M) requirements are too high		✓ ST			Realistic O & M assumptions
Assumed pollution removals not realized		✓ ST			Appropriate design/ equipment selection
Environmental pollution control operations		✓ ST			Careful planning/designing/ monitoring and use of appropriate standards
Impairment of downstream beneficial water uses	✓				Careful planning & monitoring
Impacts on adjacent land economic users including recreation/tourism		✓ ST			Careful planning/O&M
Intensification of national socioeconomic imbalances			✓ LT		Planning to be consistent with policies
Traffic congestion and nuisances along routes		✓ ST			Careful planning and time preferences
<b>C. Construction &amp; Decommissioning Phase</b>					
Changes in land use		✓			Careful planning

Potential Environmental Impacts	Significance of Impact				Recommended Mitigation Measures
	None	Small	Medium	Large	
		LT			
Environmental aesthetics	✓				Ensure minimum loss of vegetation and do excessive plantation
Water pollution		✓ ST			Design proper sewerage system and dispose of wastewater after treatment
Dust Emissions			✓ ST		Time to time water sprinkling
Gaseous emissions		✓ ST			Regular maintenance of vehicles and other machineries
Run off erosion		✓ ST			Careful planning, Proper storage/piling of Construction & Demolition waste
Increased Noise & Vibration levels			✓ ST		Ensure proper lubrication of machineries and vehicles, excessive plantation, prefer day time hours
Uncovered cut & fill trenches/areas		✓ ST			Careful Planning and Implementation
Explosion/fire hazards/hazardous materials spills		✓ ST			Firefighting system, fire alarms, emergency response system, careful transfer of oils etc.
Sanitation disease hazards		✓ ST			Training sessions for workers, proper disposal of wastewater and solid waste, provision of sanitation related stuff at the site
Thrust Boring/ Trenching / quarrying/blasting hazards		✓ ST			Careful accomplishment of the related activities and tasks

Potential Environmental Impacts	Significance of Impact				Recommended Mitigation Measures
	None	Small	Medium	Large	
Workers' accidents/ health & safety risks			✓ ST		Conduct trainings, provide PPEs, arrange firefighting system, provide first aid kit on site
Blockage of wildlife passageways	✓				There do not exist any wildlife passageway
<b>D. Operational Phase</b>					
Inadequate Operation & Maintenance		✓ ST			Adequate O&M according to set procedures
Inadequate operations phase/environmental monitoring		✓ ST			Adequate monitoring as per provided monitoring plan
Hazards to workers' health & safety			✓ ST		Readiness for emergency, provision of first aid facility at the site
Air quality deterioration	✓				Vehicles and other machineries' maintenance on regular basis, time to time monitoring
Increased noise levels		✓ ST			Regular lubrication works and maintenance, monitoring measuring noise levels time to time
Water resources' contamination	✓				Design and install proper sewerage system, dispose of water only after suitable treatment
Lowering of Groundwater table		✓ ST			Adopt water conservation strategy, check for leakages regularly
Land/ soil contamination	✓				Proper handling, collection and storage of waste materials
Nuisance to public due to industrial & transportation Activities		✓ ST			Carry out transportation during day time, careful operational activities

Potential Environmental Impacts	Significance of Impact				Recommended Mitigation Measures
	None	Small	Medium	Large	
Changes in the human settlements	✓				Project lies in Industrial area where there is no human settlement
Depreciation of environmental aesthetics		✓ ST			Careful planning & implementation, excessive plantation in and around the project site

Once the potential impacts had been identified, the assessment of each potential impact follows these steps:

- ✓ Primarily, anticipated impacts have been categorized as direct, indirect and induced impacts. These groups of impacts can be further broken down according to their nature into:
  - Positive and negative impact
  - Minor, major and moderate impact
  - Local and widespread impact
  - Temporary and permanent impact
  - Short and long term impact
  - Reversible and Irreversible impact
- ✓ This step refers to the description, quantitatively (where possible) or qualitatively, of the anticipated impacts of the proposed project. This may be achieved through the use of models or comparison with other similar activities. The predicted level of impact magnitude may be due to uncertainties in the baseline conditions, the proposed activities, external developments, or the prediction model.
- ✓ If it is determined that the predicted impact is significant when compared with the Criteria for Determining Significance, suitable mitigation measures are identified. There is a range of mitigation measures that can be applied to reduce impacts.
- ✓ Incorporation of the suggested mitigation measures reduces the adverse impact of the project and brings it within the acceptable limit. This step refers to the identification of the anticipated remaining impacts after mitigation measures have been applied. These impacts are referred as residual impacts.

### 8.1.2. Impact Matrices Methodology

Project impact evaluation matrix is used for the assessment of impacts by dividing the project action into different phases (design, construction and operations) A Project impact evaluation matrix in the table below;

Table 8-2: Impact Matrix

Classification	Impacts		
	Design	Construction	Operation
<b>Physical Environment</b>			
Geographical Landscaping	-2 P	-3 T	2 P
Quality of Air	-2 P	-3 T	2 P
Quality of Drinking Water	T	1	3 P
Quality of Wastewater	-1 T	-2 T	-1 T
Noise Levels	-1 P	2 T	1 T
Infrastructure Arrangement	-2 P	1 P	3 P
Solid Waste Management	-3 T	-1 T	3 P
<b>Ecological Environment</b>			
Trees	1 P	-1 T	2 P
Shrubs	1 P	-1 T	2 P
Birds	P	-1 T	1 P
<b>Socio-Economic Environment</b>			
Quality of Life	-2 T	-3 T	2 P
Value of Assets	-2 T	-3 T	3 P
Traffic & Transportation	-2 T	-3 T	P
Business opportunities	-2 P	-3 T	3 P
Aesthetic Value	2 P	-3 T	T
Public Health	-2 P	-3 T	3 P
Graveyard	0	0	0
Mosques	0	0	0
Key: + = Positive; - = Adverse; 3= High; 2= Medium; 1= Low; 0=Negligible; P= Permanent; T= Temporary			

## 8.2. Characteristics of Impacts

During EIA Study of Project, the predicated impacts were carefully characterized. Following is the impact characterization categories list:

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

**Table 8-3: Characterization of Impacts**

<b>Categories</b>	<b>Impact</b>	<b>Characteristics</b>
<b>Nature</b>	Direct	The environmental parameters are directly affected by the project construction or operation.
	Indirect	The environmental factor changes as a result of alteration in another parameter.
<b>Duration of Impact</b>	Short Term	The impacts that last only during the construction of the Impact proposed Project e.g., noise from the construction activities.
	Medium Term	Lasting for a period of few months to a year; the project before naturally returning to the original condition such as loss of vegetation due to clearing of campsite, contamination of soil or water by fuels or oil.
	Long Term	Lasting for period much greater than medium term impact before naturally reverting to the original condition such as loss of soil due to erosion.
<b>Geographical Extent</b>	-	The geographical extent may be local or regional.
<b>Project Phases</b>	-	Pre-construction Phases (designing), Construction Phases, Operational Phases
<b>Reversibility of Impact</b>	Temporary	The impacts that don't cross ecosystem threshold value of resilience.
	Permanent	The impacts that exceed ecosystem threshold value of resilience.
<b>Likelihood of the Impact</b>	Likely	Impact will probably occur under most circumstances.
	Unlikely	Impact could occur at some time
	Possibly	Impact may possibly occur at some time
	Rare	Impact may occur but only under exceptional circumstances.
<b>Impact Consequence Severity</b>	Major	When an activity causes irreversible damage to a unique Environmental feature; causes a decline in abundance or change in distribution over more than one generation of an entire population of species of flora or fauna; has long-term effects (period of years) on socio-economic activities of significance or regional level.
	Moderate	When an activity causes long-term (period of years), reversible damage to a unique environmental feature; causes reversible damage or change in abundance or distribution over one generation of a population of flora or fauna; has short-term effects (period of months) on socio-economic activities of significance on regional level.
	Minor	When an activity causes short-term reversible damage to an environmental feature; slight reversible damage to a few species of flora or fauna within a population over a short period; has short term effects on socio-economic activities of local significance.

	Negligible	When no measurable damage to physical, socio-economic, or biological environment above the existing level of public concern; and conformance with legislative of statutory requirements.
<b>Significance of Impact</b>	-	Impact may be categorized as high, medium, or low. Based on the Consequence, likelihood, reversibility, geographical extent, duration, level of public concern; and conformance with legislative of statutory requirements.

### 8.3. Impact Analysis and Prediction

In order to give correct categorization to the present project Rapid Environmental Assessment Procedure was followed. It revealed that there are environmental impacts relating the proposed project which can be controlled by adopting proper mitigation measures. These impacts mainly attributed to the release of dust during construction phase and proper disposal of waste discharges from the industry but most of the impacts are projected as moderate/minor impacts. Also, the project has many positive impacts on local public and national economy. The management of proposed project will adopt proper procedures to carry out the construction and operation of the unit operation or in environmental friendly way.

#### 8.3.1. Meetings

For the impact analysis and predictions detailed meetings were held with the proponent, management of proposed project and with other stakeholders. Potential factors that can affect the environment or local community in any way were discussed in relation to the implementation of proposed project. All possible mitigation measures were considered and are incorporated in the Environmental Management Plan.

#### 8.3.2. Consultations

Scoping sessions, focused group discussion and way side consultations were held with the relevant stakeholders, inhabitants of the villages, shopkeepers and workers in the area. These included local government departments, educational institutes, FIEDMC representatives, public representatives and local residents. The purpose of such consultations is to obtain the feedback from the relevant persons.

## **9. SCREENING OF POTENTIAL IMPACTS AND MITIGATION MEASURES**

Presented in this Chapter are the screening of potential environmental, social and economic impacts and assessment of their severity based on stakeholder perceptions about the project which was obtained at the inception of the EIA activity together with the baseline data.

Screening process is an integral part of the environmental assessment process and it has been carried out for this industrial unit by identifying all significant environmental and social aspects during the stages preceding construction, establishment, & operation. Environmental aspects identified during the stakeholders meetings and by the screening process were assessed for their severity and mitigation measures have been proposed on the basis of assessment. Institutionalizing compensatory mitigation implies giving impact assessment procedures the powers to discourage projects that may cause irreparable environmental damage. The mitigation measures proposed here will be adopted by the Proponent to reduce, minimize and compensate for the negative impact as far as possible. The mitigation measures can be identified and implemented effectively answering the following questions;

### **9.1. What is the problem!**

Our planet is plagued by environmental problems that deplete natural resources and strain livelihoods, many of which are exacerbated by poor industrial practices. If left unchecked, environmental problems negatively impact businesses both directly, as in supply chain disruptions, and indirectly, as in health hazards that lead to loss of man-hours and efficiency. Industries and businesses need to address the environmental concerns to ensure sustainability and long-term financial viability.

### **9.2. When will the problem occur and when should it be addressed!**

The problems will occur within the project premises and near the boundaries of the project site. The impacts will range up to the distance where project related activities are performed or up to the geographical zone where the effects spread. The Impacts will show their presence soon after the project development starts. The potential problems should be identified at planning stage of the project and suitable mitigation measures for them should be incorporated in project design. The priority should be to prevent the environmental problem from occurring. If happens, it should be mitigated at the time of occurrence as soon as possible.

### **9.3. Where the problem should be addressed!**

The problems will occur within the project premises and near the boundaries of the project site. It should be addressed and extenuated at the source i.e. where they originate.

### **9.4. How the problem should be addressed!**

The problems should be evaluated for severity of its impact and then addressed using environmentally friendly practices accordingly. The impact should be avoided or minimized to maximum possible extent. Appropriate mitigation measures should be implemented and Environmental Management & Monitoring Plan should be followed with fidelity.

### **9.5. Anticipated Environmental Impacts due to Project Location**

The project site is located in FIEDMC which is already approved by Environment Protection Department. Moreover, there is neither any human settlement within the radius of the selected site nor any site of archeological importance present in the locality of the industry. In view of these findings, there is no sensitive receptor present in the vicinity of the project site. After environmental assessment of the study area, the subject project site is the most suitable to execute the project regarding project location.

Hence, no mitigation is required.

### **9.6. Anticipated Environmental Impacts during Project Design/ Pre-Construction Phase**

The construction and operation of the industry will be carried out in well planned manner. State-of-the-art machinery will be employed. Following factors were mainly taken into account in order to predict any adverse environmental impacts.

#### **9.6.1. Land Acquisition**

The subject project is to be located in Sheikhpura at 23Km, G.T Road, Muridke, District Sheikhpura . The land is acquired on rental basis.

### 9.6.2. Topography

#### Impact

The project area has plain topography and excavation of land is not involved. So, no significant physical change in the topography is expected.

#### Mitigation

No mitigation is required.

### 9.6.3. Changes in Land Value

#### Impact

The proposed project is expected to have both positive and negative impacts on the land value of the surrounding societies/commercial areas. This impact will be permanent and beneficial in nature.

#### Mitigation

The impact will be positive. No mitigation is required.

### 9.6.4. Safety of Infrastructure

#### Impact

As, it is already mentioned that the project area falls under zone 2A, consequently, the building structures have been designed in accordance with the requirement of seismic factor as well as after due consideration given to other structural design parameters.

#### Mitigations

No mitigation is required.

### 9.6.5. Flora

#### Impact

There is no significant vegetation or large trees present at the project site. Small number of self-grown shrubs and herbs are present which will be removed while land clearing.

#### Mitigation

Though, the impact will not significant in nature, however, plantation plan will be developed and trees will be planted along the boundary wall of the industrial unit as environmental

enhancement measure. Also, it will be ensured that no exotic species in the plantation plan with known environmental setbacks.

#### **9.6.6. Impacts due to Infrastructure Development**

##### **Impact**

The project site is located at main G.T Road, Muridke, Sheikhpura and there is availability of infrastructure like roads, electricity, water supply, drainage system, etc. and also there is high potential for the further development of infrastructure in this area in near future.

##### **Mitigations**

No mitigation is required.

#### **9.6.7. Traffic Patterns**

##### **Impact**

There is only one entrance and exit point provided at proposed site and same shall be used in future. Hence, traffic patterns of the area will not get disturbed.

##### **Mitigations**

No mitigation is required.

#### **9.6.8. Water availability**

##### **Impact**

There is groundwater available at the site.

##### **Mitigations**

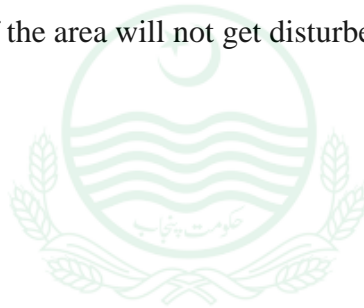
No mitigation is required.

#### **9.6.9. Seismic Hazard**

##### **Impact**

Pakistan lies on an active seismic belt of earth. According to seismic zones of UN- Habitat, the project area falls under Zone 2A. Seismic observations indicate that hundreds of shocks originate every year. Mostly, these seismic waves are of low intensity and do not have significant effect.

##### **Mitigation**



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The proposed structure of the industry shall be designed and constructed for low to moderate earthquakes. For seismic hazard analysis, updated structural and seismic evaluations will be consulted by the design engineer. The structure of the proposed project will be studied to evaluate their durability/strength to withstand moderate to high intensity earthquake.

## **9.7. Anticipated Environmental Impacts during Construction Phase**

The details of the anticipated environmental impacts owing to construction of proposed industry are as follows;

### **9.7.1. Topography**

#### **Impact**

Project lies in the plain area and no large scale excavation is involved except for levelling. So, the impact on topography will be insignificant in nature.

#### **Mitigation**

No mitigation is required.

### **9.7.2. Soil**

#### **Impacts**

The project area is a plain terrain with paved road structure. Soil erosion may occur on roadside, at contractors' camps. Contamination of soil may be caused by oil and chemical spills at asphalt plant sites, workshop areas and equipment washing yards. This impact is, however, of temporary and minor negative in nature.

#### **Mitigation**

All spoils will be disposed of at designated site and the site will be restored back to its original conditions. Low embankments shall be protected by planting grasses and shrubs at appropriate locations.

### **9.7.3. Ambient Air quality**

#### **Impact**

Air quality will be affected by fugitive dust emissions from construction machinery; dust from the unpaved surface and construction vehicles. Emissions may be carried over longer distances depending upon the wind speed, direction, temperature of surrounding air and atmospheric stability. Also, there can be slight increase in traffic causing emissions of SO<sub>2</sub>, NO<sub>x</sub>, CO and

Suspended Particulate Matter. Moreover, uncovered vehicles for transportation of building materials as well as their storage, especially gravel, sand and cement, can lead to dispersal of particulate matter.

These fugitive construction dust emissions have the potential to cause nuisance to the working staff as well as nearby receptors.

### **Mitigation**

In order to reduce dust emissions, a number of mitigation measures will be implemented, as appropriate, including:

- Haul-trucks carrying Earth, sand, aggregate and other materials shall be kept covered with tarpaulin to help contain construction materials being transported within the body of each carrier.
- Surface areas of stockpiles will be kept minimized to reduce areas of surface exposed to wind scouring. Dust producing building materials such as sand or cement should be stockpiled in low enclosures and covered, away from drainage areas where they could be easily washed away during rainfall.
- Dust-suppression methods, such as time to time water sprinkling, should be adopted
- All construction plant and equipment must be maintained in good working order and not left running when not in use
- All vehicles, machinery, equipment and generators used during construction activities should be kept in good working condition and be properly tuned and maintained in order to minimize the exhaust emissions
- Open burning of solid waste from the Contractor's camps should be strictly banned
- Preventive measures against dust should be adopted for on-site mixing and unloading operations.
- Regular water sprinkling of the site should be carried out to suppress excessive dust emission(s)
- Emissions from power generators and construction machinery are important point sources at the construction sites. Proper maintenance and repair is needed to minimize the hazardous emissions
- NEQS applicable to gaseous emissions generated by construction vehicles, equipment

and machinery should be enforced during construction works.

- Construction workers should be provided with masks for protection against the inhalation of dust
- Regular monitoring of air quality in accordance with NEQS shall be carried out

#### **9.7.4. Noise and Vibration**

##### **Impact**

During construction process compaction, blistering, mixing of raw material machinery, granulation process, use of heavy machinery for clearing of the site and transportation of construction materials can create some noise and vibration around the project site. The likely impacts due to increased noise levels include psychological effects of distraction of attention, irritation and short temperedness in the exposed persons due to persistently higher noise levels. The noise and vibration would not directly affect the residents of study area as residential units are at farther distances from site while noise impacts will be only localized. On the overall, the impact of noise generated during construction on environment would be low and mainly confined to daylight hours.

##### **Mitigation**

- A cost-effective way to reduce noise at a construction worksite is to employ quieter equipment. Avoid using equipment that is over-powered and, conversely, avoid using under powered equipment. In general, electronic powered equipment is quieter than diesel powered equipment and hydraulically powered equipment is quieter than pneumatic power
- Work activity scheduling are administrative means to control noise exposure. Planning how noise sources are sited and organized on a work site can reduce noise hazards. Jobs can be rotated so that exposure time is limited
- Noisy equipment should not be run for periods longer than necessary and should be switched off when not in use
- Attention should be given to maintenance of tools and equipment to reduce worksite noise levels. Maintaining plant and equipment in good order not only increases its life, but makes it safer to use and quieter. Loose and worn parts should be fixed as soon as possible.
- An effective way of reducing noise is to locate noisy equipment behind purpose-built

barriers. The barriers can be constructed on the work site from common construction building material. The noise source should not be visible and barrier should be located as close as possible to either the noise source or the receiver

- Vehicles' drivers will be instructed not to play loud music and avoid usage of horn around the site. Noise control measures will be taken such as provision of silencers on the heavy construction vehicles
- The green zone of plants will also help decrease sound levels

#### **9.7.5. Construction Waste Disposal**

##### **Impact**

Due to construction activities, waste will be generated at construction and contractors camp site. If it is not managed properly, it could have negative impacts on the site and surrounding area. If not disposed of at approved disposal sites and gets dispersed, it can result in the blockage of drainage channels if.

##### **Mitigation**

- Employees will be trained in basic segregation procedures, giving incentives and rewards to ensure they follow them
- Reusable/recyclable (iron bars, aluminum) waste should be sold to waste vendors and those which cannot be sold out may be used as a filling material for leveling the depressions, subject to technical feasibility
- The material which is in good and resalable condition, such as; doors, windows, wood and wood products, some metals, cardboard, paper, plastic crates, containers, bags ad sheets, in good, will be recycled or reused
- A site waste management plan will be made the responsibility of the building contractor. A schedule for the timely collection and disposal of construction debris to an approved dump site will be developed
- Solid waste generated during construction and camp sites should be safely disposed in demarcated waste disposal sites

#### **9.7.6. Municipal Solid & Liquid Waste**

The municipal waste will be in the form of food, cans, paper and wastewater from construction camps toilets and washing yards. If not managed properly, this will result in unhygienic

conditions, health risk to work force at the camp site. If left unintended, it can become a source of nuisance and environmental pollution in the project area. The impact is considered to be temporary and moderate adverse in nature.

### **Mitigation**

- Solid waste generated during construction and camp sites should be safely disposed in demarcated waste disposal sites and the contractor should provide a proper waste management plan.
- The sewage system for camps should be properly designed (pit latrines or, as required, septic tanks) to receive all sanitary wastewaters
- Lined wash areas should be constructed within the camp site or at site, for the receipt of wash waters from construction machinery
- Construction workers and supervisory staff should be encouraged and educated to practice waste minimization, reuse and recycling to reduce quantity of waste.

#### **9.7.7. Health and safety**

##### **Impacts**

Possibility of health and safety hazards of workers is always present during construction phases relating to working at height, moving objects, noise, slips, trips & fall, material & manual handling, electrical works, collapse and usage of harmful material. Health risks and work safety problems may result at the construction site if the working conditions provide unsafe and/or unfavorable working environment and due to storage, handling and transport of hazardous construction material. A number of factors having a negative impact on health and safety management include problems of communication due to low literacy level; unregulated practices on construction sites; adherence to traditional methods of working; non availability of equipment; extreme weather conditions; improper use of equipment and corruption.

##### **Mitigations**

- Basic medical training shall be provided to specified work staff and basic medical service and supplies to workers
- Layout plan for camp site, indicating safety measures taken by the contractor, e.g. firefighting equipment, safe storage of hazardous material, first aid, security, fencing, and contingency measures in case of accidents shall be developed
- Work safety measures and good workmanship practices are to be followed by the

contractor to ensure no health risks for laborers

- Protection devices (ear muffs) should be provided to the workers doing job in the vicinity of high noise generating machines
- adequate sanitation, washing, cooking and dormitory facilities including light up to satisfaction shall be provided
- Protective clothing for laborers handling hazardous materials, e.g. helmet, adequate footwear, protective goggles, gloves etc. shall be provided and usage of wearing these protective clothing during work activities shall be ensured
- A worker will be assigned duties in relation to his physical and mental health and skills.
- To handle emergency medical situation, first aid facilities will be made readily available at the site and the contractor will ensure availability of transport to handle any emergency condition during construction activities at the project site.
- Training programs, that support the achievement of unit's staff and personnel's competency in relation to health, safety and environment, will be implemented.
- The supervisory staff and workers to the extent possible will be made to follow the messages and instructions displayed on HSE notice boards installed in the premises of the site, such as;
  - Be aware of emergency escape routes
  - Promptly report all accidents to the concerned environmental manager
  - Not smoke or produce flame in No Smoking Areas

#### 9.7.8. Groundwater

##### Impact

Groundwater table can get affected in two ways; groundwater contamination and lowering of ground water table.

There is a possibility that various materials like fuel, lubricant oil and other oily products, which are used during the construction phase may contaminate groundwater, if they are not handled properly. During the construction phase, the sanitary wastewater will be generated at the workers' camp(s). If this wastewater is allowed to stagnate in water ponds on the site, it can percolate into the soil, thereby, contaminating groundwater. This impact is temporary and minor negative in nature.

**Mitigation**

- Groundwater reserves will be protected from any source of contamination such as construction and oily waste that can degrade its potable quality
- The solid waste should be disposed of in designated sites to sustain the water quality for domestic requirements
- Water conservation strategy will be adopted to not cause the lowering of groundwater table
- Regular water quality monitoring shall be done

**9.7.9. Surface Water Quality****Impacts**

There is not any appreciable surface water body in the project influenced area in respect of wastewater discharge; hence, no impacts are predicted.

**Mitigations**

No mitigation is required

**9.7.10. Flora & fauna****Impacts**

The proposed project lies in an industrial estate, and thus there exist no flora & fauna at the project site. Hence, no negative impact on ecological environment will take place on account of cutting trees and clearing of vegetation from the site.

**Mitigation**

In order to reduce construction impacts on surroundings and workers, a tree plantation program has been designed by the project proponent as it would help in cleaning the environment during operational life of the project too.

The landscape plan would assure that designated trees are planted and that, areas suitable for planting are identified and landscaped using majorly local trees and shrub species used for feeding by local bird species.

**9.7.11. Socio-Economic Environment**

A number of categories of employees will be required during the construction phase including skilled and unskilled laborers, engineer, contractor and a small number of other professionals. These levels of short-term employment will have a positive impact on the local economy and

regional unemployment. The management of the Project shall capitalize positive attitude of people of Study Area towards this project by offering them maximum employment opportunities at construction stage of the project. Strong and comprehensive plantation plan will help lessen the fear of the local people towards environmental issues.

Sustainable development approach through conservation of natural resources will prove to be the best strategy to compensate negative socio-environmental impacts. Environmental aspects of the project should be well taken care through the implementation of the Environmental Management and Monitoring Plan (EMMP) as recommended in this report. Socially responsible attitude of the project management towards local people and resources will make the project people friendly. This is a moderate beneficial impact.

## **9.8. Anticipated Environmental Impacts during Operational Phase**

After completion of construction phase; operational stage will be commenced. Following impacts are foreseen during this phase;

### **9.8.1. Air quality**

#### **Impacts**

The gaseous emissions from vehicles and generator can deteriorate the air quality of surroundings, though there will be slight increase in vehicular movement.

#### **Mitigation**

An awareness program will be run for owners of the vehicles to keep the vehicles always tune-up and ensure proper maintenance. The standby generator will be maintained well in time to avoid the black smoke. Proper tuning & lubrication work will be ensured on regular basis. Emissions of exhaust gases will be kept to minimal level employing state of the art and environment friendly machinery for the manufacturing process. Plantation will be done around the boundary wall to minimize the impact of gaseous emission.

### **9.8.2. Noise**

#### **Impacts**

Industrial noise can badly disturb the human organs and daily activities. The noise pollution can affect the communication and because increased stress, disturb sleep, lack of concentration and reduced efficiency. Generator will also cause noise in workplace.

#### **Mitigation**

Earmuffs and earplugs shall be provide to the workers working in the welding area to protect against noise. Plantation of trees along the boundary walls will help in reducing the noise levels to some extent. All the machinery shall be kept properly tuned up and regular maintenance and periodic monitoring will be done. The standby generator will be maintained well & lubrication work done on regularly basis to reduce noise. The working staff at high noisy area will be provided with earmuffs and made sure to use during operation of plant. The noise level will be maintained well within PEQS values and thus not have any significant negative impacts on the surrounding environment or the public. Proposed working hours of proposed unit is from 9:00 a.m. to 6:00 p.m. and the PEQS value of 75.0 dB (A) during daytime (6:00 a.m.-10:00 p.m.) is the PEQS standard values for industrial zones.

The noise levels will not have any significant negative impacts on the surrounding environment or the public and shall be kept within PEQS values.

### **9.8.3. Health & Safety**

#### **Impacts**

During operational phase, there may always be the possibility of occurring hazard to health and safety of workers. Operation of generator and other related machinery may also have safety and maintenance related issues.

#### **Mitigation**

Proactive measurements will be taken that prevent incidents before they manifest as accidents. Health and safety plans will be developed and implemented during operation of the project to ensure the health and safety of workers, decrease accident risks and improve onsite productivity. Personal Protective Equipment will be provided on regular basis and ensured to be worn by working personnel. For workers in areas of significant exposure, sufficient working clothes will be provided to enable daily change into clean clothes. Training programs that support the achievement of the unit's staff and personnel's competency in relation to health, safety and environment will be implemented.

### **9.8.4. Solid Waste**

If solid waste is not managed properly, it can cause bad aesthetics as well as land contamination.

#### **Mitigations**

There will be no process waste. Approximately 3-5 kg of municipal solid waste will generate on daily basis and will mainly consist of food waste and packaging waste and that will be collected in the bins provided FIEDMC. On-source segregation will be encouraged. Secondary collection and disposal of waste will be the responsibility of FIEDMC management.

#### **9.8.5. Wastewater**

##### **Impacts**

Wastewater, if disposed of without any treatment, can cause water pollution and soil contamination, if seeped through.

##### **Mitigations**

Municipal and Process wastewater will generate from the proposed unit. Process wastewater will be disposed after treatment. Municipal wastewater will also be disposed of into internal drain of FIEDMC, after treating primarily through septic tank. For this, septic tank system shall be appropriately installed and maintained. The specifications of the septic tank are already provided under "Environmental Estimates". Additionally, water conservation strategy shall be adopted to minimize the wastewater generation.

#### **9.8.6. Landscaping**

##### **Impacts**

The impacts on natural vegetation and sensitive plant communities are largely restricted to the construction phase. Operational phase impacts are likely to be restricted to maintenance activities within the site such as vegetation clearing through brush cutting from the internal road network. As such these impacts are considered to have a low intensity, and an overall Moderate-Minor significance.

##### **Mitigation**

Landscaping in the form of excessive plantation will be done at the site and the process of plantation will be kept continuous throughout project life. The massive tree rising along walls, rare end, vacant spaces available near the parking area and other places will act as a buffer zone. The plantation process to be started at construction stage shall be kept continued during operation phase of the project too. This will also make the air cleaner due to the production of pure oxygen and by adsorbing particulates from the air.

### **9.8.7. Socio-economic environment:**

#### **Impact**

According to the social survey, the pressing needs of the area are provision of drinking water supply, health care facilities, education institutions and solid waste collection facilities along with development of road infrastructure.

#### **Mitigations**

A number of categories of employees will be required during the operation phase. This will include skilled and unskilled laborers, engineers, contractors and a small number of other professionals. These levels of employment will have a positive impact on the local economy and regional unemployment.

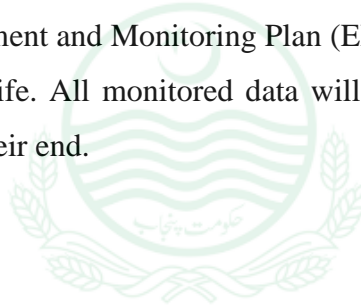
The development of the proposed project will cause high positive impacts on them and their communities.

## **9.9. Potential Environmental Enhancement Measures**

Following potential environment enhancement measures shall be taken by the Project Proponents:

- The pollutants generated in the factories can be discharged to reach standard after proper treatment measures and will not reduce existing environmental functions of this region. The company will meet the environmental assessment and approval rules, it should reduce the influence on environmental quality in this region to the minimum; the company should call on all staff to protect the region environment and put more fund into environment protection.
- All vehicles used in the installation of industrial unit will be regularly inspected and maintained.
- The proponent ensures that there will be a monitoring team under the direct supervision of project proponent which shall 'time and again' take necessary precautions and adopt mitigation measures to keep the environment clean.
- Raw materials and final product will be transported to and from the project site according to best management practices.
- Construction of boundary wall of the proposed site shall be done properly after demarcation of project area and construction and operational activities shall remain confined in this boundary wall.

- A well-integrated security system will be provided for the entire project site. All sensitive areas shall be covered by security cameras.
- All the roads shall be paved to minimize the dust emissions from the vehicles' movement on roads and other infrastructure.
- All workers and visitors shall wear protective clothing and rubber boots.
- Proper cross ventilation and proper height shall be provided to avoid suffocation. Similarly, proper lighting and spacing shall also be provided.
- Extensive plantation will be ensured in and around the project area to enhance the environmental quality.
- The labor force will be trained to use Personal Protective Equipment (PPEs) to avoid any accident at site.
- The vehicles used for transportation of material will be properly designed, covered and cleaned to avoid any risk while departing to and from the project site.
- No structural changes shall be made in the project after grant of relevant NOCs.
- Environmental Management and Monitoring Plan (EMMP) will be strictly operational throughout the project life. All monitored data will be reported to the EPA Punjab, Lahore for scrutiny at their end.



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## **10. ENVIRONMENTAL MANAGEMENT & MONITORING PLAN (EMMP)**

A comprehensive management plan is necessary to implement the recommendations and mitigation measures suggested after assessing and evaluating potential environmental impacts due to the development of the project.

The implementation of EMMP should be carefully coordinated with the design, construction and operation program of the project to ensure that relevant mitigation measures are implemented at the appropriate stage and that adequate resources are properly allocated to achieve the desired results. This EMMP has been prepared to satisfy the requirements of the Pakistan Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) Review Procedures, 2000.

For effective environmental management, the management of the project should assign the necessary responsibilities to its Health, Safety and Environment team, which should be responsible for environmental monitoring of the project.

### **10.1. Objectives of EMMP**

The EMMP provides a delivery mechanism to address potential impacts of the project activities, to enhance project benefits and to introduce standards of good practice to be adopted for all project works. The EMMP has been prepared with the objectives of:

- Defining roles and responsibilities of the project proponent for the implementation of EMMP and identifying areas where these roles and responsibilities can be shared with other parties involved in the execution and monitoring of the project.
- Outlining mitigation measures required for avoiding or minimizing potential impacts assessed in the EIA report.
- Developing a monitoring mechanism and identifying requisite monitoring parameters to confirm effectiveness of the mitigation measures recommended in the EIA report.
- Defining the requirements for communication, documentation, training and monitoring, management and implementation of the mitigation measures.

### **10.2. Institutional Capacity**

Following functionaries will be involved in the implementation of EMMP:

- Project proponent as the executer of Environmental Management and Monitoring Plan
- Project contractor(s) as executors of the EMMP during construction phase of the project
- HSE/ Project Manager
- Environmental Protection Agency (EPA), Punjab as Government Department to review and monitor the implementation of remedial and mitigation measures as provided in EIA

Specific responsibilities of key role players are illustrated hereunder:

### **10.2.1. Responsibilities of Management of Project**

Management of the project will be responsible for the environmental management and supervisory affairs during the project activities. Environmental personnel designated by the management of the project will look after the environmental related issues during the project activities. The responsibilities of Environmental personnel are as follows:

- Monitoring progress of the project as per planned schedule of activities.
- Exercising oversight over the implementation of environmental mitigation measures by the contractor.
- Documenting the experience in the implementation of the environmental process.
- Preparing training materials and implementing programs.
- Maintaining interfaces with the other lined departments/stakeholders and
- Reporting to the management of the projection the status of EMMP implementation.

### **10.2.2. Responsibilities of Project Contractor**

Contractor appointed for the commissioning of the project including the auxiliary facilities is responsible for:

- Implementation of, or adherence to, all provisions of the EMMP and with any environmental and other codes of conduct required by the project.
- Provision of proper Personal Protective Equipment (PPE) to the workers and train them for their proper use.

### **10.2.3. Responsibilities of EPA**

To review and monitor the implementation of remedial and mitigation measures as given in the EIA.

### 10.3. Environmental Trainings

One of the most important mechanisms for the enhancement of the project's overall environmental performance is to organize environmental trainings for the project personnel and the Contractor's team. Environmental training will form part of the ongoing environmental management of the project. Contractor's environmental awareness and appropriate knowledge of environmental protection is critical to the successful implementation of the EMP because without appropriate environmental awareness, knowledge and skills required for the implementation of the mitigation measures, it would be difficult for the Contractor(s) workforce to implement effective environmental protection measures. Adoption of these measures will help Proponent and the Contractor to achieve a high level of environmental awareness in the project team, which should, in turn, promote sound environmental management during project lifespan.

#### 10.3.1. Training Schedule

A training schedule will be developed by the Health & Safety manager and organized and maintained by the management of the project and contractors. Following is the comprehensive form of the training schedule;

Table 10-1: Training Schedule

Provided by	Trainee	Contents	Duration	Responsible Authority
HSE Manager & Training Assistant	All working personnel	<ul style="list-style-type: none"> <li>○ Environmental laws and regulations, daily monitoring and supervision</li> <li>○ Introduction to project EIA and EMMP</li> <li>○ Importance of safety practices and usage of PPEs</li> <li>○ Environmental sensitivities of the project area</li> <li>○ Communication of environmental problems to corresponding officials</li> </ul>	Monthly	Project Management & Contractor

		○ Waste disposal		
Consultants/ specializing in social management	Staff dealing in social matters	○ Short seminars and courses on: Social awareness ○ Effective public speaking	Monthly	Project Manager
Drivers	As specified	○ Road safety ○ Road restrictions ○ Vehicle/driving restrictions ○ Applicable rules & regulations ○ Defensive driving	Twice a month	Project Management & Contracto r
Consultants/ organizations specializing in occupational, health and safety issue	As specified	○ Short lectures relating to Occupational Safety and Health	Twice a year	Project CEO

#### 10.4. Environmental Management and Monitoring Plan (EMMP)

The Environmental Management and Monitoring Plan (EMMP) will be used as a management and monitoring tool for implementation of the mitigation measures identified in the EIA report.

The EMMP matrix lists down:

- The required mitigation measures recommended in the EIA report.
- The person/organization directly responsible for adhering to or executing the required mitigation measures and monitoring adherence to the mitigation measures.
- The parameters, which will be monitored to ensure compliance with the mitigation measures.
- The timing at which the mitigation or monitoring has to be carried out.
- Project proponent will hold primary and overall responsibility for ensuring full implementation of the EMMP.

## 10.5. EMMP for Pre-construction, Construction & Decommissioning phase

The EMMP during construction phase includes following:

- Air quality management & monitoring plan
- Noise management & monitoring plan
- Waste management & monitoring plan
- Health and safety management & monitoring plan
- Energy management & monitoring plan
- Water management & monitoring plan

Table 10-2: Air Quality Management & Monitoring Plan

Management Plan			Monitoring Plan		Cost
Sr. No.	Potential Impacts	Management & Monitoring Measures	Timeframe	Responsible Authority	(PKR)
<b>Reduce Dust Emissions</b>					
1	<b>Dust Emissions</b>	Ensure strict enforcement of on-site speed limit regulations	Pre-construction, Construction & Decommissioning phase	HSE representative	0
		Avoid excavation works in extremely dry weathers	Pre-construction, Construction & Decommissioning phase	HSE representative	0
		Sprinkle water on graded access routes when necessary to reduce dust generation by construction vehicles	Pre-construction, Construction & Decommissioning phase	HSE representative	5,000/ month
		Personal Protective equipment to be worn by the workers	Pre-construction, Construction & Decommissioning phase	Proponent/ HSE representative	10,000

		Construction materials on site must be covered to prevent their blown off by wind	Pre-construction, Construction & Decommissioning phase	Contractor	5,000
<b>Reduce Exhaust Emissions</b>					
2	<b>Exhaust Emissions</b>	Vehicle idling time shall be minimized	Pre-construction, Construction & Decommissioning phase	Proponent & Contractor	0
		Alternatively, fueled construction equipment shall be used where feasible equipment shall be properly tuned and maintained	Pre-construction, Construction & Decommissioning phase	Proponent & Contractor	0
		Sensitize truck drivers to avoid unnecessary racing of vehicle engines at loading/un-loading points and parking areas, and to switch off vehicle engines at these points	Pre-construction, Construction & Decommissioning phase	HSE representative	0

Table 10-3: Noise Management &amp; Monitoring Plan

Management Plan			Monitoring Plan		Cost
Sr. No	Potential Impacts	Management & Monitoring Measures	Schedule of Implementation	Responsible Party	(PKR)
<b>Minimization of Noise and Vibrations</b>					
		Sensitize construction vehicle drivers and machinery operators to switch off engines of	Pre-construction, Construction &	HSE representative	0

1	<b>Noise and Vibrations</b>	vehicles or machinery not being used	Decommissioning phase		
		Sensitize construction drivers to avoid gunning of vehicle engines or unnecessary hooting especially when passing through sensitive areas such as churches, mosques, residential areas and schools	Pre-construction, Construction & Decommissioning phase	HSE representative	0
		Ensure that construction machinery is kept in good condition to reduce noise generation	Pre-construction, Construction & Decommissioning phase	Proponent & Contractor	10,000
		Ensure that all generators and heavy-duty equipment are insulated or placed in enclosures to minimize ambient noise levels	Pre-construction, Construction & Decommissioning phase	Proponent & Contractor	5,000
		The noisy construction works will entirely be planned to be during daytime when most of the neighbors will be at work	Pre-construction, Construction & Decommissioning phase	Proponent & all site foreman	1,000

Table 10-4: Waste Management &amp; Monitoring Plan

Management Plan			Monitoring Plan		Cost
Sr. No.	Potential Impacts	Management & Monitoring Measures	Schedule of Implementation	Responsible Party	(PKR)

<b>Minimization of solid waste generation and ensure efficient solid waste management</b>					
1	<b>Increased solid waste generation</b>	Use of an integrated solid waste management system i.e. through a hierarchy of options: i. Source reduction ii. Recycling iii. Composting and reuse iv. Combustion v. Sanitary land filling	Pre-construction, Construction & Decommissioning phase	Proponent/ Contractor/ HSE representative	5,000
		Through accurate estimation of the sizes and quantities of materials required, order materials in the sizes and quantities they will be needed, rather than cutting them to size, or having large quantities of residual materials	Pre-construction, Construction & Decommissioning phase	Project manager/ Proponent/ HSE representative	0
		Ensure that construction materials left over at the end is used in other projects rather than being disposed of	Pre-construction, Construction & Decommissioning phase	Proponent/ Project manager	5,000
		Ensure that damaged or wasted construction materials including pipes, doors, plumbing and lighting fixtures, marbles will be	Pre-construction, Construction & Decommissioning phase	Proponent/ Project manager	1,000

	recovered for refurbishing and use in other projects			
	Donate recyclable/reusable or residual materials to local community groups, institutions	Pre-construction, Construction & Decommissioning phase	Proponent	0
	Use of durable, long-lasting materials that will not need to be replaced as often, thereby reducing the amount of construction waste generated over time	Construction Phase	Proponent & Contractor	2,000
	Provide facilities for proper handling and storage of construction materials to reduce the amount of waste caused by damage or exposure to the elements	Pre-construction, Construction & Decommissioning phase	Proponent & Contractor	5,000
	Use building materials that have minimal or no packaging to avoid the generation of excessive packaging waste	Construction Phase	Proponent & Contractor	0

Table 10-5: Health &amp; Safety Management &amp; Monitoring Plan

Management Plan			Monitoring Plan		Cost
Sr. No.	Potential Impacts	Management & Monitoring Measures	Schedule of Implementation	Responsible Party	(PKR)

<b>Minimization of occupational health and safety risks</b>					
1	<b>Health and Safety Impacts</b>	Ensure the general safety and security at all times by providing day and night security guards and adequate lighting within and around the premises	Continuous	Proponent/ HSE representative	15,000
		Construction of a perimeter wall around the project area	On commencement	Contractor/ HSE representative	10,000
		Suitable overalls, safety footwear, dust masks, gas masks, respirators, gloves, ear protection equipment etc. should be made available and construction personnel must be trained to use the equipment	Once off	Proponent/ Contractor/ HSE representative	10,000
		Implement all necessary measures to ensure health and safety of workers and the general public during operation of the project	Continuous	Proponent/ Contractor/ HSE representative	5,000
2	<b>Health &amp; Safety</b>	Well stocked first aid box which is easily available and accessible should be provided within the premises	Pre-construction, construction & Decommissioning phase	Proponent & Contractor	5,000
		Provision must be made for persons to be trained in first aid, with a certificate issued by a recognized body	One-off	Proponent & Contractor	10,000

3	<b>Fire Protection</b>	Firefighting equipment such as fire extinguishers should be provided at strategic locations such as stores and construction areas	One-off	Proponent & Contractor	15,000
		Regular inspection and maintenance of the equipment must be undertaken by a reputable service provider and records of such inspections must be maintained.	Quarterly	Proponent/ Contractor/ HSE representative	10,000
		Fire escape routes and assembly point must be marked at the project site	Continuous	Proponent/ Contractor/ HSE representative	5,000
		Signs such as “NO SMOKING” must be prominently displayed within the premises, especially in parts where flammable materials are stored	One-off	Proponent & Contractor	10,000

Table 10-6: Energy management &amp; monitoring plan

Management Plan			Monitoring Plan		Cost
Sr. No.	Potential Impacts	Management & Monitoring Measures	Schedule of Implementation	Responsible Party	(PKR)
<b>Minimization of Energy Consumption</b>					
1	<b>Increased Energy Consumption</b>	Ensure electrical equipment, appliances and lights are switched	Throughout construction period	Proponent & Contractor	11,000

		off when not being used			
		Install energy saving fluorescent tubes at all lighting points instead of bulbs which consume higher electric energy	Pre-construction, construction & Decommissioning phase	Proponent & Contractor	15,000

Table 10-7: Water Management &amp; Monitoring Plan

Management Plan			Monitoring Plan		Cost
Sr. No.	Potential Impacts	Management & Monitoring Measures	Schedule of Implementation	Responsible Party	(PKR)
<b>Minimize water consumption and ensure more efficient and safe water use</b>					
1	<b>High Water Demand</b>	Promptly detect and repair water pipelines and tank	Continuous	Proponent	5,000 /month
		Ensure taps are not running when not in use	Continuous	Proponent	1,000 /month
		Install a discharge meter at water outlets to determine and monitor total water usage	One-off	Proponent/ Construction manager	1,000

## 10.6. EMMP for Operational Phase

The EMMP during operational phase includes following:

- Air quality management & monitoring plan
- Noise management & monitoring plan
- Waste management & monitoring plan
- Health and safety management & monitoring plan
- Energy management & monitoring plan

- Water management & monitoring plan

Table 10-8: Air Quality Management &amp; Monitoring Plan

Management Plan			Monitoring Plan		Cost
Sr. No.	Potential Impacts	Management & Monitoring Measures	Schedule of Implementation	Responsible Party	(PKR)
<b>Minimize the risks of air quality deterioration due to dust and gaseous emissions</b>					
1	<b>Gaseous emissions</b>	The vehicles and generator are to be kept well maintained. Plantation will be done around the area.	Continuous	Proponent/ HSE representative	10,000/ month

Table 10-9: Noise Management &amp; Monitoring Plan

Management Plan			Monitoring Plan		Cost
Sr. No.	Potential Impacts	Management & Monitoring Measures	Schedule of Implementation	Responsible Party	(PKR)
<b>Minimization of Noise and Vibrations from machinery</b>					
1	<b>Noise and Vibrations</b>	Properly designed machinery will be purchased.	Once-off	HSE representative	Cost of machinery
		All operational machinery will be inspected and maintained for wear and tear	Throughout operation period	Proponent & Contractor	10,000 /month
		Ensure that all generators and heavy-duty equipment are insulated to minimize noise levels.	Throughout operation period	Proponent & Contractor	5,000 /month
		The noisy operational works will entirely be planned to be during	Throughout operation period	Proponent & all site foreman	1,000 /month

		daytime when most of the neighbors will be at work.			
		Ensure simple engineering and administrative controls for the operation of machinery	Throughout operation period	HSE representative	5,000 /month

Table 10-10: Waste Management &amp; Monitoring Plan

Management Plan			Monitoring Plan		Cost
Sr. No.	Potential Impacts	Management & Monitoring Measures	Schedule of Implementation	Responsible Party	(PKR)
<b>Minimization of solid waste generation and ensure efficient solid waste management</b>					
1	<b>Solid waste generation</b>	Provide solid waste handling facilities such as waste bins and skips	One-off	Proponent	8,000 /month
		Ensure that solid waste generated at the offices and industry is collected	Continuous	Proponent	10,000 /month
		Ensure that staff at project site manages their waste efficiently through recycling, reuse and proper disposal procedures	Continuous	Proponent	0
		Donate redundant but furniture to charities and institutions	Continuous	Proponent	0
<b>Minimize risks of sewage release into environment</b>					

2	Sewage Disposal	Ensure implementation of water conservation strategies to minimize the amount of sewage generated	Continuous	Proponent & HSE representative	5,000
		Conduct regular inspections for drainage pipe blockages or damages and fix appropriately	Continuous	Proponent & HSE representative	500 per inspection
		Ensure time to time monitoring of the wastewater discharged from the project to ensure that the stipulated effluent discharge rules and standards are not violated	Continuous	Proponent	10,000 per sample
		Ensure the installation of septic tank for primary treatment	Once-off	Proponent	50,000-100,000

Table 10-11: Health and Safety Management &amp; Monitoring Plan

Management Plan			Monitoring Plan		Cost
Sr. No.	Potential Impacts	Management & Monitoring Measures	Schedule of Implementation	Responsible Party	(PKR)
<b>Minimization of fire and health and safety risks</b>					

1	<b>Health and Safety Impacts</b>	<p>Implement all necessary measures to ensure health and safety of the workers and the general public during operation of the project. Train all workers of fire safety procedures</p> <p>Ensure installation of firefighting equipment with the premises of industry. Install fire extinguishers, fire alarms, smoke detectors, fire hydrants etc. to cope up with fire events</p>	One-off	Proponent	15,000
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Table 10-12: Energy Management &amp; Monitoring Plan

Management Plan			Monitoring Plan		Cost
Sr. No.	Potential Impacts	Management & Monitoring Measures	Schedule of Implementation	Responsible Party	(PKR)
<b>Minimization of Energy Consumption</b>					
1	<b>Energy Resource Utilization</b>	Switch off electrical equipment, appliances and lights when not being used	Continuous	Proponent	0
		Install occupation sensing lighting at various locations such as storage areas which are not in use all the time	One-off	Proponent	10-40% higher than ordinary lighting
		Install energy saving fluorescent tubes at all lighting points within the facility instead of bulbs	One-off	Proponent	10-40% higher than ordinary lighting

		which consume higher electric energy			
		Monitor energy use during the operation of the project and set targets for efficient energy use	Continuous	Proponent	7,000 /month
		Sensitize workers to use energy efficiently	Continuous	Proponent	5,000

Table 10-13: Water Management &amp; Monitoring Plan

Management Plan			Monitoring Plan		Cost
Sr. No.	Potential Impacts	Management & Monitoring Measures	Schedule of Implementation	Responsible Party	(PKR)
<b>Minimize water consumption and ensure more efficient and safe water use</b>					
1	<b>Water Demand</b>	Promptly detect and repair water pipelines and tank leaks.	Continuous	Proponent	7,000/month
		Ensure taps are not running when not in use.	Continuous	Proponent	0
		Users to conserve water e.g. by avoid water loss.	Continuous	Proponent	0
		Install water conserving taps that turn-off automatically	Once-off	Contractor/ Construction manager	10-40% higher

### 10.7. Schedule for Implementation and Environmental Budget

The cost required to effectively implement the mitigation measures is important for the sustainability of the Project. The proponent of the subject industrial unit has allocated the Environmental Cost or budget of Rs. 260,000/annum for recover any damages done by the project activities to environment which will include Environment, Health & Safety, for restoration, rehabilitation & landscaping of the area, for installing any pollution abating

technology or equipment, for any maintenance and repair of safety devices, for the implementation of Environmental Management Plan and other environment related aspects.

Table 10-14: Environmental Budget for the Project

<b>Environmental Component</b>	<b>Quantity (Number)</b>	<b>Amount PKR</b>	<b>Schedule of Implementation</b>
Landscaping	500-800	50,000	Once in project life
Implementation of EMMP	Lump sump	50,000	Throughout the project life
Environmental Trainings	Lump sump	50,000	Quarterly
Air Quality Monitoring	Lump sump	20,000	Twice a year
Water Quality Monitoring	Lump sump	20,000	Twice a year
Noise Level Monitoring	Lump sump	20,000	Twice a year
External Monitoring	Lump sump	50,000	Yearly
<b>Total Environmental budget</b>		<b>260,000</b>	

### 10.8. Environmental Management Team

Environmental management team will be made responsible for overseeing the environmental performance in the industry and develop, implement and monitor environmental strategies that promote sustainable production. The team will comprise Environmental Manager and Assistant Managers; their responsibilities are as follows;

<b>Position of Team Member</b>	<b>Roles and Responsibilities</b>
Environmental Manager	<ul style="list-style-type: none"> <li>○ Implementing environmental policies and practices</li> <li>○ Devising strategies to meet targets and to encourage best practice</li> <li>○ Devising the best tools and systems to monitor performance and to implement strategies</li> <li>○ Ensuring compliance with environmental legislation</li> <li>○ Assessing, analyzing and collating environmental performance data and reporting information to internal staff, clients and regulatory bodies</li> <li>○ Confirming that materials, ingredients and so on are ethically or environmentally sourced</li> <li>○ Managing environmental strategy budgets</li> </ul>

	<ul style="list-style-type: none"> <li>○ Liaising with internal staff including senior managers and directors</li> <li>○ Acting as a champion or cheerleader for environmental issues within your organization</li> <li>○ Providing environmental training to staff at all levels</li> <li>○ Writing plans and reports</li> <li>○ Keeping up to date with relevant changes in environmental legislation and initiatives including international legislation where applicable</li> <li>○ Producing educational or information resources for internal staff, clients or the general public</li> <li>○ Liaising with regulatory bodies such as the Environment Agency</li> </ul>
Assistant Manager Compliance	<ul style="list-style-type: none"> <li>○ Develop and oversee control systems to prevent or deal with violations of legal guidelines and internal policies</li> <li>○ Evaluate the efficiency of controls and improve them continuously</li> <li>○ Revise procedures, reports etc. periodically to identify hidden risks or non-conformity issues</li> <li>○ Draft, modify and implement company policies</li> <li>○ Collaborate with corporate counsels and HR departments to monitor enforcement of standards and regulations</li> <li>○ Assess the business's future ventures to identify possible compliance risks</li> <li>○ Review the work of colleagues when necessary to identify compliance issues and provide advice or training</li> <li>○ Keep abreast of regulatory developments within or outside of the company as well as evolving best practices in compliance control</li> <li>○ Prepare reports for senior management and external regulatory bodies as appropriate</li> </ul>
Assistant Manager EHS	<ul style="list-style-type: none"> <li>○ Research health and safety regulations, such as OSHA laws, and create company safety protocols.</li> <li>○ Supervise safety and security staff.</li> <li>○ Look into accident and injury claims company-wide, ensuring results consistent with company goals.</li> <li>○ Educate all personnel on health and safety policies and company safety goals</li> </ul>

## 10.9. Proposed Monitoring Program

Environmental monitoring can be categorized into two types:

- Compliance Monitoring
- Effects Monitoring

The environmental monitoring will be conducted according to SMART rules and EPA regulation.

### 10.9.1. Compliance Monitoring

Compliance monitoring will be carried out to ensure compliance with the requirements of the EIA and EMMP. The project staff and contractors will carry out the inspections on a routine basis. This will also include the routine monitoring at the project site as specified in EMMP.

### 10.9.2. Effects Monitoring

Effects monitoring will be done to monitor actual impacts of the project on selected sensitive receptors so that impacts not anticipated in the EIA report or impacts which exceed the levels anticipated in the EIA report can be identified and appropriate mitigation measures can be adopted on time.

### 10.9.3. Monitoring components

Time to time environmental monitoring will be carried out by the management of proposed unit for the following essential components of environment;

- Noise Levels
- Ambient air quality
- Water Quality
- Solid waste management
- Wastewater disposal
- Vehicular emissions
- Soil Contamination (if needed)
- Health& Safety

The monitoring can be performed through observation, in laboratory or by both means as per requirement, such as;

**Table 10-15: Proposed Monitoring Program**

Environmental Component	Monitoring Type		Timeframe
	Observation	Laboratory	
Noise Levels	✓	✓	Twice a year
Ambient air quality	✓	✓	Twice a year
Water Quality		✓	Twice a year
Solid waste management	✓		Weekly
Wastewater disposal	✓		Weekly
Vehicular emissions	✓		Monthly

Soil Contamination (if needed)		✓	Twice a year
Health & Safety	✓		Twice a week

### 10.10. Proposed EMP Reporting & Reviewing Procedures

EMP Reporting & Reviewing Procedures emphasize that the EMP shall set forth in sufficient detail all the design measures, monitoring programs, best management practices, and emergency and contingency plans to assure best that all the potential impacts are methodically controlled and suitably mitigated. In addition to reviewing the EIA report recommendations, the management of the industry should compare these documents and plans to the guidelines for such Industrial units in its evaluation of what is applicable or otherwise should be included in the EMP. Employee educational and training materials to be submitted to best for their review 3 weeks prior to the beginning of staff training.

### 10.11. Equipment Maintenance Details

The proposed project is establishment of “Sufi Chemicals ,” in FIEDMC. The management of the industry will maintain the records for Health Safety & Environment and will hire HSE manager to check and deal with the HSE issues. All industrial tools, equipment and vehicles will be kept properly maintained so that workers are not endangered. However; maintenance tasks themselves are potentially hazardous and can result in injury and a successful maintenance program is:

- Well organized and scheduled,
- Hazards controlling,
- Defining operational procedures, and
- Training key personnel

Preventive and regularly scheduled maintenance is vital to the efficiency and life of large machinery.

#### 10.11.1. Necessity of Maintenance

- Preventive maintenance preserves the value of the equipment. Keeping machines in good working order extends equipment life and keeps operators safe. It also ensures the availability of the machinery.
- Early detection of problems allows repairs to be made before the situation worsens. Machinery that does not need to be taken offline for extensive repairs will avoid

production interruptions. Regular inspections and analysis can be used to predict and prevent component failures that may create safety hazards and machinery breakdowns.

- Good maintenance is important for worker safety. Large machinery maintenance can be dangerous. It is often conducted in close contact with running machinery. The conditions can be closely confined and unhealthy. The work is non-routine and subject to human error. There is often time pressure involved as well. The Occupational Safety and Health Administration (OSHA) reports that 15 to 20 percent of industrial accidents and 10 to 15 percent of all fatal industrial accidents are related to maintenance operations.
- Preventive maintenance and scheduled equipment overhauls can diminish the chances of large machinery breakdown and thus lessen the risks that technicians face in onsite repairs. Accidents in the workplace are also significantly reduced.

#### **10.11.2. Methodology of Equipment Maintenance**

Following steps will be taken for machinery maintenance in the proposed industry;

##### ***Keep Daily Records of Use and Oversee Operation***

- Large machinery wear and breakdown are often made worse by unskilled handling. Keeping records of machinery use and monitoring daily operations will help pinpoint when and where the machinery is being used by inadequately skilled operators.
- A new way to oversee the operations of large machinery is via GPS. The device tracks movement and records it in digital records, which are organized to be easily retrieved. Problems can be caught early, and breakdowns can be prevented.

##### ***Maintain a Schedule of Planned Maintenance***

- Components break down, and wear is inevitable. Forecasts for the expected life of all components will be established and replaced on schedule. Part replacement must be done by knowledgeable technicians.
- Bearings are key components of heavy machinery equipment and can be easily damaged or worn. Bearing housings shall be regularly maintained, including inspection for corrosion and wear, and replaced when necessary. A maintenance log will also be kept to ensure regular checks are not missed and compliance is measured.

##### ***Lubricate and Clean Frequently***

- Working heavy machinery requires daily maintenance. Some components, especially moving parts in engines and power trains, demand frequent lubrication. Other components, such as hydraulic lifts and bearings, will be monitored and lubricated at the first sign of need.
- Contamination can lead to machinery breakdown. Water is a major source of corrosion. Lubrication prevents corrosion. Maintaining seals and replacing filters will help keep lubricants free of contaminants.

#### ***Inspect and Monitor Components for Wear and Damage***

- A planned maintenance schedule can predict component wear. Visually inspect components on an ongoing basis to monitor wear and prevent equipment failure. Components that must be replaced ahead of schedule may signal a larger problem that needs to be diagnosed.
- Check belts, pulleys and chains for alignment and condition. Gears and sprockets for broken teeth, cracks and misalignment will be inspected regularly.
- Fluid analysis should also be part of a regular maintenance schedule. Analysis of used lubricants and other fluids is an excellent way to diagnose problems and prevent machinery wear and breakdown. Identifying contaminants in the fluids can lead analysts to the source of wear and damage.

#### ***Protect Equipment during Storage***

- Large machinery will be stored under cover whenever possible. Motors, turbines, mixers and other equipment will be rotated frequently. Idle machinery will be inspected for rust, condensation and contamination. Oil-mist lubrication is a good solution for the damaging effects of warm, humid environments; so, lubrication will also be checked.

### **10.12. Change Management Plan**

The EIA report recognizes that changes in the operations or the EMMP may be required during the operation and therefore a Change Management Plan has been provided to manage such changes. The management of changes is discussed under two separate headings, changes to the EMMP and changes to the operation.

### **10.12.1. Changes to the EMMP**

The EIA report and the EMMP have been developed based on the best possible information available at the time of the EIA study. However, it is possible that during the construction and operational phase, some aspects of the EMMP need to be changed owing to their non-applicability in a certain area of operation or the need for additional mitigation measures based on the findings of environmental monitoring during the construction and operational phases. In such cases following actions shall be taken.

- A meeting will be held between management and the concerned contractor. During the meeting the proposed deviation from the EMMP, planning and designing will be discussed and agreed upon by all parties.
- Based on the discussion during the meeting, a change report will be produced collectively, which will include the original EMMP clause/plan or design, the change that has been agreed upon, and the reasons for the change.
- The report will be signed by all the parties and will be filed at the site office. A copy of the report will be sent to the management of the project and contractor head offices.

### **10.12.2. Changing in the Planning and Design**

The change management system recognizes three orders of changes.

#### **First Order Change**

A first order change is one that leads to a significant departure from the project described or the impacts assessed in the EIA report and consequently require a reassessment of the environmental impacts associated with the change. Examples of such change include change in location of the proposed project. In such an instance, the environmental impacts of the proposed change will be reassessed, and the results sent to the Punjab EPA for approval.

#### **Second Order Change**

A second-order change is one that entails project activities not significantly different from those described in the EIA, and which may result in project impacts whose overall magnitude would be similar to the assessment made in this report. In case of such changes, the environmental impact of the activity will be reassessed, additional mitigation measures will be specified if necessary, and the changes will be reported to the Punjab EPA.

#### **Third Order Change**

A third-order change is one that is of little consequence to the EIA report findings. This type of change does not result in impact levels exceeding those already assessed in the EIA; rather these may be made onsite to minimize the impact of an activity. The only action required in this case will be to record the change in the change record register.

### **10.12.3. Improved Monitoring and Management Practices**

The EIA study and the EMP have been developed based on the best possible information available at the time of study. However, it is possible that during the operation of project some aspects of the EMP need to be changed owing to their non-applicability in a certain area of transportation or the need for additional mitigation measures based on the findings of environmental monitoring. In such cases following actions shall be taken:

1. A meeting will be held between management and the concerned contractor. During the meeting the proposed deviation from the EMP, planning and designing will be discussed and agreed upon by all parties.
2. Based on the discussion during the meeting, a change report will be produced collectively, which will include the original EMP clause/plan or design, the change that has been agreed upon, and the reasons for the change.
3. The report will be signed by all the parties and filled at the site office. A copy of the report will be sent to proponent and contractor head offices.
4. All relevant project personnel will be informed about the change.

### **10.13. Compensation in Terms of Money**

Changes in the EMP can be done up to 5% of the total development cost in case the mitigation and monitoring of the environment according to the prescribed plan does not render useful.

### **10.14. Replacement, Relocation and Rehabilitation Plan**

The estimated life of the project is about 50 years. Much before the project approaches end of its first life cycle it will be completely renovated, refurbished and even new/latest art of the equipment will replace the older one. All civil structures and related infrastructures will be extensively renovated. All activities will be carried out in accordance with prevailing environmental management laws and controls so as to avoid any damage to any segment of environment or human health around the project site. Rehabilitation would not be required as such at current project site.



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## 11. STAKEHOLDERS CONSULTATION

Public Consultation is a mandatory part of the EIA process for development projects. It is a tool used for communication with a diverse group of stakeholders having multifarious aims such as information dissemination, exchanging views, soliciting feedback and suggestions on issues pertaining to the project, plan future actions. The adequacy of the public consultation and information disclosure is one of the basic criteria used to determine the project compliance with the national / international safeguard policies.

The consultation process was carried out in accordance with the requirements of Pakistan Environmental Procedures. The objectives of this process were to:

- ✓ Inform the public about what is proposed project
- ✓ Identify and involve all stakeholders, especially local residents, in the consultative and participation process
- ✓ Share information with stakeholders on the design and construction of the proposed project and anticipated impacts on the physical, biological and socioeconomic environment of the project area
- ✓ Understand stakeholders' concerns regarding various aspects of the project, including the existing available facilities and problems, construction of the project and the likely impacts (positive & negative) of construction and operation related activities
- ✓ Understand the perceptions, assessment of social impacts and concerns of the communities in the vicinity of the proposed project
- ✓ Provide an opportunity to the public in the public consultation session to provide valuable suggestions for the project design in a positive manner
- ✓ Reduce the chances of conflict through the early identification of controversial issues, and consult them to find acceptable solutions.

This section describes the outcome of the public consultation sessions held with different stakeholders that may be directly or indirectly affected by the proposed project.

### 11.1. Methodology of Consultation

For ascertaining the perceptions of different stakeholders about the project (during construction/operation) consultation meetings were held with them in the vicinity of the proposed project. The meetings with stakeholders were carried out from 20 to 22<sup>nd</sup> February, 2021.

Consultation was carried out in order to establish stakeholder's opinion regarding project implementation. The methods used for public consultation with project stakeholders include Scoping Sessions, Formal Meetings, Informal Meetings and Individual Interview. All the stakeholders were briefed about the project verbally. Their feedback was noted, and all the concerns voiced in the discussion were relayed to the management team of the project.

## **11.2. Study Area and Identification of Stakeholders**

The area of M-3 Industrial City, Sheikhpura Industrial Estate Development & Management Company as a whole was the part of our study area boundaries. The land for proposed unit is situated in FIEDMC – M-3 Industrial City developed by Sheikhpura Industrial Estate Development and Management Company (FIEDMIC) is adjacent to existing SEZ of Allama Iqbal Industrial City, Sheikhpura and near Sahianwala Interchange Motorway M-3.

Stakeholders are those entities who have a direct or indirect interest in project development. During the field survey, significant efforts were made to identify the possible categories of stakeholders and their stakes. The stakeholders identified during field survey were the management and working personnel in nearby industries, management of FIEDMC, local residents around the project or in close vicinity of the industrial estate, environmental experts, customers, pedestrians and road users. All the stakeholders had different types of stakes according to their professions which were listed down along with their apprehensions. Informal group discussions were also held as an additional tool for the assessment of the perceptions of the stakeholders.

## **11.3. Categories of Stakeholders Consulted**

The Stakeholders contacted during the survey belonged to different categories, as under;

### **11.3.1. Proponent's Environmental Management Team**

Possible potential impacts and mitigation measures related to the proposed project during its construction and operational phases were discussed in detail with the project proponent. They assured to undertake all the suggested mitigation measures to control, eliminate or minimize the anticipated potential impacts and control any discrepancy arose by the project to make the project environmental friendly. The environmental management team of the proponent was made aware of their responsibilities which include;

- Oversee daily activities of team members to maintain environmental management system (EMS)
- Ensure that industrial operations are in compliance with local, state and federal environmental regulations
- Follow and enforce environmental policies and procedures. ..

### **11.3.2. The responsible Authority**

The management of the industry is the responsible authority to take all mitigation measures to protect the environment prior to commencement of the project.

### **11.3.3. Other departments and agencies**

Scoping Sessions, focused group discussion and way side consultations were held with the relevant stakeholders in the area. The purpose of such consultation was to obtain feedback from relevant personnel.

For the analysis of anticipated potential impacts, detailed meetings were held with the management of the subject industrial unit, local community surrounding the project area and bearers/ members of Sheikhpura Industrial Estate. Issues were discussed that might affect the environment and implementation of proposed project. All the possible mitigation measures were considered and have been incorporated in the Environmental Management Plan (EMP) provided in this EIA report.

### **11.3.4. Environmental Practitioners and Experts**

The expert team of AAT consulting. visited the proposed project site, had discussion with stakeholders and consulted the personnel working in neighboring industries and local community residing nearby the industrial estate. People of the area belonged to different professions such as doctors, lawyers, government employees, teachers, agriculture etc. and some had their own business. People provided massive information about the project and most of them showed positive remarks regarding the project development.

### **11.3.5. Affected Wider Community**

There is no affected community present in the radius of the study area. The people showed optimistic attitude towards the development of subject unit. Stakeholders' participation Performa/ socio-economic questionnaire were also get filled to evaluate the projects impacts especially socio-economic impacts. Those Performa/ socio-economic questionnaire are

attached as appendices with this EIA report. Categories of stakeholders consulted while survey/ public consultation sessions are under:-

#### **11.4. Consultation Meetings and Formal & Informal Group Discussions**

Among all stakeholders some major stakeholders were identified in the proposed project area. Consultation meetings regarding project impacts, their magnitude and mitigation measures were held with the Management of Sufi Chemicals, environmental practitioners, local residents around the project or in close vicinity of the industrial estate, pedestrians, management of FIEDMC, general public, customers and pedestrians to know their concerns regarding proposed project. Scoping sessions and meeting were conducted with these stakeholders. Generally, it was found that people were already aware of the proposed project because the project is to be located in the Industrial Estate and various industries are being established there time to time. Majority of the stakeholders showed their full support for the proposed project.

##### ***Following are the other concerns/ suggestions of the stakeholders;***

- Exposure of noise and dust pollution will cause disturbance and health & safety issues to the local residents and other stakeholders throughout the construction stage due to the movement of construction machinery and transportation of construction materials. The effects of noise and dust pollution on the local residents should be minimized by making necessary arrangements. Dust pollution should be controlled by water sprinkling on regular basis.
- Due to the movement of loaded trucks during the construction period of proposed project, congestion on the access road will increase. Proper diversion route rather than access road should be clearly defined to avoid traffic blockage during the entire construction period.
- Local residents should be given priority for jobs during construction as well as operational phase of the project
- Public utilities should not be disturbed. Arrangements should be made to minimize the disruption of public utilities or should be rehabilitated on priority basis to reduce the impacts.
- A detailed health and safety plan must be developed to mitigate the construction and operational risks of the proposed project

- Solid waste and wastewater produced during construction and operational phases should be disposed of timely and appropriately.

Mitigation measures proposed by EIA consultants for addressing the stakeholder's concerns are as follows;

- Significant efforts including change in design should be adopted to minimize the physical and economical disturbance of the local residents.
- Local residents should be given priority while hiring manpower during construction and operational phases of the proposed project.
- Construction machinery should be placed at adequate locations away from the sensitive areas to minimize the impacts related to the noise.
- Project facilities should be located outside the existing residential areas. In order to avoid restricting the daily movement of the local stakeholders; construction vehicles should remain confined within their designated areas of movement
- The utilities to be shifted due to the implementation of the proposed project should be rehabilitated on priority basis to minimize the impacts on the stakeholders. Landscaping must be done.
- Solid waste and wastewater generated during construction at site should be disposed of safely and in an appropriate manner to not impact the environment
- All necessary measures should be taken to ensure the safety of traffic during construction, including barricades (including signs boards, pavement markings, flags, and lights).
- Dust and noise levels should be kept to minimum employing the best suitable and effective mitigation measure
- The construction activities must be confined within the project site boundary

A list of individuals consulted and their written feedback is annexed with the report.

## 12. CONCLUSIONS & RECOMMENDATION

This section presents conclusions of the EIA Report. This EIA study has been carried out as per requirements of EPA, Punjab. Based upon the findings of this environmental assessment, below are key study findings are summarized in the form of conclusion.

### 12.1.1. Conclusion

The implementation of the proposed project will have many beneficial impacts such as;

- The subject industrial unit will contribute towards resource recovery
- The establishment of this industrial unit will contribute towards industrial development in the country and country towards its GDP.
- Local people will get employment opportunities and thus the industry will contribute towards better socio-economic condition of the area.

Apart from the beneficial impacts of the project, the proposed project has potential environmental impacts during all phases. Most of the adverse impacts during construction are of a temporary nature. These potential impacts can be avoided or mitigated by adopting suitable mitigation or remedial measures as mentioned in the EIA Report. Following conclusions are based on the findings of this EIA study.

- Various liquids like fuel, lubricant oil and other oily products, which are used during the construction phase may contaminate groundwater
- Construction camp location and mismanagement of construction camp activities may lead to various social and environmental impacts such as: loss of vegetation, indiscriminate generation of solid waste, discharge of sanitary effluent, water pollution and social & cultural conflicts.
- Health risks and work safety problems may result at the workplace/camps if the working conditions provide unsafe and/or unfavorable working environment due to storage, handling and transport of construction materials and malfunctioning in operation of construction machinery and equipment
- Air quality will be affected by fugitive dust emissions from construction machinery; dust from the unpaved surface and construction vehicles. Emissions may be carried over longer distances depending upon the wind speed, direction, temperature of surrounding air and atmospheric stability.

- Air quality will be deteriorated both during pre-construction (site clearing) and construction phase of the industry due to construction activities (operation of construction machinery, dust emissions, vehicular movement, etc.) which results in increase air and noise pollution along with associated health risks.
- 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. This can result in unhygienic conditions, health risk to work force and public at the camp site.
- During construction and operational phase; increased vehicular movement will result into gaseous emissions and increased levels of noise/ vibrations.

### 12.1.2. Recommendations

Following recommendations must be incorporated prior to any of the decision about the proposed project:

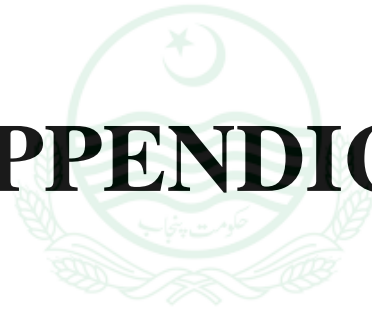
- Health and safety plan for the workers must be followed during construction and operational phases of the project
- Tree plantation plan must be followed and implemented with fidelity
- Environmental Management and Monitoring Plan should be a part of contract document of Contractors. Proper implementation of EMMP should be ensured during all the phases of the proposed project.
- All personnel staff, employees and contractors should undertake appropriate training prior to construction to ensure they are aware of the on-site responsibilities in respect of all environmental and social issues
- Drivers should be instructed to avoid using horns and playing loud music s in the proximity of the project
- Only tuned-up vehicles should be allowed at the project site so that there are no gaseous emissions
- Water conservation strategies should be adopted with an aim of resource conservation
- The wastewater generated should be disposed-off in after treating primarily through septic tank
- The solid waste should be managed properly, littering and open dumping should be avoided. On-source segregation should be encouraged.

- First aid facilities should be made readily available at construction site and inside the industrial unit during operational phase
- Continuous monitoring should be done and all environmental parameters (air, noise, water) should be kept within the permissible values of the PEQS.



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# APPENDICES



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## Glossary

<b>Accommodate</b>	(of a building or other area) provide lodging or sufficient space for. "the cottages accommodate up to six people"
<b>Assessment</b>	The action of assessing someone or something. "the assessment of educational needs"
<b>Adverse</b>	Preventing success or development; harmful; unfavorable. "taxes are having an adverse effect on production"
<b>Authorized</b>	Having official permission or approval. "an authorized dealer"
<b>Amendment</b>	a minor change or addition designed to improve a text, piece of legislation, etc. "an amendment to existing bail laws"
<b>Ambient Air</b>	Ambient air quality refers to the quality of outdoor air in our surrounding environment. It is typically measured near ground level, away from direct sources of pollution
<b>Archaeological</b>	the scientific study of material remains (as fossil relics, artifacts, and monuments) of past human life and activities
<b>Baseline</b>	The existing conditions against which impacts of the proposed action and its alternatives can be compared.
<b>Crushing</b>	Deform, pulverize, or force inwards by compressing forcefully. "you can crush a pill between two spoons"
<b>Discrepancies</b>	A difference between conflicting fact, claims or opinions
<b>Disposal</b>	the action or process of getting rid of something
<b>Proponent</b>	The person who proposes or intends to undertake a project
<b>Dumping</b>	Deposit or dispose of (rubbish, waste, or unwanted material), typically in a careless or hurried way
<b>Containers</b>	An object for holding or transporting something. "the cakes will keep for up to two weeks if kept in an airtight container"
<b>Effluent</b>	Any material in solid, liquid or gaseous form or combination thereof being discharged from industrial activity or any other source and includes a slurry, suspension or vapor
<b>Environmental Impact Statement (EIS)</b>	A document prepared to analyze the impacts on the environment of a proposed action and released to the public for review and

	comment. An EIS must meet the requirements of NEPA, CEQ, and the directives of the agency responsible for the proposed action.
<b>Emission</b>	The production and discharge of something, especially gas, or radiation.” The effects of lead emission on health”
<b>Stakeholder</b>	Stakeholders by definition are all those people and institutions who have an interest in the successful design, implementation and sustainability of the project. This includes those positively and negatively affected by the project.
<b>Mitigation</b>	The action of lessening in severity or intensity
<b>Evaluated</b>	Estimate or determine the nature, value, quality, ability, extent or significance
<b>Graded</b>	Arranged in a sequence of grades or ranks; "stratified areas of the distribution"
<b>Legislation</b>	Law enacted by a legislative body
<b>Generation</b>	The production or creation of something
<b>Incinerator</b>	A furnace or a container for burning waste materials
<b>Inadequate</b>	Not capable or competent; lacking
<b>Implementation</b>	The process of putting a decision or plan into effect; execution
<b>Intends</b>	To have in mind as something to be done or brought about; plan: to design or mean for a particular purpose, use, recipient, etc.
<b>Landfill site</b>	for the disposal of solid waste in which refuse is buried between layers of dirt so as to fill in or reclaim low-lying ground
<b>Mobilization</b>	To release or make available, as cells or chemical substances
<b>Noise</b>	Loud, unpleasant, unexpected, or undesired sound that disrupts or interferes with normal human activities
<b>Potential</b>	Having or showing the capacity to develop into something in the future
<b>Pedestrian</b>	A person who goes or travels on foot; walker
<b>Sanitary</b>	Relating to the conditions that affect hygiene and health, especially the supply of sewage facilities and clean drinking water
<b>Segregate</b>	Set apart from the rest or from each other; isolate or divide. "disabled people should not be segregated from the rest of society

<b>Settlement</b>	An official agreement intended to resolve a dispute or conflict. "unions succeeded in reaching a pay settlement
<b>Ton</b>	a measure of weight equal either to 2000 pounds (about 907 kilograms) ( short ton ) or 2240 pounds (about 1016 kilograms) (long ton )
<b>Aspects</b>	A distinct feature or element in a problem
<b>Transportation</b>	The action of transporting someone or something or the process of being transported. "the era of global mass transportation"
<b>Ultimate</b>	Being or happening at the end of a process; final. "their ultimate aim was to force his resignation"
<b>Violations</b>	the action of violating someone or something
<b>Working place</b>	From the out by side of the last open crosscut to the face
<b>Compliance</b>	Acting according to certain accepted standards
<b>Flora</b>	All the plant life in a particular region or period
<b>Fauna</b>	All the animal life in a particular region or period
<b>Demarcated</b>	Separately clearly, as if by boundaries
<b>Screening</b>	The display of a motion picture
<b>Substitutions</b>	An event in which one thing is substituted
<b>Regulations</b>	An authorized rule
<b>Stakeholders</b>	A person or organization with an interest or concern in something
<b>Rehabilitation</b>	The conversion of waste land into land suitable for use of habitation or cultivation

## List of Abbreviations

AOI	Area of Influence
IWM	Industrial Waste Management
LGO	Local Government Ordinance
PMD	Pakistan Meteorological Department
PPE	Personal Protective Equipment
CMS	Convention on Migratory Species
VECC	Valuable Environmental and cultural components
EA	Environmental Assessment
EHS	Environmental Health Safety
EIA	Environmental Impact Assessment
EPD	Environmental Protection Department
BOD <sub>5</sub>	Biological Oxygen Demand
COD	Chemical Oxygen Demand
PEPA	Pakistan Environmental Protection Act
dB(A)	Decibel
EPA	Environmental Protection Agency
ESIA	Environmental and Social Impact Assessment
ESA	Environmental and Social Assessment
ESMP	Environmental/Social Management Plan
EMP	Environmental Management Plan
EMMP	Environmental Management and Monitoring Plan
GIS	Geographical Information System
GOP	Government of Pakistan
GPS	Global Positioning System
GRC	Grievance Redress Committee
GRM	Grievance Redress Mechanism
HSE	Health Safety & Environment
HWMS	Hazardous Waste Management System
IEE	Initial Environmental Examination
IAIA	International Association for Impact Assessment

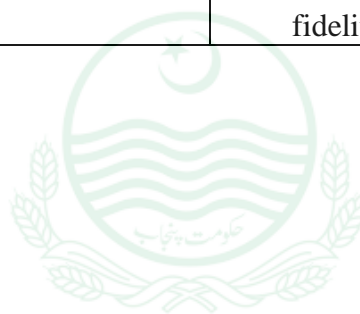
IUCN	International Union for Conservation of Nature
MW	Mega Watt
MEAS	Multilateral Environmental Agreements
MSDS	Material Safety Data Sheets
NEQS	National Environmental Quality Standards
NCS	National Conservation Strategy
PEQS	Punjab Environmental Quality Standards
NEAP	National Environmental Assessment Plan
NFPA	National Fire Protection Association
NWFP	North West Frontier Province
Q&EHS	Quality, Environment, Health & Safety
O & M	Operation and Maintenance
PKR	Pak Rupees
DCS	Dosing Control System
PPM	Parts Per Millions
PEPC	Pakistan Environmental Protection Council/Punjab
QA/QC	Quality Assurance/Quality Control
RAP	Resettlement Action Plan
SWM	Solid Waste Management
TDS	Total Dissolved Solids
UNFCCC	United Nation Framework Convention on Climate Change
UNCC	United Nation Convention to Combat Desertification
UNEP	United Nations Environmental Programs
WHO	World Health Organization
RSC	Residual Sodium Carbonate
R&R	Rehabilitation and Resettlement
WWTP	Wastewater Treatment Plant
ISWM	Integrated Solid Waste Management

### List of Individuals and Organizations Consulted and their Feedback

Sr. No	Name of individuals/ Industries	Qualification	Location	Feedback
1	Tallat Mehmood	Bachelors	Proponent Representatives	<ul style="list-style-type: none"> <li>• This manufacturing unit will contribute towards resource recovery</li> <li>• The industry will contribute towards national GDP, which is a major requirement</li> <li>• EMMP will be implemented to make the project environment friendly</li> <li>• No effluents will be discharged to environment with their toxic nature, if any</li> <li>• The industry will employ state-of-the art machinery and leave minimal impacts on the environment</li> </ul>
2	M. Qasim	Graduation		
3	Asim Shah	Bachelors		
4	Ali Butt	Nil	Local Residents & Pedestrians	<ul style="list-style-type: none"> <li>• Exposure of noise and dust particles will cause disturbance and health issues to the working staff during construction</li> <li>• people will get employment due to industrial development and thus socio-economic condition of the area will get better</li> <li>• Dust emissions will increase during construction activities</li> <li>• Area will get developed and socio-economic condition of the area will get even better</li> <li>• There will temporary disturbance to pedestrians and other moving vehicles due to construction activities</li> <li>• The industry will contribute towards industrial development in the country</li> <li>• Economy of the area will get a boost</li> </ul>
5	Aftab Ishaq	Matriculation		
6	Jamshed Mughal	Post Graduate		
7	Umer Rafiq	B.A		
8	Tahir Khan	Middle		
9	Musa	Nil		

Sr. No	Name of individuals/ Industries	Qualification	Location	Feedback
10	Ammar Ch.	Post Graduate		<ul style="list-style-type: none"> <li>Ambient air quality will deteriorate and noise levels will increase due to heavy machinery operation</li> <li>The owner of the industry should take into account the per capita income of the country and make the end product affordable accordingly</li> </ul>
11	Rana Kamala	Masters		
12	Saleem	F.A		
13	Shafeeq Ali	Islamic Education		
14	Umer Bin Aziz	Masters		
15	Umair Rafi	Post Graduate	Working Personnel in nearby Industries	<ul style="list-style-type: none"> <li>Industrial development will contribute towards economy of the area</li> <li>Health &amp; safety risks should be minimized otherwise working personnel at lower level will suffer</li> <li>There will be increase in noise levels and dust emissions during construction phase of the project</li> <li>The end product of the industry will have good market due to increased population and thus growing demand</li> <li>Employment opportunities are very low in the country and establishment of this industry will surely employ skilled and unskilled staff which will contribute towards country's GDP</li> </ul>
16	Umer Amir	Intermediate		
17	Danish Javed	Bachelors in Engineering		
18	Ansar	B.Com		
19	Hammad	Masters		
20	Furqan	Graduation		

Sr. No	Name of individuals/ Industries	Qualification	Location	Feedback
21	Ali	Bachelors	Sheikhupura Industrial Estate	<ul style="list-style-type: none"> <li>• Employment opportunities will generate for the local population</li> <li>• There can be environmental impacts such as deteriorated air quality, increased traffic movement, increased noise levels; but they can be mitigated and most of them will be temporary</li> <li>• Environmental Management and Monitoring Plan (EMMP) shall be developed properly and implement by proponent with fidelity</li> </ul>
22	Waleed	Post-Graduation		



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## Sources of Data

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## Terms of References

### Project Description

The proposed project is establishment of an industrial unit for Purchase, Transportation, Handling, Processing, and Sale of Used/New Alumina (Aluminum Oxide) all Over Pakistan processing Unit namely "Sufi Chemicals," Sheikhpura over an area of 16 Kanal.

### Scope of Work for Consultant

Activities of the consultant will strictly follow the Guidelines given in PEPA Act, 2000. An extract is narrated below:

- The environmental experts of AAT Consulting (Pvt.) Ltd. will collect the data required to initiate the working on Environmental Impact Assessment Report and organize it.
- Field surveys will be carried out for primary data collection and baseline study of the project area.
- Environmental monitoring of Noise, Air Quality and Water Quality will be done through EPA approved Laboratory.
- Scoping session and meetings with concerned stakeholders will be conducted as a part of EIA study.
- Public consultation will be carried out as part of socio-economic survey.
- The potential environmental impacts due to the development of project will be assessed and analyzed based upon the relevant information and available data.
- Best suitable and effective mitigation measures will be searched for and suggested in the EIA report.
- Environmental Management and Monitoring Plan (EMMP) will be prepared to be implemented by the relevant authorities during the pre-construction, construction operational and decommissioning phases of the project.
- The review letters generated by EPA will be addressed timely.

- After the submission of EIA report in EPA, follow-up will be done on regular basis and proponent will be assisted in every way to obtain No Objection Certificate (NOC) from (EPA).

### **Responsibilities of Proponent**

- The client will be required to provide full support to the staff of AAT Consulting (Pvt.) Ltd. in form of required technical data provision and proper execution of other related tasks.
- Safe, secure and easy access to and at the project site is required, at whatever stage of EIA Study is required.
- The client will be responsible to make the payments on-time as per agreement
- Non-refundable fee of PKR 30,000/- to be submitted to EPA in form of bank draft according to regulation 7 of the Review of IEE / EIA 2000 will be the responsibility of client
- Public Hearing is essential part of an EIA according to regulation 10 of the Review of IEE / EIA 2000. The proponent will be responsible to bear all the expenses of Public Hearing.
- The client shall respect the consultancy's privacy. All material developed including the relevant systematic and methodology has been copyrighted by the consultancy. Clients shall not reproduce copy or disclose any form of it to third parties without its prior written consent.

**Consultant**  
**AAT Consulting (Pvt.) Ltd.**  
**Contact: 0324-9483913**

**Proponent**  
**Mr. M. Afzal Awan**  
**CEO, Sufi Chemicals**  
**Contact: 0302-7086764**

## List of Names, Qualifications and Roles of EIA Team Members

<b>Team Member</b>	<b>Qualification</b>	<b>Responsibilities</b>
Umer Mirza	BSC. Environmental Sciences	Major responsibilities involve survey/site visit of the project area, collection of baseline data, arrange and involve in meetings with the client, public and other stakeholders
Mehvish Majeed	BSC. Environmental Engineering	The responsibilities include meeting with the client, site visit, and collection of baseline data, identification of impacts, addressing mitigation of adverse impacts, preparation of environmental management plan and preparation of EIA report as per EPA guidelines. Over all supervision and technical guidance to team and preparation of IEE/EIA reports
Syed Umer	Master's in Business Administration	Responsibilities are to provide assistance in arranging meetings with the stakeholders and client, conduct public consultation meetings, data collection of the social impact analysis survey and its report writing, define the baseline socioeconomic conditions of the project area, quantification of the infrastructure to be relocated
Mudassir Abbas	BSC. Environmental Engineering	The responsibilities include meeting with the client, site visit, and collection of baseline data, identification of impacts, addressing mitigation of adverse impacts, preparation of environmental management plan and preparation of Impact Assessment reports