

# FATIMA ETHANOL PLANT (FEP)

Fatima Sugar Mills Ltd., Tibbi Nizam Road, Fazal Garh near Sanawan, Tehsil & District  
Muzaffargarh

## ENVIRONMENTAL IMPACT ASSESSMENT (EIA)



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## EXECUTIVE SUMMERY

### Introduction:

Pakistan's ethanol production is experiencing rapid growth, driven by the country's expanding sugar industry. Despite its relatively small production volume, Pakistan ranks among the key ethanol-producing nations. The sugar industry, with its large-scale operations, plays a crucial role in ethanol production by utilizing molasses as a raw material. Ethanol output has significantly increased over the years, with producers focusing on enhancing efficiency and capacity. M/S Fatima Ethanol Plant (FEP) has proposed a new project for ethanol production using molasses as a feedstock. The project proponents have decided to establish a distillery unit near by the existing sugar mill already under operation. The following table presents the salient features of the proposed ethanol production expansion project.

### Salient Features of Project:

Sr. No.	Feature	Description
1)	Title of Project	Fatima Ethanol Plant (FEP)
2)	Project Location	Tibbi Nizam Road, Near Fatima Sugar Mills, Sanawan, Distt. Kot Addu. Punjab, Pakistan.
3)	Project Proponent	<p><b>Proponent Names: -</b>                      Faisal Ahmad  <b>Official Address: -</b>                      Fatima Group Regional Officer, 2<sup>nd</sup> Floor, Trust Plaza, LMQ Road, Multan  <b>Phone: -</b>                      061-4509700                      066-2250512-3  <b>Fax: -</b>                      066-2250515  <b>Email:-</b>  <a href="mailto:info@fatima-group.com">info@fatima-group.com</a>  <b>Website:-</b>  <a href="http://www.fatima-group.com">www.fatima-group.com</a></p>
4)	Project Contact Person	<p>Mr. Col Chaudhary Abdus Sattar Sulahri                      Administrator                      Tibbi Nizam Road, Near Fatima Sugar Mills, Sanawan, Kot Addu.</p>

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5)	Project Categorization	The proposed project involves the establishment of an ethanol production unit as a secondary product of the sugar industry. It falls under Category B (03) of Schedule II of the Punjab Environmental Protection Agency's (Review of IEE & EIA) Regulations, 2022. To comply with the legal requirements of Section 12 of the Punjab Environmental Protection Act, 1997 (amended 2012), the project proponent is required to submit an Environmental Impact Assessment (EIA) report to the Environment Protection Agency, Government of Punjab, Lahore, to obtain the necessary Environmental Approval (EA).
6)	Total Area	Total plot area of the project = 1904964 square feet (43 Acres 5 Kanals 16 Marlas)
7)	Total Project Cost	PKRs 5.5 Billions
8)	Project Component	The proposed project, FATIMA ETHANOL PLANT (FEP), aims to produce ethanol production as a secondary product of the sugar industry by utilizing molasses as a raw material. This separate unit will be an integral part of the existing sugar producing facility, which has already received approval from the EPA, Punjab, for its construction and operational phase. The newly proposed unit will operate through key processes, including fermentation, distillation, dehydration, and storage. The primary focus of the project will be to serve the domestic market as well as international market, with an initial production capacity of 125,000.00 liters per day.

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**Major Impacts and Recommendations for Mitigation Measures:**

The construction of the project can create some adverse impacts on the present environment. The acoustic effects, dust emission, traffic congestion, safety and sanitation during the construction period would be limited to construction of building and site preparation. During construction, the contractor will adopt all necessary measures to reduce the probable environmental impacts from different aspects. There are minimal impacts during operation period and industry will be responsible to take necessary steps during operation. The significant impacts in different phases i.e. (i) due to project location and preparation, (ii) construction phase and (ii) operation phase have been identified using the checklist process. From this process, the main potential environmental impacts, which may arise due to construction, can be grouped as follows:

- (i) Atmospheric emissions and air quality, (ii) Noise generation, (iii) Water pollution and wastewater disposal, and (iv) Health and safety. However, the magnitude of these impacts shall be very low and insignificant.

**Environmental Management and Monitoring Plan**

Potential Impacts	Mitigation Measures
<b>For Construction Phase</b>	
<b>1. Loss of Vegetation Cover/Biodiversity</b>	
Construction activity will involve excavation and removal of top soil. This may also lead to clearing of land for construction purpose which ultimately would mean that the respective area will be cleared of any sort of flora/fauna.	The proposed site has been selected after careful consideration of the land use, presence of biodiversity and other environmental parameters. Currently, there are no trees on the said location rather it is a vacant plot devoid of flora and fauna. But to ensure aesthetic value, the proponent will start planting trees once the construction phase is started.

<b>2. Gaseous Emissions</b>	
Gaseous emissions include SO <sub>x</sub> , NO <sub>x</sub> , CO <sub>2</sub> , lead and CO during construction phase. These gases are ozone depleting agents. Besides, they also pose threat to human health.	EURO II quality fuel shall be used in the machinery and generator/s to avoid emission of lead. Vehicles and machineries with good conditions which fall on the quality standards shall be used to control the exhaust emissions. Stacks with scrubbers shall be provided to reduce emissions from the generator/s.
<b>3. Dust Emissions</b>	
Generation of dust and particulate matters is an issue that could arise due to construction activities.	The construction materials e.g. soil, clay etc. would be covered appropriately. Instead of open and dry dumping, sprinkling of water in a quantity that reduces the chances of dust generation would be done. The workers would be provided safety gloves, masks and ear buds and wherever necessary goggles to avoid health complications.
<b>4. Noise Generation</b>	
Noise emissions due to transportation, movement of heavy materials, excavation, generators may create healthnuisance for the workers and local community.	The working hours shall be limited to 08 in the morning till 05 in the evening to avoid noise during night shift. Vehicle maintenance would be ensured so that emissions of any sort, be it gaseous emissions or noise generation, would be controlled. The workers will be provided with ear plugs and other personal safety equipment to avoid invoking of any health issues.

<b>5. Solid Waste Generation</b>	
Unplanned dumping of solid waste generation during construction phase can lead to blockage of roads, waterways and also create unaesthetic sight of the proposed location.	Solid waste generation quantity during construction phase shall be reused in construction activities rather than dumping. The solid waste during construction phase will consist mostly of soil, packaging materials, iron rods and food leftovers. The organic portion of solid waste shall be collected by sanitary workers of that area.
<b>6. Wastewater Generation</b>	
Unplanned wastewater disposal may contaminate the surface water channels, surface soil and depending upon the quantity of wastewater generated, it has a potential to contaminate the ground water aquifers.	Wastewater generation during construction phase shall be reused again for material making for construction phase and sprinkling of dust on soil. A Septic tank unit shall be constructed for onsite sewage treatment prior to discharge into nearby Nala.
<b>7. Accidental Spills</b>	
Accidental spills of oil, fuel and lubricants can cause surface water contamination and surface soil contamination. It may also lead to fire hazards depending upon the quantity and nature of spills.	Accidental spills shall be avoided by providing spill kits at different places and also ensuring the safe transportation of different raw material that may be in liquid state.
<b>8. Equipment Breakdown/Accidents</b>	
Accidents and/or emergency breakdown of the equipment/machineries/vehicles involved may create environmental, health and safety hazards.	This situation can be avoided by regular maintenance of the vehicles for quality assurance. Besides, equipment will be checked prior to operation to avoid accidents and human health danger due to such accidents.

<b>9. Soil Erosion</b>	
Loss of vegetation cover and trees may lead to soil erosion hence resulting in dust emission and loss of fertile land cover.	The construction activities shall be planned in a way that reduces the chances of vegetation cover loss and its consequent soil erosion issues. Soil erosions are due to wind and water. The proposed project is planned for construction during the coming months after Environmental Approval, which are dry and sunny. Hence, the probability of soil erosion due to natural factor will be negligible to none.
<b>10. Social Impacts</b>	
Problems regarding privacy of local community may arise due to invasion of construction workers.	Improper social behaviors e.g., staring and teasing shall be discouraged and any such incident will be reported to the site in-charge, proponents directly. Workers will be hired from the local community to avoid social issues.
<b>11. Training and Awareness</b>	
Unskilled workers may create issues in attaining the overall health environment and safety policy.	Regular onsite and offsite training of the workers shall be conducted. Impromptu meetings and discussions with the site in-charge and daily wages workers will be done to resolve any issues that may create health safety and environmental problems during construction phase.
<b>For Operation Phase</b>	
<b>1. Solid Waste Management</b>	
Improper and unplanned solid waste dumping can cause environment, health and safety issues. It also can potentially deteriorate the living quality of the residents besides reducing the aesthetic quality of the industry.	At the site, only solid waste will be domestic like paper, polythene bags, etc. which will be collected by sanitary workers of that area.

<b>2. Wastewater Disposal</b>	
Wastewater generated due to domestic/commercial activities will result in the spread of vector borne diseases like dengue, malaria, as well as spread the nuisance of foul smell.	To tackle wastewater/ spent water, an Effluent Treatment Plant (ETP) will be installed on site. There shell also be wastewater of domestic nature, as well as of cleaning type for which advance septic tanks shell be constructed.
<b>3. Energy Conservation</b>	
Excessive use of energy will exert more pressure on the already dwindling energy resources of the area.	The workers/employees will be encouraged to follow energy conservation strategies developed during operational phase. Machineries and equipment will be kept in good maintained shape to avoid extra fuel consumption. As the power source shall be in-house through self-generation, therefore, no pressure shall be exerted on existing national grid.
<b>4. Noise Generation</b>	
Noise emissions due to traffic and anyactivities will create issues to the local residents.	There will be no such unmanaged activity that may create excessive noise. There will be state of art machinery that creates less noise (within the standards) during working hours.
<b>5. Emergency/Fire Hazards</b>	
Emergencies e.g. fire incidents may lead to environmental, health and safety issues to the local residents.	Emergency exits have already been planned. Firefighting equipment will be provided and adequate trainings will be provided to tackle any situation of fire hazards. Callpoints at suitable locations will be installed. Moreover, there is not any significant residential settlement or village near the project site which could be harmed from such hazard.

<b>6. Training of Staff</b>	
Unskilled personnel will not be able to tackle environmental, health and safety related situations which may further aggravate any such issues and cause loss of human life and property.	Regular training of the staff will be conducted. Proper monitoring and reporting mechanism will be developed where the team will be responsible to communicate/report any illegal or hazardous situation to the team leader.
<b>6. Groundwater Consumption</b>	
The groundwater will be used for domestic purpose at said project. Water storage will also be required for emergency response in case of a fire. Prolonged water consumption may in the long run lower/deplete the underground water table. This will be a permanent and moderate negative impact.	<p>An effective 'Water Conservation Plan' will be developed and for domestic purpose water will be gained from ground water. Following operational measures will be adopted for water conservation:</p> <ul style="list-style-type: none"> <li>• It will be made sure that all faucets, circulating pumps, etc. do not leak and are in good repair;</li> <li>• Any leaking or dripping faucet, pump or toilet will be reported immediately;</li> <li>• All the utility bills will be kept in a safe place to track the consumption of water; and purchase and use of water-saving equipment will be practiced;</li> <li>• An effective residents' training program will be implemented about water conservation</li> </ul>

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

**Environmental Management Plan and Proposed Monitoring:**

Environmental impact of a project is worked out using various factors and parameters, so that

an Environmental Management Plan can be evolved to take mitigation measures, wherever these might be considered necessary in order of appropriateness of elimination, reduction and compensation as the goals. The development of the EMP is to make some person responsible for implementing the mitigation measures as identified so that smooth implementation of the mitigation measures can be assured. Monitoring plans have also been included to ensure the compliance of the EMP by contractors and other responsible authorities.

Monitoring at the proposed site should be conducted for:

- Air Environment (Meteorology, Ambient Air Quality, Noise Levels, Emissions, Traffic Pattern, etc.)
- Water Environment (Quality, and Quantity of all potential water/water sources)
- Ecological Environment (Terrestrial and Aquatic Flora & Fauna)
- Socio-Economic Environment (Demographic profile, Occupational Structure, Educational Status, Literacy Status, etc.)

### **Conclusion and Recommendations:**

The Environmental Impact Assessment contains description of the project, description of the environmental baseline, potential environmental impacts and suggested mitigation measures. An implementation mechanism for mitigation measures in the form of an Environmental Management Plan is included in the study. While the objectives of this study have been to describe the project and its environmental impact, it also identifies adverse environmental factors associated with the project. Appropriate mitigation measures as explained in the environmental study should reduce, if not eliminate, these impacts so that these are within acceptable limits. It is further concluded that all potential environmental concerns associated with the project have been adequately addressed, and no further study is required in this context.

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

- Plantation as far as permissible and within the scope of the project be carried out.
- Sustainable development approach through conservation of natural environment be followed.
- Environmental aspects of the project should be well taken care through implementation of the Environmental Management Plan as recommended in this

report.

- The project management may adopt “cleaner and greener environment” as its motto and this will make the project more environment friendly.

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

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## Glossary

- Ambient: relating to the immediate surroundings of something
- Baseline: conditions prevailing at the time of study or before initiation of any project
- Discharge: spilling, leaking, pumping, depositing, seeping, releasing, flowing out, pouring, emitting, emptying or dumping, etc.
- Effluent: 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
- Environment: air, water and land; all layers of the atmosphere; all organic and inorganic matter and living organisms; the ecosystem and ecological relationships; buildings, structures, roads, facilities and works; all social and economic conditions affecting community life; and the inter-relationships between any of the factors mentioned
- Environment budget: monetary assets reserved for environmental activity
- Environmental Impact Assessment: an environmental study comprising collection of data, prediction of qualitative and quantitative impacts, comparison of alternatives, evaluation of preventive, migratory and compensatory measures, formulation of environmental management and training plans and monitoring arrangements, and framing of recommendations and such other components as may be prescribed
- Fauna: animal life occurring in particular region or time
- Flora: plant life occurring in particular region or time
- Initial Environmental Examination: a preliminary environmental review of the reasonably foreseeable qualitative and quantitative impacts on the environment of a proposed project to determine whether it is likely to cause an environmental effect for requiring preparation of an environmental impact assessment
- National Environmental Quality Standards: the permissible standards for emission of air pollutants and noise and for discharge of effluents and waste
- Nuisance: a person, thing or circumstances causing inconvenience or annoyance.
- pH: negative log of hydrogen concentration:
- Proponent: the person who intends to carry-out a proposed project.

- Sustainability: such developments that meet the needs of the present generation without compromising the ability of future generations to meet their needs
- Waste: any material, substance, or by-product eliminated or discarded as no longer useful or required after the completion of a process

## List of Abbreviations

BOD	Biochemical Oxygen Demand
C&I P	Commerce and Investment
COD	Chemical Oxygen Demand
EIA	Environmental Impact
EMP	Assessment
EMP	Environmental Management Plan
EPA	Environmental Mitigation & Monitoring Plan
EPD	Environmental Protection Agency
EPO	Environmental Protection Department
GOP	Environmental Protection Ordinance
GOP	Government of Pakistan
HSE	Health, Safety & Environment
HC	Horticulture Committee
IEE	Initial Environmental Examination
Kmp/h	Kilo Meter Per Hour
Km	Kilo Meter
NEQS	National Environmental Quality Standards
NOC	No Objection Certificate
NWFP	North West Frontier Province
OSHA	Occupation Health and Safety
PEPA -97	Pakistan Environmental Protection Act, 1997
PCGIP	Punjab Cities of Governance Improvement Project
PM	Particulate Matters

PEPO-83	Pakistan Environmental Protection Ordinance, 1983
TDS	Total Dissolved Solids
TMA	Tehsil Municipal Administration
UC	Union Council
WAPDA	Water and Power Development Authority
WHO	World Health Organization
CO <sub>2</sub>	Carbon dioxide
°C	Degree Celsius
M/s	Messer

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## CHAPTER-1 INTRODUCTION

### 1.1 Background

Pakistan's ethanol production is growing rapidly, driven by its expanding sugar industry. Despite its relatively moderate production volume, Pakistan is emerging as a key player in ethanol production. The sugar industry plays a crucial role in ethanol output by utilizing molasses, a byproduct of sugar processing. Ethanol production in Pakistan has witnessed steady growth over the years. M/S Fatima Ethanol Plant (FEP) has proposed a new project for ethanol production using molasses as a raw material. The project proponents have decided to establish a distillery unit adjacent to the existing sugar mill, which is already under construction.

i) Project Title

Fatima Ethanol Plant (FEP)

ii) Project Location

Tibbi Nizam Road, Near Fatima Sugar Mills, Sanawan, Distt. Kot Addu.

### 1.2 Purpose of the Report

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

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

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

### 1.3 Details of the Proponent

**Proponent Name:**

Faisal Ahmad

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**Phone:**

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#### ii) Contact Person

**Name:**

Mr. Col Chaudhary Abdus Sattar Sulahri

**Designation:-**

Administrator

**Official Address:-**

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## 1.4 Details of Environmental Consultant

**Name:-**

ECTECH Environment Consultants

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The following table presents a list of team members at senior level:

**Table 1: List of Team Members**

Name	Qualification	Experience (Years)	Areas of Expertise	Position in EIA Team
1. Muhammad Anees	L.L.B	30	Legal &Public Consultation	Project Manager
2. Muhammad Azeem	M.Sc. Chemistry	21	IEE/EIA/ESIA/EMP -Audits -Sampling, Analysis & Monitoring, -Environmental Modeling -Public Consultations -Ecology	Chief Environmentalist
3. Raza Hasan Mashhadi	M.A. Economics	19	-Socio-economics -IEE/EIA/ESIA/EMP	Senior Sociologist
4. Muhammad Umer	B. Sc Electrical Engineering	11	Renewable Energy Expert	Electrical and Environmental Engineer
5. Muhammad Umair	M.S Environmental Sciences	12	IEE/EIA/ESIA/EMP -Audits -Sampling, Analysis &	Senior Environmentalist

			Monitoring, -Environmental Modeling -Public Consultations -Ecology	
6. Ibrar Hussain	BS Chemistry	1.5	-Environmental Monitoring & Sampling	Laboratory Chemist
7. Muhammad Sohail	F.Sc.	3	Field Survey	Field Assistant

### 1.5 Brief Description of Nature, Size, and Location of the Project

M/s Fatima Ethanol Plant (FEP) has proposed a project for an ethanol production unit adjacent to an existed sugar mill which is in operation at Sanawan, Distt. Kot Addu. The project will cover an area of 9 acres with an initial production capacity of 125,000.00 liters per day. The ethanol production process will utilize molasses as the primary raw material, with fermentation, distillation, and dehydration as the key processes. The selected land for construction and installation of machinery is considered highly feasible for the project's requirements.

Total cost of the project is PKR 5.5 Billion. Around 3 MW electricity will be used as source of energy, directed from Waste to Energy Generation power plant. While water usage during the operational phase will be around 1650 m<sup>3</sup>/day. The ground water will be used through electric motors. Process Wastewater will be treated through ETP plant by bringing it with in PEQ's effluent limits than it will be discharged during operation phase. However, effluents from equipment cooling and floor washing shall be reused after suitable treatment such as for sprinkling within site area, etc. Similarly, septic tanks will be installed to treat the sewage generated during construction and operation phases before domestically disposing of in nearby nullah.

Special mitigatory measures would be adopted for solid waste disposal. Solid waste may include waste/unused construction materials, which should be disposed of properly. Solid waste produced during operation will be collected by vehicles to dispose of at a particular site from where it will be reused. Waste segregation units will be provided at site. Recyclable items will be provided to recycling contractor.

## 1.6 Objectives of the Report

Objectives to conduct EIA are as follows:

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

## 1.7 The Report Structure

This EIA document is structured as follow:

**Chapter-1 Introduction:** Containing general information about the project and process of carrying out the study.

**Chapter-2 Environmental Policy, Legal and Administrative Framework:** Describes the policies, laws and regulations governing this EIA.

**Chapter-3 Description of the Project:** Describes an overall detail of the works to be done.

**Chapter-4 Description of the Environment:** Gives information on Physical, biological and social conditions collected through survey of the Project area.

**Chapter-5 Stakeholders Consultations:** Gives information on concerns about the said project and stakeholders' involvement especially the local population as an important feature of the environmental assessment.

**Chapter-6 Environmental Impacts Due to Project & Mitigation Measures:** Identifies various environmental impacts and their preventive actions.

**Chapter-7 Environmental Management Plan (EMP):** Contains comprehensive prescriptions regarding environmental impacts and their mitigation measures.

**Chapter-8 Conclusions and Recommendations:** Concludes the EIA report with some practical recommendations.

## **CHAPTER-2**

### **POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK**

#### **2.1 Introduction**

This section provides an overview of the policy framework and legislation that applies to the proposed project. This project is expected to comply with all the legislation related to environment in Pakistan, and to obtain all the regulatory clearances required. After the approval of 18<sup>th</sup> amendment, powers have been delegated to the provincial Environmental Protection Agencies/Departments (EPAs/EPDs.)

#### **2.2 Institutional Setup**

##### **2.2.1 Punjab Environmental Protection Council**

The Punjab Environment Protection Council (PEPC) is the apex decision- making body of the province. It has been developed under the provision of PEPA 1997 (amended). It is headed by Chief Minister of Punjab.

##### **2.2.2 Environmental Protection Agency, Punjab**

The Punjab Environmental Protection Agency has been established under the provisions of the Punjab Environmental Protection Act, 1997 headed by the Director General. It has been given jurisdiction for review, approval and monitoring of environmental assessment projects. As regards the proposed projects, the EPA Punjab will be responsible for review of the EIA Report, issuing a `No objection Certificate (NOC) and an overall/broad based monitoring of the proposed project during execution and operational activities to ensure compliance with the Environmental Management Plan (EMP).

#### **2.3 Relevant Legal and Policy Framework**

The applicable laws for the environmental study of the proposed project are briefly given below. The proponent of the proposed project will abide by the applicable laws and regulations. A number of laws have been promulgated by the Government of the Pakistan (GOP) to deal with the environmental and social aspects related to the implementation of various development projects in the country. In 1983, the GOP issued an Environmental Protection Ordinance (EPO) that has now been repealed by

the PEPA, 1997, through an Act of Parliament. Under the Act, it is mandatory to carry out an IEE/EIA for all development projects.

The Pak EPA has also framed guidelines for preparation of EIA of projects in various developmental sectors, According to PEPA 1997; the National Environmental Quality Standards (NEQS) were established for discharge of effluents and emission of gasses from various Municipal and Industrial sources. The latest revision of NEQS as PEQS was carried out in year 2016. Provincial Environment Protection Departments are also working on the formulation and enforcement of environmental statutes and by-laws. The GOP has issued several policies, guidelines and adopted measures for streamlining the environmental assessment including the transportation sector. Though, the need for environmental screening and assessment has received some weightage during the recent past, strict implementation of the PEQS is still a dream to be realized. The applicable laws for the environmental study of the Proposed Project are briefly described below:

### **2.3.1 Pakistan Environmental Protection Ordinance (PEPO), 1983**

In 1983, the Government of Pakistan issued Environmental Protection Ordinance (PEPO). It was the first legislation promulgated for the protection of environment. The promulgation of this ordinance was followed, in 1984 by the establishment of the Pakistan Environment Protection Agency, the primary government institution dealing with the environmental issues.

### **2.3.2 National Conservation Strategy (NCS), 1992**

The Pakistan National Conservation Strategy (NCS) is the principal policy document for environment issues in the country that was approved by the federal cabinet in March, 1992. The NCS works on a ten-year planning and implementation cycle. It deals with fourteen (14) core areas, which are stated hereunder:

- 1) Maintaining soils in crop land;
- 2) Increasing irrigation efficiency;
- 3) Protecting water sheds;
- 4) Supporting forestry and plantations;
- 5) Restoring rangelands and improving livestock;
- 6) Protecting water bodies and sustaining fisheries;
- 7) Conserving biodiversity;

- 8) Increasing energy efficiency;
- 9) Developing and deploying material and energy renewable;
- 10) Preventing / abating pollution;
- 11) Managing urban wastes;
- 12) Supporting institutions for common resources;
- 13) Integrating population and environmental programs;
- 14) Preserving the cultural heritage

Based on the NCS, policies are being framed for institutional strengthening and human resource development for environmental protection, especially at the local and provincial level.

The NCS is a policy document that deals with the core environmental issues in Pakistan at macro level and recommends an action plan to address these issues. Project specified mitigation prescriptions cannot be expected in NCS document, however, the principles of environment protection, conservation and management provided in the NCS document have to be used as guidelines during the planning and execution of projects.

As a signatory to the Convention on Biological Diversity in 1992, it was also felt necessary for Pakistan to develop a national strategy for the conservation of biodiversity. Accordingly, the Government of Pakistan constituted a Biodiversity Working Group, under the auspices of the Ministry of Environment, to develop a Biodiversity Action Plan (BAP) for the country, which was completed after an extensive consultative process. The plan, which has been designed to complement the NCS and the proposed provincial conservation strategies, identifies the causes of biodiversity loss in Pakistan and suggests a series of proposals for action to conserve biodiversity in the country. PEPC has approved the action plan and steering committees at federal and provincial levels have been formed to implement it.

BAP recognizes that at project level Environmental Impact Assessment (EIA) is used as a tool to identify environmental impacts of a proposed project and to plan for reducing adverse impacts. BAP further stipulates that an EIA should be initiated to attain early stage in project development cycle and that public participation in review of potential effects is important.

### **2.3.3 Punjab Environmental Protection Act, 1997 (Amended 2012)**

A comprehensive legislation was evolved over-time to prepare and implement national environmental policies. It is entitled as "the Punjab Environmental Protection Act, 1997 (Amended 2012)". The PEPA

1997 was enacted repealing PEPO 1983. The PEPA 1997 provides the framework for implementation of National Conservation Strategy, protection and conservation of species, wildlife habitats and biodiversity, conservation of renewable resources, establishment of Environmental Tribunals, appointment of Environmental Magistrates, Initial Environmental Examinations (IEE), Environmental Impact Assessment (EIA) and promotion of public education and awareness of environmental issues through mass media.

The Punjab Environmental Protection Act (PEPA), 1997 (Amended 2012) is the basic legislative tool empowering the Government of Punjab to frame regulations for the protection of the environment. The Act is applicable to a broad range of issues and extends to air, water, soil, marine and noise pollution, as well as to the handling of hazardous wastes. Penalties have been prescribed for those contravening the provisions of the Act.

Some portions from the Act are reproduced below for reference purposes.

**Section 11(1)** states that "Subject to the provisions of this Act and the rules and regulations made there under, no person shall discharge or emit, or allow the discharge or emission of, any effluent or waste or air pollutant or noise in an amount, concentration or level which is in excess of the "Punjab Environmental Quality Standards". The Punjab Environmental Protection Agency, the body mainly responsible for enforcing the PEPA, 1997 amended (2012), has published Punjab Environmental Quality Standards (PEQS) time and again.

**Section 12(1)** requires that "No proponent of a project shall commence construction or operation unless he has filed with the Provincial Agency an Environmental Impact Assessment (EIA) or, where the project is likely to cause an adverse environmental effect, an Environmental Impact Assessment (EIA), and has obtained from the provincial agency approval in respect thereof".

#### **2.3.4 Punjab Environmental Quality Standards (PEQS), 2016**

In order to control the Environmental Pollution, the Government of Punjab has laid down Punjab Environmental Quality Standards (PEQS), 2016 for municipal and industrial liquid effluents, industrial gaseous emissions, motor vehicle exhaust and noise. The PEQS were first promulgated in 1993 and have been amended in 1995, 2000 and 2016. The standards specify the following:

- Maximum allowable concentration of pollutants (32 parameters) in municipal and liquid industrial effluents discharged to inland waters and the sewage treatment facilities

- Maximum allowable concentration of pollutants (33 parameters) in drinking water
- Maximum allowable concentration of pollutants (16 parameters) in gaseous emissions from industrial sources
- Maximum allowable concentration of pollutants (6 parameters) in gaseous emissions from vehicle exhausts and noise emission from vehicles
- Maximum allowable concentration of pollutants (9 parameters) in ambient air
- Maximum allowable concentration of ambient noise

### **2.3.5 National Environmental Policy, 2005**

Govt. of Pakistan has notified National Environmental Policy, 2005 for different projects/aspects in which guidelines/priorities have been given to undertake/commence the projects having significant environmental impacts. The National Environmental Policy (2005) provides a framework for addressing the environmental issues (particularly pollution of fresh water bodies and coastal waters, air pollution, lack of proper waste management, deforestation, loss of bio diversity, desertification, etc.) confronting Pakistan. It recognizes the goals and objectives of the Pakistan National Conservation Strategy (PNCS, 1992), National Environmental Action Plans, and other existing environment related national policies, strategies, and action plans.

It also provides broad guidelines to the federal government, provincial governments, formally federally/provincially administrated territories and local governments to address their environmental concerns and to ensure effective management of their environmental resources.

### **2.3.6 Review of EIA/EIA Regulations, 2022**

The Govt. of Pakistan has issued Review of the Environmental Impact Assessment (EIA) and Initial Environmental Examination Regulations 2022, to review the Initial Environmental Examination (IEE) / Environment Impact Assessment (EIA) reports. Categorization of the projects for EIA and EIA is one of the main components of the Regulations. Projects have been classified on the basis of expected degree of adverse environmental impacts.

Salient features of the regulations are listed below:

- Categories of projects requiring IEE and EIA are issued through two schedules attached with the regulations.

- A fee depending upon the category of the project has been imposed for the review of IEE and EIA projects.
- The submittal is to be accompanied by an application in prescribed format included as Schedule IV of the Regulation.
- The EPA is required to issue conformation of compliance within 15 days of receipt of request and complete documentation.
- The IEE/ EIA approval will be valid for three years from date of accord.

### **2.3.7 Guidelines for the Preparation and Review of Environmental Reports**

The Govt. of Pakistan has also framed guidelines for the preparation of environmental reports of projects in various developmental sectors.

### **2.3.8 Punjab Local Government Act (amended), 2022**

Schedules 4 and 8 of the Act contain provisions pertaining to environmental pollution. Notwithstanding any specific provisions, every local government may perform functions conferred by or under the Punjab Local Government Act, 2022 and in performance of such functions may exercise such powers, which are necessary and appropriate. Under the ordinance, the local councils are authorized to restrict projects causing pollution to air, water or land. They may also initiate schemes for improving the environment.

### **2.3.9 Pakistan Penal Code, 1860**

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

### **2.3.10 The Land Acquisition Act, 1894**

The land Acquisition Act (1894) deals with the acquisition of private properties for public purposes.

There are 55 sections in this Act mainly dealing with area notification, surveys, acquisition, compensation, apportionment awards, disputes resolution, penalties and exemptions. Although quite old, this Act laid out the legal basis for any property affected by a project and for compensating the affected owners of the land.

### **2.3.11 Antiquities Act, 1975**

The Antiquities Act, 1975, protects the country's national and cultural heritage. The said Act defines 'antiquities' as ancient products of human activity, historical sites, or sites of anthropological or cultural interest, national monuments, etc. The said Act was formulated to protect such antiquities from destruction, theft, negligence, unlawful excavation, trade and export. The said Act restrains any proponents from undertaking any activity within sixty-one meters or two hundred feet of a protected. There is no such site close to the proposed project and thus no provisions of the said Act are attracted to project activities.

### **2.3.12 Punjab Wildlife (Protection, Preservation, Conservation and Management) Act, 1974**

This Act was enacted in 1974 and is amended time and again for regulation of activities relating to protection, conservation and management of wildlife in the province. Enabling rules were notified in the same year to enforce the Act.

### **2.3.13 Punjab Plantation and Maintenance of Trees Act, 1974**

The provincial government enacted this law in 1974 to regulate tree plantation and enforce measures for protection of tree plantations in the province.

### **2.3.14 Cutting of Trees (Prohibition) Act, 1975**

This Act prohibits cutting or chopping of trees without permission of the Forest Department. The Act presents fine or imprisonment or both, for illegal cutting of trees but has not mentioned any compensatory afforestation. However, it's a common practice to plant 7-10 trees for compensation of 1 tree to be rooted up.

### **2.3.15 Protection of Trees and Brushwood Act, 1949**

The protection of trees and brushwood Act, 1949 prohibits cutting or chopping of trees and brushwood without prior permission from the relevant government agency.

### **2.3.16 The Factories Act, 1934**

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

### **2.3.17 Labour Laws**

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

### **2.3.18 Punjab Special Premises (Preservation) Ordinance, 1985**

The Government of the Punjab enforced this ordinance in 1985 to ensure that special premises, such as buildings, monuments, and shrines of national, religious or socio- cultural significance are not threatened by any activity. There are no such special premises close to the project site.

## **CHAPTER 3**

### **DESCRIPTION OF THE PROJECT**

#### **3.1 General**

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

#### **3.2 Type and Category**

The project envisages with the installation of Ethanol Production (Distilleries) Unit. The project falls under the category B (03) of Schedule II of Punjab Environment Protection Agency's (Review of IEE & EIA) Regulations, 2022. Therefore, to fulfill the legal requirement of the section-12 of the Punjab Environmental Protection Act, 1997(amended 2012), the proponent is required to submit an EIA report in the Environment Protection Agency, Government of the Punjab, Lahore to obtain the required Environmental Approval (EA).

#### **3.3 Objectives of the Project**

The overall objective of this EIA is to carry out a detailed environmental assessment of the project area, to assess impacts caused by the different activities of the proposed project and to address measures to mitigate adverse environmental impacts arising from the execution of the proposed project.

The specific objectives of the EIA Study are as follows:

- To determine pre-project state of affairs and to assess post-project conditions if they have changed for better or worse
- Documentation of all the resources likely to be affected due to the implementation of the proposed project
- To provide maximum information to the proponent and other stakeholders about the existing environmental conditions and the implications of the proposed project
- Allow the Planners to minimize potential impacts of the proposed project on different environmental conditions such as physical environment, biological environment and socio-economic environment
- To facilitate decision makers to take informed decisions.

### 3.4 Alternatives Considered and Reasons for their Rejection

The installation of Ethanol Production (Distilleries) Unit has commercial values. To fulfill the commercial aspects of the project under reference of this EIA report, it has to be sited at the place having commercial processing activities. It shall also meet the legal requirement of the Punjab Environment Protection Act, 1997(amendment 2012). Availability of the unit at the best convenient place is equally important among other considerations for the site selection. Availability of the access roads, communication facilities, electricity, basic infrastructure, etc. is yet the other necessary requirement.

Keeping these requirements and their feasibility, other basic infrastructural requirements are also available at the selected site. Project will also facilitate the people of the area with increasing the opportunity of employment and other related facilities. As the proposed Ethanol Production (Distilleries) Unit will operate on power produced by WAPDA under MEPCO facility.

#### 3.4.1 Alternatives Site Consideration and Reasons for its Rejection

As part of the site selection process for the Fatima Ethanol Plant (FEP) in Kot Addu District, two potential locations were initially assessed. The first site, although geographically close to the Fatima Sugar Mills and offering suitable infrastructure, was rejected due to land acquisition constraints—specifically, the private landowner was unwilling to sell or lease the property, making the site legally and practically inaccessible for development. In contrast, the second site is being considered as a viable option due to its favorable topography, legal availability, appropriate distance from residential settlements, and compatibility with environmental and operational requirements. It also offers better potential for infrastructure development and future expansion, making it a more feasible and sustainable choice for the plant.

#### 3.4.1 GPS Points & Locations of Proposed sites for Fatima Ethanol Plant (FEP)

**Table 2: GPS points of Proposed Site**

Sr. No.	Location of Proposed Sites	Latitude	Longitude	Remarks
1.	Proposed Site -1 (Near To Fatima Sugar Mill)	30°17'26.35"N	70°57'51.93"E	Rejected
2.	Proposed Site -2 (2.5 Km away Fatima Sugar Mill)	30°18'20.14"N	70°57'49.08"E	Considered



Figure 1: Google Earth Map Showing Location of Project Site – 1

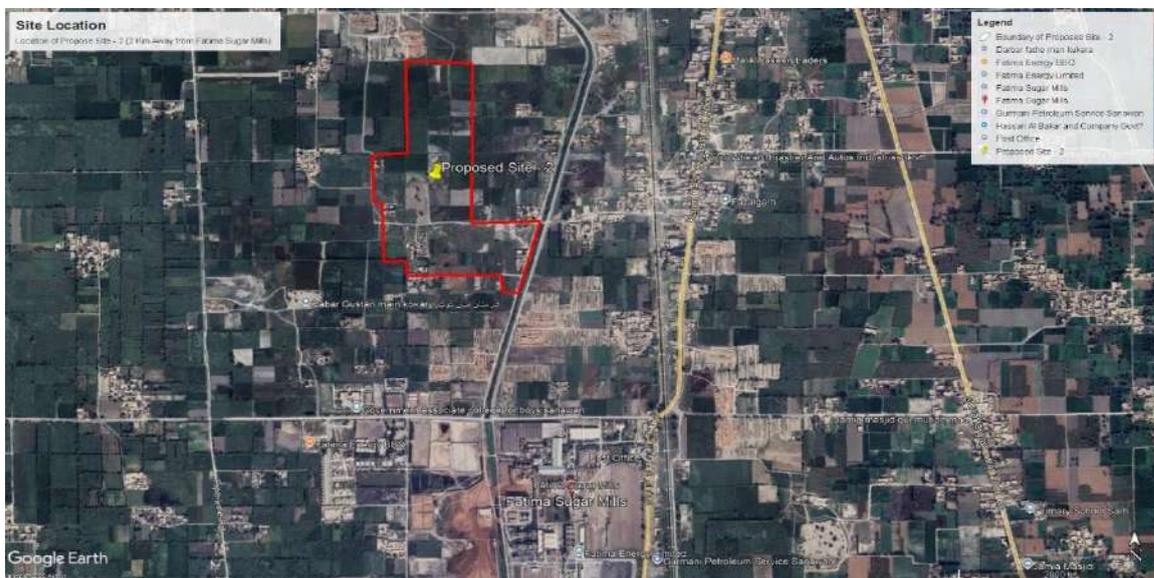


Figure 2: Google Earth Map Showing Location of Project Site - 2

### 3.5 Location of the Project

The proposed site for Fatima Ethanol Plant (FEP) is situated at Tibbi Nizam Road, Near Fatima Sugar Mills, Sanawan, District Kot Addu. The coordinates of the proposed site are **30°18'20.14"N 70°57'49.08"E**. A copy of the Aks-e-Shajra is attached as Annexure-I.

### **3.6 Land use**

The proposed land for the construction of Fatima Ethanol Plant is currently empty.

### **3.7 Vegetation Features of the Site**

Currently, there is no vegetation at proposed project site. Tree species found around the project site in nearby area include Shisham (*Dalbergia sisoo*), Alustonia, Neem (*Azadirachta indica*), Keekar (*Acacia nilotica*), Bottle palm and Rubber plant (*Ficus elastica*). Similarly, no fruit trees are found at the project site except those planted in nearby villages such as Mango (*Mangifera indica anacardiaceae*), Guava (*Psidium guajava*) and Jaman (*Syzygium jambulenum*). The installation of the machine unit will involve no cutting of trees, as there is no such vegetation on the proposed land. Rather, trees will be planted by the proponent, in the vicinity of the project.

### **3.8 Cost and Magnitude of Operation**

The proposed project, Fatima Ethanol Plant (FEP), aims to establish an ethanol production facility utilizing molasses, a by-product of sugar manufacturing. This initiative seeks to capitalize on the significant potential for ethanol production from sugarcane molasses in Pakistan, where approximately 90 sugar mills operate with a total crushing capacity estimated at 6.8 million tonnes daily.

The facility will employ processes such as fermentation, distillation, dehydration, and storage to produce ethanol. The project is designed with a total production capacity of 125,000.00 Liters per day, operating continuously on a 24-hour basis. The total estimated cost of the project is Rs. 5.5 billion.

Focusing primarily on the domestic market, the project aims to contribute to energy security by providing an alternative to traditional fossil fuels. Ethanol can be blended with petrol, potentially reducing the country's reliance on imported fuels. This approach aligns with global trends where countries utilize ethanol to enhance energy security and reduce greenhouse gas emissions.

By integrating ethanol production into the existing sugar industry infrastructure, the project not only adds value to the sugar production process but also promotes sustainable energy practices in Pakistan.

**Table 3: Cost Of Project And Total Financial Plan**

<b>FATIMA SUGAR MILLS DISTILLERY</b>			
125,000 LITERS PER DAY			
<b><u>COST OF PROJECT AND TOTAL FINANCIAL PLAN</u></b>			
<b>COST OF PROJECT:</b>	<b>(Rs. In thousand)</b>		
	<b>LOCAL</b>	<b>FOREIGN</b>	<b>TOTAL</b>
Land and development/Drainage	100,000	0	100,000
Building and Civil works	500,000	0	500,000
Plant & Machinery (Imported)	0	1,550,000	1,550,000
Foreign design and Trays		750,000	750,000
Plant & Machinery (Local)	1,400,000	0	1,400,000
Importation and local transportation	250,000	0	250,000
Erection and installation	450,000	0	450,000
Furniture, Fixture and Utilities	10,000	0	10,000
Vehicle	5,000	0	5,000
Interest during Construction	450,000	0	450,000
Pre-operating cost	15,000	0	15,000
Contingencies	20,000	0	20,000
Fixed cost of Project			5,500,000
	3,200,000	2300000	5,500,000
Total Project Cost			
<b>FINANCIAL PLAN</b>			
<b>EQUITY</b>			
30%	1,650,000		1,650,000
			0
70%	3,850,000		3,850,000
Foreign	2,300,000		2,300,000
Local	3,200,000		3,200,000
			0
<b><u>TOTAL FINANCIAL PLAN</u></b>	<b><u>5,500,000</u></b>		<b><u>5,500,000</u></b>

### 3.9 Schedule of Implementation

No construction work has been initiated so far as the company is waiting for the Environmental Approval from the Department. After the approval, the project construction work would be carried out within 13-14 months.

**Table 4: Plant Construction Schedule**

FATIMA SUGAR MILLS DISTILLERY				
ID	Task Name	Duration	Start	Finish
1	Construction Plan	401 days	Sun 4/13/25	Mon 10/26/26
2	Preliminaries and Permissions	60 days	Sun 4/13/25	Thu 7/3/25
3	Contract with Technology Suppliers	45 days	Tue 6/10/25	Mon 8/11/25
4	Soil Survey	15 days	Sun 4/13/25	Thu 5/1/25
5	Appointment of Prject team	30 days	Sun 4/13/25	Thu 5/22/25
6	Selection of Engineering Consultant	10 days	Sun 4/13/25	Thu 4/24/25
7	Selection of Civil Contractor	15 days	Thu 5/1/25	Wed 5/21/25
8	Arrangement of Civil Materials	45 days	Wed 5/28/25	Tue 7/29/25
9	Receipt of Civil Design Local	30 days	Fri 5/23/25	Thu 7/3/25
10	Receipt of Foreign Design	90 days	Tue 8/12/25	Mon 12/15/25
11	Opening of L/C for M.S sheet	60 days	Thu 11/13/25	Wed 2/4/26
12	L/Cs of Foreign Materials	30 days	Fri 12/12/25	Thu 1/22/26
13	Selection of Mechanical Contractors	30 days	Fri 12/12/25	Thu 1/22/26
14	Receipt of Foreign Equipment	90 days	Thu 2/5/26	Wed 6/10/26
15	Start of Mechanical Erection	75 days	Fri 4/3/26	Thu 7/16/26
16	Erection of Foreign Equipment	90 days	Thu 4/23/26	Wed 8/26/26
17	Completion of all Works	7 days	Fri 9/4/26	Mon 9/14/26
18	Testing and Cold Run	15 days	Tue 9/15/26	Mon 10/5/26
19	Seart Up and Commissioning	15 days	Tue 10/6/26	Mon 10/26/26

### 3.10 Description of the Project:

Producing ethanol from sugarcane molasses involves several key steps, each critical to ensuring efficient and high-quality ethanol output. Here's a detailed breakdown of the process:

- Molasses Storage
- Molasses Plus Water Called Mash (Dilution)
- Clarification Of Sludge's
- Pre fermentation Growing Of Yeast Cells
- Main Fermentation (Production Of 8% Alcohol)
- Vacuum Distillation (55% Crude Alcohol Production)
- By Product Will Be Send To Biogas Plant
- Purification Of Alcohol From Light Impurities
- Rectification To Produce 96.4% Pure Alcohol
- Demethanisation Under Vacuum
- Storage Of Ena Alcohol

#### 1. Molasses Storage:

The Fatima Ethanol Plant will be equipped with a dedicated molasses storage facility designed to safely store raw material sourced both internally from Fatima Sugar Mills and

externally from third-party suppliers. The storage system will consist of large-capacity steel storage tanks with proper containment measures to prevent leakage and contamination. These tanks will be equipped with temperature control systems to prevent spoilage and maintain the quality of molasses over time. The design will also include bund walls for secondary containment and drainage systems to manage any accidental spills in compliance with environmental safety regulations. Adequate storage capacity will ensure continuous plant operation even during fluctuations in supply, supporting both operational efficiency and sustainable resource management.

## **2. Molasses Plus Water Called Mash (Dilution):**

In the initial stage of ethanol production at the Fatima Ethanol Plant, molasses is diluted with water to form a solution known as "mash." This mash serves as the primary feedstock for the fermentation process. The dilution is carefully controlled to achieve the optimal sugar concentration required for efficient microbial activity during fermentation. The process is carried out in dedicated dilution tanks equipped with agitators to ensure uniform mixing and prevent settling of solids. Water used for dilution is treated to meet process-quality standards, ensuring no contaminants interfere with fermentation. This controlled preparation of mash is critical to maximizing ethanol yield and maintaining consistent product quality throughout production.

## **3. Clarification of Sludge:**

During the ethanol production process at the Fatima Ethanol Plant, clarification of sludge is a critical step to separate solid impurities and suspended particles from the fermentation and distillation by-products. The sludge primarily consists of unfermented organic matter, cell debris, and other residual solids. This mixture is directed to a clarification system, typically involving decanters or settling tanks, where solids are separated from the liquid stream through gravitational settling or mechanical means. The clarified liquid is either reused in the process or treated further, while the dewatered sludge is collected for safe disposal or potential use as a soil conditioner, depending on its composition. This step ensures the efficient operation of downstream processes and helps maintain environmental compliance by reducing organic load in effluent streams.

## **4. Pre fermentation Growing Of Yeast Cells:**

Before the fermentation process begins at the Fatima Ethanol Plant, a pre-fermentation step is carried out to grow and activate yeast cells to ensure high fermentation efficiency. In this

stage, a selected strain of yeast is cultured in a controlled environment using a nutrient-rich medium that includes diluted molasses and essential growth nutrients. This propagation process takes place in sterile yeast growth tanks under optimal temperature, pH, and aeration conditions to promote rapid cell multiplication. The objective is to build a healthy and active yeast population capable of efficiently converting sugars in the mash into ethanol during the main fermentation phase. Proper yeast propagation not only enhances ethanol yield but also reduces the risk of contamination and fermentation failure. The diluted molasses is transferred to fermentation tanks. Nutrients such as urea and enzymes are added to support yeast growth and activity. For instance, in a typical setup, 10 kg of yeast, 10 kg of urea, and 100 grams of enzyme are added to a 50 KL pre-fermentor containing 3 to 4 tons of molasses. The pH is adjusted to around 4.8 to 5, and the temperature is maintained at approximately 32°C to promote optimal yeast propagation.

#### **5. Main Fermentation (Production Of 8% Alcohol):**

The main fermentation process at the Fatima Ethanol Plant is the core stage where the prepared mash, containing diluted molasses and nutrients, is converted into ethanol through the metabolic activity of yeast. The mash is transferred to large fermenters where the previously propagated yeast is added under controlled conditions. During fermentation, the yeast consumes the sugars present in the mash and produces ethanol along with carbon dioxide as a by-product. The process is typically carried out over 24 to 30 hours at an optimal temperature and pH to maximize alcohol yield and minimize contamination. By the end of this stage, the fermented broth—commonly referred to as "beer"—contains approximately 8% alcohol by volume. Continuous monitoring of key parameters ensures a stable and efficient fermentation process, forming the foundation for high-quality ethanol production in subsequent distillation stages.

#### **6. Vacuum Distillation (55% Crude Alcohol Production) :**

Following fermentation, the ethanol-rich "beer" undergoes vacuum distillation at the Fatima Ethanol Plant to concentrate the alcohol content and separate it from the remaining liquid and solids. In this process, the fermented mash is heated under reduced pressure, allowing ethanol to evaporate at a lower temperature, which helps preserve product quality and reduces energy consumption. The vapors are then condensed to yield approximately 55% crude alcohol, which is further refined in subsequent distillation stages to achieve fuel-grade or industrial-grade ethanol. The non-alcoholic residue, known as spent wash, is collected as a by-product and directed to the on-site biogas plant. There, it is utilized as feedstock for

anaerobic digestion, supporting renewable energy generation and sustainable waste management practices.

**a. Biogas Plant:**

A biogas plant at the Fatima Ethanol Plant could serve as an efficient and sustainable solution for managing organic waste while contributing to the plant's energy needs. By utilizing organic materials, such as residual biomass from the ethanol production process (e.g., stillage, molasses, and other by-products), the biogas plant would convert these into methane through anaerobic digestion. The methane generated can be used as a renewable energy source to power the plant's operations, reducing reliance on external energy inputs and lowering overall operational costs. Additionally, the by-products of biogas production, like digestate, can be used as organic fertilizer, further enhancing sustainability. Implementing a biogas plant would not only improve waste management practices but also help in reducing the plant's carbon footprint, contributing to the overall goal of greener, more efficient energy systems within the ethanol production industry.

**7. Purification Of Alcohol From Light Impurities:**

After the initial vacuum distillation, the crude alcohol undergoes a purification process to remove light volatile impurities such as aldehydes, esters, and other low-boiling compounds that may affect the quality of the final product. This is achieved through rectification in specialized distillation columns designed to selectively separate these impurities from ethanol based on differences in boiling points. Controlled temperature, pressure, and reflux ratios are maintained to ensure high-purity ethanol recovery. The purified alcohol meets the required specifications for industrial or fuel-grade use, while the separated light impurities are either safely disposed of or further treated in accordance with environmental regulations. This purification step is critical for ensuring product consistency, safety, and compliance with market standards.

**8. Rectification To Produce 96.4% Pure Alcohol:**

In the final stage of ethanol processing at the Fatima Ethanol Plant, rectification is carried out to increase the alcohol purity to 96.4%. This process involves the use of highly efficient rectification columns where the partially purified alcohol from previous stages is subjected to fractional distillation. Under controlled temperature and reflux conditions, ethanol is separated from remaining water and heavier impurities, achieving an azeotropic concentration of 96.4% purity—commonly known as rectified spirit. This high-grade ethanol

is suitable for use in industrial, pharmaceutical, and fuel applications. The process ensures that the final product meets national and international quality standards, while non-condensable residues are either recycled or handled responsibly to maintain environmental compliance.

#### **9. Demethanisation Under Vacuum:**

Demethanisation under vacuum is an essential step at the Fatima Ethanol Plant to remove residual light gases, primarily methane and other low-boiling compounds, from the rectified alcohol stream. This process is carried out in a dedicated demethaniser column operating under reduced pressure, which lowers the boiling points of the volatile components and enhances their separation from ethanol. By applying vacuum conditions, the plant ensures efficient removal of these impurities without exposing the alcohol to high temperatures, thereby preserving its quality and reducing energy consumption. The extracted light gases are either flared off or redirected for controlled use, depending on their composition. This step ensures that the final ethanol product meets stringent purity standards required for downstream applications.

#### **10. Storage Of ENA Alcohol:**

Extra Neutral Alcohol (ENA), once produced and purified to a high standard, is stored in dedicated storage tanks at the Fatima Ethanol Plant. These tanks are constructed using stainless steel or food-grade coated materials to preserve the purity and quality of the ENA, which is primarily used in pharmaceuticals, cosmetics, and beverage industries. The storage system is designed with features such as nitrogen blanketing to prevent oxidation, flame arrestors for safety, and level monitoring systems to manage inventory efficiently. Tanks are located within a bunded area to contain any potential spills and comply with safety and environmental regulations. Proper ventilation, access control, and regular quality checks ensure that the ENA remains uncontaminated and stable until it is dispatched for end use.

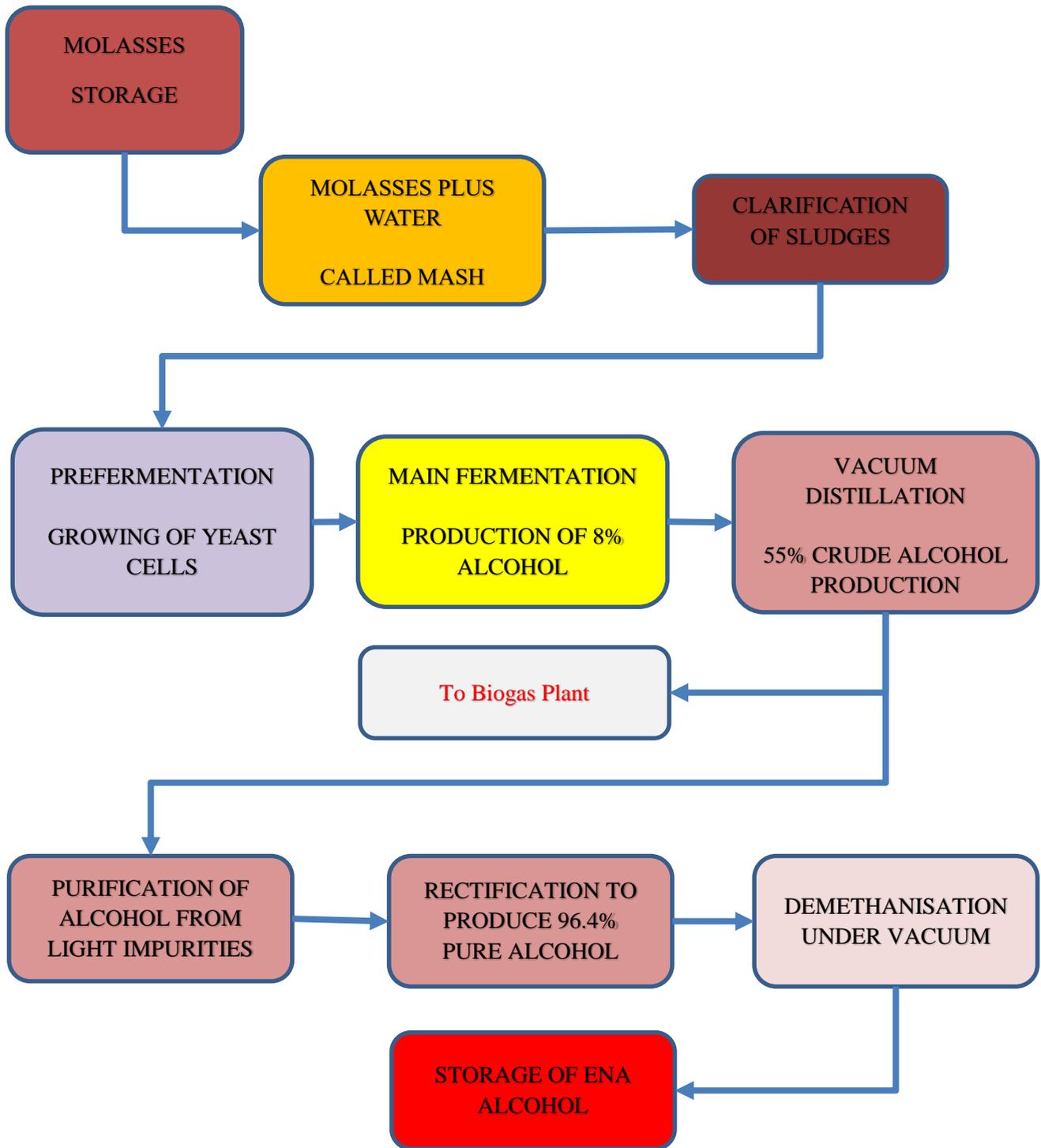


Figure 3: Process Flow Diagram

The Project layout plan is attached as Annexure-II.

### 3.10.1 Raw Materials & Products

In ethanol production from sugarcane molasses, the raw material—molasses—undergoes fermentation and distillation processes. The approximate yield of ethanol is about 70 gallons per ton of molasses, accounting for known and unknown losses during production. Further more details are as per given below:

Category	Quantity	Units	Remarks
<b>Molasses</b>	550	tons/day	Main sugar source
<b>Water</b>	1650	tons/day	Used for dilution
<b>Wort Produced</b>	2200	tons/day	Molasses + Water mixture
<b>Yeast</b>	0.005	tons/day	For fermentation
<b>Alcohol</b>	176 (daily) / 176 (hourly)	tons	Final ethanol output
<b>To Storage</b>	182.6	tons/hour	Purified ENA
<b>Effluent/Wash</b>	2024–2200	tons/day/hr	Sent to Biogas
<b>Power Use</b>	215	kWh	Fermentation + Distillation

### 3.10.2 Energy Requirement

The Fatima Ethanol Plant integrates a thermal power plant that utilizes biogas and biofuel generated as by-products of the ethanol production process. This thermal power plant is designed to reduce the plant's dependency on external electricity sources while promoting sustainability by harnessing renewable energy. The biogas, produced from the anaerobic digestion of organic waste (such as spent wash and other fermentation residues), is used to fuel a combined heat and power (CHP) system. Additionally, biofuels, such as the residual biomass from the ethanol production process, are used as an alternative fuel to further reduce the plant's carbon footprint. The thermal power plant has a capacity to generate 3 MW of electricity, sufficient to meet the operational demands of the Fatima Ethanol Plant, with any surplus energy being fed back into the grid or utilized for other operations within the facility. This energy-efficient system supports the plant's commitment to renewable energy, cost-effectiveness, and environmental responsibility. However electricity from WAPDA also will be utilized in emergency or as per schedule.

### 3.10.3 Water Requirement

Water will be required per day is given as below in the **construction phase:**

Activity	Estimated Share (%)	Approx. Daily Volume (liters)
Concrete mixing & curing	50%	3,000
Dust suppression & site cleaning	20%	1,200
Equipment & tool cleaning	15%	900
Labor domestic use	15%	900
<b>Total Daily Water Use</b>	<b>100%</b>	<b>6,000 liters/day</b>

Water will be required per day is given as below in the **operational phase:**

Category	Quantity	Units	Remarks
<b>Process Water</b>	1,650,000	Liters/day (1,650 m <sup>3</sup> /day)	Used in dilution, fermentation, and distillation
<b>Domestic Water (108 workers)</b>	6,480	Liters/day (6.5 m <sup>3</sup> /day)	For drinking, washing, sanitation
<b>Total Water Consumption</b>	<b>1,656,480</b>	<b>Liters/day (1,656.5 m<sup>3</sup>/day)</b>	Combined total usage

### 3.10.4 Man Power Requirement

Around 120 to 160 workers will be employed during Construction of the project.

The details of workers are as below:

Phase	Estimated Manpower
<b>Planning &amp; Design (1-2 months)</b>	5-10 engineers/design team members
<b>Site Preparation (1 month)</b>	20-30 workers (laborers, site supervisors, equipment operators)
<b>Construction (6-7 months)</b>	30-60 workers (civil, mechanical, electrical engineers, technicians, welders, specialized workers)
<b>Commissioning &amp; Testing (1 month)</b>	5-10 workers (commissioning engineers, operators, safety officers)
<b>Total Estimated Manpower</b>	60-110 workers over the project duration

Around 108 workers will be employed during operation of the project.

The details of workers are as below:

<b>Production Staff</b>	<b>Strength</b>
General Manager	1
Production Manager	1
Chemists	6
Foreman	5
Plant Operators	13
Workers	28
Electrician Technicians	9
Fitters	9
Helpers	20
<b>TOTAL</b>	<b>92</b>
<b>Marketing Staff</b>	
Sale officers	1
Excise Clerk	1
Workers	2
Export staff at Khi	2
<b>TOTAL</b>	<b>6</b>
<b>Admin Staff</b>	
Manager/Assistant Manager	1
Security	2
Drivers	4
<b>TOTAL</b>	<b>8</b>
<b>Accounts staff</b>	<b>2</b>
<b>GRANDTOTAL</b>	<b>108</b>

### 3.10.5 Solid Waste

During construction phase, special migratory measures would be adopted for solid waste disposal. Solid waste may include waste/unused construction materials, which should be disposed of properly. Solid waste produced will be collected by vehicles to dispose of at a particular site from where it will be reused. Waste segregation units will be provided at site. Recyclable items will be provided to recycling contractor. Same measures shall be taken for such waste produced during operation phase too. This waste would be temporarily stored for its reuse in future.

In the ethanol production process from sugarcane molasses, several types of solid waste are generated: such as Yeast Sludge, Bagasse and filter cake (Press Mud)

**Yeast Sludge:** During fermentation, yeast is used to convert sugars in the molasses into ethanol. Post-fermentation, the residual yeast biomass, known as yeast sludge, accumulates. This sludge is rich in protein and essential amino acids, making it a valuable resource for producing single-cell protein or as an additive in animal feed.

**Bagasse:** Although not a direct byproduct of the ethanol production process, bagasse is the fibrous residue remaining after extracting juice from sugarcane during sugar production. In integrated sugar and ethanol production facilities, bagasse serves as a primary fuel source for boilers, providing energy for various operations.

**Filter Cake (Press Mud):** During the clarification of sugarcane juice in sugar mills, impurities are removed, resulting in a solid residue known as filter cake or press mud. While primarily a byproduct of sugar production, in facilities where sugar and ethanol production are integrated, filter cake can be utilized as a soil amendment or in composting due to its rich organic matter content.

Effective management and utilization of these solid wastes can enhance the sustainability and economic viability of ethanol production from sugarcane molasses.

### 3.10.6 Wastewater Treatment

During the construction phase of the ethanol production facility, no process wastewater will be discharged. However, during the operational phase, process wastewater will be generated. Effluents from equipment cooling, as well as from equipment and floor washing, will be treated appropriately and reused for purposes such as site area sprinkling. Additionally, septic tanks will be installed to treat sewage generated during the construction phase. In the operational phase, an Effluent Treatment Plant (ETP) will be installed to treat wastewater before its disposal in the nearby nullah.

### 3.10.7 Septic Tank

Septic tanks are suitable for conditions where the wastewater can drain away and be absorbed into the soil without contaminating ground water where it is extracted. A septic tank takes raw sewage in, allows the solids to settle (sludge) and allows the remaining liquid to flow into the surrounding soil by means of a soak away. Scum on the surface is also prevented from leaving the tank. Microorganisms in the anaerobic environment in the tank digest the sludge and scum.

The system consists of several stages, supply to the tank, the tank itself and the soak field. Septic tanks take sewage (grey water - washing and black water - sewage from latrines) but not rainwater. Sludge volume is reduced by microbial action but still needs periodic emptying. Retention time of septic tank will be 2 -3 days for this unit. Drawing of septic tank is shown below:

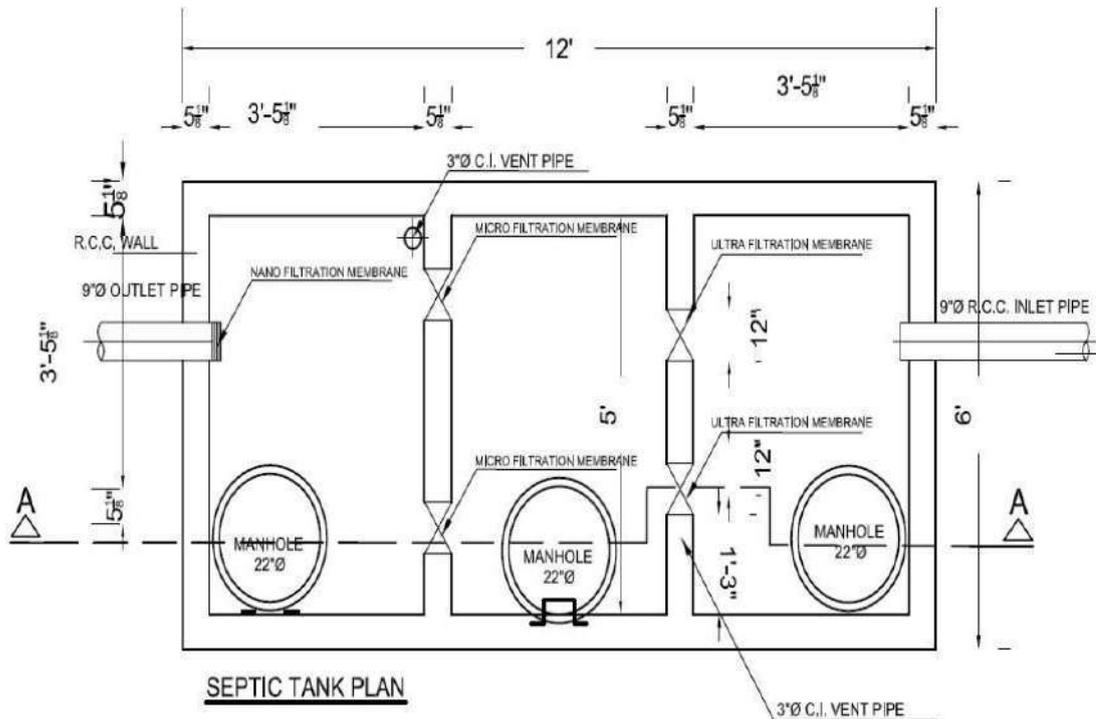


Figure 4: Septic Tank Drawing

### 3.11 Restoration and Rehabilitation Plans

There will be no any matter of rehabilitation as the proposed site is owned by the project proponent. However, at the end of the life of the project, it will be dully dismantled with special precautions to avoid/minimize pollution and at the same time taking all safety precautions to protect human life and property around the project tsite. Debris or any other wastes resulting from demolishing will be disposed of in environmentally sustainable fashion. The material capable of recycling/reuse will be either sold in the market or be re-used for other suitable purposes. While dismantling, all government rules and regulations as applicable to such activities will be strictly adhered to. During entire construction period, necessary precautions will be taken to ensure that no damage is done to the basic infrastructure like sewerage systems, power transmission lines, road, private or public property and daily human life.

Safety measures as desired under the code of demolition will be adopted to avoid any harm to human, property around, or the environment in the project area. After completion; all

construction matrix, debris and garbage will be removed off immediately from site within the minimum possible time under safe conditions. Any minor spillover of these materials will be cleared adequately, the land, if and where pitted will be adequately leveled. On the hole, the project site and the area in its near vicinity will be made neat and clean.

### **3.12 Government Approval by Project**

Fatima Ethanol Plant (FEP) is incorporated as company in Securities and Exchange Commission of Pakistan (SECP) under umbrella of Fatima Sugar Mills while it has also been registered in Federal Board of Revenue (FBR). Similarly, the company is a member of Dera Ghazi Khan Chamber of Commerce and Association (DGCCA). The proponent has applied for electricity connection in Multan Electric Power Company (MEPCO) too. To date, approvals or permissions from following departments have been secured by the project proponent:

1. NOC from District Officer Industries, Prices, Weights & Measures, Kot Addu dated April 05, 2025 (annexure-III).
2. Permission from Office of the Executive Engineer High/way Division, Muzaffar Garh on April 14, 2025 (annexure-IV).
3. Permission from Office of the Executive Engineer Kot Addu Canal Division, Kot Addu on April 15, 2025 (annexure-V).
4. NOC from Civil Defense Officer, Kot Addu Muzaffar Garh on June 24, 2025 (annexure-VI).
5. NOC from Office of the Executive Engineer River Diversion, Muzaffar Garh dated July 25, 2025 (annexure-VII).

## CHAPTER 4

### DESCRIPTION OF ENVIRONMENT

#### 4.1 Data Collection

The primary data was collected by surveying the project area and its nearby vicinity. The secondary data regarding physical parameters (topography, geology, seismology, hydrology and climatology) was obtained by visiting relevant departments and their official websites. The biological parameters (flora and fauna) were also studied in the project and study area. The vegetation of the area was studied by preparing a floristic list based on visual observation. The species were recorded with reference to their historical existence in the project influenced area. Information on wildlife fauna species (mammals, amphibians, reptiles, birds, etc.) in the assessment area was compiled based on opportunistic observation, gathering the existing information and consultation with local experts, community members, government and Non-Government Organizations (NGOs). The socio-economic aspects were studied and analyzed by conducting detailed village profile and household surveys.

#### 4.2 Physical Environment

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

##### 4.2.1 Geological Formation

The district lies between 30°45'-30°4' north latitudes and 70°48'-71°30' east longitudes. The riverine area of District Kot Addu lies close to the eastern bank of the Indus River. Kot Addu is bounded on the north by Layyah District, on the east by Muzaffargarh District, on the south by Dera Ghazi Khan District, and on the west by Rajanpur District.

This district is divided into three main physical features: (a) Riverside area, (b) canal-irrigated area, and (c) semi-desert area. The riverside area of Kot Addu lies along the eastern bank of the Indus River, primarily falling within the riverbed and its floodplain. The canal-irrigated area lies further inland and is separated from the riverine belt by protective embankments such as the

Minchan Bund. This fertile tract, supported by an extensive canal network from the Taunsa Barrage, lies at an approximate elevation of 150 to 200 meters (490 to 655 ft.) above sea level. The third part of the district consists of semi-arid and sandy regions toward the southwestern side, exhibiting features similar to those of the nearby Thal desert. This area includes stretches of sand dunes and sparse vegetation typical of arid zones.

#### **4.2.2 Soils**

The project site in District Kot Addu mainly comprises silty, eroded loess and shallow residual soils, with some areas of gullied land. Lacustrine clay deposits are also found in parts of the area, particularly near low-lying zones. Soil samples collected from different sites in the region showed similar characteristics, predominantly clay loam in texture. The soils of the project area consist of loess, old alluvial deposits, and recent stream valley sediments brought by the Indus River and its tributaries. These soils are generally medium-textured with a significant proportion of clayey material. Most soils in the region are deep, except where they have formed directly over bedrock. Similar to other parts of the country, the soils in Kot Addu are sodic in nature, affecting their fertility and requiring proper soil management for agriculture and construction

#### **4.2.3 Seismicity**

The Seismic Zoning Map of Pakistan showing the proposed project site in District Kot Addu is presented as Figure-5, indicating seismic zones as per the Building Code of Pakistan – 2007. According to the Seismic Zoning Map, the proposed project area falls within Seismic Zone 2B, which indicates a moderate level of seismic risk and requires appropriate structural design considerations to ensure compliance with national safety standards.

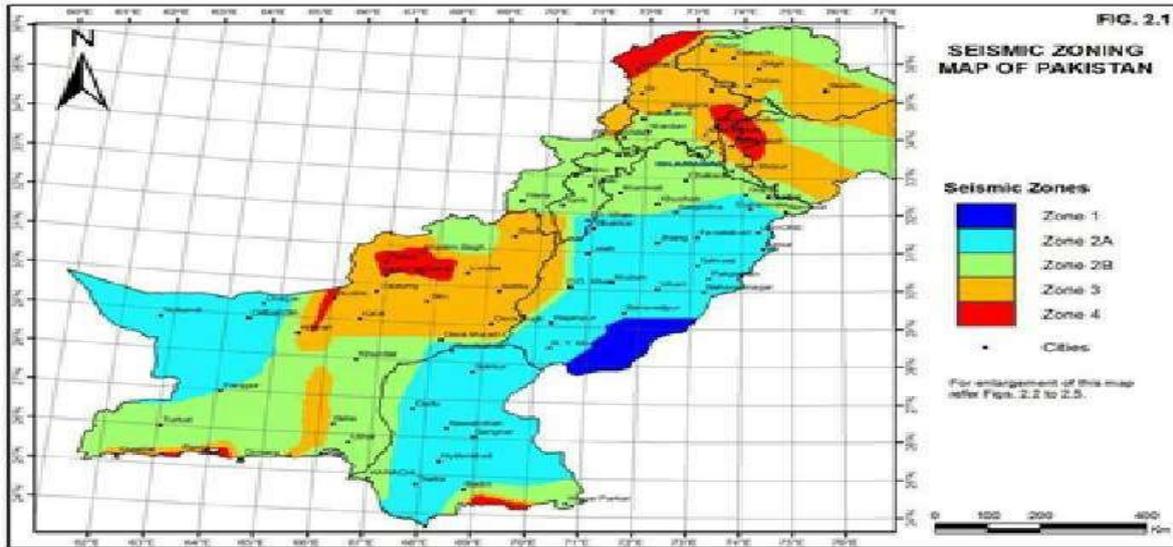


Figure 5: Seismic Zoning Map of Pakistan

#### 4.2.4 Climate

The climate of District Kot Addu is classified as 'desert' under the Köppen-Geiger climate classification system (BWh). The region experiences extremely hot summers and mild winters, with very low annual rainfall. Rainfall is infrequent and irregular throughout the year, with most precipitation occurring during the monsoon season. The average annual temperature in Kot Addu is approximately 26.5 °C, and the area receives an average annual rainfall of around 100–120 mm, reflecting the arid nature of the region.

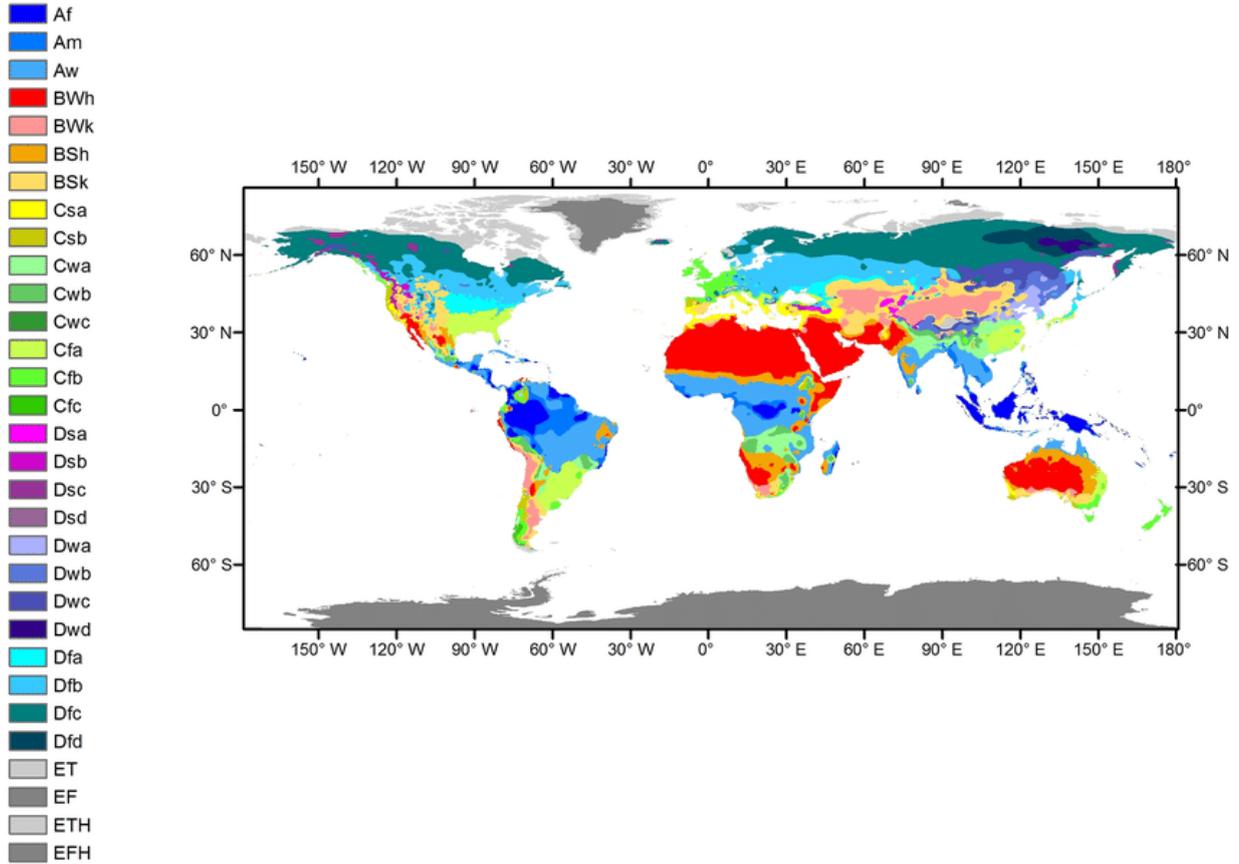


Figure 6: Koppen Gieger Climate Classification Map

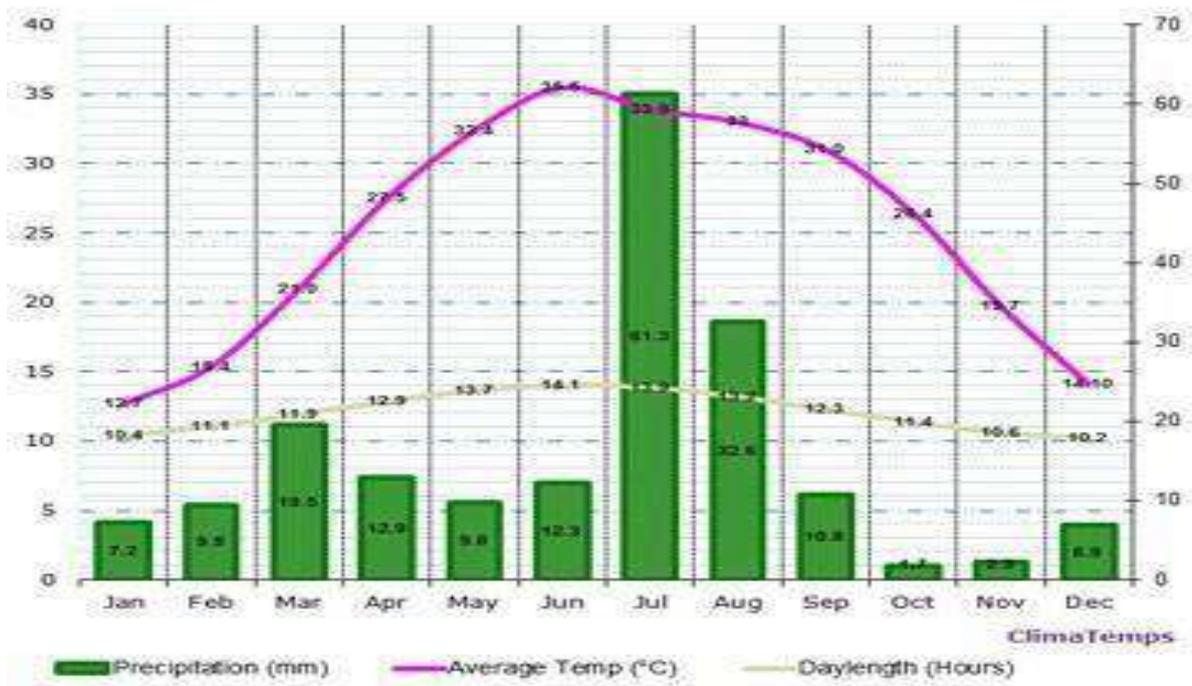


Figure 7: Climate of Area

#### **4.2.5 Rainfall**

In Kot Addu, the average annual temperature is approximately 26.5 °C. The region receives low annual precipitation, averaging around 100 to 120 mm, characteristic of its arid to semi-arid climate.

#### **4.2.6 Hydrological Study**

Hydrological studies conducted in the project-affected area of District Kot Addu indicate that the sub-surface lithology consists of a mixture of clay/shale, silty-sandy clay, sandstone, limestone, gravel, cobbles, pebbles, and occasional boulders. The area is intersected by various seasonal tributaries and water channels that contribute to the regular recharge of the groundwater aquifer. Typically, the aquifer lies beneath the surface, enclosed between thick layers of clay and shale. Numerous tube wells have been installed by local farmers for agricultural use, and these have been operational for an extended period without any reported decline in water availability. During the site survey, specific investigations were conducted to assess potential water shortage or drawdown in these tube wells. The findings revealed that there was no indication of water depletion. A water sample was also collected from a tube well located just outside the project boundary and tested for quality. Laboratory analysis confirmed the absence of any contaminants, indicating that the groundwater is clean and suitable for use.

#### **4.2.7 Ground Water**

There is neither any canal nor river immediately surrounding the project site in District Kot Addu. The primary sources of irrigation in the area are underground water and rainwater. Groundwater is also extensively used for drinking purposes by the local population and is available in sufficient quantity. The Public Health Engineering Department, Government of Punjab, has installed multiple tube wells in the project study area to provide potable water to residents.

Groundwater recharge in the region primarily occurs through seepage from nearby unlined canals, watercourses, and irrigation practices. Direct recharge from rainfall is minimal due to the arid climate. Additional recharge also occurs from local ponds, domestic water supply systems, and sewerage infrastructure. The depth of the groundwater table in the area generally ranges from 60 to 200 feet. Hand pumps are typically installed at depths of 80 to 200 feet, motor pumps from 80 to 450 feet, and tube wells between 200 and 400 feet. The groundwater in the area is generally brackish, with Total Dissolved Solids (TDS) values commonly ranging between 1000 and 3500 ppm."



Figure 8: Ground Water Sampling From Project Site

The analysis results regarding various physical, chemical and biological parameters are given in the Annexure-VIII while interpretation of data with the PEQS is given hereinafter. It is clear from laboratory analysis results that all testing parameters regarding drinking water quality are in compliance of PEQS limiting values. Thus, water can be used on site for potable purposes.

#### 4.2.8 Surface Water/Wet Lands

No surface water body/wet lands is present near the proposed site while river Indus is flowing miles away from the project site.

#### 4.2.9 Wastewater

There is wastewater drain (Nala) flowing on the rare side of the project site. It is used as main drainage channel for industrial and local community wastewater. Industrial and sewerage waters are being collectively drained out in this nala passing at a small distance, therefore, detailed monitoring of effluent drain along with wastewater sampling was done here in upstream to establish baseline conditions. The wastewater is ultimately discharged into the river. The test results show that certain important parameters are in violation of PEQS. This presents that discharge of untreated wastewater of industries and communities into the nalah not being properly treated before their discharge into the drain are the cause of high levels of pollutants.



Figure 9: Wastewater Sampling near Project Site-Upstream

#### **4.2.10 Air and Emission Resources**

The ambient conditions regarding air resources, noise levels and traffic concentrations around the project site as monitored during baseline studies are given hereunder:

##### **4.2.10.1 Ambient Air Quality**

The proposed project site is located in moderately open and clean atmosphere in the outskirts of Kot Addu city and is mostly surrounded by agriculture lands and rural settlements along with Industrial units. In the proposed project area, Particulate Matter (SPM & PM<sub>10</sub>), Smoke, Hydrocarbons (HCs), Oxides of Nitrogen (NO<sub>x</sub>), Sulphur Dioxide (SO<sub>2</sub>) and Carbon Monoxide (CO) are the key air pollutants. The currently operating industrial units of Fatima Sugar Mills, nearby main road, passage ways to villages as well as gaseous emissions from other scattered kiln units, are the main sources of air pollutants including NO<sub>x</sub>, SO<sub>2</sub>, CO, PM, HCs, smoke, etc. Further, hot and dry conditions during summer season change the air quality by increasing particulate matter due to drying of road pavements and open soil.

Ambient air quality results obtained through monitoring carried out for criteria pollutants i.e. CO, NO<sub>2</sub>, SO<sub>2</sub> and PM at the project site around Feb 20, 2025 have been used as baseline data for the purpose of this EIA report. The monitoring results are presented as Annexure-VIII. The air quality around the proposed project site is comparatively better as against if the unit would be installed in any area where industrial, commercial and transportation sources were haphazardly situated.



Figure 10: Ambient Air Monitoring at Project Site

#### 4.2.10.2 Ambient Noise

In the study area, operations of industrial units of different kinds, traffic flows on roads and commercial activities going on there along with other anthropogenic activities are the major sources of noise. Noise level monitoring was carried out at project and its surrounding areas. The monitoring was carried out in all types of prevailing zones including Industrial, residential, commercial and silence in addition to the baseline monitoring carried out at the project site and for traffic noise. Monitoring results so obtained at the project site have been presented in Annexure-VIII for analysis.



Figure 11: Ambient Noise Level Monitoring at Project site

The baseline monitored data show that measured noise level values are currently in compliance of PEQS set for industrial areas.

#### 4.2.11 Traffic Count Data

The traffic count data of the nearby passing Tibbi Nizam Road was also collected according to the format as provided by the guidelines of EPA. The counting was done for 3 hours on May 27, 2023.

**Table 5: Traffic Count Data around the Site**

Sr. No.	Vehicle Type	8:00 am-9:00 am	11:00 pm-12:00 pm	5:00 pm-6:00 pm
1.	Large Vehicles (Trucks, Buses, Tractor Trolleys, Mini buses)	36	27	57
2.	Medium Sized Vehicles (Suzuki Pickups, Cars, Jeeps, Taxis)	60	39	62
3.	Small Vehicles (Rickshaws, Motorcycles, Scooters)	69	48	44
4.	Slow Vehicles (Animal-Driven Carts, Tongas)	21	15	25
5.	Others (Bicycles)	41	34	13

### 4.3 Biological Environment

A country's natural capital is primarily composed of its wilderness areas and scenic landscapes, along with their associated flora and fauna. This natural capital is evaluated at various levels—genus, species, and community-habitat or ecosystem—and collectively referred to as 'Biological Diversity.' Pakistan is home to nine major ecological zones, and the concept of biodiversity is relevant at all administrative levels, including district, province, and national. The richness of genera, species, habitats, and ecosystems within a project area directly reflects its biodiversity value.

District Kot Addu holds ecological significance due to its diverse natural flora and fauna, particularly in the less developed and semi-arid southern parts. However, increasing population pressure and expanding development activities have led to some degradation of natural habitats. While the area still supports various species typical of irrigated and arid zones, the project site itself lacks significant vegetation. There are no dense or well-established trees and shrubs present on the site, except for a few scattered trees along main roads and pathways.

#### 4.3.1 Flora and Fauna

The flora of District Kot Addu reflects two distinct ecological zones: the irrigated northern region and the semi-arid to arid southern region. The northern part of the district, which benefits from

canal irrigation and fertile soil, supports vegetation similar to that found in other irrigated areas of central Punjab, including various grasses, shrubs, and cultivated crops. In contrast, the southern parts of Kot Addu gradually transition into the sandy and dry terrain of the Thal desert, where the vegetation becomes sparse and adapted to arid conditions. This semi-desert region also supports diverse wildlife, including species such as wild cats, Chinkara (gazelle), wild boars, jackals, foxes, badgers, porcupines, squirrels, gerbils, wild rats, poisonous snakes, hog deer, blue bulls (nilgai), and several other desert-adapted animals.



Figure 12: Biodiversity in the study area



Figure 13: Flora in the Study Area



Figure 14: Vegetation Features around the site

## **4.4 Socioeconomic Assessment**

This section presents study methodology and socio-economic conditions of the area, human and economic development, quality of life values, etc. The main objectives of socio-economic study were to furnish appropriate information about the baseline socio-economic conditions of the study area and to identify and assess significant social impacts of the project activities on the surrounding area and people.

### **4.4.1 Data Sources**

A qualitative and semi-quantitative study methodology was adopted to conduct this survey. The study included the collection of both primary and secondary data. As far as primary data collection regarding study area was concerned, a comprehensive village profile survey performa has been used covering all above components and attached herewith as Annexure-IX while for the purpose of secondary information, data published by various departments, institutes and organizations were reviewed and officials met during the study tours were consulted.

### **4.4.2 Data Processing**

Statistical and computer applications were used to codify, organize and tabulate data collected from various sources. During processing of the data, only relevant and valid information were included for empirical analysis to establish the realities of the community and its people.

### **4.4.3 Data Analysis**

This section presents analysis of existing status of various socio-economic parameters such as income, employment, basic facilities, education, health, recreation, migration, conflicts, ethnic status, role of women, professions, residential conditions, etc.

#### **4.4.3.1 Study Area Localities**

The location of the site for FEP is important in many aspects as it is situated inside the industrial estate. Major localities include Sanawa, Tibba Gormani, Gashkori Chowk, and Peer Mitha which are important human settlements in the zone of influence. The geographical locations of the settlements are presented in Table-6 while general location map of the study area has already been attached as Figure-2 exhibiting the distances and directions of major localities in surroundings of the project site.

**Table 6: Geographical Positions of Settlements of Study Area**

Sr. No.	Locality/ Settlement	GPS	Tehsil	Union Council	Distance (Km)
1.	Sanawa		Kot Addu	Sanawa	
2.	Tibba Gormani		Kot Addu	Gormani	
3.	Gashkori Chowk		Kot Addu	Sanawa	
4.	Peer Mitha		Kot Addu	Sanawa	

#### 4.4.3.2 Demographic Structure

According to the information collected directly from the people of the study area through interviews, following is the demographic structure of the study area.

**Table 7: Demographic Structure of the Study Area**

Sr. No.	Locality/ Settlement	No. of Houses	Average Household Size	Population (Approx.)	Gender	
					Male (%)	Female (%)
1.	Sanawa	8000	6	48000	49	51
2.	Tibba Gormani	7000	6	42000	51	49
3.	Gashkori Chowk	600	6	3600	40	60
4.	Peer Mitha	15	6	90	50	50

#### 4.4.3.3 Sources of Income

Majority of the people belong to poor and lower middle class along with few upper-class landlords of the society. Most of the people are working as farmers, then laborers, live-stockers and businessmen, and next are employees in numbers. General occupations of the people of study area are given in the Table-8.

**Table 8: General Occupations of the People of the Study Area**

Sr. No.	Locality	General Occupations (%)				
		Labor	Farmer	Employees	Business	Livestock
1.	Sanawa	10	30	10	40	10
2.	Tibba Gormani	10	30	10	40	10
3.	Gashkori Chowk	10	30	10	40	10
4.	Peer Mitha	50	30	10	5	15

Similarly, following table depicts the level of average monthly income of various groups in the villages of the study area.

**Table 9: General Income Groups among the People of the Study Area**

Sr. No.	Income Group	Income Group (%)			
		Sanawa	Tibba Gormani	Gashkori Chowk	Peer Mitha
1.	100–9,999	5	5	5	5
2.	10,000–14,999	5	5	10	5
3.	15,000–19,999	5	5	20	30
4.	20,000–24,999	15	15	20	20
5.	25,000–29,999	20	20	15	20
6.	30,000 & above	50	50	30	20

#### 4.3.3.4 Household Expenditure

Average household expenditures including both food and non-food on monthly basis remain PKRS 70,000-1,00,000.

#### 4.3.3.5 Housing Conditions

The houses in the study area range between 5-12 marlas on the average extending sometimes up to very large sizes. More than 90% of the houses as assessed in the study area are paccas, and 10% semi paccas. Similarly, it was reported during the social survey that more than 70% of the respondents had their own houses. Remaining less than 30% are simple tenants.

#### 4.3.3.6 Industries

Industrial units situated in the study area includes Fatima Sugar Mill, Fatima Energy, some poultry farms and a number of brick kilns in the vicinity. The proposed project site is located in Sanawa. All the utilities are available at the door step of each industry.

#### 4.3.3.7 Basic Facilities

Basic facilities like electricity, sui gas, roads, transport, gas, cellular service, etc. are available and are well organized. Similarly, about 15 mosques, 1-2 graveyards and many shops are present in every village. The hand pumps, motor pumps and sometimes tube wells are used for extraction of water from underground/seepage sources. The drainage system comprising open channels is provided with inappropriate disposal points outside villages.

**Table 10: Basic Amenities Available in the Study Area**

Sr. No.	Basic Amenities	Current Status			
		Sanawa	Tibba Gormani	Gashkori Chowk	Peer Mitha
1.	Drinking Water Supply	√	√	√	√
2.	Mosque	√	√	√	√
3.	Market	√	√	√	√
4.	Shops	√	√	√	√
5.	Graveyard	√	√	√	√
6.	Telephone Connections	√	√	√	√
7.	Electricity	√	√	√	√
8.	Drainage System	√	√	√	√
9.	Disposal of Wastewater	×	×	×	×
10.	Proper Disposal of Solid Waste	×	×	×	×
11.	Canal Water	√	√	√	√
12.	Access Road	√	√	√	√
13.	Sui Gas	√	√	√	√

#### 4.3.3.8 Educational Facilities

An overview of education facilities available in the area is given in the following table:

**Table 11: Educational Facilities Available in the Area**

Sr. No.	Locality	Primary	Middle	High	College	Madrassa
1.	Sanawa	B&G***√	B&G***√	B&G***√	B&G***√	√
2.	Tibba Gormani	B&G***√	B&G***√	B&G***√	B&G***√	√
3.	Gashkori Chowk	G**√	B <sup>r</sup> √	×	×	√
4.	Peer Mitha	×	×	×	×	×

Where\*B=Boys

\*\*G=Girls

\*\*\*B&G= Boys & Girls

#### 4.3.3.9 Status of Literacy

Men in the study area are a mix of illiterate through graduate though intermediate and graduate are quite less in numbers. A vast majority of the women of the area are illiterate while young females of the study area are literate though till primary level.

#### 4.3.3.10 Non-Governmental Organizations

There is not any appropriate non-governmental or the social welfare organization working in the area at local level. There is a need of such an organization especially on female side.

#### 4.3.3.11 Agriculture

A short description in this regard is given hereunder:

##### 4.3.3.11.1 Major Crops

The crops usually seeded in the area include

- Wheat
- Rice
- Cotton
- Fruit Orchards
- Sugarcane, etc.

##### 4.3.3.11.2 Cropping System

Mixed wheat cropping system is being followed where rice, mixed fodder, cotton and wheat are grown in kharif while sugarcane as main crop in rabi season.

#### 4.3.3.11.3 Cropping Intensity

In the study area, cropping intensity varies from 90 to 130%.

**Table 12: Average Production of Major Crops & Fodder (Mann Per Acre)**

Season	Crops	Sanawa	Tibba Gormani	Gashkori Chowk	Peer Mitha
Rabi	1. Sugarcane	900 - 1500	900 - 1500	900 - 1500	900 - 1500
	2. Rice	35-40	35-40	35-40	35-40
Kharif	1. Wheat	35-40	35-40	35-40	35-40
	2. Cotton	45-50	45-50	45-50	45-50

#### 4.3.3.11.4 Agricultural Land Holdings

The individual agricultural farm land size ranges between 25-50 acres on the average.

#### 4.3.3.11.5 Rates of Agricultural Products

The price (PKRS) of wheat crop in the study area varies from 2500-3000 per 40 Kg that of rice stands at 4000-4500 per such quantity on the average. Similarly, rates of sugar cane and cotton remain at rupees 500-600 per 40 Kg and 5000-6000 per 40 Kg respectively.

#### 4.3.3.12 Source of Irrigation

The study area lies in Head Taunsa. \*\*\*This doab forms a hydrologic basin between Ravi and Chenab rivers. Marala Ravi Link, Upper Chenab Canal, Lower Chenab Canal and Haveli Canal form the canal system. In addition to it, the Doab has a number of distributaries namely Jhang, Rakh, Main Ali, Burala distributaries. This extensive irrigation system has not played only a vital role in re-shaping the economy of the area but also added to the hazards of water logging and salinity. The problem has reached to such an alarming stage that an acre of land is going to waste every 3 minutes which meant a colossal loss to the agriculture and environment of the area. To check further deterioration and to reclaim the land and environment a Salinity Control and Reclamation Project (**SCARP-I**) was established with the objective to lower subsoil water table and salinity in the area\*\*\*. The canals and tube wells constitute the source of irrigation of crops; about 70% of the total area is irrigated by these means, mainly by the canals. The remaining 5% of the cropped area is farmed under Barani condition. Area irrigated by tube wells is increasing

day by day. Muzzafargarh Canal is the major source of irrigation.

#### **4.3.3.13 Livestock**

The cows, buffaloes, sheep, donkeys and goats are the major livestock animals of the area which are raised for the domestic and commercial purposes to be used for transportation, food and farming.

#### **4.3.3.14 Land Price**

The land prices vary from 70,000.00 per marla to 2,50,000.00 per marla on the average.

### **4.3.4 Quality of Life Values**

The forthcoming paragraphs present the detail about quality of life values in the study area.

#### **4.3.4.1 Public Health**

The diseases particularly water borne, are commonly prevailing in the area and include hepatitis B&C, sugar, blood pressure and cardiac. There is not any BHU/hospital established in the study area except for Sanawa.

#### **4.3.4.2 Recreational Resources**

No adequate public parks and playgrounds are present in the study area except for a cricket ground at Kot Adu. The open and level fields of the localities are used as play grounds by the youth. Urs and fairs are playing a vital role to provide some recreational opportunities to the locals of rural areas while different parks and grounds are available at Kot Adu and Taunsa Barrage.

#### **4.3.4.3 Aesthetic Values**

Unfortunately, aesthetic values of the area have not been taken care of by the successive governments.

#### **4.3.4.4 Archeological or Historical Treasures**

There are no historical places or archeological sources such as ancient monuments, forts, sculpture, etc. in the study area. However, religious sites including shrines of some saints were

recognized in the study area.

#### **4.3.4.5 Cultural Values**

A short description in this regard is as under:

##### **4.3.4.5.1 Types of Community**

People primarily show traditional rural lifestyle along with a slight modern change in all walks of life.

##### **4.3.4.5.2 Types of Family**

The joint/extended family system prevails in all localities of the area.

##### **4.3.4.5.3 Ethnic Status**

The Baloch, Gormani, Arain, Syed, Gashkori and Jutt are the major casts/clans along with other tribes living together in the area. An overview in this regard is as under:

**Table 13: Major Castes and Methods of Decision Making**

Sr. No.	Locality	Major Castes	Decision Making	Key Decision Maker in Panchayat
1.	Sanawa	Baloch, Gormani, Arain, Syed	Panchayat/Police	Muhammad Akram
2.	Tibba Gormani	Gormani	Panchayat/Police	M. Zubair
3.	Gashkori Chowk	Gashkori Baloch	Panchayat/Police	Khan Muhammad
4.	Peer Mitha	Jutt Muhanay, Baloch	Panchayat/Police	Ahsan Gormani

#### **4.3.4.5.4 Status of Conflicts**

There prevails normal and sometimes standard social harmony and cohesion among the people of the study area. No significant religious, ethnic, political and tribal conflicts exist among the people of the study area except for theft of water and land occupation. If such incident happens, Panchayat system still exists to resolve the quarrels in most of the cases along with the police and judicial system too as final state authorities.

#### **4.3.4.5.5 Decision Making Authority**

In rural settlements, men have gained almost all the intra family and inter family matters. Females have no authority in decision making. This shows no or least participation of the females in decision-making process. However, trend is changing in town of Sanawan due to increasing literacy rate and provision of urban facilities.

#### **4.3.4.5.6 Role of Women**

Role of females in most of the rural settlements is traditional. A number of females from study area are working in fields. The role of women in agricultural activities is rather still substantial. However, role of females in some slots especially in the areas, is changing from conventional to modern where like other rural settlements, previously, most of the females were engaged in housekeeping and agriculture too but now women here are also performing duties very well in industry and teaching along with health care sector. Additionally, females also perform outdoor activities and duties. Females of the study area with no distinction are supposed to be responsible to perform all the family activities and are involved in all types of family functions.

## CHAPTER 5

### STAKEHOLDER CONSULTATION

#### 5.1 General

This section deals with the public concerns about the said project. Stakeholders' involvement especially the local population is an important feature of the environmental assessment and can lead to a better and more acceptable decision making regarding the project design and its implementation. It gives the feeling of an ownership to the local population.

Keeping in view the requirement of 'Review of IEE/EIA Regulations 2022' the consultations were carried out with the stakeholders/public. The outcomes of the public consultations are discussed in this section of the report.

#### 5.2 Objectives of Public Consultations

The main objectives of the study were:

- To inform stakeholders about the establishment of proposed FEP.
- To provide an opportunity for those which otherwise would be unrepresented to present their views and values, therefore, allowing more sensitive consideration of mitigation measures and trade-offs;
- Obtaining knowledge of communities regarding people, culture and traditions;
- To create continuous contacts among general public, other stakeholders, government departments and project management;
- To help in transparent and reality based decision regarding the acceptance of the EIA report by the EPA;
- To identify and assess significant social impacts, of the project activities on the surrounding area and people;
- To propose suitable means for probable mitigation of the significant adverse social impacts.

### **5.3 Identification of Stakeholders**

During the course of identification of primary, secondary and tertiary stakeholders, it was expected/predicted that following stakeholders including people, government departments and non-government organizations may be affected positively or negatively, directly or indirectly with the development of proposed project:

- Project Affected Persons
- General Public residing in the Project Influenced Area
- Schools & Colleges
- Madrassas
- Local Administration–District Administration of Kot Adu and Tehsil Administration, Kot Adu
- Agriculture Office, Kot Adu
- District Office Irrigation, Kot Adu
- Tehsil Office Agriculture, Kot Adu
- Education Office, Kot Adu
- Wildlife Office, Kot Adu
- Livestock Office, Kot Adu
- Environmental Protection Agency, Kot Adu
- Non-Governmental Organizations

### **5.4 Study Approach and Methodology**

Following methodology and approach were used for the present study:

#### **5.4.1 Study Area**

The area around Sanawa as a whole was the part of our study boundaries but specifically, it included 4 major localities namely Sanawa, Tibba Gormani, Peer Mitha, Gashkori Chowk and their subdivisions or extensions situated around the project site. These localities are situated in various union councils of Tehsil and District Kot Adu.

##### **5.4.1.1 Universe**

Universe of the project study area included the entire adult male population living around the

project site in above mentioned localities.

#### 5.4.1.2 Study Schedule

The composition and schedule to conduct the group discussions and interviews has already been given as Annexure-X while impact location profile was prepared using the attached Performa (Annexure-XI).

#### 5.4.1.3 Data Processing

Statistical and computer applications were used to codify, organize and tabulate data collected from various sources. During processing of the data, only relevant and valid information were included for empirical analysis to establish the realities of the community and its people.

#### 5.4.1.4 Sample Size

The distribution of sample for both farm and non-farm houses from each of the six localities has been shown below in Table 14.

**Table 14: Numbers of Respondents from Each Locality**

Locality/Settlement	Union Council	No. of Respondents
Sanawa	Sanawa	10
Tibba Gormani	Gormani	10
Gashkori Chowk	Sanawa	10
Peer Mitha	Sanawa	10

#### 5.4.2 Data Sources and Collection Methodology

A qualitative and semi-quantitative methodology was adopted to conduct this study. The study included the collection of both primary and secondary data through following steps:

##### 5.4.2.1 Scoping Sessions

A structured moderator guideline was formed to steer the discussions. Focus groups were organized in each locality of the study area. Detailed group discussions were organized; these were held in the open spaces, drawing rooms and along roadsides. The target respondents

including local authorities, government officers and public representatives were interviewed. Prior to consultation, the stakeholders were informed about the date, venue and time of consultation through personal contacts. During the discussion, the relevant responses, opinions, beliefs and attitudes were observed and recorded.

#### **5.4.2.2 Focus Group Discussions**

A semi-structured interview schedule was used as a tool for data collection. To get the information and feedback about the Project and its potential impacts, Focus Group Discussions (**FGDs**) were held during the scoping sessions. Before FGDs initiation and open discussions to some particular issues, a briefing about the Project was given to the participants, which helped them to foresee the impacts. Personal observations were also included in the methodology in order to collect relevant information about locality and people of the community.

#### **5.4.2.3 Wayside Consultations**

Along with scoping sessions and FGDs, wayside consultations were carried out with different representatives of the community who have or may have any kind of indirect impact by the Project. These stakeholders included individuals, comprising of pedestrians, drivers, passengers, vendors, shopkeepers, local inhabitants, officials, representatives of NGOs, teachers, students, etc. The basic purpose of such type of consultations was not only to get the feedback about the Project potential impacts and community perceptions but also to disseminate the information of the Project to maximum number of people/communities.

#### **5.4.2.4 Secondary Data**

Secondary data was also used to collect important information regarding localities, the people and the project. For this purpose, published data provided by the relevant sources or departments as well as filed investigations already carried out by this consultant were used.

A list of persons from general public consulted during SS, FGD and WSC is presented in Table

**Table 15: Locality Wise List of Respondents Interviewed**

Sr. No.	Date	Venue	Union Council	No. of Participants	Name of Main Participants
1.	25/01/2025	Sanawa	Sanawa	10	M. Akram, Rasheed Shah, Tehseen Rasheed, M. Jalal, M. Yahya, Qamar Farooq, M. Khalil, M. Nadeem, M. Saleem
2.	25/01/2025	Tibba Gormani	Gormani	10	M. Zubair, M. Ramzan, M. Amir, M. Altaf, M. Ajmal, M. Ashiq, M. Akbar, M. Munawar, M. Khairat, Arooj
3.	25/01/2025	Gashkori Chowk	Sanawa	10	Khadim Hussain, Abid Hussain, Sajad Hussain, Imran Khan, Fiaz Rasool, Munawar Rasool, Nawaz Rasool, Raziq Khan, Ashiq Khan, Atta Ullah M. Sajjad
4.	25/01/2025	Peer Mitha	Sanawa	10	Ghulam Yaseen, Muhammad Manzoor, Manzoor Hussain, M. Amjad, Ghulam Shabir, Farooq Ahmad, Fida Hussain, Muhammad Hafeez, Yaseen, Yameen

Similarly, a list of offices and institutions visited and officers consulted there for their opinion regarding the establishment of current project in the area is given in Table 16.

**Table 16: List of Government Offices Visited for Consultations**

Sr. No.	Name of Office	Name of the Officer	Designation	Contact Detail	Feedback
1.	Office of Assistant Commissioner Tehsil Kot Adu	Asghar Iqbal Laghari	Assistant Commissioner	0300-4030055	Positive
2.	Irrigation	M. Hasnat Agha	Assistant	0300-7620386	Positive
3.	Agriculture Department, Tehsil Kot Adu	M. Afzal Qureshi	A.D	0301-6950914	Positive
4.	Education	Naveed Abdullah Khan Sumbal	Deputy Education Officer	0345-7291055	Positive
5.	Irrigation and Drainage	M. Taimoor	XEN	0332-6206393	Positive
6.	Fisheries	Manzoor Hussain	A.D.	0301-6969026	Positive
7.	Forest	Mujeeb Ur Rehman	DFO	0333-8357770	Positive
8.	Health	Meer Kamran	Medical Superintendent	0333-6869111	Positive

Some other offices including, DD EPA Kot Adu, Forest Office Kot Adu, AD Agriculture Kot Adu, Senior Manager Contracts, and schools in the study area were also consulted during study visits.

## 5.5 Stakeholders' Perception regarding the Proposed Project

This section presents community awareness and perception about the proposed FEP Project:

- i) Majority of the people perceive that construction of proposed unit would cause high positive impacts on them and their communities particularly people residing in villages. They have high expectations and hopes from the proposed project and its management for community and environment stewardship.
- ii) They co-relate their positive attitude towards FEP with many socio-economic opportunities and benefits. This trend will enhance family protection, socialization and socio-emotional satisfaction of people. They reckon that construction of the proposed unit in the area will improve the level of general awareness of people about different aspects of their life. Social change will further be activated due to this progress.
- iii) People of adjacent localities have reservations regarding the prices of land which they were previously paid at the time of commencement of the project. They have reservations

- regarding the dust pollution created by the nearby kiln units. They are also though little bit apprehensive of some negative impacts on the community during the construction and operation phases like noise, dust, wastewater, etc.
- iv) The people seek some benefits in terms of women development too through the establishment and operation of the proposed project.
  - v) According to the views of people residing around, educational institutes, health facilities at door step, drinking water supply, organized access roads and employment are the pressing needs of the area.
  - vi) Govt. authorities have no objection on the establishment of this specific project. They perceive many positive impacts due to the proposed unit. However, as the project is going to be established in an area where industrial and sewage waters are being collectively drained out in the public drain, wastewater of proposed project shall be treated inhouse before it would be finally discharged into drain or the nalah. Thus government officials urge to treat the effluents properly and regularly and avoid contaminating any underground water and agricultural fields.

## 5.6 Key Study Finding

The study findings depict that people perceive overall positive social impacts by development of proposed individual project. Their attitude towards project development is highly positive with the expectation that locals are provided with jobs especially where unskilled labor is required. Majority of the people is convinced for positive sign for development in area and they correlate this change with the pace of their upward social mobility and progress. However, they have some reservations regarding effluent treatment and land acquisition.



Figure 15: Some Glimpses of Public Consultation

## 5.7 Outcomes of consultations

The outcomes of the primary and secondary consultation are precisely briefed as below:

- All actions associated with the project should be taken through proper consultations.
- There should be a continuous community consultation program throughout the project implementation period.
- There should be employment opportunities for skilled and unskilled people, preference should be given to the local communities.
- To include local people wherever possible in jobs during the construction of project. Thus, income generating activity of the area should be enhanced.
- Reduce the chances of environmental effects like noise/ vibration and dust emissions caused to the nearby community.

Overall, the project is good for the surrounding residents in specific and the country in general. They have no serious concerns with the project because this project will increase the employment and enhance the luxury lifestyle with affordable cost.

## CHAPTER 6

### SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

#### 6.1 Environmental Impacts due to Project and Mitigation Measures

This section identifies the potential impacts related with design, construction and operation of project on the physical, ecological and socio-economic domains of the environment. Accordingly, mitigation measures have also been proposed to manage the environment and for sustainable development. Strict environmental management will be observed during the project operation phase. Legal requirements of the PEPA and PEQS Pakistan will be rating standard for the activities. The project proponent is filling with the EPA Punjab, written affidavit and undertaking on judicial papers, that project throughout life will operate under environmental orders. The project activities will neither adversely affect the population nor the environment around the project site.

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

#### 6.2 Environmental Screening of the Proposed Project

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

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

The negative impacts predicted in this manner are the "unmitigated" impacts. Appropriate

mitigation measures have been recommended as part of this EIA. The occurrence and severity of the potentially adverse impacts will be reduced as a consequence of the incorporation of these mitigation measures into the project design/management.

### **6.3 Objectives**

Objectives of screening out of all possible impacts and then providing their mitigation measures are:

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

### **6.4 Environmental Impact Characterization**

During Environmental Impact Assessment (EIA), the predicted impacts were characterized, various aspects of the impact characterization include:

1. Nature (direct/indirect)
2. Duration of Impact (short term, medium term, long term)
3. Geographical Extent (local/regional)
4. Timing (project phase)
5. Reversibility of Impact (reversible/irreversible)
6. Likelihood of the Impact (certain/likely/unlikely/rare)
7. Impact Consequence Severity (severe/moderate and mild)
8. Significance of Impact (High/Medium/Low)

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

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

## 6.5 Environmental Problems due to Project Location and Mitigation Measures

The potential impacts assessed due to project location are change in land use pattern, pressure on the existing natural resources, natural hazards like floods, earth quake, changes in the socio-cultural patterns of the local community, local community displacement issues, and obstruction of accessibility to the community already residing in the locality.

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

**Table 17: Environmental Problems/Mitigation Measures Due to Project Location**

Potential Impacts	Mitigation Measures
<b>1. Change in Land Use Pattern</b>	
Any new intervention has its first and foremost impact of changing the land use pattern of the area. The impact of this nature is irreversible therefore site selection needs to have careful consideration of the impacts that may arise due to the changes in land use patterns.	Prior to selection of site, the project proponent has had careful consideration of site alternatives and hence due to current land use nature, price, and comparatively less environmental impacts the site was selected out of the four alternatives. Another factor adding to the feasibility of the proposed site was that it involved no displacement of local community, inside the existing industrial hub and less energy consumption for transportation.
<b>2. Pressure of Resources</b>	
Yet another impact to be considered prior to site identification is the availability of already existing resources e.g., water, gas, electricity, etc. any new intervention can exert pressure and marginalize the existing community. This could eventually create a sense of deprivation among the already existing community and may eventually result in social unrest.	Considering this very important factor, the site identification was done after evaluating the extent of provision of resources. The water requirements, energy requirement, social services (identified in the previous chapters) were done and based on the availability of resources to meet the present and future demand, the mentioned site was identified.

<b>3. Natural Hazards</b>	
It is very important to assess the extent of damage or any natural hazard e.g. earthquake, floods, landslides may cause.	The proposed site identified within environmentally /geologically safe and does not fall in any of the earthquake zones.
<b>4. Displacement of Local Community</b>	
Displacement of local community can tend to create social issues and aggravate negative feelings from the existing population towards the project.	The proposed project is planned on a site which has already been acquired by the proponents after going through its socio-culture, environmental and economic considerations. There is not going to be displaced any local community or whatsoever.
<b>5. Accessibility Issues to the Local Community</b>	
Another important impact considered was obstruction or changes in the patterns of transportation and increase travel time/distance for the local community.	The proposed project site is a vacant plot and does not involve damage to any roads. Nature, size and scope of work also limit the extent of activities during construction as well as operational phases.
<b>6. Presence of Sensitive Areas</b>	
Development interventions can degrade the quality and life expectancy of ecologically, socially and historically sensitive areas.	There are not sensitive areas of any nature be it ecological, social or historical in the proposed area
<b>7. Availability of Existing Infrastructure and Services</b>	
Unavailability of infrastructure can render the entire project void and impractical due to absence of important community infrastructure.	The proposed project is well connected to the rest of the city through major asphalt roads. Commercial buildings, housing societies, hospitals, clinic and transport facilities available hence making the location ideal for the said purpose

### 6.6 Environmental Problems due to Project Design and Mitigation Measures

Environmental issues may also arise during project design phase which may cause potential threats to the overall project life if not considered timely. The potential problems associated

with project design phase are identified in the Table 18 hereunder:

**Table 18: Environmental Problems/Mitigation Measures Due to Project Design**

Potential Impacts	Mitigation Measures
<b>1. Increased Energy Consumption</b>	
The design of building plays a vital role in determining the energy demand. Unplanned design may lead to overall rise in energy demand.	The design of the project is in such way that it allows adequate energy consumption and natural ventilating process to eliminate the factor of suffocations.
<b>2. Traffic Congestion</b>	
Unplanned traffic management and traffic infrastructure development may lead to traffic related issues such as accidents and traffic congestion.	The project has included traffic management as integral part of its overall design. The project construction activities are planned within the project area. Transportation of heavy construction materials will be done during less traffic hours.
<b>3. Fire Exits/Emergency Evacuation Plan</b>	
Emergency evacuation plans are necessary as fire issues may arise due to electric short circuit, gas leakages etc.	The project proposes Emergency Evacuation Plans in events of fire hazards. Quality of wiring work and gas lines will be ensured through installation of good quality wiring during construction and proper monitoring during operational phase. The site will be equipped with proper firefighting materials to ensure increased safety.
<b>4. Accessibility to Public Utility/Service</b>	
Inaccessibility to public utilities will render the project uninhabitable.	Resolving the issues of accessibility to public utilities / services will be resolved through proper design planning of infrastructure.
<b>5. Careful Planning of Greenbelts/Horticulture Plan</b>	

Unavailability of green belts would create aesthetic nuisance.	The design of proposed project involves establishment of green belts and develop aesthetically crafted lawns around the project building to increase its aesthetic value.
<b>6. Underground Sewer/Drinking Water Lines</b>	
Wires and pipelines lay open and above surface may consequently give rise to leakages, contamination and short circuits in the lines.	There will be no any such issue because water will be gained from underground sources.

### 6.7 Environmental Problems due to Project Construction and Mitigation Measures

The land is owned by the proponent. Construction work will be started after obtaining approval from EPA. Following are some potential impacts and their mitigation measures for construction phase.

**Table 19: Environmental Impacts/Mitigation Measures due to Project Construction**

Potential Impacts	Mitigation Measures
<b>1. Loss of Vegetation Cover/Biodiversity</b>	
Construction activity will involve excavation and removal of top soil. This may also lead to clearing of land for construction purpose which ultimately would mean that the respective area will be cleared of any sort of flora/fauna.	The proposed site has been selected after careful consideration of the land use, presence of biodiversity and other environmental parameters. Currently, there are no trees on the said location rather it is a vacant plot devoid of flora and fauna. But to ensure aesthetic value, the proponent will plant trees once the construction phase is complete.

<b>2. Gaseous Emissions</b>	
Gaseous emissions include SO <sub>x</sub> , NO <sub>x</sub> , CO <sub>2</sub> , lead and CO during construction phase. These gases are ozone depleting agents. Besides, they also pose threat to human health.	EURO II quality fuel shall be used in the machinery and generator/s to avoid emission of lead. Vehicles and machineries with good conditions which fall on the quality standards shall be used to control the exhaust emissions. Stacks with scrubbers shall be provided to reduce emissions from the generator/s.
<b>3. Dust Emissions</b>	
Generation of dust and particulate matters is an issue that could arise due to construction activities.	The construction materials e.g. soil, clay would be covered appropriately. Instead of open and dry dumping, sprinkling of water in a quantity that reduces the chances of dust generation would be done. The workers would be provided safety gloves, masks and ear buds and wherever necessary goggles to avoid health complications.
<b>4. Noise Generation</b>	
Noise emissions due to transportation, movement of heavy materials, excavation, generators may create healthnuisance for the workers and local community.	The working hours shall be limited to 08 in the morning till 05 in the evening to avoid noise during night shift. Vehicle maintenance would be ensured so that emissions of any sort, be it gaseous emissions or noise generation, would be controlled. The workers will be provided with ear plugs and other personal safety equipment to avoid invoking of any health issues.

<b>5. Solid Waste Generation</b>	
Unplanned dumping of solid waste generation during construction phase can lead to blockage of roads, waterways and also create unaesthetic sight of the proposed location.	Solid waste generation quantity during construction phase shall be reused in construction activities rather than dumping. The solid waste during construction phase will consist most of soil, packaging materials, iron rods and food leftovers. The organic portion of solid waste shall be collected by sanitary workers of that area.
<b>6. Wastewater Generation</b>	
Unplanned wastewater disposal may contaminate the surface water channels, surface soil and depending upon the quantity of wastewater generated, it has a potential to contaminate the ground water aquifers.	Wastewater generation during construction phase shall be reused again for material making for construction phase and sprinkling of dust on soil. A Septic tank unit shall be constructed for onsite sewage treatment prior to discharge into nearby Nala.
<b>7. Accidental Spills</b>	
Accidental spills of oil, fuel and lubricants can cause surface water contamination and surface soil contamination. It may also lead to fire hazards depending upon the quantity and nature of spills.	Accidental spills shall be avoided by providing spill kits at different places and also ensuring the safe transportation of different raw material that may be in liquid state.
<b>8. Equipment Breakdown/Accidents</b>	
Accidents and/or emergency breakdown of the equipment/machineries/vehicles involved may create environmental, health and safety hazards.	This situation can be avoided by regular maintenance of the vehicles for quality assurance. Besides, equipment will be checked prior to operation to avoid accidents and human health danger due to such accidents.

<b>9. Soil Erosion</b>	
Loss of vegetation cover and trees may lead to soil erosion hence resulting in dust emission and loss of fertile land cover.	The construction activities shall be planned in a way that reduces the chances of vegetation cover loss and its consequent soil erosion issues. Soil erosions are due to wind and water. The proposed project is planned for construction during the coming months after Environmental Approval, which are dry and sunny. Hence, the probability of soil erosion due to natural factor will be negligible to none.
<b>10. Social Impacts</b>	
Problems regarding privacy of local community may arise due to invasion of construction workers.	Improper social behaviors e.g., staring and teasing shall be discouraged and any such incident will be reported to the site in-charge, proponents directly. Workers will be hired from the local community to avoid social issues.
<b>11. Training and Awareness</b>	
Unskilled workers may create issues in attaining the overall health environment and safety policy.	Regular onsite and offsite training of the workers shall be conducted. Impromptu meetings and discussions with the site in-charge and daily wages workers will be done to resolve any issues that may create health safety and environmental problems during construction phase.

## 6.8 Environmental Problems due to Project Operation and Mitigation Measures

Table 20 provides a detailed overview of the environmental aspects and subsequent environmental impacts that may arise during project operational phase. Appropriate mitigation measures are also proposed for the remedy of any such potential impacts.

**Table 20: Environmental Problems/Mitigation Measures Due to Project Operations**

Potential Impacts	Mitigation Measures
<b>1. Solid Waste Management</b>	
Improper and unplanned solid waste dumping can cause environment, health and safety issues. It also can potentially deteriorate the living quality of the residents besides reducing the aesthetic quality of the steel mill.	At the site, only solid waste will be domestic like paper, polythene bags, etc. which will be collected by sanitary workers of that area.
<b>2. Wastewater Disposal</b>	
Wastewater generated due to domestic/commercial activities will result in the spread of vector borne diseases like dengue, malaria, as well as spread the nuisance of foul smell.	To tackle wastewater, septic tank will be constructed. The wastewater will be of domestic nature and of cleaning type, etc.
<b>3. Energy Conservation</b>	
Excessive use of energy will exert more pressure on the already dwindling energy resources of the city/country.	The workers/employees will be encouraged to follow energy conservation strategies developed during operational phase. Machineries and equipment will be kept in good maintained shape to avoid extra fuel consumption. As the power source shall be in house through self-generation, therefore, no pressure shall be exerted on existing national grid.

<b>4. Noise Generation</b>	
Noise emissions due to traffic and any activities will create issues to the residents.	There will be no such activity that may create excessive noise. There will be small machinery that creates less noise (within the standards) during working hours.
<b>5. Emergency/Fire Hazards</b>	
Emergencies e.g. fire incidents may lead to environmental, health and safety issues to the local residents.	Emergency exits have already been planned. Firefighting equipment will be provided and adequate trainings will be provided to tackle any situation of fire hazards. Call points at suitable locations will be installed. Moreover, there is not any residential settlement or village near the project site which could be harmed from such hazard.
<b>6. Training of Staff</b>	
Unskilled personnel will not be able to tackle environmental, health and safety related situations which may further aggravate any such issues and cause loss of human life and property.	Regular training of the staff will be conducted. Proper monitoring and reporting mechanism will be developed where the team will be responsible to communicate/report any illegal or hazardous situation to the team leader.
<b>6. Groundwater Consumption</b>	

<p>The groundwater will be used for domestic purpose at said project. Water storage will also be required for emergency response in case of a fire. Prolonged water consumption may in the long run lower/deplete the underground water table. This will be a permanent and moderate negative impact.</p>	<p>An effective 'Water Conservation Plan' will be developed and for domestic purpose water will be gained from ground water. Following operational measures will be adopted for water conservation:</p> <ul style="list-style-type: none"> <li>• It will be made sure that all faucets, circulating pumps, etc. do not leak and are in good repair;</li> <li>• Any leaking or dripping faucet, pump or toilet will be reported immediately;</li> <li>• All the utility bills will be kept in a safe place to track the consumption of water; and purchase and use of water-saving equipment will be practiced;</li> <li>• An effective residents' training program will be implemented about water conservation</li> </ul>
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### 6.9 Potential Environmental Enhancement Measures

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

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

### 6.10 Impact Identification with Checklist

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

## **CHAPTER 7**

### **ENVIRONMENTAL MANAGEMENT AND MONITORING PROGRAM**

#### **7.1 General**

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

#### **7.2 Objectives of EMP**

The objectives of EMP are:

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

#### **7.3 Institutional Capacity of the Unit**

The organizational structure for the Environment Management Plan is outlined below:

##### **7.3.1 Primary Responsibilities**

The primary responsibility for implementing EMP within the unit lies under owner's responsibility.

##### **7.3.2 Operation Management & Control**

Conducting the operational activities in environmentally sound manner will be the responsibility of the concerned Manager for which he will be trained.

##### **7.3.3 Supervision & Monitoring**

Senior Supervisor will be responsible for all environmental issues and for the implementation of EMP.

### **7.3.4 Communications and Documentation**

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

### **7.3.5 Meetings**

Two kinds of environmental meetings will take place during the project

- Kick-off meetings
- Weekly meetings

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

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

### **7.3.6 Changes-Record Register**

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

## **7.4 Staff and Training**

### **7.4.1 Environmental Committee and its Responsibilities**

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

- To ensure implementation of all the proposed mitigation measures during and after the operational phase of the project.
- To organize routine monitoring of motor vehicle emissions, air quality, noise and

vibration; etc. In case, the noise levels exceed the acceptable levels, a penalty or ban must be enforced.

- To develop operational guidelines and implementation schedule.
- Receiving complaints from residents and institutions and assisting the local environmental authority including liaison with Punjab EPA.
- To ensure that the proposed project is implemented in an environmentally friendly manner, causing least harm to the existing environment including flora and fauna, sites of religious and cultural significance, etc.

#### **7.4.2 Technical Training Programs:**

In order to raise the level of professional and managerial staff, they need to upgrade their knowledge in the related areas. The Environmental committee would play a key role in this respect and arrange the trainings. A training program is proposed to train the staff who will be involved in the operational phase.

#### **7.4.3 Environmental Technical Assistance and Training Plan**

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

#### **7.4.4 Environmental Training schedule**

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

The primary responsibility for providing training to all the project personnel will be TO formulate indicative environmental training program, which will be finalized before the commencement of the project. The ECTECH will train the project proponent's staff and other

staff engaged for the project. Training will cover all staff levels, ranging from the management and supervisory to the skilled and unskilled categories. The scope of the training will cover the requirements of the EIA and the EMP, with special emphasis on sensitizing the project staff to environmental, ethnic, and social context of the area.

**Table 21: Environmental Training Schedule**

Staff	Trainer	Contents	Schedule
Selected management and staff from the project Proponents	ECTECH	<ul style="list-style-type: none"> <li>• Environmental sensitivity of project area</li> <li>• Key findings of the EIA mitigation measures</li> <li>• EMP</li> <li>• Social and cultural Values of area</li> </ul>	Prior to the start to the project activities
All Employees	ECTECH	<ul style="list-style-type: none"> <li>• Environmental sensitivity of project area</li> <li>• Mitigation measures contingency plan</li> <li>• Community issues</li> <li>• Social and cultural values</li> </ul>	Prior to the startof the Project activities
Drivers	ECTECH	<ul style="list-style-type: none"> <li>• Road safety</li> <li>• Defensive driving</li> </ul>	Before and during the project activities.

## 7.5 Summary of Impacts and their Mitigation Measures

**Table 22: Environmental Management and Monitoring Plan**

Potential Impacts	Mitigation Measures
<b>For Construction Phase</b>	
<b>1. Loss of Vegetation Cover/Biodiversity</b>	

<p>Construction activity will involve excavation and removal of top soil. This may also lead to clearing of land for construction purpose which ultimately would mean that the respective area will be cleared of any sort of flora/fauna.</p>	<p>The proposed site has been selected after careful consideration of the land use, presence of biodiversity and other environmental parameters. Currently, there are no trees on the said location rather it is a vacant plot devoid of flora and fauna. But to ensure aesthetic value, the proponent will plant trees once the construction phase is complete.</p>
<p><b>2. Gaseous Emissions</b></p>	
<p>Gaseous emissions include SO<sub>x</sub>, NO<sub>x</sub>, CO<sub>2</sub>, lead and CO during construction phase. These gases are ozone depleting agents. Besides, they also pose threat to human health.</p>	<p>EURO II quality fuel shall be used in the machinery and generator/s to avoid emission of lead. Vehicles and machineries with good conditions which fall on the quality standards shall be used to control the exhaust emissions. Stacks with scrubbers shall be provided to reduce emissions from the generator/s.</p>
<p><b>3. Dust Emissions</b></p>	
<p>Generation of dust and particulate matters is an issue that could arise due to construction activities.</p>	<p>The construction materials e.g. soil, clay would be covered appropriately. Instead of open and dry dumping, sprinkling of water in a quantity that reduces the chances of dust generation would be done. The workers would be provided safety gloves, masks and earbuds and wherever necessary goggles to avoid health complications.</p>

<b>4. Noise Generation</b>	
Noise emissions due to transportation, movement of heavy materials, excavation, generators may create health nuisance for the workers and local community.	The working hours shall be limited to 08 in the morning till 05 in the evening to avoid noise during night shift. Vehicle maintenance would be ensured so that emissions of any sort, be it gaseous emissions or noise generation, would be controlled. The workers will be provided with ear plugs and other personal safety equipment to avoid invoking of any health issues.
<b>5. Solid Waste Generation</b>	
Unplanned dumping of solid waste generation during construction phase can lead to blockage of roads, waterways and also create unaesthetic sight of the proposed location.	Solid waste generation quantity during construction phase shall be reused in construction activities rather than dumping. The solid waste during construction phase will consist most of soil, packaging materials, iron rods and food leftovers. The organic portion of solid waste shall be collected by sanitary workers of that area.
<b>6. Wastewater Generation</b>	
Unplanned wastewater disposal may contaminate the surface water channels, surface soil and depending upon the quantity of wastewater generated, it has a potential to contaminate the ground water aquifers.	Wastewater generation during construction phase shall be reused again for material making for construction phase and sprinkling of dust on soil. A Septic tank unit shall be constructed for onsite sewage treatment prior to discharge into nearby Nala.
<b>7. Accidental Spills</b>	
Accidental spills of oil, fuel and lubricants can cause surface water contamination and surface soil contamination. It may also lead to fire hazards depending upon the quantity and nature of spills.	Accidental spills shall be avoided by providing spill kits at different places and also ensuring the safe transportation of different raw material that may be in liquid state.

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

<b>For Operation Phase</b>	
<b>1. Solid Waste Management</b>	
Improper and unplanned solid waste dumping can cause environment, health and safety issues. It also can potentially deteriorate the living quality of the residents besides reducing the aesthetic quality of the steel mill.	At the site, only solid waste will be domestic like paper, polythene bags, etc. which will be collected by sanitary workers of that area.
<b>2. Wastewater Disposal</b>	
Wastewater generated due to domestic/commercial activities will result in the spread of vector borne diseases like dengue, malaria, as well as spread the nuisance of foul smell.	To tackle wastewater, septic tank will be constructed. The wastewater will be of domestic nature and of cleaning type, etc.
<b>3. Energy Conservation</b>	
Excessive use of energy will exert more pressure on the already dwindling energy resources of the city/country.	The workers/employees will be encouraged to follow energy conservation strategies developed during operational phase. Machineries and equipment will be kept in good maintained shape to avoid extra fuel consumption. As the power source shall be in house through self-generation, therefore, no pressure shall be exerted on existing national grid.
<b>4. Noise Generation</b>	
Noise emissions due to traffic and any activities will create issues to the residents.	There will be no such activity that may create excessive noise. There will be small machinery that creates less noise (within the standards) during working hours.

<b>5. Emergency/Fire Hazards</b>	
Emergencies e.g. fire incidents may lead to environmental, health and safety issues to the local residents.	Emergency exits have already been planned. Firefighting equipment will be provided and adequate trainings will be provided to tackle any situation of fire hazards. Callpoints at suitable locations will be installed. Moreover, there is not any residential settlement or village near the project site which could be harmed from such hazard.
<b>6. Training of Staff</b>	
Unskilled personnel will not be able to tackle environmental, health and safety related situations which may further aggravate any such issues and cause loss of human life and property.	Regular training of the staff will be conducted. Proper monitoring and reporting mechanism will be developed where the team will be responsible to communicate/report any illegal or hazardous situation to the team leader.

<b>-6. Groundwater Consumption</b>	
<p>The groundwater will be used for domestic purpose at said project. Water storage will also be required for emergency response in case of a fire. Prolonged water consumption may in the long run lower/deplete the underground water table. This will be a permanent and moderate negative impact.</p>	<p>An effective 'Water Conservation Plan' will be developed and for domestic purpose water will be gained from ground water. Following operational measures will be adopted for water conservation:</p> <ul style="list-style-type: none"> <li>• It will be made sure that all faucets, circulating pumps, etc. do not leak and are in good repair;</li> <li>• Any leaking or dripping faucet, pump or toilet will be reported immediately;</li> <li>• All the utility bills will be kept in a safe place to track the consumption of water; and purchase and use of water-saving equipment will be practiced;</li> <li>• An effective residents' training program will be implemented about water conservation</li> </ul>

Persons involved during constructional and operational phase must be aware of following responsibilities and equipment, maintenance details:

**Table 23: List of persons involved during implementation of EMP**

Sr. No.	Description	Responsibility	Who will be involved	Outcomes
1	Air Quality	Administration	All employees	<ul style="list-style-type: none"> <li>• Better understanding of the health impacts associated with air pollution</li> <li>• Develop a monitoring and reporting system for air pollution</li> <li>• Third party involvement especially EPA approved labs will be decided under potentially harmful circumstances</li> </ul>
2	Solid Waste	Administration	Staff	<ul style="list-style-type: none"> <li>• The staff will be trained to follow the principles of recycling, reuse, reduce and will be taught to follow solid waste segregation at source.</li> </ul>

## 7.6 Emergency Preparedness Plan

In order to cope with emergency due to major fire hazards, a proper fire escape plan has been designed. A proper **emergency escape** is present in the building along with **fire extinguishers** at each floor.

### Fire Alarm and detection System

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

				<ul style="list-style-type: none"> <li>• Improved understating regarding health impacts associated with unplanned waste management</li> <li>• A monitoring and reporting system that would enable the supervisor to keep control of all unnecessary scattering</li> </ul>
3	Wastewater	Administration	Employees but specific attention to the staff	<ul style="list-style-type: none"> <li>• Improved understanding of the conservation techniques</li> <li>• Quality assurance through lab analysis if need be found</li> <li>• Overflow control in the drains through continuous cleaning</li> </ul>
4	Noise	Administration	All employee	<ul style="list-style-type: none"> <li>• Monitoring and reporting system for noise related issues if detected</li> </ul>

telephone (line and cellular).

**The system comprises the following.**

- Smoke detector
- Call points
- Control panel in security room
- Fire signs
- Calling the Fire Brigades

				<ul style="list-style-type: none"> <li>• Appropriate measures would be identified and implemented</li> <li>• Guidance to the employee on adopting good practices for noise and any other practice that otherwise could lead to environmental nuisance.</li> </ul>
5	Firefighting	Administration	All employee	<ul style="list-style-type: none"> <li>• Improved understanding of keeping a tab on all potential threats that could lead to fire hazards</li> <li>• Understanding on how to use the firefighting equipment</li> <li>• Understanding regarding emergency exits and use of fire point.</li> </ul>
6	Landscaping	Administration	Staff	<ul style="list-style-type: none"> <li>• Improved efforts for maintaining the green belts and tree plantations</li> </ul>
7	Accidental Spills	Administration	All staff	<ul style="list-style-type: none"> <li>• Improved understanding regarding how to react during minor and major spills according to the measures identified</li> </ul>

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

### Medical Aid

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

### 7.7 Equipment Maintenance Detail

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

### 7.8 Environmental Budget

The total cost of the project is Rs. 5.5 Billions, which includes 1,200,000 Pak Rupees for the environmental management. The estimations are as followings:

### 7.9 Environmental Management Cost

The following table depicts environmental monitoring and management cost for operation phase.

**Table 24: Environmental Management Cost (Per Year)**

Environmental Component	Quantity	Amount (PKR)
Tree Plantation	300	100,0000
Health & Safety measures and provision of PPE's	L.S.	500,000
Air, Water Quality & Nnoise Monitoring	L.S.	350,000
Environmental Trainings	L.S.	350,000
Total Environmental Management and Monitoring Cost.		1,200,000

## **CHAPTER 8**

### **CONCLUSION AND RECOMMENDATIONS**

#### **8.1 Conclusion and Recommendations**

The Environmental Impact Assessment contains description of the project, description of the environmental baseline, potential environmental impacts and suggested mitigation measures. An implementation mechanism for mitigation measures in the form of an Environmental Management Plan is included in the study. While the objectives of this study have been to describe the project and its environmental impact, it also identifies adverse environmental factors associated with the project. Appropriate mitigation measures as explained in the environmental study should reduce, if not eliminate, these impacts so that these are within acceptable limits. It is further concluded that all potential environmental concerns associated with the project have been adequately addressed, and no further study is required in this context.

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

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

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

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- 24. Land Acquisition Act, 1894
- 25. Miscellaneous documents regarding the project

Environmental Impact Assessment EIA Report  
FATIMA ETHANOL PLANT (FEP)



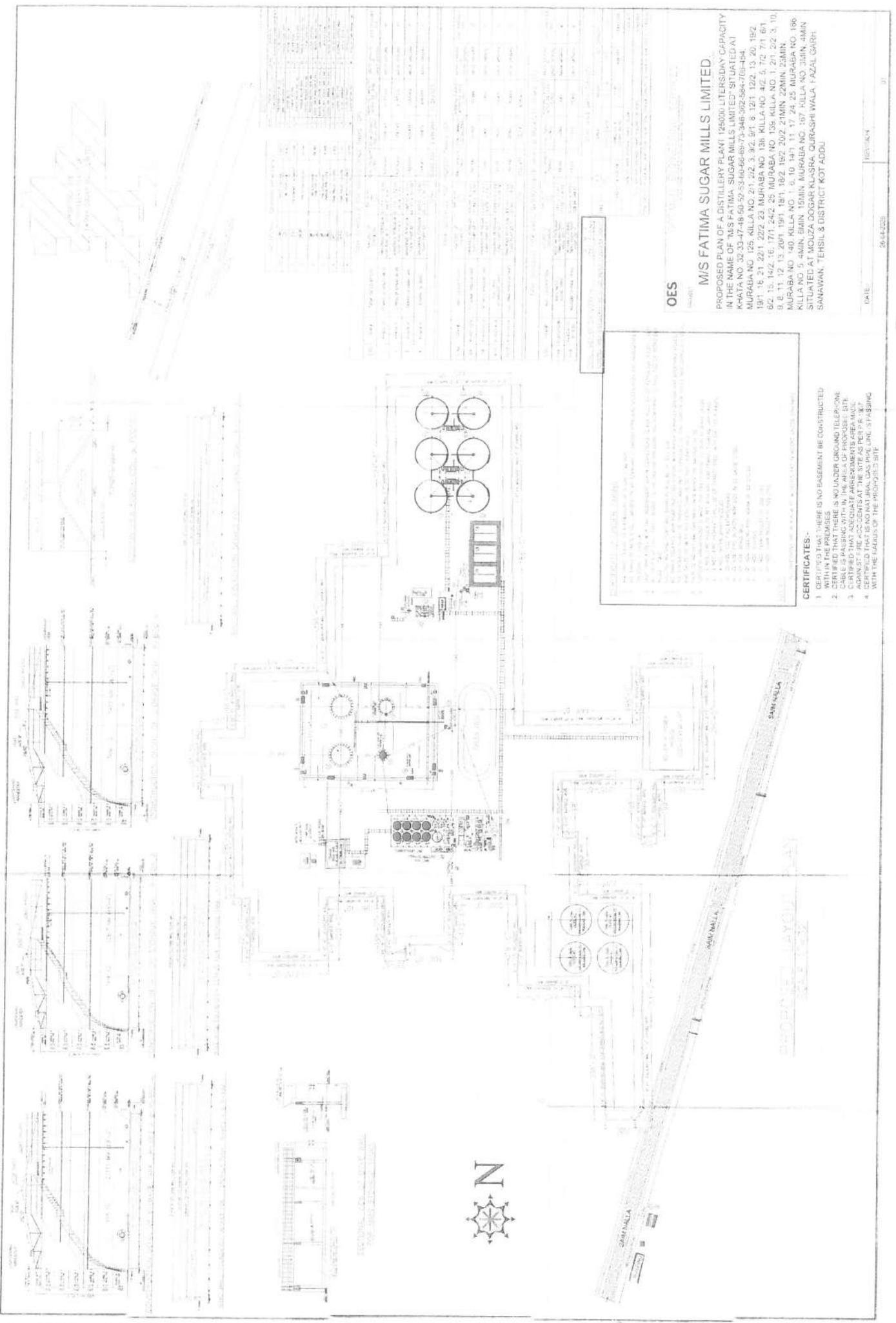
# **ANNEXURES**

**Annexure-I**  
**Aks-e-Shajra**



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**Annexure-II**  
**Project Layout Plan**



OES

**M/S FATIMA SUGAR MILLS LIMITED**

PROPOSED PLAN OF A DISTILLERY PLANT 125000 LITERS/DAY CAPACITY IN THE NAME OF M/S FATIMA SUGAR MILLS LIMITED, SITUATED AT KHATA NO. 32, 33, 47, 48, 50, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

- CERTIFICATES:-**
1. CERTIFIED THAT THERE IS NO BASEMENT BE CONSTRUCTED WITH IN THE PREMISES.
  2. CERTIFIED THAT THERE IS NO UNDER GROUND TELEPHONE CABLE IS PASSING WITH IN THE SITE.
  3. CERTIFIED THAT ADEQUATE APPROXIMATE AREA MULTI ADMINSTRATIVE ACCIDENTS AT THE SITE AS PER P.R. 387.
  4. CERTIFIED THAT THERE IS NO NATURAL GAS PIPE LINE, STIPASSING WITH THE MARGINS OF THE PROPOSED SITE.

DATE: 26-04-2025

REVISION: 01



**Annexure-III**  
NOC from District Officer Industries, Prices, Weights &  
Measures, Kot Addu



Ph.No.066-9200270

**DISTRICT OFFICER  
INDUSTRIES, PRICES, WEIGHTS & MEASURES  
KOTADDU**

NO. 180/IPWM/MZG

Dated: 05/04/2025

To

✓ The Deputy Commissioner / Chairperson DPDC  
Kot Addu

**SUBJECT: REPORT REGARDING ETHANOL DISTILLERY UNIT OF FATIMA  
SUGAR MILLS SINAWAN TEHSIL & DISTRICT KOT ADDU**

Please refer to the District Planning and Design Committee Kot Addu held on 27<sup>th</sup> March 2025 on the subject cited above.

It is submitted that the undersigned has visited the installation and construction site of the Ethanol Distillery Unit of Fatima Sugar Mills Sinawan Tehsil & District Kot Addu on 03-04-2025.

During the visit, the site was assessed and no observations have been found that impede the installation of the industrial unit under Location Clearance Policy Notification No. DO/E&IP/MZG/Negative Area/2005/293 dated 30<sup>th</sup> June 2005. It is noted that

- The proposed site is not located in the jurisdiction of Municipal Committee Sinawan
- The Proposed site is not located within a thickly populated area

In view of above, this office has NO OBJECTION for the provision of NOC for the construction of the Ethanol Distillery Unit of Fatima Sugar Mills Sinawan Tehsil & District Kot Addu on the aforementioned location by the District Planning & Design Committee Kot Addu.

**DISTRICT OFFICER  
INDUSTRIES, PRICES, WEIGHTS & MEASURES  
KOTADDU**

Copy to:

The Secretary District Planning & Design Committee (DPDC, Kot Addu)

**Annexure-IV**  
Permission from Office of the Executive Engineer High/way  
Division, Muzaffar Garh



To,

Col. Ch. Abdus Sattar Sulehri @,  
Administrator Fatima Group,  
Sinawan District Kot Addu

No: M-13/ 223 /DB

Dated 14 / 04 /2025

Subject: - PERMISSION FOR FATIMA ETHANOL PROJECT WITH FATIMA SUGAR MILLS LTD. SINAWAN DISTRICT KOT ADDU

Please refer to your office letter No:FSML/Admin/05-14/25 dated 11.04.2025 on the subject noted above.

Necessary NOC may be granted on the following conditions: -

1. The work will be done through thrush boring depth must be 6ft and it will not damage the road.
2. If any, damage happens to Highway Road your mill will take the full responsibility and pay the expense for repair & maintenance of the road.
3. It is pertinent to mention here an affidavit may provided that as and when the road will widen / reconstruction, it will be shifted at your own expenses.

Submitted for further necessary action please.

  
EXECUTIVE ENGINEER  
Highway Division, Muzaffargarh

C.C: -

The Sub Divisional Officer, Highway Sub Division, Kot Addu for information with reference to his letter No:511/KA dated 12.04.2025 and he is directed to pursue the matter at his personal level.

**Annexure-V**

Permission from Office of the Executive Engineer Kot Addu  
Canal Division, Kot Addu



OFFICE OF THE  
EXECUTIVE ENGINEER,  
KOT ADU CANAL DIVISION,  
KOT ADU.

Ph : # 066-2242926  
Fax : # 066-2241926  
E-mail: irrigation\_xenkada@yahoo.com

No. 277 /2-L.  
Dated. 15/04 /2025

To,  
Deputy Commissioner,  
District Kot Adu.

Subject: - PERMISSION FOR FATIMA ETHANOL PROJECT WITH FATIMMA SUGARMILLS LTD SANAWAN DISTT KOT ADU.

With reference to the Administrator Fatima Group Letter No FSL/Admin/05-1/25 dated 11 April 2025 regarding subject matter, the coordinates of land in question were sent to Flood Risk Assessment Unit Irrigation Department and they have reported that subject land is out of flood plain. The Coordinates of the land are Lat: 30.303952 and Long: 70.965777. This is for your kind information and further necessary action please.

  
Executive Engineer,  
Kot Adu Canal Division,  
Kot Adu.

Copy of the above is forwarded to the following for information.

1. Superintending Engineer Muzaffargarh Canal Circle Multan.
2. Col Ch Abdus Sattar Sulahri Administrator Fatima Group with reference to his letter No FSL/Admin/05-1/25 dated 11 April 2025.

**Annexure-VI**  
NOC from Civil Defence Officer, Kot AdduMuzaffar Garh



Office of the  
**CIVIL DEFENCE OFFICER**  
**MUZAFFARGARH/KOT ADDU**  
Phone No.066-9200140  
Email:-[civildefencemuzaffargarh@gmail.com](mailto:civildefencemuzaffargarh@gmail.com)

To,

The Administrator Fatima Group,  
Fatima Sugar Mills Limited,  
Sanawan, Kot Addu.



No: CD/MZG/2025/768

Dated:- 24 - 06 - 2025

**SUBJECT:- NOC REGARDING FIRE PREVENTION MEASURES FOR ETHANOL/DISTILLERY PLANT WITHIN PREMISES OF (M/S FATIMA SUGAR MILLS LIMITED).**

Reference your office letter No.FSML/Admin/4-2/25 dated 17-04-2025 on the subject noted above.

It is submitted that a conditionally No Objection Certificate is being issued from this office before the commencement of the plant with the directions to adopt all fire prevention measures. When the construction of Distillery will be completed, the undersigned will revisit the site for inspection to ensure all fire safety measures and will issue the final No Objection Certificate.

However, this office has no objection of the construction of distillery plant for the time being.

*Ref. 24-06-25*

**CIVIL DEFENCE OFFICER**  
**MUZAFFARGARH/KOT ADDU**

**Annexure-VII**  
NOC from Office of the Executive Engineer River Diversion,  
Muzaffar Garh



# OFFICE OF THE EXECUTIVE ENGINEER, RIVER DIVERSION DIVISION MUZAFFARGARH

066-2423198

066-2551798

E-Mail: xenrdd\_mzg@yahoo.com

To

Col Ch Abdus Sattar Sulahri  
Administrator Fatima Group,  
Sanawan, Kot Adu.  
PTCL # 066-2250513-14 (Ext.102)  
Phone # 0302-8275555

No. 602/1-AG

Date. 25/07 /2025

Subject:- **NOC FOR TREATED EFFLUENT WASTES OF FATIMA SUGAR MILL FOR ETHANOL PLANT INTO DRAIN.**

Reference: - Your letter No.FSML/Admin/4-3/26 dated. 25-04-2025.

This office has No Objection for the discharge of well-treated waste of Fatima Sugar Mill for Ethanol Plant into the Ghazi Ghat Main Drain at RD.111+500, on the following terms and conditions.

1. Minimum drop should not be less than free board 1.5 with proper protection of bed of the Drain.
2. Solid particles on un-treated Effluent should not enter in to the Drain.
3. In case of solid deposit in the Drain by Effluent of Industrial waste, the Drain section will be cleared at the expenses of Fatima Sugar Mill for Ethanol Plant.
4. Fatima Sugar Mill for Ethanol Plant shall deposit a refundable security of Rs.300000/- (Three Lac Only) to Irrigation Department (As mentioned in clause 6 of NOC).
5. Effluent charges of Rs.35000/- per Cusecs per Annum according to the notification No.SO(REV)/IRR/2-1997 dated.12.06.2014, would be charged from Fatima Sugar Mill for Ethanol Plant for operation of Drain which can be increase annually (as mentioned in clause of NOC). Total discharge is 6 cusecs hence Fatima Sugar Mill for Ethanol Plant will deposit Rs.210000/- per annum in this regard. The charges may vary as per notification of Government time to time.
6. Fatima Sugar Mill for Ethanol Plant is liable to ensure the discharge quantity of the treated effluent into Drain.
7. The agreement between the Government of Punjab and Fatima Sugar Mill for Ethanol Plant will executed every year.
8. In case of any extra charges imposed by Government for operation of Ghazi Ghat Main Drain falling in the area responsibility will be acceptable to Fatima Sugar Mill for Ethanol Plant.
9. In case of violation or other any reason the Government reserves the right to withdraw the facility.
10. Either party can terminate the agreement by giving 01 month advance notice in writing to other.
11. All points will be terminated for non submission of Effluent Charges later than 3 months.

E/EN Draft

*am Tahir*  
Executive Engineer,  
River Diversion Division,  
Muzaffargarh

**Annexure-VIII**  
Laboratory Monitoring Results



**ENVIRONMENTAL PROTECTION AGENCY  
GOVERNMENT OF THE PUNJAB  
National Hockey Stadium, Gate No. 08  
Gaddafi Stadium Complex, Lahore**



*Validation # 4041*

**Validation for Stack & Ambient Monitoring / Sampling**

Emission Monitoring under CTM-34 or OTM-39			
Facility Name & Address	<i>Fabima Ethanol plant Tibbi Nizam Road Sanawan, Dist Kot Addu</i>	No of Stacks / Sampling Point	<i>1 A.A.</i>
Industry Category	<i>(Baseline study)</i>		
Analyzer Model & Make	<i>Korba &amp; Monitor Lab + Teledge Analyser</i>		
Average stack emission Values of CO, NOx (in mg/nM3)			
Excess Air / Excess Oxygen (%age):-			
Analyzer exposed for Ramp-Up phase to the sample gas for 5 minutes	Yes	NO	NA
Analyzer flow rate and EC temperature monitored during calibration and testing	Yes	No	NA
Test Data Phase of sample gas recorded with 15 second interval	Yes	No	NA
All key requirements to ensure QA/QC complied for said EPA approved Method	Yes	No	NA
<b>Particulate Matter (PM) Monitoring / Sampling under USEPA Method 5 / 17</b>			
Model & Make of Iso-kinetic PM Assembly			
The PM sampling train is complete as per Method 5 & 17	Yes	No	NA
Leak Test performed prior to sampling	Yes	No	NA
Field data Sheet for PM Sampling filled during PM sampling	Yes	No	NA
Data for determining of "K" factor & DGM "Y" Factor filled during sampling	Yes	No	NA
All method key requirements during sampling were compiled to ensure QA/QC	Yes	No	NA
Filter of Particulate matter is suitable for metal Testing	Yes	No	NA
<b>SOx sampling as per Method 8 (Thorin Indicator Method)</b>			
The right absorbent solution are available for SOx Sampling	Yes	No	NA
The equipment is capable to maintain flow rate @ 2.0LPM or as per method 8 requirement	Yes	No	NA
Sampling for SOx is performed as per method	Yes	No	NA
<b>Ambient Air Quality Monitoring by Automatic Monitors for CO, O3, SO2, NOx, PM2.5 &amp; PM10</b>			
In case of continuous monitoring at a site, One Point QC Check Single analyzer & Zero/span check is performed every 14 days.	Yes	No	NA
The CE of NOx analyzer is ensured to be maintained within 96% - 104.1%	Yes	No	NA
Zero/span check is performed prior to starting ambient monitoring	Yes	No	NA
All key requirements for Critical & Operational Criteria for ambient air monitoring by automatic monitors were compiled during monitoring	Yes	No	NA
The measuring techniques of monitors comply PEQS	Yes	No	NA
<b>Ambient Air Sampling of SPM, PM10, Pb by High Volume Sampler</b>			
In case of Sampling for SPM through samplers, the flow rate of sampler comply PEQS (1.1m3/min).	Yes	No	NA
Calibration of Sampler performed prior to sampling	Yes	No	NA
<b>Vehicular Emissions &amp; Noise Measurement</b>			
Sampling of Vehicle emissions and noise measurement have been performed as per method and SOPs	Yes	No	NA

Remarks (if Any):-

Signature

Name of EPA Officer **MOHAMMAD NADEEM**  
RESEARCH OFFICER  
ENVIRONMENT PROTECTION  
AGENCY PUNJAB LAHORE

Dated

*28/2/25*

Name of Assistant / Deputy Analyst, Analyst



Signature



ENVIRONMENTAL PROTECTION AGENCY  
GOVERNMENT OF THE PUNJAB  
National Hockey Stadium, Gate No. 08  
Gaddafi Stadium Complex, Lahore



validation #14041

Validation for Wastewater & Drinking Water

Facility /Project Name & Address Phone	Fatima, ethanol Plant		Sampling Point					
	Tibbi Nizam Road, Sangwan		Same Nale upstream, water handpan					
	Dist, Kot Addu.							
Waste Water (WW) Treatment facility Primary Secondary Tertiary NA			Drinking Water (W) Treatment Facility					
Total WW collected Sample ..... 1L			Total Collected Drinking water samples... 1L					
Sample Tag for testing parameter is assigned on sample container			Yes	NO	NA			
Sample is preserved properly for each testing parameter			Yes	NO	NA			
Sample size is adequate for testing the target parameters			Yes	NO	NA			
Wastewater Flow Measurement performed to ensure sample representativeness			Yes	NO	NA			
No. of Waste Water outlets	Waste Water Flow m <sup>3</sup> /hr from each outlet (Optional)	Water Intake m <sup>3</sup> /hr (Optional)	Water Mass balance complied during sampling (Optional)	Sample Type				
			Yes No	Grab	Composite			
				W, W & G.W				
Parameter	Matrix		Container	Sample Size	Preservation	Yes	NO	NA
	W	WW						
Coliform, Total or Fecal	/	/	Sterile Container	100 mL	Refrigerate 6 C	/	/	/
Coliform, Total or Fecal, Chlorinated Water	/	/	Sterile Container	100 mL	0.008% Thiosulphate & cooled 6 C	/	/	/
Color, Turbidity	/	/	P,G	500 mL	Cool 6 C	/	/	/
Hardness, Total	/	/	P,G	500ml	HNO3 to pH < 2	/	/	/
Nitrogen, Nitrate + Nitrite, Phenolic Compounds, Oil & Grease, COD, NH3	/	/	P,G	2000 mL	H2SO4 to pH < 2, Cool 6C	/	/	/
Metals, General	/	/	P,G Rinsed 1:1 HNO3	500 mL	HNO3 to pH < 2	/	/	/
Cyanide, Total	/	/	P,G	500 mL	NaOH to pH > 12, Cool 6C	/	/	/
Pesticides, General	/	/	Glass	1 Liter	Cool 6 C	/	/	/
Field Parameters*								
Field parameter			pH meter, Model Make	Measurement Method	Calibrated in Field	Measured value		
pH			/	/	Yes NO	/	/	/
Temp			/	/	/	/	/	/
Cl			/	/	/	/	/	/

\* Field testing parameters only be validated by RAs, ROs, DD (Labs)

Remarks for Sample Quality (if Any):-

Signature

Name of EPA Office with office Address  
Inspectors / RAs / ROs or ADs / DDs

MUHAMMAD NADEEM  
RESEARCH OFFICER  
ENVIRONMENTAL PROTECTION  
AGENCY PUNJAB LAHORE

Dated

28/2/25  
Durrani

Signature

Name of Assistant Deputy Analyst, Analyst  
with Name of Private Lab along with Address





# SOLUTION ENVIRONMENTAL & ANALYTICAL LABORATORY



## AMBIENT AIR MONITORING REPORT

**Client Name :** Fatima Ethanol Plant      **Address:** Tibbi Nizam Road, Sanawan, Distt. Kot Addu

**Monitoring Location:** Project Site      **Monitoring Time:** 24 Hours

**Starting Date:** 19-02-2025 to 20-02-2025      **Reporting Date:** 24-02-2025

**Monitoring By:** SEAL      **Reference No.:** SEAL/Lab/2025/AA/001

### Results: -

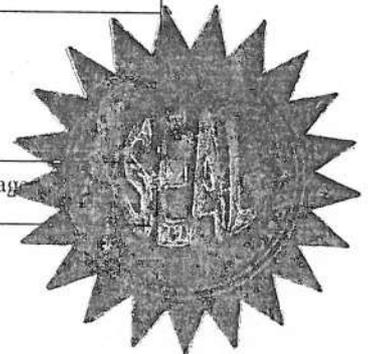
Sr. No.	Parameter	Method	Unit	Results	PEQS
1	Particulate Matter PM <sub>10</sub>	40 CFR Part 50, App J (US-EPA)	µg/m <sup>3</sup>	112	150
2	Particulate Matter (PM <sub>2.5</sub> )	40 CFR Part 50, App J (US-EPA)	µg/m <sup>3</sup>	28	35
3	Carbon monoxide (CO)	40 CFR Part 50, App. C (US-EPA)	mg/m <sup>3</sup>	2.85	5
4	Oxides of Nitrogen NO <sub>x</sub> (NO & NO <sub>2</sub> )	40 CFR Part 50, App F (US-EPA)	µg/m <sup>3</sup>	50.1	120
5	Sulphur dioxide SO <sub>x</sub> (SO <sub>2</sub> )	EQSA-0197-114 (US-EPA)	µg/m <sup>3</sup>	47.9	120

### PEQS: Punjab Environmental Quality Standards

#### Note:

- Quality was assured through self-calibration of the instrument.
- The measurements were carried out on client request.
- The client is responsible lawful usage of reported data in future.

ANALYZED BY	REVIEWED BY	APPROVED BY
Lab Analyst	Assistant Lab Manager	Lab Manager





# SOLUTION ENVIRONMENTAL & ANALYTICAL LABORATORY



## NOISE LEVEL MONITORING REPORT

**Client Name:** Fatima Ethanol Plant

**Address:** Tibbi Nizam Road, Sanawan, Distt. K Addu

**Monitoring Date:** 19-02-2025

**Instrument Used:** Digital Sound Level Meter T.M 102

**Reporting Date:** 24-02-2025

**Monitoring By:** SEAL

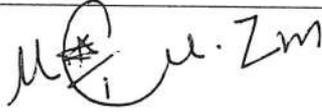
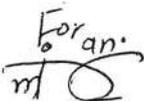
**Reference No:** SEAL/Lab/2025/NM/001

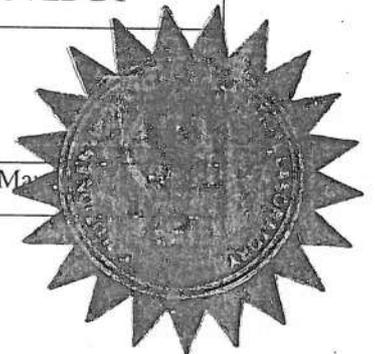
### Results: -

Sr. No.	Location	Average dB(A)
1.	North Boundary of Site	61.3
2.	South Boundary of Site	63.8
3.	East Boundary of Site	54.9
4.	West Boundary of Site	57.5
5.	Near Main Gate	62.7
<b>PEQS (Industrial Area Day Time)</b>		<b>75 dB (A)</b>

### Note:

- The average noise levels describe the overall ambient noise levels of the proposed site.
- Selected measurement units were dB (A) otherwise stated.
- Quality was assured through self-calibration of the instrument.
- The measurements were carried out on client request.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for any negotiations.

ANALYZED BY	REVIEWED BY	APPROVED BY
		
Lab Analyst	Assistant Lab Manager	Lab Manager





# SOLUTION ENVIRONMENTAL & ANALYTICAL LABORATORY

EPA CERTIFIED



## GROUND WATER ANALYSIS REPORT

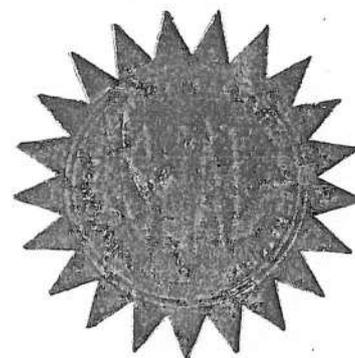
**Project Title:** Fatima Ethanol Plant      **Address:** Tibbi Nizam Road, Sanawan, Distt. Kot Addu

**Sampling Point:** Water Hand Pump      **Nature of Sample:** Ground Water  
**Sampling Date:** 20-02-2025      **Date of Completion:** 28-02-2025  
**Sampling By:** SEAL      **Temp. & Humidity:** 23-27 C° & 50-70 %  
**Reference No.:** SEAL/Lab/2025/GW/121

**Results: -**

Sr. No.	Parameter	Method	Unit	Result	PEQS
1	pH	APHA 4500-H <sup>+</sup> B	--	6.93	6.5-8.5
2	Total Dissolved Solids (TDS)	APHA 2540 C	mg/l	809	1000
3	Chloride	4500- APHA Cl <sup>-</sup> B	mg/l	122.31	250
4	Fluoride	APHA 4500-F <sup>-</sup> D	mg/l	BDL	1.5
5	Taste	APHA 2120 B	Object. /unobj.	Unobject.	Unobject.
6	Odour	APHA 2120 B	Object. /unobj.	Unobject.	Unobject.
7	Colour	APHA 2120 B	TCU	0.13	15
8	Nitrate (as NO <sub>3</sub> )	APHA 4500-NO <sub>3</sub> <sup>-</sup> E	mg/l	0.3	50
9	Nitrite (as NO <sub>2</sub> )	APHA 4500-NO <sub>2</sub> <sup>-</sup> B	mg/l	0.002	3
10	Lead	APHA-Pb B	mg/l	0.0	0.05
11	Total Hardness as CaCO <sub>3</sub>	APHA 2340 C	mg/l	153.68	500
12	Turbidity	APHA 2130 B	NTU	0.1	5
13	Zinc	APHA 3500-Zn B	mg/l	0.0	5
14	Aluminum	APHA 3111 D	mg/l	BDL	0.2
15	Chromium	APHA 3500-Cr B	mg/l	0.0	0.050
16	Cadmium	APHA 3500-Cd D	mg/l	0.0	0.01
17	Copper	APHA 3500-Cu C	mg/l	BDL	2
18	Boron	APHA 4500-B C	mg/l	0.1	0.300
19	Barium	APHA 3111 B	mg/l	0.43	0.700

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**HEAD OFFICE:** Plot # 12, Water Avenue, Green View Society, Off Kacha Jail Road, Kot Lakhpat, Lahore, Pakistan. **PHONES:** +92-42-35922295-96, **FAX:** +92-42-35922296  
**EMAIL:** info@seal.com.pk / nihalasghar@gmail.com / hr@seal.com.pk

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**PHONES:** +92-300-9768799 **EMAIL:** karachi@seal.com.pk



# SOLUTION ENVIRONMENTAL & ANALYTICAL LABORATORY



**Project Title:** Fatima Ethanol Plant      **Address:** Tibbi Nizam Road, Sanawan, Distt. Kot Addu

**Sampling Point:** Water Hand Pump      **Nature of Sample:** Ground Water  
**Sampling Date:** 20-02-2025      **Date of Completion:** 28-02-2025  
**Sampling By:** SEAL      **Temp. & Humidity:** 23-27 C° & 50-70 %  
**Reference No.:** SEAL/Lab/2025/GW/121

**Results: -**

Sr. No.	Parameter	Method	Unit	Result	PEQS
20	Antimony	APHA 3114 C	mg/l	0.009	0.020
21	Arsenic	APHA 3114 C	mg/l	BDL	0.050
22	Cyanide	APHA 4500-CN-D	mg/l	0.000	0.05
23	Mercury	APHA 3112	mg/l	BDL	0.001
24	Nickel	APHA 3111 B	mg/l	0.0	0.020
25	Residual Chlorine	APHA 4500-Cl <sub>2</sub>	mg/l	0.29	0.2 - 0.5
26	Total Coliform	APHA 9222 B	Number/100ml	0	0/100 ml
27	Thermo Coliform	APHA 9222 B	Number/100ml	0	0/100 ml
28	E. coli	APHA 9222 C	Number/100ml	0	0/100 ml

PEQS = Punjab Environmental Quality Standards

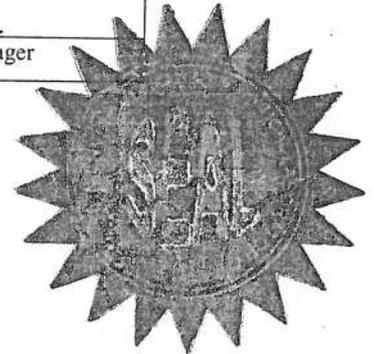
BDL = (Below Detection Limit)

APHA = American Public Health Association

**Note:**

- This report should be reproduced as a whole and not in parts.
- The responsibility of the ethical use of the results reported in this report lies with the client.
- Consequently, the laboratory is absolved of its responsibility for any claim that may result through the use by the client or others of the results appearing in this report.
- The left-over samples (if so available) shall be retained for 10 days after the issuance of the report unless otherwise negotiated between the client and the laboratory.
- The report is not valid for any negotiation.

ANALYZED BY	REVIEWED BY	APPROVED BY
Lab Analyst	Assistant Lab Manager	Lab Manager





EPA CERTIFIED

# SOLUTION ENVIRONMENTAL & ANALYTICAL LABORATORY



## WASTEWATER ANALYSIS REPORT

**Client Name:** Fatima Ethanol Plant **Address:** Tibbi Nizam Road, Sanawan, Distt. Kot Addu

**Sampling Point:** Saim Nala Upstream **Nature of Sample:** Waste water

**Sampling Date:** 20-02-2025 **Date of Completion:** 28-02-2025  
**Temp. & Humidity:** 23-27 C° & 50-70 %

**Sampling By:** Solution Environmental & Analytical Laboratory **Reference No.:** SEAL/LAB/2025/WW/124

### Results:-

Sr. No.	Parameters	Method	Unit	Result	PEQS
1	Temperature	APHA 2550 B	°C	21.8	<3°
2	pH	APHA 4500-H+ B	---	7.52	6-9
3	Chemical Oxygen Demand (COD)	APHA 5220 D	mg/l	124	150
4	Biochemical Oxygen Demand (BOD <sub>5</sub> )	APHA 5210 D	mg/l	62.0	80
5	Total Dissolved Solids (TDS)	APHA 2540 C	mg/l	569	3500
6	Total Suspended Solids (TSS)	APHA 2540 D	mg/l	130	200
7	Oil & Grease	APHA 5520 B	mg/l	0.1	10
8	Chromium (Hexa & Trivalent)	APHA 3500-Cr B	mg/l	0.0	1.0
9	Sulphate (SO <sub>4</sub> <sup>2-</sup> )	APHA 4500-SO <sub>4</sub> <sup>2-</sup> C	mg/l	485	600
10	Iron (Fe <sup>2+</sup> )	APHA 3111 B	mg/l	2.3761	8
11	Chlorine (Cl <sub>2</sub> ) Free	APHA 4500-Cl <sub>2</sub> G	mg/l	0.28	1.0
12	Fluoride (F <sup>-</sup> )	APHA 4500-F <sup>-</sup> D	mg/l	0.85	10
13	Chloride	APHA 4500-Cl <sup>-</sup> B	mg/l	58.71	1000
14	Ammonia (NH <sub>3</sub> )	APHA 4500-NH <sub>3</sub> C	mg/l	22.90	40
15	Cadmium	APHA 3500-Cd D	mg/l	0.03	0.1
16	Lead	APHA-Pb B	mg/l	0.0069	0.5
17	Arsenic	APHA 3114 C	mg/l	0.63	1.0
18	Phenolic Compounds	APHA 5530 D	mg/l	0.0078	0.1
19	Copper	APHA 3500-Cu C	mg/l	0.0	1.0





# SOLUTION ENVIRONMENTAL & ANALYTICAL LABORATORY



**Client Name:** Fatima Ethanol Plant **Address:** Tibbi Nizam Road, Sanawan, Distt. Kot Addu

**Sampling Point:** Saim Nala Upstream **Nature of Sample:** Waste water

**Sampling Date:** 20-02-2025 **Date of Completion:** 28-02-2025

**Temp. & Humidity:** 23-27 C° & 50-70 %

**Sampling By:** Solution Environmental & Analytical Laboratory **Reference No.:** SEAL/LAB/2025/WW/124

**Results:-**

Sr. No.	Parameters	Method	Unit	Result	PEQS
20	Barium	APHA 3111 B	mg/l	0.76	1.5
21	Silver	APHA 3111 B	mg/l	0.0	1.0
22	Zinc	APHA 3500-Zn B	mg/l	0.6921	5.0
23	Nickel	APHA 3111 B	mg/l	0.0	1.0
24	Boron	APHA 4500-B C	mg/l	0.51	6.0
25	Mercury	APHA 3112 B	mg/l	BDL	0.01
26	Sulphide (S <sup>2-</sup> )	APHA 4500-S <sup>2-</sup> F	mg/l	0.26	1.0
27	Total Toxic Metals	---	mg/l	1.17	2.0
28	Cyanide	APHA 4500-CN D	mg/l	0.019	1.0

PEQS = Punjab Environmental Quality Standards

BDL= (Below Detection Limit)

N.D= Not Detected

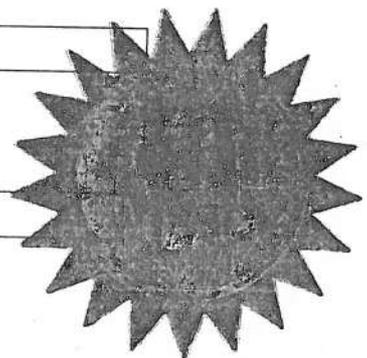
APHA = American Public Health Association

**Note:**

- Standard Method for the Examination of Water & Wastewater, 23<sup>rd</sup> Edition, 2017
- This report should be reproduced as a whole and not in parts.
- The responsibility of the ethical use of the results reported in this report lies with the client.
- Consequently, the laboratory is absolved of its responsibility for any claim that may result through the use by the client or others of the results appearing in this report.
- The left-over samples (if so available) shall be retained for 15 days after the issuance of the report unless otherwise negotiated between the client and the laboratory.
- The report is not valid for any negotiations.
- Total Toxic Metals(Cadmium, Lead,Mercury,Arsenic,Chromium,Copper,Nickle,Zinc and Barium).

ANALYZED BY	REVIEWED BY	APPROVED BY
Lab Analyst	Assistant Lab Manager	Lab Manager

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**Annexure-IX**  
Village Profile Survey Performa

**EIA FOR THE ESTABLISHMENT OF ETHANOL PLANT AT FATIMA SUGAR  
MILLS LTD**

**Tibi Nizam Road, Near Fatima Sugar Mills, Sanawan,  
Distt. Kot Addu**

**Questionnaire for Socioeconomic Survey- General Public, Instrument No. 03**

**Target Group:**

This shall include the general public in the surrounding areas of the project. The individuals from the public shall be selected from the nearby settlements. Approximately 15-20 individuals shall be interviewed and their remarks/ feedback shall be recorded.

**Overview:**

This survey is being carried out by ECTECH Environment Consultants for EIA study for the Development of Fatima Ethanol Plant.

**Aims and Objectives**

The survey is targeted to obtain data and to study the present socioeconomic conditions of the area and to understand the availability of material, construction personnel, plant and machinery etc. required during the construction and operation of the project.

**EIA FOR THE ESTABLISHMENT OF ETHANOL PLANT AT FATIMA SUGAR  
MILLS LTD  
Tibi Nizam Road, Near Fatima Sugar Mills, Sanawan,  
Distt. Kot Addu**

**Questionnaire for Socioeconomic Survey- General Public**

Name of Respondent / Tribe: .....

City: ..... U.C Name: ..... Date of Survey: .....

Goth / Settlement/Mohalla Name: .....

*[Brief the Respondent with the project information, then proceed further]*

**1. Settlement/ Mohalla Information**

<b>Description</b>	<b>No.</b>
1. No. of houses in the Settlement/ Mohalla	
2. Pucca houses	
3. Semi Pucca houses	
4. Katcha houses	
5. Average no. of persons per house	
6. Average inhabitants per house - Under 5 years - 6-18 years - 19-49 years - Over 50 years	
7. Estimated total population	
8. Other pertinent information	

**2. Educational Facilities in Area:**

<b>No. of Institutes</b>	<b>Male</b>	<b>Female</b>	<b>Total</b>
1. Degree College			
2. Intermediate College			
3. Technical/Commercial Institutes			
4. Higher Secondary School			
5. Secondary School			
6. Middle School			

7. Primary School			
8. Madrassah			
9. Others (specify) ..... .....			

**3. Respondent's House information**

Question	Response [Yes/No]
1. Do you live here permanently?	
2. Are you owner of a house?	
3. If yes, how many Marlas? .....	
4. Are you tenant of a house?	
5. If yes, how much monthly rent you pay? Rs.....	

**4. What are the sources of income of the Respondent's family?**

Source of income	Income (Rs. Per Year)
Farming	
Livestock – herding	
Business	
Govt. Service	
Private Service	
Remittance from abroad	
Other: (describe)	

**5. Agriculture in the Target Area**

Crop	No. of Acres Cultivated
Wheat	
Sugarcane	
Grams	

Bajra	
Cotton	
Rice	

Crop	No. of Acres Cultivated
Various Fruits (Citrus, Guava, Mango etc.)	
Vegetables (Onion, Turnip, Tomato etc.)	
Others (specify) ..... .....	

**6. Physical Infrastructure of UC**

**6.1 Source of Drinking Water Supply**

- Hand Pump
- Open wells
- Network of Water Supply Pipelines
- PHE Department
- Tube Wells
- Watercourses
- River / Stream
- Overhead Water tank
- Other Specify: .....

**6.2 What is the existing drainage system in UC**

- Covered/underground
- Open drains
- None
- Other (Specify) .....

**6.3 Communication Infrastructure to Mohalla/Goth**

Description	Remarks
1. Metalled Road	
2. Un-metalled Road	
3. Katcha Track	
4. Railway Track	

**6.4 Other Social Infrastructure**

Description	No.	Condition/Remarks
1. Cattle Sheds		
2. Shops		
3. Mosque		
4. Shrines		
5. Graveyards		
6. Archeological Sites		
7. Others (specify) ..... .....		

**6.5 Medical facilities**

a. Are you satisfied with the current medical facilities in the area? Yes  No

If no, what you think should be done to improve the situation

.....

State the numbers of following in the area

Sr. No	Hospital	BHU / RHC	Dispensary	Clinic	Other
1					
2					
3					
4					

**6.5** Are there any socially deprived persons living in surrounding including landless tenants, widows and orphans? Yes  No

If yes, then give numbers.....

**6.6 Construction Material Availability**

Are the following materials easily available in the target are/nearby areas

- Cement Yes  No
- Steel Yes  No
- Bricks Yes  No
- Sand Yes  No
- Aggregate Yes  No

- Wood            Yes             No
- Fuel            Yes             No
- Transport      Yes             No

If not available State the nearest location of availability

#### 6.7 Construction Staff Availability

Are the following staff easily available in the target are/nearby areas

- Mason            Yes             No
- Skilled labor    Yes             No
- Plumbers        Yes             No
- Electricians     Yes             No
- Steel fixers      Yes             No

If not available State the nearest location of availability

#### 6.8 Plant & Machinery Availability

Are the following plant & machinery easily available in the target area/nearby areas

- Crane            Yes             No
- Trailers          Yes             No
- Water Tankers    Yes             No
- Trolleys         Yes             No

If not available State the nearest location of availability

#### 6.9 Facility Availability

Are the following facilities easily available in the target area?

- Water for construction            Yes             No
- Electrical Power                    Yes             No
- Access to site for heavy traffic    Yes             No
- Drainage                              Yes             No
- Debris Disposal                      Yes             No
- Waste Disposal                        Yes             No

If not available State the nearest location of availability

**6.10 Medical Staff Availability**

Are the following staff easily available in the target are/nearby areas

- Doctors            Yes             No
- Paramedical      Yes             No
- Nurses            Yes             No
- Technicians      Yes             No
- Janitors          Yes             No
- Drivers            Yes             No

If not available State the nearest location of availability

**7. Public Toilets Area in the area**

State the availability, condition and number of public toilets in the area:

.....  
.....

**8. Acceptance of People from Other Areas**

State the level of acceptance of people from other areas of country:

.....  
.....  
.....

**9. Women**

- Common diseases: 1 ..... 2 ..... 3 .....
- Working in field:                      Yes                       No
- Working in Factories:                  Yes                       No
- Others (Specify): .....

**10. Any concern related to proposed resort in your opinion**

.....  
.....  
.....

**Annexure-X**  
Group Discussions and Interviews Performa

**EIA FOR THE ESTABLISHMENT OF ETHANOL PLANT AT FATIMA SUGAR  
MILLS LTD**

**Tibi Nizam Road, Near Fatima Sugar Mills, Sanawan,  
Distt. Kot Addu**

**Questionnaire for Public Consultation- Instrument No. 02**

**Target Group:**

This shall include the general public in the surrounding areas of the project. The groups for public consultation may be selected from the settlement. 4 to 6 groups of persons shall be collectively interviewed and their remarks/ feedback shall be recorded.

**Overview:**

This survey is being carried out by ECTECH Environment Consultants for EIA study for the Development of Fatima Ethanol Plant.

**Aims and Objectives**

The survey is targeted to obtain data and to achieve the following in this connection:

- Introduction to the general public for the construction of the resort.
- Introduction of services and intervention proposed for the resort.
- Appraise the general public about the socioeconomic benefits and uplift of the area
- Feedback from the general public in the surrounding areas
- Resolution of differences if any before the submission of EIA report

**EIA FOR THE ESTABLISHMENT OF ETHANOL PLANT AT FATIMA SUGAR  
MILLS LTD  
Tibi Nizam Road, Near Fatima Sugar Mills, Sanawan,  
Distt. Kot Addu**

**Questionnaire for Public Consultation**

Date of Survey .....

Venue/ Location: .....

No. of Male Participants.....No. of Female Participants: .....

*[Brief the Respondent with the project information including services, attentions and advantages of the proposed project, then record the feedback/ remarks]*

Sr. No.	Names of Participants	Individual or Collective Feedback
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

<b>Sr. No.</b>	<b>Names of Participants</b>	<b>Individual or Collective Feedback</b>
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		

**EIA FOR THE ESTABLISHMENT OF ETHANOL PLANT AT FATIMA SUGAR  
MILLS LTD**

**Tibi Nizam Road, Near Fatima Sugar Mills, Sanawan,  
Distt. Kot Addu**

**Questionnaire for Stakeholders Consultation- Instrument No. 01**

**Target Group:**

This may include the stakeholders in the area as stated below.

- AC/DC Office
- Forest Department
- Agriculture Department
- Irrigation Department
- TMA, Local Government
- Water and Sanitation Authority
- Public Health Engineering Department
- Civil Defense
- Disaster Management Authority
- Land Revenue Department
- Environment Protection Department
- National Highway Authority
- Health Department
- Waste Management Department
- Chamber of Commerce (if available)
- Notables including local MNA, MPA (if available)

**Overview:**

This survey is being carried out by ECTECH Environment Consultants for EIA study for the Development of Fatima Ethanol Plant.

**Aims and Objectives**

The survey is targeted to obtain data and to achieve the following in this connection:

- Feedback from the stakeholders in the area
- Resolution of differences if any before the submission of EIA report
- Seeking guidance and support from the stakeholders for the resolution of constraints

**EIA FOR THE ESTABLISHMENT OF ETHANOL PLANT AT FATIMA SUGAR  
MILLS LTD  
Tibi Nizam Road, Near Fatima Sugar Mills, Sanawan,  
Distt. Kot Addu**

**Questionnaire for Stakeholders Consultation**

Name of Respondent.....

Designation..... Date of Survey .....

Department/Organization: .....

Location: .....

*[Brief the Respondent with the project information including ownership, services, attentions and other pertinent data, then proceed further]*

1. Did you know about this project: Mark [ ✓ ]                      Yes     No

2. Do you have any reservation to this project?  
Yes                       No

If yes, please advise.

.....  
.....  
.....  
.....

3. If no, has your department/organization initiated any plans pertaining to your organization with regard to this project?

.....  
.....  
.....  
.....

4. Do you think this project shall have impact on the area as well as general public?

State what positive impacts do you think this project will bring to the area?

.....  
.....  
.....  
.....

5. What negative impacts do you think this project will have on the general public?

.....  
.....  
.....  
.....

6. What would you like to be particularly included in the project?

.....  
.....  
.....  
.....

7. Any other comments and suggestions related to proposed project?

.....  
.....  
.....  
.....

**Annexure-XI**  
Impact Profile Performa

## Impact Location Profile

### IMPACT LOCATION PROFILE

ID # [                    ]  
Date [                    ]  
Survey Team [           ]  
UC \_\_\_\_\_

1. Identification of Locality/village \_\_\_\_\_

Tehsil: \_\_\_\_\_ District \_\_\_\_\_

#### 2. Population

Households Size \_\_\_\_\_ Population \_\_\_\_\_  
Gender Composition \_\_\_\_\_ Male (%) \_\_\_\_\_  
Female (%) \_\_\_\_\_

#### 3. Social setup/Ethnicity (castes, tribes, decision making, etc.)

Caste groups \_\_\_\_\_

Domination Caste \_\_\_\_\_ 2<sup>nd</sup> Domination Caste \_\_\_\_\_

Methods of decision making \_\_\_\_\_

Name & Caste of the decision maker \_\_\_\_\_

Other information relating to social setup \_\_\_\_\_

#### 4. Major Occupations of the Resident (Tick)

Farming [           Livestock           Labour           service           Poultry]

Other (specify) \_\_\_\_\_

#### 5. Women Development

Women potential/willing to participate in income generation activities such as: \_\_\_\_\_

Project impact on the women activities \_\_\_\_\_

**6. Social Action Plan**

Prioritize the needs of Development works in this area (Mohalla) \_\_\_\_\_

**7. Trees / Vegetations**

Major type and No. of trees in the are \_\_\_\_\_

**8. Recreational Facilities**

Recreational facilities in the area \_\_\_\_\_

**9. Price Data**

Value of land per Marla (Rs) \_\_\_\_\_

Labour wage rate per day (Rs) \_\_\_\_\_

Price of major Nos. agri, Produce (crops/vegetable. orchards) in the area.

- i) Crop \_\_\_\_\_ Price per 40kgs \_\_\_\_\_
- ii) Crop \_\_\_\_\_ Price per 40kgs \_\_\_\_\_
- iii) Crop \_\_\_\_\_ Price per 40kgs \_\_\_\_\_
- iv) Crop/vegetables/orchards \_\_\_\_\_ Price per 40kgs \_\_\_\_\_
- v) Crop/vegetables/orchards \_\_\_\_\_ Price per 40kgs \_\_\_\_\_
- vi) Crop/vegetables/orchards \_\_\_\_\_ Price per 40kgs \_\_\_\_\_

Price of major 3 Nos. fertilizers in the area:

- i) - Name of Fertilizer \_\_\_\_\_ Price per bag (Rs) \_\_\_\_\_
- ii) Name of Fertilizer \_\_\_\_\_ Price per bag (Rs) \_\_\_\_\_
- iii) Name of Fertilizer \_\_\_\_\_ Price per bag (Rs) \_\_\_\_\_

**10. Diseases**

Major diseases — incidence types and cause of Diseases

---



---



---



---

**11. Access to infrastructure**

Availability at site the following social services (the relevant) if not distance of nearby facility (Km)

<u>Social Amenities</u>	<u>Tick</u>	<u>Distance (Km)</u>
Road	[	]
Electricity	[	]
Dispensary / Health Unit	[	]
Schools (primary)	[	]
Sui Gas / cylinder	[	]
Drinking water / water supply	[	]
Telephone	[	]
Sewerage / Drainage	[	]
Fuel Point	[	]
Fuel Wood	[	]
Other ( <i>specify</i> )	[	]

Source (s) of drinking water \_\_\_\_\_  
 Source (s) of irrigation \_\_\_\_\_

**12. Potential Social Impacts of the project**

Awareness about the project----- Potential social impacts of the proposed project