LIST OF ABBREVIATIONS

AOI	Area of Influence
ENA	Extra Neutral Alcohol
EIA	Environmental Impact Assessment
EMMP	Environmental Management and Monitoring Plan
EMP	Environmental Management Plan
EPA	Environmental Protection Agency, Punjab
EPD	Environmental Protection Department
IEE	Initial Environmental Examination
L/Day	Liter per day
m^3/day	Cubic meter per day
PEQS	Punjab Environmental Quality Standards
NOC	No Objection Certificate
PEPA, 1997	Punjab Environmental Protection Act, 1997 (Amended 2012)
PKR	Pakistani Rupees
PM	Particulate Matter

EXECUTIVE SUMMARY

Title of Project: Installation of ENA Plant at M/s Noon Sugar Mills Limited.

Location of Project: Within existing premises of Noon Sugar Mills Limited at Gujrat Road, Tehsil Bhalwal, District Sargodha (32.276857"North and 72.913989 East)

PROJECT PROPONENT	PROJECT CONSULTANT
Sher Afzal Khan Niazi General Manager Site Noon Sugar Mills Limited, Contact No. +92-03227834755 Email: **sher.afzal@noonsugar.com**	**Ecogreen Company (Pvt.) Ltd.** 2nd Floor, Plot No. 7, A Block Commercial Area, Canal View Society, Lahore Contact No. +042-35294298 042-32355915 info@ecogreen.com.pk

Name & Details of the Organization:

The proponent of said project engaged M/s Ecogreen Company (Pvt.) Limited to carry out the EIA Study of aforesaid project in accordance with EPA guidelines. For this purpose, the details of experts working on this assignment are given below in Table-

Table 1: Consultant Details

Consultant Details	
Consultant	**Ecogreen Company (Pvt.) Limited**
Address	2nd Floor, Plot No. 7, A Block Commercial Area, Canal View Society, Lahore
Contact No.	042-35294298 042-32355915
Focal Person	
Name	Kiran Irshad
Designation	Lead Environment Professional
Contact	kiran@ecogreen.com.pk

A Brief Outline of the Proposal (Type, Production Capacity, Process Technology and Land Requirement)

This executive summary of Environmental Impact Assessment (EIA) Report presents a brief account of foreseeable environmental and social impacts likely to emanate from the project Installation of **ENA Plant** of capacity **65,000 liter per day** by M/s Noon Sugar Mills Limited proposed within existing premises of Noon Sugar Mills Limited at Gujrat Road, Tehsil Bhalwal, and District Sargodha over an area of **167,930 Sqft.** The proposed project is planned to be established within the premises of Noon Sugar Mills Limited for production of ENA grade ethanol from the molasses, which is a by-product of sugar industry. This ethanol will be exported in the international market and very little amount will be sold locally as per requirement in Pakistan. Ethanol is basically used in different industries like Pharmaceutical, Chemical, Cosmetic, Detergent and Solvent Industries. In this said project, molasses is being used as raw material for production of ethanol that are by product of sugar mills. The molasses contains 45-48% of total sugar, which is converted in to ethanol by fermentation process. First molasses is diluted by adding water and adjust the total dissolved solids up to 7-8%, then yeast is added in diluted molasses solution and fermentation process takes place. As process goes up glucose is converted in to ethyl alcohol and carbon dioxide. After sufficient conversion of glucose in to ethyl alcohol this solution is then passed through distillation columns. Based on the temperature difference ethyl alcohol will be separated from solution and condense into liquid form. same will be followed for the extension project.

The report describes the various actual and potential environmental impacts pertaining to both phases of the project, i.e. construction phase and the operation phase with reference to their extent and magnitude. Environmental Impact Assessment (EIA) study of the project has been conducted in accordance with the **Punjab Environmental Protection (Amendment) Act 2012** and **The Punjab Environmental Protection (Review of Initial Environmental Examination/ Environmental Impact Assessment) Regulations, 2022**.

Salient Features of the project:

Project Name	Installation of ENA Plant at M/s Noon Sugar Mills Limited
Location	Existing premises of Noon Sugar Mills Limited at Gujrat Road, Tehsil Bhalwal, District Sargodha.
Coordinates of Project	32.276857"North and 72.913989 East
Proponent Name	Mr. Sher Afzal Khan Niazi
Project Cost	Approx. PKR 1379.12 Million
Environmental Budget	Approx. PKR 2 Million
Total Area	167,930 Sqft
Products	ENA Grade Ethanol
Production Capacity	65000 Liters/Day
Manpower	During Construction 50-70 During operation 50-100
No. of Boilers	Already present boiler will be used for Instant project (01 Nos. of capacity 100 tons)
Fuel of Boilers	Bagasse/ Biogas Initially bagasse will be used as fuel for boiler but after startup of distillery operation. Biogas will be produced and used as fuel for boiler.
Water Source	$50m^3$ Per Hour & it will be fulfilled Via Canal Water & Tube-well
Source of Power	WAPDA, and Turbine-generated, Solar System Power to be used
Water requirement	$50m^3$ Per Hour
Period of Construction/ Extension	Approx. 01 Year
Waste water generated	750-800 m^3/ day

Wastewater treatment	Wastewater treatment i.e. Anaerobic treatment in bio-digesters will be carried out. Waste water will then be treated through clarifiers and temporarily stored in insulated ponds. From there the treated wastewater will be shifted to agricultural land through tankers for irrigation purposes.
Solid waste	Solid waste (Sludge) quantity would be 15-20 tons per day
Solid waste Management	Sludge used as fertilizers and sold to farmers

The major impacts and recommended mitigation measures

Environmental impact evaluation actually grows out of scoping and baseline study of the project. In principle, EIA assigns various quantified values to different levels of all the impacts affecting the project. This step is generally considered as the most technical in nature and therefore is the most difficult and controversial part of the EIA. Impacts anticipated during construction and operational phase may include noise, air emissions, water conservation and pollution, soil contamination (physical), community, workers' safety and employment conflicts (socio-economic). The brief description of the impacts and their mitigation measures during construction and operational phase are discussed in detailed in this report.

IMPACT	**MITIGATION MEASURE**	
	CONSTRUCTION PHASE	**OPERATION PHASE**
Solid-waste generation	• Provide solid waste handling facilities such as waste bins and skips in all sections of the factory. • Ensure that solid waste generated is regularly disposed off appropriately • Waste will be managed by as per municipal practices.	• Proper solid waste handling is being done and same will be followed after the installation of ENA Plant • Sludge (slurry) will be sold; disposed off through contractors.

	• Non-biodegradable and recyclable matter, such as containers, wastes, used materials, waste packaging materials, will be sold to local contractors for recycling or reuse purpose.	
Wastewater generation	• No water will be disposed off into sewer lines without proper treatment. • Domestic wastewater will be treated in the septic tank before final disposal.	• Waste water from distillery will be sent to primary (anaerobic treatment) where organic matters will be converted through anaerobic treatment into biogas. • Biogas will be utilized as an alternative fuel for steam generation in boilers.
Air pollution	• Management needs to regularly carry out checks of all machinery and carry out regular servicing and maintenance of it in order to keep the environmental impact on account of their emissions to its minimum level. • For reducing fugitive dust, regular water sprinkling on roads will be done. • All trucks proposed to be used for transportation will be covered with tarpaulin, maintained and optimally loaded. • Moreover, the garden development and tree plantation activities of proponent during operational phase would ensure minimal impact of fugitive dust emissions.	• Biogas produced in anaerobic treatment (Digesters) during spent wash treatment will be transferred to the boiler for steam generation. • Boiler is equipped with cyclones to mitigate its anticipated effects to the environment. • Proper ventilation plan, good housekeeping, and periodic monitoring for preventive maintenance are the control measures which will check air pollution. • Air masks, helmets and safety uniforms will be provided to the workers and proper check will be made to check its compliance in the premises.

		• No anticipated air pollution will occur as the plant will be equipped with best pollution control technologies.

Proposed Monitoring

During construction, ambient air quality for dust level in particular, vehicle and equipment exhaust, noise level, solid waste management and soil contamination, community and workers' safety (visual) need to be monitored on regular basis.

During operation, ambient air quality for dust level in particular, noise level, solid waste management and soil contamination, and community & workers safety need to be monitored as per guidelines of EPA.

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SCREENING

For the prediction and mitigation of impacts associated with project implementation at an early stage of project development, it is pre-requisite under the environmental laws to undertake Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) Study as the case may be. As per the statutory notification of The Punjab Environmental Protection (Review of Initial Environmental Examination and Environment Impact Assessment) Regulations, 2022 made under Section 12 of Punjab Environmental Protection Act, 1997 (Amended 2012), which is reproduced as under;

"No proponent of a project shall commence construction or operation unless he has filed with the Government Agency designated by Federal Environmental Protection Agency or Provincial Environmental Protection Agencies, as the case may be or where the project is likely to cause an adverse environmental effect an Environmental Impact Assessment (EIA) and has obtained from the Government Agency approval in respect thereof."

The aforesaid project falls under Schedule II i.e., Project requiring EIA**, Category B (3);** ***Manufacturing and Processing -Sugar Mills and Distilleries.***

Thus, an EIA Study has been conducted and report has been prepared for submission in EPA Punjab as prescribed to seek Environmental Approval/NOC.

SCOPING

Spatial and temporal boundaries of Environmental Assessment

The said project is proposed Installation of ENA Plant at M/s Noon Sugar Mills Limited at Gujrat Road, Tehsil Bhalwal, District Sargodha and will be installed by adopting proper mitigation measures to avoid disturbance to local environment. The nearest settlements are present at the distance 2-3km residential area, (Bhalwal is present at the distance of 1km) school or college, medical facility and industries are present in 5 km vicinity of the project area. No environmental sensitive area is present within area of influence that could be impacted due to current project installation.

Figure 1: Project Site

Important issues and concerns raised during consultation

During consultation it was observed that maximum of people was in favor of project and following issues and concerns were raised which are presented in Stakeholder Consultation in detail.

During survey following concerns of the local community, Government Departments and Environmental Practitioners and experts were noted:

- Locals should be preferred for the job opportunities.
- Wastewater should be treated and dispose off properly.
- Solid waste should be managed effectively by adopting the standard practices of the area.
- Cleanliness of the area should be ensured.
- An effective EMMP should be designed and enforced with true spirit.
- Health of the workers should be ensured.
- Plantation should be carried out at extensive scale.
- Noisy activities should be confined.
- Indigenous tress around the facility should be planted to control air pollution.
- Tree cutting should be avoided to the extent possible.

Significant impacts and factors to be determined

Main impacts and factors to be determined are

- Job opportunities for locals
- Tree plantation at designated green areas
- Occupational Health and safety
- Emergency preparedness
- Site Security
- Traffic Management
- Hygiene management
- Control Air emissions
- Confined noisy activities
- Resource conservation
- Excessive water consumption

CONSIDERATION OF ALTERNATIVES

Site Alternative, Their Selection & Rejection Criteria

For the said project, no site alternative was considered as the project is Installation of ENA Plant at M/s Noon Sugar Mills Limited in Sargodha. The selected site is suitable for instant project due to the following reasons:

- The site is owned by Noon Sugar Mills Limited and there is no dispute associate with the landownership
- The site is designated as industrial area
- This selected site is within the premises of Noon Sugar Mills Limited from where molasses will be easily transported to distillery plant for ethanol production.
- The site is open area within existing premises, hence tree cutting or land clearing is not required
- There is no sensitive or protected area in proximity of the site
- The site is located at a suitable distance from community.
- The site is accessible through main roads and infrastructure of that area is fully developed.

Keeping in view these requirements and the availability of land required for the instant project, this site is best suited for the construction of aforementioned plant. It is envisaged that, there is no protected or environmentally sensitive area present in the vicinity of the project area that could be impacted due to the establishment of the said project. Accordingly, the selected site is ideally suited for the development of the ENA Plant as the site is located within Sugar Mills.

Design/technology alternatives, their selection and rejection criteria

For establishment of instant project state-of-the-art technology has been selected to minimize emissions and ensure environment friendly operation. Proponent intends huge investment for this project so latest/state of art technology will be preferred to ensure good quality products and sustainable operations.

Environmental Alternatives, their selection and rejection criteria

After completion of construction, proper landscaping will be done. Solid waste and wastewater will be handled properly in environment friendly manner. Moreover, the proponent is very concerned and conscious about the quality and equally about the environmental protection and resource conservation. Proper tree plantation will be done

at designated green areas after completion of construction. Latest and energy efficient machinery will be installed.

Economic Alternatives, their selection and rejection criteria

- ✓ No wastewater will be disposed off into any water body
- ✓ Building design will be such that maximum use of day light and energy efficient lights will be installed to minimize electricity consumption.
- ✓ Currently selected technology and design is economically efficient.

DESCRIPTION OF THE PROJECT

Type & Category of Project:

This proposed project falls under Schedule II i.e., Project requiring EIA**, Category B (3);** ***Manufacturing and Processing -Sugar Mills and Distilleries.***

Thus, an EIA Study has been conducted and report has been prepared for submission in EPA Punjab as prescribed to seek Environmental Approval/NOC.

Project Objective

The objective of aforesaid project is the production of highly purified form of ethanol from the sugar cane molasses to meet market demand. The project will encompass modern state-of-the-art unit with the objective of initiating, producing and market safe efficacious, cost effective and superior quality products to improve the environment and well-being of the community. The above-said project will provide customized and quality products to cater the needs of ethanol by taking into consideration the best ways to reduce pollution and safeguarding the environment. The project will have following advantages:

- To produce ethanol from molasses (by product of sugar mill) that meet increasing demand of market.
- To provide additional income and gainful employment to local people.
- Socio-economic up-lift of Noon Sugar Mills Limited and the local community through direct job placements and indirect business opportunities.
- To provide Products for export to other countries hence gaining the foreign exchange for the country.
- For creation of new job opportunities and promoting income prospects for those engaged in the allied activities associated with operation of project is considered as indirect objectives of the project.

Location and Site Layout of the Project:

The aforesaid project under study is titled as *"**Installation of ENA Plant** at **M/s Noon Sugar Mills Limited.**"* having production capacity of 65000 L/D. The project is located within premises of Noon Sugar Mills Limited at Gujrat Road, Tehsil Bhalwal, District Sargodha as shown in the Figure 1. Having coordinates of site are; 32.276857"North and 72.913989 East**.** The location of the aforesaid project is:

Figure 2: Location Map of the Proposed Project

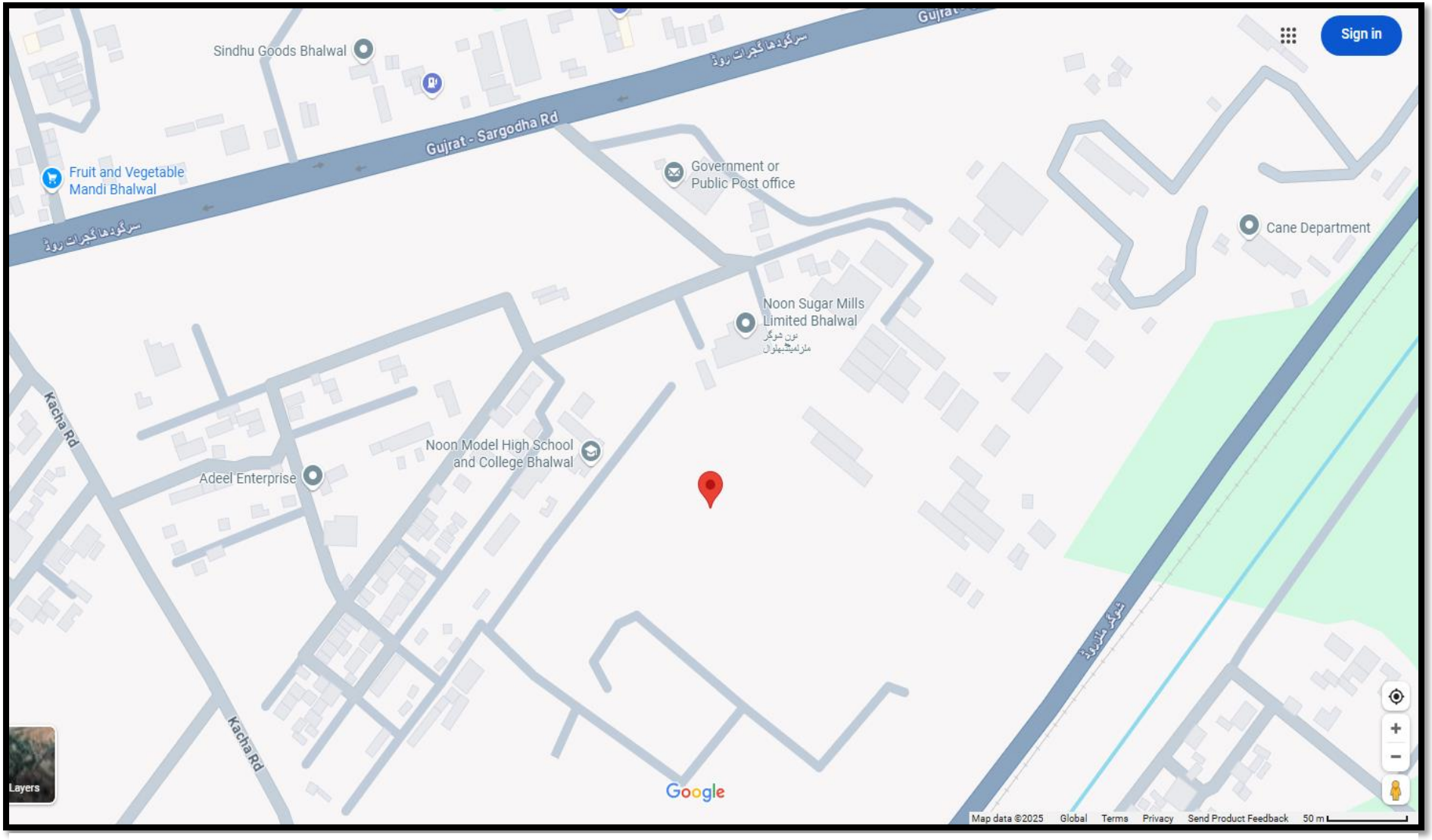


Figure 3: Proposed Project Area

ALTERNATIVES

Site Alternatives

No site alternative was considered because the proposed project is Installation of ENA Plant within premises of M/s Noon Sugar Mills Limited and is under the ownership of proponent industry.

Technology Alternative

Industrial method of preparation of ethanol

There are two methods to get ethanol, industrially. All these methods utilize raw materials which can be obtained from petroleum, natural gas, coal and biomass. The methods are outlined below.

1. By hydration of alkenes.
2. By fermentation of carbohydrates.

Process, Raw Material & Product Alternatives

1. By Hydration of Alkenes

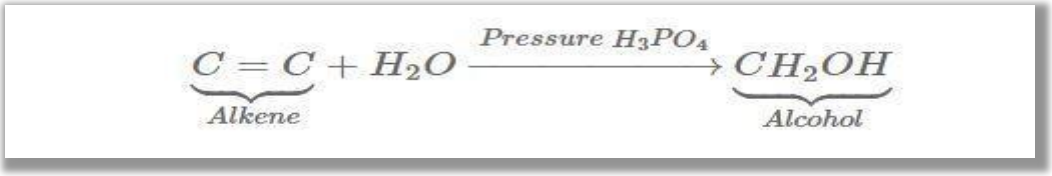
Alkenes can be obtained by the cracking of petroleum can be easily converted into alcohols by hydration in the following two ways.

a. By the direct addition of water.

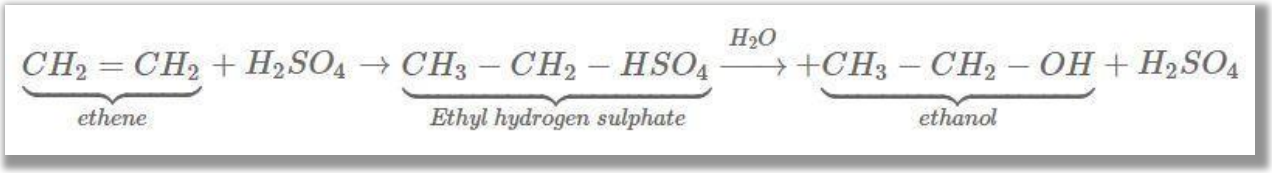
Alkenes can be converted into alcohols by direct addition of water in the presence of the phosphoric acid which acts as the catalyst.

b. By the indirect method of hydration.

Alkenes are directly hydrated at high temperature and pressure to form alcohols. This reaction is carried out in presence of acid like H3PO4.



Hydration of unsymmetrical alkenes follow Markovinkov's rule. Alkenes can also be hydrated indirectly in presence of Conc. H_2SO_4.

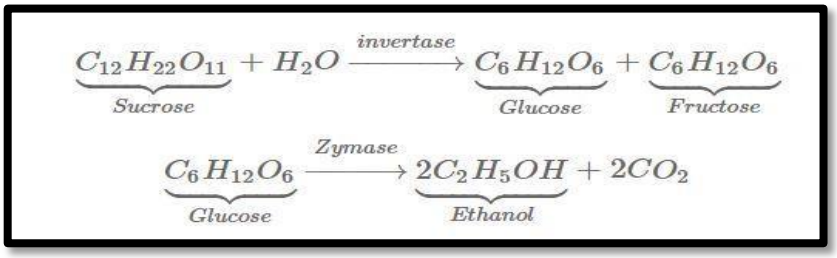


c. Fermentation

Fermentation is defined as the slow process of decomposition of large and complex organic molecules into simpler ones by the action of different enzymes. It is a complex biochemical process which is regarded as one of the oldest methods of manufacture of alcohol. By this method ethyl, alcohol can be manufactured using two types of raw material molasses and starch.

a. From Molasses

Molasses is dark colored mother liquor obtained after crystallization of sugar. It contains carbohydrates like sucrose, glucose, fructose etc. in significant quantity. Molasses is first hydrolyzed with water to form the dilute solution which is then mixed with yeast, a unicellular fungus containing enzymes like zymase, invertase, diastase etc,). The different steps involved in this process are.



The alcohol obtained from molasses is called "wash" which contains the low percentage of ethyl alcohol (8-9%). When impure ethyl alcohol is subjected to fractional distillation, pure alcohol is obtained containing the purity of about 90-97%. This alcohol is called 'rectified spirit'.

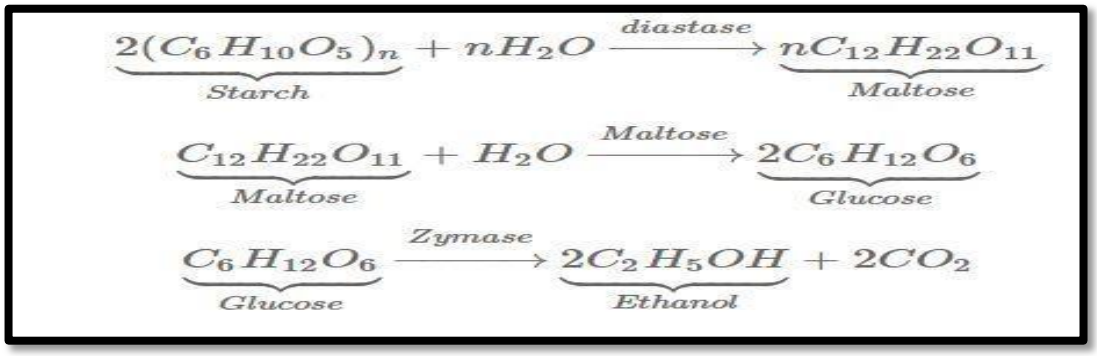
b. from starch.

Ethyl alcohol also is manufactured from starch containing food grains like millet, rice, wheat, maize, buckwheat etc. In this method, food grains are cooked at first to release

starch granules. The solution is diluted with water and the resulting solution is called 'mash'.

'Mash' is mixed with malt which is geminated barely containing a unicellular plant, yeast. Yeast contains different enzymes required for fermentation.

The fermented liquor obtained by this method is called 'wash' which is subjected to fractional distillation to obtained pure alcohol having the purity of about 90-97% and is called 'rectified spirit'.



The above mentioned processes are efficient and effective in many ways but the proposed plant works under the fermentation process using molasses as a raw material. As Noon Sugar Mills Ltd. is a sugar manufacturing industry thus, molasses is produced as a by-product in large quantities. Instead of wasting the instant project aims to utilize it in the other way for the production of ethanol and generating foreign exchange from it. The process is feasible as they are recovering Carbon dioxide from the process along with the spent wash produced is being used in the biogas production to be used for steam generation in the boiler. This process seems to be cost effective and efficient in the view of the proponent as other methods are expensive and their energy consumption is high and have environmental concerns. Moreover, this methodology also ensures reuse of by-products / waste from the industry in an efficient and sustainable manner.

Project Location and Layout

The proposed site for the Installation of ENA Plant is located within premises of Noon Sugar Mills Limited at Gujrat Road, Tehsil Bhalwal, District Sargodha. The coordinates of site are; 32.276857"North and 72.913989 East given in below Figure. The google map of project is attached as Annexure II.

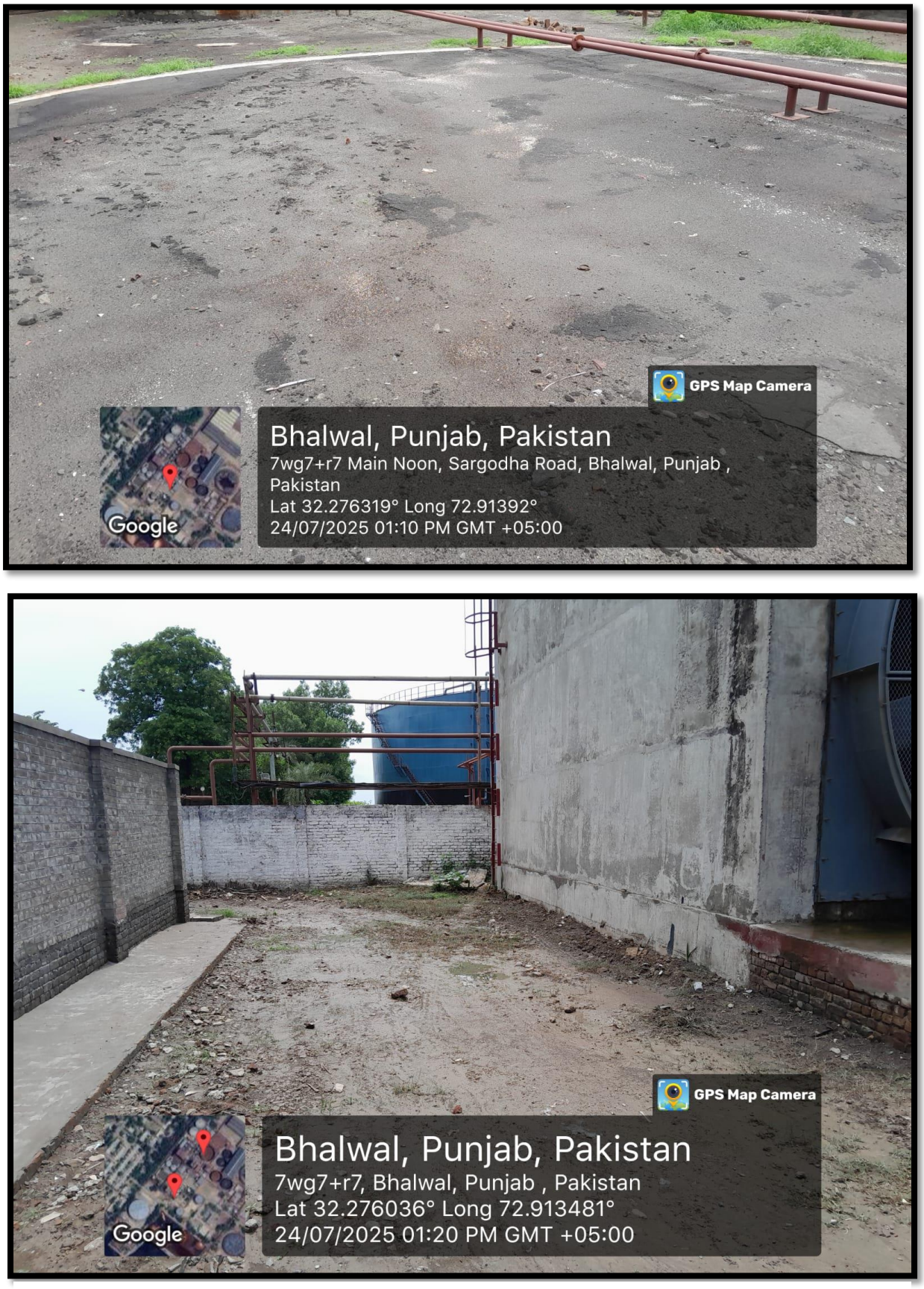


Figure 4: Site Pictures

Google Earth Map:

Figure 5: Project Location

Land Use on the Site

The land use on proposed project is open plot. The pictorial evidence of the proposed project location is shown in Figure below;

Figure 6: Land Use on the Proposed Project Site

Road Access

The site is accessible through Gujrat-Sargodha Road. The road access map of project is attached below:

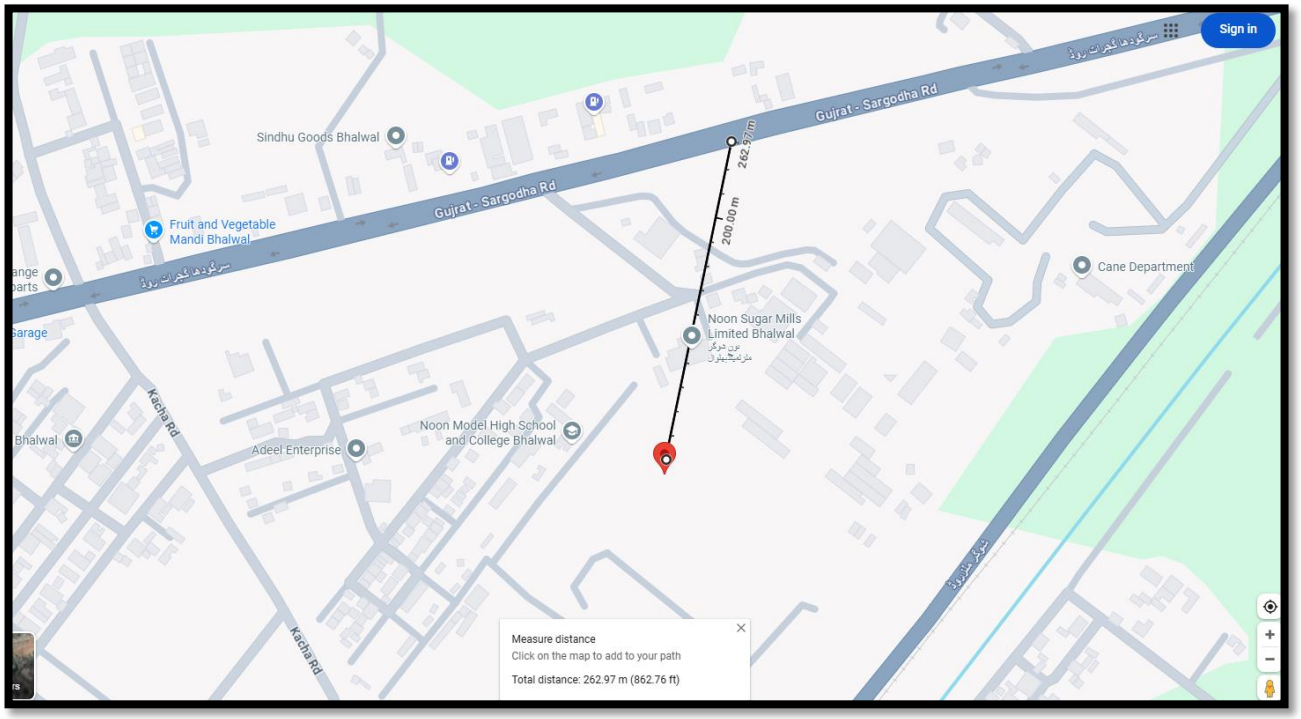


Figure 7: Road Access Map of Proposed Site

Vegetation Features

Landscaping/ Tree plantation is present in surroundings of project area. During operation phase, green belts will be developed and it will serve as a useful green buffer.

Cost and Magnitude of Operation

The estimated cost of aforesaid project is **approximately PKR 1379.15 Million.** Purchase of raw material, operation and maintenance of production machinery are the costly activities involved in the operation phase of said project. Equipment safety will be assured if these operations are carefully managed. The cost breakup of the project is given in below, however, budget will be allocated for purchase and maintenance of standardized PPEs for workers and for waste management and environmental enhancement. Despite these costs, this project was found to be financially feasible. Magnitude of operations includes:

NOON SUGAR MILLS LTD., BHALWAL. (DISTILLERY)

Estimated Cost Installation of ENA Grade New Distillation Unit (capacity 65,000 litres/day)

Sr. No.	Description	Cost (Rs. Millions)
1	Interis Charges (with Interis design & Commissioning Charges)	233.28
2	Pumps (Germany)	50.00
3	DCS & Automation	40.00
4	Daily Receiver Tanks with Structure Shed	10.00
5	SS Material (150 M.Tons)	351.60
6	Fabrication for SS Material	150.00
7	SS Tubes (5000 Tubes)	20.00
8	SS Piping	40.00
9	MS Pipiing	30.00
10	Valves (BFV , GV, NRV, SS Ball Valve etc.)	10.00
11	Heat Exchanger	15.00
12	Structure	40.00
13	Fabrication and erection	150.00
14	Electrification/Cabling	100.00
15	Civil Work	44.27
16	RO Plant (100 M.Tons /Hr)	30.00
17	Cooling Tower (650 M.Tons /Hr)	50.00
18	Government Approvals / Miscellaneous	15.00
Estimated Total Cost		1,379.15

Schedule of Implementation

The proponent intended to complete the construction in a period of a year.

Table 2: Schedule of Implementation

Sr. #	Activities	6 Months			6 Months		
		2M	2M	2M	2M	2M	2M
1.	Detailed Designing						
2.	Mobilization of Contractors						
3.	Demolition of existing hall						
4.	Preparation of site						
5.	Civil Works						
6.	Installation of facilities						

Project Description

The management of Noon Sugar Mills Limited intends to Install ENA Plant at M/s Noon Sugar Mills Limited for production of ethanol having total area of 167930 Sqft with production capacity of 65000 L/D. The layout map is attached herewith as **Annex- III**

Raw Material and Chemicals Used

The molasses is the raw material that produced as by product sugar processing and following chemicals are required for ENA Ethanol production;

1. Molasses (MT)
2. Sulphuric acid (Kg)
3. Urea (kgs)
4. Diammonium Phosphate (DAP) (Kg)
5. Antifoam (Kg)
6. Calgon (Kg)
7. Anti-scalent for distillation
8. Sodium fluoride (Kg)
9. Phosphoric acid (Kg)
10. Cortec Al-385 (kgs), Cortec Al-330 (kgs), Cortec AL-310 (Fingicide Kgs)
11. Yeast (Kg)
12. Caustic Soda (Kg)
13. Soda Ash (Kg)
14. Lactocide (lb)
15. Common Salt (kgs)

16. Hydro Chloric Acid (kgs)
17. Lactocide (lb)

Final Product

ENA Grade Ethanol

Process Description

The said project is Installation of ENA Plant at M/s Noon Sugar Mills Limited for production of Ethanol from molasses. The main steps involved in the process are following and process flow chart is given in below;

1. Molasses Storage and Handling
2. Molasses Dilution
3. Pre fermentation
4. Fermentation
5. Distillation Process
6. Final Product Storage

Molasses Storage and Handling

The received molasses will be stored in the molasses tanks (total 8) already present there is no need to install molasses tanks for extension project), arrangement should be made for temperature monitoring and pumps for circulation in case abnormal rise of temperature will occurred. Forecasting Emergency arrangement in case of fire or internal burning of molasses.

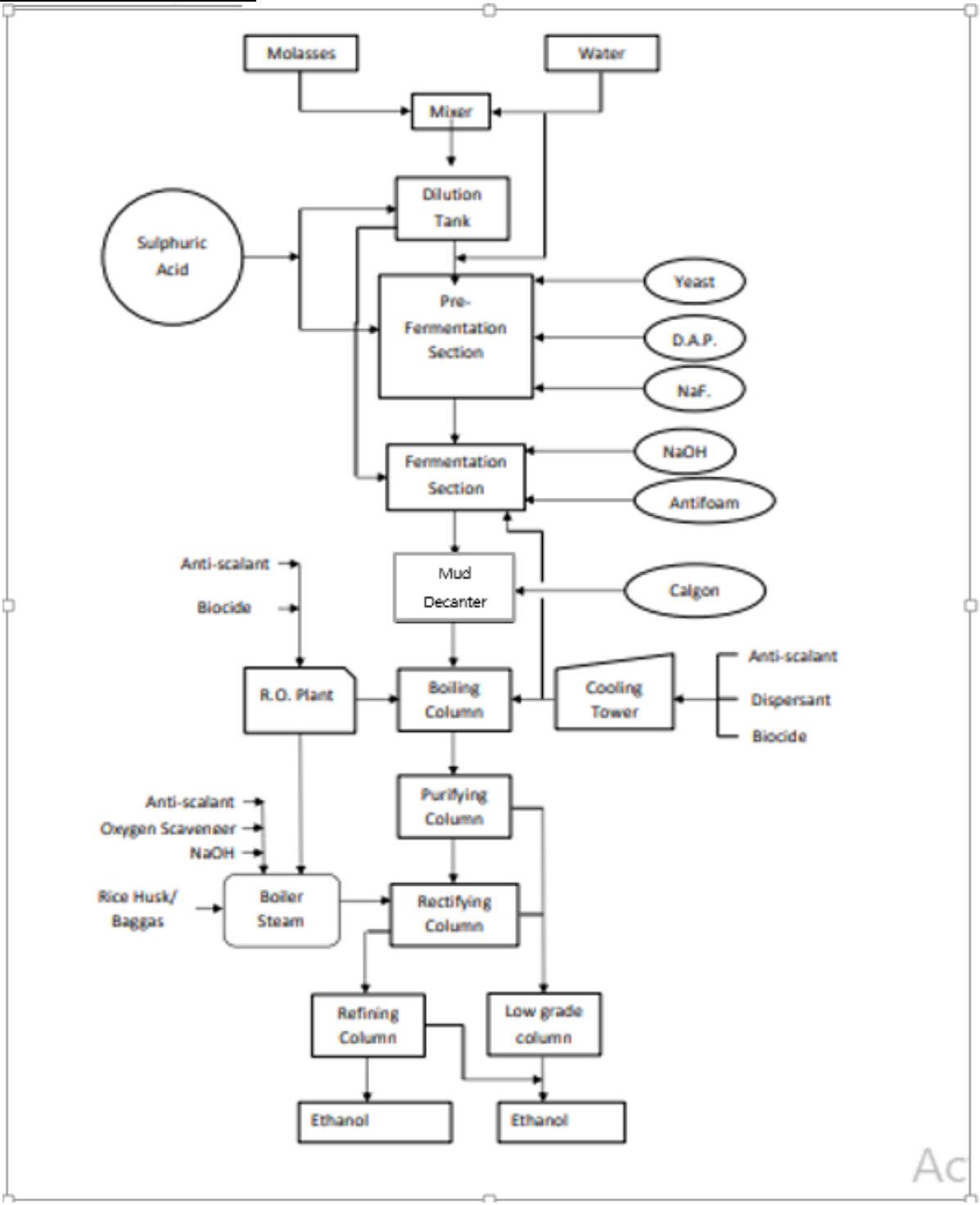


Figure 8: Process Flow Chart

Molasses Dilution

Molasses is a thick viscous by product of the sugar industry which is acidic in nature, rich in salt and contain sugar which could not be crystallized. Molasses from bulk storage transferred will be to molasses receiving tank and diluted with process water. In which molasses brix reduced to 30 to 33 from 90 that is required for Refermentation/fermentation process.

Pre-fermentation Process:

In this step, yeast culture will be developed and then added to fermentation for alcohol production. Pre- fermentation is an exothermic reaction in which temperature will be controlled by cooling water circulating in plate and frame exchanger.

Fermentation Process

The pre fermented media is shifted to fermentation section during plant start up. In this step, diluted molasses 67% of Fermenter`s capacity of 30 Brix added , fermenter filled within 14 to 16hrs and left for reaction and reaction completed in 40hrs , ethanol produced 7.5 to 9.0 % depend upon molasses sugar , feed brix and transferred to distillation for purification.

Distillation:

In this step produced ethanol from fermentation and purified in distillation with the help of steam and vacuum by multistage distillation column from C-510,511,520,530,540,560,561,550. The ethanol vapors are condensed and cooled to room temperature.

Final Storage

The ethanol separated, cooled in cooler and then stored in daily storage tanks placed in receiver room, after daily storage tanks the ethanol will shift to final storage tanks.

List of Machinery

The list of machines is in below Table.

Table 3 List of Machines

NOON SUGA RMILLS LTD. (DISTILLERY), BHALWAL

LIST OF DISTLLATION EQUIPMENTS

ENA Grade Plant (65000 Litres/day capacity)

ITEM NO.	DESCRIPTION	QTY (NO.)
1	DISTILLATION COLUMN (C-510 , C-511 , C-520)	01
2	LUTTER COLUMN (C-521)	01
3	HYDRO SELECTION COLUMN (C-530)	01
4	RECTIFICATION COLUMN (C-540)	01
5	REFINING COLUMN (C-550)	01
6	IMPURITIES COLUMN (C-560 A)	01
7	IMPURITIES COLUMN (C-560 B)	01
8	IMPURITIES COLUMN (C-561 B)	01
9	ANTI FOAM TANK (R-519)	01
10	CONDENSATE TANK (R-541)	01
11	CONDENSATE TANK (R-542)	01
12	REBOILER	7
13	PROCESS TANK	11
14	COOLING TOWER (650 M.Tons /Hr)	01
15	CONDENSERS	06
16	CENTRIFUGAL PUMPS	44
17	AIR COMPRESSOR / AIR BLOWER	04
18	DAILY PRODUCTION RECEIVER TANK	03
19	HEAT EXCHANGERS	15

Supplies

Following supplies will be required for project process.

Water Requirement

The water requirement mainly for the proposed project is for domestic as well as process water. The total quantity of domestic water consumption can be calculated by multiplying per capita average water consumption to total number of employees. By taking the average water consumption 70 lpcd, the daily water requirement for 50-100 persons will be 7m^3/day.

Whereas the process water requirement for the unit is 50m^3 per hour. This water requirement will be fulfilled by tube-well and canal water.

Wastewater Treatment

During processing generated wastewater will be treated through primary treatment facility (anaerobic treatment, bio-digesters) where organic matters will be converted through anaerobic treatment. In primary treatment, biogas will be produced that will be used as an alternative fuel for steam generation in boilers. After treatment this treated waste water will be sent to insulated ponds for temporary storage from where it will be shifted for reuse in **agriculture land through tankers.**

Air Emissions

During construction, dust emissions will be controlled by water sprinkling. Proper tuning of vehicles carried out on the regular basis in order to control the air pollution. The material prone to wind will be covered with tarpaulin sheet.

During operation phase, air emissions will chiefly arise from boiler along with solvent vapor, odor, PM, dust and lint from floor cleaning and from the generators. Cyclones has been installed with Boiler to mitigate its anticipated effects to the environment. (Design Specification of installed equipment is attached herewith). Biogas is being used as fuel for boilers. Air masks, helmets and safety uniforms will be provided to the workers and proper check will be made to check its compliance in the premises. Hence, by adopting proper mitigation measures, air emissions have been controlled.

Solid Waste

Waste generated during construction would include mostly construction material (mainly steel and wood), empty cement bags, excavated earth and general packaging waste. Reusable construction material will be recovered from the waste as much as possible

The solid wastes produced during operational will be sold to EPA Certified contractor. (Copy of contract is attached as **Annexure V**). The disposal of non-biodegradable and recyclable matter, such as containers, waste papers, used materials, waste packaging materials, will be carried out as per area practices.

Manpower

During construction phase, 50-70 workers will be hired including local, skilled and technical staff as well. During operational phase, 50-100 worker will be hired that include both permanent staff and daily wagers.

Power Requirement

Power requirement of the project will be 300 kv/hr. The fuel of boiler is bagasse and biogas. No new boiler will be installed for extension project, already installed boilers will be used, design specifications of pollution control equipment are attached herewith as **Annexure IV.**

Emergency Response

Emergency response preparedness committee has been formulated consisted of heads of all the departments same will be followed Emergency Response Leader will be the head of the team assisted by safety team and safety Officer. Emergency Response Leader along with his team will ensure that in the case of emergency, team is prepared for fire-fighting and the first aid kits will be provided which may include; blankets, hot water bottles, stretchers, benches, sterilized dressing, snake bite kit, cotton and iodine (2% alcohol). Incidents and accidents may take place unexpectedly during project operations no matter how effective, strong and efficient the mitigation measures for all adverse impacts; especially the safety issues may be adopted. These may include; accident and natural disasters.

Restoration and Rehabilitation Plan

The industry will implement a comprehensive restoration program focusing on site cleanup, safe disposal of hazardous waste, and soil/groundwater remediation in compliance with environmental standards. Native vegetation will be replanted to restore ecological balance, while greenbelt development will reduce residual impacts. Continuous monitoring and maintenance will be ensured to achieve long-term sustainability and safe reuse of the site.

Any green or Sustainable Features Planned

- ✓ Development of greenbelts and urban forestry around the facility to improve air quality and biodiversity.
- ✓ Use of eco-friendly construction materials and energy-efficient technologies during rehabilitation.

Tree Plantation Plan: Tree plantation plan along with pictorial view of planted trees is attached herewith

DESCRIPTION OF THE ENVIRONMENT

General

This section describes the baseline conditions, which shows the clear-cut picture of existing environmental resources; physical, ecological, and socio-economic environment of the Project Area. Information on these aspects has been derived from field visits to the project area as well as information obtained through visits to the Government departments and other relevant agencies.

The primary data was collected by surveying the project area and its nearby vicinity. The secondary data regarding physical parameters (topography, geology, seismology, hydrology and climatology) was obtained by visiting relevant departments and their official websites. The biological parameters (flora and fauna) were also studied in the project area. The vegetation of project 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 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 and government departments. The socio-economic aspects were studied and analyzed by conducting detailed socio-economic surveys

Baseline Physical Environment

In this section, physical resources such as; topography, soil, climate, surface as well as ground water resources and its quality, ambient air quality and geology of not only the project site but also the city 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 the project site is present in the following sub sections.

Topography &Geology

Sargodha mainly comprises of flat and fertile plains. It is situated in Punjab province. It is located at Northwest of Lahore, between longitude 72.67111 East and latitude 32.08361 North. The City covers an area of approximately 155 km^2, while the district covers more than 5854 km^2. The soil of Sargodha comprises of clay loam. The topography of the selected

project site is flat. The coordinates of the site are; **Latitude** 32.276857"North and 72.913989 **Longitude**.

Seismicity

According to Seismic Zoning of Pakistan, the project area lies in Zone 2A of Modified Mericalli (M.M.) scale and represents minor damage in the past due to the Earthquake. Distant earthquakes may cause damage to structures with fundamental period greater than 1.0 second, corresponds to intensity V and VI of the M.M scale (National Disaster Management Authority). The seismic zoning of Pakistan is given below in **Figure** below:

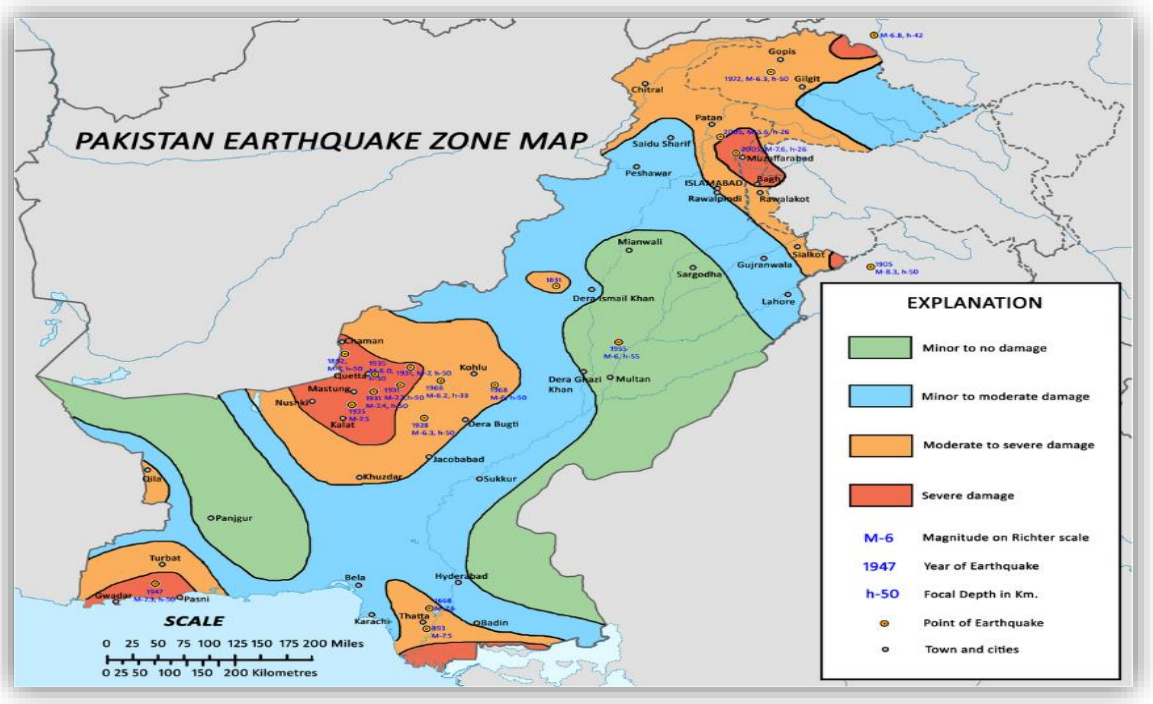


Figure 9: Seismic Zoning of Pakistan

Climate

The climate of the district is average. During site visit **22°C** was measured during day time and **8°C** during night. The bulk of monsoon precipitation occurs in July and August, with monthly averages of **22mm** and **16mm** respectively. Minimum rainfall occurs in the month of October i.e. 1.0 mm and there is no rainfall observed in the month of November (PMD)[1].

[1] https://www.besttimetovisit.com.pk/pakistan/sargodha-3110351

Ambient Air Quality

The primary air pollutants are; carbon monoxide (CO), oxides of nitrogen (NOx), sulphur dioxide (SO_2), and particulate matter (PM). In order to determine the air quality of the area, environmental monitoring was carried out by SEAL being EPA certified Laboratory and having the requisite air sampling device and expertise for collection of samples. To determine the air quality of the area ambient air was monitored & following results were obtained;

Table 4: Air Quality Monitoring Results

S#	Monitoring Source	CO	NO	NO_2	SO_2	O_3	$PM_{2.5}$	PM_{10}
PEQs		mg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³
		10	40	80	120	130	35	150
1	Midpoint	2.2	30	60	90	90	32	140

Noise

Noise level measurements had been carried out within the selected site. This analysis showed that values are much below the limit prescribed under the Punjab Environmental Quality Standards (PEQS).

Table 5: Ambient Noise Monitoring Results

S. No.	Monitoring source	Unit	PEQS	Conc.
1	East Boundary	dB (A) Leq	75	56
2	West Boundary	dB (A) Leq	75	54
3	North Boundary	dB (A) Leq	75	50
4	South Boundary	dB (A) Leq	75	52

Hydrology

Groundwater quality results of project area are given below:

Table 6: Ground water Analysis Results

Sr.#	Parameters	Units	PEQS	Result	Test Method Used	Remarks
1.	pH @ 25 °C	-	6.5-8.5	6.98	APHA 4500H⁺ B	Complies
2.	TDS	mg/l	< 1000	440	APHA 2540 C	Complies
3.	Alkalinity	mg/l	NGVS	190	APHA 2320 B	-
4.	Conductivity	µS/cm	NGVS	800	APHA 2510 B	-
5.	Chloride	mg/l	< 250	70	APHA 4500 Cl-B	Complies
6.	Hardness	mg/l	< 500	170	APHA 2340 C	Complies
7.	Calcium	mg/l	NGVS	42	APHA 3500 Ca-B	-
8.	Magnesium	mg/l	NGVS	15.7	APHA 3500 Mg B	-
9.	Turbidity	NTU	<5	1.4	APHA 2130 B	Complies
10.	Fluoride	mg/l	≤ 1.5	0.20	APHA 4500 F D	Complies
11.	Iron	mg/l	0.3	BDL	APHA 3113-B	Complies
12.	Sodium	mg/l	NGVS	80	APHA 3500 Na-B	-
13.	Potassium	mg/l	NGVS	0.8	APHA 3500 K-B	-
14.	Nitrate	mg/l	≤50	0.17	APHA 4500 NO_3-B	Complies
15.	Nitrite (NO_2)	mg/l	≤ 3	BDL	APHA 4500 NO_2 B	Complies

Monitoring reports are attached as **Annexure VI**

Baseline Biological Environment

In sub-sections below biological features are discussed below:

Flora

Sargodha lies in the green zone and many native species are present. The ornamental plants and tree had been planted at the boundaries of the various residential societies present in vicinity of project area. The detail of the tree species present in the study area is given in **Table below;**

Table 7: Vegetation features near project site

Sr.#	Local Name	Biological Name
1	Kikar	*Vachellia nilotica*
2	Simal	*Bombax ceiba*
3	Neem	*Azadircuhta indica*
4	Shisham	*Dalbergia sissoo*
5	Siris	*Albizia lebbeck*

Fauna

The fauna consists of mammals, birds, reptiles and amphibians. With an increase in the rate of urbanization, the ecology of city has been considerably affected but there is no threatened or endangered species found in the project site. No wildlife was present there. Only the Jungle Cat (Felis chaus), Field Mouse (Mus musculus) and Common Crow (Corvus splendens) passed by temporarily. During site visit near plant site no such fauna was noticed that could be impacted due to installation of aforementioned project as it is located within the existing unit of M/s Noon Sugar Mills Limited.

Archaeological Sites or Wetlands

It is envisaged that no building of archaeological, cultural and historical importance is expected to be damaged due to the installation of said project at the selected site. Moreover, there is no wetland or surface water body reported to be affected due to the installation of the aforesaid project.

Endangered Species

There is no floral or faunal species inhabiting the project area that are included in the Red Data Book of IUCN. The populations of birds are reported to be reduced over time due to excessive pesticide sprays in agricultural crops and loss of habitat.

Baseline Socioeconomic Environment

Socio economic environment is represented by the human and economic development and quality of life values. For the study of socio-economic environment of the project area, field surveys were conducted and interviews were held with the various stakeholders. The socioeconomic conditions of the project area are as follow:

Industry

The abovementioned project (Installation of ENA Plant) is proposed to be installed within the existing facility of M/s Noon Sugar Mills Limited. The proposed project site is also surrounded by various other industrial activities nearby industries are mentioned in below map:

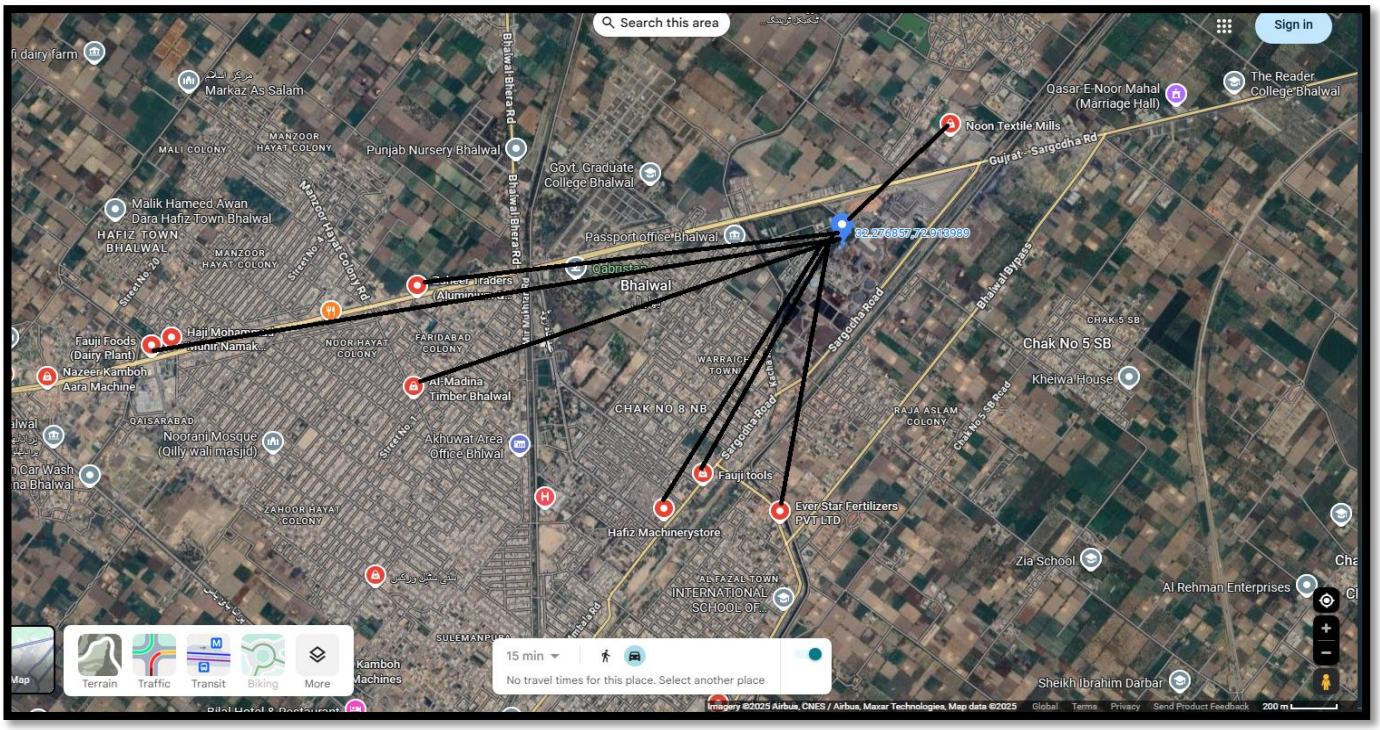


Figure 10: Industries Located Nearby Project Area

Health Facilities

Healthcare services are provided to the citizens by both public and private sector hospitals. Moreover, there are a number of private hospitals, clinics and laboratories in the Sargodha City.

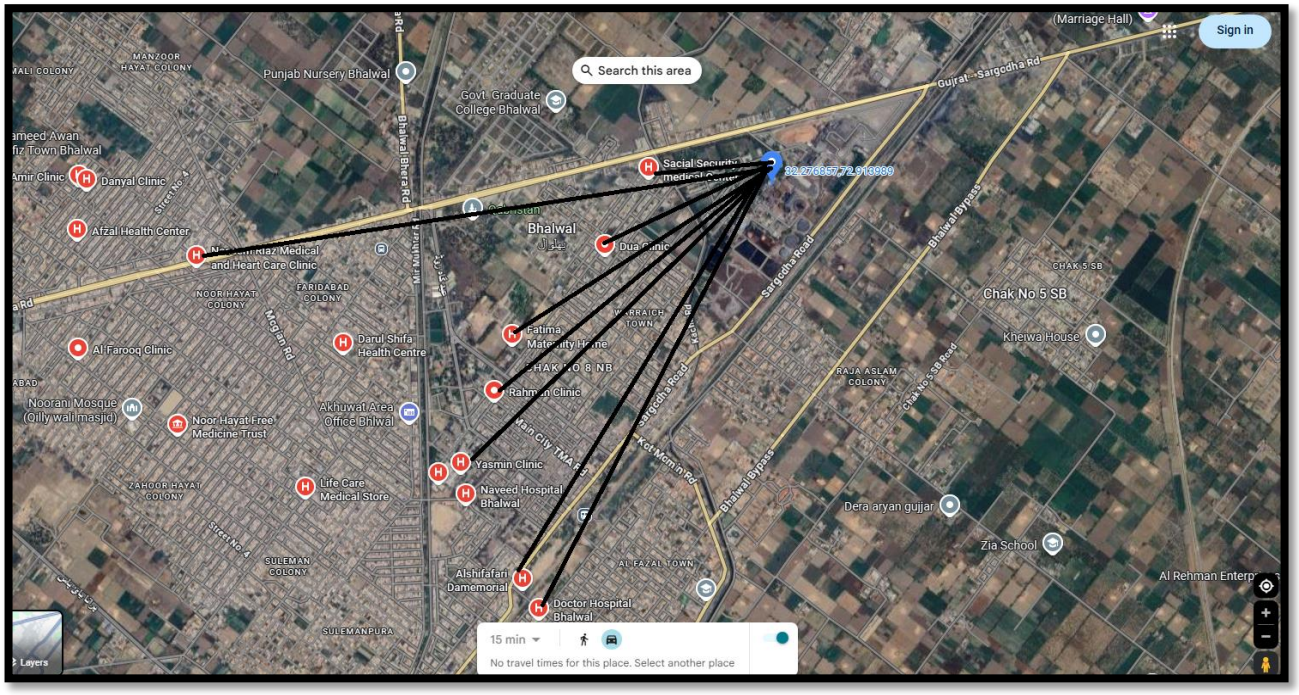


Figure 11: Health Facilities

Educational Facilities

Education up to higher secondary is present in project area. Institutes present in project area are shown in map below.

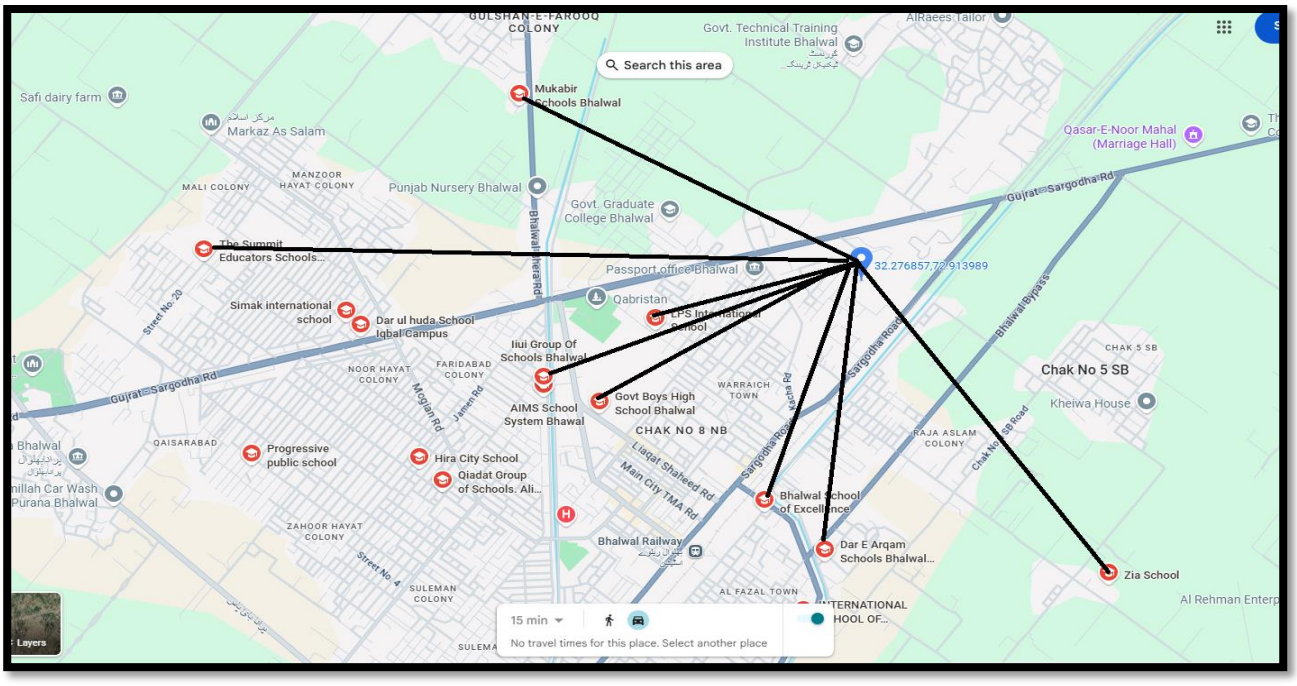


Figure 12: Nearby Educational Institutes

Figure 13: Nearest School

Lab Reports of Environmental Analysis

Testing of different parameters was carried by employing EPA certified laboratory i.e. SEAL to check the quality of different environmental parameters. The copy of the lab reports of these parameters (ambient air analysis, ground water quality analysis and noise) are attached herewith as **Annex-VI**

Site Suitability

As the project site is located within existing premises of M/s Noon Sugar Mills Limited and it is under the ownership of company. (Land ownership documents are attached as **Annexure VII**). The site does no fall in environmental sensitive area and all commodities are at a suitable distance from project site as they will not impacted by the construction and operational activities even locals will get more benefits and job opportunities. No replacement, relocation and rehabilitation are required for the development of instant project.

IMPACT ASSESSMENT

General

This section discusses the potential environmental impact due to Installation of ENA Plant at M/s Noon Sugar Mills Limited. The impacts may include; soil contamination, water resources depletion, biological resources disturbance and socio-economic impacts and, where applicable, identifies mitigation measures that will reduce significantly, if not eliminate, its adverse impact. The assessment carried out in this Section is based on potential impacts on overall environmental receptors within the project area.

Methodologies for Impact Identification

This section discusses the project's potential environmental impact of above-mentioned unit. The adverse impact may occur on; the area's geomorphology, soil, water resources, air resource, biological resources and socio-economic condition and where applicable, identifies mitigation measures that will reduce significantly, if not eliminate, its adverse impact. The assessment carried out in the sub-sections below is based on potential impacts on overall environmental receptors within the project area. Impacts are evaluated on the basis of magnitude, immediacy and sustainability.

The said project will not pose any adverse impact or threat on any component of the environment. The impact assessment criteria are given below along with their impacts:

Table 8: Impact Significance Criteria

Impact	Criteria
No Impact	When the proposed activity will have no impact
Long Term	When the impact is of high intensity with high spread and high duration or of high intensity with medium spread and medium duration
Moderate Term	When the impact is of moderate intensity with high spread and high duration or of high intensity with low/ moderate spread and low duration
Short Term	When the impact is of low intensity but with moderate spread and moderate duration or of moderate intensity
Insignificant	When the impact is of low intensity, low spread and low duration
Adverse	When the impact is of large intensity, spread easily and long-term
Beneficial	When the impacts are positive and improve the environmental conditions

Table 9: Impact Matrix Checklist for Designing Phase

Environmental Sensitivities	Intensity of Impact						Impact Nature		Impact Significance				
	Low Intensity	Moderate Intensity	High Intensity	Local	National	Regional	Beneficial	Adverse	Insignificant	No Impact	Short Term	Moderate	Long Term
Physical Parameters													
Topography													
Land Acquisitions													
Seismicity													
Biological Parameters													
Land Environment													
Flora													
Fauna													
Social Parameters													
Local Economy													
Social Impacts													

Table 10: Impact Matrix Checklist for Construction Phase

Environmental Sensitivities	Intensity of Impact						Impact Nature		Impact Significance				
	Low Intensity	Moderate Intensity	High Intensity	Local	Moderate	Regional	Beneficial	Adverse	Insignificant	No Impact	Short Term	Moderate	Long Term
Physical Parameters													
Air Quality	✓												
Noise		✓											
Water Quality		✓											
Biological Parameters													
Land Environment													
Flora	✓												
Fauna	✓												
Physical Parameters													
Local Economy													
Social Impacts													
Health & Safety	✓												

Table 11: Impact Matrix Checklist for Operational Phase

Environmental Sensitivities	Intensity of Impact						Impact Nature		Impact Significance				
	Low Intensity	Moderate Intensity	High Intensity	Local	Moderate	Regional	Beneficial	Adverse	Insignificant	No Impact	Short Term	Moderate	Long Term
Physical Parameters													
Noise	✓												
Water Quality	✓												
Biological Parameters													
Land Environment	✓												
Flora	✓												
Fauna	✓												
Physical Parameters													
Local Economy			✓										
Social Impacts			✓										
Health & Safety	✓												

Identification of Monitoring Requirements

The last step in the assessment process is the identification of minimum monitoring requirements. The scope and frequency of monitoring depends on the residual impacts. The purpose of monitoring is to confirm that the impact is within the prescribed limits and to provide timely information if acceptable limits are being breached.

Methodology for Impact Evaluation

These tools have been used to identify the significance and magnitude of the impact as well as the nature, reversibility and extent:

- An Impact Screening Checklist
- Project Impact Evaluation Matrix

Following is given a brief description of assessment tools:

a. Impact Screening Checklist

The impact screening checklist is developed to screen out potentially insignificant environmental and social impacts from potentially significant adverse environmental and social impacts during planning & designing, demolition, construction and operational phases of the project. The objective of impact screening process is to assess the significance of issues related to the air, water, noise, soil, transportation, civil work, communication, the hazards and external constraints. The beneficial and adverse impacts of project during planning & designing, construction and operational phases are identified based on their duration, location, frequency, extent, significance and reversibility. The impact of each activity on various environmental parameters is given below:

Table 12: Characteristics of Impacts

Sr#	Environmental Component	Impact Characteristics												
		Duration		Location		Frequency		Extent		Significance			Reversibility	
		Long	Short	Direct	Indirect	Cont.	Intermittent	Wide	Local	Large	Moderate	Minor	Rev.	Irrev.
Beneficial Impacts														
1	Employment Opportunity	◙		◙		◙			◙		◙		◙	
2	Export of finished goods	◙		◙		◙			◙		◙		◙	
3	Appreciation in Land Value	◙			◙	◙			◙			◙		◙
4	Tree Plantation	◙		◙		◙			◙		◙		◙	
Adverse Impacts														
1	Air Pollution		●	●			●		●			●	●	
2	Wastewater		●	●		●			●			●		●
3	Solid Waste and By-Products		●	●			●		●			●		●
4	Health and Safety		●		●		●		●			●		●
5	Chemical Hazards		●		●	●			●		●			●
6	Physical Hazards		●	●			●		●			●		●
7	Security Risks		●		●		●		●		●		●	

b. Project Impact Evaluation Matrix

The Project Impact Evaluation Matrix was developed by placing different environmental parameters that are likely to be affected by the proposed project actions, grouped into categories i.e., physical, ecological, socio-economic environment and hazards. For assessment of associated impact risk assessment methodology was used. Moreover, the risk assessment was done on the basis of project phases (planning & designing, construction and operation). A Project Impact Evaluation Matrix is attached as **Table 17** below:

Table 13: Impact Evaluation Matrix

Environmental Parameters	Impact Assessment dur Different Phases	
	Construction	Operational
Planning and Designing		
i. Location	+2p	+2p
ii. Design	+1p	+1p
A: Physical		
1. Land Resources		
i. Soil Erosion and Contaminati	-2t	-2t
ii. Transportation	-1t	-1t
iii. Solid Waste and By-Product	-2t	-1p
2. Air Resources		
i. Noise Pollution	-1t	-1t
ii. Air Pollution	-1t	-1t
iii. Dust Emissions	-1t	-1t
3. Water Resources		
i. Ground Water	-1p	-1p
ii. Wastewater	-1p	-1p
B : Ecological		
Flora		
i. Tree Cutting	-1t	+1p
Fauna		
ii. Terrestrial Fauna	NA	NA
C: Socio-Economic		
i. Employment Opportunities	+1t	+3p
ii. Land Value Appreciation	+1t	+2t
iii. Economic Uplift of Study A	+1p	+3p
D: Hazards		
i. Physical Hazards	-1t	-1p

SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

General

This Chapter identifies the potential impacts (positive and adverse) on the physical, biological and socio-economic environment of project area due to Installation of ENA Plant at M/s Noon Sugar Mills Limited. It also identifies measures that will help to mitigate the adverse environmental and social impacts as well as it will enhance positive impacts of aforesaid project. Impacts are assessed by analyzing their magnitude and sensitivity, which is a legal requirement as discussed above;

Impact and Mitigation Management

Purpose of mitigation is to evade, reduce or balance the expected antagonistic effects in suitable way and to integrate these for devising environmental management strategy or plan. At every stage of project, mitigation plan for all the adverse impacts should be predicted to find out the best alternative. The objectives of mitigation are to:

- Invent of best substitution, better alternatives and ways to reduce the adverse environmental and social impacts in immediate surroundings.
- To improve the environmental and societal payback of project.
- To prevaricate, remedy/reduce and pro-vocative impacts.
- To certify that remaining negative influences are kept within permissible limits.

In this part of the EIA Report, a number of complications including; cleanliness, environmental health and safety, societal and environmental managing and inspection, industrial vulnerability, tools and apparatuses and during operational activities, influx of workers and procurement of land have been deeply elaborated.

Approaches for Mitigation Measures

Following approaches may be used to mitigate the impacts of the project:

Table 14: Approaches for Mitigation Measures

Avoid: Change of route or site details, to avoid damage important ecological archaeological features.
Replace: Regenerate similar habitat of equivalent ecological value in different locati
Reduce: Filters, cyclones, noise barriers, dust, enclosures, visual screening, wild corridors and changed time of activities to reduce the impact.
Restore: Site restoration at the end of the operational activities.
Compensate: Relocation of displaced communities, facilities for the affec communities, financial compensation for the affected individuals, etc.

Expected Positive Impacts

Following is the expected outcome for construction of above stated project:

a) Increase in Employment Opportunities

Due to construction of aforesaid project, the employment opportunity will be slightly enhanced. During construction phase, 50-70 workers will be hired from local community include; skilled and un-skilled workers. During operational phase, approximately 50-100 persons will be required. It will include hiring of technical and non-technical staff. Locals will also have the opportunity to diversify their income by being employed. Hence, there will be an increased employment opportunity for the local people which will have a positive impact on the socio-economic status of the area.

b) Tree Plantation

At the end of said project, trees will be planted in the designated green areas to enhance the aesthetic beauty of the area.

c) Adverse Impacts and Mitigation Measures

This section identifies the potentially significant and in-significant adverse environmental and social impacts anticipated during the operation phase of said unit. Appropriate mitigation and management measures, where applicable, have also been suggested to reduce the severity of anticipated impact up to the extent possible.

Impacts and Mitigations due to Project Location

During planning and designing phase most of the associated impacts will be associated with the selection of appropriate location and design that would have minimal impact on the environment and society. It will include:

i. Impacts of Location

This said project is Installation of ENA Plant at M/s Noon Sugar Mills Limited and does not involve any disturbance in the area. There is no human settlement, heritage building, social structure, grassland or preserved area in the project vicinity that could be damaged, dislocated or dismantled due to the project activity in proposed area. Project site is located within premises of already existing industrial unit of M/s Noon Sugar Mills Limited. Hence, the impact of location is considered to be in-significant as the project site is away from the surface water body, residential area and no protected area (is reported in 1-2 km vicinity of the project area).

Nature of Impact

The nature of proposed impact will be direct, low, short-term and hence in-significant.

Mitigation Measures

Following mitigation measures has been adopted to reduce the impact of said project location on sensitive receptors:

- The selected site located at adequate distance from the various sensitive receptors.
- The selected site is located within premises of industrial unit establishment of aforesaid project no change in the land use of area is being envisaged.
- The site is owned by the proponent and no dispute is associated.
- The wastewater will be treated prior to its disposal.
- The generated solid waste will be collected by Contractor and it will be disposed off through the standard practices of area.

It is envisaged that no mitigation measures will required as the said project is planned to be established within premises of already present industrial unit of M/s Noon Sugar Mills

Limited and no adverse impacts on its surroundings due to significant distances from all sensitive receptors.

Impacts and Mitigations due to Design

The design phase of aforesaid project optimized the use of best available technology in order to prevent or minimize potentially significant environmental impacts associated with the project as well as to ensure high level business and environmental performances. In pre-construction/design phase, a management system was provided at design level for the reduction of impacts. Design of said project will adhere to all standards, technical and legal requirements in order to avoid adverse impacts on the socio-environment and human health. Efficient infrastructure will be developed. Procurement of construction materials from approved dealers will be ensured. The technology adopted for the ENA Ethanol Production is state of the art technology. The process will be fully closed. This technology is adopted because of the following reasons:

- The process will take place in a fully closed system which will ensure zero emissions from the proposed plant.
- The proposed emergency system would be partially connected and Monitored computerized.
- Through the selected system high quality of product will be produced.
- The generated wastewater will be treated before final disposal and it can be reused in nearby agricultural lands.

The Proponent intends to reduce the environmental and social issues up to practically possible safe limit.

Nature of Impact

The nature of the proposed impact will be direct, low, short-term and hence in-significant.

Mitigation

No additional mitigation measure will be required as state of art technology is being adopted for ENA Ethanol production. It has been ensured by proponent that no wastewater will be

disposed of without treatment. This generated wastewater will be treated and dispose off in environmental friendly way.

Impacts and Mitigation during Construction Phase

Project construction phase will be 01 year whose activities will effect land environment, water, air, noise level, soil quality, socio-economic trend of area, etc. These impacts had been controlled effectively by adopting best management practices.

By the implementation of said project, a positive impact on the socio-economic culture for the people has been observed. The chance for local employment, fabrication, brick masonry, painting and machinery erection works had been increased.

The construction phase of aforesaid project will include activities associated with the site leveling, construction of civil structures, architectural works and building services. The construction phase would bring in immediate but short term changes on various components of environment near the project site. This section explains how aforesaid project will affect different environmental aspects and its mitigation measures to manage the impact. The impacts during construction phase will be temporary and localized. Even though, the measures proposed to minimize such impacts.

i. Impacts of Dust and Exhaust Emissions

Air quality is expected to deteriorate locally mainly due to fugitive dust emission and exhaust gaseous emission from vehicular movement. This will cause short-term but moderate impacts on local environment. Soil erosion may occur in small area and they will be prone to wind erosion. Air pollutants such as; NOx, SOx and CO emissions may be generated from the working of construction machinery on-site which includes; hauling vehicles, loaders, trucks, mixers, etc. This machinery will generate smoke and other potential pollutants in air. This impact is considered to be negative of minor magnitude. The effect due to construction is however, of temporary nature and will have no permanent impact on environment.

Nature of Impact

The nature of proposed impact will be direct, medium, short-term and hence significant.

Mitigation

- Dust control measures are need to be taken to control the same; Following mitigation measures will be adopted to mitigate the anticipated impact:
- Ensure that trucks carrying the raw-material should be covered by tarpaulin to reduce fugitive dust emissions.
- Water spraying/sprinkling should be done on regular basis.
- Ensure that all equipment and vehicles, used during the construction phase, are properly tuned and maintained in good working condition, in order to minimize the exhaust emissions and it will be regulated by concerned authority.
- Ensure that high quality fuel having low sulfur contents will be used in the vehicles engaged in the construction activity.
- Ensure that dust emission generated due to vehicular movement is minimized by restricted speed limit and vehicular movement impacts which will be minimized through good traffic management at site.
- Ensure that dust emission during the construction phase will be minimized by implementing best management practices.

ii. Soil Erosion and Contamination

During constructional activities the chances of soil erosion and contamination may be increased. Soil erosion from construction activities will deteriorate the soil quality. There are low chances of land contamination due to release/spill of lubricants, oil and other materials during the construction period. Erosion may also result from movement of heavy vehicle such as; bulldozers, excavators, trucks and pick-ups. The impact will be short term, localized and can be controlled through immediate appropriate management and mitigation measures. This impact is considered negative of minor magnitude. Hence, the impact is in-significant.

Nature of Impact

The nature of proposed impact will be direct, medium, short-term and hence significant.

Mitigations

Following mitigation measures will be adopted to protect the soil from erosion and contamination:

- During construction phase no tree removal is involved however, tree plantation will be done after completion of construction at designated green areas.
- Native and fast growing trees will be planted in the designated green areas.
- Spill prevention and response plan for storage, usage and transfer of fuel should be prepared (if used on site) and implemented.
- Workers should be trained on spill prevention and response plan.
- Maintenance and washing of vehicles as well as equipment will be carried out at designated areas within the facility.
- Any hard surface or tarpaulin should be spread on area to prevent soil contamination.
- Regular inspections should be carried out to detect leakages in construction vehicles and equipment.
- Machinery involved should be maintained properly to avoid leakages.

iii. Socioeconomic Impacts

In project area, no significant changes are envisaged in traditional life style and occupation of local people residing in the nearby communities. The local people are rather benefited due to the provision of job opportunities. No impact is envisaged due to influx of workers as local will be preferred and hired for working. Moreover, health and safety related issues may arise during the construction activities. These impacts are in-significant can be further reduced significantly by adopting best management practices.

Nature of Impact

The nature of proposed impact will be direct, low, short-term and hence in-significant.

Mitigation Measures

Following mitigation measures will be adopted to reduce the socio-economic impact on the community:

- Good relations with local communities will be promoted by encouraging Contractor to provide opportunities for skilled and un-skilled employment to the locals as well as on-job training.
- The contractor should prefer hiring local labor from adjacent community
- The contractor will keep the copy of National Identity Card (CNIC) of his employees and will warn the workers not to involve in any anti-social activities
- At the time of hiring the Contractor has to ensure that workers should be of good repute.
- First aid kits will be available at site.
- Training of workers should be carried out for operating various constructional machinery, safety procedures should be adopted, environmental awareness should be carried out, equip all workers with safety boots, helmets, gloves, protective masks and monitoring of their proper and sustained usage will be carried out. In case of accidents, contractor will provide free medical treatment to the community.
- The Contractor will be responsible for sensitivity towards the local customs and traditions

Impacts & Mitigation during Operational Phase

This section delineates the potential impacts during operation phase of the project and the mitigation measures to counteract these impacts. The summary of the impacts and possible mitigation measures are as follows:

i. Impact on Ecology

Currently, the site is being use for industrial activities. After the completion of said project different native and ornamental plants species will be planted at designated green spaces and along boundary of project site. The overall aesthetic beauty of the area has been enhanced and it will have a significant impact on the overall ecology, aesthetic and landscape of the area.

Nature of Impact

The nature of proposed impact will be direct, low, short-term and hence in-significant.

Mitigation Measures

This impact is considered to be positive, long-term and significant. Hence, it doesn't require any mitigation measure.

ii. Impact on Air Environment

During operation phase, air emissions will chiefly arise from boiler along with solvent vapor, odor, PM, dust and lint from floor cleaning and from the generators.

Nature of Impact

The nature of proposed impact will be direct, low, short-term and hence in-significant.

Mitigation Measures

Following mitigation measures will be adopted:

- For dust suppression regular sprinkling of water will be carried out.
- Vehicles used for transportation of raw material as well as finished product and the utility vehicles will be regularly serviced and maintained in order to keep the environmental impact on account of their exhaust emissions to its minimum level.
- Cyclones are installed to control emissions from the boilers for steam generation.
- Generator will be placed in closed space to reduce air emission.
- Biogas will be used as fuel for boiler.
- Native tree would be planted along the boundary of project area to keep environment healthy.

iii. Noise Environment

Noise, an unwanted sound, affects human being. Excessive exposure to noise produces varying degree of damage to hearing system. It leads to headache, fatigue, etc. Continuous exposure of increased level of noise will have an adverse impact on the health of workers as well as the people residing in surrounding area.

Nature of Impact

The nature of proposed impact will be direct, low, short-term and hence in-significant.

Mitigation Measures

In general the following methods will be adopted to control the noise pollution from the above-said unit;

- Residential area is located at safe distance from project site.
- Proper encasement of noise generating sources will be done to control the noise levels within prescribe PEQS limits.
- Greenbelt will be developed all around the plant which will be acting as noise barrier.
- The use of concrete and masonry walls & barriers keeping in view the benefits of stiffness weight & cavity construction & the need to provide well sealed sound attenuating doors & windows.
- The use of complete or partial enclosures, as and if required.
- Attenuation by use of sound absorbents on walls and fixed or suspended ceilings.
- The use of mufflers, sound attenuation and acoustic louvers in air flow paths, taking particular care to direct inlet and discharge an opening away from critical areas wherever possible, so as to take advantage of direct effects.
- All the workers will be provided with ear plugs/ear muffs, masks, gloves and safety shoes as per job requirement.
- All the transporters will be advised to carry out regular maintenance of their vehicles

iv. Solid Waste Management

The solid waste generated from the process is mainly sludge. While recyclable waste sold out to EPA contractor and domestic waste will be handles as per area practices.

Nature of Impact

The nature of impact will be direct, low, long-term and significant.

Mitigation

Following mitigations should be adopted to manage generated solid waste:

- Sludge will be handed over to EPA Certified Contractors
- The recyclable waste including plastic, packaging material sold out to contractor.

- Waste bins will be placed in the facility at the strategic position for the collection of solid waste.
- The installed bins will be covered in order to reduce the chances of the disease vector production.
- Regular training will be given to the workers dealing with the waste management it will include; identification, segregation and management of waste.

v. Water consumption and wastewater production

Water requirement will be fulfilled by taking water from irrigation canal. Process Water requirement will be approx. 50m^3/hour. Domestic and process wastewater will be treated before disposal.

Nature of Impact

The nature of impact will be direct, low, long-term and significant.

Mitigation

Following mitigations should be adopted to manage generated wastewater:

- The domestic wastewater will be treated prior to final disposal.
- Water conservation activities will be adopted for the preservation of water.
- Water conserving methods will be applied by placing taps and toilets.
- All faults will be monitored and fixed.
- Freshwater conservation techniques should be adopted to ensure sustainable development.
- Monitoring of effluents shall be carried out by Composite or Grab Sampling to ensure Compliance with PEQS.
- It will be ensured that no solid waste will be entered in the wastewater.

vi**. Occupational Health and Safety**

Following health and safety impacts arise during the operational phase of the above-said project:

- Fermentation
- Slips, trips and falls on ground
- Unguarded machinery
- Hazards associated with the fire and explosion
- Noise and vibration
- Electrical burns and electric shock

Nature of Impact

The nature of proposed impact will be direct, low, long-term and hence significant.

Mitigation

The following mitigation measures are suggested that could be applied to reduce the risk of health and safety:

- Spillage prevention plan should be adopted and it should be implemented effectively.
- Workers are properly trained handling machines and equipment.
- Floor surfaces shall be maintained and cleaned on regular basis.
- Floor should be kept clean and free of oil spills, other slippery fluids or materials and obstructions.
- The effective use of hearing-protection devices shall be ensured.
- Protective measures and emergency rescue procedures should be followed strictly.
- Only authorized persons shall be allowed in the processing and industrial premises.
- Unloading of raw-material and loads of final products should be controlled, supervised, slow and smooth.

vii. Security Risks

A large number of workers will be hired including; Managers, Engineers, skilled and un-skilled laborers. The increase in number of individuals residing in area, may lead to an increase in crime and violence in surrounding areas. The nature of impact is considered to be low as the locals will be preferred for hiring.

Nature of Impact

The nature of proposed impact will be direct, low, long-term and hence significant.

Mitigation Measures

Following mitigation measures will be adopted:

- Proper security will be provided to the workers working in the premises of proposed project.
- CNIC of all the workers will be kept by the proponent.
- Security to the workers at site should be provided.

Viii. Emergency Response

Emergency response preparedness committee has been formulated consisted of heads of all the departments same will be followed Emergency Response Leader will be the head of the team assisted by safety team and safety Officers, Emergency Response Leader along with his team will ensure that in the case of emergency, team is prepared for fire-fighting and the first aid kits will be provided which may include; blankets, hot water bottles, stretchers, benches, sterilized dressing, snake bite kit, cotton and iodine (2% alcohol). Incidents and accidents may take place unexpectedly during project operations no matter how effective, strong and efficient the mitigation measures for all adverse impacts; especially the safety issues may be adopted. These may include; accident and natural disasters.

Nature of Impact

The nature of the proposed impact will be direct, low, long-term and hence significant.

Mitigation

Following mitigation measure will be adopted:

- Site in-charge should be responsible to ensure that fire-fighting plan has been implemented with true spirit.
- Safety team will be responsible to monitor the activities and to act on approved firefighting plan in the case of fire.
- Workers should be given adequate training of handling machinery.
- Emergency call service must be made available.
- The drills to check the response of the workers against any emergency situation will be carried out on the regular basis.

- Safety and hazards signs will be displayed with the facility to avoid any unfortunate incident.
- Only authorized persons will be allowed in factory premises.

ix. Socioeconomic Impact

It is envisaged that adverse impacts associated with the said project includes; local community will be disturbed due to increase in the traffic load (i.e., vehicles carrying raw material and final products), wastewater management, soil pollution, etc. The intensity of impacts occurred due to the establishment of aforesaid project will be quite low. The commencement of aforesaid project will have a beneficial impact on the surrounding community such as; increase in employment opportunity, increase in wages of the local area employees, increase in revenue generation, provision of social welfare funds of employees and appreciation of land value.

Nature of Impact

The aforesaid impact is considered to be positive and will have a direct, medium, long term and significant impact.

Mitigation Measure

No mitigation measures will be required.

x. Health & Safety of Workers

Improper handling of machinery and unskilled labor may cause various health issues such as; work place incident and physical hazards, etc. To ensure the safety of workers these impacts need to be managed effectively.

Nature of Impact

The nature of impact will be direct, low, long-term and significant.

Mitigation

Following mitigations should be adopted to improve the health and safety:

- Regular inspection and maintenance of the plant will be carried out to eliminate the risk and associated hazards of any unfortunate incident.

- Workers will be trained on the regular basis regarding personal safety, disaster management physical and chemical hazards.
- Operators operating the plant should be fully trained and equipped.
- Training regarding HSE should be given on the regular basis.
- Workers will be given PPEs such as; helmets, mask, ear-plugs/muffs, safety boots, etc.
- It should be strictly enforced to wear PPEs while working.
- Incidents should be reported directly to the concerned authority.
- Floor surfaces shall be maintained and cleaned on regular basis.
- Floor should be kept clean and free of oil spills, other slippery fluids or materials and obstructions.
- The effective use of hearing-protection devices shall be ensured.
- Protective measures and emergency rescue procedures should be followed strictly.
- Only authorized persons shall be allowed in the processing and industrial premises.
- Unloading of the raw-material and loads of the final products should be controlled, supervised, slow and smooth.

Potential Environmental Enhancement Measures

The said project will be result in following benefits:

- Direct and indirect employment opportunities,
- Gains in the local and national economy,
- Industrial development in region
- Tree plantation

Tree plantation along boundary of project will act as environmental enhancement measure. Indigenous and ornamental tree species will be grown on all open spaces and along boundary of project (Tree Plantation plan is attached herewith)

The environmental budget allocated for tree plantation, management & disposal of solid waste and wastewater and Environmental monitoring is approximately **PKRs 2 Million** approx.

ENVIRONMENTAL MANAGEMENT AND MONITORING PROGRAM

General

This EIA Report provides the Environmental Management and Monitoring Plan (EMMP) for implementation of aforesaid project in order to keep anticipated environmental and social impacts in check by adopting suggested mitigation measures and monitoring of the certain parameters moreover, to ensure the compliance of EMMP. As per the environmental legislation in Pakistan, the EMMP for the operations phase, along with other documents, is to be submitted in EPA, Punjab to obtain confirmation for compliance and Environmental Approval/NOC for project execution. Even after implementation of the suggested mitigation measures, the impact may remain significant and require regular environmental monitoring. This section also underlines the monitoring framework for operation phase to check compliance of EMMP and to take timely actions for correction in case any negligence & accidence of significant criteria, requirements or goals is found.

Objectives of Environmental Management Program

The primary objectives of the EMP are to:

- Facilitate the implementation of the mitigation measures identified in this EIA Study.
- Define the responsibilities of the project proponent and contractor and provide a means of effective communication of environmental issues between them.
- Identify monitoring parameters in order to ensure the effectiveness of the mitigation measures.
- Provide a mechanism for taking timely action in the face of unanticipated environmental situations.
- Identify training requirements at various levels.

Components of EMMP

Components of EMP are as follows

- Management plan
- Monitoring Plan
- Communication and documentation
- Institutional capacity
- Environmental training

Proposed Mitigation actions

It lists all the mitigation measures identified in the EIA and the associated environmental or social aspect in line during construction and operational phase with the administrative framework involving all the responsible implementing authorities who are required to take the planned actions/measures and monitor it accordingly. It enhances project benefits by reducing its impacts and making it environment friendly.

Table 15: Environmental Management Plan

Project Activities	Type of Impact	Potential Impacts On Environment	Mitigation Measure	Institutional Responsibility	
				Implementing Body	Supervisio
Civil works	Physical, Social, Biological Aesthetical	Soil Erosion, Emissions, Water Contamination, Noise & Vibration, Wildlife affected, Employment, Health &Safety of Workers	• Record keeping and timely transfer of SW from bins to the disposal site for ultimate management and disposal • Dust emission from soil piles and aggregate storage stockpiles will be reduced by keeping the material moist by sprinkling of water at appropriate frequency. Covering the pile, for example with tarpaulin or thick plastic sheets, to prevent emission. • Noise control measures will be implemented • Paved roads are already there that will be used for transportation of raw material. • Camping site will be established during construction	Contractor	Proponent

Movement and fueling of vehicles	Physical Aesthetical	Soil &Water Contamination due to Fuel Leakages &Spillage, Emissions, Noise &Vibration	• Periodic maintenance and inspection of vehicles will be done • Vehicles with leaks will be operated after maintenance. • Vehicles should not be washed or serviced in the field.	Contractor	Proponent
Transportation construction material	Bio-physical	Dust and Particulate Emissions, Noise Generation, Safety and Health Effects	• Excessive use of horns will be avoided • PPE's will be provided to workers • Covering of trucks carrying transporting material • Night time driving of project vehicles will be limited where possible • Low speed limit will be maintained on the section of the access road that is adjacent to the community and site. • The fence surrounding the site will be put in on during the construction to prevent access to the construction site	Contractor	Proponent
Ecological Resource	Physical, aesthetical and biological	Flora & Fauna	• More tree plantation will be done at designated green areas.	Project Manager	Project Manager
Wastewater management	Physical/ Social	Degradation of water quality	• Wastewater generated from process activities will be treated through anaerobic digestion and then transferred to agricultural land through tankers.	Environment officer	Proponent
Air quality management	Physical	Dust and PM	• Cyclones are installed at boilers to control air emissions • Biogas will be used as fuel in boilers	Environment officer	Proponent

			• Control measures have taken to control the matriculate matter. • As Prescribed periodic Monitoring of ambient air and maintenance of machinery should be done on regular interval.		
Noise generation	Physical, soc biological	Psychological and hearing problems	• There will be ban on the use of horn in the area. • Proponent has planned a proper plantation plan which will also act as barrier for noise.	Environment officer	Proponent
Solid Wa Generation	Physical, Biological, Social	Soil Contamination, effecting GW Quality, vectors production, odor, Health, Welfare	• Sludge will be sold to third party contractors for safe disposal. • The solid waste from the project should not be allowed to pile up. • Solid waste should be disposed off properly as per local practice • Recyclable waste should be dispose off through certified contractor	Environment officer	Proponent
Health and Safety	Biological	Injury may happen while handling machines	• Personal Protective equipment's (PPE's) i.e. masks, gloves and sanitizers will be provided to the workers • Warning signs will be placed in local language. • Fire drills training has been carried to avoid hazards • Proper maintenance of machines has been carried out • First aid kits and other necessary equipment will be kept available at site. • Dengue larvae eradication has been done	HSE Manager	Proponent

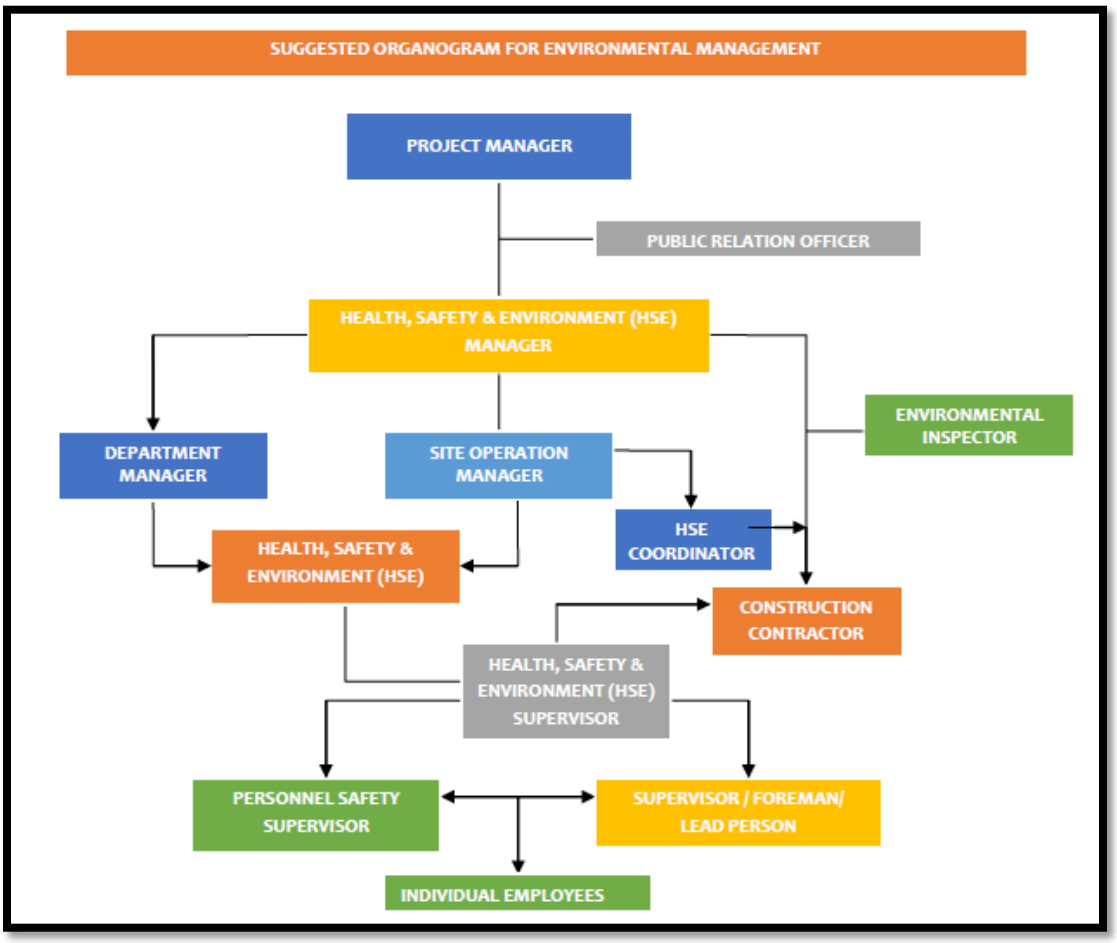
Schedule for Implementation of Environmental Budget

The allocated environmental budget is **PKR 2 Million approx.** The allocated environmental budget will be spent on landscape/green zone management, Environmental Monitoring, solid waste management and wastewater management. The proponent will plant indigenous and ornamental plants to increase the aesthetic value of the area. Thus, the project is also a source of employment for locals and would help in economic development activities of the area.

Environmental Management Team along with their roles and responsibilities

The primary responsibility for implementing different aspects of the EMP within the company lies with the concerned departments of Noon Sugar Mills Limited.

Table 16: Proposed Hierarchy of Monitoring team



Proposed Monitoring program

Environmental monitoring is a vital component of the Environmental Management Plan. It is the mechanism through which the effectiveness of the EMP in protecting the environment is measured. The feedback provided by the environmental monitoring is instrumental in identifying any problem or lapse in the system under implementation and planning corrective actions. For domestic activities already constructed facilities will be used. Solid waste disposal will be according to standard practices of area. It should be noted that it is difficult to outline a formal monitoring protocol for specific environmental parameters and

key impacts until detailed project design have been completed. The main objectives of the environmental monitoring are:

- To provide a mechanism to determine whether the project construction contractors are carrying out the project in conformity with the EMP.
- To identify areas where the impacts of the project are exceeding the criteria of significance and, therefore, require corrective actions.
- To document the actual project impacts on physical, biological, and socio-economic receptors, quantitatively where possible, in order to design better and more effective mitigation measures.

Following environmental record should be maintained:

- Periodic inspection reports of the site
- Incident record of all moderate and major incidents and accidents. The record will include:
  - ✓ Location or limit of the accident
  - ✓ Estimated quantity or the amount of injury
  - ✓ Nature of injury or loss (temporary or permanent)
  - ✓ Restoration measures
  - ✓ Photographs
- Description of any damage to vegetation, water resource, or community asset.
- Corrective measures taken, if any
- Waste Tracking Register that will hold records of waste generated during the construction period. This will include quantities of waste disposed, recycled, or reused.
- Records of water consumption with use wise breakdown
- Survey reports, in particular, the following:
  - ✓ Vehicle and equipment noise.
  - ✓ Ambient noise survey reports.

- ✓ Ambient level of PM
- ✓ Vendor data—all vendors disturbed by the project and compensation paid Public infrastructure: Record of all damages and repair work undertaken.
- ✓ Employment
- ✓ Total number of unskilled, semi-skilled, and skilled jobs offered during Construction.
- ✓ Name and domicile of the employed staff.
- ✓ Project and Community Interface
- ✓ Record of community complains and the measures taken to address them.
- ✓ Number of meetings held in various communities and data of persons who attended.

Proposed EMP reporting and reviewing procedures

During construction, EMP reporting and reviewing will be done by the contractor/HSE department. Following steps will be taken during reporting and reviewing of EMP.

1. **Data recording and maintenance:** All forms that will be used for monitoring will be numbered and a tracking system will be developed for each. In this manner, it will be ensured that all forms are returned to the office, be filled, unused or discarded.
2. **Storage of information:** A database will be prepared for collecting the information during the project. The database may include information on training programs, non-compliance, corrective actions and results of monitoring. It will also contain photographic records of project site.
3. **Site Monitoring:** Quarterly Monitoring will be done by monitoring team as per SMART Rules and will be reviewed by concerned. The parameters that will be measured are given below.

Sampling	Parameters
Ambient Air Quality	SO_2, NO, O_3, NO_2, CO, PM 2.5, PM_{10}
Drinking Water	TDS, pH, Color, Taste, Odor, Total Hardness as $CaCO_3$, Turbidity.
Noise Level	Area Mid-Point

Afterward, monitoring reports will be submitted in EPA as per condition of Environmental Approval of construction phase. Furthermore, recorded data will be reviewed by supervisory so that it can be further improved if required.

Environmental Training

Training is an integral part of a preventive strategy. Environmental training will be required to ensure proper implementation of effective environmental management and monitoring plan; and disaster management plan. However, training could be organized by proponent involving relevant staff. As a trainer, competent Consultant can be outsourced. Important training under the spectrum needs to include:

- Training on fire fighting and safety management;
- Training on environmental safeguards and compliance;
- Staff training on environmental monitoring and reporting;
- Training on occupational health and safety measure.

Table 17: Training Schedule

Target Audience	Trainers	Contents	Schedule
Selected Management Staff	Subject Expert	Key finding of mitigation measure	Quarterly
All Personnel	HSE Officer	Mitigation measures especially firefighting, safety, health and	Monthly
Technical Staff	HSE Officer	Waste disposal, vehicle movement restriction	After every three month
Other Staff	HSE Officer	Waste disposal, resource conservation and other mitigation workers	Monthly

PUBLIC CONSULTATION AND PUBLIC DISCLOSURE

General

Public consultation refers to the process by which the concerns of various stakeholders and local community who have a plausible stake in the environmental management & associated impacts of the project or activity are ascertained with a view to taking into account all the material concerns in the project or activity design as appropriate. According to the Review of IEE and EIA Review Regulations, 2022 public consultation is mandatory for any socio-environmental study for the commencement of any project.

Impact assessment survey and public consultation sessions held with different stakeholder groups that may be impacted by this project commencement were carried out. The consultation process was carried out in accordance with the guidelines laid by EPA, Punjab. The objectives of this process were to:

- Share information with stakeholders on proposed project establishment.
- Access the impacts on the physical, biological and socio-economic environment.
- Understand stakeholder concerns regarding various aspects of the project commencement.
- Note valuable suggestions of local stakeholders to improve the proposed project design.
- Understand the perceptions, assessment of social impacts and concerns of the affected people/communities of the project area.
- Find out the awareness level and situation of acceptability to identify any issues for the implementation of the proposed project.
- Invite people to express their views about the positive/negative impacts on their lifestyles and environment.
- Disclose information about contact offices/officers for any complaints/queries.

It is envisaged, there will be no social impact being foreseen due to the commencement of aforesaid project at aforesaid location. This EIA Report includes all the comments, which were taken into account during the social survey and preparing the definitive development concept for the installation and operation of proposed project. Public consultation questionnaires and consultation with locals are attached as **Annex-VIII** of this EIA Report.

Consultation with Government officials

Consultation regarding Extension of Distillery Plant was carried out and Concerns of locals, Environmental Practitioners & experts and Government EPA departments were discussed and asked to consider them while construction of above-said project. Locals will be preferred for employment after providing proper training. Mitigations measures mentioned in EMP will be truly implemented.

The responsible authority

Overall responsibility for implementation of EMP will be of project proponent. He will appoint a HSE/Project Manager of relevant qualification. HSE/Project Manager will act as Environmental Manager and will manage the all HSE conditions.

Consultation with Affected and wider community

In addition, to the use of direct methods to evince the response of the various stakeholders in targeted population residing in study area was ascertained by conducting a sample survey, through specially formatted questionnaires (attached in the Annex-VIII of this EIA Report). Questions posed to the public were related to creation of possible impacts, adverse impacts and beneficial impacts, including; employment opportunities, income generation activities, change in living standards and provision of the basic amenity.

Personal views of the respondents on the establishment of above-mentioned unit by Noon Sugar Mills Limited, possible disturbance to the residents near the AOI and infringement of their privacy were also recorded. The various rounds of public meetings and consultations were arranged in project and study area. The objectives of consultation with the affected persons are given in the table below:

- Disclose the proponent plan for the construction/operation of said facility.
- To share information on the design and specifications of project works.
- To analyze the expected impact on the socio-economic environment.
- To understand their concerns regarding various aspects of project commencement.

Views, Concerns and Suggestions of Various Stakeholders

The major socio-economic concerns and problems of the affected persons of various communities have been given in tabulated form below (**Table)** along with their main concerns and remarks. Community showed a lot of concerns; a few are being mentioned here:

- Removal of shrubs and trees should be avoided to the extent possible in the case of clearance green zones should be established within the facility.
- Indigenous tress around the facility should be planted to control air pollution and as the compensation of removed trees.
- The project will become the source of income for local to earn their livelihood easily and honorably, so locals should be preferred.
- The area will inhabit and will be used for the beneficial purposes.
- For the solid waste management and waste disposal, proper disposal techniques should be adopted.
- Water spraying/sprinkling should be done on the regular basis for dust suppression.
- Employment opportunities will be generated and locals should be hired on the priority basis.
- The air pollution is one of the major impact from which Punjab is being affected at the large scale. So, ambient air quality should be monitored regularly and air pollution expected to generate from the operation should be mitigated beforehand.
- Good relations with the local communities will be promoted by encouraging Contractor to provide opportunities for skilled and unskilled employment to the locals as well as on-job training.
- Noise generated activities should be carried out during day hours.

The views and the concerns of the local communities, direct and indirect stakeholders has been complied and are presented in the tabular form below:

Table 22: Views and Concerns of Stakeholders

Sr.#	Respondents	CNIC/Contact No.	Concerns
i.	**Shahbaz Ahmad**	0302-9552910	During the survey in the study area follow concerns of the local community were noted: ◎ Locals should be preferred for the opportunities. ◎ Wastewater should be treated prior to f disposal. ◎ Noisy activities should be confined. ◎ Solid waste should be managed effectively adopting the standard practices of the area. ◎ Cleanliness of the area should be ensured. ◎ An effective EMMP should be designed enforced with true spirit. ◎ Health of the workers should be ensured. ◎ Plantation should be carried out at extens scale. ◎Workers should be hired from local commur ◎ Indigenous tress around the facility should planted to control air pollution.
ii.	**Tabassum Rasool**	0305-5266980	
iii.	**Saqlain Shah**	0300-6064831	
iv.	**Faheem Anwar**	0301-3063930	
v.	**M. Hamid**	0306-5300858	
vi.	**M. Rizwan**	0307-7903420	
vii.	**Abdul Sahar**	0303-9551528	
viii.	**M. Yasir**	0302-9183611	
ix.	**Irfan Haider**	0321-4156512	
x.	**Saif Ur Rehman**	0302-5182311	
xi.	**Khawar Abbas**	0303-6999445	

xii.	**M. Haseeb Riaz**	0304-5371518	During the survey in the study area follow concerns of the local community were noted: ◎ Locals should be preferred for the opportunities. ◎ Wastewater should be treated prior to f disposal. ◎ Noisy activities should be confined. ◎ Solid waste should be managed effectively adopting the standard practices of the area. ◎ Cleanliness of the area should be ensured. ◎ An effective EMMP should be designed enforced with true spirit. ◎ Health of the workers should be ensured. ◎ Plantation should be carried out at exten scale. ◎Workers should be hired from local commur ◎ Indigenous tress around the facility should planted to control air pollution.
xiii.	**M. Ali**	0308-0126329	
xiv.	**M. Arshad Shahzad**	0305-3634545	
xv.	**Shakeel Abas**	0306-1294472	
xvi.	**Syed Esan Shab**	31304-5940961-7	
xvii.	**M. Amjad**	31304-8715233-1	
xviii.	**Sadam Hussain**	31304-8205906-7	
xix.	**Nazir Ahmed**	31304-1822488-1	
xx.	**M. Amir**	31304-1899421-7	

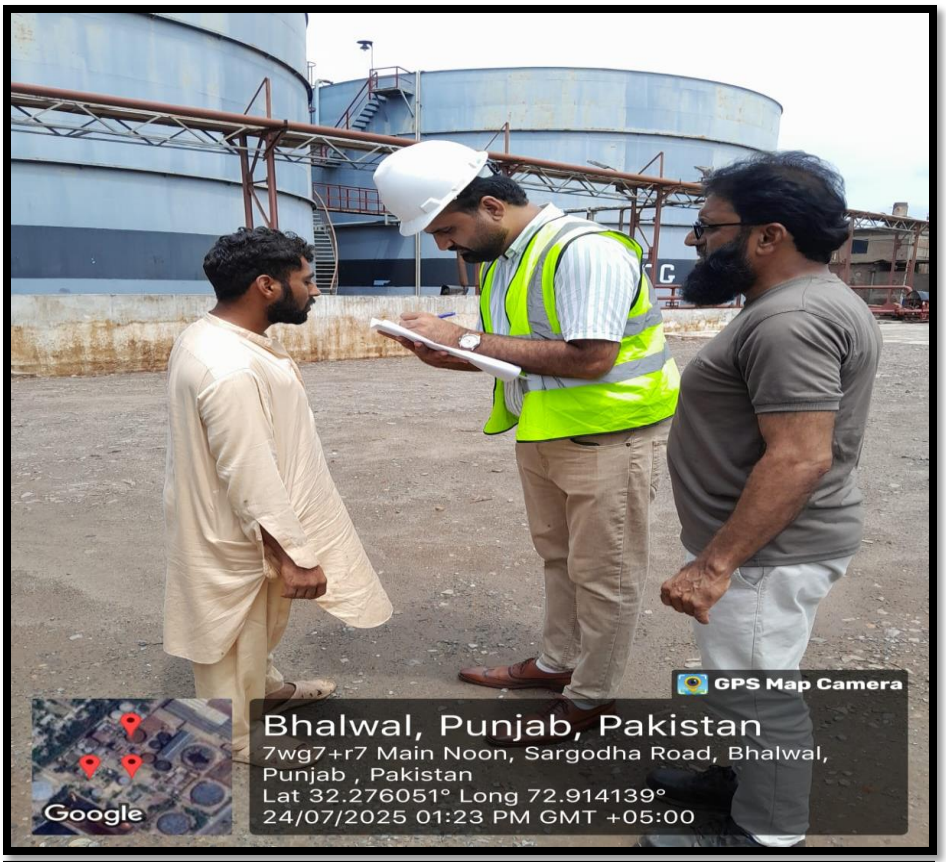

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Figure 14: Consultation with Local People of Area