



BANNARI AMMAN SUGARS LIMITED

**KOLUNDAMPATTU VILLAGE, THANDARAMPATTU TALUK
TIRUVANNAMALAI DISTRICT**

PROPOSED SUGAR AND CO-GENERATION UNIT

EXECUTIVE SUMMARY

SUGAR UNIT - 5000 TCD
CO-GEN PLANT - 28.8 MW / HOUR

1. INTRODUCTION

BANNARI AMMAN SUGARS LIMITED is one of the flagship company of **M/s.Bannari Amman Group**. This group is one of the largest industrial houses in South India, reputed in the field of Sugar, Alcohol, Cogen, Granite, Textiles, Trading and Distribution.

Bannari Amman Sugars Limited has three sugar units, one is at Sathyamangalam - Erode district and other two are at Nanjangud and Kollegal of Karnataka state. This company has more than 30 years of experience and knowledge in the field of sugar, alcohol and cogen sectors.

Bannari Amman Sugars Limited has proposed to set up an integrated Sugar complex with Sugar, Cogeneration and Distillery units with latest and most sophisticated state of the art technology with environmental friendly features at **Kolundampattu Village, Thandampattu Taluk, Tiruvannamalai District in Tamilnadu State**.

The Company proposes to establish a **Sugar Plant with 5000 Tonnes per day cane crush** and **Cogeneration Plant with 28.8 MW / Hour** capacity. All the by-products such as Bagasse, Molasses and Pressmud would be effectively utilized as a raw material in the proposed cogen plant and distillery unit.

1.1 Production Capacity

1.1.1 Products:

S.No	Product	Production Capacity	
		Sugar Unit	Cogen Plant
1.	White Crystal Sugar (Refined Sugar)	1,50,000 MT / Annum	-
2.	Power	-	28.8 MW / Hour

1.1.2 Byproducts:

S. No	Byproducts	Quantity per Annum	Mode of Disposal
1.	Bagasse	3,15,000 MT	Bagasse will be used as fuel in the Cogen Boiler
2.	Pressmud	40,500 MT	Will be used as manure in the agricultural field / Biocompost manufacture
3.	Molasses	60,000 MT	Molasses will be used as raw material for Alcohol production

1.2 Raw Material Requirement:

The details of raw material requirement for Sugar and Co-gen units are shown below.

S.No	Raw Material	Requirement (Tonnes / Month)	
		Sugar Unit	Cogen Plant
1.	Sugar cane	1,50,000	-
2.	Lime	490	-
3.	Phosphoric Acid	15	-
4.	Triple Super Phosphate	30	-
5.	Bagasse	-	45,000

1.3 WATER REQUIREMENT

The fresh water sourced from Pennai River for drinking, domestic usages, utility and process. The Water Requirement details for the proposed Sugar and Cogen units are furnished below:

S.No	Description	Fresh water requirement (KLD)		Recycled water consumption (KLD)	
		Sugar	Cogen	Sugar	Cogen
1.	Process	650	-	-	-
2.	Boiler	-	718	-	-
3.	Cooling tower	1200	180	-	-
4.	Floor washings	75	-	-	-
5.	Gardening	-	-	627	229
6.	Domestic Purposes	35	2	-	-
	Total	1960	900	627	229

The Management is aware of statutory requirements and accordingly they have engaged **M/s. Pure Enviro Engineering Pvt Ltd.**, Chennai to study and submit Environmental Impact Assessment Report incorporating the baseline environmental status and predict the impacts due to proposed activity and suggest a suitable Environmental Management Plan.

The report is based on the studies made and presents the details of manufacturing process, air pollution sources, water pollution sources and suggestion of suitable environmental management plan and suitable pollution control measures to meet the standards for Air, Water and Noise stipulated by the Pollution Control Boards.

2.0 PROCESS DESCRIPTION

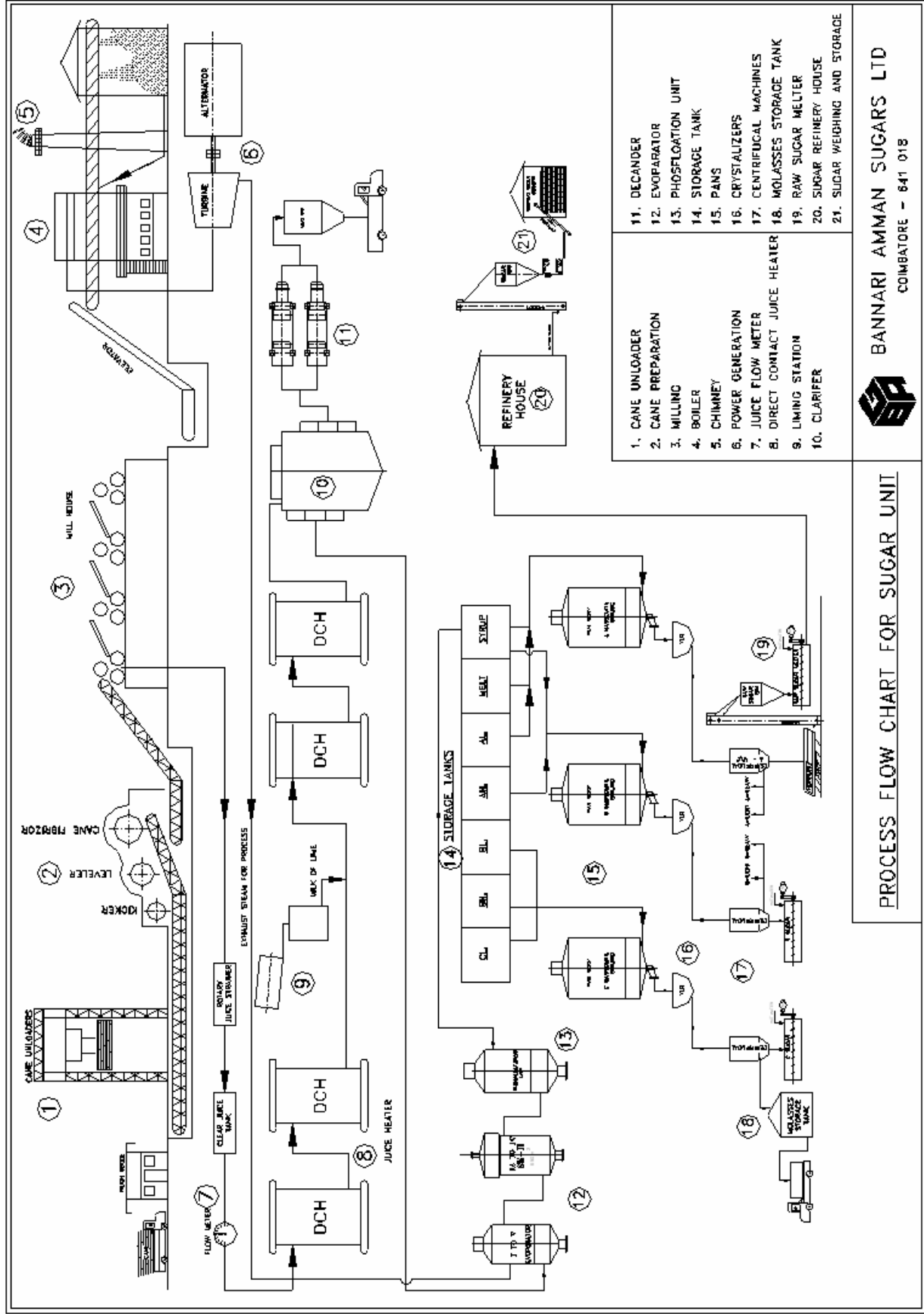
2.1 SUGAR MANUFACTURE

The Sugar cane is received from the farmlands through trucks, weighed and unloaded in the milling carrier. Series of roller mills crushed the cane and extract the juice leaving the Bagasse, a very valuable fuel for the Cogen boiler. The steam generated from cogen boiler is passed through turbines and in turn power is generated. Emerging out low pressure steam is utilised in the process section.

Extracted cane juice is heated to 60 - 65 ° C and lime water is mixed with that to maintain the pH of 7-7.2. Thereafter it settled in huge clarifiers for about 2-1/2 hours to settle the solid residues in it called as Pressmud. This pressmud finds use in Biocomposting and will be converted into manure. The clear settled juice is sent to the Evaporators to evaporate the water and convert it into syrup.

The syrup is further boiled in Pan and sugar crystals are formed in it. High speed centrifugal machines used to separate the sugar crystals and molasses from the syrup. This molasses finds use at distilleries to produce alcohol.

The separated sugar is dried and then subjected to further refining in the Refining House to get refined sugar. The refined sugar is marketed in 50 and 100 Kg. bags as per the requirements.



PROCESS FLOW CHART FOR SUGAR UNIT



BANNARI AMMAN SUGARS LTD
COMBATORE - 641 018

(i) 2.2 COGENERATION OF POWER

Co-generation is generally defined as the coincident generation of Electrical power and useful thermal energy from the same input fuel. High pressure steam is generated and is used in a turbine for generating power and the steam is drawn from the turbine at low pressures and the heat energy in the low pressure steam is used in the sugar process.

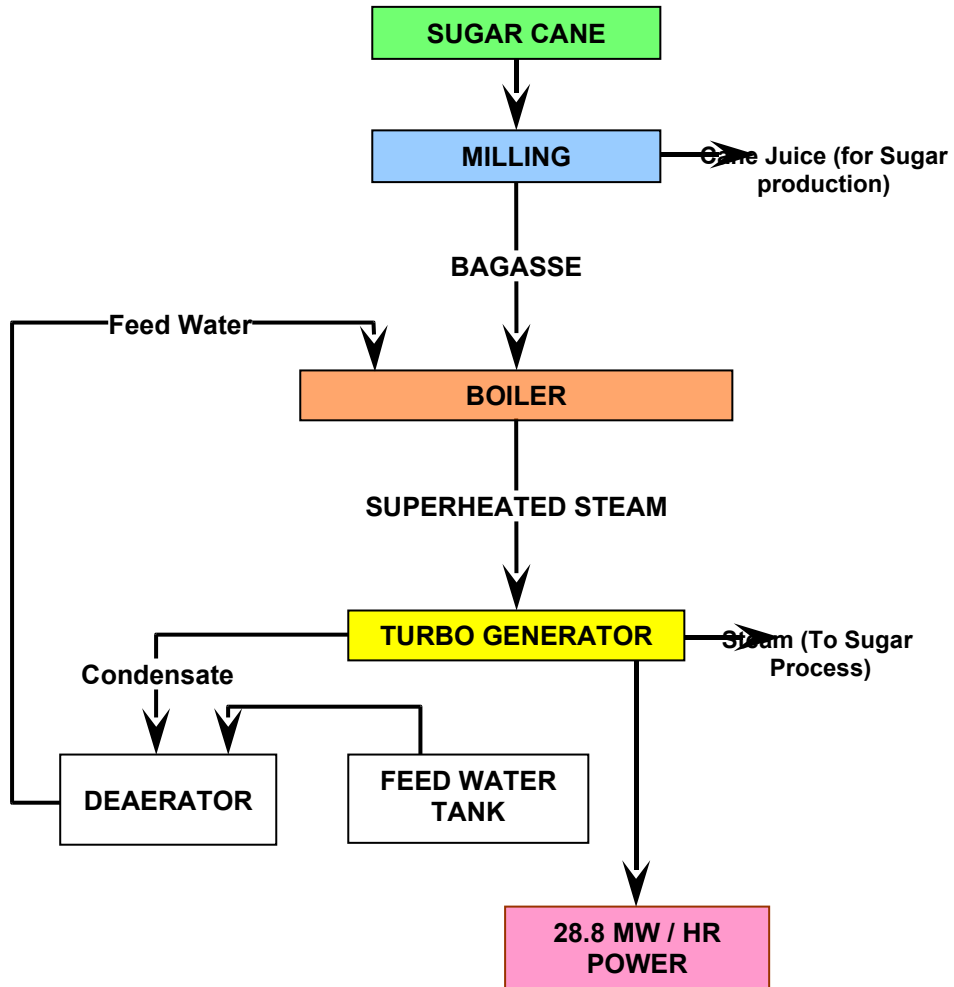
The entire steam to be generated in the new boiler of 135 TPH, at 110 ata working pressure, is to be passed through one double extraction cum condensing turbo generator of 28.8 MW capacity. Both the boiler and the turbogenerator will be installed with all the necessary auxiliary plants and systems required for efficient operation of the co-generation plant. The rejected heat, in the form of useful thermal energy, is supplied to the process.

The Cogeneration Plant with 28.8 MW envisage unique features such as PLC based control system, stack height of 79 m and SPM monitoring system.

The cogeneration plant boiler will be designed to handle multifuels like Bagasse, Imported Coal, biomass fuels & Biogas. The turbine will be triple extraction cum condensing machine with air cooled condenser.

Cogeneration concept proposed uses higher pressure and temperature steam to get more power out of the system such that the surplus power, over and above that required for the operation of the sugar plant, could be exported to the electricity grid. The plant will be exporting 17.2 MW during cane crushing season and 26.3 MW during the off-season period to TNEB's Grid.

CO-GENERATION SCHEME



3.0 PROPOSED ENVIRONMENTAL MANAGEMENT PLAN (EMP)

The company will maintain clean environment and it has plans to have the latest and modern system of water treatment plant for waste water treatment such that, it will safeguard the environment.

The proposed Effluent Water Treatment Plant will be designed to handle the effluents discharged from both Sugar and Cogeneration Plants. It is proposed to have an activated sludge recirculation process.

The raw effluent collected from different points will be passed through a bar screen chamber for removal of coarse and suspended matters. This effluent will be passed through an Oil and Grease Separator, where an Oil Skimmer will be provided for removal of floating oil. Next, the effluent will flow to an equalization tank where the effluent will be agitated by means of sufficient capacity Aerators. The well aerated effluent will be passed through a Pre-Clarifier through a wedge type screen. The screen is used to remove suspended particles if any. In the Pre-Clarifier, the suspended solids are settled and diverted to Sludge Drying bed.

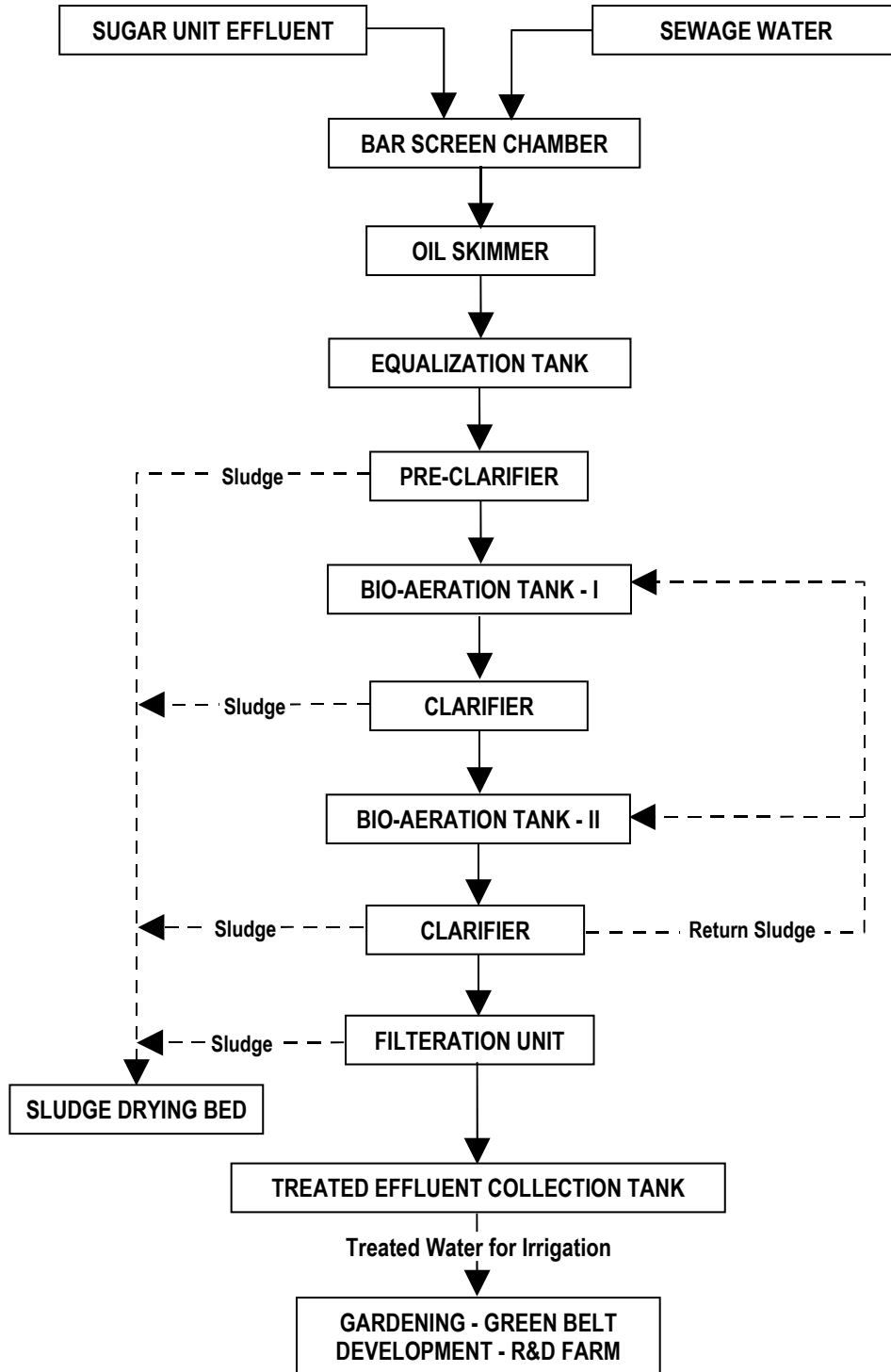
The effluent water is then sent for Aeration Tank where 8 Nos. of Aerators will be installed. The first stage aerated water is diverted to Clarifier. The clear liquid from the Clarifier is transferred to Second Stage Aeration where 4 Nos. of 7.5 HP Aerators will be used. By the two stage aeration, the final BOD is brought down to below 30-mg/litre.

In order to remove the suspended solids, second stage aerated effluent is passed through a Clarifier where the suspended solids are brought down to less than 100-mg/litre. The solids are then pumped to Sludge Drying Bed. Part of the sludge from the Clarifier is taken back to Aeration Tanks as activated sludge to bring down the BOD within the norms prescribed by Pollution Control Boards.

The treated water will be utilised for Gardening, Green Belt Development and R & D farm irrigation.

SUGAR - COGEN COMPLEX

EFFLUENT TREATMENT PLANT (ETP) FLOW DIAGRAM



4.0 BASELINE ENVIRONMENTAL STATUS

To depict the baseline environmental scenario, a study area of 10 km radial distance around the proposed activity site of Bannari Amman Sugars Ltd was studied. Baseline information for Air, Water, Noise and Socio Economic environments are taken into consideration to assess the existing scenario.

The air quality for the twelve locations was analyzed by considering predominant wind direction. The air quality levels are in norms with the standards stipulated by the Pollution Control Boards.

The Soil and Water samples were collected from 12 locations respectively by considering the Bannari Amman Sugars as the mid point. The parameters of the soil and water samples were collected, analyzed and recorded. In the project site, the parameters of water are within the prescribed norms.

The noise data were collected from 12 locations and are within the norms.

5.0 PREDICTION OF IMPACTS

The potential impacts on the environment due to the proposed activity are identified based on the nature and extent of the various activities associated with the project implementation and operation as well as the current status of the environmental quality at the project site. Both beneficial (Positive) and adverse impacts are considered.

The sources of air pollution, water pollution and solid waste generation are identified in the proposed Sugar and Co-gen unit and the impacts due to the above are superimposed on the existing baseline environment.

6.0 ENVIRONMENTAL MANAGEMENT PLAN (EMP)

Environmental Management Plan includes the protection, mitigation and enhancement measures to be implemented to reduce the adverse impact on the environment and thereby meet the stipulated norms specified by the Pollution Control Boards.

The adverse environmental impacts during the functional phase of the proposed Sugar and Co-gen Unit under normal operating conditions are from air emissions, wastewater generation and solid waste generation. The abatement measures for the above are considered as per Pollution Control Boards' guidelines.

6.1 WASTE WATER GENERATION FROM PROPOSED SUGAR & COGEN

The wastewater generation details are furnished below:

S.No	Wastewater	Source	Quantity Generated m ³ /day		Mode of Disposal
			Sugar	Cogen	
1	Sewage	Domestic	30	2	Treated water will be sent to Green Belt / R&D Farm
2	Effluent	Process	370	-	Treated water will be sent to Green Belt / R&D Farm
3	Floor wash water	Process sections	75	-	Treated water will be sent to Green Belt / R&D Farm
4	Boiler blow down water	Boiler	-	199	Treated water will be sent to Green Belt / R&D Farm
5	Cooling tower bleeding water	Sugar mill Cooling Tower	150	-	Treated water will be sent to Green Belt / R&D Farm
6	Cooling tower bleeding water	Co-gen Cooling Tower	-	30	Treated water will be sent to Green Belt / R&D Farm
		TOTAL	625	231	

6.2 OTHER WASTES

6.2.1 SOLID WASTE GENERATION FROM PROPOSED SUGAR & COGEN

The solid waste generation from the operation phase is furnished below.

S.No	Solid Waste	Quantity Generated per Annum	Method of Collection	Mode of disposal
1	Boiler–Bottom Ash	5000 MT	Mechanical conveyors into common silo for further disposal.	Sent to Cement Kilns / manure
2	Boiler Fly Ash	5760 MT		
3	Lime grit	2700 MT	Mechanical screw conveyor	For land fill in low lying area
4	Sludge form ETP	150 MT	Sludge drying beds	Used as Manure

6.2.2 LIQUID WASTE GENERATION FROM PROPOSED SUGAR & COGEN

The other liquid waste generation from the operation phase is furnished below.

S.No	Solid Waste	Quantity Generated per Annum	Method of Collection	Mode of disposal
1	Used oil from D.G. set	0.18 KL	M.S. Barrels	Used as Lubricants in the sugar mill machineries
2	Spent turbine oil waste (Filtrate sludge)	4.0 KL		
3	Waste oil residue from ETP	2.0 KL		

6.3 PROPOSED TREATMENT & UTILISATION SYSTEMS IN A NUTSHELL:

The effluent water generated from the factory is Aerobically treated in the Effluent Treatment Plant along with sewage water, floor wash water, etc. The treated water of 627 KLD will be used for Gardening, Green Belt Development and R & D farm irrigation.

A quantity of 299 KLD, the Blow-down water released from the Cogen boiler and Bleeding water from the cooling tower are also utilised in Green Belt Programme.

To avoid the Air Pollution problems due to the Proposed Boiler, 79 m height Chimney and an Electro Static Precipitator (ESP) to prevent the emission of particles in the atmosphere would be incorporated. (The detailed process is furnished in the Para 3.0 of this report).

6.4 COSTS FOR ENVIRONMENTAL MANAGEMENT PLAN

S.No	Control Measures	Capital Cost (Rupees in Lakhs)
1	Air Pollution Control	450
2	Water Pollution Control	250
3	Noise Pollution Control	60
4	Environmental Monitoring and Management	70
5	Green Belt Development	10
	Total Cost	840

7.0 SOCIO-ECONOMIC CONSIDERATION

The total number of employees for three shift operation is worked out to be 500 for Sugar Unit and 19 for the proposed Cogeneration Plant.

The surplus power, over and above that required for the operation of the factory, would be exported to the electricity grid and thereby contributing to enhance the electricity availability.

The proposed integrated sugar complex which would ultimately support the livelihood of more than 30,000 people comprising of farmers, farm labourers, vehicle operators, etc., leading to the overall economical development of this region.

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