

INDEX

1. EXECUTIVE SUMMERY
2. INTRODUCTION OF THE PROJECT/ BACKGROUND INFORMATION
 - 2.1 Identification of the project and Project Proponent
 - 2.2 Nature of the Project
 - 2.3 Need of project with description for region and country
 - 2.4 Demand and Supply gap
 - 2.5 Imports vs. Indigenous production
 - 2.6 Export Possibility
 - 2.7 Domestic/ Export Markets
 - 2.8 Employment Generation due to Project
3. PROJECT DESCRIPTION
 - 3.1 Type of Project
 - 3.2 Location of Project
 - 3.3 Details of Alternate sites
 - 3.4 Size of magnitude of Operation
 - 3.5 Project Description
 - 3.6 Raw material and Finished Products
 - 3.7 Resources optimization
 - 3.8 Availability of Resource (Water, Power/ Power Requirement)
 - 3.9 Quantity of Waste to be Generated
4. SITE ANALYSIS
 - 4.1 Connectivity
 - 4.2 Land form, Land use, Land ownership
 - 4.3 Topography
 - 4.4 Existing land use pattern
 - 4.5 Existing Infrastructure
 - 4.6 Soil classification
 - 4.7 Climatic data for secondary sources

- 4.8 Social Infrastructure available
- 5. PLANNING BRIEF
 - 5.1 Planning concept
 - 5.2 Population Projection
 - 5.3 Land use planning
 - 5.4 Assessment of Infrastructure Demand
 - 5.5 Amenities/ Facilities
- 6. PROPOSED INFRASTRUCTURE
 - 6.1 Industrial area
 - 6.2 Residential area
 - 6.3 Green Belt
 - 6.4 Social Infrastructure
 - 6.5 Connectivity
 - 6.6 Drinking Water Management
 - 6.7 Sewerage System
 - 6.8 Industrial Waste management
 - 6.9 Air Pollution
 - 6.10 Solid waste Management
 - 6.11 Power Requirement & Supply/ Source
- 7. REHABILITATION AND RESETTLEMENT (R & R PLAN)
 - 7.1 Policy to be adopted
- 8. PROJECT SCHEDULE & COST ESTIMATES
 - 8.1 Time schedule for the Project
 - 8.2 Estimated project cost (Economic viability of the project)
- 9. ANALYSIS OF PROPOSAL
 - 9.1 Financial and Social benefits

CHAPTER 01

EXECUTIVE SUMMARY

M/s Sonhira Sahkari Sakhar Karkhana Ltd. is proposing expansion consisting of Sugar plant, Co-Generation, & Distillery. Sonhira SSK is desirous to produce sugar, Power and alcohol at Post Wangi, Tal.-Kadegaon, Dist-Sangli Maharashtra. Capacity of the complex shall be Sugar- 2500 TCD to 7000 TCD, Power- 22 MW to 34 MW and Alcohol- 30 KLPD to 60 KLPD.

The Notification no S. O. 1533 promulgated on 14th September 2006 have covered these types of industries under its entry 1(d), 5(g) and 5(j). It is stated that 1 (d) Captive Power Plant, 5(g) Distillery & 5(J) Sugar processing industry.

The existing land is on admeasuring area of 109.3046 hectare Proposed Layout Plan is attached as **Annexure –II**. This is an Agricultural Land. The Land has been already changed to Industrial Land use. Thus there is no change in the Land use pattern. This project is a proposed expansion industrial Unit. The river, city, Railway line, National Highway is sufficiently at a safe distance. Local Authority has provided all infrastructures like assured Electrical Power, Continuous water supply with purification from water works having RSF (Rapid Sand Filtration) and disinfection, the internal road network, external approach road and networking. There is no sensitive establishment in the vicinity (study zone) such as health resort, hospital, archaeological monuments, sanctuaries etc. All villages are provided with drinking water from wells or Government Water Supply Schemes RWS. Hence we do not encroach upon their resource.

There will be no nuisance from noise. Machinery and Equipments will be provided with Acoustic Enclosure. There will be crushing operations. Labour strength is also limited in this LSI unit.

Sonhira Sahkari Sakhar Karkhana Ltd. is desirous to produce the products like sugars, Power and Alcohol.

List of Products:

Sr.No	Product	Existing		Proposed		Total Capacity after expansion	
		Quantity	Unit	Quantity	Unit	Quantity	Unit
1.	Sugar	2500	TCD	4500	TCD	7000	TCD
2.	Alcohol	30	KLPD	30	KLPD	60	KLPD
3.	Power	22	MW	12	MW	34	MW

Whereas, during production fresh water input requirement is **2115** cum/day

In Safety and occupationally Health will be dealt carefully. A disciplined approach is natural to this industry. Safety policy will be in place. This unit is registered under Factories Act and is bounded by State Factory Rules. Thus, first aid trained and Fire-fighting trained person will be available in every shift. Safety Officer will be appointed. Wherever necessary, provisions of other Acts, like petroleum Act, Explosive Act etc. will be obeyed. Firefighting system is kept as per norms of Insurance Company and CIF.

DMP (Disaster Management Plan) and off-site emergency plan will be in place. Accordingly, Personal protection equipment will be given and use will be insisted. Consulting physician will be retained to attend the factory.

This Existing project is located at village, Wangi, Tal. Kadegaon Dist. Sangli, Maharashtra. The Site is 17 Km towards from Takari railway Station. The land and infrastructure is made available by local authority and the raw material is easily available. State Highway is passing adjacent to the project site.

The industry is proposing expansion to manufacturing Sugar, Alcohol, and power for growing needs of India. This will not disturb the present land use because our area

occupied will be only small % of influence zone of 10 km. No Rehabilitation is required.
There will be no problematic waste materials as all will be disposed as per CPCB norms.

CHAPTER 02

INTRODUCTION OF THE PROJECT/ BACKGROUND INFORMATION

2.1 Identification of the project and Project Proponent

M/s Sonhira Sahkari Sakhar Karkhana Ltd, acronymic (Sonhira SSK), a Limited company is floated and promoted by a reputed Hon'ble Dr. Patangrao Kadam. He is the founder of the Sonhira Sahakari Sakhar Karkhana Ltd., Mohanrao Kadamnangar, Wangi, Tal. Kadegaon, Dist-Sangli in Maharashtra.

Sonhira SSK sugar factory is an important milestone in Agro-industrial transition conceived by Dr. Patangrao Kadam. Sonhira is like a Kalpavrusha for the people of the area around which he has visualizes the flow of economic opportunities. Dr. Patnagrao Kadam had indentifies a number of interconnected plans and programmes which include production of spirit and other chemicals form molasses, co-generation of electricity from bagasse, sugarcane development and research project, agricultural information services for farmers.

Sonhira SSK has got power to change the social, economic environment of the area.

Application has been submitted to MPCB for the Consent to establish. The manufacturing site will be located at Wangi, Tal- Kadegaon Dist- Sangli, Maharashtra. The plot admeasures about **109.3046 hectare**. The company shall manufacture sugar, power and alcohol.

Form I, as is prescribed by the EIA Notification, 2006 amendment 2009 is duly filled up and will be submitted along with Prefeasibility Report.

The Form I & Prefeasibility report generally covering Justification, Nearby Land Use, Resources, Process, Pollution Control, Aesthetics, Risk Involved, Consequent Developments and Environmental Sensitive Issues.

2.2 Nature of the Project

M/s Sonhira Sahkari Sakhar Karkhana Ltd. is proposing expansion with capacity as Sugar 4500 TCD, Power generation 12 MW and Alcohol 30 KLD. This level of production will not be commenced from day one, but will be commissioned smoothly. This is an optimum site for us because it is manageable from production, pollution control and quality assurance point of view.

2.3 Need of project with description for region and country

1. India has been known as the original home of sugar cane and sugar. India is the second largest producer of sugar in the world after Brazil and produces more of cane sugar and not beet sugar. It produces approximately 22 million tons of sugar annually with Maharashtra contributing over one-third of it.
2. In India sugar is a prime requirement in every house hold. Almost 75 % of the sugar available in the open market is consumed by bulk consumers like bakeries, candy makers, sweet makers, & soft drink manufactures.
3. The crushing season in the country starts from October and reaches its peak in January before finally ending in March or April of the next year. But based on cane availability, the start of crushing season may postponed by one to one and half months in different states of the country.
4. The period of November to March, 150 days is an ideal one for sugar recovery in general, more particularly in Bihar & Uttar Pradesh. From April onwards, sugar recovery shows a down ward trend and in June the percentage of sugar recovery comes to lowest levels.

5. Sugar cane and sugar production in India typically follows a cyclic pattern, wherein 2 to 3 years of higher production are followed by 3 to 4 years of lower production.
6. The production of sugar cane in India has increased during the last ten years and is still on an increasing trend. The productivity of cane in the northern areas of the country is lower than the productivity in southern areas. In India, sugar is grown over 4 million hectares of land
7. After two consecutive years of decline in sugar production i.e. MY 2008/09 & MY 2009/10 (Marketing Year), production has started to resurge in MY 2010/11 & is gained in 2011/12. The gap between demand & supply is narrow and depends mainly on climatic conditions and cane sugar price, Fair and Remunerative Price (FRP) declared by the government.
8. A distilled beverage, liquor, or spirit is a potable liquid containing ethanol produced by distillation of fermented grain, fruit, or vegetables. There are about 295 distilleries in India, mostly concentrated in Maharashtra, Uttar Pradesh, Andhra Pradesh, Karnataka, Tamil Nadu, Gujarat and Madhya Pradesh. The process of distillation results in release of large amounts of waste and wastewater, which have a considerable environmental impact by polluting both water bodies and soil, by causing an adverse climatic effect as well as odour nuisance. The effluent generated from the distillery is highly colored and contains high organic as well as inorganic substances. The effluents of distillery require comprehensive treatment to meet the prescribed standard for disposal into inland water. Distillery is, therefore, one of the highly water polluting industry and is also listed as one among the 17 categories of highly polluting industries.

9. Power generation is the most essential input for growth and development of any sector. Rapid growth in India is the consequent result of such availability of power in the past and the present rising trend of power demand is the consequent result of the desire of keeping pace with the past progress. This is more true for an advanced State like Maharashtra. As per the approach paper of the Planning Commission meant for formulating the 11th Five Year Plan, the growth of power sector needs to be at least 10% to support the expected GDP growth of 7 per cent per annum. West Region of India, where we are, the expected peak electrical load is showing a rising trend as

Year	2007	2011	2016	2021
Peak Load MW	37264	50406	68371	89441
Increase %	100	135	183	240

If we do not take conscious steps now, very dark days are likely to be before us. Region-wise Demand-supply position is also worth seeing.

Region & MU	Demand	Supply	Deficit %
Western	215983	186904	13.5
Southern	157179	155790	0.9

It is evident that in West Region where we are located the percentage deficit of power is as high as 13.5, while the same figure for Southern Region is only 0.9%.

India Electricity Act, 2003 is promulgated. In this, the Government has laid a reviewed policy which now is in favor of private entities investing in building, and operating new Power Plants. Thus 2003 Act has put in place the Rules and Regulations that encourage private investment for power generation. This is both the Centre and the States, where they have provided equitable and level playing ground to private investors. The demand exists, and the Government alone cannot fulfill this. Such scenario will continue for a

long time in Maharashtra. Hence the time is conducive for private sector to actively participate and help the Government today.

Justification: -

1. In the industry, effluent produced will be treated and recycled and will be used through proper storage. Therefore, problems of pollution hazard are nil. Consent from Environmental Department and Pollution Control Board can be obtained as a matter of routine.
2. Cane growing needs a longer time to get the crop. The management of sugar factory is implementing lift irrigation schemes for sugar cane growers under the cane development program. They have decided to implement drip irrigation scheme to irrigate more land in minimum water quantity. Thus a large water is conserved is a **Justification**.
3. During over production of Sugar Cane and low prices for Sugar in the market shall make viable to manufacture Alcohol directly from the Sugar Cane Juice Syrup. This will assure returns to the farmers. This will help to maintain socio economy in the region is also a **Justification**.
 - How this project is economically strong
 - How the wastage and scrap arising out of one development activity can serve as raw material for us, in turn again to be useful to serve further national development in building, bridges, factories etc and
 - How the pollution generated from this unit can be successfully managed through EMP implementation.
 - How the residual pollution can be successfully managed through common facilities like, though it is hardly needed in this instant case.

2.4 Demand and Supply gap

As per the increase in population demand in the Market for sugar and power always prevail.

As far as the products like sugar, power and alcohol are concerned; there is a huge gap in our country in demand and supply.

2.5 Imports vs. Indigenous production

Sugar Statistics (All India)

Year	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Total sugar production* (000, tonnes)	28361	26356	14538	18912	24394	25500
Sugar import/export	Export and Import depends up on Production, Supply & Demand					

*includes Khandsari Sugar 2006/07- 500, 2007/08- 425, 2008/09- 435, 2009/10- 343, 20010/11- 420

World Scenario

1. Over 3/4ths of the total sugar produced is consumed domestically in the countries in which it is produced, and the rest is treaded around the globe which is often termed as World Sugar. The world exports of sugar however around 40 million tons and the leading sugar exporting country is Brazil exporting to around 55 % of its total produce.
2. Contribution of sugar production (%) of India in total world sugar production

European Union	10.42 %
Brazil	22.66 %
India	14.49 %
China	8.23 %
USA	4.53 %
Australia	2.74 %
Thailand	4.59 %
Mexico	3.3 %
Pakistan	2.39 %
Russia	2.20 %
Rest World	24.44 %

As per the increase in demand of products, need of Imports may get increased. But if production is done in self sufficient manner at the national level (indigenously), there is no need of dependency on the other resources for the Import of goods. Power generation with baggase helps to reduce solid waste quantity as also will be the best use of bio-waste to Power generation concept.

Export Possibility

Marketing will be done at national level as well as international level. Requirement of alcohol and Sugar globally is always be there. And there is a huge potential for these products in global market. Around 30-40 % finished goods can be exported to the Regulated and non regulated international Market.

2.6 Domestic / Export Markets

Marketing will be done at the local level as well as finished goods will be exported to the Regulated and non- regulated International Market. Power will be consumed locally.

2.7 Employment Generation due to Project

Employments generated for administration and production purposes will be recruited locally without any difficulty.

Indirect employment is done through road-side business & allied activities.

Existing project around 335 no. of skilled and 526- no. of unskilled workers and for

Proposed project needs - 150 no. skilled worker and 300 no unskilled workers.

CHAPTER 03

PROJECT DESCRIPTION

3.1 Type of Project:

M/S Sonhira Sahakari Sakhar Karkhana Ltd is proposing expansion a complex consisting of Sugar plant, Co-Generation, & Distillery. Sonhira Sahkari Sakhar Karkhana Ltd. is desirous to produce sugar, Power and alcohol Mohanrao Kadamnagar at Post Wangi, Tal-Kadegaon, Dist-Sangli, and Maharashtra. Capacity of the complex shall be Sugar- 4500 TCD, Power generation- 12 MW and Alcohol- 30 KLPD.

List of Products

Sr.No	Product	Existing		Proposed		Total Capacity after expansion	
		Quantity	Unit	Quantity	Unit	Quantity	Unit
1.	Sugar	2500	TCD	4500	TCD	7000	TCD
2.	Alcohol	30	KLPD	30	KLPD	60	KLPD
3.	Power	22	MW	12	MW	34	MW

With Screening it is necessary for Sonhira SSK to approach Delegated Authority from Ministry of Environment and Forest (MoEF), New Delhi for Environment Clearance for guidance for this unit. This Pre-feasibility report however, is prepared for forming a framework for EIA study, Scoping and finalizing the Terms of Reference, as may be required.

The Local Authority has a desire to improve status of this District and has encouraged Industrial establishments Mohanrao Kadamnagar at post Wangi, Tal. Kadegaon Dist.

Sangli. In order to have a sustainable development, the pollution generation from this industry is finally made insignificant having taken all the precautions right from raw material selection up to low or no waste generation and conversion.

3.2 Location of Project:

The proposed production shall be at post Wangi, Tal. Kadegaon Dist-Sangli in Maharashtra state. Area is around **109.3046 hectare**.

The Geographical Location of this Industry is 17⁰13'20.8" N latitude and 74⁰22'19.0" E Longitude with an elevation of 652m (2139.11ft) above mean sea level (MSL). Local Authority has assured to provide all infrastructure like assured Electrical power, continuous water supply with purification from water works having RSF (Rapid Sand Filtration) and disinfection, the internal road network, external approach road etc.

Some important air distances from proposed site are as under:

1. Nearest Airport at Kolhapur 60.10 km towards SSW direction
2. Nearest National High way (NH.4) 22 km towards West direction.
3. Nearest Railway station at Takari is 17 km towards South Direction.
4. Nearest Habitat is village Wangi 2.33 km towards NE direction.
5. Nearest River is "Krishna" at 11 km towards SW direction.

GPS Location and Google Imagery of the proposed site are attached as (**Annexure I**).

Site Analysis

As this is an expansion project hence there is no new site selection.

Lay-Out

Layout is designed properly. It is proposed to make construction to house storage yards for Raw Material and finished products, ware houses, utility building, Canteen and administrative offices. In addition to this plant, attendant waste minimization,

sophisticated R & D laboratory is required and shall be provided.

The Layout of facility is prepared based on following:

1. There will be sufficient space for the movement of vehicles especially fire tender.
2. Shortest route for transfer of Raw material & Products from one department to other.
3. Consideration of prevalent Wind speed & direction for dispersion of Pollutants.
4. Optimum Utilization of utilities.
5. Use of Natural gradient to transport waste water.

Proposed Layout Plan is given as **(Annexure II)**.

3.4 Size or Magnitude of Operation:

M/s Sonhira SSK is proposing expansion with capacity as, mentioned below. This level of production will not be commenced from day one, but will be commissioned smoothly.

Sr.No	Product	Existing		Proposed		Total Capacity after expansion	
		Quantity	Unit	Quantity	Unit	Quantity	Unit
1.	Sugar	2500	TCD	4500	TCD	7000	TCD
2.	Alcohol	30	KLPD	30	KLPD	60	KLPD
3.	Power	22	MW	12	MW	34	MW

This will not disturb the present land use because our area occupied will be only small % of influence zone of 10 km.

Landscape and greenery will be developed in 33% area and only native species will be promoted

No Rehabilitation is required

5 Project Description with Processes Details:

Product Details:

Sr. No.	Product name	Quantity	Unit
1.	Sugar	2500-7000	TCD
2.	Power generation	22-34	MW
3.	Alcohol	30-60	KLPD

Manufacturing Process:

(A) Manufacturing Process of Alcohol:- (Molasses-based)

Molasses, a by-product of sugar industry is used as raw material by most of the distilleries for production of alcohol by fermentation and distillation processes. The molasses contains about 40-50% sugar, which is diluted to bring sugar contents to 10-15% sugar, 20-25⁰ Brix for further fermentation process. The pH is adjusted by addition of sulphuric acid, if necessary.

Yeast culture is done in the laboratory and propagated in a series of fermenters, each about 10 times larger than the previous one. The diluted molasses is inoculated with about 10% by volume of yeast inoculums. In the fermenters the reducible sugars are broken down to ethyl alcohol and carbon di oxide (CO₂). The reaction is exothermic and cooling water is sprayed on fermenter walls to maintain the temperature at 29-30⁰C.

Sludge is produced and discharged from the bottom, while the clear fermented beer from top is sent to degasifying section of the analyser which is a bubble- Cap- fractionating column, the beer is heated by live steam and fractionated to give a 40% alcohol stream from the top. This stream is further fractionated in the rectifier column to obtain rectified spirit. Part of the rectified spirit is sent back to the column, and the condensed water from this stage, known as “spent lees” is usually pumped back to the analyzer column. The bottom discharge from the analyzer column is known as the spent wash, which is drained off after heat exchange with the incoming beer from the fermenters.

In general the layout of, most distilleries is similar and can be divided into two broad sections. The first section houses laboratory; yeast propagation vessels, diluters, pre-fermenters and fermentation vessels. The second section houses all the distillation columns condensers and heat exchangers.

The first section generally has two floors with equipment like diluter, pre-fermenters, etc., and laboratory placed on the first. Fermentation vessels are laid on the ground floor with their top extending about 1.5 m. into the first floor. The ground floor of the fermenters is usually wet because of the cooling water sprayed on the outer walls of the fermenters. This water splashes on the floor and flows out through open channels on the floor along with fermenter sludge and washes water.

The yeast propagation vessels are generally closed reactors where strict temperature control is maintained. The diluter in most of the distilleries is of continuous type where the molasses and water streams are pumped into two coaxial tubes in a closed vessel. The two streams get thoroughly mixed by the high turbulence before they flow into the fermenter. A single diluter with a diameter of about 300-400 m, an overall height of about 3,0000101 and a capacity of about 15,000 to 30,000 L of diluted molasses per hour is commonly used for continuous dilution. Generally, the continuous diluter is cleaned once in a day with water and steam. There is no process waste stream produced from yeast propagation vessels, diluter and pre- fermenters except the wash waters used for

cleaning after processing cycles. Most of the distilleries have open top fermenters where CO₂ is generally not recovered.

Manufacturing process for Alcohol:

In India, Alcohol is manufactured by below mentioned processes:

Continuous Process:

In this process yeast is recycled. Fermentation and distillation is coupled to get a continuous supply of fermented beer for the distillation column. The advantage of the process is that a highly active yeast cell initiates the fermentation rapidly and the alcohol yield is also much higher compared to the batch process.

Bio-still process is one of the continuous processes, which is a trade name in which molasses is fed to the fermenter at a constant flow rate. The flow rate of molasses is controlled to maintain the sugar and alcohol concentrations in the wash at 0.2% or lower and 6-7% respectively.

The waste streams comprise spent wash which is the main source of waste water, spent lees and yeast sludge. Spent lees are usually mixed with the spent wash. The yeast sludge is disposed separately after drying. In addition wastewater may be generated from the bottling, fermentation tank cooling and washing and utility sections of the plant, which is used as a diluents for the treated spent wash.

Plantation white sugar manufacturing process

I. Cane weighment:-

Harvested cane is transported through bullock carts, Trucks, tractors and brought to factory site. Where cane weighment is done on Weigh Bridge.

II. Cane Carrier:

Weighed cane is taken to cane carrier with the help of cranes for further preparation.

III. Cane kicker and leveler: -

Cane kicker and cane leveler are the two units which are mountain on the cane kicker kicks forward the cane where cane leveler just levels the cane in a carrier.

IV. Fibrizer: -

Leveled cane is taken for carrier Fibrizer that prepares the cane. By means the cane is cut in to fine pieces to make possible for maximum juice extraction.

V. Four Mill tandems: -

Prepared cane is carried through inter rake carrier and passed through four mill tandem consists set of three rollers in triangle position from where prepared cane is crushed in three rollers to get maximum juice.

VI. Boiler: -

Residual cane remaining after crushing in four mill tandems is called bagasse is taken to the boiler through carriers where bagasse is used as a fuel. Boiler is a unit where steam is generated. The steam is used to drive power turbine, mill turbine, fibrizer, to boil juice and further sugar manufacturing process.

VII. Raw juice weighment: -

Juice collected from four mill tandems is taken to juice weighing tank for juice weighment to get the idea of actual juice quantity.

VIII. Raw juice heating: -

Weighed raw juice is generally of 35° C is heated in turbine juice heater up to 70° C.

IX. Juice sulphitation: -

Heated raw juice is taken in to the juice sulphiters where milk of lime is added in to the juice as well as SO₂ is passed through juice. Milk of lime helps to settle down the scum contaminated in juice and SO₂ gas acts as bleaching agent to improve color of juice.

X. Sulphited juice heating: -

Sulphited juice is heated again in tubular juice heaters up to 102° C to 103° C.

XI. Rapi Dorr: -

Heated sulphited juice is collected in a Rapi-dorr where some sort of retention is provided to juice to settle down scum contaminated in juice & to separate clear juice. Settled scum is passed through olives to suck juice mixed as fertilizer in farms.

XII. Clear juice heater: -

Clear juice from rapi dorr is heated again in tubular juice heaters up to 100-111° C.

XIII. Evaporators: -

Clear juice contains around 70% of water. The clear juice is boiled / heated in a series of 4 to 6 evaporator vessels to evaporate water from clear juice.

XIV. Pans:-

Thick clear juice obtained from evaporator vessels called syrup is taken on pan floor and boiled in the pan bodied. Pan is also a vessel in which syrup is boiled. After super saturation stage of the syrup, crystal formation occurs in pan. The pan is boiled up to proper size of crystals are formed.

XV. Crystallizer: -

After the crystallization process in pan a ready material containing sugar crystals called massecuite is dropped in to crystallizers to get maximum exhaustion of sugar.

XVI. Centrifugal Machines: -

A ready massecuite is rotated in centrifugal machine having high RPM to separate sugar and mother liquor from massecuite.

XVII. Hopper: -

Separated Sugar from centrifugal machines dropped in to the hoppers where sugar is dried and cooled down.

XVIII. Elevator and Grader: -

Sugar is lifted the hoppers by elevator and forwarded for gradation of sugar in to the graders.

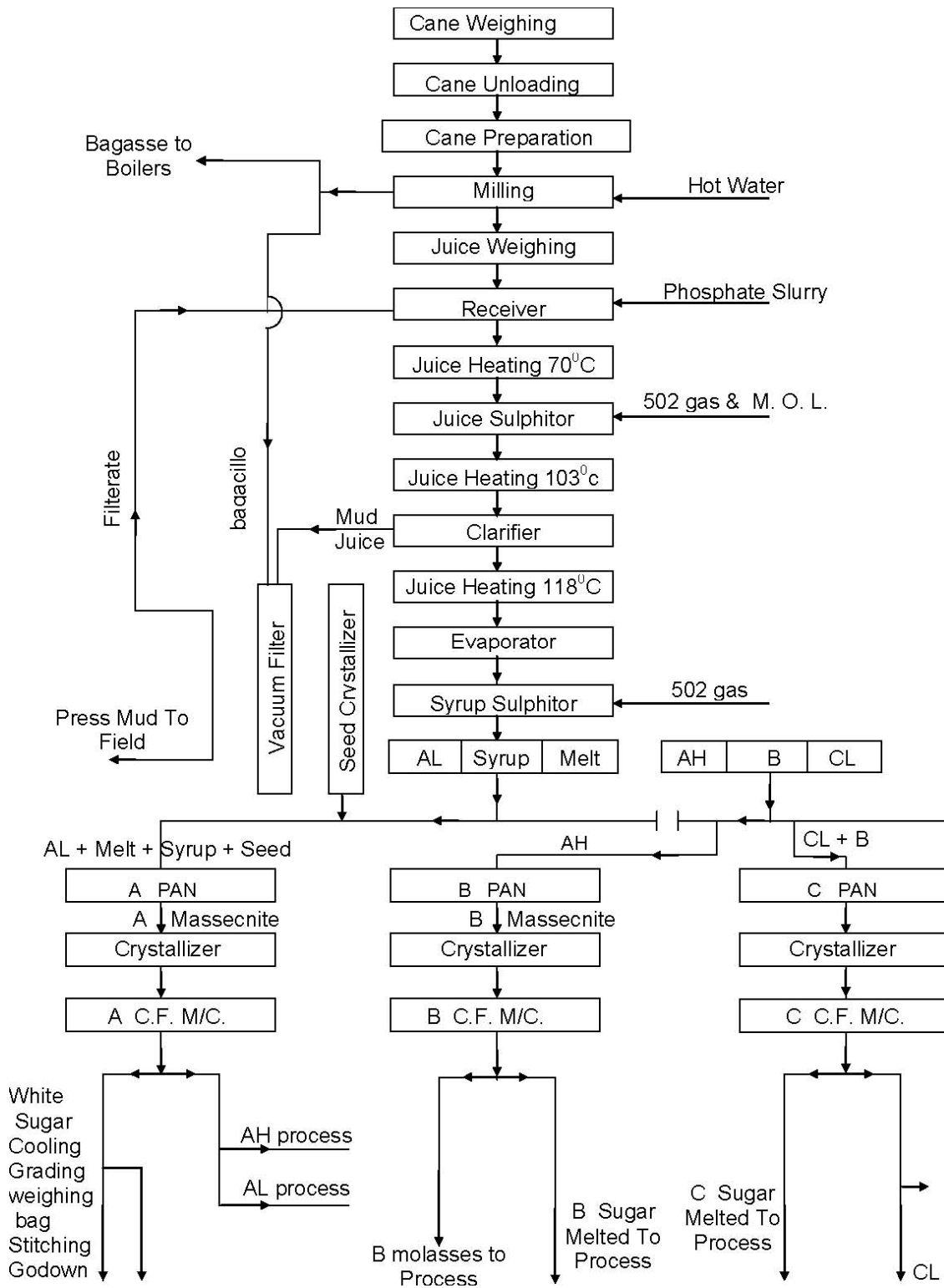
XIX. Sugar silo weighing Bagging: -

Graded sugar stored temporarily in sugar silo, weighed in Automatic machines and packed in jute as well as P.P. bags.

XX. Go-downs: -

Packed jute, P.P. bags in various kilogram packing are stored in go-downs and then sold at proper time as per requirement.

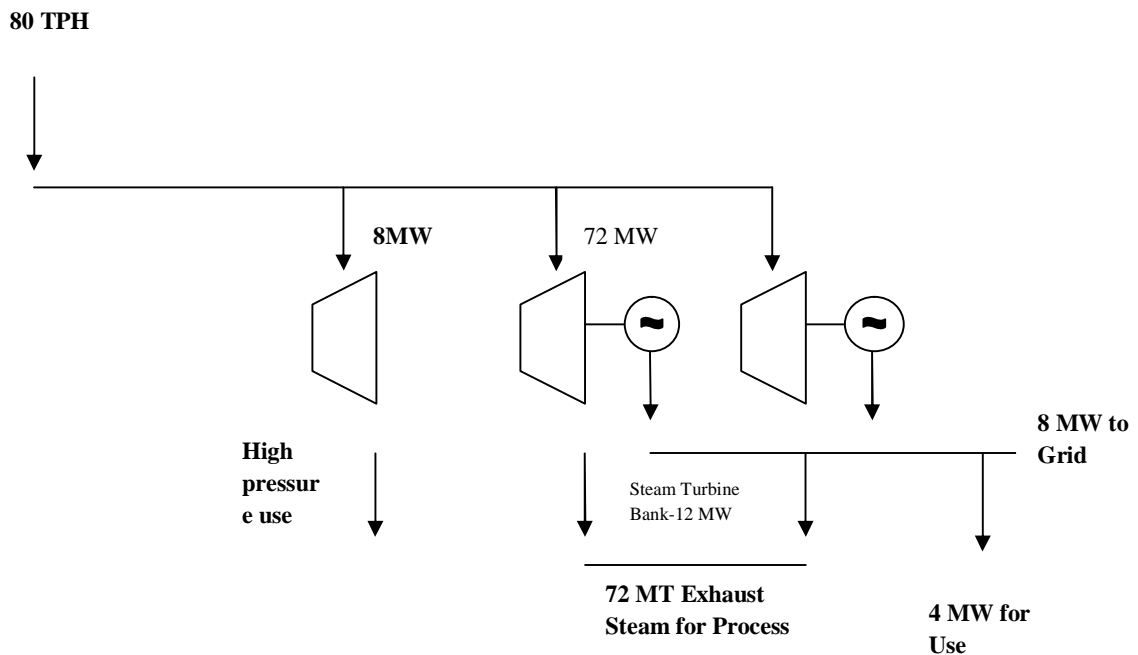
Manufacturing process flow diagram of sugar



Manufacturing Process Flow Diagram for Captive Power Plant:-

Co-generation Unit: - Manufacturing process

Cogeneration will be done through steam turbines of double extraction condensing route (DEC) by 80 TPH Boiler at 540°C steam temperature and using steam turbines for T.G. sets.



The Plant will house the following equipments:

Plant Machinery: The prominent plant and machinery requirement is as follows:

Technology selection:

1. The process used is based on Raw materials that are available, without any bottleneck.

2. Thus it is not necessary to store any one of it in excess. Excess storage also means wastage. Here we can follow easily the principle of JIT (Just in Time) procurement. Basic raw material i.e. sugar cane is available in the surrounding area abundantly. Rest of the raw material is the byproduct of the prevailing process e.g. Bagasse and Molasses.
3. The process is cost effective, safe and environment friendly.
4. There is no highly elevated pressure condition in processing.
5. Working pressure of furnaces is reasonably low. Such furnaces are available and are easy to manage.
6. No hazardous material is involved in process.
7. We can recover alcohol and generate power from molasses and Bagasse. After recovery the remains can be used in brick making and as manure thus following the principal of “at source reduction of waste”

3.6 Raw Material for finished Product:

List of Raw Materials: (For Expansion)

List of raw materials for Sugar Plant

Sr. No	Raw Material	Quantity/day	Quantity /month
1.	Sugarcane	4500 MT	135000 MT
2.	Lime	9.3 MT	279 MT
3.	Sulphur	2.7 MT	81 MT

List of Products

Sr. no.	Product	Consented Qty (MT)	Total After Expansion (MT)	Qty applied for expansion (MT)
	Based on	2500 TCD	7000 TCD	4500TCD
1	Sugar	8250	27300	19050
2	Molasses	3000	8400	5400
3	Pressmud	3000	8400	5400
4	Bagasse	33700	63000	29300
5	Co-gen	22 MW	34 MW	12 MW

3.7 Source for Raw Material Procurement: Raw Material is easily available in the local Market and in the surrounding

Mode of Transport of Raw Materials: The raw materials will be transported locally by way of road.

Storage at the site: Raw materials will be stored in Storage Yard at the project site as per the norms. Location of Storage Yard is demarcated in Layout Plan.

3.8 Availability of Resources (Water, Power/Power Requirement):

Power: The total power generation here will be **34 MW/day**. The power required for the factory will be consumed from the in-house production and excess will be sold to MSEB.

Water: The water requirement is about **2115cum/ day** for domestic, greenery, process, and part cooling purposes. The source of water is already available from existing dam and the same is adequate and satisfactory. The source is dependable and reliable.

Manpower: The manpower required for administration and production purposes will be recruited locally without any difficulty. The requirement will be variable as per phase of working but shall be about **450** Nos. workforces including staff members shall work in shifts.

Fuel for DG Set: Fuel used will be HSD. (50 lit /hr).

DG Set: Proposed DG set capacity shall be of 500 KVA.

Land: Approximately **109.3046** hectare of land is already in the possession of proponent.

Cost: 141.21 crore.

Capital investments

Units	Existing	Proposed Expansion
Sugar & Co-generation plant	198.74 Cr.	103.21 Cr.
Distillery Unit	15.70 Cr.	38.00 Cr.
Total	214.44 Cr.	141.21 Cr.

3.9 Quantity of Waste water going to be generated:

Water & wastewater

Details of ETP Scheme

TREATMENT APPROACH:-

I) For sugar & co – generation facility.

Sonhira SSK Ltd. is a well-established sugar unit a crushing capacity of 2500 TCD. With overwhelming response from the surrounding. Farmers, it is intended to increase the Crushing Capacity to 7000 TCD. The farmer in the region will be greatly benefited by getting due price for his agricultural produce i.e. sugarcane, at the same time enjoying the other facilities such as proper and scientific irrigation, agricultural guidance, better conveyance and in other field such as better medical, educational recreational facilities that come along with better living standards attained.

All along this process, the management intends to conserve environment and an effluent treatment plant is upgraded to revised capacity. The salient features of E.T.P. worked out for the revised capacity are given below.

II. Basic data for design

(Max.)Effluent Volume	700 cum/day
pH	5.5-6.5 mg/l
T.S.S.	800-1000 mg/l
B.O.D.	1200-1500 mg/l
C.O.D.	2500-3000 mg/l
O & G	5-10 mg/l

III. Treatment Approach

The sugar factory effluent emanated mainly form washing cleaning operation thereby entraining organic load in the form of sugar juice, sugar particles, bagasse etc. in the wash waters leading to effluent generation. An in plant control in the form of controlled washing absolutely nil washing

is a theoretical phenomenon as periodic cleaning is a must for better machinery operation) can reduce the unnecessary hydraulic load to a great extent. Also there is a practice in the sugar factories to have open gutters and all gutters leading to the main drain, ultimately joining the effluent treatment plant. In this process a lot of clean/partially clean water leads to effluent treatment plant through unnecessarily so.

Observing the characteristics, it is evident that the effluent is highly biodegradable. However before subjecting the same to bio treatment, a 'preliminary' treatment unit is devised to remove floating matter, grit oil and grease and for the measurement of flow.

After preliminary treatment, the effluent will be subjected to equalization tank to equalize the organic load subjected to biological treatment. An anaerobic phase in the form of anaerobic lagoon has many advantages namely better absorption of shock load, reduction of organic matter with lower energy input. Thereafter, it is subjected to two stage aerobic biological treatment to ensure complete degradation of organic matter. Various biological treatment modes in aerobic treatment have been tried, and the most effective mode determined for the sugar factory effluent is extended aeration where the F/M is kept low and MLSS concentration high by optimum sludge recirculation the sludge being separated in a secondary clarifier. The small quantity of excess sludge would be de-watered by Centrifuge. Two stage Aeration-Clarification Process is proposed followed by Tertiary Treatment in form of Dual media filtration. The treated water shall be re-utilized for non process application, and can safely be disposed on land for irrigation.

IV. Design of Treatment Units

A. Preliminary Treatment: This would consist of bar screens, grit chamber, in an elongated channel of requisite hydraulic characteristics.

A mechanized Oil Skimming unit is provided, to have continuous removal of oil

B. Equalization cum Anaerobic Lagoon

(Max.) Effluent Flow	700 cum/day
Taking C.O.D. loading rate at 0.45kg/cum/d Volume required	4667 cum
Provide a liquid depth	3m
Therefore Area	1556 sqm

Provide a lagoon with dimensions 50m×31m × (3 + 0.5) m

The treatment efficiency expected in the lagoon is 60% for BOD reduction and 50% for COD reduction. Inlet B.O.D. concentration will be 1500 mg/l. outlet B.O.D. will therefore be 600 mg/l. this therefore will be subjected to extended aeration process.

C. Aeration Tank-I

(Max.) Effluent Flow	700 cum/day
B.O.D.(After An. Lagoon)	600 mg/l
Taking F/M	0.15
Taking MLSS concentration	3000 mg/l
Volume of tank	933 cum

The existing aeration tank has the required capacity

A. Oxygen Required

Oxygen required at the rate of 2 kg.O₂/kg. BOD = 840 kg/day.

Tanking Oxygenation capacity of standard aerator = 1.3 kg O₂ /HP Hr.

Provide diffused Air Aeration having HP equivalent to 31 HP

B. Secondary Clarifier-I

Effluent flow = 700cum/day

Flow subjected to clarifier with sludge recycle-

Total flow = 910 cum/day

Taking O.F.rate = 15 cum/sqm/day

Therefore area required = 61 sqm

A new clarifier shall be added with 9 m dia. And 2.5m SWD suits the purpose.

Adequate capacity pump will be installed for recirculation of this sludge into the aeration tank.

It is expected that, with this mode, the B.O.D. reduction of effluent after this stage treatment will be minimum 75%.

Outlet B.O.D. will therefore be 150 mg/l.

C. Aeration Tank-II

(Max.) B.O.D. load	105 kg/d
Taking F/M	0.15
Taking MLSS concentration	2500 mg/l
Volume of tank	280 cum

Provide aeration tank with dimensions, 12.5 m × 10.5 m × (3 + 0.5) m

H. Oxygen Required

Oxygen required at the rate of 2 kg. O₂/kg.BOD = 210 kg/day

Taking Oxygenation capacity of standard aerator = 1.3 kg o₂/HP Hr.

$$= 7.7 \text{ HP}$$

Provide diffused Air aeration having HP equivalent to 8 HP

J. Secondary Clarifier- II

Effluent flow = 700 cum/day

Flow subjected to clarifier with sludge recycle-

Total flow = 910 cum/day

Taking O.F.rate = 15 cum/sqm/day

Therefore area required = 61 sqm

A new clarifier shall be added with 9 m dia and 2.5m SWD.

Adequate capacity pump will be installed for recirculation of this sludge into the aeration tank.

It is expected that, with this mode, the B.O.D. reduction of effluent after this stage treatment will be minimum 75%.

Outlet B.O.D. will therefore be 38 mg/l.

K. Duel Media Filter

In order to have a polishing stage of treatment, Tertiary Treatment in the form of Duel Media Filter is proposed, which will result in reduction in Turbidity, organic and trace colour of the treated effluent.

L. Treated Sump

Provide H.R.R. of 4 hrs.

Provide a treated sump with dimensions: 10 m × 5 m × (2.5 + 0.3) m.

Adequate capacity pump would be installed to lift the effluent for disposal.

M. Sludge Drying Bed

Adequate capacities S.D.B. are available to De water Excess Sludge.

N. Treated Effluent storage Lagoon (Balancing Tank)

For the storage during non-consumption of water for irrigation purpose.

Provide a tank with H.R.T. of fifteen days, for the storage during non-consumption of water for non process purpose.

A lined Lagoon with storage capacity of 10500 cum shall be provided.

O. Cleaning day effluent storage Lagoon

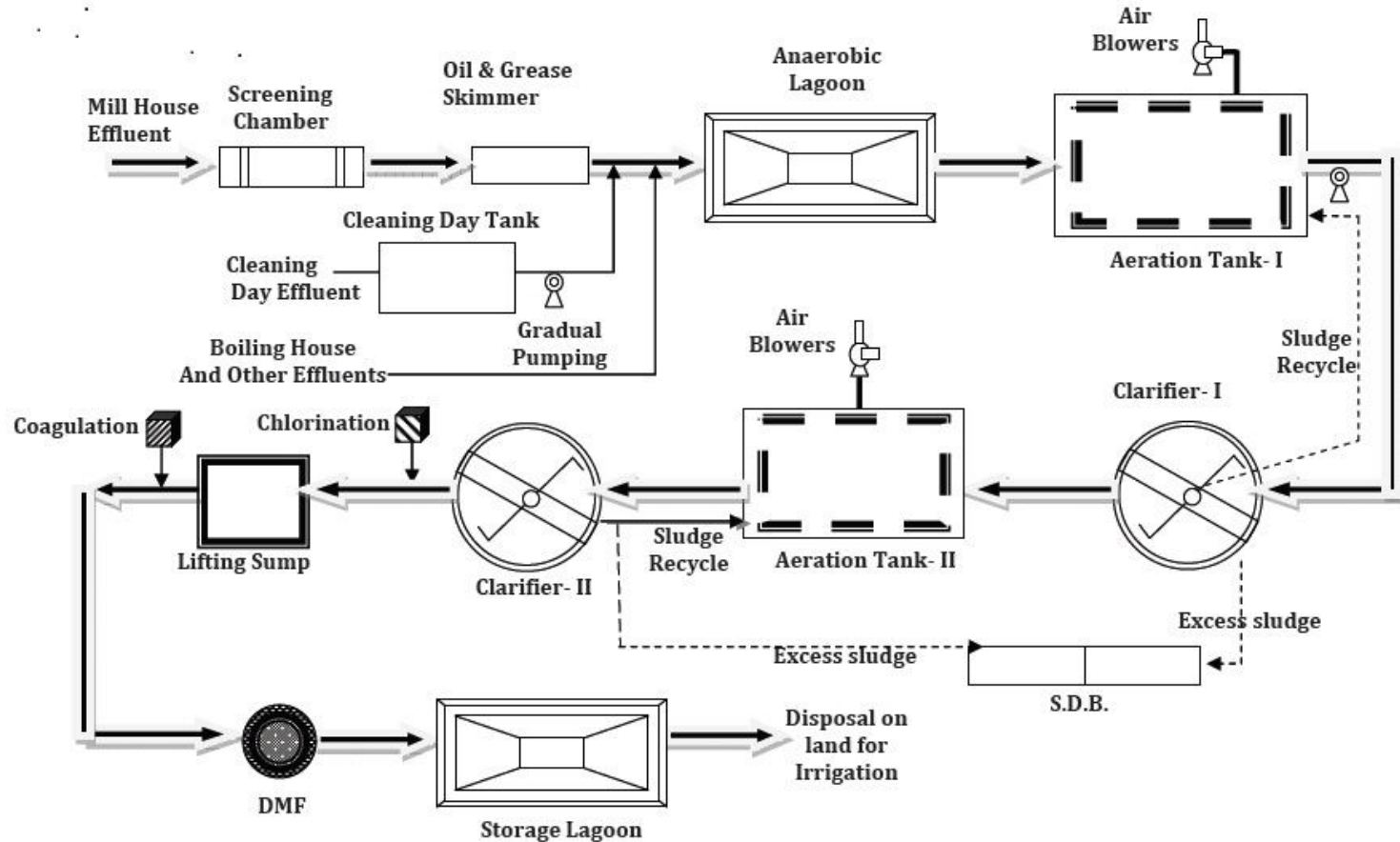
For the storage during cleaning operations, so that the effluent can be slowly loaded to E.T.P. During normal working operations.

Provide a tank with H.R.T. of two days

A lagoon with storage capacity of 1400 cum shall be provided

P. Disposal

Disposal forms a very important part of optimum effluent management. The treated water shall be re-utilized for Non process applications and can safely be disposed on land for irrigation.



Schematic Process Flow Diagram For Effluent Treatment Plant At M/S. SONHIRA S.S.K. LTD.

Water Budget (Distillery)

Utilization	Water input	Cum /d
Cooling tower	Fresh water	100
Floor & vessel washing	Fresh water	10
Fermentation	Fresh water	58
Co2 scrubbing	Fresh water	10
Domestic	Fresh water	15

EFFLUENT TREATMENT

Stream (A): Domestic Effluent

The domestic effluent is fully biodegradable. Hence, it is treated in well-designed

Stream (A) : Domestic Effluent

The domestic effluent is fully biodegradable. Hence, it is treated in well-designed

Septic tanks followed by anaerobic filter, of adequate capacity.

Stream (B): Industrial wastewater

Zero Pollution by Distillery Effluent - Technical Approach

The spent wash coming out of distillery is passed through heat exchanger to reduce the temperature from incoming 90°-100° C to 30°-40° C. This is found necessary, as the major culture grouping is in mesophilic range. The initially neutralized effluent is then taken to the 1st phase process of Acid Formation.

The basic operation is divided into two phases as it is necessarily a two phase operation and which gives greater stability to 2nd phase operation of 'methane phase'. The effluent after acid formation enters the 2nd phase reactor, wherein it is conditioned with return sludge/supernatant. Multiple entry inlet and weir outlet combined with higher flow through jet mixers and sparger mechanism with high velocity gives the 'upflow sludge blanket reactor with 'complete mix' facility. The effluent after methane phase reactor is subjected to flash degasification to release entrapped gases. This is thereafter subjected to settling operation to avoid carryover of biomass/solids which is recycled back to the digester for maintenance of biomass. The supernatant is also partially recycled to maintain inlet conditions as per design. The biogas is collected into a storage tank with pressure maintenance facility and is used in the combustion device or flared.

The basic advantage of the process is this overcomes all the practical problems of various sub techniques, which is required to suit Indian Working conditions.

Composting is the decomposition of heterogeneous organic wastes by a mixed microbial population in a moist, warm, aerobic environment. By gathering the inert base material of Filter Cake from Sugar Factory into heaps and Spraying with the Spentwash, along with the culture dosage, by conserving some of the heat of fermentation, the temperature rises and rates of degradation result which are far higher than those achieved under ambient conditions. The mature end product is 'humus', consisting largely of the humic acids. The aim of composting is to convert a major proportion of organic wastes into a marketable product.

A judicious combination of treatment disposal techniques in the form of Anaerobic Digester and Composting with Filter Cake from sugar factory is successfully working at many factories. This is so because it is unwise to waste the energy source available and

which can satisfy almost 90% of distillery (steam) requirement. And also there is no liquid waste remaining for disposal.

It is however observed that in most of the cases, the material balance requirement of Composting Process is not fulfilled; forcing the distillery managements to discharge untreated / partially treated effluent in the environment / river for dilution. This specifies the need of adopting a 'Composite Approach' wherein after Anaerobic Digestion, with the help of Multi Effect Evaporator; the anaerobically digested Spentwash is reduced to desired volume suitable for the mass balance of the composting process and Filter Cake availability. This will also result in utilizable water of neutral pH and low organic matter concentration to be reused after treatment.

This technique is really useful in achieving the full proof technology of zero pollution by adopting the approach of,

Biodigestion + MEE + Aerobic Composting

By adopting the above technology, it is possible to achieve not only zero pollution but also will utilize fully the nutrient values and organic matter of Spentwash for the resource generation.

a) Treatment Unit Design

(i) Acid Phase Reactor

Inlet characteristics-

(Max.) Wastewater flow = 300 Existing + 300 Expansion = 600 cum/d

COD (mg/l) = 100000 - 110000

BOD (mg/l) = 40000 - 50000

TSS (mg/l) = 2000 - 3000

The spent wash from distillery is collected in a one-day holding tank working as Acid Formation Reactor cum Lifting Sump from where pumping of the effluent would be done to Biodigester.

Initially, pH adjustment has to be carried out and the same tank would be used for neutralization and initial mixing.

(Max.) wastewater flow	600 cum/day
Taking detention time	24 Hrs
Volume of equalization tank	600 cum
Taking a liquid depth	3 m
Area required	200 sqm

Provide a tank with dimensions 20 x 10 x (3+0.5) m. Two chemical pumps (one stand by) of capacity 30 cum/hr and a total head 15m would be provided to pump the effluent to anaerobic digester. Adequate mixing arrangement would be provided for mixing the effluent with chemicals in the tank.

(ii) Anaerobic Digester

The effluent would then be pumped to anaerobic digester.

(Max.) Volume of effluent	600 cum/day
C.O.D. concentration taken	110000 mg/l
Total C.O.D. load	66000 kg/d
C.O.D. loading rate	5 kg .C.O.D./cum/d
Volume of Digester	13200 cum

Provide a digester with this volume and with suitable diameter/Height ratio.

Adequate recirculation would be done of the effluent from the digester outlet to the inlet point. The inlet would be multiple inlets so that no dead pockets are formed.

The biogas formed would be collected in the upper space of the anaerobic digester, which would also act as temporary storage arrangement. The biogas would be taken for burning in the boilers.

The effluent at the digester outlet is expected to have following characteristics.

Flow	:	600 cum/day
Temperature	:	Ambient
pH	:	7-7.2
B.O.D.	:	4000-5000 mg/l
C.O.D.	:	22000 - 25000 mg/l
T.S.S.	:	6000-7000 mg/l

b) MEE Technology

It has been imperative that the waste volume should be reduced to as small as possible. This is to achieve the critical material balance with the filler material i.e. press mud, which is available seasonally, i.e. for a shorter duration, and therefore in a limited quantity. This purpose is achieved with the help of Multi Effect Evaporator system, which is specially designed for such application and effluent. This achieves a dual purpose of not only volume reduction of the Spent wash, which is further validated to achieve zero discharge, but more important, water recovery, which can be reused in the process.

c) Composting

For scientific aerobic composting CPCB has laid following New Guidelines:

- Working days of Distilleries maximum : 270 days
- Spent wash storage capacity: less than 30 days
- Press-mud to Spent wash ratio 1:2.5
- Proper preparation of land for avoiding leaching and percolation.
- Land required for composting 800 MT/Acre/Cycle
- Equipment: Homogenizing machine

Thus for our purpose, following ancillary units will be provided:

Sr.No.	Unit	Particulars
1	Storage tank of 30 days	In earthwork, with HDPE lining.
2	Windrow Floor	Entire area concreted with LDPE lining
3	Homogenizing machine	Sturdy design with heavy-duty rotor construction and gear box
4	Spraying of spent wash	Auto-spray with fine droplets network
7	Maturation Yard	Storage and maturation of Compost before dispatch, with sieving arrangements.

Material Balance Basis

Distillery capacity	30 +30 KLPD
Spent wash per day	300+300=600 cum
Spent wash per day (After MEE)	75+75=150 cum
Working days of Distillery	270 days
Spent wash annually	270 x 150 = 40500 cum

PM : SW (Pressmud to Spent wash) ratio, Composting Cycle (60 days each)	1:2.5
PM required annually	$40500 / 2.5 = 16200$ MT
PM Production daily from sister concern sugar factory (adjoining)	160 MT
PM Production annually (160 days)	25600 MT
Hence, the Pressmud available is sufficient	

Land Required at the rate of	800 MT/Acre/Cycle
Duration of cycle	60 days
No. of Cycles per year	Four
PM Tonnage per cycle	$16200 / 4 = 4050$ MT
Land Required for 4050 MT	$4050 / 800 = 5.06$ acres
Provide 15% extra for roads, gutters etc.	5.82 acres ,say 6 Acres
Area for Press Mud and Finished Product	0.5 acres
Area required for compost yard	6.5 Acres
Laboratory, Admin. Office	0.50 acres
Lagoon Storage	1.50 acres
Total land requirement	8.5acres

Total land of 8.5 acres is reserved for the purpose. Thus zero discharge is achieved from the beginning.

II. DISPOSAL

Disposal is of predominant importance in total environmental management.

Stream (A)

The treated domestic sewage coming out of septic tank and anaerobic filter shall be disposed on land for gardening.

Stream (B)

The stream of industrial effluent of highly polluted type coming after distillation, Re-boiler and M.E.E. treatment is then converted in solid compost. The Compost has following quality:

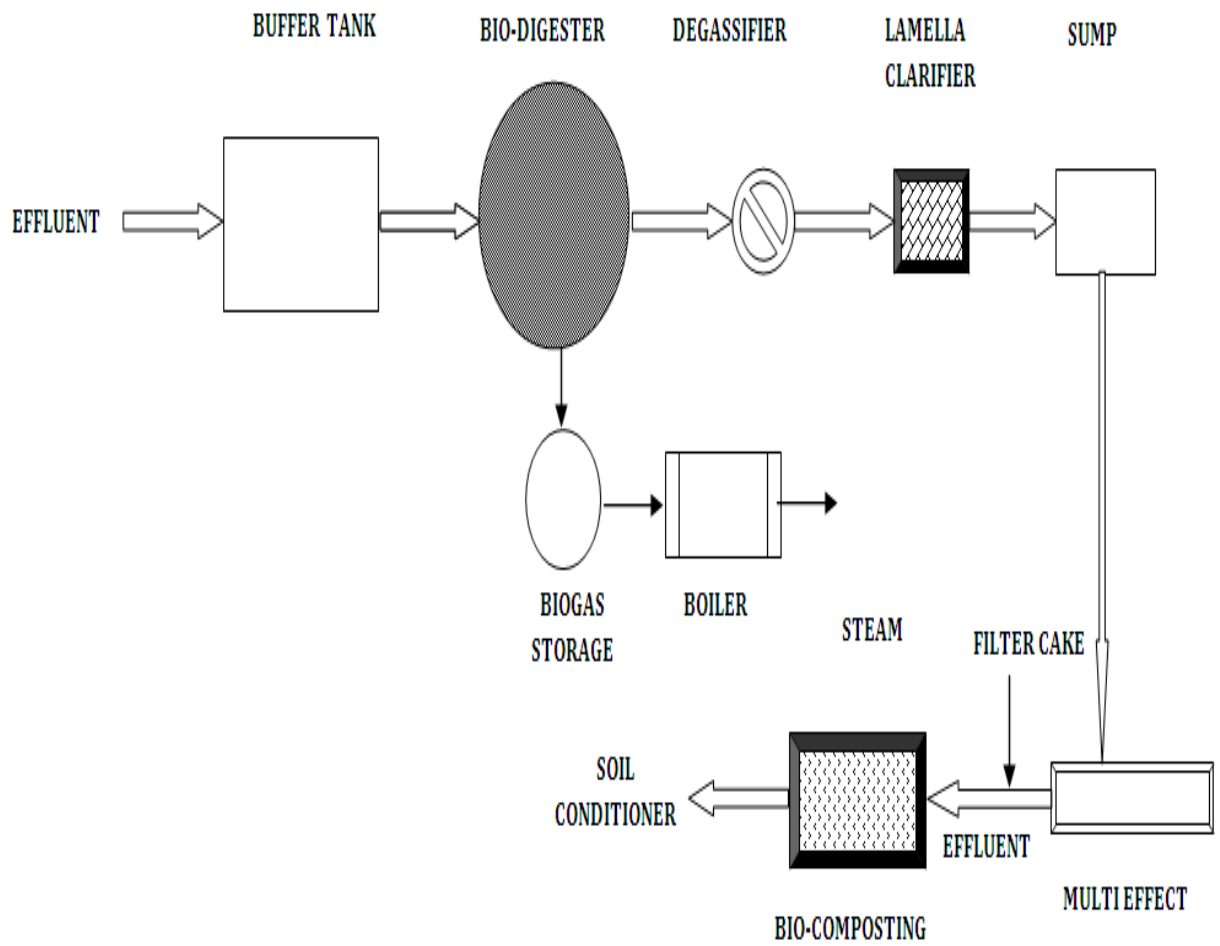
Moisture Contents	Less than 35%
Organic Carbon	20 –25%
Phosphorus	1.5 to 2%
Nitrogen	1.5 to 2%
Potassium	2 to 3.5%
C: N Ratio	Less than 17

The compost has a ready and developed demand in this area. This will largely substitute the fertilizer and soil conditioners for the crop.

III. RECONNAISSANCE

M/s. SONHIRA S.S.K.Ltd. is establishing a trend in environmental management of distillery effluent by adopting the Best Available Technology, which will eliminate

possibility of pollution occurrence by even a chance. Technology being implemented will not only give the best technical option for treatment of this difficult waste, but also will evolve useful Compost, which will largely substitute the fertilizer requirement of farmer in the region.



**Schematic Process Flow Diagram
For Treatment of Distillery Effluent**

i. Solid Waste

The main solid waste from this factory will be non-hazardous from office, garden and Sewage Treatment Plant.

The main solid waste from this factory will be of non-hazardous from office, garden and sewage Treatment Plant.

Non hazardous waste will be segregated as compostable and saleable. This will be so done.

Sonhira SSK has in place the following mitigation policy future:

- Waste minimization at all levels of operations.
- The plant will produce very less amount of scrap material. All these will however be stored carefully on raised platform, with dwarf toe-walls all around and an overhead roof.
- The main solid waste from sugar unit will be in form of bagasse which is utilized completely for power generation.
- The hazardous waste will be disposed scientifically as per the norms.

(a) Non Hazardous Solid Waste:

Based on above working, the summery is:

Sr. No	Waste	Quantity	Treatment	Disposal
1.	Fly/Boiler Ash	510 MT/M	----	Landfill/sale to Bricks manufacturer and used for compost production
2	Sludge from waste water treatment	0.5 MT/M	-----	Use as manure
3	Yeast Sludge	10.0 MT/D	-----	Used in Composting

(b) Generation of hazardous solid waste:

Category	Description	Quantity generated	Disposal
5.1	Used/ Spent oil	2 Tonnes/ year	Sale to MOEF Approved Recycler
33.2	ETP Sludge	18 Tonnes/ year	Sale to MOEF Approved Recycler

Aesthetics:

Boiler Turbine, Cane Crusher, Centrifuges etc. shall be source of noise and vibrations. Sturdy foundations and anti vibration arrangements shall be provided to reduce the effect. Acoustic enclosures and enclosures shall be done to reduce noise level. Tree plantation will be carried out. PPF's will be provided to the workers in this area.

There will be no nuisance from noise as the machinery and equipments are acoustically enclosed. DG sets will run occasionally.

No nuisance will go to surrounding area.

CHAPTER 04

SITE ANALYSIS

4.1 Connectivity:

The existing project located at Wangi, Tal- Kadegaon Dist. Sangli Maharashtra. Total area is around 109.2046 hectare.

The Geographical Location of this industry is 17⁰13'20.8" N latitude and 74⁰22'19.0" E Longitude with an elevation of 652m (2139.11ft). Local Authority has assured to provide all infrastructure like assured Electrical power, continuous water supply with purification from water works having RSF (Rapid Sand Filtration) and disinfection, the internal road network, external approach road etc.

Some important air distances from proposed site are as under:

1. Nearest Airport at Kolhapur 62.10 km towards SSW direction
2. Nearest National Highway way (NH.4) 22 km towards West direction.
3. Nearest Railway station at Takari is 17 km towards South Direction.
4. Nearest Habitat is village Wangi at 02.33 km towards NE direction.
5. Nearest River is Krishna at 11 km towards SW direction.

GPS Location and Google Imagery of the proposed site are attached as (**Annexure I**).

4.2 Land form, Land use and Land ownership:

Land Form: Although land is on the upper elevation compared to the surrounding area, the said Land has a large portion with plain contour. Slope is gentle to moderate type.

Land Ownership: Land ownership is with project proponents. Total area is about 109.3046 hectare.

Existing Land use Pattern The Land is agricultural and is barren with no cultivation. This agricultural land will be now used for the industrial purpose. Hence there is a change in land use pattern.

Existing Infrastructure: The Land is agricultural and is barren with no cultivation. This agricultural land will be now used for the industrial purpose. This being expansion project on same land there is a no change in land use pattern. This Project will participate in improvement of the physical infrastructure of this area by incorporating Roof rain water harvesting, Storm water management and green belt development.

4.3 Topography: It is situated in the river basins of the Warna and Krishna river. The vegetal cover too varies from the typical monsoon forest in the western parts to scrub and poor grass in the eastern parts. Geographically, the entire district comprises of Deccan trap. According to soil, climate and rainfall district could be divided as i) Western Mountain/Hilly area with maximum rainfall, ii) Plain land in the basins of rivers with medium range rainfall iii) Eastern plateau with inferior quality soil and minimum rainfall (drought prone area).

Site

1. Climatic condition suitable for finer adjustment of control, making it fit for process condition.
2. Well connected road network with ease of transportation.
3. Almost leveled ground and load bearing soil.

4.6 Soil Classification:

The soil varies from deep black soil in the river valleys to shallow murum red or gray in the hilly areas. Laterite soil exists on the ghats in the extreme western parts of the district

4.7 Climate data from secondary sources:

Sangli district can be broadly divided into three agro climatic zones as under : Western part of Shirala tahsil \tahsils of Shirala (East), Walwa, Miraj (West) Tahsils of Khanapur, Atpadi, Kavathe Mahankal, Jath, Miraj(East) and Tasgaon (East).The climate gets hotter and drier towards the east and humidity goes on increasing towards the west. The maximum temperature ranges between 31.5°C and 38.2° C, while the minimum temperature ranges from 12.9°C to 22.7°C. The climate in the district is fairly tolerable

throughout the year. The winter is pleasant from December to February. The summer season starts from mid February to May. June to September is the months of normal rainy season. July and August are the months of heavy rainfall.

Climate Classification: Project site features a dry and arid climate under the Koppen climate Classification.

Rainfall:

The climate ranges from the rainiest in the Chandoli (Shirala) region, which has average annual rainfall of over 4000 mm, to the driest in Atpadi and Jath tehsils where the average annual rainfall is about 300 mm in a year.

4.8 Social Infrastructure available:

Infrastructures like Airport is at the distance of 62.10 Km and Railway Station is at 17 km in South –West direction and nearest habitat is at the distance of 2.33 Km in North East direction, River Krishna is 11 km in South West direction is located near the study area.

CHAPTER 05
PLANNING BRIEF

5.1 Planning Concept:

The area covered under study zone comprises of medium to heavy soil quality. Profuse availability of stored water has encouraged villagers to grow cash crops.

Facilities:

This site appeared to be environmentally best as also from the business angle and therefore this option was finally adopted. This site is at Wangi and means safe transportation, less need of Utilities, less constructing buildings and roads, less fuel, less water with optimization of infrastructure.

Local Authority has provided all infrastructure like assured Electrical power, continuous water supply with purification from water works having RSF (Rapid Sand Filtration) and disinfection, the internal road network, external approach road.

All surrounding villages are provided with drinking water from wells or Government Water Supply Schemes RWS. Hence we do not encroach upon their supply.

5.2 Population Projection:

In 2011, Sangli had population of 2,822,143 of which male and female were 1,435,728 and 1,386,415 respectively. In 2001 census, Sangli had a population of 2,583,524 of which males were 1,320,088 and remaining 1,263,436 were females. Sangli District population constituted 2.51 percent of total Maharashtra population. In 2001 census, this figure for Sangli District was at 2.67 percent of Maharashtra population. Out of the total Sangli population for 2011 census, 25.49 percent lives in urban regions of district. In total 719,357 people lives in urban areas of which males are 364,604 and females are 354,753. Sex Ratio in urban region of Sangli district is 973 as per 2011 census data. Similarly child sex ratio in Sangli district was 889 in 2011 census. Child population (0-6) in urban region was 76,494 of which males and females. Average literacy rate of Sangli in 2011 were 81.48 compared to 76.62 of 2001

Industrial development is leading to increasing need of Sugar and its products at national as well as international level, which are very essential for everyone in order to fulfil their future. The requirement of Sugar & Alcohol promotes R & D center in each industrial sector.

5.3 Land use planning:

The proposed project is in Agricultural area and is a prime Agricultural Land. The land-use is already as “Agricultural”. Thus there is a change in the status. This is flat land whereby Cutting-filling balances and there will be No/Low Borrowing from nature. Topography Map of the proposed site is attached as (**Annexure III**).

Proposed site will house the facilities, some part will remain untouched for the Future Expansion and 33% area will be demarcated for Green belt development.

5.4 Assessment of Infrastructure Demand (Physical and Social):

In Sonhira SSK proposed new project will be having only Sugar, Alcohol and Power generation; which require good Physical Infrastructure; so there will be demand of installation of physical infrastructure and social infrastructure. As manpower requirement is optimum for the proposed project which will be from local areas and will not lead to any additional load on the existing social infrastructure

5.5 Amenities/ Facilities:

Sonhira SSK is proposing Sugar co-generation and Alcohol Manufacturing products in existing agricultural area. Local body provides many basic facilities like uninterrupted water supply, power and Road Network & solids disposal facility. This site is inside the village area and there will be requirement of means safe transportation, need of Utilities, construction of buildings and roads, fuel, water with optimization of infrastructure.

CHAPTER 06

PROPOSED INFRASTRUCTURE

6.1 Industrial area:

The proposed expansion project is coming in Agricultural area. There will be production of Sugar, Alcohol and Power generation. Sonhira SSK proposes new proposal of producing Sugar- 4500 TCD, Power- 12 MW, and Alcohol- 30 KLPD.

6.2 Residential Area:

In Sonhira SSK there will be existing residential colony.

6.3 Green Belt:

The total Plot area i.e. **16.5014 hector** is demarcated and additional along the boundaries shall be proposed for tree plantation. The selection of trees is based upon the climatological conditions of the Study area.

In and around the Sonhira SSK project plantation is carried out to develop green belt. The treated sewage water is used for green belt development within the factory premises. Following are the status of green belt development.

List of Species for landscape development:

Sr. No.	Name of Plant	Common Name
1	<i>Cocus nucifera</i>	Coconut
2	<i>Manilkara zapota</i>	Chiku
3	<i>Areca catechu</i>	Supari
4	<i>Mangifera indica</i>	Mango
5	<i>Citrus limetta</i>	Mosambi
6		Acalifa

7		Arakapatra
8	<i>Tectona grandis</i>	Sagwan
9	<i>Grevillea robusta,</i>	Silver ok
10	<i>Saraca asoca</i>	Ashok
11	<i>Eucalyptus</i>	Nilgiri
12	<i>Casuarina equisetifolia</i>	Suru
13		Christmas tree
14	<i>Araucaria columnaris</i>	Croton
15		Exora
16		Mukheda
17	<i>Nerium oleander</i>	Kaner
18	<i>Duranta erecta</i>	Duranda
19	<i>Hibiscus spp.</i>	Jaswand
20		Hemeliya
21		Snowbush
23		Kakiandra
24		Kupia
25		Drejita
26		Jiranium
27	<i>Magnolia champaca</i>	Sonchafa
28	Bougainvillea spp	Boganwel
29	<i>Delonix regia</i>	Gulmohor
30	<i>Tamarindus indica</i>	Chinch
31	<i>Psidium guava</i>	Peru
32	<i>Embelica officinalis</i>	Aawala
33	<i>Eugenia jambolana</i>	Jambhul
34		Nagchafa
35		Kagdi limbu
36	<i>Moringa olifera</i>	Shevga
37		Jaseandi yellow

38		Parijat
39		Golden bamboo
40		Buch
41		Rain tree
42		Kardal
43		Scordia
44		Ventena white
45		Sunshine duranda
46	<i>Acacia,</i>	Thrown tree
47	<i>Azadiricta indica</i>	Neem

6.4 Social Infrastructure:

In Sonhira SSK there is no need of providing any Social infrastructure as the proposed expansion project is involving only very small number of man power. Existing infrastructure will be sufficient to accommodate the increasing load from the proposed project.

6.5 Connectivity:

This proposed manufacturing facility will be located at Sonhira SSK in Sangli district, Maharashtra. The Site is 2.33 km from nearest habitat Village- Wangi and 17 km from railway Station and 60.10 km from Air port. The land and infrastructure is made available by Local Authority and the raw material is easily available through the easy transport via road connectivity and via Sea route and Air route. The Nearest National Highway is No. 4.

6.6 Water Management:

The water requirement is about **2115 cum/ day** for Domestic and Processes. The source of water is already availability from existing water works of local authority and the same is adequate and satisfactory. We are not encroaching on anybody's water source.

6.7 Sewage System:

The Domestic Effluent will be treated in Sewage Treatment Plant and will be used for green belt after treatment.

6.8 Industrial Waste Management:

Sonhira SSK proposed expansion Capacity of the complex shall be Sugar- 4500 TCD, Power- 12 MW, and Alcohol- 30 KLPD. Sonhira SSK desires to expansion to produce three products in this large size industrial sector. As there are only 03 products, pollution control work can be much streamlined than a heterogeneous mixed stream. The details regarding pollution control of water, waste water, air and solid wastes are as follows:

II) Water consumption & wastewater

The water supply will be through the Chinchani Dam. Local body has provided full water works including filtration and disinfection. We are not encroaching on anybody's water source

At this location there is already a Sugar Unit of the same management exists.

The efforts taken by them in this respect are also indicated. Further, regarding new product looking to the description of manufacturing operations and the corresponding flow sheet, management knows from which unit operation or process, air pollutants are expected. For the purpose of arresting and capturing the pollutants, measures are proposed and designed.

The following is discussed:

#	Source	Pollutant	In-plant Measures	Control Equipment
1	Cane Yard	SPM road dust, Juice HC	Leveled Roads & land, rubber tire, slow speed. Less waiting	--
2	Boiler	SPM, CO	Feed Bagasse more dry, also methane	Dampers, ID Fan, CO ₂ meter, Fly-ash arrestor (*), Light ash through very tall

				stack.
3	Proposed Boiler	SPM, CO	Feed Bagasse more dry, also methane	Dampers, ID Fan, CO ₂ meter, Fly-ash arrestor (*), Light ash through very tall stack.
4	Fermentation	CO ₂	Tank covered	Scrubbed in water
5	Distillation	HC	Closed circuit	
6	Spent-wash	HC, Heat	Heat Exchanger	(Not open to sky cooling)
7	Other effluents	H ₂ O, CO ₂	--	Fully Aerobic regime.

(*) = The Dust Collector of suitable capacity, with hopper bottom. The dust-free air is sucked and thrown into stack through duct by I.D. Fan.

In addition, other attendant efforts like water spraying, tree plantations and covered storage, etc shall be adopted, wherever feasible and required will be done. Totally the pollution control may cost **Rs.2 Cr.** with O & M anticipated at 10% of it per annum.

It will be our endeavor to procure purer raw materials, to avoid any type of dust or emissions. It will be our endeavor to have smooth and paved internal roads to avoid fugitives and automatic segregator. In addition, other attendant efforts like water spraying, tree plantations and covered storage etc shall be adopted, wherever feasible and needed.

Fugitive Emissions:

A number of mitigation measures are taken to control fugitive emissions, the presence of which will be noticeable by plain vision if not controlled. The measures are thus taken seriously and continuously such as:

- Rubber wheel carts / trucks to bring in Raw Materials, not filled high, sides cladded, slow speed travel, avoiding vibrations en-route.
- Collection of fugitive emissions by suitable suction system at the time of casting etc.

- Engineering the plant layout in such a way so as to virtually Eliminate need of using heavy equipment for material handling in the main plant
- Internal roads paved, scrap area paved, leveled, no undulations, no sharp curves, slow speed. No open storage of materials on barren unlined land to the maximum extent possible.

6.10 Solid Waste Management:

The main solid waste from this factory will be of non-hazardous from office, garden and sewage Treatment Plant.

Non hazardous waste will be segregated as compostable and saleable. This will be so done.

Sonhira SSK has in place the following mitigation policy future:

- Waste minimization at all levels of operations.
- The plant will produce very less amount of scrap material. All these will however be stored carefully on raised platform, with dwarf toe-walls all around and an overhead roof.
- The main solid waste from sugar unit will be in form of bagasse which is utilized completely for power generation.

The hazardous waste will be disposed scientifically as per the norms.

(a) Non Hazardous Solid Waste:

Based on above working, the summery is

Sr. No.	Type of Waste	Quantity	Treatment	Disposal
1	Fly / Boiler Ash	510 MT/M	-----	Landfill/Sale to Bricks Manufacturers and used for compost production
2	Sludge from waste water treatment	0.5 MT/M	-----	Use as manure
3	Yeast Sludge	10.0 MT/D	-----	Composting

(b) Generation of hazardous solid waste

Sr.No.	Category	Description	Quantity generated	Disposal
1.	20.3	Distillation residue	10 MT/D	Composting
2.	5.1	Used/Spent Oil	300 Kg/M	Reuse in own boiler as fuel

6.11 Power Requirement & Supply/ Source

Sonhira SSK will be generating 34 MW power from its Co generation plant.

DG set only in emergency backup of capacity 500 kVA for proposed product. Quantity of fuel shall be 50 L/hr of HSD.

CHAPTER 07

REHABILITATION AND RESETTLEMENT (R & R PLAN)

7.1 Policy to be adopted

This project does not require acquisition of Land and the Infrastructure so there is no any kind of activity of Rehabilitation and Resettlement to be carried out over here

CHAPTER 08

PROJECT SCHEDULE & COST ESTIMATES

8.1 Time schedule of the Project

8.2 Estimated project cost (Economic Viability of the Project)

Estimated project cost is 141.21 Cr.

CHAPTER 09

ANALYSIS OF PROPOSAL

9.1 Financial and Social Benefits

M/s Sonhira Sahkari Sakhar Karkhana Ltd has proposed expansion for Sugar and Alcohol manufacturing products which will be used in the market by different industries at National as well as International levels.

Approximate percentage of 30-40 % manufactured goods will be exported in the national market. This will be financial benefit to the industry as well as nation for a generation of foreign revenue.

By doing so, M/s Sonhira SSK can participate towards the development of nation by generating the foreign exchange, and also serve the social community.

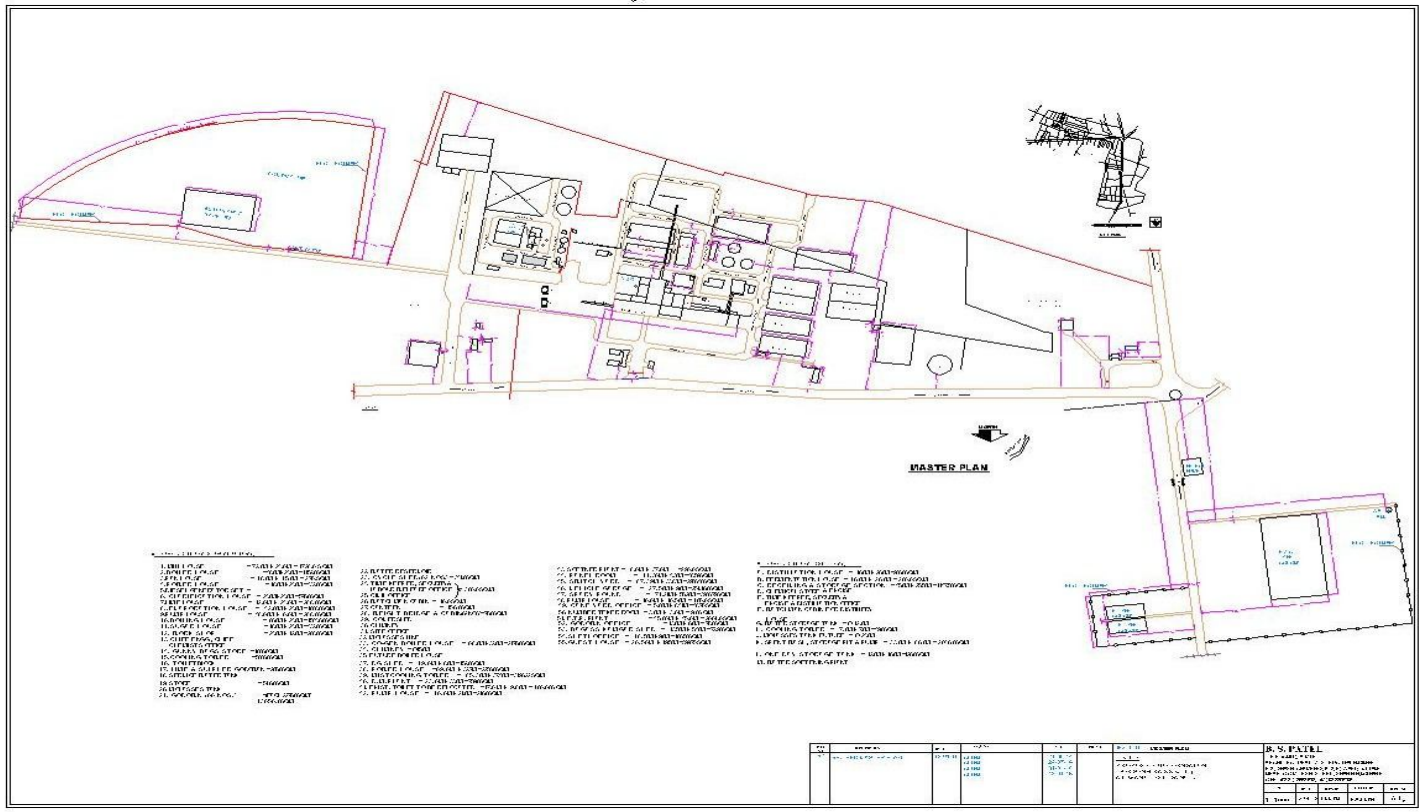
ANNEXURE I

Google Image Location of Project Site



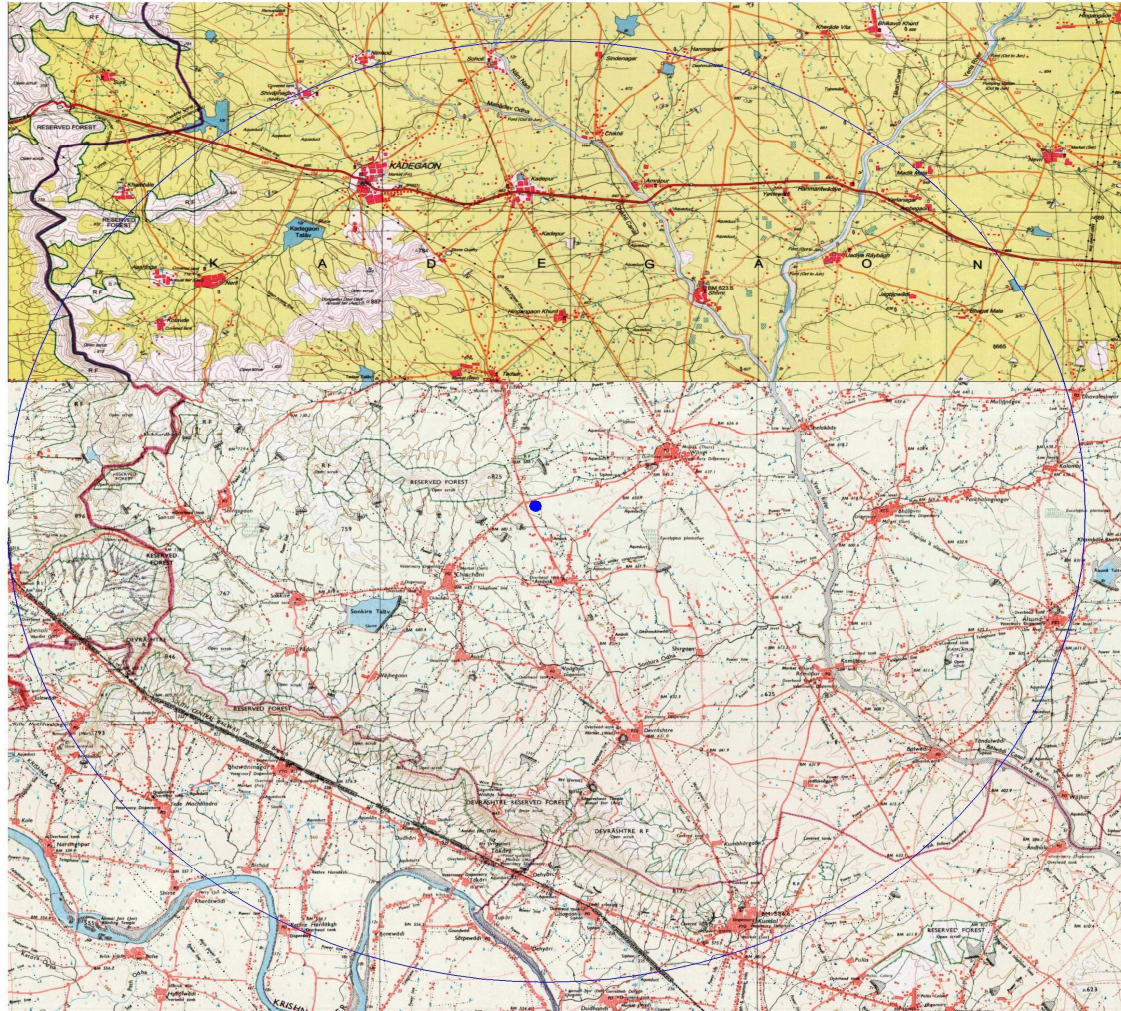
ANNEXURE II

Proposed Master Layout Plan



ANNEXURE III

Toposheet of Study Are



ANNEXURE IV

Project Location showing in Map

