PRE FEASIBILITY REPORT

New Molasses Based Distillery unit of 50 KLPD

M/S. Shree Halasidhanath Sahakari Sakhar Karkhana Limited

Shankaranandnagar, Nipani, Tal. Chikodi, Dist. Belgaum 591237

Prepared By

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October 2018

1.0 Introduction

1.1 Identification of project and project proponent

M/s. Shree Halasidhanath Sahakari Sakhar Karkhana Ltd., (SHSSKL) is a cooperative sugar mill located at Shankaranandnagar, village Yamagarni, Nipani, Tal. Chikodi, Dist. Belgaum. It was registered on 22.04.1981 having reg no. DSK/REG-2/80-81. The factory started cane crushing from the year 1986-87. It was founded under the leadership of Mr. Baburao Patil-Budihalkar. Presently, Mr. Chandrakant Kothiwale is the chairman of the factory. The present installed capacity of the sugar factory is 3,500TCD. It is also operating a cogeneration unit of 15MW. This was established in the year 2017-18. Because of new ethanol related policies of Government of India, the management of SHSSKL has decided to install distillery unit of 50 KLPD.

1.2 Project Setting

For any industrial project availability of raw materials, water, power as well as adequate land is considered as key elements. In case of the proposed project, the management checked the above factors and planned to set up the proposed activity within the existing premises of the sugar mill. The site meets the guidelines prescribed by Ministry of Environment, Forest and Climate Change (MoEFCC) to establish an industry. It is located approximately 0.750 km away from Pune-Bangalore national highway (NH-4). The geographical coordinates of the proposed site are

1) 16°25'49.74"N & 74°21'33.55"E
2) 16°25'49.68"N & 74°21'38.43"E
3) 16°25'44.90"N & 74°21'38.51"E
4) 16°25'43.45"N & 74°21'34.75"E

It is 575 m above mean sea level. Nearest town to the site is Nipani which is at approx 3 km from the site towards NE.

1.3 Highlights of the Project

Table 1.1: Project Highlights

1	**Name of the Proponent**	**M/s. Shree Halasidhanath Sahakari Sakhar Karkhana Ltd.,** (SHSSKL)
2	**Project**	New Molasses based 50KLPD distillery unit (Incineration boiler technology)
3	**Location of the project**	Shankaranandnagar,Yamgarni, Nipani, Tal. Chikodi, Dist. Belgaum, Karnataka 591237
4	**Land**	The factory is having total land of 102 acres Existing sugar unit has occupied land of approx 40 acres

		The factory has made provision of 15 acres for distillery unit Greenbelt = existing 13 acres + proposed 5 acres = Total 18 acres
5.	**Product**	i) Rectified Spirit – 50 KLPD OR ii) ENA – 50 KLPD OR iii) Ethanol – 50 KLPD iv) Fusel oil: 200L/day
6	**Operation days per annum**	Maximum 330 days
7.	**Main Raw Material**	Molasses: maximum 193TPD • Fuel: Coal 44.5 TPD and Spent wash 124 TPD
	Power	1300 KWHr (1.3MWhr) Power Source: Captive through 1.5 MW STG, Alternate source state electricity board
8.	**Water Requirement**	**Distillery unit** • 532 m^3/day (**Source**: with permission from Minor Irrigation Division of Belgaum)
	ZLD scheme	For spent wash: Multi-effect evaporation followed by incineration For spent lees, condensate of MEE and other effluent – Condensate polishing unit – treated water will be reused for molasses dilution or cooling tower make and for watering greenbelt plants
	Nearest river	Vedganga river at approx 3 km towards north of the site
	Nearest sanctuary/national park	Radhanagari sanctuary in Kolhapur district of Maharashtra approx 50 km from site.

1.4 Need of project and its importance to the country and region

India is one of the largest producers of sugarcane as well as sugar in the world. The sugarcane is a cash crop for farmers. There are about 564 installed sugar factories in India. Most of the sugar industries are located in rural areas providing employment to rural masses. Sugar factories from Maharashtra are the backbone of rural economy. These factories have contributed for the development of economy as well as infrastructure in rural areas, generated ample of employment opportunity to local people.

The project proponent is one of a cooperative sugar factory from northern part of Karnataka. The cultivation of sugarcane is increasing every year in the command area of the factory and it is anticipated to grow gradually for next few seasons. In addition, the sugar factory is having plans to promote and support the cane development programme, in its command area.

Table 1.2: Expected cane availability for next five years (some figures are rounded)

S. No.	Season	Sugarcane Area (Ha)	Yield (MT)	Sugarcane Production (Qt– rounded)	Expected Crushing (T)	Expected molasses generation (Tons)
1.	2018-19	7875	80	7,56,000	6,30,000	26,900 (4.26%)
2.	2019-20	8663	83	8,55,000	7,19,000	30,918 (4.3%)
3.	2020-21	8128	85	8,35,000	6,90,800	29,704 (4.3%)
4.	2021-22	8250	85	8,52,000	7,01,250	29,452 (4.2%)
5.	2022-23	8313	87	8,71,400	7,23,200	30,374 (4.2%)

Expected average molasses production is around 30,000 MT/annum. In case of bumper season, the molasses generation will be 31,000 Tons. The proposed distillery unit will require molasses of around 33,000MT/annum. Therefore, required molasses will be procured from nearby sugar mills.

1.5 Steam and Power

Steam required for the proposed project i.e. distillery of 50KLPD will be maximum 387.20 TPD and power requirement will be 1.3 MW (distillery). In the project, a new incineration boiler of 20 TPH is proposed. Steam will be first fed to STG of 1.5 MW and exhaust low pressure steam will be used for distillery operation and MEE. New boiler will be multi-fuel operational, it is proposed to use coal as a fuel to incinerate spent wash. Spent wash of max. 60 brix (% solids) of 124 TPD will be incinerated using 44.5 TPD coal. Steam of maximum 16.2 TPH will be required for the proposed operations i.e. distillery and MEE. In case of failure in captive power supply, it will be procured from State Electricity Board. In addition, provision of diesel generator is made in the proposed project.

1.6 Import vs. Indigenous Production

The processes of manufacturing of rectified spirit, extra neutral alcohol and ethanol are well set. These processes are simple and straight and the technology for the same is available indigenously. The technologies for pollution control/disposal are also available indigenously.

1.7 Export Possibility

The finished goods from proposed distillery activity viz. Rectified Spirit (RS), Extra Neutral Alcohol (ENA) and Anhydrous Alcohol (AA or fuel ethanol) are having excellent potential of export.

1.8 Domestic /Export Markets

Domestic market for RS, and ENA are Bangalore, Mumbai, Goa, Hyderabad, etc. as well as the other states of the country. For fuel ethanol, petro-chemical industries are the major buyers.

1.9 Employment Generation

Proposed distillery unit will provide direct employment to 80 persons from which 30-35 will be skilled and others will be semi-skilled and unskilled. The project has a potential to generate large number of indirect employment to sizable extent.

2.0 PROJECT DESCRIPTION

2.1 Type of project

SHSSKL has proposed to install a new molasses based distillery of 50 KLPD. The project proponent is an agro-based, leading cooperative industry from north Karnataka. The factory is having adequate land (102 acres) of which 15 acres will be allocated for distillery and its ancillary units (including storage lagoons, coal and ash storage yard etc.). Proposed site meets the MoEF&CC guidelines for site selection of industry. It is >500m away from national highway as well as HFL of river Vedganga. There is no sanctuary or national park or biosphere reserve within 10 km radius of the site.

The factory is going to produce required steam of maximum 16.2 TPH through new incineration boiler. It has planned to install steam turbine generator of 1.5 MW to fulfill its captive power requirement of 1.3 MWhr.

In the case of proposed project, distillery is placed in 5 (g) - as 'A' category as per EIA Notification, 2006 (as amended till the date). Therefore, the proposed activity will be appraised at central level.

2.2 Location with coordinates

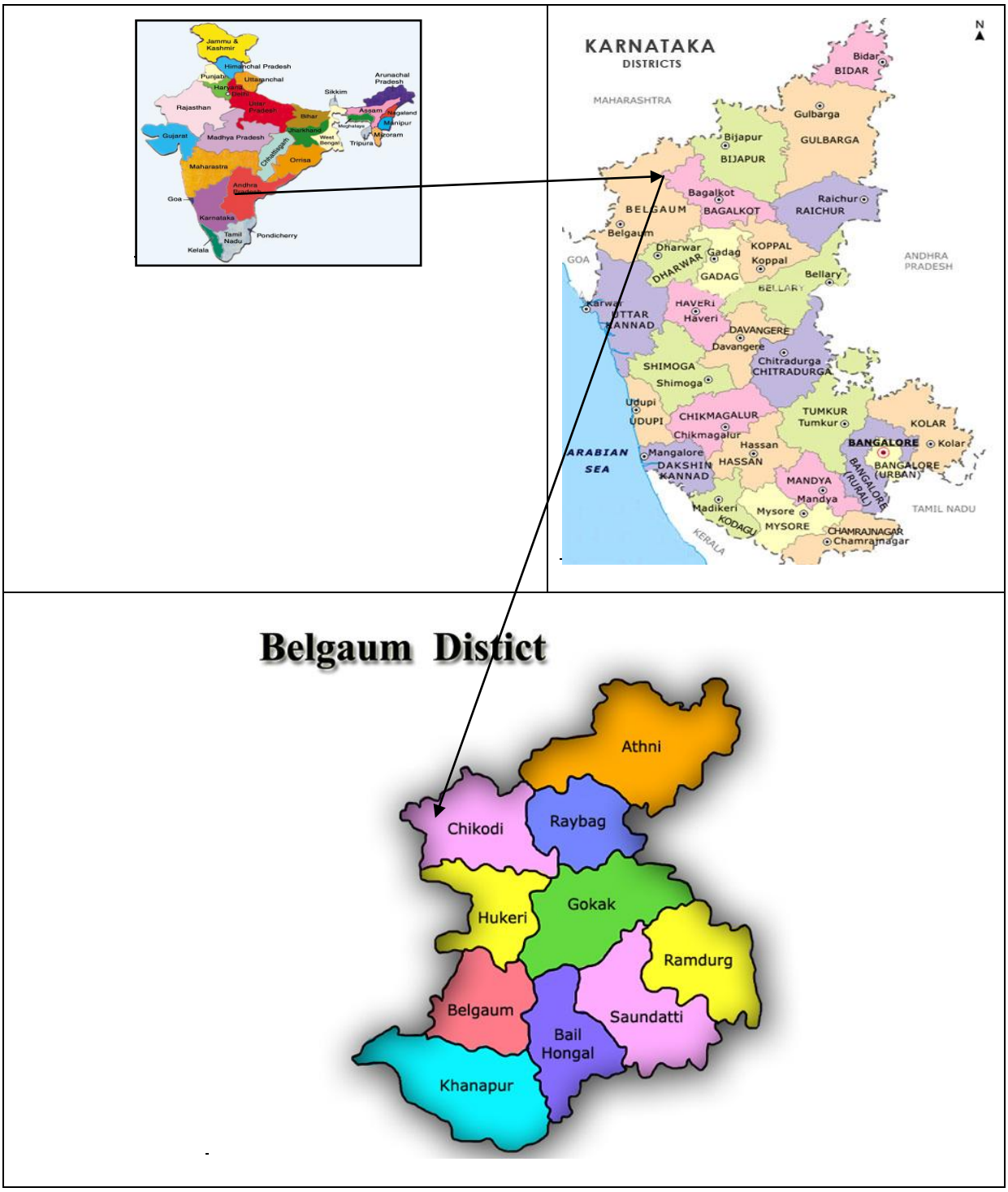

Figure 2.1: Location Map

Project coordinates:

1) 16°25'49.74"N & 74°21'33.55"E
2) 16°25'49.68"N & 74°21'38.43"E
3) 16°25'44.90"N & 74°21'38.51"E
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It is 575 m above mean sea level.

Figure 2.2: Satellite Image of the project site

2.3 Details of alternative site consider and basis of selecting the proposed site

The project proponent has planned to set up the distillery within its premises. Plot/survey number proposed are based on general requirements, if required it may change the same (based on detailed engineering specifications) but it will be within its own premises. Hence, alternative sites (outside its premises) for the proposed project are not considered, because of the following reasons.

The present site fulfills the industrial site selection criteria of MoEFCC/CPCB/MPCB i.e. site is >500 m away from high flood line (HFL) of nearest river (Vedganga), it is >500 m away from national highway (NH 4), railway line. There is no protected area such as sanctuary, national park, biosphere reserve within 10km radius of the proposed site. There is no defense installation, recreation site, etc. within 25 km radius of the site.

2. Availability of raw material: The basic raw material for the proposed project will be molasses. It will be mainly supplied by existing sugar mill.

3. Availability of infrastructure/facilities: Proposed site is well connected by state and national highways as well as railway. Reasonably good infrastructure, support facilities and labor etc. are available in the vicinity.

2.4 Size or magnitude of operation

New molasses based distillery unit of 50 KLPD

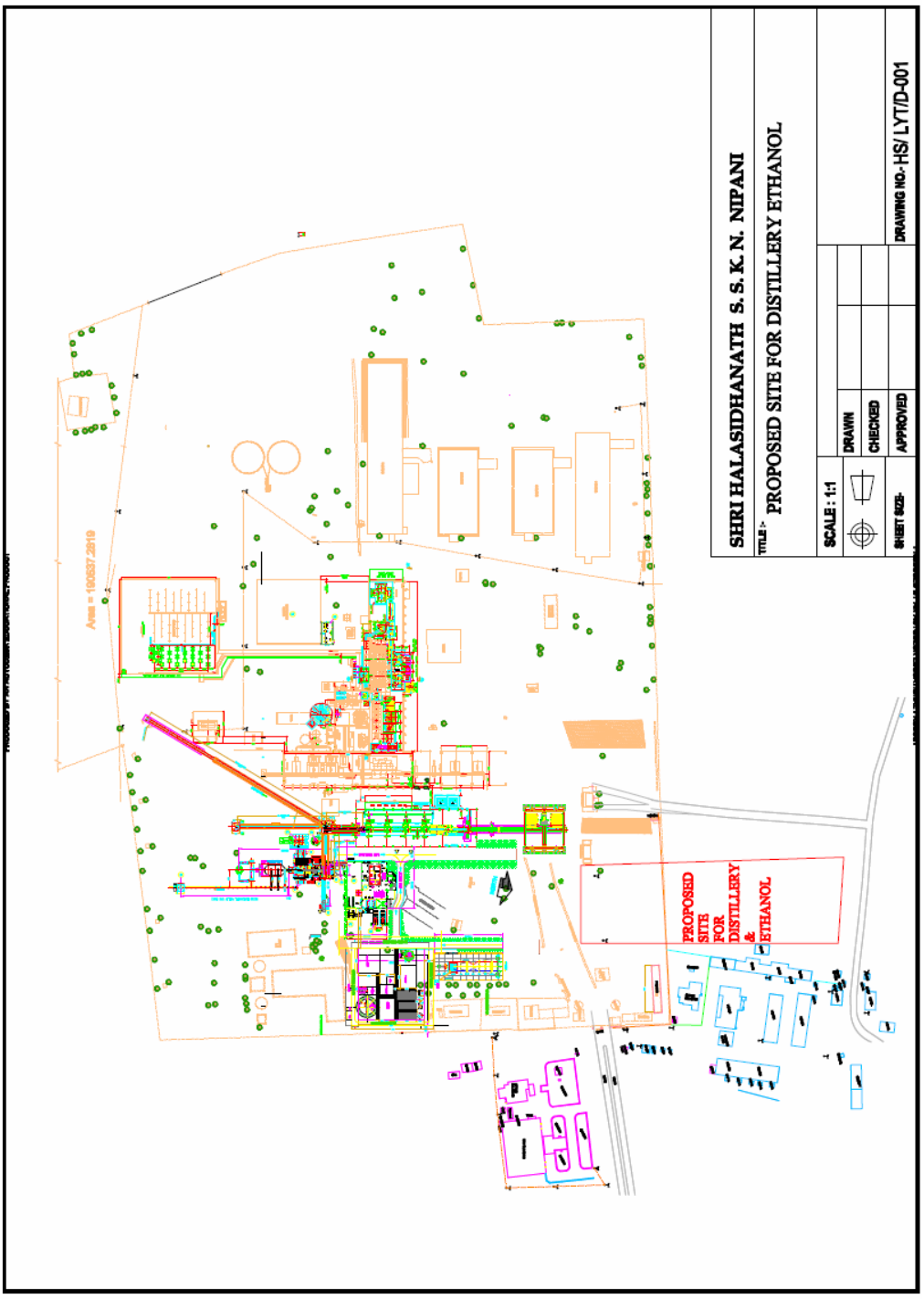

Figure 2.3: Project Layout (Red coloured mark area allocated for proposed activity)

2.5 Project description with process details

Process: Distillery

SHSSKL decided to adopt the latest technology to achieve Zero Liquid Discharge (ZLD) for the proposed 50 KLPD unit. The peculiarities of manufacturing process are as follows:

Manufacturing Process

The production process involves the following stages

1. Fermentation
2. Distillation

- **Fermentation-** Molasses is the chief raw material used for production of alcohol. Molasses contains about 50% total sugars, of which 30 to 33% are cane sugar and the rest are reducing sugar. During the fermentation, yeast strains of the species *Saccharomyces cerevisieae*, a living microorganism belonging to class fungi converts sugar present in the molasses in to alcohol. The continuous fermentation process involves addition of fresh nutrients medium either continuously or intermittent withdrawal of portion of nutrient for recovery of fermentation products. In continuous process fermenter is in constant usage with little shut down and after initial inoculation of yeast culture, further inoculation is not necessary.
- **Distillation-** After fermentation the next stage in the manufacturing process is to separate alcohol from fermented wash and to concentrate it to 95%. This is called Rectified Spirit (RS). For this purpose, distillation method is employed. After separation of alcohol, the remaining part is the effluent of the process i.e. spentwash and spent lees.
- **Manufacture Extra Neutral Alcohol (ENA)**

  ENA is prepared by wash to ENA. After fermentation the next stage in the manufacturing process is to separate alcohol from fermented wash and to concentrate it to 95%. This is called Rectified Spirit(RS) & by diluting rectified spirit with soft water for the removal of impurities like higher alcohols, aldehydes and methyl alcohol. This process is done in the ENA column. Estimated steam requirement for manufacturing of ENA is 6.7 TPH
- **Anhydrous Alcohol (AA)**

  Anhydrous alcohol is an important product required by industry. As per IS specification, it is nearly 100% pure or water free alcohol. Alcohol as manufactured by Indian distilleries is rectified spirit, which is 94.68% alcohol. Molecular Sieves process will be adopted for dehydration of alcohol. Estimated steam requirement for manufacturing of ethanol (AA) is 5.8 TPH.

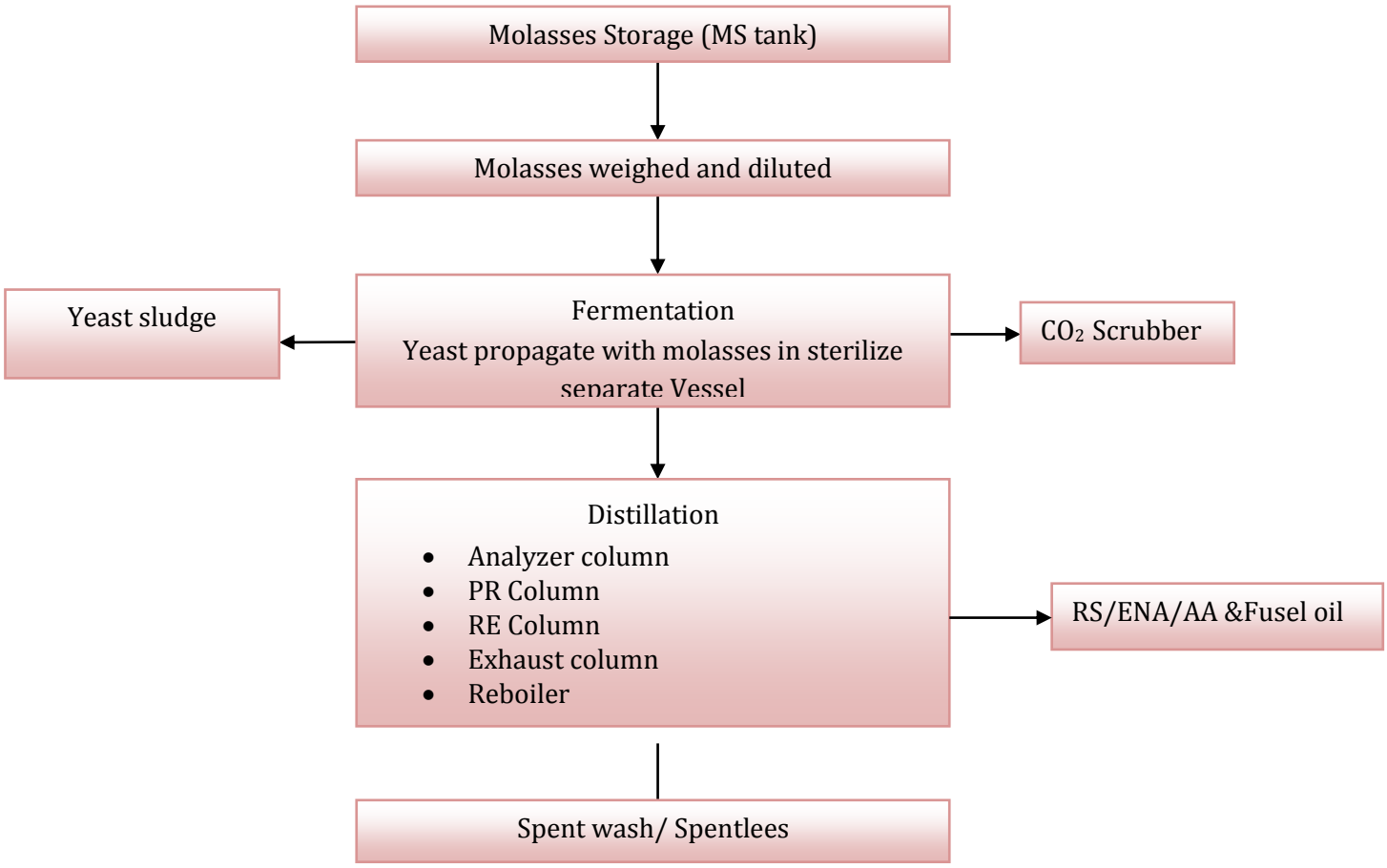

Figure 2.4: Schematic of RS/ENA/AA Manufacturing Process

2.6 Raw Materials for Finished Products

Raw material other than molasses for the proposed project will be procured from nearby markets. Product wise raw material consumption is given below. The factory is estimated to have own molasses to an extent of 30,000 tons and remaining molasses of approx 33,700 tons will be procured from nearby sugar mills. There are about three sugar mills located in 50 km radius of the factory, who doesn't have distillery unit. The collective cane crushing capacity of these units is to the tune of 21,000 TCD and hence, estimated molasses generation is 840 tons per day (molasses generation average 4% on cane). Therefore, considering average season of 150 days, these mills can supply 126,000 tons of molasses.

Table 2.1: Availability of raw materials, finished goods/ product and mode of transport

Raw materials	Estimated quantity	Source market	Final product	Estimated quantity KL/day	Source market	Transport mode
Molasses	193TPD	Own factory, upto 30,000 tons Remaining 33,700 tons will be procured from nearby sugar mills	Rectified spirit + Impure spirit (5%)	50 KLPD	Maharashtra India	Surface transport through Tanker
			OR			
			ENA + Impure spirit (6 %)	50KLPD		
			OR			
			Fuel Alcohol + Impure spirit (5%)	50KLPD		
Nutrients N, P (daily)	45-46Kg	Balgaum, Kolhapur, Bangalore, Pune	-	-	-	By road - Truck Tempo
Turkey Red Oil (TRO) (daily)	135 Kg	Balgaum, Kolhapur, Bangalore, Pune	-	-	-	By road - Truck Tempo

2.7 Resource optimization / recycle and reuse envisaged in the project

Distillery project is an effort for efficient use of available land, water and molasses. Steam will be used twice – once for power generation and the exhaust steam will be used in distillery. Condensate water will be recycled/reused, that will reduce the freshwater requirement.

2.9 Water Requirement and Its source

Necessary water requirement for the proposed project will be met from River Vedganga. Water will be required for domestic, process and utility purpose. Daily fresh water requirement for the proposed project will be as follows.

Table 2.2: Water Balance: Distillery (Quantities in cum/day)

) Sr. no.	Particulars	Consumption
A	**Fresh Water Requirement**	
1	For molasses dilution	500
2	For cooling tower make up (Fermentation, Distillation, F.A. and Evaporation etc.)	450
3	Fermenter Washing	10
4	For vacuum pump	15
5	For air blower	10
6	For fusel oil decanter and alcohol scrubber	59
7	For Boiler, 15 MT/hr.	384
8	Others (Domestic)	10
9	**Total water consumption**	**1438**
B	**Recycle streams after treated through CPU unit**	
1	Evaporation Process condensate	400
2	Spent lees	100
3	Cooling tower blow down	75
4	WTP reject	15
5	Boiler blow down	5
6	Steam condensate water return to boiler	384
7	**Total Water for CPU**	**979**
8	Water recycle to process and non-process application after treatment through CPU (90% on Sr.No.B-7)	881
C	**Others Stream**	
1	For vacuum pump	15
2	For air blower	10
3	**Total**	25
D	**Actual water recycles(B-8 +C-3)**	906
	Actual fresh water requirement (Sr.No.A-9-D)	532

Net fresh water requirement for distillery unit = 532 m^3/day

2.9.1 Power & Fuel requirement and Its source

The power required for the proposed distillery unit will be 1.3 MWHr which will be met through captive generation. As stated earlier, the factory is going to install a new STG set of 1.5MW.

Table 2.3: Power and fuel requirement

Sr. No.	Particulars	Requirement	Source
1.	Power (distillery)	1.3 MW	In-house (Captive)
2.	Fuel Coal Spent wash	 44.5 TPD 124.00 TPD	 Wardha-Chandrapur coal block In-house (from own production)

Fuel: In case of proposed project, coal will be used as a main fuel to incinerate spent wash. Indian coal will be used and its requirement will be 44.5 TPD. It will be sourced from Wardha-Chandrapur coal block of Maharashtra or wherever available (based on economic aspects).

Spent wash of 124 TPD having 60% solids will be incinerated. Its calorific value is observed in the range of 1600 – 1800 Kcal/g and ash content is observed maximum upto 18%.

2.10 Waste generation & disposal scheme

Quantities of waste to be generated & scheme for their disposal are given in following chart:

Liquid waste

Distillery Unit

Spent wash generation rate will be 10 L/L of alcohol. Therefore, spent wash generation will be 500 m3 per day (with 12^0 brix) from the 50 KLPD unit. Spent wash volume will be reduced through multi-effect evaporation (MEE) treatment and it will be 100 m3/day at 60^0 brix. Spent wash is having specific gravity of 1.24. After MEE, concentrated spent wash will be sent to incineration boiler.

Effluent such as spent lees, cleaning water and condensate of MEE will be treated in condensate polishing unit (CPU). Treated water will be recycled/reused within the premises and thus, zero liquid discharge (ZLD) will be achieved.

Spent wash storage lagoons

Spent wash storage lagoon of five days capacity (two in number) and one lagoon of maximum 30 days capacity will be provided.

2.10.2 Solid waste

The proposed industrial activity will generate solid waste in the form of fermentation sludge which is biodegradable. The quantity and disposal technique is given briefly in the following table.

Table 2.4: Solid waste Generation and Disposal

#	Waste	Quantity (in TPA)	Upshot
1	Yeast sludge (dry)	80-100	Mixed into soil
2	Boiler Ash (per annum)	13,240	sold to brick manufacturing units
3	Distillery CPU Sludge	90-100	Mixed into soil
4	Spent oil from DG	1-2 KL	Spent oil is burnt in boiler

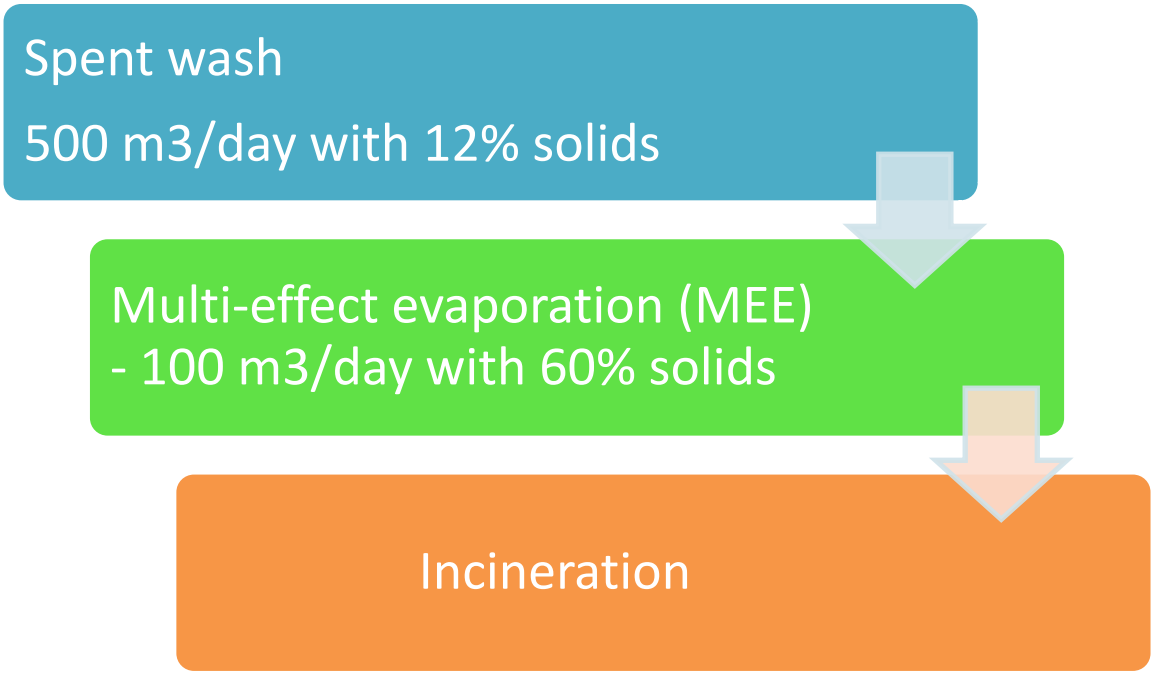

Figure 2.5: Flow diagram of spent wash disposal scheme

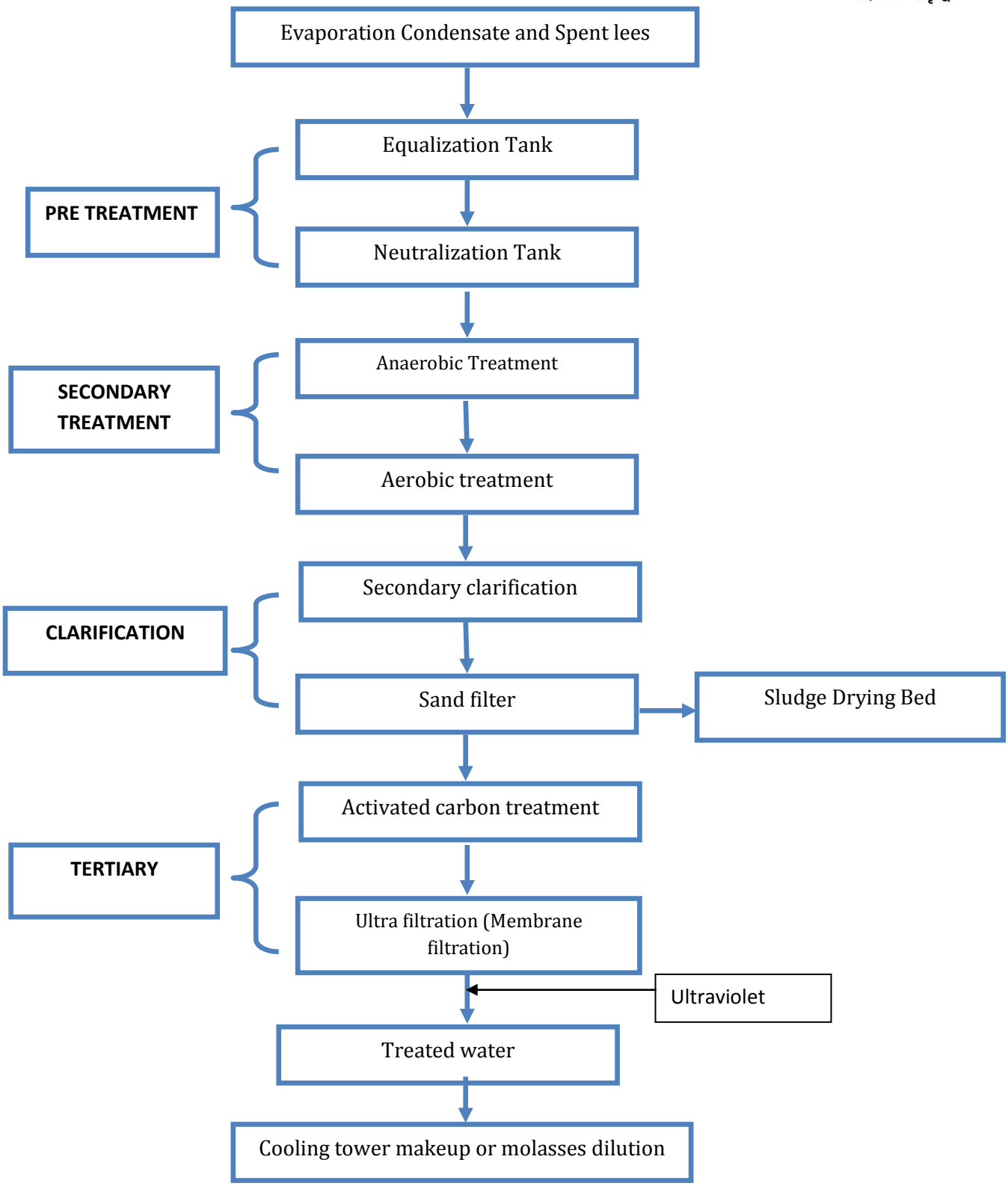

Figure 2.6: Schematic Diagram of CPU

2.10.3 Air Emission & Control

Air emissions will be mainly due to burning of coal and spent wash in incineration boiler of 20 TPH. It is proposed to install ESP as an air pollution control device for stack emissions. A new stack of 75m height is proposed for the project. Coal and ash will be handled mechanically through closed conveyors. Coal will be stored in closed yard and to control fugitive dust during loading/unloading and its transfer, dust suppression system as well as bag filters will be installed. Greenbelt of 5 acres is proposed for the distillery which is an additional measure for air emissions. DG set of adequate capacity with adequate stack height and acoustic enclosures will be provided.

2.10.4 Noise Control

Steam turbine generator will be a major noise source. Apart from that, noise is anticipated from pumps, motor drives, utilities etc. The plant and equipment will be specified and designed with a view to minimize noise pollution. The major noise producing equipment will be provided with acoustic enclosures, soundproof covers and silencers. DG set will be provided with acoustic enclosures. Ear Plugs and ear muffs will be provided to the workers in utility section. Greenbelt will be developed.

2.10.5 Health and Safety Measures

SHSSKL is committed to the Health and Safety of its all employees. It strives to provide hygienic & safe work place and continually improve the effectiveness of health & safety system.

To meet these objectives the SHSSKL will;

- Comply all relevant laws, regulation, statutory provisions & codes of practice
- Continually asses Risks & Hazards so as to evolve establish & upgrade hazard control measures, emergency preparedness, & risks mitigation and correct the deficiency identified in timely manner
- Ensure safe handling, storage, use and disposal of all substance & materials which are classified as hazardous to health & environment
- Create awareness amongst employees by providing appropriate training, motivation information's so as to create individual sense of duty, responsibility & participations and an institutionalize culture of continually improvement in safety, health & environment matters
- Make HOD responsible to communicate the safety policy to all concerned in his department
- Make supervisors responsible or implementation of the safety precautions, use of safety devices, & the safety of the people
- Empower employees at all levels to be responsible & accountable for their personal health & safety

- Fire protection system shall be provided in accordance to the LPA's regulations. The firefighting system will consist of a hydrant network
- Factory has already a fire protection system including electric driven pump, one diesel engine pump, and one jockey pump, etc.
- Portable fire extinguishers shall be provided in strategic locations in new unit.
- Alcohol vapor condensing system, lightening arresting system etc. will be provided
- All material, equipment, wires and cables of standard make will be used

2.11 Schematic representation of the feasibility drawing which give information of EIA purpose

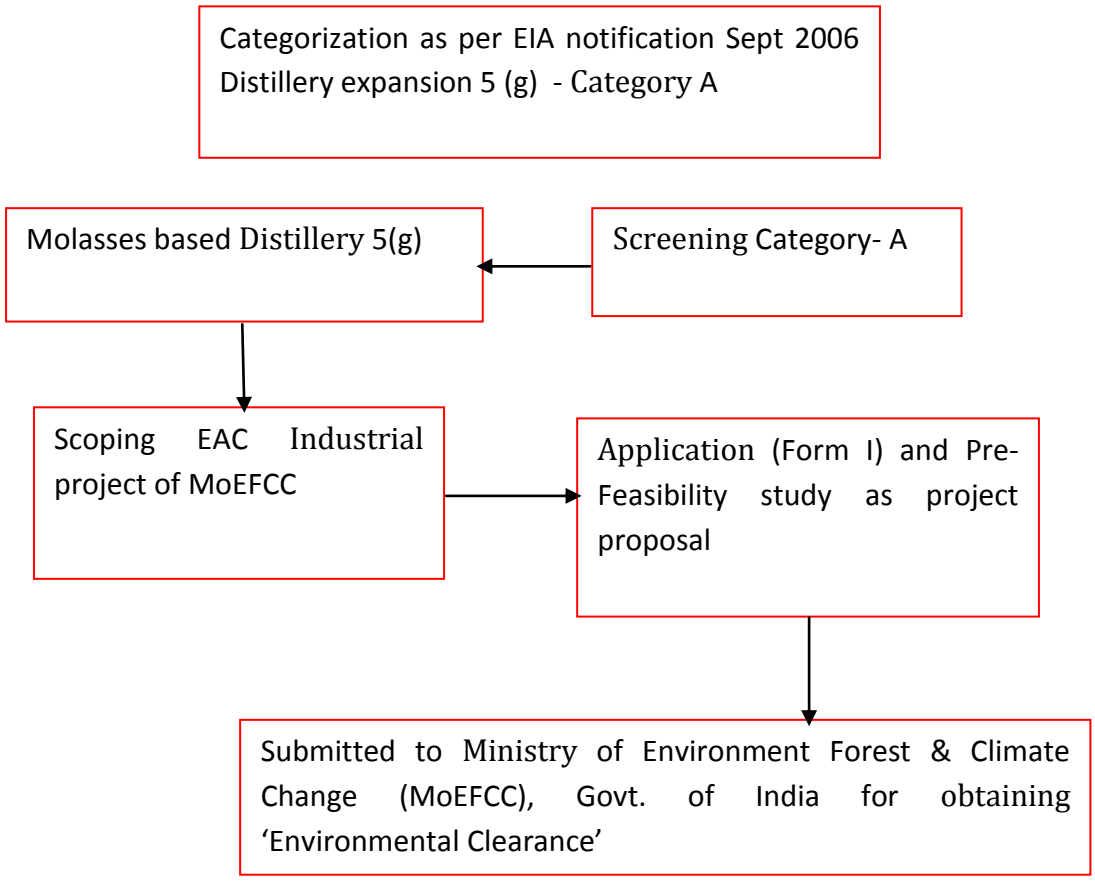

Figure 2.7: Categorization of Proposed Project as per EIA Notification

3.0 SITE ANALYSIS

3.1 Connectivity

The site is well connected by road, railway as well as air network. It is approx.30 km from Kolhapur. It is 0.750 km from Pune-Bangalore national highway (NH-4). Three km north of town Nipani. Nearest railway station is Kolhapur which is 30km from the site and air port of Belgaum is at 80 km from the site. Nearest port is Marmagoa port which is approx 120km from site.

3.2 Land form, land use and ownership

The sugar factory is holding approx. 102 acres of land. The land is flat, open and already under the industrial use (i.e. sugar factory and allied units). Out of available land, a provision is made for approx. 15 acre for the proposed distillery unit. As per the guidelines, 33% of land proposed for green belt i.e. approx. 5 acres. Hence, the total land required for the proposed distillery will be 20.00 acres, which is readily available with the factory (project proponent).

3.3 Topography

5) The terrain is almost flat, no hills in the surroundings. The geographical coordinates of the area are – 16°25'49.74"N & 74°21'33.55"E
6) 16°25'49.68"N & 74°21'38.43"E
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It is 575 m above mean sea level. Nearest town to the site is Nipani which is at approx 3 km from the site towards NE.

3.4 Salient Features

The proposed project requires no additional land. Therefore, no issues of rehabilitation and restoration are involved. There won't be change in the land use pattern since the land is already used for industrial purpose. There is no sanctuary, biosphere reserve or national park within the 10km radius area. The project surrounding land is either fallow land or used for agricultural purpose. Vedganga river is approx. 3 km towards north of the project site.

Table 3.1: Salient features of the project location

Roads	National Highway No. 4 is 0.750 km from the site
Nearest Residential area (village)	Nipani is approx. 3 km from the project site (Towards south)
Railway Station	Kolhapur ~30km
Air Port	Kolhapur ~30 km
River	Vedganga river is approx. 3 km.
Schools	There are about 20 schools and five colleges in Nipani
Colleges	Devchand College ~2km
Medical and health care centers	In Nipani – one government hospital and many private hospitals are available
Banks	Syndicate Bank, 2.5km from project site and almost all nationalized and private banks have branches in Nipani
Market places	Nipani is a nearest market place at approx. 3km from the project site
Protected Area/ Sanctuaries/NP	No
CRZ applicability	Not applicable
Seismicity	Seismic Zone- III

Note: All the above mentioned distances are the aerial distance from the project site

3.5 Existing Infrastructure

Table 3.2: Existing Infrastructure

Land	Total plot area available with the industry is 102 acre. Land required for the proposed expansion is about 20 acres including greenbelt area of 05.00 acres
Water	Source: Vedganga River
Power	Captive power supply
Road	Pune-Bangalore NH-4 is 0.750km from site
Fuel	Fuel required for steam generation will be coal & spent wash, which will be obtained from coal blocks of Wardha-Chandrapur & from own distillery unit
Steam generator	New incineration boiler of 20 TPH will be installed

3.5.1 Raw Material: Sugarcane

The viability of the proposed distillery unit depends on the availability of raw material i.e. sugar cane, molasses. **Table 3.3**, shows the cane production from the operational/command area of the factory and its cane crushing performance for last five years.

Table 3.3: Production & Crushing Performance for last five years

Sr. No.	Particulars	2013-14	2014-15	2015-16	2016-17	2017-18
1	Gross operational days	126	135	123	62	147
2	Cane crushed (MT)	255103	257765	254377	181683	404779
3	Sugar produced (Qtls)	318450	318170	306130	202730	435050
4	Sugar recovery (%)	12.52	12.37	12.01	11.16	10.75
5	Bagasse generation on cane (%)	30.79	30.28	29.73	29.33	28.40
6	Molasses (MT)	10659	9875	9890	9490	23420

3.5.2 Irrigation and transportation facilities

The SHSSKL is located in the vicinity of Vedganga river (approx. 3 km from project site). Cane is usually grown by using river water. In some parts, water from well and bore well is also used for irrigation. Very good road network is available in the vicinity of the site.

3.5.3 Fuel

Fuel required for steam generation will be coal & spent wash.

3.5.4 Water

At present sugar factory draw water from Vedganga River, the permission is for 9.5 lakh gallons per day (=3596 m3 per day). The water requirement for proposed project will be around 532 m^3/day. Water conservation will be achieved by recycling of water.

3.5.5 Power

As stated earlier, SHSSKL is going to install a new STG of 1.5 MW to meet the requirement of 1.3 MWhr. Thus, the required power will be sourced from this captive power station. In case of non-availability of power from captive source, it will be taken from state electricity board.

3.6 Soil classification

Soil is a natural medium for plant growth. Soil supplies nutrients for growing plants and plants serving for man. Soil mainly being the resultant products of the parent rock materials have a high resemblance in matters of textures, colour and contents. The soils of Belgaum district are classified

by physical studies and by the survey of Karnataka State Department of Agricultural, Bangalore (K.S.D.A). These soils have been classified into five broad categories. Viz;

Medium black soils

Deep black soils

Mixed red and black soils

Red lomy soils and

Laterite soils

Medium Black Soils: These soils are found in the surrounding areas of the site.

3.7 Social Infrastructure available

The sugar factory has already initiated several activities for the development of the region. Some of the prime activities are as follows.

- The factory is providing medical aid to the employees and their dependents at free of cost
- It provides primary school educational facilities to the children of workers
- The factory also arranges field demonstration to educate the farmers in sugarcane cultivation through application of scientific methods
- It provides drip irrigation facilities to the sugarcane growers on subsidized basis
- It provides insurance policy facilities to members and workers
- To facilitate better transport of sugarcane, the factory has undertaken major programme to construct roads in its area of operation

4.0 PLANNING BRIEF

4.1 Planning concept

This is an agro-based industry. Sugar cane which is the main raw material of the industry is available easily and adequately. It is a renewable source. The project is a vertical integration, because proposed distillery will receive raw material molasses from the sugar unit.

4.2 Facilities for Transport

SHSSKL is situated very close to NH 4. All the villages from the command area of SHSSKL are accessible by asphalted (*pucca*) road, operational around the year. Hence, public transportation is available. State transport (ST) buses ply on schedule and connect almost all the villages of the command area.

4.3 Town and country planning / Development authority classification

The project is located at Village Yamgarni of Belgaum district. Local Grampanchayat is the authority for planning. The Gram-panchayat has issued 'No Objection Certificates (NOC)' for distillery project.

4.4 Population projection

No major population flux is anticipated due to the project. In the proposed project candidates from local areas will be preferred for employment. Only for exceptional posts, it may employ candidates from other areas. In that case existing colony have the facilities to accommodate the additional man power for the new activity.

4.5 Land use Planning

Total plot area with sugar industry is 102acre. Land required for proposed project is 20.00 acres. Existing greenbelt area is 13 acre and additional 5.00 acre of green belt will be developed.

Assessment of infrastructure Demand (Physical & Social)

The basic infrastructure such as roads, electricity, transportation, drinking water supply, health centers and hospitals, school, colleges, sanitation facilities are available in the vicinity. The proposed project is not going to exert any unbearable load on any of these infrastructure and resources.

4.6 Amenities/ Facilities

Following amenities/facilities are available at existing sugar factory

- Housing colony for employees
- Guest house facility
- Petrol pump
- Canteen

- Medical facility
- Separate dedicated parking facility for goods vehicle and personal vehicles at site
- Provision of street light within premises as well as on approach road
- Security check post and round the clock security persons on duty
- Fire extinguishing facilities (sugar unit)
- Drinking water and power supply to housing colony
- Diesel generator as a backup facility
- Fresh water and wastewater treatment plants

5.0 PROPOSED INFRASTRUCTURE

5.1 Industrial Area

The proposed project will be carried out in the existing factory premises only. The total allocated land for the proposed project is 20.00 acres (includes greenbelt).

5.2 Residential Area

Existing housing colony area is approx. 1 acre. There is no plan to expand this housing colony.

5.3 Greenbelt Area

Proposed greenbelt area is ~5.00acre.

5.4 Social infrastructure

Only existing/available infrastructure will be used. No new roads or water/air routes will be developed

5.5 Connectivity

The site is well connected by road, railway and air way. The same is described earlier.

5.6 Drinking water management

SHSSKL draws water from Vedganga River. It operates a special water treatment plant to supply drinking water to factory as well as the staff colony.

5.7 Industrial waste management

Distillery spent wash is a major source of liquid waste which will disposed through evaporation (MEE) followed by incineration. The Process condensate from evaporators and spent lees from the process will be treat in Condensate Polishing Unit (CPU) and used for process and cooling tower make up water, etc. The sanitary wastewater will be disposed by using septic tank and soak pit system. Thus, due to proper treatment of effluent, disposal of treated water within the factory premises and recycling of it, the issue of wastewater is envisaged to be insignificant.

Table 5.1: Solid/ Hazardous waste generation, treatment & Disposal

#	Waste	Quantity (in TPA)	Upshot
1	Yeast sludge (dry)	80-100	Mixed into soil
2	Boiler Ash (per annum)	13,240	sold to brick manufacturing units
3	Distillery CPU Sludge	90-100	Mixed into soil
4	Spent oil from DG	1-2 KL	Spent oil is burnt in boiler

5.8 Power Requirement and Source

Particular	Power (MW)	Source
Distillery	**1.3**	**Captive**

5.9 Rehabilitation and Resettlement (R & R) Plan

There will be no any issue of rehabilitation and resettlement (R & R) for the proposed project, since the required land is available with the factory.

5.10 Project Scheduled & Cost Estimates

Table 5.2: Project scheduled & Cost Estimate

1.	Date of start of construction (Anticipatory)	Nov. 2019
2.	Date of completion (Anticipatory)	Oct. 2020
3.	Proposed Project cost	Rs. 7442.00 lakhs
4.	EMP cost	Rs. 2851.00 lakhs (rounded figure)

5.11 Analysis of proposal (Final Recommendations)

I) Benefits

- This industry will produce RS, ENA and Anhydrous Alcohol (fuel ethanol) which are useful products for the country. It will earn & save foreign exchange in the potable alcohol cadre as well blending in petrol
- Cane growers are likely to get good rates for their crop
- No external electricity required (during cane crushing season) due to in-house power generation in the proposed activity
- The evaporation condensate, spent lees and other non-polluting water will be recycled into process and cooling tower makeup water which will minimize the fresh water requirement
- Solid waste like sludge from process and CPU is a soil enriching material
- Ash will be sold to brick manufacturing unit

- Compatible architecture will be adopted and Land is already under industrial use. Trees will be maintained and not razed down.
- No Rehabilitation is involved.
- The problematic liquid waste materials such as distillery spent wash will be disposed off through incineration and other wastewater will be treated in CPU; ZLD will be achieved
- The process is straight line and the technologies are available indigenously
- Indirect employment to many since, the project is agro-based
- The aggregate effect of the project is likely to boost the local economy
- Direct employment opportunities for 80 local youths.

II) Conclusion

a) Proposed distillery is very necessary for effective utilization of land and molasses

b) The local sugarcane growers are strongly willing for the project

c) The candidate site is suitable from general MoEFCC expectations.

d) Water, power, raw material, filler material and market is assured and found available with ease.

e) Full precautions will be taken for pollution control, resource conservation and environmental protection

f) All the units are agro-based and hence promote sustainable development