EXECUTIVE SUMMERY OF EIA

Expansion of existing Distillery from30 KLPD to 60 KLPD

Babhulgaon, Tal. Basmathnagar, District Hingoli, **Maharashtra**

M/s Purna Sahakari Sakhar Karkhana Ltd

Contents

Executive summery

1. Project in brief

M/s Purna Sahkari Sakhar Karkhana Ltd, Basamatnagar, Dist. Hingoli was registered as a cooperative society vide registration number PBN/PRG/ A-2 dated 16th January 1970. Initially the crushing capacity of the mill was 1250 TCD. Subsequently with the increase in the availability of cane the crushing capacity of the mill was expanded to 2500 TCD in the year 1990-91. In order to increase its product portfolio by use of its most valuable by product molasses the mill added a distillery capacity 30 KL per day Rectified spirit in the year 1991-1992 based on continuous fermentation of bio-still technology and atmospheric distillation method. An alcohol dehydration plant for production of fuel grade ethanol having capacity 20 KL /day was added to the distillery plant in the year 2008. The management of the mill has decided to expand the capacity of the distillery from 30 to 60 KLPD using modern technology of Fed-batch fermentation and Multi Pressure distillation. Proposed expansion i.e additional 30 KLPD distillery will be set up adjacent to the existing Distillery unit. Distillery is an integral unit of M/s Purna Sahakari Sakhar Karkhana Ltd., and is located in the sugar mill premises, as an independent unit with existing distillery.

Project location

Existing sugar factory premises is located at Gut no. 237, 238, 239, 240, 241, 242 village Babhulgaon, Tal. Basmathnagar, District Hingoli, Maharashtra. The Proposed Distillery unit is geographically located at 19°16'53.10"N & 77° 8'14.60"E, at a maximum elevation of 395 m above MSL. Project location on MRSAC map of Basmatnagar taluka of Hingoli district and project boundary on Google imagery is shown in below Figure. Proposed project will be within existing factory premises. The entire Distillery / Ethanol Plant project expansion will be within existing factory premises. Proposed expansion i.e. additional of 30 KLPD distillery will be set up adjacent to the existing Distillery unit. The site is located in rural surroundings. There are no Eco-sensitive zones like Tropical Forests, Biosphere Reserves, National Parks, Wild Life Sanctuaries, and Coral Formation Reserves within 10 km Influence Zone of the Project site. Environmental setting of the project site is given in **Error! Reference source not found.**1 below.

Table 1: Environmental Setting in and around the proposed Project site

Site Location	Name	Distance
Nearest Habitation	Babhulgaon Pimpala Chorya Bagdad Bhoripgaon	1.0 km in SE 1.25 Km towards SW 2.27 Km towards W 2.8 Km towards NE
Nearest Town	Basmatnagar	4.5 km towards NE
Nearest Railway Station	Basmatnagar Railway Station	4.5 km towards NE
Nearest Airport	Shri. Guru Gobind Singh Ji Airport	23.5 km towards SE
Nearest IMD Observatory	Parbhani	38 km towards W
Nearest River / Water body	Purna river Godavari	17 km towards SW 17.5 km in SSE
Approach to site by Road	NH 222 Basmath –Ardhapura Road 4.km in NNE	

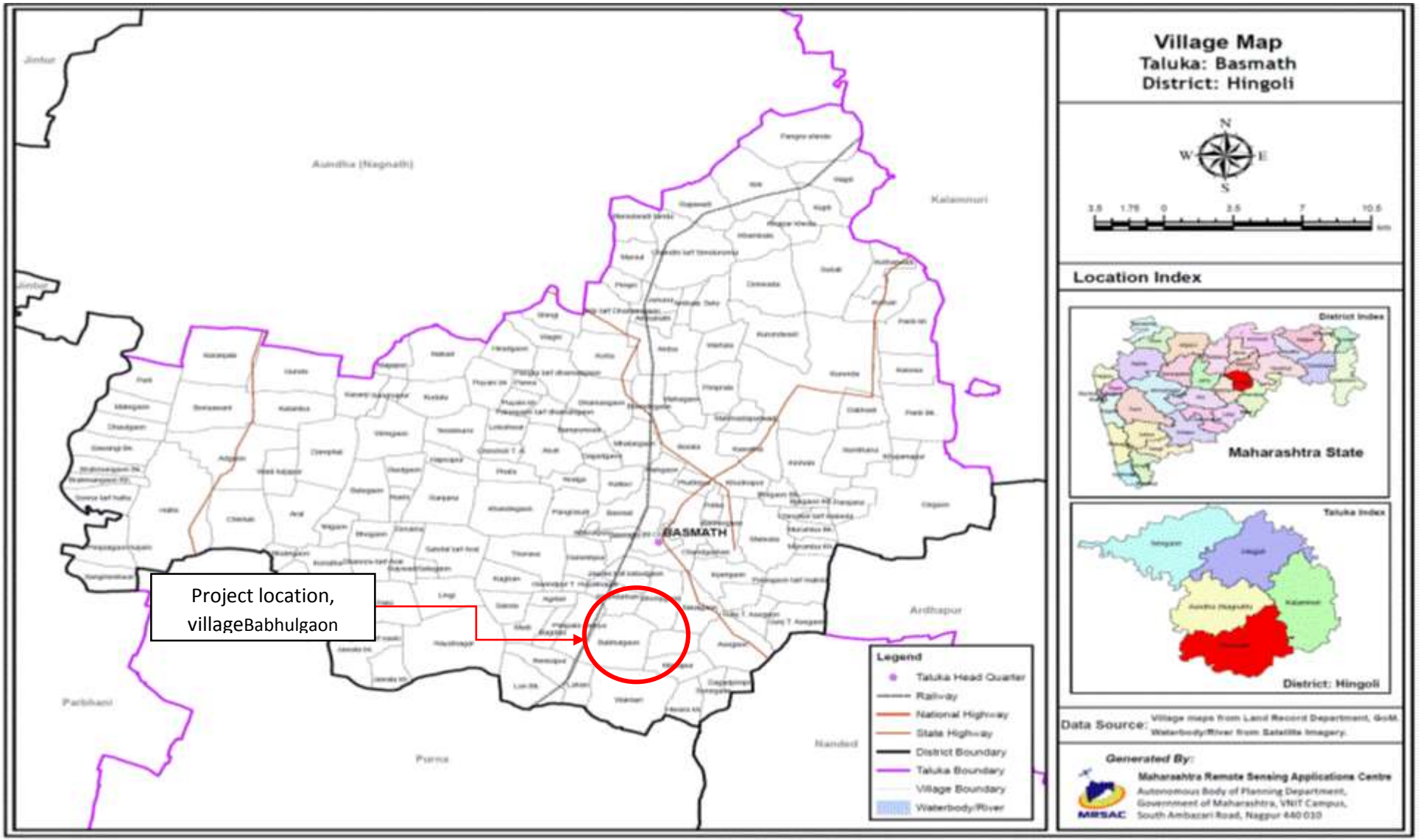

Figure 1: Map showing general location of the proposed project on MRSAC map

Figure 2: Google image of the Project Site with Boundary coordinates

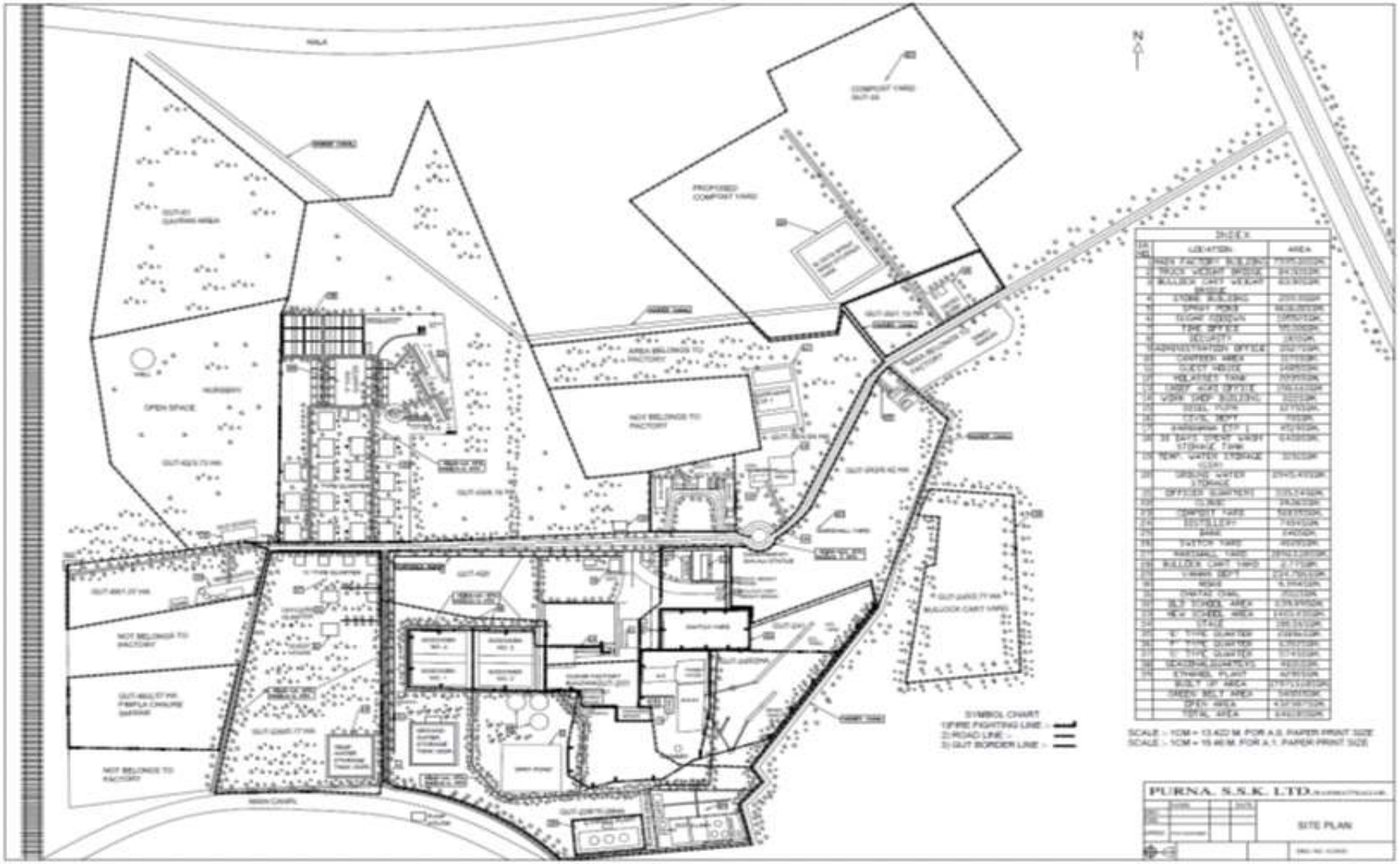

Figure 3: Plant layout

2. Project information in brief

Table 2: Salient features of integrated project

#	Particulate	Description
1.	Project	Expansion of existing Distillery from30 KLPD to 60 KLPD
	Location	Babhulgaon, Tal. Basmathnagar, Dist. Hingoli, Maharashtra.
2.	Product	Molasses/Sugarcane juice based distillery/Ethanol Plant (30 to 60 KLPD) -Rectified spirit/ Ethanol total 60 KLPD ad fusel Oil 0.18 KLPD **Existing** Rectified spirit/Ethanol 30 KLPD (One at time or in combination) **Proposed RS:** ENA/Ethanol 30 KLPD (One at a time or in combination) Fusel oil 0.09 KLPD Proposed expansion i.e. additional of 30 KLPD distillery will be set up adjacent to the existing 30 KLPD Distillery unit
3.	Molasses requirement (TPA)	**Existing** C-Molasses 32400 MTA for 270 days (this is existing for old distillery) **Proposed** B-heavy Molasses: 33475 MT per annum C molasses : 11310 MT per annum
4.	Sugarcane juice	Sugarcane juice: 1,00,000 MT per annum
5.	Operation days	330 days
6.	Water requirement	Existing sugar 3713 CMD (total Industrial requirement 3657 m^3/d+ Domestic 56 m^3/d) Existing distillery 355 CMD Proposed distillery 245 CMD (240 Process+ 5 CMD additional domestic requirement)
7.	Source of water	Canal water (Permission obtained or under process) any other source
8.	Boiler	Existing distillery: No separate boiler for existing distillery, steam us taken from Sugar Existing Sugar boiler and cogeneration: 100 TPH TG 18 MW Proposed Distillery: 12 TPH with TG 1.0 MW
9.	DG Set	Existing DG 250 kVA
10.	Fuel	**Existing Sugar Boiler** Bagasse: 36 TPH (864 MTD) **For proposed Incineration boiler** Bagasse 2.2 TPH (55 MTD) Con. Spent wash 1.5 TPH (36 TPD) Coal: 1 TPH
11.	Steam	Existing Sugar steam requirement: 65 TPH Distillery Steam requirement: 7.5 TPH Proposed steam requirement : 8 TPH
12.	Power Requirement	Existing Distillery: 0.5 MW

#	Particulate	Description
		Operating power: 0.7 MW
13.	Total effluent generation	Existing sugar 252.5 CMD Cogeneration boiler 30 CMD Existing distillery trade effluent 240.0 CMD and it is treated through Re-boiler bio-methanation followed MEE along with Bio-composting. Proposed Distillery spent wash generation 266 CMD will be treated through MEE followed by Incineration boiler
14.	Ash	**Existing** Bagasse ash from existing Cogeneration boiler: 17.5 TPD Yeast sludge: 2-3 TPD **Proposed** Bagasse ash : 1 TPD Spent wash ash: 5 TPD Coal ash 8.4 TPD Yeast sludge: 2-3 TPD
15.	Air pollution control measures	Existing stack height 76 m with ESP Proposed stack height 42 m with Wet scrubber /**Electrostatic precipitator**
16.	Man-power	Existing Sugar and Distillery : 600 (Skilled and unskilled) Proposed Distillery : 80 (Skilled and unskilled)
17.	Total project cost	63.57 Cr.
18.	EMP capital cost	3.08 Cr.
19.	CER Cost	94 akhs (Brown field project 15 % of the total cost)

3. Process Description

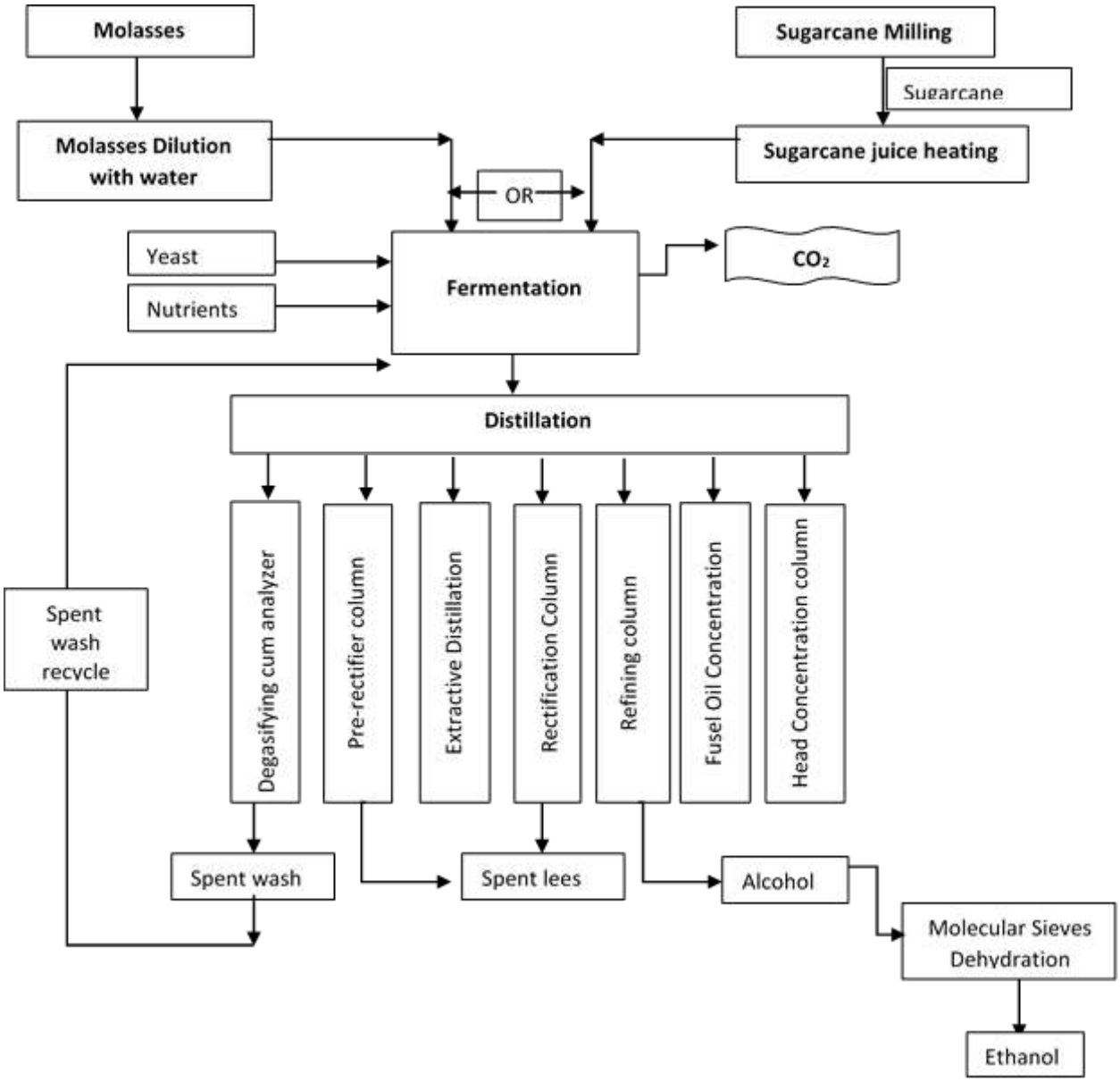

Figure 1: Diagrammatic representation of Manufacturing flow char for the distillery

4. Description of the environment

The study area as per approved standard ToR in SIA/MH/IND2/59505/2020 dated 31-12-2020. The study period conducted was from **Nov 2020 to Jan 2021**. Baseline study has been conducted as per EIA Manual of the MoEFCC and methodologies mentioned in Technical EIA Guidelines Manual for Distilleries by IL&FS Ecosmart Ltd., approved by MoEFCC.

Table 3: Baseline monitoring parameters and frequency

Components	Parameters	Frequency	Methodology adopted	Observation
Ambient air quality	$PM_{2.5}$,PM_{10},SO_2,NO_x,	Ambient air quality samples are monitored at 9 locations for 24 hours twice a week for the study period	PM_{10}/$PM_{2.5}$: Gravimetric method SO_2: Modified West and Gaeke Method. (IS : 5182, Part II) NOx : Jacobs and Hochheiser Method. (IS 5182 Part VI)	All parameters are within NAAQ 2009 standards.
Meteorology	Surface : Wind speed and direction , temperature, relative humidity and rainfall	Secondary data Hourly continuous readings during the study period at plant site secondary data collected IMD	Monitoring data for primary data IS: 8829	Monthly total annual avg. rainfall 924.8 mm (IMD Nanded 1981 – 2010) High recorder temp: 46.7 ^{0}C Lowest recorded : 5^{0}C
Water quality	Physical, Chemical and Bacteriological parameters.	Primary data :- Ground water samples were collected from **8** locations and **2** surface water samples were collected from one locations	Standard methods for Examination of Water and Wastewater' published by American Public Health Association (APHA)	All parameters are within limit except MPN count and E-Coli in surface water.
Ecology	Terrestrial fauna and flora and River ecology	Field survey conducted in 10 km study area, once during the study period	Listing of floral and faunal species.	Accasia sp. Azadirachta indica , Cassia tora, Senna siamea etc. Common mormon, Lemon pansy, green bee-eater, drongo etc
Noise	Noise levels in dB(A)	Continuous 24 – hourly monitoring at **9** locations once	IS: 4954 as adopted by CPCB.	Day: 50.6-62.8 dB(A) Night: 37.6 – 51.5 dB(A)

Components	Parameters	Frequency	Methodology adopted	Observation
		during the study period		
Soil	Physico-chemical	Sampling at **8** locations around project site once during the study period.	BIS specifications	Dark brown to black, clay loam, soil is medium in fertility, good water holding capacity, heavy metal contamination signs not seen.
Socioeconomic Data	Socio-economic characteristics of the affected area	General in 10 km radial study area and data collected around the project site through field visits	-	Sanitation facilities are unsatisfactory, Power supply facility is available in almost villages and town, Drinking water sources is mostly from PWD water supply, Medical facilities in terms of primary health center and primary health sub centers in the rural areas are good.
Land use pattern	Land use for different categories	10 km radius, Based on data published in Primary Census Abstract and satellite imagery LISS –III	Topo-sheets Satellite imageries	Most of the land is Agricultural land followed by Barren land
Geology and hydrogeology	Type, drainage etc.	Field Observations in 10 km study area and from secondary data	Authenticate published data.	Basaltic lava flows, the ground water in Deccan trap basalt occurs mostly in the upper weathered and fractured parts down to 20-25 m depth,

Components	Parameters	Frequency	Methodology adopted	Observation
				alluvium occurs in small areas.

5. Anticipated Environmental Impacts

Anticipated environmental impacts due to operation of the proposed project are given in below Table 4.

Table 4: Anticipated Impacts

Environmental Facets	Anticipated Impacts
Air Environment	Probable increase in concentration of air pollutants due to process, fugitive, and utility emissions.
Water Environment	Generation of industrial & domestic wastewater.
Land Environment	Impacts on land due to improper disposal of hazardous/ solid waste.
Ecological Environment	Positive as greenbelt of appropriate width will be developed and maintained by the factory in the area. No impacts are envisaged on aquatic flora & fauna as there will be zero effluent discharge outside the plant premises.
Social Environment	Overall development of the area in respect of the infrastructure development, educational growth, health facilities etc.
Economic Environment	Positive impacts on economy of the region and the country as the Alcohol will be exported and revenue generation.
Noise Environment	Minor increase in noise level within the project area.
Occupational Health & Safety	Major health hazards are identified in worst case scenario.

6. Environmental Monitoring Program

Table 5: Environmental monitoring schedule

Sr. No.	Particulate	Parameters	Number of location	Frequency
1.	Ambient air quality	PM_{10}, $PM_{2.5}$, SO_2, NOx, CO, etc.	Ambient air quality at minimum 3 locations. Two samples downwind direction at 500m and 1000m respectively. One sample upwind direction at 500m.	Monthly
2.	Stack gas	PM, SO_2 and NOx	Number of stacks	Monthly
			Online stack monitoring is installed for existing system.	-
3.	Work place	$PM_{2.5}$, SO_2, NOx, CO, O_3	Process emission in workplace area/plants (for each area/plant minimum 2 locations and 1 location outside plant area near vent)	Monthly
4.				Monthly

	Waste water	pH, EC, SS, TDS, O&G, Ammonical Nitrogen, COD, BOD, Chloride, Sulphides etc.	Camera at spent wash tank is also installed.	
5.	Surface water and Ground water	pH, Salinity, Conductivity, TDS, Turbidity, DO, BOD, Phosphate, Nitrates, Sulphates, Chlorides, Total Coliforms (TC) & *E.Coli*	3-5 location Ground as well as Surface water. Within 1 km radius from spent wash tank and compost yard. 2 locations downward 1 location upward additional three locations within 10 km radius from the site. River sample One each at upstream and downstream	Half yearly
6.	Solid waste	Ash	• Sludge and ash. • Before used as manure if used manure	Monthly
7.	Soil Organic and Inorganic matter	N, P, K, moisture, EC, heavy metals etc.	At lands utilizing compost manure and treated effluent, 3 locations	Pre – monsoon and Post monsoon
8.	Noise	Equivalent noise level - dB (A) at min. Noise Levels measurement at high noise generating places as well as sensitive receptors in the vicinity	5 location At all source and outside the Plant area.	Monthly
9.	Green belt	Number of plantation (units), number of survived plants/ trees, number of poor plant/ trees.	In and around the plant site	Monthly
10.	Soil	Texture, pH, electrical conductivity, cation exchange capacity, alkali metals, Sodium Absorption Ratio (SAR), permeability, porosity.	2-3 near Solid/ hazardous waste storage. At least five locations from Greenbelt and area where manure of biological waste is applied. Near spent wash storage lagoon	Quarterly

11.	Occupational health	Health and fitness checkup of employees getting exposed to various hazards and all other staff	All worker	Yearly/ twice a year
12.	Emergency preparedness, such as fire fighting	Fire protection and safety measures to take care of fire and explosion hazards, to be assessed and steps taken for their prevention.	Mock drill records, on site emergency plan, evacuation plan	Monthly during operation phase

7. Additional Studies

The following Additional Studies are to be done in reference to the awarded Terms of References issued by MoEFCC, New Delhi.

- Public Consultation

8. Project Benefits

- Readily available infrastructure, fuel, & water for renewable energy power generation project.
- Provides an initiative to sugar mill to concentrate more on conservation of energy & reduction of operating cost, thereby improving their profitability of operation.
- Saves the expenditure on safe storage and disposal of bagasse.
- Benefits of quick return on biomass power capital investment and generation of additional revenue.
- The economic benefits available to the sugar factories from sale of exportable surplus and improvement in the operations
- Entire integrated project is proposed to be set up based on the stand-alone commercial viability of each component of the project.
- The current bio-fuel policy of the Government of India, the government has allowed the use of B- heavy molasses, cane juice and waste grain for production of fuel ethanol and is pushing the use of these feedstock (B-molasses & Cane juice in particular) by fixing better prices for ethanol manufactured from these raw materials as compared to Sugar.

9. Environmental Management Plan

Following mitigation measures shall be adopted by factory to minimize the impact of project on the surrounding environment.

Table 6: EMP for various Environmental Attributes

Environmental Attributes	Mitigation Measures
Air Quality Management	**Process Emission** • **Wet scrubber /Electrostatic precipitator** shall be provided for air pollution control equipment. • The whole process will be carried out in closed condition so as to avoid any chances of VOC emissions. **Utility Emission** • All the D.G. sets shall be standby arrangement and will only be used during power failure. • Adequate stack height shall be provided to Boiler and D.G. sets. • **Wet scrubber /Electrostatic precipitator** shall be provided as an air pollution control device to the boiler. **Fugitive Emission** • The main raw material and product shall be brought in and dispatched by road in covered enclosures. • Dust suppression on haul roads shall be done at regular intervals.
Water & Wastewater Management	• The proposed Sugar and distillery would be based on "Zero Liquid Discharge "technology. • Spent Total Spent wash generation will be 600 CMD. For Existing Distillery Spent wash will be treated trough Multi effect evaporator (MEE) followed Bio composting. For proposed Distillery Spent wash will be treated trough Multi effect evaporator (MEE) followed by **12** TPH Incineration boiler. • Domestic wastewater will be partly sent to existing sugar ETP and partly send to septic tank via soak pits. • Proper storm water drainage will be provided during rainy season to avoid mixing of storm water with effluent. • Rain water harvesting from the catchment area will be done for the proposed distillery project.
Noise Management	• Closed room shall be provided for all the utilities so as to attenuate the noise pollution. • Acoustic enclosure shall be provided to D.G sets. • Free flow of traffic movement shall be maintained. Earmuffs shall be used while running equipment's of the plant. • Proper maintenance, oiling and greasing of machines at regular intervals shall be done to reduce generation of noise. • Greenbelt shall be developed around the periphery of the plant to reduce noise levels.
Odor Management	• Odor shall be primarily controlled at source by good operational practices, including physical and management control measures. • Better housekeeping will maintain good hygiene condition by regular steaming of all fermentation equipment. • Use of efficient biocides to control bacterial contamination. • Control of temperature during fermentation to avoid in-activation/ killing of yeast.

	• Avoid staling of fermented wash.
Solid & Hazardous Waste Management	• The hazardous waste i.e. spent oil generated shall be very minor and shall be burnt in boiler along with fuel. • Bagasse and spent wash ash will be used as manure • CPU & yeast sludge can be used in greenbelt development
Traffic Management	• Culverts shall be maintained. • The trucks carrying raw material & fuel shall be covered to reduce any fugitive dust generation. • Good traffic management system shall be developed and implemented for the incoming and outgoing vehicles so as to avoid congestion on the public road.
Green Belt Development / Plantation	• Plantation shall been done as per Central Pollution Control Board (CPCB) Norms. • The plantation in and around the plant site helps/will help to attenuate the pollution level. • Native species shall be given priority for Avenue plantation.
Corporate Social Responsibility	• An amount of **INR 64 lakhs** (1% of the total cost) will be allocated for CSR activities in the coming 3 years which will be utilized on the basis of requirement for weaker sections of the society for next 3 years.
Occupational Health & Safety	• Factory shall monitor the health of its worker before placement and periodically examine during the employment • Health effects of various activities and health hazard if any observed shall be recorded and discussed with the health experts for corrective and preventive actions need to be taken by the industry • All safety gear shall be provided to workers and care shall be taken by EMC that these are used properly by them. All safety norms shall be followed