

## EXECUTIVE SUMMARY

### ES.1 Project Description

M/s. Belgaum Sugars Pvt. Ltd. (BSPL) - Distillery Division has proposed to Establish Multi feed (Juice/Grain) based Distillery unit of capacity 400 KLD at Sy. Nos. 56/2, 59/1, 59/2, 59/3, 59/4, 59/5, 59/6, 60/1, 60/2, 60/3, 60/4, 60/5, 65/1, 65/3, 65/6, 68/3, 68/6+5B, 68/5B, 68/10, 68/7,68/4A, 68/4B, 68/4C, 68/4D, 69/1, 69/2, 69/3, 69/4, 69/5, 69/7, 69/9 of Hudali Village, Belagavi Taluk, Belagavi District, Karnataka. The Land required for the proposed project is 5 Acres 38 Guntas which is carved out from the total land area of 50 Acres 30 Guntas of existing Sugar complex. The ToR documents were submitted for issuance of ToR vide proposal No. IA/KA/IND2/231970/2021 on 29.09.2021 and accordingly, the ToR was issued on 05/10/2021 vide letter No. File No. IA-J-11011/409/2021-IA-II (I) by MoEF & CC, GoI. The Environmental Impact Assessment (EIA) report is based on ToR issued and the structure is as per EIA notification, 2006.

The salient features of the project are as follows:

Sl. No.	Items	Particulars
1.	Objective of the Project	Establishment of 400 KLD Multi feed (juice/Grain) based Distillery unit.
2.	Promoters	M/s. Belgaum Sugars Pvt. Ltd. – Distillery Division
3.	Project Location	Sy. Nos. 56/2, 59/1, 59/2, 59/3, 59/4, 59/5, 59/6, 60/1, 60/2, 60/3, 60/4, 60/5, 65/1, 65/3, 65/6, 68/3, 68/6+5B, 68/5B, 68/10, 68/7,68/4A, 68/4B, 68/4C, 68/4D, 69/1, 69/2, 69/3, 69/4, 69/5, 69/7, 69/9 of Hudali Village, Belagavi Taluk, Belagavi District, Karnataka.
4.	Total Investment	Rs. 198 Crores
5.	Latitude and Longitude	15°58'32.77"N & 74°39'52.08"E
6.	Category	5 (g) Distillery, Category 'A' >100 KLD
7.	Water Demand and Source	<p><b>Source of water: Markandeya River</b></p> <p><b>Water Requirement For Syrup Based Ethanol Production</b></p> <ul style="list-style-type: none"> <li>• Fresh Water Required : 1637.63 m<sup>3</sup>/day</li> <li>• Water CPU Recycled: 1882.65 m<sup>3</sup>/day</li> <li>• Total Water Requirement : 3520.28 m<sup>3</sup>/day</li> </ul> <p><b>Water Requirement for Grain Based Ethanol Production</b></p> <ul style="list-style-type: none"> <li>• Fresh Water Required : 1987.6 m<sup>3</sup>/day</li> <li>• Water CPU Recycled : 1855.87 m<sup>3</sup>/day</li> <li>• Total Water Requirement : 3843.5 m<sup>3</sup>/day</li> </ul>

Sl. No.	Items	Particulars
8.	Power Supply	<p><b>Construction Phase :</b> Power requirement During Construction Phase – 0.50 MW Power requirement will be met from existing 14 MW Co-generation unit.</p> <p><b>Operational Phase</b> Power Requirement for Cane Juice/Syrup based ethanol Production – 4655 KWH Power Requirement for Grain based Ethanol Production – 6325 KWH Power requirement will be met from proposed Co-generation unit of 36 MW/Hr for which EC has been obtained</p>
9.	No. of Working days	330 days
10.	Total Manpower (during operation phase)	200 Nos.

## ES.2 Raw Material Requirement & Product/by-products from proposed Distillery

Sl. No.	Raw Material	Quantity	Mode of Transport	Source	Storage
1	Cane Juice/ Syrup	1380 TPD for 120 days	Pipelines/ Tankers	From own sugar complex	-
2	Grain	936 TPD for 210 days	By Road in covered Trucks	Nearby open markets in Belagavi / Hudali	Grain Silos
<b>Chemicals / Nutrients</b>					
1	Sulphuric Acid	800 litres/ day	Tankers	Nearest Market	Acid proof tank
2	DAP	400 Kg/ day	Truck	Local	50 Kg Bags in Chemical store room
3	Urea	1400 Kg/ day	Truck	Local	50 Kg Bags in Chemical store room
4	Antifoam	700 Kg/ day	Truck	Local	Acid proof tank in Chemical store room

Sl. No.	Raw Material	Quantity	Mode of Transport	Source	Storage
5	Yeast culture / Enzyme	550 Kg/ day	Truck	From Local Manufacturers	In 10 Kg drums, separately stored in Yeast store room

• **Products and By-products**

Sl. No.	Particulars	Quantity	
<b>Product</b>			
1	Ethanol	400 KLD	
<b>By- Products</b>			
2	Spent wash powder or Potash derived from spent wash	75 TPD (Juice mode)	77.65 TPD (Grain mode)
3	CO <sub>2</sub>	320TPD	
4	Yeast Sludge	30 MT/day	
5	DDGS (Dried Distillers Grains Soluble)	193 TPD (Grain mode)	

### ES.3 Criteria for Site Selection and Resource Requirement

The proposed site location is ideal because of suitable raw material availability and transportation of raw material is easier since the project site is nearest to SH 54 Road is passing adjacent to the M/s. Belgaum Sugars Pvt. Ltd., Hence good accessibility. There are no National Parks/Tiger Reserves/Elephant corridors within 10 km radius of the project site.

Sl.No.	Particulars	Details
1.	Land (Acre)	M/s. Belgaum Sugars Pvt. Ltd., (BSPL) has existing sugar complex with the total land area of 50 Acres 30 Guntas out of which 5 Acres 38 Guntas will be utilized for the establishment of proposed distillery and 17 Acres of land is reserved for green belt development.
2.	Power Source & Requirement	Source of Power is existing Co-generation unit of 36 MW/Hr in the Sugar Complex During Operation Phase Power Requirement for Cane Juice/Syrup based ethanol Production – 4655 KWH Power Requirement for Grain based ethanol Production – 6325 KWH
3.	Boiler	Existing Boiler of capacity 80 TPH
4.	APCE	Electro Static Precipitator (ESP) attached to common chimney

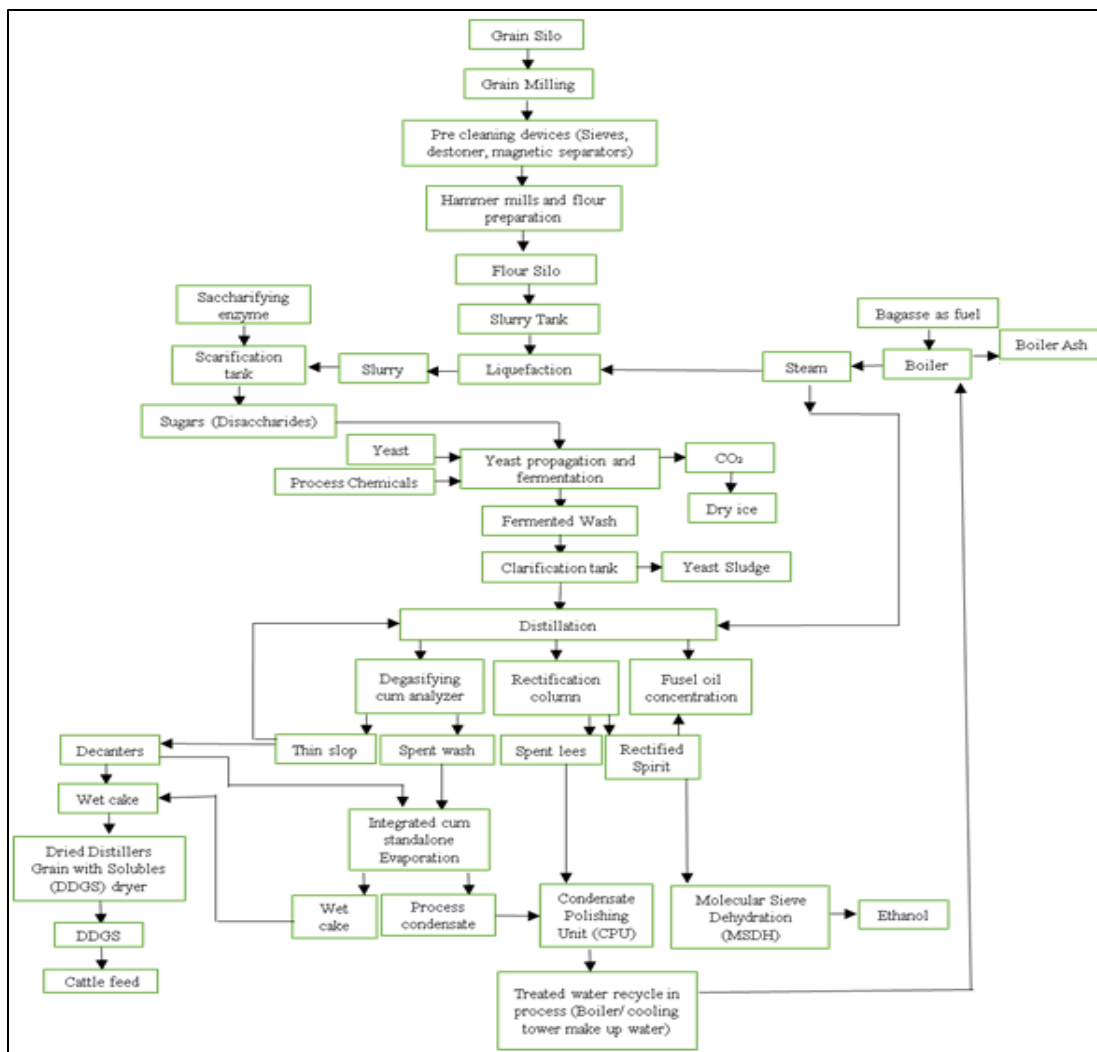
		of height 85 meters
5.	DG Set as a backup power	The Existing DG set of capacity 1250 KVA with stack as per KSPCB norms.

## ES.4 Process Description

The Process Description of Grain Based Ethanol

- Milling Section
- Liquefaction Section
- Pre Liquefaction
- Jet Cooking
- Post Liquefaction
- Partial Pre Saccharification Process
- Fermentation Section
- Multi Pressure Vacuum Distillation
- Dehydration Technology
- Evaporation

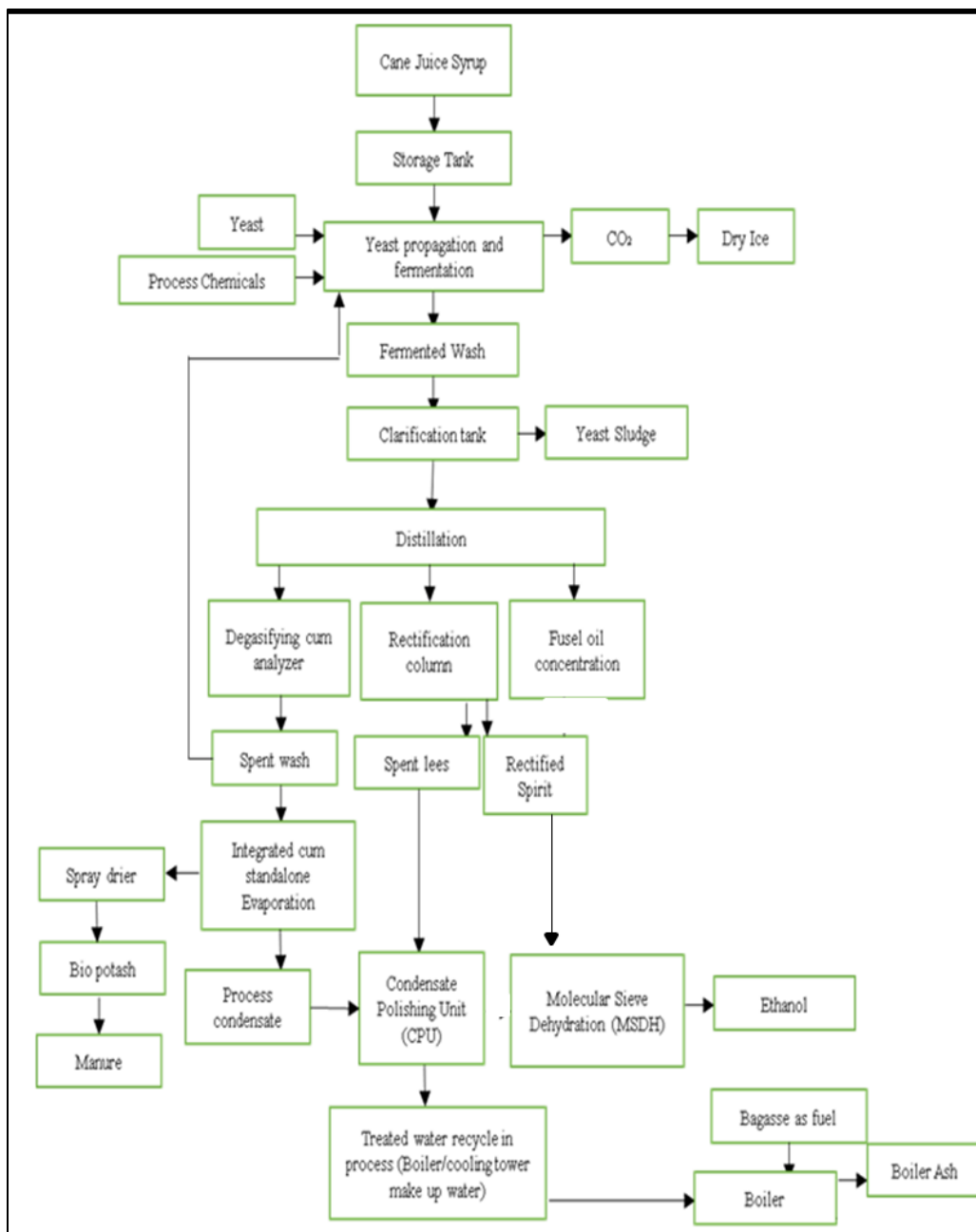
The detailed manufacturing process is explained in process flow chart for Grain Based Ethanol Production



Process flowchart- Grain Based Ethanol Production

### Process Description of Cane Juice Based Ethanol Production

- Feed Preparation and weighing
- Yeast Propagation and Fermentation
- Multi-pressure Distillation



Process flowchart- Cane Juice Syrup Based Ethanol

## ES.5 Present Status of Environment

In order to assess the baseline environment of the project site, monitoring of various environmental attributes were conducted by EHSCPL during October 2021 to December 2021. In addition to the baseline monitoring, field inspection of study area within 10 Km radius, collection of secondary data and discussion with neighbourhood public, officials were done by the study team.

**Land Use:** In the study area of 10 Km radius majority of the project buffer (Outside the proposed industrial premises) is open Scrub occupying an area of 14114 Ha (42.12%) followed by Deciduous forest is 7345 Ha (21.92%). Fallow land occupying an area of 5604 Ha representing about 16.72 %, Sparse Vegetation area is another land use occupying an area of 2806 Ha with 8.38 %. Next in the order are Agriculture land of 2205 Ha (6.58 %), water body contributing to 2.98 % with an area of 997 Ha, lastly Settlement is 437 Ha with 1.30%.

**Meteorology:** Meteorological monitoring was carried out at project site during October 2021 to December 2021. The average temperature during the year ranges from 18 °C to 32°C. The total rainfall in 2020 was 460 mm.

**Air Environment:** Ambient air quality monitoring was carried out at 8 locations including one downwind and one upwind direction. The AAQM results for PM<sub>10</sub> (55.48 µg/m<sup>3</sup> to 72.43 µg/m<sup>3</sup>), PM<sub>2.5</sub> (20.39 µg/m<sup>3</sup> to 31.13 µg/m<sup>3</sup>), SO<sub>2</sub> (4.91 µg/m<sup>3</sup> to 7.37 µg/m<sup>3</sup>), NO<sub>2</sub> (14.88 µg/m<sup>3</sup> to 22.76 µg/m<sup>3</sup>), CO (0.63 mg/m<sup>3</sup> to 1.22 mg/m<sup>3</sup>), NH<sub>3</sub> (4.93 µg/m<sup>3</sup> to 7.01 µg/m<sup>3</sup>) and O<sub>3</sub> (1.12 µg/m<sup>3</sup> to 1.94 µg/m<sup>3</sup>) were well within the standards stipulated by NAAQ standards, 2009. Lead & Nickel are found in trace quantities in the study area. The rest of the parameters as per NAAQ, 2009 were found to be below detectable limit. AQI of the study area was calculated and found to be good for all the parameters.

**Noise Levels:** The ambient noise level monitoring was conducted at 8 locations in and around the project site. The noise levels were in the range of 42.01 to 71.30 dB(A) during day time and 34.32 to 53.58 dB(A) during night time. The results of noise levels during day and night were found to be within CPCB standards.

**Surface Water Quality:** Surface Water sampling analysis is carried out at 7 locations in the study area. Analysis reports reveals that, the surface water quality in the study area are of Good quality (SW-1, SW-2, SW-3, SW-4, SW-5, SW-6 & SW-7). The DO levels were found to be ranging from 4 mg/L (SW-7) to 5.7 mg/L (SW-1, SW-4 & SW-5) with mean value of 5.04 mg/L, BOD levels ranging from 21 mg/L (SW-4) to 60 mg/L (SW-1) with mean value of 36 mg/L and COD levels ranging from 60 mg/L (SW-4) to 180 mg/L (SW-1) with mean value 113.4 mg/L.

**Ground Water Quality:** Ground water (Bore well) samples were collected at 8 locations and analysed to know the baseline water environment. The pH ranges from 6.63 (GW-8) to 7.22 (GW-2) with mean value of 6.94. The total suspended solids were detected in five samples out of eight samples, whose values ranges from 1 mg/L (GW-7) to 3 mg/L (GW-5) with mean value of 2 mg/L. The Electrical conductivity of the ground water samples ranges from 339 µs/cm (GW-8) to 2080 µs/cm (GW-5) with mean value of 1108.63 µs/cm. The Potassium values ranges from 0.40 mg/L (GW-7) to 16.60 mg/L (GW-5) with mean value of 4.40 mg/L, Calcium values ranges from 20 mg/L (GW-8) to 112 mg/L (GW-2) with mean value of 67.68 mg/L. Magnesium values ranges from 3.645 mg/L (GW-8) to 51.03 mg/L (GW-5) with mean value of 24.82 mg/L. As per the IS 10500:2012 Standards (Second revision), all the values are well within the standards.

**Geology:** Unclassified Gneisses and Granites with inclusions of Schistose Rocks of Archean Age, Variegated Limestone, Unclassified Sandstone, Cherty Limestone with Shale (Kaladgi

Group) and Sandstone with Conglomerate (Badami Group) belonging to Kaladgi Super Group of Upper Proterozoic period. Alluvium and Soils of Recent period were underlain by Basalt of Deccan Traps belonging to Upper Cretaceous to Lower Eocene period.

**Hydrogeology:** The general flow direction of groundwater in the study area is towards East. The depth to water level varied between 8.0 to 30 m. The annual water level fluctuation is reported to be varying between 2.0 to 8.0 m in the study area.

**Biological Environment:** The project area is predominantly surrounded by agricultural lands in all direction throughout the 10 km radius. Therefore, to understand the ecological status of the study area, the entire study area is divided into four quartiles i.e., NW, NE, SE and SW.

During the studies, a total of 11,513 tree species were found in the project site in which 10,803 species falls in below 30 cm GBH (girth at breast height) and 710 species of trees falls in above 30 cm GBH.

A total of 26 tree species (n=710) belonging to 15 families were recorded project site possess above 30 cm GBH and the predominant tree species recorded are *Muntingia calabura* L. (n=209), *Roystonea regia* (Kunth) O.F.Cook (n=160), *Terminalia catappa* L. (n=48) and *Thespesia populnea* (L.) Sol. ex Corrêa (n=44). A total of 15 families were recorded in the tree species where the dominant families are Fabaceae (n=8) followed by Arecaceae, Meliaceae, Moraceae and Myrtaceae which consist of 2 species per family.

The proposed project M/s. Belgaum Sugars Pvt. Ltd. (BSPL) falls under Northern Transition Zone of agro-climatic region. The project site is surrounded by agricultural land, Shirur dam canal and reserve forest. As per the IUCN conservation status, 2021 *Santalum album* Linn and *Dalbergia latifolia* Roxb. are the only Vulnerable tree species recorded in Project site and Study area respectively. There is no protected area and eco sensitive area present in the study area. A wide variant bird species recorded in the project site and study area, as per the Wildlife (Protection) Act, 1972 Black Kite and Shikra are the Schedule I bird species and Crimson rose is the only one schedule I butterfly species recorded in the study area. Similarly, Crimson rose is the only schedule I butterfly species recorded in the project site.

**Socio Economic Studies:** Socio-economic survey was conducted through field survey which was carried out in 18 sample villages from the total 25 villages in the project area. The potential respondents in the sample households were contacted personally by the field investigators who explain the purpose of the visit and seek their participation by sharing relevant information impartially within 10 km radius and the perceptions of the respondents in surrounding areas are summarized as follows:

- Industrial growth in the region has significantly supported the sustainable livelihoods in the area especially for skilled and semi-skilled persons.
- Development of the secondary sector in the area has positively contributed to induced development leading to creation of multiplier self and wage employment opportunities.
- It would help further strengthen infrastructure development in the area.



## **ES.6 Anticipated Environmental Impacts and Mitigation Measures**

### **ES.6.1 Land Environment**

- **During Construction Phase**

Deposition of dust on trees/vegetation/crops around the industry is anticipated due to the emission of particulate matter during construction phase. This may affect the photosynthetic activity and the rate of transpiration of the species located up to 4 Km radius from the project site. Reduction in tree species having capacity to absorb air pollution and reduces carbon sequestration capacity

Water sprinkling 2 to 3 times per day in the construction area and providing temporary barricades to reduce the dust deposition on crops and trees. The loss of vegetation during construction phase is temporary. Plantation will be increased & same will act as pollution sink as 33% of total site area will be brought under greenbelt development all along the periphery.

- **During Operation Phase**

Discharge of untreated spent wash, spent lees & condensate from the industry on the land will leads to formation of organic acids during decomposition and thereby causing immobilization of plant nutrients, death of many soil organisms in the soil can lead to change in soil structure. Deposition of fly ash from the exhaust stacks on the surrounding agricultural lands will leads to reduction of transpiration and guttation in the plants, decreases in crop yield and deposition of toxic substances present in fly ash on plants. Improper handling of hazardous and non-hazardous wastes generated will creates soil contamination and accidental spillage of chemicals during storage, handling, leakage of pumps and in pipelines within the industrial site will contaminate soil and ground water regime.

Spent wash which is high in BOD/COD/TDS will be concentrated using MEE & further it will be dried to derive Potash powder & sold to farmers as manure. Condensate Polishing Unit of 2400 KLD has been proposed to treat the condensate & spent lees generated from the Distillery process. Fly ash is generated as a result of combustion will be captured in an electrostatic precipitator (ESP) before the flue gases reach the stack. These ESP generally have multiple pyramidal hoppers at the bottom, in which the ash is collected by gravity and then is transferred to a storage silo. The yeast sludge and ETP sludge will be reused as manure and Boiler ash will be sold to brick manufacturers & the industrial premises of all such storage areas will be made impervious.

### **ES.6.2 Solid and Hazardous Waste Generation**

- **During Construction Phase**

The major solid waste generated during construction phase will be construction/concrete debris. Some metal waste, oil and grease from construction machines. Improper disposal of the hazardous waste such as solvents, paints, used oil from DG sets will lead to create soil and

ground water pollution. The generated top soil during construction phase will be stored separately and it will be reused for green belt development purpose. The generated domestic solid waste will be segregated into organic and inorganic wastes and handed over to nearby municipality.

- **During Operation Phase**

Solid waste will be generated mainly in the form of fly ash, press mud, yeast sludge. Improper handling of solid waste generated will lead to soil deterioration of land environment and in turn ground water pollution. Improper handling of used oil from DG sets will also affect the soil and ground water.

The generated domestic solid waste is segregated as organic and inorganic wastes, then it is handed over to local municipal. Used Oil and oil soaked cotton waste will be stored at an identified place, in leak proof drums & will be handed over to KSPCB Authorized recyclers.

### **ES.6.3 Air Environment**

- **During Construction Phase**

Main sources of emission during the construction are the dust emitted during levelling, grading, earthworks, formation works, movement of equipment, vehicles and other activities. The vehicles used for transportation of construction material will be with valid PUC. Temporary sheds will be developed in order to store the construction material inside the project premises. The machinery used for construction purpose will be properly maintained and serviced.

- **During Operational Phase**

The sources of air pollution are emission from 80 TPH Boiler and the existing DG Set of 1250 KVA. The fugitive emissions will be from activities viz. loading / unloading of bagasse and coal, transportation of raw materials and from fly ash to respective storage areas. Regular water sprinkling on all exposed surfaces will be carried out to suppress dust, erecting the high barricades/walls to act as wind shield during storage of raw materials. Cleaning the return conveyer belt to remove loose dust. The speed limit of 30 km/hr will be maintained for Vehicles within the premise. Implementation of correct loading and unloading practices. Materials shall be transported in securely covered trucks to reduce dust emission. The height of common stack of 85 m from AGL is to 80 TPH Boiler and stack 30 of mtrs height is provided for existing DG set as per KSPCB Norms. The Boiler/Boilers will be connected to ESP followed by Chimney as per CPCB to mitigate the pollution with the efficiency of 96%.

### **ES.6.4 Noise Environment**

- **During Construction Phase**

The source of noise during construction period will be due to movement of construction vehicles, noise from construction equipment like dozer, scrapers, concrete mixers, cranes, Pumps, compressors, and use of DG sets. Operation of these machineries will generate the noise level in the range of 78 -85 dB(A) near the source. Chronic exposure to high noise will lead to varying degree of damage to human hearing system, Sleep deprivation, annoyance, stress, poor

concentration, mental fatigue and headache. The noise control measures during construction phase includes selection of low noise generating equipment's, provisions of caps for the equipment and regular maintenance of the equipment's.

The workers exposed to the high noise area will be provided with PPE like ear muff/ plugs to the workers. The high noise zones at site will be demarcated and provided with enclosures & barriers also, these activities will be restricted only for daytime. Where ever possible, equipment will be provided with silencers and mufflers. Overall, the impact of increase in noise on the environment would be insignificant, as it will be localized and mainly confined to the day hours.

- **During Operational Phase**

Primarily noise will be generated from equipment's such as Boiler's, Steam turbine, DG sets and process operations. Exposure to high noise causes varying degree of damage to human hearing system which is initially reversible. Sleep deprivation, annoyance, stress, poor concentration, mental fatigue and headache are few of the other effects which are caused due to prolonged exposure to high level noise.

The levels of outdoor Noise, whether they are intrusive or the normal background environment, vary extensively at distances greater than about a hundred meters from the source. This variation is caused by changes in weather conditions and by topographical features such as ground cover, hills and other obstacles between the source and the receiver.

## **ES.6.5 Hydrology & Geology**

The formation of pits, excavation of top soil and weathered portion for formation of pits for foundation. Collapse of top soil and weathered portion and fly rock due to blasting anticipated. To harness the storm water, harvesting structures are suggested within the Project area to augment the declining water levels.

The collapse can be avoided by formation of benches of 1.5 m to 3.0 m height for working conveniently and making access to sub surface level for excavation. Percolation pits at 6 places shall be constructed with dimensions 10 m X 10 m X 3m depth to harvest the roof top water during monsoon to augment the water levels of the aquifer.

## **ES.6.6 Water environment**

- **During Construction Phase**

Impact on water quality during construction phase will be mainly due to sewage generated from the labour camp from construction workers. Oil spillage from vehicles and machines like DG sets used at the construction site. during construction activities, run off from the construction site may contain more of eroded soil and loose materials that may contaminate the surface water.

Labour camp and the surrounding area will be maintained clean & tidy by proper drainage system, raw sewage collection tank etc. The DG Sets used as backup power will generate small quantity of used oil & oil-soaked cotton waste which will be stored at an identified place, in a leak proof barrel & disposed to KSPCB Authorized vendors as per HWM Rule 2016. By

segregating the construction area and construction of concrete drains for storm water, contamination will be prevented.

- **During Operational Phase**

Improper Storage of spent wash will contaminate ground water, as the spent wash has the very high levels organic contents which will create high pollution. Effluent from the distillery if not treated and disposed properly, will contaminate both the surface and ground water. The unscientific treatment and disposal of generated sewage from industry workers will lead to sub-surface soil pollution and contaminate ground water due to infiltration.

Distillery effluent such as condensate, spent lees and other waste water from processing will be treated in Condensate polishing unit (CPU capacity 2400 KLD) & reused for process. Effluent generated from Sugar Plant will be treated in existing Effluent Treatment Plant (ETP of capacity 780 KLD) and reused for greenbelt development. Generated Sewage will be treated in sewage treatment plant of capacity 10 KLD (SBR Technology).

### **ES.6.7 Biological Environment**

- **During Construction Phase**

A total of 710 trees recorded in the project site and no trees will be removed for the proposed of the project. There will be changes in the ecosystem it can be immediate or later effect.

This would have changes in micro climate conditions of the area the birds, small sized mammals and reptiles will be disturbed in their natural activity and moment due to production of noise, air pollution and water pollution from the proposed construction activities

The trucks carrying construction and raw material will be covered in order to prevent the fugitive emissions/dust emissions due to material handling.

- **During Operational Phase**

Improper disposal of the Solid waste and Hazardous waste which affects the plants growth due to unavailable of nutrients in the top layer (soil erosion) and also leads to death of soil micro organisms. Chances of Forest Fire and loss of habitat due to risks and hazards of the industry since the RF are adjacent to the project site.

The acoustic enclosures will be provided to DG set and smooth vehicular movement will be adopted to reduce noise levels. Proper management of solid and hazardous waste, waste water will treated by installing Zero liquid discharge, hence there is no industrial waste disposal on land or to nearby water bodies.

### **ES.6.8 Socio Economic Environment**

- **During Construction Phase**

There is no impact on natural resources sustainability, land, human settlement, livelihoods, and economic development. During the construction phase, around 150-200 construction labourers will get direct employment (non-technical) opportunities. Local villagers will get an employment for all recruitments of non-technical (Temporary /Permanent).

- **During Operational Phase**

During the operational phase a total of 200 personal will get job opportunities in skilled, semi-skilled and unskilled works. Sufficient stack height will be provided and regular monitoring will be carried out to know about air emissions. Installing appropriate equipment to check air pollution Conducting Entrepreneurship Development Camps to nurture entrepreneurial talents among the local youth.

## **ES.7 Environment Monitoring Programme**

The Environmental Monitoring Programme will be strictly implemented during construction and operational phases which will cost Rs. 28,030/month during construction phase and Rs. 43,515/month during operational phase. Report on Six monthly compliance to the EC conditions will be submitted to Integrated RO, MoEF & CC, Bengaluru. Similarly, the monthly Environmental Monitoring reports will be submitted to Regional office, KSPCB, Belagavi and the Environment Statement will be submitted every year to Regional Office, KSPCB, Belagavi.

## **ES.8 Project Benefits**

- M/s. BSPL continues to recruit skilled, semi-skilled & unskilled workers from the nearby villages for the proposed Distillery project which improves socio-economic status of the people of the surroundings It creates employment opportunities to 200 Nos. directly & indirectly from the proposed project.
- The management will continue its support to the local administration and provide other form of assistance for the development of public amenities viz., water distribution, building of school rooms, health centers, Education programme, Health camps, Agricultural programmes & sponsorships to meritorious students
- Green belt of 17 acres (33.33 % of total area of 50 Acres 30 Guntas) is reserved for both existing and proposed industry. Out of which 15 acres is developed for existing sugar and co-gen unit remaining 2 acres is reserved for proposed distillery unit.
- The socio-economic status of the local people will further improve, there by infrastructure facilities like roads, communication systems etc., will improve.
- The land rates in the area will improve in the nearby areas due to the implementation of the project. This will help in overall improvement of healthcare facilities, educational facilities, infrastructure facilities & socio-economic status of the people in the surrounding area.

## ES.9 Environment Management Plan

The EMP consists of summary of impacts, mitigation measures, allocation of resources, responsibility and time frame for implementation. The EMP for the project is given below.

Sl. No	Environmental Attributes	Impacts	Mitigation Measures	Time Frame
<b>A. Construction Phase (Capital Cost)</b>				
1.	Air Pollution	Increase in Particulate matter due to movement of vehicles and use of DG sets for construction activities.	<ul style="list-style-type: none"> <li>Regular water sprinkling will be carried out to suppress the dust.</li> <li>It will be ensured that diesel powered vehicles and construction machinery are properly maintained to minimize the exhaust emissions.</li> <li>The machinery used for construction purpose will be properly maintained and serviced.</li> </ul>	During construction phase
2.	Noise Levels	Increased noise level affects the health of the workforce & tranquility of surrounding.	<ul style="list-style-type: none"> <li>The noise control measures include selection of low noise generating equipment's, provisions of caps for the equipment and regular maintenance of the equipment's</li> <li>The workers exposed to the high noise area will be provided with PPEs like ear muff/ plugs to the workers.</li> <li>The high noise zones at site will be demarcated and provided with enclosures &amp; barriers also, those activities will be restricted only for day.</li> <li>Where ever possible, equipment will be provided with silencers and mufflers</li> </ul>	During construction phase
3.	Water quality	Oil spillage and sewage if left logging will percolate & contaminate ground water. Also it will contaminate surface water through run-off and cause a breeding	<ul style="list-style-type: none"> <li>Labour camp and the surrounding area will be maintained clean &amp; tidy by proper drainage system, raw sewage collection tank etc. The DG Sets used as backup power will generate small quantity of used oil &amp; oil soaked cotton waste which will be stored at an identified place, in a leak proof barrel &amp; disposed to KSPCB Authorized vendors as per</li> </ul>	During Construction phase

Sl. No	Environmental Attributes	Impacts	Mitigation Measures	Time Frame
		place for vector borne diseases and cause health impacts.	<p>HWM Rule 2016.</p> <ul style="list-style-type: none"> <li>Oil interceptors will be used; also vehicles will be washed at the designated place to control spillage at the site and accidental spillages to be cleaned up promptly.</li> <li>By segregating the construction area and construction of concrete drains for storm water, contamination will be prevented.</li> <li>The generated sewage from labour camps will be treated in mobile STP.</li> </ul>	
4.	Soil	Temporary displacement of soil may be envisaged.	<ul style="list-style-type: none"> <li>Excavated earth shall be stored separately and fully utilized for green belt development. Garland drains shall be constructed to arrest the surface run off and soil erosion. The drains shall be frequently desilted for free flow of water.</li> <li>Water sprinkling through sprinklers/tankers (Suggested time period: 2 - 3 times/day)</li> <li>All road drainage structures (ditches, out sloping, culverts, water bars, dips, etc.) will be in place as soon as possible during the construction of the road. Surface water drainage will be provided for sites associated with road construction such as waste areas, borrow areas and rock pits. All drainage water will be filtered through natural vegetation before it enters streams.</li> <li>Soil binding and fast growing vegetation grass would be grown around the construction site before commencement of construction activity to reduce soil erosion;</li> </ul>	During construction phase
5.	Ecology and Biodiversity	Slight impact on EB due to construction activity, displacement of habitat,	<ul style="list-style-type: none"> <li>Green belt development is scientifically planned to compensate the impact on EB.</li> <li>Native species of trees will be proposed to be</li> </ul>	During construction phase

Sl. No	Environmental Attributes	Impacts	Mitigation Measures	Time Frame
		tree cutting or transplantation etc.,	planted all along the periphery.	
6.	Hydrology & geology	No Impacts	<ul style="list-style-type: none"> <li>Rain water harvesting plan will be implemented scientifically.</li> </ul>	During construction phase
7.	Traffic Management	Increase in dust due to fast movement of vehicles, also due to rise in dust chances of low visibility may result in accidents	<ul style="list-style-type: none"> <li>Speed restriction on vehicles &lt;15 KMPH same will be ensured by trained securities,</li> <li>Vehicular movement will be in a staggered manner.</li> <li>Periodic sprinkling will be carried out to suppress the dust.</li> <li>Asphalting of internal roads within the project site will further minimize the dust emission.</li> </ul>	During construction phase
8.	Solid & Hazardous Waste Management	The solid waste generated during construction will be debris, metal scrap, empty paint cans, etc. The municipal solid waste generated from labours colony creates unhygienic conditions in the vicinity and improper storage will generate leachate and in turn this would affect surface water quality.	<ul style="list-style-type: none"> <li>The solid waste generated during construction will be debris, metal scrap, empty paint cans, etc., this will be segregated – debris will be utilized for levelling of land formation of roads etc., metal scrap will be stored separately &amp; used as raw material, empty cans will be handed over to authorized recyclers.</li> <li>The municipal solid waste will be segregated in to organic &amp; inorganic, organic will be composted in a small earth pit &amp; in-organic will be handed over to KSPCB approved authorized recyclers.</li> </ul>	During construction phase
<b>B. Operation Phase (Capital Cost)</b>				
1.	Air Pollution	Gaseous and fugitive emissions from Boilers, Process, storage, transportation of raw	<ul style="list-style-type: none"> <li>The efficiency of ESP is 96 %. Clean air will be let out from the chimneys are connected to 80 TPH Boiler (RCC Chimney Height 85 m AGL).</li> <li>Green belt of 17 acres (33.33 % of total area of 50</li> </ul>	During Operation Phase



Sl. No	Environmental Attributes	Impacts	Mitigation Measures	Time Frame
		materials and finished products, DG sets	<p>Acres 30 Guntas) is reserved for both existing and proposed industry to mitigate air/Noise pollution.</p> <ul style="list-style-type: none"> <li>All the internal roads will be asphalted to control particulate emissions.</li> <li>Regular maintenance of air pollution control equipment will be carried out to ensure proper &amp; effective performance.</li> </ul>	
2.	Noise Levels	Prolonged exposure to high level noise will lead sleep deprivation, fatigue, stress and productivity losses in the workplace	<ul style="list-style-type: none"> <li>Noise level can be reduced by stopping leakages from various steam lines, compressed air lines and other high pressure equipment.</li> <li>Noise generating equipment will be provided with proper sound proof enclosures</li> <li>The workers in the plant premises will be provided with proper PPEs which include ear muff and ear plugs</li> <li>Green belt will be developed all along the periphery to reduce noise level.</li> </ul>	During Operation Phase
3.	Water quality	Ground water pollution, flooding due to the generation of spent wash, Sewage, Storm water run off	<ul style="list-style-type: none"> <li>The condensate generated will be treated in CPU of capacity 2400 KLD. The treated water will be reused in the process.</li> <li>Spent wash generated during the process of distillation will be passed through Bio-digester followed by concentration in MEE, and dried through spray driers to remove about 92 – 95 % moisture content &amp; then packed and sold out in local market as a spent wash powder.</li> <li>Storm water drains will be provided to avoid flooding in the proposed site. Storm water gutters/drains will be constructed in the premises on either side of the haul roads.</li> <li>The generated domestic sewage is treated in STP of capacity 10 KLD.</li> </ul>	During Operation Phase

Sl. No	Environmental Attributes	Impacts	Mitigation Measures	Time Frame
			<ul style="list-style-type: none"> <li>Garland channels will be provided around the storage yards.</li> <li>Harvested rainwater will be reused for greenery development/sprinkling applications and non-potable uses thereby conservation fresh water requirement.</li> <li>Rainwater harvesting sump will be proposed for implementation</li> </ul>	
4.	Ecology and Biodiversity	Positive Impact	<ul style="list-style-type: none"> <li>Development of 33 % of green belt (17 Acres) in the existing and proposed unit, have increased the movement of birds, butterflies, etc.</li> <li>Arrangements of proper watering during summers for greenery.</li> </ul>	During Operation Phase
5.	Solid waste	<ul style="list-style-type: none"> <li>Municipal Solid waste</li> <li>Yeast Sludge</li> <li>Sludge from CPU</li> <li>Boiler Ash/Flyash/Bottom ash</li> <li>Used Oil &amp; Oil soaked cotton waste</li> <li>Empty Barrels / Containers</li> <li>DDGS</li> </ul>	<ul style="list-style-type: none"> <li>The collected domestic solid waste of 50 Kg/day will be segregated into organic and inorganic solid waste, then it will be handed over to local municipality for further treatment</li> <li>Yeast sludge of 30 MT/ day and Sludge from CPU &amp; ETP of 0.015 MT/day will be mixed in required proportion and reused as manure</li> <li>Bottom ash (30 MTD) will be Sold to brick manufacturers, Excess will be used in landfilling.</li> <li>Used oil &amp; Oil soaked cotton waste, spent turbine oil; waste oil residue from CPU will be stored at an identified place in leak proof containers &amp; will be disposed to KSPCB authorized dealers.</li> <li>DDGS (193 TPD) waste is sold as cattle feed</li> </ul>	During Operation Phase
6.	Risk & hazards and Occupational Health & Safety	Health impacts on employees workers and surrounding villagers	<ul style="list-style-type: none"> <li>Medical examinations periodically as per the Factories act 1948 and Karnataka Factory rules 1969</li> <li>Personnel Protection equipment (safety shoes, goggles, respirators/ masks, Aprons etc.)</li> </ul>	During Operation Phase

Sl. No	Environmental Attributes	Impacts	Mitigation Measures	Time Frame
			<ul style="list-style-type: none"> <li>• Maintenance of Occupational Health centre and First aid kits</li> <li>• Training to workers on firefighting, use of PPE's, emergency preparedness and first aid</li> <li>• Visual signage and posters display to create awareness on health and safety topics</li> <li>• Environment monitoring in the workplace (Indoor air monitoring, Particulate matter, VOC's etc.)</li> <li>• All precautionary methods will be adopted by the company to reduce the risk of exposure of employees to occupational safety and health hazards.</li> <li>• Pre &amp; post medical check-ups will be done of all the employees. Employees will be regularly examined and the medical records will be maintained for each employee. Pulmonary function test and periodical medical checkup shall be done once in every year. The following tests will be conducted for each worker as Occupational health surveillance programme: Lung Function Test, Radiology – X-ray, Pulmonary Function Test, and Audiometric Test.</li> <li>• For the safety of workers, personnel protective appliances like hand gloves, goggles, aprons, ear mufflers, nose mask etc. will be provided.</li> <li>• Proper ventilation system will be provided in the process area.</li> </ul>	
7.	Hydrology & geology	Depletion of water table	<ul style="list-style-type: none"> <li>• Conjunctive use of surface and ground water ensures rise in ground water level and improves water quality</li> <li>• Rainwater harvesting plan will be implemented scientifically. Roof run off &amp; surface runoff will be</li> </ul>	During Operation Phase

Sl. No	Environmental Attributes	Impacts	Mitigation Measures	Time Frame
			<p>segregated &amp; collected in separate sumps. Roof runoff will be used for non-potable purposes &amp; surface runoff will be connected to ground water recharge pits.</p> <ul style="list-style-type: none"> <li>Garland drainage arrangements will be made around Project site to avoid stagnation of water. The channelized water will be collected in catch pit &amp; will be used for dust suppression within the construction site</li> </ul>	
8.	Socio-economic Environment	<ul style="list-style-type: none"> <li>Positive impact</li> </ul>	<ul style="list-style-type: none"> <li>Due to proposed project local people will get permanent jobs,</li> <li>Socio-economic statue of the surrounding people will improve.</li> <li>The project has very strong positive impact, which is likely to result in the improvement of economic situation of Hudali Village and nearby villages.</li> <li>Overall people's perception on the project is a mix of advantages and disadvantages. On one hand, they expect job opportunities, market expansion etc. as advantages and on the other hand they are worried about the damage to agriculture.</li> <li>As an impact of identification of the project, small-scale industrial economy is likely to flourish in the surrounding area. The small-scale industrial units are expected to get financial supports from the financial institutions and banks. In this way, an overall development may take place in this area.</li> <li>The process of development will have maximum impact on the lifestyle of the local people. The project and the consequent peripheral industrial economy will generate income to the local and migrated people which will increase the aggregate</li> </ul>	During Operation Phase

Sl. No	Environmental Attributes	Impacts	Mitigation Measures	Time Frame
			demand. This demand will get realized in the market and finally, lead to the market in the locality of the project. Market expansion supported by	
9.	Energy Conservation measures	Positive impact due to use of solar energy	<ul style="list-style-type: none"> <li>Provision of Solar lighting will be made at project site.</li> </ul>	During Operation Phase

## ES.10 Conclusion

M/s. Belgaum Sugars Pvt. Ltd., is operating Existing Sugar Complex with 3500 TCD sugarcane crushing capacity and 14 MW cogeneration unit at Hudali Village, Belagavi Taluk, Belagavi District, Karnataka. Later based on the demand, the management has decided to go for capacity expansion of cane crushing from 3500 TCD to 7500 TCD of sugarcane and capacity expansion of co-gen unit from 14 MW to 36 MW/Hr for which BSPL has obtained Environmental Clearance for 7500 TCD sugar plant, 36 MW Co-generation unit from Karnataka State Level Environmental Impact Assessment Authority (KSEIAA). The Sugar unit and the Co-gen unit for which EC & CFE-Expansion work is under progress at site and it will be implemented by 2022.

Now considering the huge demand of Ethanol/ ENA than that of Sugar the management has decided to establish 400 KLD multi feed (Juice/Grains) based Distillery unit in the existing Sugar Complex premises.

- Any type of development activity has both beneficial and adverse impacts on the environment in which it operates.
- The impacts are identified and evaluated by the project proponents to reduce their negative impacts and maximize the positive impacts on the surrounding environment.
- The proposed project will generate an optimum employment opportunity for the local population.
- Full-fledged Environmental Management Cell (EMC) is already in place in the existing sugar complex same will be used for the proposed Distillery project. It is already constituted with qualified Engineers to oversee the Environmental Health and Safety (EHS) aspects of the industry & same will continue the same for the upcoming Distillery in the existing sugar complex also.
- The project is considered as eco-friendly in view of the proposal involving utilization of various waste resources in a scientific way and which helps in creating a platform of sustainable development. The project will be farmer friendly as it helps in improvement in the livelihood and socio economic status of the area.
- The industry is also contributing to growing Distillery sector of the Nation and thus contributing revenue to the country.

Overall, this project will have positive impact on the Environment if, the recommended Environmental Management Plan (EMP) & monitoring aspects, measures are fully implemented in high spirit by the project proponent.