

J-11011/690/2008-IA-II(I), Category 'A'

# **EXECUTIVE SUMMARY** of **Environmental Impact Assessment Report**

Expansion of sugar unit from 4,000 TCD to 7,500 TCD and molasses/  
sugarcane juice/syrup based distillery unit from 45 KLPD to 120 KLPD  
of

**M/s. Karmaveer Shankarrao Kale Sahakari Sakhar Karkhana Ltd.**  
At. Gautamnagar, Post. Kolpewadi, Tal. Kopergaon,  
Dist. Ahmednagar Maharashtra 423602



Prepared by



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## EXECUTIVE SUMMARY

### 1.0 INTRODUCTION

M/s. Karmaveer Shankarrao Kale Sahakari Sakhar Karkhana Ltd. (KSKSSKL) Kolpewadi, Tal. Kopargaon, Dist. Ahmednagar, Maharashtra is registered under the Bombay Co-operative Society Act, 1952 on 04.06.1953 vide Registration No. G 260. The industry is very progressive and has achieved best technical performance & expanded its capacity time-to-time. The factory having sugar and its allied units like distillery, country liquor bottling and oxygen plant in its premises.

The sugar factory is operational since 1956 and its licensed capacity was 800 TCD. The factory has improved the crushing capacity gradually to 2500 TCD and 4000 TCD. Because of increase in sugar cane availability in its command area, the management of the factory has decided to enhance the existing sugar crushing capacity from 4,000 to 7,500 TCD. Due to this expansion, the availability of bagasse and molasses will also increase. Considering all these aspects and to gain more benefits from this industrial complex the management also decided to enhance the capacity of the existing distillery from 45 to 120 KLPD.

The existing sugar ETP will be modified to treat the additional effluent generated after expansion. Zero liquid discharge (ZLD) of spent wash for total 120 KLPD is planned through concentration of spent wash followed by incineration.

### 1.1 Features of the site

The total land allocated for industrial activity project is around 42.61 Ha of land. The proposed expansion will take place in the existing industrial plot. No additional land needs to be procured. Available open land is adequate to accommodate proposed expansion. The existing site meets the industrial sitting guidelines of the Ministry of Environment, Forest and Climate Change (MoEFCC). This site location map is enclosed as annexure II in the main EIA report. The other important aspects are highlighted in the following table.

Table 1: Highlights of the Project

1.	Project Proponent	M/s Karmaveer Shankarrao Kale Sahakari Sakhar Karkhana Ltd.			
2.	Project	Expansion Of Sugar Unit From 4,000 TCD to 7,500 TCD and Molasses/Sugarcane juice/syrup Based Distillery Unit From 45 KLPD to 120 KLPD			
3.	Location of the project	The expansion is proposed on Gut no: 109/1, 109/2, 109/3, 110 and 111 at Gautamnagar, Post- Kolpewadi, Tal-Kopargaon, Dist- Ahmednagar, Maharashtra.			
4.	Working days	Sugar: Average 160 days (Max. 200 days) and Distillery unit: year around			
5.	Product	A. Sugar			
		Product	Existing	Proposed	Total
		Sugar (Recovery@11.5%) (TPD)	460	402.5	862.5

		<b>By-products</b>			
		Bagasse @ 28.0%, TPD	1120	980	2,100
		Molasses 'C' @5 %, TPD OR	200	175	375
		Molasses 'B' @6%, TPD	240	210	450
		Press mud @4 %, TPD	160	140	300
		<b>B. Distillery</b>			
		Rectified spirit / ENA / Anhydrous Alcohol (KLPD)	45	75	120
		<b>By-product</b>			
		Fusel oil (L/day)	180	300	480
6.	Effluent Treatment System	<p><b>For sugar mill effluent:</b> ETP (Existing ETP will be upgraded)</p> <p>Domestic effluent: Existing sugar unit ETP</p> <p><b>For spent wash:</b> Evaporation followed by incineration</p> <p><b>For spent lees, condensate and other effluent:</b> Two stage biological treatment followed by tertiary treatment (CPU)</p>			
7.	Air Pollution Control	<p><b>Sugar Unit:</b> Stack of height 72 m and ESP as air pollution control device</p> <p><b>Distillery Unit:</b> Stack height of 72 m and ESP as air pollution control device</p>			
<b>INFRASTRUCTURE</b>					
8.	Land	<p>Total land available: 4, 26,138 sq.m (42.61 ha); proposed expansion will take place within the same.</p> <p>Greenbelt area = 1, 41,495 sq.m. (14.15 ha)</p> <p>Expansion will be done in the existing area proposed for sugar and distillery unit, Available land is under the possession of the project proponent. No need of acquisition of new land</p>			
9.	Main Raw Material required	<b>A. Sugar unit</b>			
		<b>Raw Material</b>	<b>Existing</b>	<b>Proposed</b>	<b>Total</b>
		Sugar cane (TPD)	4,000	3,500	7,500
		Lime (TPD)	6.0	5.25	11.25
		Sulphur (TPD)	2.0	1.5	3.5
		<b>B. Distillery unit</b>			
		<b>Raw material</b>	<b>Existing</b>	<b>Proposed</b>	<b>Quantity</b>
		Molasses (C-Type) OR	167 TPD	277 TPD	444 TPD
		Molasses (B-Type) OR		400 TPD	400 TPD
		Sugarcane (for juice)		1,715 TPD	1,715 TPD
		Nutrient N,P	45 kg/d	150 kg/d	240 kg/d
		Turkey Red Oil (TRO)	67 kg/d	113 kg/d	180 kg/d

10.	Technology for Product Manufacturing	Sugar: Double sulphitation process to produce plantation white sugar Distillery: Continuous fermentation & Multi-pressure-vacuum distillation for the production of Rectified spirit or Extra Neutral Alcohol with Molecular Sieve De-Hydration (MSDH) plant for Anhydrous/Fuel ethanol
11.	Steam required and source (Boiler)	Sugar unit: 2850 TPD (119 TPH) Source: 130 TPH boiler (100 TPH + 30 TPH) Distillery Unit: 624 TPD (26 TPH) Source: 30 TPH incineration boiler (Existing 15 TPH + proposed 15 TPH)
12.	Fuel utilization	Sugar Unit: Bagasse: 1,295 TPD Distillery Unit: Conc. Spent-wash 218 TPD + coal 60.83 TPD or bagasse 105 TPD
13.	Power required	Sugar unit: 7.5 MW (Source: Captive from 8 MW TGS) Distillery unit: 2.5 MW (Source: Captive from 3 MW TGS)
14.	Total Water Requirement and source	Sugar Unit: 278 m <sup>3</sup> /day Distillery Unit: 480 m <sup>3</sup> /day Source: Godavari right canal
15.	Manpower	Direct employment to 74 persons and about 30-35 seasonal employment (existing 835 employees)
<b>FINANCIAL ASPECTS</b>		
16.	Total Project Cost	Rs. 21,821 Lakhs (Rs. 7300.00 lakh, sugar unit and Rs. 14357.00 lakhs for distillery) including: ➤ EMP cost: for Sugar unit: Rs. 470 Lakh ➤ EMP cost for Distillery unit: Rs. 5050 Lakh ❖ ESC/CER cost: Rs. 164 Lakh

## 2.0 MATERIAL AND INFRASTRUCTURE

### 2.1 Water

The sugar unit will require 278 m<sup>3</sup>/day fresh water considering recycling of process condensate and reuse of water and distillery unit requires 480 m<sup>3</sup>/day fresh water. Water balance of both units given in tables 3 & 4

**Table 2: Water Balance 7500 TCD Sugar Unit**

Fresh water requirement for boiler		
A	Total water requirement for 130 TPH high pressure boiler@ 98.57% efficiency	3120
B	Return condensate from process to the boiler	2850
C	Loss of fresh water during process: (A - B)	270
D	Net fresh water requirement for High Pressure Boiler = Loss	270

Water Balance for Sugar Process		
A	Hot water generation in process from boiling house	7746
B	Consumption of hot water in sugar process and spray pond	6720
C	Total excess condensate available: (A – B )	1026
Net freshwater requirement for sugar unit		278

Table 3: Water Balance 120 KLPD Distillery Unit

WATER INPUT		Quantity (M <sup>3</sup> /Day)
A	Total Water Input at start-up for Boiler, molasses dilution, CT makeup, and cooling	2667
WATER OUTPUT		
B	Total Water Output form evaporation unit, cooling tower, WTP	2667
RECYCLE STREAMS		
C	Total water recycle from distillery process after CPU	2187
D	Total net fresh water requirement : (B-C)	480
Fresh water requirement per lit of Alcohol incl. domestic water		4 lit/lit

## 2.2 Fuel

Bagasse will be used as a fuel for sugar unit boiler. Concentrated spent wash of >550 brix up to 600 brix will be incinerated along with coal or bagasse for distillery project. Spent wash available for incineration will be 176 m<sup>3</sup>/day (218 TPD).

## 2.3 Steam

Steam required for the sugar unit process will be the max. 119 TPH which will be fulfilled through existing 130 TPH (100 TPH + 30 TPH) capacity boiler. Steam requirement for existing 45 KLPD and proposed 75 KLPD distillery unit will be 26 TPH. Required steam will be fulfilled from existing 15 TPH and proposed 15 TPH incineration (15 TPH + 15 TPH = 30 TPH capacity) or independent incineration boiler of 30 TPH.

## 2.4 Power

The total power requirement for sugar unit will be 7.5 MW, it will be procured from 8 MW capacity TGS installed with 100 TPH capacity bagasse fired boiler.

Power requirement for distillery unit will be 2.5 MW it will be fulfilled from independent 3 MW steam turbine generator installed with incineration boiler. In case of shut down, power will be generated from DG set or purchased from state electricity grid. Existing two DG set of 320 KVA and 750 KVA will be in use.



## 2.5 Boiler

In existing scenario, two boilers are available, of which

1. 100 TPH boiler with stack of height 72 m and ESP as air pollution control device for sugar unit.
2. 15 TPH boiler with stack height of 72 m and ESP as air pollution control device for distillery unit

For proposed project,

- 1 no. 100 TPH Boiler with ESP and 1 no. 30 TPH boiler (existing standby) with wet scrubber as air pollution control device both will be attached to stack of height 72 m for sugar unit and
- New 30 TPH multi-fuel (coal/bagasse and spent wash) incineration boiler or existing 15 TPH and new 15 TPH incineration boiler with stack height of 72 m and Electro Static Precipitator (ESP) as air pollution control device for distillery unit

## 2.6 Land

The sugar mill already possesses around 42.61 Ha of land that includes sugar, distillery and allied units including storage of raw and finished products, storage of fuel, country liquor bottling unit, oxygen plant, residential colony, parking etc. The mill has allotted around 14.15 Ha land for greenbelt that is 33.25 % of total land, out of which existing greenbelt is 11.74 Ha and 2.4 Ha. will be developed as greenbelt. Proposed built-up area of sugar and distillery unit will be around 11,264 sq. m. The detailed land break-up given in chapter 2, of EIA report.

## 2.7 Manpower

Proposed Sugar & distillery project will provide direct employment to 74 persons and about 30-35 seasonal employment in addition to existing 835 employees. However, it has a great potential to generate large indirect employment mainly through transportation of Sugar, coal and ethanol. Since sugar is an agro-based industry, increasing the cane crushing capacity will be helpful to local farmers as well as agricultural labour.

## 3.0 PROCESS DESCRIPTION

### A. Sugar

The double sulphitation process for manufacturing plantation white sugar processed in this expansion. The process consists of the following steps. A flowchart of the process is given in fig. 1.



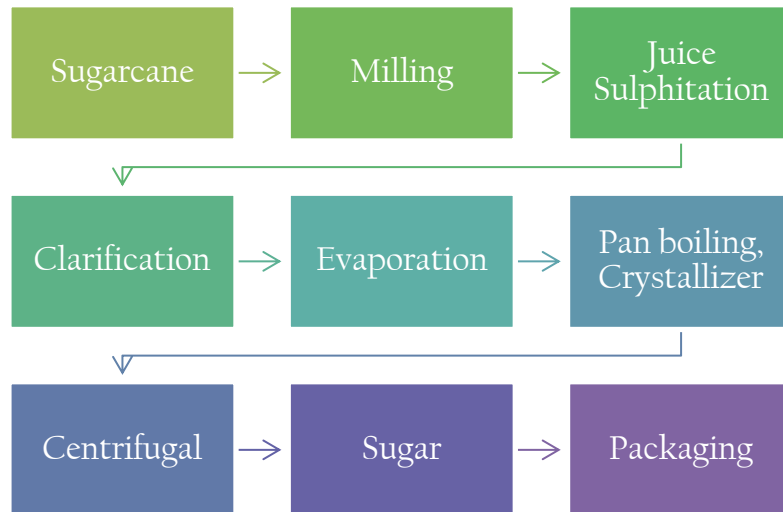


Fig. 1: Flowchart Sugar Manufacturing Process

### B. Distillery

For the proposed expansion project, the management has planned to adopt the latest technology for process as well as for effluent disposal. Overall objective of this is to achieve high efficiency of operations, save energy and water and achieve Zero Liquid Discharge (ZLD).

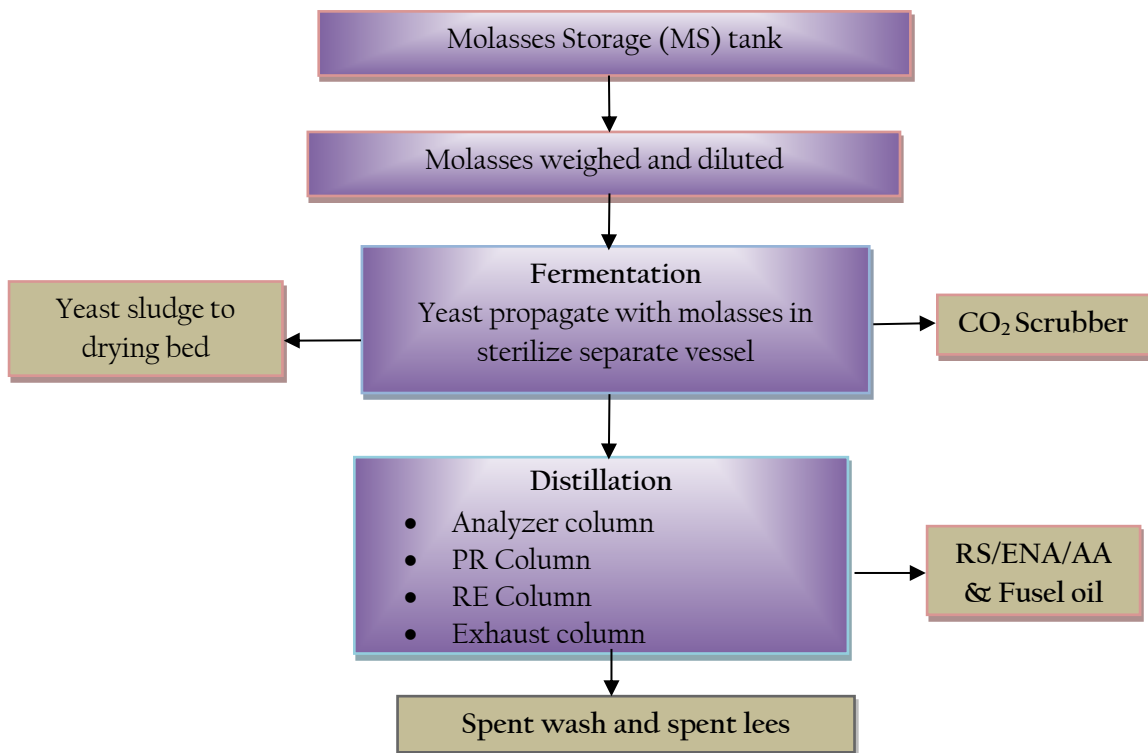


Fig. 2: Schematic of Distillery Manufacturing Process

#### 4.0 BASELINE ENVIRONMENTAL CONDITIONS

The guiding factors for the present baseline study are the requirements prescribed by the Ministry of Environment, Forestry and Climate Change (MoEF&CC) for conducting Environmental Impact Assessment study published in the EIA notification 2006 and its subsequent amendments. Apart from this, the terms of reference for the EIA also considered while planning and executing the monitoring. For baseline data collection, sampling of air, water and soil was carried out from March to May 2023.

Table 4: Summary of Environmental features of study area

#	Facet	In brief
1	General characteristics	Hot and dry
2	Rainfall	An average annual rainfall is 572 mm Rains are received mainly during June-September months
3	Temperature	The maximum temperature in summer is around 38°C and minimum temperature in winter is around 10°C
4	Humidity	The maximum humidity in the study area ranges between 60 to 80 percent in the month of August and minimum humidity ranges from 30-40 percent in the month of March and April.
5	Wind	Predominant wind direction was WNW and the wind speed was between 0.50 to 2.10 km/ hr. (>40.6 %) during the study period
6	Land use	Crop land area 88.31 %, scrub land 6.03 %, settlement area 2.79%, waterbody 2.53% and road 0.34%
7	Air Quality	Complies NAAQ standards of Nov. 2009 at all monitored locations
8	Noise	Complies the standard
9	Groundwater	Sample collected from said locations is fulfilling the criteria of the specified limits of IS 10500:2012.
10	Soil	The soils are within the acceptable limit and not of much consequence for growing a range of crops. The soils are found to be very shallow (soil depth less than 10 cm) to deep black alluvial soils.
11	Nearest sanctuary	Nandur-Madhyameshwar bird Sanctuary (Approx. 29 km)

#### 4.1 Land-use/ Land cover classes details

The break-up of land use/land cover is shown in Fig. 4

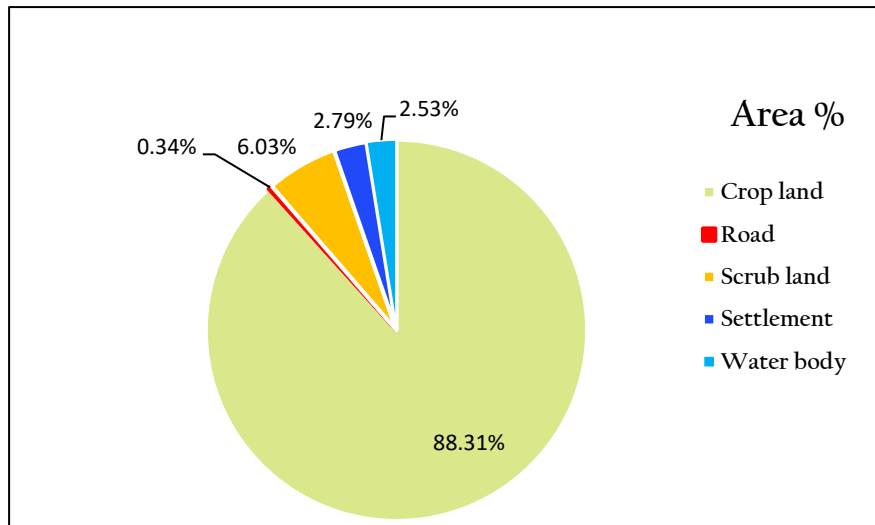


Figure 3: Details of Land use

### 5.0 IMPACT ASSESSMENT

#### 5.1 Air Environment

Ambient air quality of the study area was assessed through a network of eight air monitoring stations, considering the wind pattern for the study area. The values for PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub> and NO<sub>x</sub> for all monitored locations were well within National Ambient Air Quality (NAAQ) Standard limits.

##### 5.1.1 Impact causing factors

- 1) **Emissions from process:** Mainly due to generation of steam from boilers using fuel i.e. Bagasse, spent wash with bagasse/coal.
- 2) **Transportation:** Vehicular pollution due to transportation activity, dust from roads, loading unloading of material and transportation of material will involve mainly transportation of coal, molasses to some extent and ethanol/spirit. Hence, this could cause minor increase mainly in NO<sub>x</sub>, particulate matter and HC.
- 3) **Fugitive Emissions and Other sources of air pollution:** Fugitive emissions from handling and storage of coal and ash transportation activities. System for suppression of dust from handling of coal and ash will be installed. It includes mainly, use of pulse jet bag filters for coal loading-unloading on conveyors, foggers/dust suppressors in coal and ash storage yard, wind breakers for ash storage area.

**5.1.2 Impact Assessment:** Estimated incremental concentrations of PM<sub>10</sub>, PM<sub>2.5</sub> and SO<sub>x</sub> in the downwind direction of the site are minor, considering the baseline value. The baseline concentrations of these pollutants are well within the NAAQS. Therefore, after adding the incremental concentration to the baseline value at nearest downwind site will not exceed the NAAQS. So, it is anticipated that, the increase in the concentration of these air pollutants due to the burning of fuel, likely to cause minor negative impact on air environment.

### 5.1.3 Preventive, control and mitigation measures

- Separate ESP with 72 m height stack height provided for sugar and distillery incineration boiler to control particulate emissions.
- Mechanized system for coal, bagasse & ash handling
- CO<sub>2</sub> generated in fermentation process will be bottled
- Development of greenbelt
- Wind breaks will be developed to control PM generation from ash storage yard
- PPE will be provided to workers, working in dust prone areas
- The carbon dioxide emissions from fermentation process will be controlled by bottling the generated gas in a bottling plant
- Job rotation for workers, working in dust prone areas
- Use of economically affordable techniques for suppression of dust from handling and storage area
- Ash will be transported in closed/covered vehicles to the brick manufacturing unit
- Construction of permanent roads

#### 5.1.3.1 Air Pollutant Dispersion Modeling

Prediction of impacts on air environment has been carried out employing mathematical model - AERMOD view dispersion model 11.2 software developed by Lakes Environment Software, Canada.

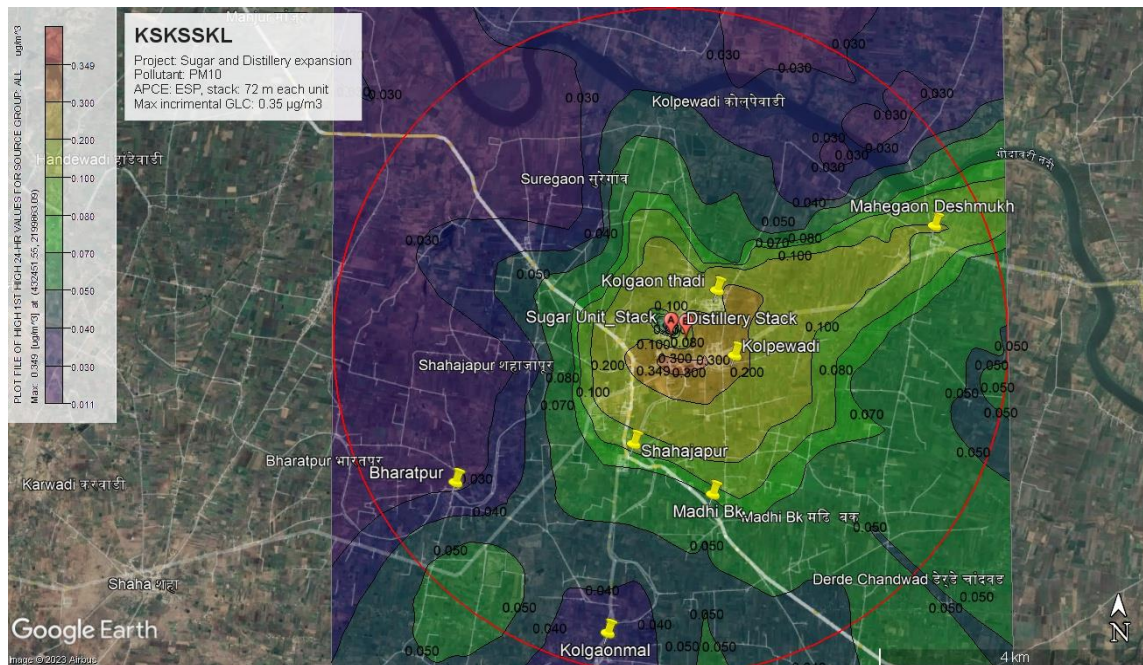


Figure 5: Isopleth showing GLC location and distance for PM<sub>10</sub> (Short term 24 hourly)



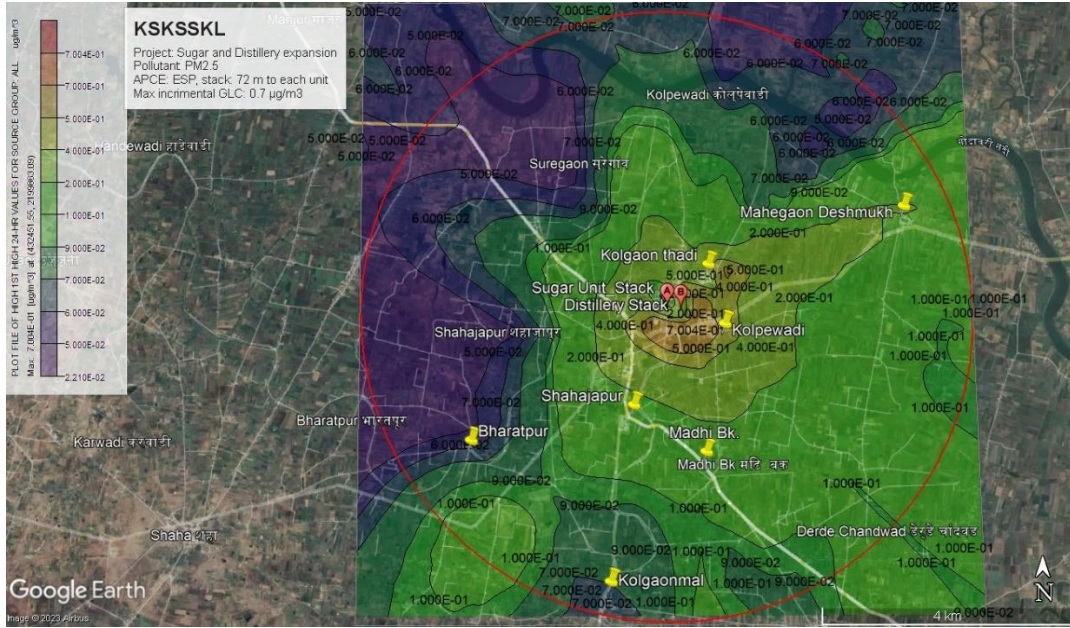


Figure 6: Isopleth showing GLC location and distance for PM<sub>2.5</sub> (Short term 24 hourly)

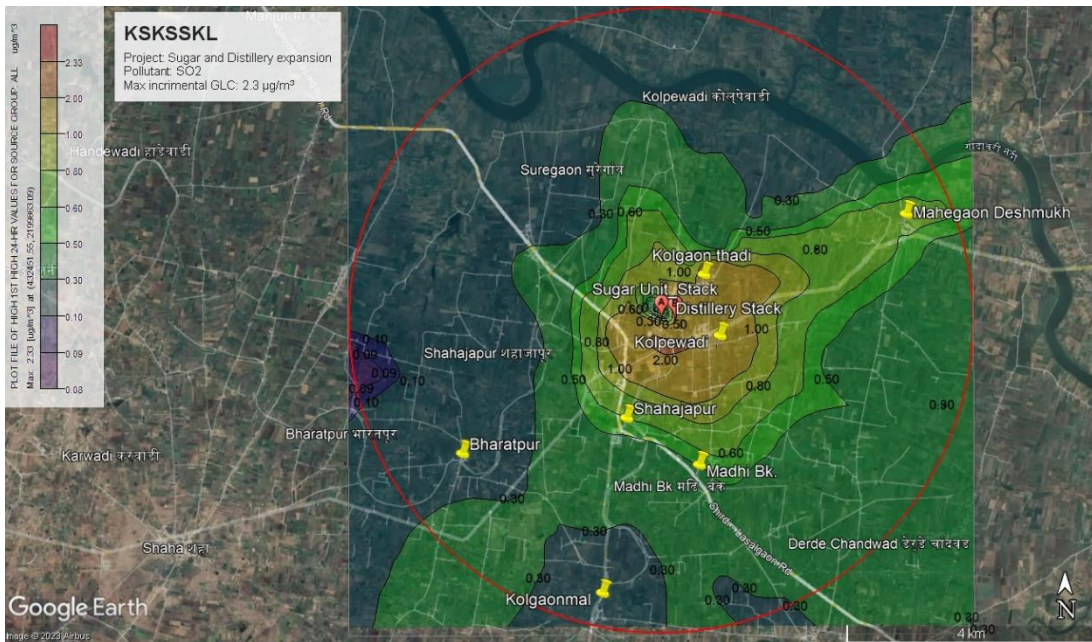


Figure 7: Isopleth showing GLC location and distance for SO<sub>2</sub> (Short term 24 hourly)

Incremental load summary giving in following table no. 8.

Table 5: Summary of Maximum 24-hour GLC due to proposed project

Locations	Project Site	Kolpewadi	Kolgao n Thadi	Shahajapur	Madhi (Bk)	Mahegaon Deshmukh	Kolgao n- Mal	Bhar atpur
Direction	-	ESE	NNE	SW	SSE	NE	NNE	WS W
<b>PM<sub>10</sub> Maximum GLC (0.35 µg/m<sup>3</sup>) at 19°53'14.36"N &amp; 74°21'25"E</b>								
PM <sub>10</sub> - Avg. Baseline value (µg/m <sup>3</sup> )	59.43	58.33	56.95	57.16	58.00	56.07	57.85	57.60
Incremental Conc. (µg/m <sup>3</sup> )	0.1	0.2	0.1	0.08	0.07	0.1	0.04	0.04
Post Project Scenario (µg/m <sup>3</sup> )	59.53	58.23	57.05	57.24	58.07	56.17	57.89	57.64
<b>SO<sub>2</sub> Maximum GLC (2.33 µg/m<sup>3</sup>) at 19°53'14.36"N &amp; 74°21'25"E</b>								
SO <sub>2</sub> - Avg. Baseline value (µg/m <sup>3</sup> )	13.48	12.96	13.94	13.32	12.77	12.71	13.98	13.62
Incremental Conc. (µg/m <sup>3</sup> )	0.6	1.0	1.0	0.5	0.5	0.6	0.3	0.3
Post Project Scenario (µg/m <sup>3</sup> )	13.54	13.96	14.94	13.82	13.27	13.31	14.28	13.92

From the mathematical modeling of air pollutant dispersion study, it is observed that -

- Maximum increase in the concentration of PM and SO<sub>2</sub> is predicted at approx. 0.4 km i.e. roughly 400-600 m towards SE of the stack
- Sugar factory own land, Kolpewadi village and agriculture land use observed at this distance
- Village Kolpewadi is the nearest ambient air quality (AAQ) monitored location to incremental GLC towards SE
- Average 58.33 µg/m<sup>3</sup> concentration of PM<sub>10</sub> and 12.96 µg/m<sup>3</sup> concentration of SO<sub>2</sub> was recorded at village Kolpewadi during monitoring period.
- The maximum incremental load predicted at Kolpewadi village is 0.2 µg/m<sup>3</sup> for particulate matter (PM<sub>10</sub>) and 1.00 µg/m<sup>3</sup> for SO<sub>2</sub>.
- From the mathematical modeling study, it is observed that resultant concentration of air pollutant PM 10 and SO<sub>2</sub> in downwind directions will be well within the national ambient air quality standards prescribed by CPCB in Nov. 2009.
- Fly ash emitted through flue gasses likely to settle mainly in 0.4-2 km distance from stack. Thus, minor negative impact anticipated on vegetation in surrounding areas upto 2 km.

## 5.2 Water Environment

**5.2.1 Impact causing factors:** Drawl of fresh water in large quantity and its usage, water pollution, disposal of polluted water into nearby waterbodies.

**5.2.2 Impact Assessment:** No negative impact on water environment and aquatic ecosystem is envisaged due to the proposed project. Minor negative impact is envisaged on soil within the premises. The project proponent has water drawl permission from Irrigation Department to lift the water from Godavari right canal. Thus, water used in the project will be exclusively allocated for industrial activities.

**5.2.3 Environment management plan:** In order to reduce the fresh water intake, the management has planned to reuse of waste water after proper treatment (Thro' ETP and CPU). Wastewater from various sources will be collected and properly treated so as to reutilize it and thus conserve the fresh water resource. The treated water shall be mainly reused in the sugar unit for auxiliary requirements and/or for gardening activity. The sanitary wastewater will be treated in sugar unit ETP. Thus, zero liquid discharge will be achieved. Boiler blow down and water from cooling tower will be stored in ponds and recycled thereafter. The management also proposed to install rainwater harvesting system to recharge the aquifer and partly fulfill the requirement during startup.

## 5.3 Land Environment

### a) Impact of effluent discharge

As discussed earlier, highly polluted wastewater i.e. spent wash will be disposed by incineration process. It will be stored in impervious lagoons as per CPCB guidelines. Other polluted water will be treated in CPU and reused.

### b) Solid waste

Table 6: Solid Waste and its Management

#	Waste	Quantity TPD	Treatment	Disposal	Remark
<b>Sugar Unit</b>					
1	Sugar ETP sludge (TPD)	2.5	Drying	Land Application	Organic + Inorganic
2	Ash (TPD)	25.9	Mix with press mud	Used as a soil enriching material	Inorganic
<b>Distillery</b>					
1	Yeast sludge (wet weight)	1.5	Drying in SDB	Used as a soil enriching material	Organic
2	Incineration Boiler Ash				



	Concentrated spent wash (@18%)	39.28	-	Sold to brick manufacturing unit	Inorganic
	Coal ash (@35%) OR	21.29	-		
	Bagasse ash (@ 2%)	2.1	-	Used as a soil enriching material	Inorganic
3	CPU sludge (wet weight) TPD	0.8	Drying in SDB		Organic

**5.3.1 Impact causing factors:** Disposal of solid and hazardous waste, disposal of effluent, change in topography

**5.3.2 Impact Assessment:** The project is not going to generate any hazardous waste. The only hazardous waste likely to be generated will be scrap oil from DG set, automobiles, gears etc. Since the DG set will run only in case of failure of regular power supply. The quantity of used or scrap oil will be low.

Since, the solid waste is non-toxic and non-hazardous, it is anticipated that the solid waste will have no negative impact on land but very negligible negative impact on air environment due to emissions from stack. Minor negative impact is also envisaging on the land environment of the site due to construction of the proposed unit.

**5.3.3 Environmental management plan:** The solid waste viz. ash (60.57 TPD) will be generated due to burning of spent wash along with coal in incineration boiler; this ash will be given to the local bricks manufacturer. Ash from sugar unit is estimated to be about 25.9 TPD which is non-toxic in nature, therefore it will be given to the farmers for land application. Sludge from CPU is usually biodegradable, organic which doesn't contain any toxic or hazardous elements. Therefore, this will be safely disposed by mixing into soil as manure.

## 5.4 Ecology

**5.4.1 Impact causing factors:** Discharge of air and water pollutants into environment, solid waste, change in land use, removal of vegetation cover, reclamation of wetland/water bodies etc.

**5.4.2 Impact Assessment:** In general, it is observed that, Impact of an industrial activity on ecology and biodiversity mainly due to a) Habitat destruction and/or, alteration and/or fragmentation, b). Disturbance to wild life from project or linked activities, c) Pollution related impact on ecosystem d). Threat to rare, endangered flora and fauna from the project related activities.

Considering this, the present project examined for its impact in the abovementioned categories. In the later part of the assessment, likelihood score estimated to determine the actual ecological sensitivity by considering project specific data

**5.4.3 Environmental management plan:** Wild mammal species such as blackbucks, chinkara or Indian fox though have been reported in this area, but actually seen rarely. Their presence reported

particularly in extreme water shortage or similar situation. Therefore, it is anticipated that, the project process may not cause any negative impact on rare and endangered species of animals. It mainly comprises of proper fencing of the unit, monitoring the changes takes place in the surrounding habitat.

## 5.5 Socio- economic environment

**5.5.1 Impact Causing Factors:** issues of rehabilitation; restoration; population flux; pressure on available resources and infrastructure.

**5.5.2 Impact Assessment:** Considering the long-term benefits to the locals, the project will have positive impact on socio-economic environment.

**5.5.3 Environment Management Plan:** Project is agro-based – therefore, indirectly beneficial to local farmers; no issues of rehabilitation or restoration; local candidates will be employed – thus, migration of population to the site surrounding area and pressure on infrastructure and resources is anticipated to be negligible.

Table 8: Financial provision for CER activities planned for next three year

CSR activity head	Year			TOTAL
	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	
<b>Budgetary provision (Rs. in lakhs)</b>				
<b>Improvement in social infrastructure</b>				
Provision of rooftop solar system in local schools	20	15	15	50
Provision for green belt development in nearby villages	10	10	10	30
Provision of clean drinking water facility in local schools and villages	10	10	10	30
Infrastructure Development/Maintenance (Eg. Road, canal maintenance, etc)	15	15	10	40
Other activities for maintaining social and cultural harmony	5	5	4	14
<b>TOTAL BUDGETARY ALLOCATION FOR NEXT THREE YEARS</b> (0.75% of the capital budget)				<b>164</b>

## 6.0 FIRE PROTECTION SYSTEM

Fire protection system is already installed in existing sugar and distillery unit, OISD-117 and LPA regulations. The fire- fighting system consist of a hydrant network, piping etc. Fire protection system will also include one electric driven pump, one diesel engine driven pump, one jockey pump, piping, basin etc. Water hydrants is provided at all strategic points. A suitable Fire ring system as per the guidelines of TAC will be incorporated. The same will be upgraded after expansion of the project.

Automatic fire Sprinkler System (Water Hydrant) – Electro-magnetic dehydration system uses an electric fire detection system installed in the area as open sprinklers /spray nozzles. Upon sensing a hazard, the Electromagnetic valve opens.

### 6.1 Safety Aspects through Design and Engineering

- All design will be as per ISI standard specification and drawings are to be approved by factory/electrical inspectorate/safety inspectorate weights & measurement inspectorates.
- All distillation columns accessed from flooring(grating)
- The roof of the structures (fermentation, distillation, receivers) must be covered totally by pre-coated sheets (pre-painted galvano loom sheet i.e. PPGL sheets) of 0.5 mm thickness.
- The layout will take into account the working space & safety requirement of Factory Inspectorate, Govt. of Maharashtra State.

### 6.2 Plant Lighting

Plant building lighting will be as per norms & as per Electrical inspectorate/factory inspectorate norms.

## 7.0 SAFETY, OCCUPATIONAL HEALTH MANAGEMENT

- Existing safety, occupational and health management will be modified suitably so as to make it suitable for proposed project (as per the statutory guidelines)
- Regular medical checkup of workers, contractual workers and employees
- safety gears and PPE to workers and employees

## 8.0 SUMMARY OF ENVIRONMENTMANAGEMENTPLAN

Table 9: Summary of Environment Management Plan

Environmental Aspect	Impact causing factor	Control/Mitigation Measures
Air Environment	Generation of Particulate Matter (PM), SO <sub>2</sub> , NO <sub>x</sub> from boiler of sugar unit and incineration Generation of Carbon dioxide from fermentation, Odour from spent wash storage	<ul style="list-style-type: none"> <li>• ESP to control fly ash emission through stack with height 72 m for sugar boiler and 72 m for distillery incineration boiler with ESP</li> <li>• CO<sub>2</sub> bottling plant after separation/scrubbing of the gas</li> <li>• Mechanized system for coal, bagasse and ash handling</li> <li>• Fugitive dust control/suppression for coal yard will be done properly</li> <li>• Wind breaks for ash storage area</li> <li>• Development of greenbelt</li> </ul>

	Handling of bagasse, coal and ash	<ul style="list-style-type: none"> <li>Continuous online emission monitoring system as per the norms</li> </ul>
Water Environment	Effluent generation from processes, cleaning, blow down water & condensate. Storage of spentwash, its treatment and disposal	<p>Sugar effluent and spray pond overflow will be treated in upgraded ETP. Condensates will be treated in CPU and then recycled.</p> <p>'Zero liquid discharge' will be achieved in distillery by implementing -</p> <ul style="list-style-type: none"> <li>Integrated and stand-alone evaporation (using MEE) as a primary treatment to reduce the spentwash volume</li> <li>Incineration of concentrated spentwash by burning with coal/bagasse in furnace</li> <li>Spentlees, condensate of MEE and other effluents will be treated in condensate polishing unit (CPU) and treated water will be reused in distillery.</li> <li>All the effluent will be properly treated/ utilized/disposed within the premises</li> <li>Separate lagoons for storage of raw and concentrated spentwash.</li> <li>Spentwash storage tanks will be made impervious as per CREP guidelines</li> <li>Fresh water requirement will be reduced by recycling of water (treated water), using rain water during startup period</li> <li>Piezometric well, in downstream area of spentwash storage to monitor ground water quality</li> <li>Continuous online effluent monitoring system – as per the norms</li> </ul>
Soil Environment	Boiler ash from coal and spent wash	Given to the nearby brick manufacturing unit
	Bagasse ash and sludge from fermentation unit, spent wash tanks and CPU	It is organic in nature, degradable hence, mixed into soil
	Excavated fertile soil	Stacked separately and reused for greenbelt development

		Stones and excess soil will be used for foundation or internal roads or leveling purpose within premises
Noise	Increase in noise level due to operation of machines, motors, vehicular movement, DG set etc.	<ul style="list-style-type: none"> <li>• Regular maintenance of machines and factory vehicles</li> <li>• provisions of separate parking for goods and other vehicles</li> <li>• Internal roads will be either asphalted or RCC, leveled, illuminated and will be maintained</li> <li>• Safety sign boards will be placed at strategic locations within premises</li> <li>• Provision of adequate personal protective equipment for workers</li> <li>• Job rotation for high noise level work places, if required</li> <li>• Regular health checkup for workers</li> <li>• Acoustic enclosure will be provided to DG set</li> </ul>
Ecology and Biodiversity	Air, water, soil and noise pollution Tree cutting felling, disturbance to wildlife due to project	<ul style="list-style-type: none"> <li>• Adequate preventive, control and mitigation measures for air, water and soil pollutants</li> <li>• No tree cutting/ felling involved since project is on open land</li> <li>• No wildlife sanctuary, national park or biosphere reserve within 10km radius, site is not in migratory route of any wildlife,</li> <li>• Development of greenbelt will help to enhance the biodiversity and will provide habitat to many species</li> <li>• Proper fencing to the industrial unit to prevent entry of animals</li> <li>• Areas close to the industry should be strictly and effectively protected from fire.</li> <li>• Mass level awareness at local level is required about behavioral characteristics of wild animals. It will help in reducing probable man-animal conflict</li> <li>• Provision of ambulance with first aid facilities available at strategic location within premises as well as in the neighboring villages (if required)</li> </ul>

		<ul style="list-style-type: none"> <li>• Nigh time light arrangements in the unit, to be made non-intense, non-glary; it should not disturb the wild animals</li> </ul>
Socio-economic Environment	Rehabilitation and Restoration (RR), pressure on available manmade infrastructure/resource due to population flux	<ul style="list-style-type: none"> <li>• No rehabilitation and restoration issue involved since site is already under the possession of project proponent</li> <li>• Local candidates will be preferred for employment. Skilled work force is available at nearby towns and cities</li> </ul>
Safety and Occupational health	Accidents, improper work practices	<ul style="list-style-type: none"> <li>• Safety officer and safety committee will be formulated</li> <li>• Provision of adequate safety gears</li> <li>• Insurance policy for workers</li> <li>• Regular health check-up</li> </ul>
Risk and disaster management	Fire, accidents, earthquake, etc.	<ul style="list-style-type: none"> <li>• The entire premises will be declared as 'no smoking zone'</li> <li>• Lightening arresting system will be installed</li> <li>• Ethanol vapor condensing system will be installed at storage area</li> <li>• Proper storage of molasses, ethanol and coal</li> <li>• Ethanol storage as per PESO guidelines</li> <li>• Firefighting system as per OISD and local authority guidelines</li> <li>• Earthquake resistant construction</li> </ul>

Table 10: Estimated Capital & Recurring Expenses for Environment Management

#	Particulars	Capital cost in Lakh
<b>A. Sugar unit</b>		
1	Sugar ETP Up-gradation	150.00
2	Upgradation of fuel handling system	80.00
3	Upgradation of ash handling system	40.00
4	Condensate polishing unit	200.00
<b>B. Distillery unit</b>		
1	Multi Effect Evaporator (MEE)	900.00
2	Incineration boiler with electrostatic precipitator	3500.00
3	Fuel handling system	70.00

4	Ash handling system	90.00
5	Coal and bagasse yard	30.00
6	Spent-wash storage tanks	110.00
7	Upgradation of Condensate polishing unit	100.00
8	CO <sub>2</sub> Bottling	155.00
9	Environmental monitoring and management for Sugar and distillery unit	25.00
10	Greenbelt development for Sugar and distillery unit	40.00
11	Rainwater harvesting for Sugar and distillery unit	30.00
	<b>Total</b>	<b>5520.00</b>
<b>C. Recurring Expenses/ Annum for Environment Management</b>		
1	Salaries and wages	75.00
2	Maintenance @1.5% on capital investment for EMP i.e. 6325.00	327.00
3	Miscellaneous/contingency	15.00
	<b>Total</b>	<b>417.00</b>
	<b>D. Additional Provision towards CER (0.75 % of capital investment)</b>	<b>164.00</b>

## 9.0 CONCLUSION

The potential environmental, social and economic impacts of the project have been assessed during the EIA study and given in this draft EIA report for public hearing. The proposed expansion of the sugar and distillery unit will have positive and negative impacts on the local environment. It has been endeavored to minimize the negative impacts by addressing them through environmental management plan. Necessary control measures have been suggested to meet with the norms and safeguard the environment. The implementation of this project will definitely improve the physical and social infrastructure of the surrounding area. Adequate financial provision is made by management of KSKSSKL for EMP and ESC activities (i.e. for upliftment of the local people). The proposed project will contribute to economic growth of the region.