

# **EXECUTIVE SUMMARY**

**OF**

## **DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT**

**FOR**

### **PUBLIC HEARING**

**OF**

**Expansion of Distillery (45 KLPD to 700 KLPD)  
by New Installation of 655 KLPD Multi-Feedstock  
(Molasses/Sugar Syrup/Grain) based Distillery Plant for  
Production of RS/ENA/IA/Ethanol/Aviation Fuel,  
Expansion of Sugar Mill (5000 TCD to 15000 TCD)  
along with Co-Generation Power Plant (19.5 MW to 70 MW)  
& Compressed Biogas Plant (CBG 30 TPD)**

**At**

**Village Patas Taluka Daund,  
District Pune, Maharashtra**

**APPLICANT**



**M/s. Bhima Sahakari Sakhar Karkhana Ltd.**

**Regd. Office : Madhukarnagar Patas,**

**Taluka Daund, District Pune Maharashtra 412 219**

**E-mail: bhimapatas@gmail.com**



## EXECUTIVE SUMMARY

### 1.0 PROJECT DESCRIPTION

#### 1.1 INTRODUCTION

M/s. Bhima Sahakari Sakhar Karkhana Ltd. is currently operating a 45 KLPD Distillery, Sugar mill of sugarcane crushing capacity of 5000 TCD along with Co-generation Power Plant of 19.5 MW at Village Patas, Taluka Daund, District Pune, Maharashtra.

Environment clearance has been obtained from MoEF&CC, New Delhi for Proposed 45 KLPD Molasses based Distillery Unit at Village Madhukarnagar, Taluk Daund in District Pune, Maharashtra Vide File No. J-11011/115/2008-IA II (I) Dated 17th March 2009. Subsequently for the same, amendment in Environment clearance was obtained from MoEF&CC, New Delhi vide File No. J-11011/115/2008-IA II (I) Dated 4th February 2015. Environmental Clearance for 19.5 MW cogeneration project at the Sugar Factory by M/s. Bhima Sahakari Sakhar Karkhana Ltd. was also obtained from Environment Department, Government of Maharashtra Vide Letter No. SEAC-2010/CR523/TC2 dated 27.09.2011.

CTO has been obtained for 45 KLPD Molasses based distillery unit from MPCB vide letter no. Format1.0/CAC/UAN No. MPCB-CONSENT-0000214521/CR/2410001911 dated 20.10.2024.

CTO has been obtained for 5000 TCD sugar unit from MPCB vide letter no. Format1.0/CAC/UAN No. MPCB-CONSENT-0000210504/CR/2411001421 dated 24.11.2024.

Earlier, the company has applied for Expansion of Distillery (45 KLPD to 700 KLPD) by new installation of 655 KLPD Molasses/Sugar Syrup/Grain Based Distillery, Sugar Mill (5000 TCD to 15000 TCD) & Co-Generation Power Plant (19 MW to 24.5 MW) under Ethanol blending programme at Village Patas, Taluka Daund, District Pune, Maharashtra under B2 category vide Proposal No. IA/MH/IND2/444356/2023 which was submitted on 14.09.2023. Subsequently, EAC Meeting was held on 06.10.2023 at Agenda no. 09 and project proposal was returned in present form as Certified compliance report of the sugar and cogeneration power plant was not submitted.

Now, the company is proposing “Expansion of Distillery (45 KLPD to 700 KLPD) by new installation of 655 KLPD Multi-feedstock (Molasses/Sugar Syrup/Grain) based Distillery plant for production of RS/ENA/IA/Ethanol/Aviation fuel, expansion of Sugar Mill (5000 TCD to 15000 TCD) along with Co-Generation Power Plant (19.5 MW to 70 MW) & Compressed Biogas Plant (CBG 30 TPD)” and has decided to increase the capacity of Co-Generation power plant from 19.5 MW to 70 MW due to project viability and increased power and steam requirement of plant along with manufacture of ENA/RS/Ethanol/ Aviation fuel depending on market demand & installation of Compressed Biogas Plant inside the existing plant premises.

As per EIA Notification dated 14th Sep, 2006 and its subsequent amendments, this project falls under Category “A”, Project or Activity ‘5(g)’, Distilleries [Molasses based Distilleries >100 KLD], ‘5(j)’ Sugar Industry, ‘1(d)’ Thermal power plant and will be appraised at Central level in MoEFCC, New Delhi.

#### Details of Earlier ECs & Consents

S. No.	EC & Consents for Existing Plant	Letter no. and Validity
1.	Environmental Clearance obtained from MoEF&CC, New Delhi for Proposed 45 KLPD Molasses based Distillery Unit	File No.: -11011/115/2008-IA II (I) Dated: 17.03.2009
2.	Environment clearance for 19.5 MW cogeneration power plant at sugar factory was obtained from Govt. of Maharashtra	Inward No.: 3415 Dated: 13.10.2011
3.	Amendment in Environment clearance for Proposed 45 KLPD Molasses based distillery was obtained from MoEF&CC, New Delhi	File No.: J-11011/115/2008-IA II (I) Dated: 04.02.2015
4.	Latest CTO has been obtained for 45 KLPD Molasses based distillery	Letter No.: Format1.0/CAC/UAN No. MPCB-CONSENT-0000175635/CR/2405002169 Dated: 24.05.2024 valid till 31.08.25
5.	Latest CTO has been obtained for the sugar mill and cogeneration power plant	Letter No.: Format1.0/CAC/UAN No. MPCB-CONSENT-0000175289/CR/2405001561 Dated: 16.05.2024 valid till 31.07.25

#### 1.2 DETAILS ABOUT THE PROJECT

S. No.	Particulars	Details		
A.	<b>Nature</b>	Expansion of Distillery (45 KLPD to 700 KLPD) by new installation of 655 KLPD Multi-feedstock (Molasses/Sugar Syrup/Grain) based Distillery plant for production of RS/ENA/IA/Ethanol/Aviation fuel, expansion of Sugar Mill (5000 TCD to 15000 TCD) along with Co-Generation Power Plant (19.5 MW to 70 MW) & Compressed Biogas Plant (CBG 30 TPD) at Village Patas, Taluka Daund, District Pune, Maharashtra by M/s. Bhima Sahakari Sakhar Karkhana Ltd.		
B.	<b>Size of the Project</b>			
	<b>Particular</b>	<b>Existing Capacity</b>	<b>Additional Capacity</b>	<b>Total Capacity after expansion</b>
	Distillery	45 KLPD Molasses based Distillery (RS/ENA/AA & Fusel Oil)	655 KLPD Molasses/Sugar syrup/Grain based Distillery (Ethanol/ If Aviation Fuel is produced-400 KLPD)	700 KLPD [RS/ENA/IA/Ethanol/ Fusel Oil] If Aviation Fuel is produced-400 KLPD

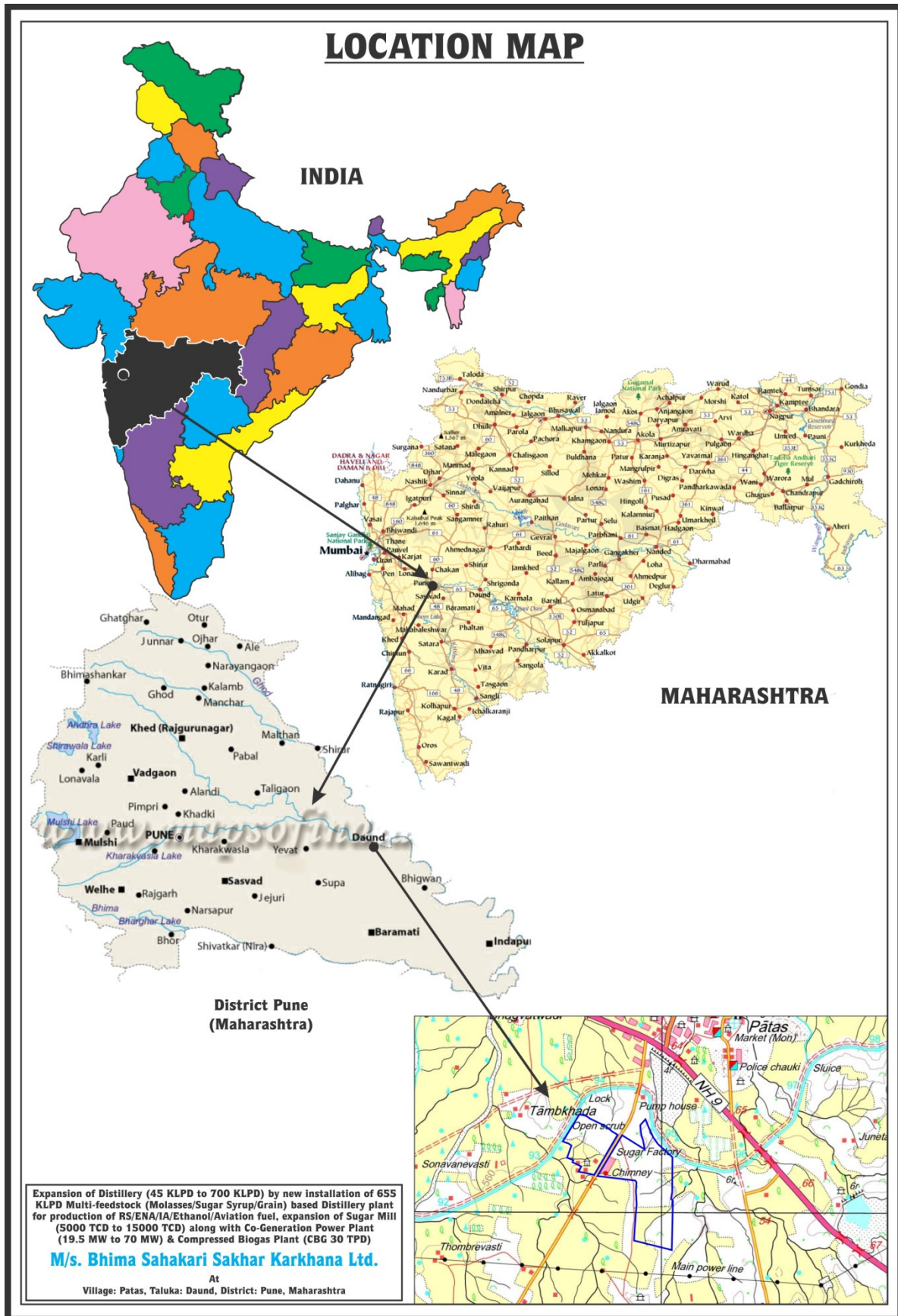
	Sugar Mill	5000 TCD	10000 TCD	15000 TCD
	Co-generation Power Plant	19.5 MW	50.5 MW	70 MW
	Compressed Biogas Plant	-	30 TPD	30 TPD
<b>C.</b>	<b>Location details</b>			
	Village	Patas		
	Tehsil	Daund		
	District	Pune		
	State	Maharashtra		
	Latitude	18°24'46.74"N to 18°25'33.97"N		
	Longitude	74°26'55.24"E to 74°27'35.03"E		
	Toposheet No.	47J/6, 47J/7, 47J/10, & 47J/11		
<b>D.</b>	<b>Area Details</b>			
	Total Plant Area	The existing plant area is 200.15 acres (81 ha); No additional land is required for the expansion as the same will be done within the existing plant premises.		
	Greenbelt / Plantation Area	33% of the plant area i.e., 66.05 acres (26.73 ha)		
<b>E.</b>	<b>Environmental Settings</b>			
1.	Nearest Village	Patas (~0.55 km in North Direction)		
2.	Nearest Town / City	Daund (~11.7 Km in ENE direction)		
3.	Nearest National Highway / State Highway	NH 65 (~0.8 km in North direction), NH 965 G (~0.8 km in East direction), SH 67 (~ 1.0 km in NNE direction), NH 965 D (~7.0 km in West direction), SH 62 (~ 8.5 km in WNW direction), NH 160 (~ 8.8 km in ESE direction)		
4.	Nearest Railway station	Patas RS (~5.5 km in NNE direction), Daund Junction (~ 13.4 km in ENE direction)		
5.	Nearest Airport	Pune International Airport (~57.5 km in WNW direction)		
6.	National Parks, Reserved Forests (RF)/ Protected Forests (PF), Wildlife Sanctuaries, Biosphere Reserves, Tiger/ Elephant Reserves, Wildlife Corridors etc. within 10 km radius	No National Parks/ Wildlife Sanctuaries / Biosphere Reserves, Tiger/ Elephant Reserves, Wildlife Corridors, Protected Forest (PF) within 10 km radius. Some unnamed RF (~ 6.5 km in SSW direction), RF (~9.2 km in NNE direction), RF (~9.8 km in SW direction)		
7.	River / Water Body (within 10 km radius)	New Mutha Right Bank Canal (Adjacent), Athmori Odha (~ 0.8 km in WNW direction), Victoria Talav (~ 3.0 km in West direction), Janal Odha (~3.5 km in NW direction), Kurkumbhcha Odha (~ 6.0 km in ENE direction), Wasunde Pajhar Talav (~ 8.5 km in SSE direction), Jambal Talav (~8.8 km in South direction), Bhima River (~ 9.0 km in NNE direction), Bhagirathi Odha (~ 9.5 km in ENE direction)		
8.	Seismic zone	Seismic Zone - III Moderate Damage Risk Zone as per (based on the Vulnerability Atlas of India – 2nd Edition, BMTPC).		

<b>F. Cost Details</b>		
1.	Total cost of the project	Rs.2073.6 Crores
2.	Cost for Environmental Protection Measures	<ul style="list-style-type: none"> <li>• Capital Cost - Rs. 134.70 Crores</li> <li>• Recurring Cost – Rs. 13.22 Crores / annum</li> </ul>
<b>G.</b>	<b>Products &amp; By-products</b>	<p><b>Products</b></p> <ul style="list-style-type: none"> <li>• Sugar Mill- Sugar</li> <li>• Distillery- RS/ENA/IA/Ethanol/Fusel oil/Aviation Fuel (400 KLPD) and Power</li> </ul> <p><b>By Product</b></p> <ul style="list-style-type: none"> <li>• Sugar Mill- Molasses, press mud &amp; bagasse</li> <li>• Distillery-</li> <li>• Molasses/ Sugar syrup-based operations: CO2</li> <li>• Grain based operations: CO2 &amp; DDGS Molasses based operations- Carbon dioxide</li> </ul>
<b>H.</b>	<b>Working days</b>	<p><b>Sugar Mill-</b> 120 to 140 Days</p> <p><b>Distillery-</b> 350 Days</p>

*Source: Site visit & Pre-feasibility Report*

### 1.3 LOCATION MAP

The plant site is located at Village Patas, Taluka Daund, District Pune, Maharashtra.



## 1.4 Requirements for the Project

### 1.4.1 Land Requirement

The existing plant area is 200.15 acres (81 ha); No additional land is required for the expansion as the same will be done within the existing plant premises.

Out of total plant area, 66.05 acres (26.73 ha) i.e., 33% of the plant area is being/will be developed as greenbelt & plantation.

### 1.4.2 Raw Material Requirement

Sugarcane is the main raw material required for the sugar mill which will be procured from nearby farmers and outside areas by road. Lime and sulphur shall be required in small quantity. The basic raw material used for the manufacturing of alcohol will be Molasses & Sugar Syrup/Grain in this project. Presently the molasses is being used from in-house sugar industry and nearby sugar mills. The basic raw material for Grain based operations will be Grains. Grains such as damaged broken rice, maize, bajra & sorghum will be used as raw material which is easily available from the local market. All the raw materials and finished product shall be transported by road. Details of Raw material required, source and mode of transportation is given in table below:

#### Raw Material Requirement Storage, Source & Transportation

S. No.	Particulars	Requirement		Source & Mode of Transportation
		Existing capacity	After Expansion (TPD)	
<b>SUGAR MILL</b>				
1.	Sugar Cane	5000 TCD	15000 TCD	Through suppliers by road
<b>DISTILLERY</b>				
2.	C-Heavy Molasses	184 KLPD	2874 KLPD	Own sugar mill or nearby sugar mills by pipeline/road
		or		
3.	B-Heavy Molasses	146 KLPD	2277 KLPD	
		or		
4.	Sugar Syrup	156 KLPD	2414 KLPD	
or				
5.	Grains- (broken rice, maize, bajra & sorghum)	-	1680 TPD	Through suppliers by road
<b>CHEMICALS</b>				
5.	Sodium Hydroxide (Caustic soda)	450 kg/day	7000 kg/day	Near-by Markets by road
	Enzymes (Alpha amylase, Amyloglucosidase)	58.5 kg/day	910 kg/day	
	Nutrients	90 kg/day	1400 kg/day	



	Antifoam Agent (kg/day)	22.5 kg/day	350 kg/day	
	Yeast (Active Dry Yeast/Distiller's Yeast (kg/day)	22.5 kg/day	350 kg/day	
	Lime (kg/day)	7500 Kg/ day	22500 Kg/ day	
	Sulphur (kg/day)	3000 Kg/ day	9000 Kg/day	

Source: Pre-feasibility report

### 1.4.3 Fuel Requirement

Details regarding quantity of fuel required their source along with their mode of transportation for the project are given in table below:

#### Fuel Requirement

Boiler Type	Fuel Requirement for boilers		Storage facility	Source & Mode of Transportation
	Existing amount	Amount after expansion		
<b>SUGAR MILL</b>				
Bagasse Fired boiler	1080 TPD	2021 TPD	Covered / open storage yard	From own sugar mill/local Suppliers by Truck
<b>DISTILLERY</b>				
Slop fired Incineration boiler	Bagasse 130 TPD	Max. Concentrated Spent Wash 1750 TPD & Bagasse 950 TPD	Covered / open storage yard for bagasse & Storage tank for SW	From own existing & proposed distillery by pipelines

### 1.4.4 Other Basic Requirements

Other basic requirements for the project are given in Table below.

#### Basic Requirements for the Project

S. No.	Particular	Total Requirement after expansion	Source
1.	Fresh Water (KLPD) for Sugar Mill	678	surface water and treated water from sugar mill
2.	Water Requirement for Distillery (KLPD)	Max req. 2759 (Grain based operation)	
3.	Water required for CBG Plant (KLPD)	150	
4.	Water requirement for Aviation fuel plant (KLPD)	720	
4.	<b>Manpower (persons)</b>		Unskilled / Semi-Skilled - Local Area; Skilled – Outside
	For Sugar Mill	461	
	For Distillery	165	

Source: Pre-feasibility Report

## 1.5 PROCESS DESCRIPTION

### Sugar Manufacturing Process

- Extraction of Juice
- Clarification
- Evaporation
- Crystallization
- Centrifugation
- Drying, grading & bagging

### Molasses/ Sugar syrup based distillery Manufacturing Process

- Molasses/ sugar syrup Unloading and Storage
- Yeast Propagation
- Fermentation
- Multi Pressure Distillation
- Dehydration System for Ethanol Production
- Alcohol bulk storage
- Multi-Effect Evaporation Section
- Incineration Boiler along with the turbine generator

## 1.6 DESCRIPTION OF ENVIRONMENT

### 1.6.1 Presentation of Results (Air, Noise, Water and Soil)

Baseline study of the study area was conducted during Summer Season (March to May, 2024).

**Air:** Ambient Air Quality Monitoring reveals that the concentrations of PM10 and PM2.5 for all the 8 AAQM stations were found 42.8 to 78.4 µg/m<sup>3</sup> and 25.8 to 46.7 µg/m<sup>3</sup> respectively. The concentrations of SO<sub>2</sub> and NO<sub>2</sub> were found to be in range of 5.0 to 13.9 µg/m<sup>3</sup> and 10.1 to 26.5 µg/m<sup>3</sup> respectively. Highest PM, SO<sub>2</sub> and NO<sub>2</sub> concentration were found near Village Patas due to its closeness to NH 65 and operational plant.

**Noise:** Ambient noise levels were measured at 8 locations within the 10 km radius area from the plant site. Noise levels vary from 50.1 to 57.1 Leq dB (A) during day time and 39.6 to 47.9 Leq dB(A) during night time. During day & night time, the values are not much varying and some level of noise is always found due to human and vehicular activities.

**Groundwater** was analyzed for 8 locations. The pH of the groundwater samples ranged from 7.49 to 7.67 which is within the permissible limit. The color and turbidity were below detection limit and odor and taste were agreeable. The total dissolved solids ranged from 429 to 735 mg/l. Physical quality of the groundwater samples was fair. Total hardness 262.7-420.5 (mg/l) and alkalinity 205.2-355 (mg/l) was observed. Samples were less polluted as indicated by the values of chlorides 60.54 to 130.10 (mg/l) and sulphates 33.68- 71.65 (mg/l). The Fluoride concentration

is 0.45-0.96 (mg/l). Based on the moderate conductivity values (693.0 to 1175  $\mu$ S/cm), the groundwater samples are rich in dissolved substances and minerals which are good for irrigation purpose. The sodium 37.0 to 85.0 (mg/l) and potassium 4.0 to 19.0 (mg/l) concentration are very low indicating absence of pollution of groundwater samples. Total suspended solids, Nickel, Mercury, Arsenic, Lead, Cadmium, Manganese, Copper, Chromium, Anionic Detergents, Phenolic compounds, Boron, Aluminum and phosphates were BDL for all the villages.

**Soil:** Soil monitoring was carried out at 6 locations All the soil samples collected were varying in color i.e., Bright Brown, Greyish Brown and Brownish Black texture analysis of soil samples were shown different proportion of sand, silt, and clay percentage in soil samples. Higher percentage of silt is shown in the soil samples. The pH ranged from 7.74 to 8.29 which is moderately alkaline to alkaline and appropriate for agricultural soils. Water holding capacity (39.67% to 47.72%) is favorable for the crops but showed tendency towards water logging. However, the bulk density (g/cc) 1.30 to 1.45 was within the optimum level. Calcium ranges from 5374.78 to 8305.51 mg/kg, Sodium 163.61 to 312.98 mg/kg, Potassium 269.92 to 418.45 (kg/ha) was moderate to high, Available nitrogen 196.37 to 280.46 (kg/ha) was low and Available phosphorus 16.81 to 32.73 (kg/ha) is high. Chloride levels range from 825.81 to 969.72 mg/kg and SAR ranges from 0.52 to 1.01 of the soil samples. The average conductivity values are 0.26 to 0.50 (mS/cm) which is average in all locations.

#### **Traffic Study**

Traffic survey has been conducted for 24 hours at NH-65 which is adjacent to plant site in North direction. The LOS value is “C” after the project expansion which is “Good” for NH-65. Hence, the additional load on the carrying Capacity of the concern roads has not changed the LOS value.

#### **Biological Environment**

No Schedule-1 was found in the core as well as buffer zone. No endangered or endemic species (as notified in IUCN Red Data Book) are located within the study area. No migratory birds breed in the study area. No Tiger Reserve/ Elephant Corridor/ Turtle breeding place is located within 10 km radius of the study area. Baseline study period was during March to May, 2024. Visit was conducted by FAEs concerned.

#### **Socio-Economic Environment**

A detailed Socio-Economic report of 10 km radius area of the Plant Site has been carried out which comprises of 24 villages out of which 2 villages comes under 0-3 Km radius area, 11 villages come under 3-7 km radius area and 11 villages comes under 7-10 Km radius area. In the observed villages, number of scheduled caste (SC) population is (12.35 %) and Schedule Tribe population is low (1.98 %) in study area while (85.68 %) of the population has been observed as others. The sex ratio in the study area is 857 females per 1000 males (as per Census 2011). The

child sex ratio in study area is 863 females per 1000 male (as per census 2011). The 10 km radius study area demonstrates a literacy rate of 77.57% as per census data. The male literacy rate in the study area works out to be 84.54 % whereas the female literacy rate, which is an important indicator for social change, is observed to be 70.26% in the study area as per the census data 2011.

## 1.6.2 OCCUPATIONAL HEALTH MEASURES

The plant has following hazardous chemicals that are used in process and can prove harmful if not handled properly. The medical health checkup will be carried out regularly to find out any previous symptoms related to any disorder or disease. The industry will provide proper training to employees pertaining to medical emergencies and situations. The exposure levels of hazardous chemicals will never be surpassed and in case of leakage or sudden emergency, proper measures will be taken to avoid emergency situations.

S. No.	Hazards	Threshold limit	Impacts	Mitigation measures
1.	Sulphur	5ppm Averaged over an 8hr worksheet	Sulphur can cause irritation in respiratory tissues, breathing, severe air way obstruction etc.	<ul style="list-style-type: none"> <li>• Proper PPEs to be provided to workers.</li> <li>• Handling in accordance with good industrial hygiene and safety practice</li> <li>• Avoid contact with water. Direct contact with water may cause an exothermic reaction.</li> </ul>
2.	Phosphoric acid	1mg/m <sup>3</sup> Averaged over an 8hr worksheet	Phosphoric acid reduces scale in evaporators and also makes the nature of scales softer.	<ul style="list-style-type: none"> <li>• Proper PPEs to be provided to workers.</li> <li>• Handling in accordance with good industrial hygiene and safety practice</li> <li>• Avoid contact with water. Direct contact with water may cause an exothermic reaction.</li> </ul>
3.	Lime	5mg/m <sup>3</sup> Averaged over an 8hr worksheet	Lime is used to maintain pH level in sugar mill	<ul style="list-style-type: none"> <li>• Proper PPEs to be provided to workers.</li> <li>• Handling in accordance with good industrial hygiene and safety practice</li> <li>• Avoid contact with water. Direct contact with water may cause an exothermic reaction.</li> </ul>
4.	Sodium hydroxide	2 mg/m <sup>3</sup> Acute toxicity of the vapor (LC50): 320	Caustic soda can cause burns.	<ul style="list-style-type: none"> <li>• Proper PPEs to be provided to workers.</li> <li>• Handling in accordance with good industrial hygiene and</li> </ul>

		mg/m <sup>3</sup>		safety practice
5.	Carbon dioxide	5000 ppm	Headaches, dizziness, restlessness, a tingling or pins or needles feeling, difficulty breathing, sweating, tiredness, increased heart rate, elevated blood pressure, coma, asphyxia, and convulsions	<ul style="list-style-type: none"> <li>• Avoid contact with water. Direct contact with water may cause an exothermic reaction.</li> <li>• Carbon dioxide will be collected in scrubbers and sold to vendors.</li> <li>• Proper monitoring and maintenance of fermentation equipment.</li> <li>• Proper PPEs to be provided to workers exposed to the zone.</li> <li>• Regular checking of pipes and bolts for avoiding any fugitive emissions.</li> <li>• Proper CO<sub>2</sub> monitors to be provided.</li> </ul>
6.	Ethyl alcohol	1000 ppm	Alcohol storage tank bursting or leakage can cause fire or explosion hazards	<ul style="list-style-type: none"> <li>• Proper flow meter to check the flow of alcohol in storage tanks.</li> <li>• Proper training to employees to act in case of alcohol leakage.</li> <li>• Proper fire extinguishers adequate for the fire that can happen in distillery i.e. foam type.</li> <li>• Proper fire hydrant network will be spread in all the areas prone to fire hazard.</li> <li>• Fire sensors and alarms.</li> <li>• PESO guidelines to be strictly followed.</li> </ul>
7.	Dust exposure	-	Sudden dust cloud can affect the respiratory tract and interfere with breathing. Cause pneumoconiosis Some particles dissolve in the bloodstream. The blood then carries the substance around the body where it may affect the brain, kidneys and other organs.	<ul style="list-style-type: none"> <li>• Proper dust mask for persons handling bagasse.</li> <li>• Regular water sprinkling to avoid dust dispersion.</li> <li>• Storage of bagasse in covered sheds and continuous water sprinkling.</li> <li>• Proper greenbelt will be developed in all the areas having the probability of dust explosions.</li> </ul>
8.	Noise exposure	75 dB(A) during day time And 70dB(A) during night	Elevated workplace or environmental noise can cause hearing impairment, hypertension, ischemic heart disease, annoyance, and sleep	<ul style="list-style-type: none"> <li>• Proper PPEs to be provided like ear muffs and ear plugs</li> <li>• Alternation of duties.</li> <li>• Regular audiometry check-up.</li> <li>• Proper maintenance, oiling &amp;</li> </ul>

		time	disturbance.	greasing of machines to detect any loosened nuts, bolts.
9.	Heat exposure	-	Prolonged or intense exposure to hot temperatures can cause heat-related illnesses such as heat exhaustion, heat cramps, and heat stroke	<ul style="list-style-type: none"> <li>• Alternation of duties.</li> <li>• Proper PPEs to the workers.</li> </ul>
10.	Electrocution	-	Electric shock, brain damage	<ul style="list-style-type: none"> <li>• Proper earthing.</li> <li>• Doubly insulated instruments/machineries.</li> <li>• Proper PPEs like rubber gum boots to be provided.</li> </ul>
11.	Physical	-	Fall, slip trip, physical injuries.	<ul style="list-style-type: none"> <li>• Proper PPEs for workers operating at heights like safety helmets, fall protection etc.</li> <li>• Proper first aid facilities at all danger prone areas.</li> </ul>

*Source: National Institute of Occupational Safety and Health document*

### 1.6.3 ENVIRONMENTAL MONITORING PROGRAMME

Details of the environmental monitoring schedule / frequency, which will be undertaken for various environmental components, as per conditions of EC/CTE/CTO are given in Table below.

#### Frequency and Location for Post Project Monitoring

S. No.	Description	Frequency of Monitoring	Locations of monitoring
1.	Ambient Air Quality	As per EC/CTO condition	Within and outside plant area at least 4 locations (1 within and 3 outside the plant area at an angle of 120 <sup>0</sup> each) covering upwind and downwind directions
2.	Stack Emission Monitoring	Continuous monitoring (Online)	Plant Site (Boiler stacks)
3.	Performance Guarantee (PG) test of pollution control equipment	Yearly	All pollution control devices
4.	Fugitive emission	As per EC/CTO condition	In the plant site
5.	Noise level monitoring	As per EC/CTO condition	Plant boundary & nearby areas
6.	Ground water quality	Twice a year (Pre & Post monsoon)	In & around the plant site
7.	Effluent quality	Daily (In house laboratory)	ETP/STP Outlet
8.	Soil Quality	Yearly	In & around the plant site
9.	Medical checkup of employees	Yearly	Nearby hospitals/dispensary/on-site
10.	Compliance Audit	Half yearly	In & around the plant site
11.	OHS Audit	Yearly	In & around the plant site

## 1.7 PROJECT BENEFITS

The expansion of sugar mill and distillery project of Bhima Sahakari Sakhar Karkhana Ltd., will result in growth of the surrounding areas by increasing indirect employment opportunities in the region including ancillary development and supporting infrastructure. Development of social amenities will be in the form of medical facilities, education to underprivileged and creation of self-help groups. Maharashtra will get revenues in terms of taxes and local people will get direct & indirect employment. Business opportunities for local community will be available. No adverse effect on environment is envisaged as proper mitigation measures will be taken up for the same. Projects will be implemented based on community needs and with significant local contributions. Important areas identified through socio-economic survey and public hearing will be considered for social welfare activities covered under EMP. This approach will strengthen the groups, empower the members.

## 1.8 ENVIRONMENT MANAGEMENT PLAN

Following mitigation measures will be adopted by the company to minimize the impact of project on the surrounding environment:

Particulars	Details
<b>Air Quality Management</b>	<p><b><u>Sugar Mill-</u></b></p> <ul style="list-style-type: none"> <li>For existing Operation of 5000 TCD Sugar Mill, five boilers of 2x20 TPH, 30 TPH &amp; 2x50 TPH capacity with wet scrubber as APCE and stack height of 30 m (common stack for 2x20 TPH boiler), 30m (30 TPH boiler) &amp; 40m (common stack for 2x50 TPH boiler) is installed. As a part of proposed expansion, existing 2 x 20 TPH boilers and 30 TPH boiler will be dismantled and 2 x 50 TPH boilers will remain in use.</li> <li>In addition to this, proposed 220 TPH boiler with ESP as APCE and stack height of 85 m will be installed to control the particulate and gaseous emissions in accordance with CPCB guidelines.</li> </ul> <p><b><u>Distillery-</u></b></p> <ul style="list-style-type: none"> <li>For existing operation of 45 KLPD Molasses based Distillery, 20 TPH bagasse fired boiler of adjacent sugar mill is being utilized which is installed with wet scrubber as APCE and stack height of 30m (common stack for 2x20 TPH boiler).</li> <li>As a part of proposed expansion, 150 TPH incineration boiler with ESP as APCE &amp; stack height 90 m will be installed to control the particulate and gaseous emissions in accordance with CPCB guidelines</li> <li>CO<sub>2</sub> generated (533 TPD) during the fermentation process is/will be collected and sold to authorized vendors as per local demand.</li> <li>DG Set (2 x 160 &amp; 1 x 500 KVA) installed at the plant site have stack height of 3 m each and 5 m respectively as per CPCB guidelines. As part of expansion, DG Set (2 x 1500 KVA) will be installed at the plant site having stack height 8 m as</li> </ul>

	<p>per CPCB guidelines.</p> <ul style="list-style-type: none"> <li>• Out of total plant area, 66.05 acres (26.73 ha) i.e., 33% of the plant area is being/will be developed as greenbelt &amp; plantation out of which 23951 nos. of trees has been planted as greenbelt. As a part of proposed expansion, additional 42884 no. of trees as greenbelt will be developed.</li> <li>• Closed Storage, closed handling &amp; conveyance of chemicals/materials are being/will be followed at the plant site to control fugitive emissions.</li> <li>• Regular water sprinkling is done to control dust emissions.</li> <li>• Online Stack Monitoring system is already installed at the plant site with existing stack and additional SPM will be installed for the proposed new stacks.</li> <li>• The overall quality of the ambient air is being/will be monitored and maintained within the limits prescribed by CPCB / SPCB after the commencement of the operations of expansion project.</li> </ul>
<p><b>Water &amp; Waste Water Management</b></p>	<p>The Molasses/Sugar Syrup/Grain based distillery and Sugar Mill will be based on “Zero Effluent Discharge”.</p> <ul style="list-style-type: none"> <li>• Domestic waste water generated from the sugar mill &amp; Distillery will be treated in Proposed STP of capacity 50 KLPD respectively.</li> <li>• Rain Water harvesting is being/will be done within the plant premises.</li> <li>• Regular monitoring of ground water quality is being/ will be carried out.</li> </ul> <p><b><u>Sugar Mill-</u></b></p> <ul style="list-style-type: none"> <li>• A full-fledged ETP (Capacity 500 KLPD) for sugar and co-gen is already in place. As a part of expansion Effluent from Sugar Unit &amp; Co-generation Power Plant will be treated in expanded capacity of ETP (1100 KLPD) and treated water is recycled/reused in process, distillery process, greenbelt development.</li> </ul> <p><b><u>Molasses/Sugar Syrup based Distillery-</u></b></p> <ul style="list-style-type: none"> <li>• At present, the 45 KLPD distillery is following the bio methanation-bio composting route in which bio compost is produced (497 TPD) which is sold as manure. After expansion the company will phase out bio-composting and follow incineration route. Spent wash after getting partially recycled to the process generated from the analyzer column during the operation, will be concentrated in integrated &amp; standalone Multi – Effect Evaporator (MEE). Concentrated spent wash (max. 1750 KLPD for C-Heavy based molasses operations) will be burnt as fuel in incineration boiler along with bagasse.</li> <li>• As a part of expansion, Effluent from Molasses/Sugar Syrup based (max. 6448 KLPD) will be treated in expanded capacity of CPU/ETP (7600 KLPD) and treated water is recycled/reused in process &amp; greenbelt development.</li> </ul> <p><b><u>Grain based Distillery operations-</u></b></p> <ul style="list-style-type: none"> <li>• Raw spent wash after partially getting recycled (3587 KLPD) will be passed through Centrifuge Decanters for separation of suspended solids separated as Wet Cake- 1750 TPD (also known as DWG – Distiller’s Wet Grains). Thin Slops from the Decanter Centrifuge will be partly recycled to process (20% to 30%) and the</li> </ul>



	<p>balance will be fed to Thin Slop Evaporation Plant for concentration of remaining solids to form Slop Syrup of 30% - 35% w/w TS and partly recycled. These will be combined &amp; sent for drying in a Dryer.</p> <ul style="list-style-type: none"> <li>• DWGS Drier: The Wet Cake (1750 TPD) and Syrup mixture will be dried in Steam Tube Bundle Dryer for producing Dried Distillers Grains Soluble (DDGS) with 8-10% moisture (max.). The DDGS (735 TPD) will be utilized as Cattle, poultry &amp; fish feed ingredients.</li> <li>• The MEE Condensate, Dryer condensate, Spent Lees, CT Blow down, DM Plant reject, boiler blow down, Scrubber Effluent, Lab washing (4138 KLPD) will be treated in CPU/ETP (7600 KLPD) and this treated water is then recycled back to process thus reducing the fresh water consumption.</li> </ul>
<p><b>Noise Management</b></p>	<ul style="list-style-type: none"> <li>• Proper maintenance, oiling and greasing of machines at regular intervals is being/will be done to reduce generation of noise.</li> <li>• Personal Protective Equipment like earplugs and earmuffs is being/will be provided to the workers exposed to high noise level.</li> <li>• D.G. sets installed are provided with acoustic enclosures to control the noise level within the prescribed limit.</li> <li>• Out of total plant area, 66.05 acres (26.73 ha) i.e., 33% of the plant area is being/will be developed as greenbelt &amp; plantation.</li> <li>• Regular monitoring of noise level is being / will be carried out in and around plant premises to find out any high noise level zones and measures are being/will be implemented accordingly.</li> </ul>
<p><b>Solid &amp; Hazardous Waste Management</b></p>	<p><b><u>Grain based operations –</u></b></p> <ul style="list-style-type: none"> <li>• Solid waste from the Grain based operations generally comprises of fibres and proteins in the form of DDGS (735 TPD), which will be ideally used as Cattle, poultry &amp; fish feed ingredients.</li> </ul> <p><b><u>Molasses/Sugar Syrup based operations-</u></b></p> <ul style="list-style-type: none"> <li>• At present, the 45 KLPD distillery is following the bio methanation-bio composting route in which bio compost is produced (250 TPD) which is sold as manure.</li> <li>• After expansion, Concentrated spent wash (max. 1750 KLPD for C-Heavy Molasses based distillery) will be burnt as fuel in incineration boiler along with bagasse.</li> <li>• Fly ash (14 TPD) generated from the bagasse fired boiler and Fly ash (210 TPD) generated from Conc. Spent wash fired boiler are/will be supplied to brick manufacturers for brick manufacturing in covered vehicles only. The company has already signed the MoU with the nearby brick manufactures for the supply of fly ash.</li> </ul> <p><b><u>Sugar Mill –</u></b></p> <ul style="list-style-type: none"> <li>• Molasses (675 TPD) is dark color viscous matter generated from Sugar industry. This will be used as raw material in distillery for fuel grade Alcohol production.</li> </ul>

	<ul style="list-style-type: none"> <li>• Fly ash (31 TPD) generated from the boilers are/will be supplied to brick manufacturers for brick manufacturing in covered vehicles only. The company has already signed the MoU with the nearby brick manufactures for the supply of fly ash.</li> <li>• Bagasse (4200 TPD) generated from sugar mill is being/will be used as fuel for power generation in co-generation power plant.</li> <li>• Press Mud (600 TPD) generated from sugar mill is/will be given to the farmers as Make-Up Soil conditioner.</li> <li>• Yeast sludge will be mixed with press mud and will be given to farmers for soil amendment or in -house manufacturing of organic manure (bio-composting).</li> <li>• ETP sludge will be dewatered in Filter Press and will be used as manure.</li> <li>• Bio manure from CBG Plant will be supplied to farmers.</li> <li>• Used oil &amp; grease (5.1 KL/annum) generated from the Distillery &amp; Sugar Mill plant machinery/ gear boxes as hazardous waste is being/will be sold out to the CPCB authorized recycler.</li> </ul>
<p><b>Greenbelt Development and Plantation</b></p>	<ul style="list-style-type: none"> <li>• Out of total plant area, 66.05 acres (26.73 ha) i.e., 33% of the plant area is being/will be developed as greenbelt &amp; plantation.</li> <li>• Greenbelt has been/will be developed as per Central Pollution Control Board (CPCB) guidelines.</li> <li>• Greenbelt development along with the road &amp; plant boundary will be continued to attenuate noise level, arrest dust and improve the environment in surrounding.</li> </ul>
<p><b>Occupational health &amp; safety</b></p>	<ul style="list-style-type: none"> <li>• Occupational health surveillance program has been/will be taken as a regular exercise for all the employees and their records maintained.</li> <li>• Proper storage and handling precautions has been/will be taken. The storage area has been/will be kept cool, dry and well-ventilated and away from the source of heat, flame or oxidizers.</li> <li>• Use of Personal Protective Equipment (PPEs) has been/will be encouraged. Proper training program on use of PPEs, characteristics of the material handled and safety precautions has been/will be arranged.</li> <li>• Fire safety measures has been/will be incorporated within the factory premises. All the fire extinguishing media such as water, dry chemicals, CO<sub>2</sub>, sand, dolomite, foam, etc. has been/will be kept in vital locations.</li> <li>• Mock drill has been/will be arranged for the worker to test the effectiveness of the training program time to time and the way to react in case of emergency.</li> <li>• Safety precautions has been/will be displayed in the premises on the banners, boards, etc.</li> </ul>

## 1.9 CONCLUSION

The expansion of sugar mill and distillery will prove beneficial to the local people as more infrastructure development, improvement in education and health facilities, roads, availability of drinking water, etc. in near-by villages will be done. There will be increase in revenue generation to the government by way of royalty, excise and government taxes etc. There will be no significant impact on the area, as adequate preventive measures are being/will be adopted to maintain the various pollutants within permissible limits. Regular monitoring of all the components of environment is being/ will be done. Increased social welfare measures taken by the company will bring development in near-by villages. Greenbelt development around the area is being/will be also taken up as an effective pollution mitigation technique, as well as to control the pollutants released from the premises of M/s. Bhima Sahakari Sakhar Karkhana Ltd.

