EXECUTIVE SUMMARY

EXPANSION OF SUGARCANE CRUSHING CAPACITY FROM 1200 TCD TO 4700 TCD, ESTABLISHMENT OF COGENERATION POWER PLANT CAPACITY OF 20 MW, AND MULTIFEED (C MOLASSES/B-HEAVY MOLASSES/CANE JUICE/SYRUP) BASED 150 KLPD DISTILLERY

AT

CHANDAPURI, TALUKA MALSHIRAS, DISTRICT SOLAPUR, MAHARASHTRA STATE

BY

ONKAR SAKHAR KARKHANA PRIVATE LIMITED (OSKPL)

AREA:16.20 HECTARES

COST OF THE EXPANSION: Rs. 313.99 CR.

TORS GRANTED: F. No. J-11011/321/2022-IA-II(I) dated 23th August 2022

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

1. 0 INTRODUCTION

M/s. Onkar Sakhar Karkhana Private Limited (OSKPL) is a private limited company and is located Post Chandapuri, Taluka: Malshiras, District: Solapur. The industry is registered under the State of Maharashtra under the Companies Act, 2013 bearing certificate of incorporation CIN number U74999PN2017PTC168931 dated February 15, 2007. The industry started its first crushing operation in the year 2013 with the installed capacity of 2500 TCD. The industry proposes to expands sugarcane crushing capacity from 1200 TCD to 4700 TCD, establishment of Co-generation power plant capacity of 20 MW and establishment of 150 KLPD distillery unit to produce 150 KLPD RS/ENA/Ethanol based on C Molasses/B Heavy Molasses/sugarcane juice/syrup as raw material.

The command area is rich in sugarcane cultivation and has excellent irrigation facilities. Considering the Sugarcane cultivation potential and the availability of sugarcane in the command area the industry proposes to expand its sugarcane crushing capacity from 1200 TCD to 4700 TCD and Co-generation power plant capacity of 20 MW in order to utilized additional bagasse generated after the proposed expansion of sugar unit. The industry also proposes to establish 150 KLPD distillery to consume the available molasses from its own sugar unit and utilize sugarcane juice/syrup for the production of RS/ENA/Ethanol.

1.1 PROJECT LOCATION

The salient features of the project site are

Table 1 Salient features of the project site

Sr. No.	Features	Description	Direction wrt site
1.	latitude	17°44'31.25"N	
2.	Longitude	74°56'42.19"E.	
3.	Elevation above MSL	534 meters	
4.	Nearest City/Town	Malshiras~18 Km	NNE
5.	Nearest Village	Chandapuri~1.3Km	SE
		Nimgaon~5 Km	NE
6.	Road	National Highway No 548E ~, 1.7 Km	S
		State Highway No 153 ~3.9 Km	E
7.	Nearest water body	Nimgaon Lake~2.0Km	E
		Neera River right canal~ 0.03Km	E
		Bhima River~30Km	E
8.	Railway Station	Pandharpur, 50 Km	E
9.	Airport	Solapur Airport, 130 Km	EES
10.	Protected Area for reserved forest	Protected forest near Tarangfal village ~ 3Km	NNW
11.	Reserved Forests	Rreserved forest 1 ~ 3 Km near Tarangfal	N
		Reserved forest 2 ~near garvad village~3Km	W
		Reserved forest 3 near Ladevasti ~2.59Km	SW

Sr. No.	Features	Description	Direction wrt site
		Reserved forest 4 near Nimgaon Lake~3.91 Km	E
12.	Wildlife Sanctuary	None within 10 Km	
13.	Archeological site	None within 10 km	
14.	State boundary	None within 10 km	
15.	Defense installations	None within 10 km	
16.	Average Rainfall	524.9 mm	
17.	Seismicity	III	

2.0 PROJECT DESCRIPTION

The details about the maufacturing capacity of existing unit as well as after the proposed expansion are given in table below

Table 2 Existing and Proposed Products manufacturing quantities

Sr. No.	Description	Unit	Existing Capacity	Proposed Capacity	Total	Remark
1.	Sugar Unit	TCD	1200	3500	4700	Steam and Power will be taken from proposed 110 TPH Boiler and 20 MW TG Set. Existing 1*35 TPH boiler will be kept as Standby after expansion
2	Co-generation Power	MW	00	20	20	
3.	Distillery Unit	KLPD	00	150	150	
a	Rectified Spirit or	KLPD	00	150	150	Only one product at a time
	Extra Neutral Alcohol or		00	150	150	
	Ethanol		00	150	150	
b	Power from TG Set	MW	00	3.0	3.0	TG Set Connected to proposed 30 TPH incineration Boiler

2.1 RESOURCE REQUIREMENT AND INFRASTRUCTURE FACILITIES

A) Raw material requirement

The details of the raw material requirement for sugar and distillery unit and its source are given in table below. The sugarcane is transported in bullock cart, Truck, Tractors etc and other chemicals are transported to the site through designated vehicles by Pakka Roads. The other raw materials like bagasse and Molasses are produced from its own sugar unit. In case of shortage of molasses, it shall be purchased from nearby sugar industries.

Sugar and Cogeneration power plant division

Table 3 Raw material requirement and its source for sugar unit

Sr. No.	Item		Quantity			Unit	Source
			Existing	Proposed	Total		
1	Sugar Cane		1200	3500	4700	MT/day	Farmers within command area
Consumable Chemicals							
1	Sulfur		667	1925	2592	Kg/Day	Open Market
2	Lime		1800	5250	7050	Kg/Day	
3	Ortho phosphoric Acid		84	245	329	Kg/Day	
Utilities							
1	Total Steam Requirement		24	80	104	TPH	110 TPH New Boiler (Existing 35 TPH boiler will be kept as standby after expansion)
2	Fuel Bagasse		15.9	34.10	50	TPH	Sugar unit
3	Water	Domestic	90	0	90	CMD	Zero water requirement for industrial purpose due to all the condensate will be recycled after treatment, in fact **210 CMD water saved and used for distillery usages.** 90 CMD for Domestic purpose
		Industrial	00	00	00		
4	Power		1.36	5.36	6.72	MW	Own Co-generation power plant
5	Manpower		250	120	370	Nos	Local

Table 4 Raw material requirement and its source for distillery unit

Sr. No.	Item	Quantity	Unit	Remarks/Source
150 KLPD Distillery				
1 a	B Heavy molasses OR	470	MT/day	Distillery unit will run for 150 days (During off season) on B heavy molasses available from our existing unit
1 b	C Molasses	580	MT/day	
2	Sugar cane juice OR	2000	MT/day	Distillery unit will be run for 180 days During crushing season (Equivalent sugarcane 200 TCD)
	Sugar cane Syrup	1000		
Consumable Chemicals				
1	Sodium Meta bi-sulphate	75	Kg/Day	Stored in Fermentation house Source: Market Mumbai, Pune, Solapur
2	De-foam agent	150	Kg/Day	

Sr. No.	Item		Quantity	Unit	Remarks/Source
3	Nutrients (Fertilizers DAP)		130	Kg/Day	
4	Enzymes		40	Kg/Day	
Utilities					
1	Total requirement of Steam		28.125	TPH	Proposed 30 TPH Incinerator boiler
2	Fuel	Conc. Spent wash	361	MT/Day	Source: Conc. Spent wash & bagasse – Own sugar unit. Coal – Open Market Remark: In case of shortage of bagasse coal shall be used as fuel. Fuel - [(Conc. Spent wash + Bagasse) OR (Conc. Spent wash + Coal)]
3		Bagasse OR	154	MT/Day	
4		Coal	79	MT/day	
5	Water	Domestic use	5 CMD	CMD	Source: - Nira River Right Canal Process condensate and dilute effluent recycled after treatment
		Distillery Unit	539 CMD		
6	Power		2.5	MW	Proposed 3 MW TG Set connected to Incinerator boiler.
7	Man power		90	No.	Local

B) Land use Details

Details of existing and proposed land utilization pattern within the project site is given in table below

Table 5 Landuse breakup

Sr. No.	Description	Area in Sq. Mt.		% Of Total Area	
1	Built-up Area				
	Existing -	8251.176	20491.38	5.09	12.58
	Proposed -	12140.2		7.49	
2	Area Under Utility				
	Existing -	8329.224	13718.04	5.14	8.47
	Proposed -	5388.818		3.33	
3	Parking Area	21546.63		13.30	
4	Area Under Road	18346.81		11.33	
5	Green Belt Development	54134.09		33.42	
6	Open Space	33863.03		20.90	
Total		**162000**		**100**	

C) Power Requirement

At present, the power requirement is 1.36 MW. Additional 7.86 MW of power will be required after the proposed expansion/establishment. Thus, the total power requirement after the proposed expansion will be 9.22 MW. The details of which are given in table below.

Table 6 Details of the power requirement

Sr. No	Unit	Existing (MW)	Proposed (MW)	Total (MW)	Source
1.	Sugar Unit and cogeneration power plant	1.36	5.36	**6.72**	Proposed own 20 MW Co-generation power plant.
2.	Distillery Unit	00	2.5	**2.5**	Proposed 3 MW TG Set connected to Incinerator boiler.
	Total	**1.36**	**7.86**	**9.22**	

D) Water Consumption Details

Source of water is Nira Right Bank Canal, which is adjacent to the project site. The necessary Application for seeking the permission is Submitted to Irrigation Authority and it is under process

Table 7 Water Consumption Details

Description	Quantity	Remarks
Domestic use	95 CMD	For Sugar division 90 CMD and for Distillery division 5 CMD
Sugar and Co-generation Power Plant	0 CMD	Due to excess condensate available from Sugar unit, there shall not be any water requirement for sugar and co-generation unit.
Distillery Unit	585 CMD OR	When C Molasses used as raw material
	533 CMD OR	When B Heavy Molasses used as raw material
	408 CMD	When Juice/syrup Molasses used as raw material

Sugar and Cogeneration power plant Division

The detailed water budget for sugar, cogeneration unit and distillery unit are as under.

Table 8 Water Budget -Sugar and Co-generation Power Plant

Sr. No.	Details	Water Requirement (KLD)			Consumption/Losses (KLD)			Reuse / Recovery (KLD)			Waste Generation (KLD)			Remark
		E	P	T	E	P	T	E	P	T	E	P	T	
Domestic Purpose														
1	Domestic	60	30	90	20	10	30	0	0	0	40	20	60	Used for gardening
Industrial Purpose														
1	Boiler 110 TPH	00	2410	2410	00	155	155	00	2200	2200	00	55	55	625 KLD of treated effluent shall be recycled after RO treatment. [RO permeate 405 KLD, RO reject 200 KLD and 20 KLD Loss (i.e., 200 KLD shall be used for greenbelt purpose)]
2	DM Plant	00	230	230	00	210	210	0	0	0	00	20	20	
3	Process water	35	100	135	7	18	25	0	0	0	28	82	110	
4	Washing of equipment	10	30	40	0	0	0	0	0	0	10	30	40	
5	Condenser Water	0	0	0	0	0	0	180	525	705	0	0	0	
6	Spray pond blowdown	180	525	705	90	265	355	0	0	0	90	260	350	
7	Cooling tower	00	360	360	00	310	310	0	0	0	00	50	50	
8	Recycling of Excess Condensate	0	0	0	0	0	0	180	525	705	0	0	0	
9	Recycle of treated effluent	0	0	0	0	0	0	40	365	405	0	0	0	
Total		225	3655	3880	97	958	1055	400	3615	4015	128	497	625	

Net Water saving would be:

Industrial Purpose: 3880 – 4015 = -135 KLD. (**135 KLD** of water shall be saved)

Due to excess condensate available from Sugar unit, there shall not be any water requirement for sugar and co-generation unit.

Domestic Purpose:

At present water requirement is 60 KLD and additionally 30 KLD after the proposed expansion i.e., total of 90 KLD.]

Water Budget for Distillery unit

For "C" molasses as raw material

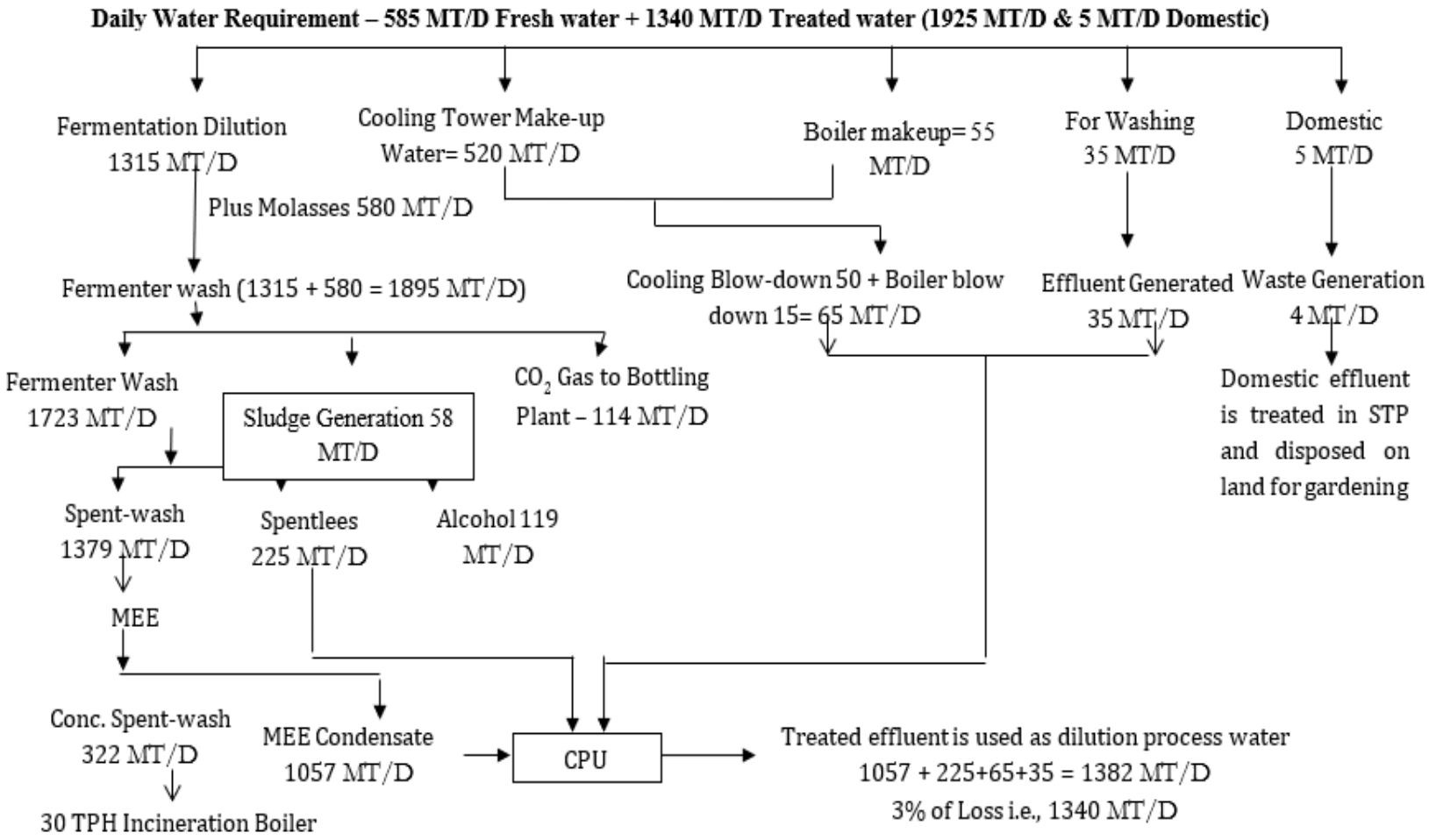

Figure 1 Material balance flow sheet for C Molasses as raw material

For "B" Heavy molasses as raw material

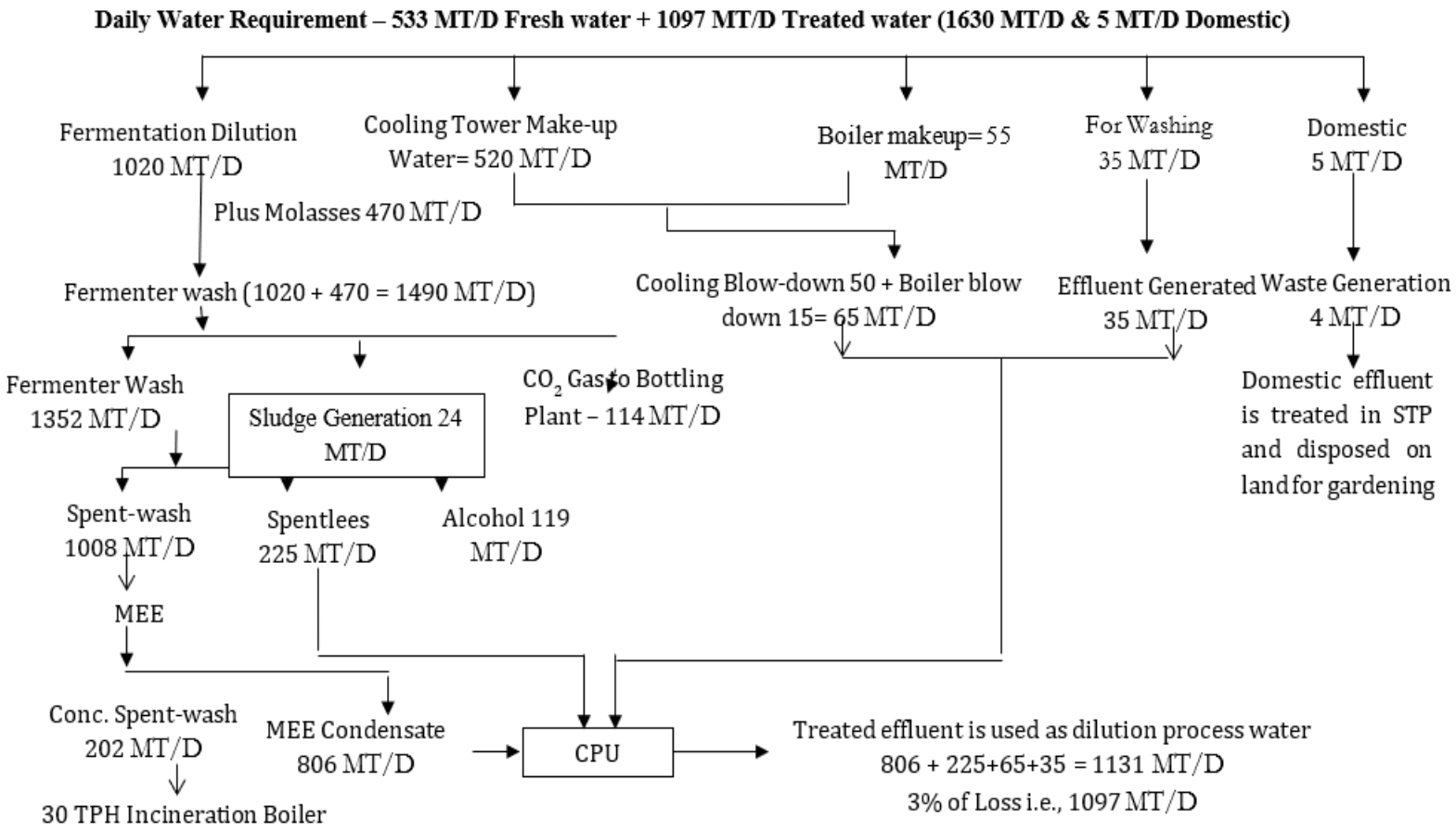

Figure 2 Material balance flow sheet for B Heavy Molasses as raw material

For Sugarcane juice/Syrup as raw material

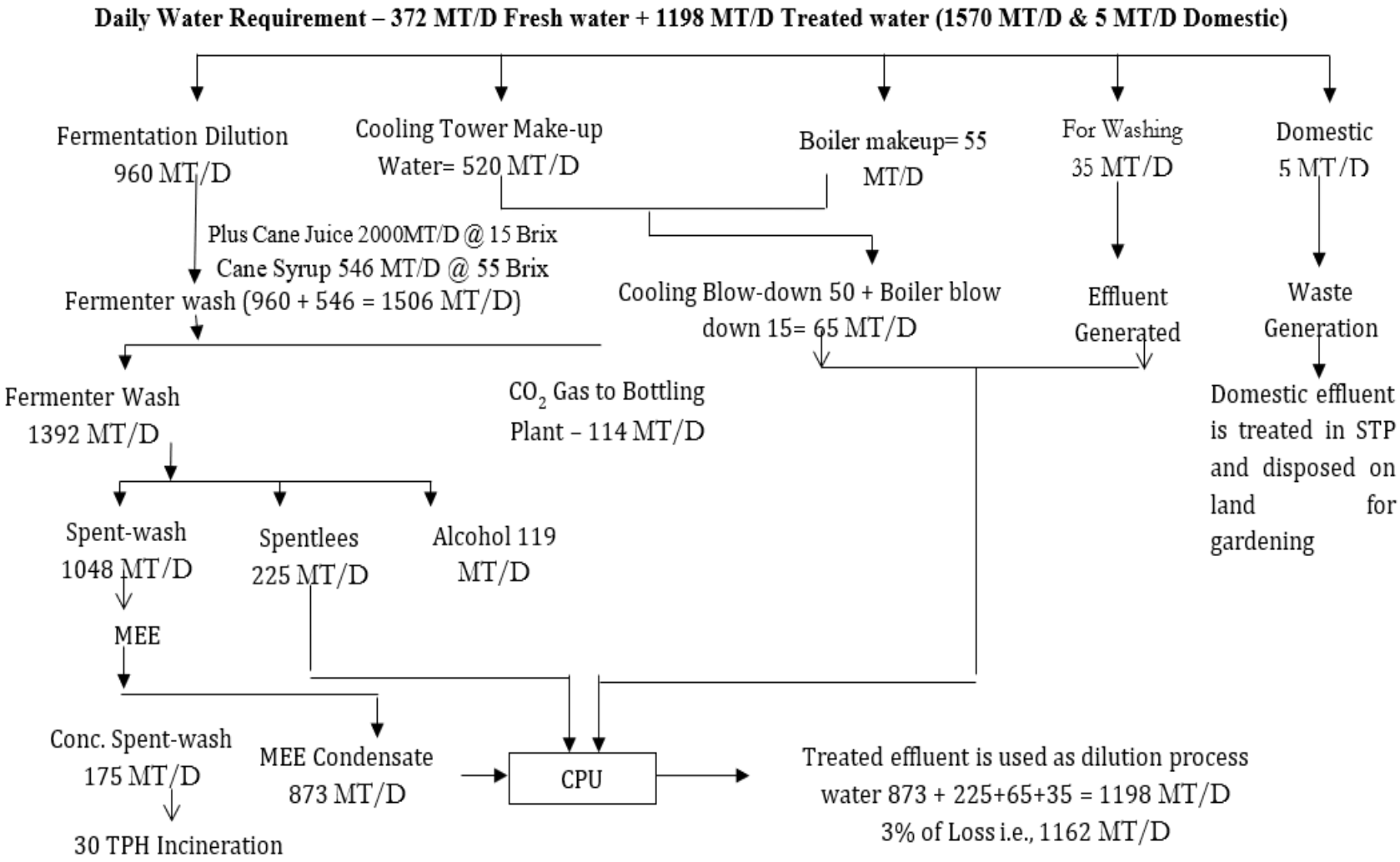

Figure 3 Material balance flow sheet for Sugarcane Juice or Syrup as raw material

Distillery Division

Table 9 Water consumption details for various raw materials

Sr. No.	Propose	Water consumption (MT/D)		
		C Molasses	B heavy molasses	Sugarcane juice/ syrup
Domestic				
1	Domestic	5	5	5
Industrial				
1	Process	1315	1020	960
2	Boiler make up	55	55	55
3	Cooling tower makeup	520	520	520
4	Washings	35	35	35
	Total	**1925**	**1630**	**1570**

Table 10 Wastewater generation details for various raw materials

Sr. No.	Propose	Wastewater Generation (MT/D)			Remarks
		C Molasses	B heavy molasses	Sugarcane juice/ syrup	
Domestic					
1	Domestic	4	4	4	To proposed STP
Industrial					
1	Process				
a	Conc. Spentwash	322*	202*	175*	Burnt in to Proposed 30 TPH incineration boiler
b	Spentlees	225	225	225	To CPU and recycled back as process water
c	MEE Condensates	1057	806	873	
2	Boiler blow down	15	15	15	
3	Cooling tower blow down	50	50	50	
4	Washings	35	35	35	
	Total	**1382**	**1131**	**1198**	

Table 11 Treated effluent recycled from ZLD System for various raw materials

Sr. No.	Propose	Wastewater Generation (CMD)			Remarks
		C Molasses	B heavy molasses	Sugarcane juice/ syrup	
1	Treated effluent recycled from CPU	1340	1097	1162	After treatment in CPU (Considering 3% Losses)

Table 12 Net freshwater requirement for various raw materials for industrial purpose

Sr. No.	Propose	Wastewater Generation (CMD)		
		C Molasses	B heavy molasses	Sugarcane juice/ syrup
Industrial				
1	Total water consumption including domestic	1925	1630	1570
2	Treated effluent recycled from CPU	1340	1097	1162
	Net fresh water requirement	**585**	**533**	**408**
	KL/KL of Alcohol	**3.90**	**3.55**	**2.72**

E) Wastewater generation and its treatment technology

Sugar and Co-generation power plant

Table 13 Details of effluent generation, treatment scheme and disposal arrangement for sugar unit and co-generation power plant

Sr. No.	Description	Quantity CMD	Treatment technology and disposal
1	Sugar factory trade effluent	150	All wastewater generated shall be treated in existing ETP after up-gradation followed by RO and recycled back in to process and RO reject of 200 KLD shall be used for greenbelt/gardening purpose.
2	Co-generation Power plant effluent	125	
4	Spray pond overflow	350	
	Excess Condensates	705	Treated in condensate polishing unit based on primary, secondary and tertiary treatment and reused as process water or utilities.
5	Domestic effluent	60	Treated in STP and disposed on land for gardening.

Distillery unit

The industry shall adopt Zero Liquid Discharge System for the treatment of wastewater generated from the proposed distillery unit. The effluent streams are separated into strong stream (Spent wash) and weak stream (Spent lees, Utilities process condensates etc). The raw spent wash is treated based on Concentration and Incineration principles.

A) C Molasses as raw material: -

The raw spent wash (1379 MT/D) shall be concentrated in MEE [322 MT/D]. The evaporator condensates (1057 MT/D) shall be treated in proposed condensate polishing unit based on primary, secondary and tertiary treatment along with other dilute effluent streams (Spentlees-225 MT/D, Boiler blow down of 15 MT/D, Cooling tower blow down of 50 MT/D, and Fermenter washings of 35 MT/D totaling to 325 MT/D). Total effluent going to CPU shall be 1382 MT/D out of which 3% losses and remaining 1340 CMD shall be recycled back as process water or make up water for cooling tower and boiler.

B) B' Heavy Molasses as raw material:

The raw spent wash (1008 MT/D) shall be concentrated in MEE [202 MT]. The evaporator condensates (806 CMD) shall be treated in proposed condensate polishing unit based on primary, secondary and tertiary

treatment along with other dilute effluent streams (Spentlees-225 MT/D, Boiler blow down of 15 MT/D, Cooling tower blow down of 50 MT/D, and Fermenter washings of 35 MT/D totaling to 325 MT/D). Total effluent going to CPU shall be 1131 MT/D out of which 3% losses and remaining 1097 MT/D shall be recycled back as process water or make up water for cooling tower and boiler.

C) Sugarcane Juice/ Syrup as raw material:

The raw spent wash (1048 MT/D) shall be concentrated in MEE (175 MT). The evaporator condensates (873 MT/D) shall be treated in proposed condensate polishing unit based on primary, secondary and tertiary treatment along with other dilute effluent streams (Spentlees-225 MT/D, Boiler blow down of 15 MT/D, Cooling tower blow down of 50 MT/D, and Fermenter washings of 35 MT/D totaling to 325 CMD). Total effluent going to CPU shall be 1198 MT/D out of which 3% losses and remaining 1162 MT/D shall be recycled back as process water or make up water for cooling tower and boiler.

F) Air Emission Management

Table 14 Details of boilers and its APC equipment for existing as well as proposed

Sr. No.	Stack Attached to	Type of Fuel	Minimum Stack Required in meter	Stack Height in meter Based on SO2 Emission	APC Equipment
Boiler and its APC Equipment's and Stack Height Details					
1	Existing 35 TPH & Proposed 110 TPH	Bagasse	56.64	60 (Existing Stack is Adequate for existing 35 TPH and proposed 110 TPH boilers)	Multi-cyclone Dust Collector for existing 35 TPH boiler and Bag-Filter for proposed 110 TPH boiler
2	1*30 TPH Incineration Boiler	Conc SW + Bagasse	68.10	72	ESP
		Conc SW + Coal	69.91		
TG Set and its APC Equipment's and Stack Height Details					
3	Existing - DG Set 2*320 KVA Proposed - DG Set 1*750 KVA	HSD	-	6.0 meter above roof level	-

G) Solid waste Management

a) Non-Hazardous solid wastes details

Table 15 Details of non-hazardous waste generated and its disposal

Sr. No.	Description of waste			Quantity	Mode of Collection and Disposal
1.	Boiler Ash from Existing 35 TPH & Proposed 110 TPH [Existing 35 TPH boiler shall be standby after proposed expansion]			Existing 35 TPH Boiler – 5.73 MT/D Proposed 110 TPH Boiler - 18 MT/D	All the solid wastes are mixed with Press mud/ETP sludge and sold as manure.
2.	ETP Sludge			131 MT/A	
3.	Press mud			188 MT/D	
4.	Incinerator boiler Ash	C Molasses Conc. SW	Bagasse OR	53.125 MT/D	Sold as potash rich manure to farmers.
			Coal	61.52 MT/D	
		B Heavy Molasses Conc. SW	Bagasse OR	34.87 MT/D	
			Coal	48.32 MT/D	
		Cane Syrup/Juice Conc. SW	Bagasse OR	30.87 MT/D	
			Coal	51.60 MT/D	
Other Solid Wastes					
1.	Paper waste			0.01 MT/M	Manually collected and stored in a designated area and sold to scrap vendors
2.	Plastic waste			0.01 MT/M	
3.	Municipal Solid waste				
	Non-Biodegradable			100 Kg/M	Manually collected and sold to scrap vendors
	Bio-degradable			1 MT/M	Used in Composting

b. Hazardous Waste

Table 16 Details of hazardous waste generated and its disposal

Sr. No.	Category	Description of waste	Quantity	Mode of Collection and Disposal
1.	5.1	Used Oil	1.3 KLA	Shall be collected in Leak Proof Containers and utilized as lubricant for bullock carts.

3. 0 BASELINE ENVIRONMENTAL STATUS
3.1 AIR ENVIRONMENT
3.1.1 METEOROLOGICAL CHARACTERISTICS OF THE STUDY AREA

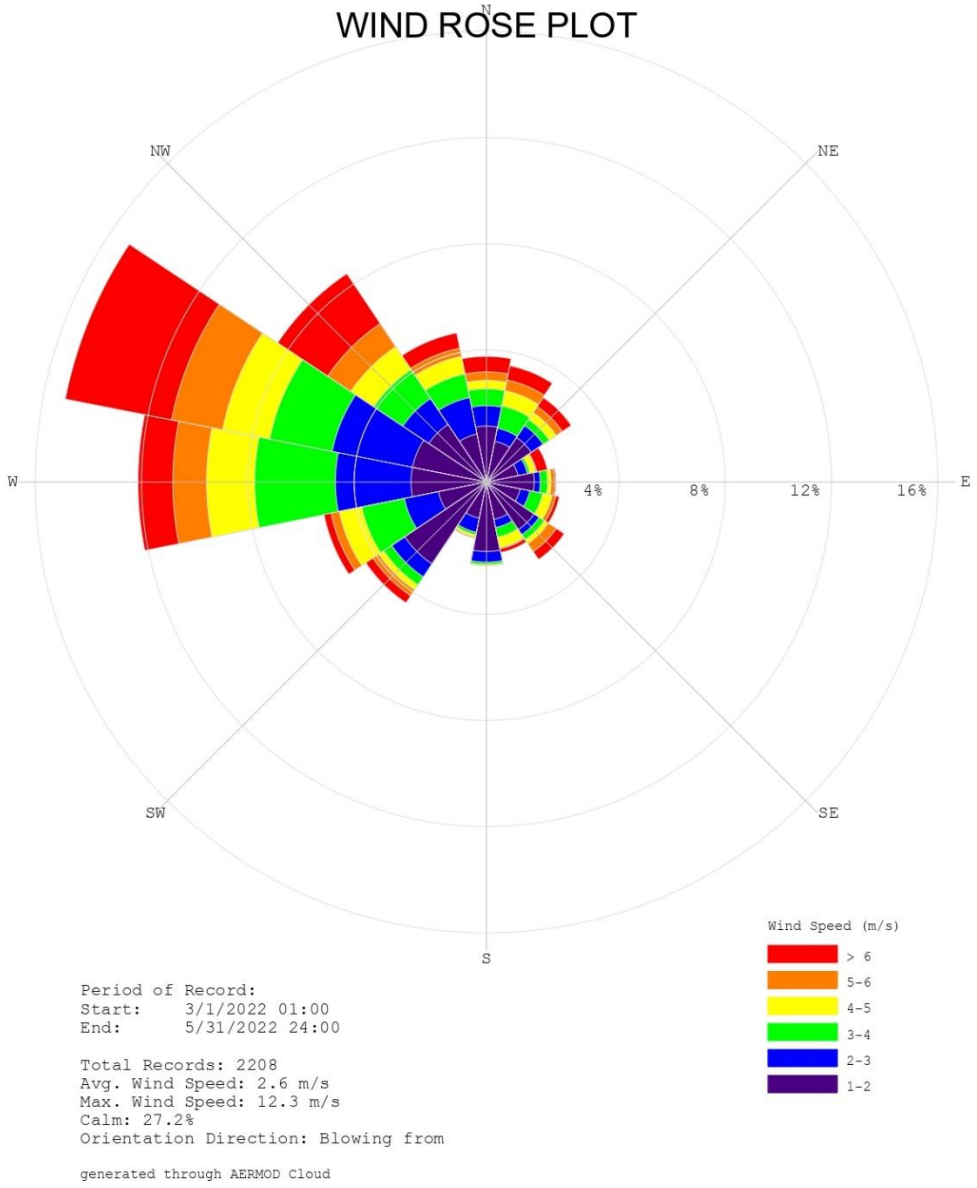

Figure 4 Windrose diagram for the study area (blowing from)

From **Figure 2** it can be seen that the Average wind speed of the study period is 2.6 m/s. and the predominant wind direction is from Northwest-west to Southeast-east direction. This has been used in selecting the receptors.

Table 17 Receptor summary

Sr. No.	Symbol	Description	Latitude	Longitude	Distance	Direction (in degree)
	Stack 1	Existing (60 m)	17°44'31.41"N	74°56'40.06"E	---	---
	Stack 2	Proposed (72 m)	17°44'19.28"N	74°56'50.56"E	---	
1	A1	Near Entry Gate (Within Industry premises)	17°44'32.52"N	74°56'43.42"E	---	---
2	A2	Near Proposed Distillery Unit (Within Industry premises)	17°44'20.35"N	74°56'54.29"E	---	---
3	A3	Near Maldoli	17°43'33.76"N	75° 2'11.20"E	9.55	98.46
4	A4	Near Hanuman Mandir Chandapuri	17°43'48.34"N	74°57'33.75"E	1.59 Km	126.91
5	A5	Near Nimgaon	17°45'48.47"N	74°59'13.88"E	5.02 Km	56.65
6	A6	Near Piliv	17°40'42.70"N	74°58'1.80"E	6.98	162.60
7	A7	Near Tarangfal	17°46'29.95"N	74°55'29.43"E	4.65 Km	329.29
8	A8	Near Bhandewasti	17°42'49.14"N	74°53'56.72"E	5.82 Km	241.35

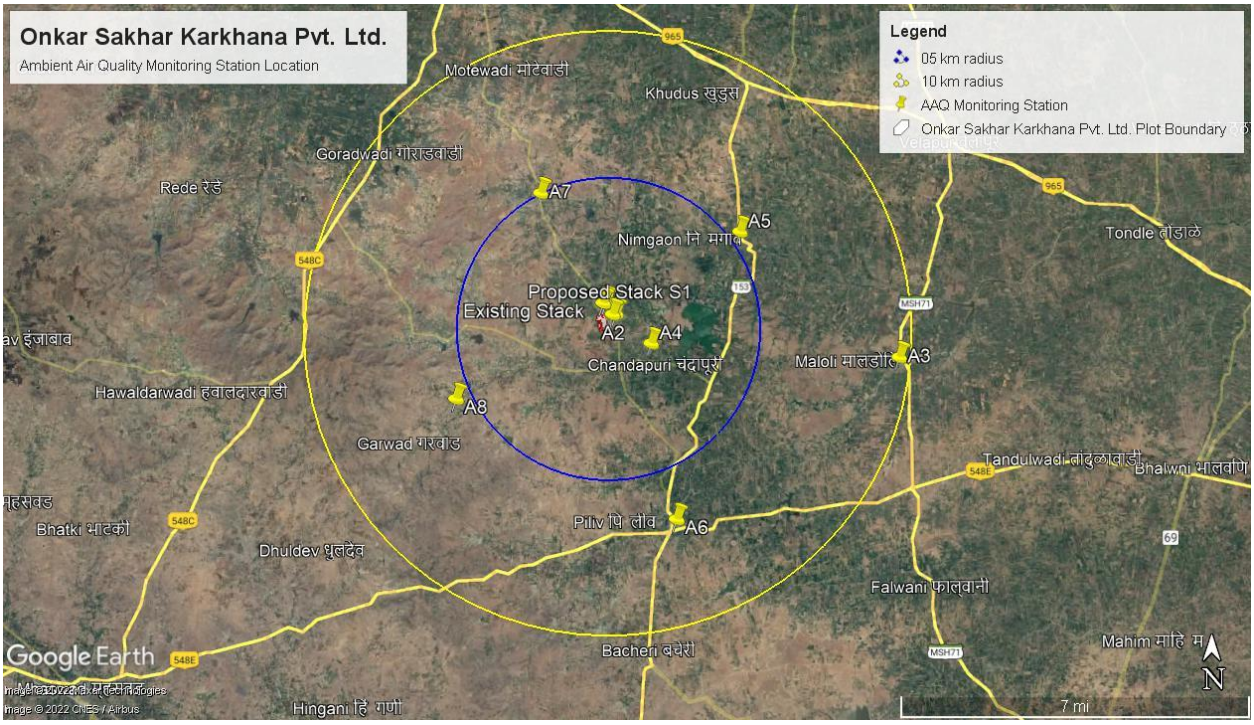

Figure 5 10 km. radius study area map indicating Ambient air quality monitoring locations

Table 18 Ambient air quality monitoring results

Sr. No.	Receptor/ Village		Pollutant	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	CO (mg/m^3)
			NAAQ Standard	**100**	**60**	**80**	**80**	**04 (1 hr)**
1	**A1**	Near Entry Gate (Within Industry premises)	Maximum	**61.10**	**40.90**	**24.60**	**29.90**	**1.50**
			Minimum	49.20	25.20	11.64	16.50	0.70
			Average	55.80	35.90	20.67	25.91	1.07
			98 Percentile	60.32	40.02	23.87	29.33	1.50
2	**A2**	Near Proposed Distillery Unit (Within Industry premises)	Maximum	**62.20**	**41.30**	**24.80**	**29.30**	**1.60**
			Minimum	50.30	25.90	12.54	17.84	0.80
			Average	56.55	36.25	21.51	26.15	1.22
			98 Percentile	61.00	40.47	24.33	28.83	1.60
3	**A3**	Near Maldoli	Maximum	**54.70**	**36.30**	**20.20**	**22.70**	**1.10**
			Minimum	46.80	28.80	15.80	16.40	0.40
			Average	50.59	32.45	17.23	19.71	0.72
			98 Percentile	54.30	35.45	19.50	22.50	1.10
4	**A4**	Near Hanuman Mandir Chandapuri	Maximum	**58.40**	**38.00**	**22.90**	**27.20**	**1.40**
			Minimum	49.70	31.00	16.90	19.30	0.50
			Average	53.90	34.37	19.10	22.62	0.92
			98 Percentile	57.50	37.15	22.05	27.05	1.35
5	**A5**	Near Nimgaon	Maximum	**53.20**	**34.80**	**16.61**	**20.40**	**1.00**
			Minimum	45.80	29.20	13.23	17.80	0.30
			Average	49.31	31.88	14.74	18.97	0.62
			98 Percentile	52.85	34.35	16.23	20.30	1.00
6	**A6**	Near Piliv	Maximum	**51.50**	**32.10**	**21.20**	**23.30**	**1.30**
			Minimum	46.10	28.60	16.10	17.30	0.50
			Average	48.46	30.15	18.09	20.30	0.83
			98 Percentile	51.30	31.90	20.70	23.20	1.25
7	**A7**	Near Tarangfal	Maximum	**48.20**	**29.30**	**12.61**	**15.20**	**0.80**
			Minimum	42.50	26.30	9.74	12.80	0.20
			Average	44.99	27.57	11.17	14.02	0.47
			98 Percentile	47.89	29.04	12.57	15.20	0.80
8	**A8**	Near Bhandewasti	Maximum	**45.30**	**25.10**	**11.41**	**14.90**	**0.60**
			Minimum	40.20	22.90	8.63	12.60	0.10
			Average	42.46	23.83	9.96	13.62	0.30
			98 Percentile	45.20	25.10	11.27	14.90	0.60

3.1.1 IMPACT ON AIR QUALITY DUE TO PROPOSED ACTIVITY

Table 19 Details of the incremental concentrations due to proposed expansion

Sr. No.	Receptor/Village	PM10- 24-hour concentration (µg/m3)			PM2.5- 24-hour concentration (µg/m3)			SO_2- 24-hour concentration (µg/m3)			NOx- 24-hour concentration (µg/m3)		
		Background	Incremental	Total	Background	Incremental	Total	Background	Incremental	Total	Background	Incremental	Total
1	Near Entry Gate (Within Industry premises)	61.10	0.0	61.10	40.90	0.0	40.90	24.60	0.0	24.60	29.90	0.0	29.90
2	Near Proposed Distillery Unit (Within Industry premises)	62.20	0.0	62.20	41.30	0.0	41.30	24.80	0.01	24.81	29.30	0.01	29.31
3	Near Maldoli	54.70	0.09	54.79	36.30	0.06	36.36	20.20	0.35	20.55	22.70	0.33	23.03
4	Near Hanuman Mandir Chandapuri	58.40	0.16	58.56	38.00	0.11	38.11	22.90	0.58	23.48	27.20	0.54	27.74
5	Near Nimgaon	52.20	0.04	52.24	34.80	0.03	34.83	16.61	0.13	16.74	20.40	0.13	20.53
6	Near Piliv	51.50	0.04	51.54	32.10	0.02	32.12	21.20	0.13	21.33	23.30	0.13	23.43
7	Near Tarangfal	48.20	0.06	48.26	29.30	0.04	29.34	12.61	0.20	12.81	15.20	0.19	15.39
8	Near Bhandewasti	45.30	0.06	45.36	25.10	0.04	25.14	11.41	0.25	11.66	14.90	0.23	15.13

Conclusions

Air quality predictions are done considering the concentrated spentwash, bagasse or coal as a fuel. Considered the proposed boilers working at full load conditions to estimate the GLC of PM10, PM2.5, SO2 and NOx due to the proposed expansion/establishment of the industry under the prevailing conditions of meteorology and emission data set, air quality modeling is performed for Onkar Sakhar Karkhana Pvt Ltd. Incremental concentrations are worked out for 8 receptor locations, at which ambient air quality monitoring was carried out. Total concentrations are computed considering background (Ambient Air Monitoring) concentrations and incremental concentrations (AERMOD) due to the proposed expansion/establishment. Results are compared with the Ambient Air Quality Standards (AAQS).

From the results, it can say that,

- At the selected 8 receptor locations, surrounded in 10 km radius around Onkar Sakhar Karkhana Pvt Ltd, Chandapuri, Tal. Malshiras, Dist. Solapur, Maharashtra State. GLCs are well within the limits of AAQS.
- Under the working conditions of proposed 1*110 TPH sugar division boiler and proposed 1*30 TPH incineration boiler, PM_{10}GLCs at all the 8 receptor locations are in the range of **45.36 µg/m3** to **62.2 µg/m3** which are within the limits of AAQS.
- Similarly, $PM_{2.5}$ GLCs for those receptors are in the range of **25.14 µg/m3** to **41.3 µg/m3** which is within the limits of AAQS.
- For SO_2, GLCs are in the range of **11.66 µg/m3** to **24.81 µg/m3**which is within the limits of AAQS.
- NO_x GLCs are in the range of **15.13 µg/m3** to **29.90 µg/m3**which is within the limits of AAQS.

It can be inferred that there shall not be any adverse effect on Ambient Air Quality due to the proposed expansion/establishment.

3.2 WATER ENVIRONMENT

The unit is located at Village Chandapuri, Taluka Malshiras, District Solapur, Maharashtra State. Majority of the study area (10 km around site) is under agriculture land use. Source of water is Nira Right Bank Canal, which is 0.05 Km away from the project site. The necessary permissions for lifting the water for industrial use are in process. (Application Submitted to Irrigation Authority).

Bheema River, Nira Right Bank Canal and Nimgaon Lake are main source of water for agriculture use. Nira Right Bank Canal at 0.05 km towards East from the project site. Groundwater is used as an alternate source in surrounding villages for domestic and drinking purposes. Therefore, it is important to assess the existing baseline status of both ground water quality and surface water quality within the study area.

3.2.1 GROUND WATER

Table 20 Details of the ground water quality monitoring sampling locations

Sr. No.	Symbol	Description	Latitude	Longitude
1	GW-1	Near Nimgaon	17°45'50.39"N	74°59'8.41"E
2	GW -2	Near Nimgaon Lake	17°44'58.94"N	74°58'59.96"E
3	GW -3	Near Kusmod	17°42'0.03"N	75° 0'22.40"E
4	GW -4	Near Tarangphal	17°46'28.42"N	74°55'24.59"E
5	GW -5	Near Chandapuri	17°43'52.64"N	74°57'33.10"E
6	GW -6	Near Garwad	17°44'5.64"N	74°53'22.04"E
7	GW -7	Near Bhande Wasti	17°42'43.61"N	74°53'51.16"E
8	GW -8	Near Piliv	17°41'34.14"N	74°57'35.07"E

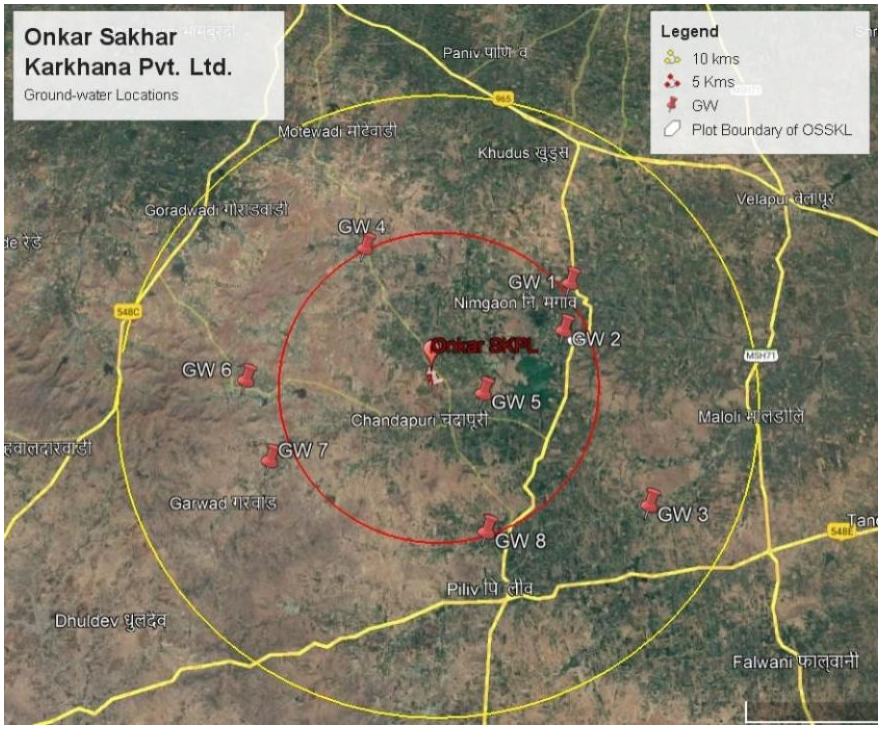

Figure 6 10 km. radius study area map indicating groundwater sampling location

Table 21 Groundwater analysis report within 10 km radius of the study area

Sr. No	Description	Unit	Results								Desirable	Permissible
			GW-1	GW-2	GW-3	GW-4	GW-5	GW-6	GW-7	GW-8	IS 10500:2012 Standards	
1	pH	---	6.90	6.85	7.04	6.86	6.92	6.77	7.23	7.34	6.5-8.5	No relaxation
2	Temperature	^oC	26.5	27	26.8	26.2	27.1	26.1	26.6	27.4	Not Specified	
3	Turbidity	NTU	0.9	0.97	1.02	0.85	1.06	0.79	0.98	1.1	1	5
4	Electrical Conductivity	µS/cm	1668	1346	1844	2597	2122	5024	5539	2885	Not Specified	
5	Total Dissolved Solids	mg/lit	393.1	354	389	372.6	390.4	348.1	360.9	436.8	500	2000
6	Total Suspended Solids	mg/lit	3	5	3	4	6	4	4	3	Not Specified	
7	Salinity	ppt	1.8	1.3	1.5	1.2	1.6	1.8	1.4	1.5	Not Specified	
8	Chemical Oxygen Demand	mg/lit	18	24	27	16	34	28	22	37	Not Specified	
9	Biochemical Oxygen Demand @ 27^oC for 3 days	mg/lit	< 4	4	5	< 4	8	6	5	11	Not Specified	
10	Chlorides as Cl-	mg/lit	124	110	132	105	96	88	126	139	250	1000
11	Sulphates as SO_4--	mg/lit	36	45	51	47	56	38	43	51	200	400
12	Fluoride as F^-	mg/lit	0.68	0.43	0.57	0.50	0.64	0.62	0.70	0.61	1	1.5
13	Total Alkalinity as $CaCO_3$	mg/lit	144	168	137	170	163	130	141	165	200	600
14	Nitrate as NO_3	mg/lit	3.7	3.2	4.8	5.6	3.6	6.1	4.3	4.8	45	No relaxation
15	Nitrite as NO_2	mg/lit	0.08	0.06	0.05	0.11	0.10	0.13	0.08	0.09	Not Specified	
16	Ammonia as N	mg/lit	0.25	0.26	0.20	0.28	0.34	0.28	0.23	0.30	0.5	No Relaxation
17	Total Phosphate as PO_4	mg/lit	0.16	0.19	0.15	0.16	0.18	0.14	0.20	0.19	Not Specified	
18	Magnesium as Mg	mg/lit	41	24	29	33	38	40	19	37	30	100
19	Total Hardness as $CaCO_3$	mg/lit	321	190	244	238	296	320	174	312	200	600
20	Calcium as Ca	mg/lit	60	36	49	40	55	61	38	63	75	200
21	Sodium as Na	mg/lit	29	22	28	27	31	24	33	30	Not Specified	

Sr. No	Description	Unit	Results								Desirable	Permissible
			GW-1	GW-2	GW-3	GW-4	GW-5	GW-6	GW-7	GW-8	IS 10500:2012 Standards	
22	Iron as Fe	mg/lit	0.18	0.13	0.16	0.24	0.14	0.20	0.17	0.19	0.3	No Relaxation
23	Copper as Cu	mg/lit	0.05	0.07	0.06	0.07	0.08	0.06	0.05	0.08	0.05	1.5
24	Total Chromium as Cr	mg/lit	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	0.05	No Relaxation
25	Chromium as Cr+6	mg/lit	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	0.10	No Relaxation
26	Nickel as Ni	mg/lit	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	0.02	No relaxation
27	Cadmium as Cd	mg/lit	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	0.003	No relaxation
28	Mercury as Hg	mg/lit	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	0.001	No Relaxation
29	Arsenic as As	mg/lit	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	0.01	0.05
30	Cyanide as Cn	mg/lit	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	0.05	No Relaxation
31	Lead as Pb	mg/lit	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	0.01	No Relaxation
32	Zinc as Zn	mg/lit	0.05	0.04	0.03	0.04	0.05	0.05	0.04	0.05	5	15
33	Total Coliform	Org/ml	10	13	0	15	10	13	11	0	No Relaxation	
34	Fecal Coliform	Org/ml	Present	Present	Absent	Present	Present	Present	Present	Absent	No Relaxation	

3.2.2 SURFACE WATER

Table 22 Details of surface water quality monitoring locations

Sr. No.	Symbol	Description	Latitude	Longitude
1	SW-1	Nimgaon Lake	17°44'22.76"N	74°58'45.49"E
2	SW -2	Near Magarwadi	17°45'52.48"N	74°57'34.68"E
3	SW -3	Near Project site	17°44'22.41"N	74°56'57.96"E
4	SW -4	Near Garwad	17°44'2.73"N	74°54'24.02"E
5	SW -5	Near Sulewadi	17°40'31.37"N	74°54'23.91"E
6	SW -6	Lake Near Garwad Pati	17°46'23.83"N	74°51'58.32"E
7	SW -7	Near Kusmod	17°43'4.01"N	75° 0'19.00"E

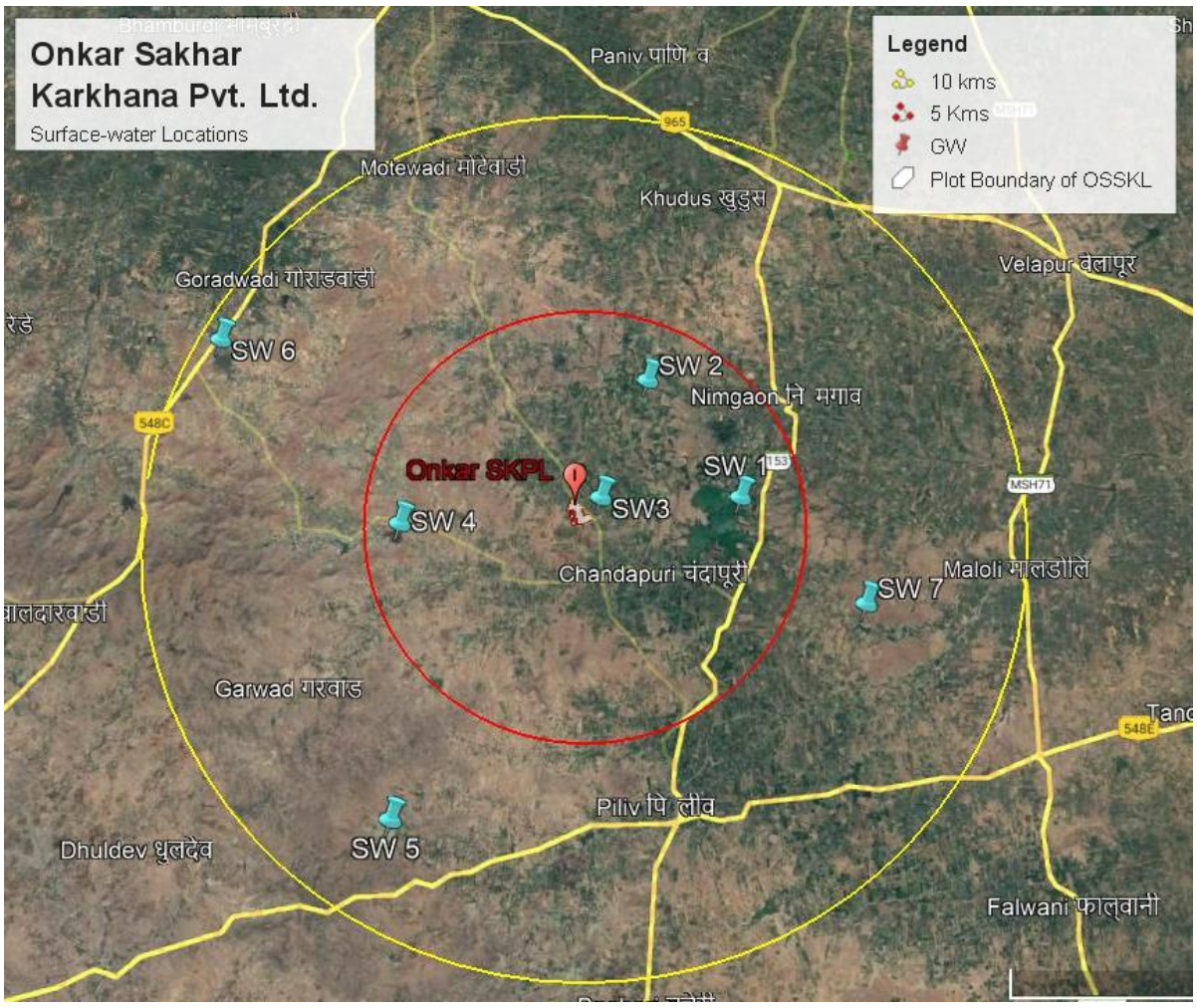

Figure 7 10 km. radius study area map indicating surface water sampling location

Table 23 Surface water analysis report within 10 km radius of the study area

Sr No.	Description	Unit	Results						
			SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7
1	pH	---	7.41	7.53	7.12	7.20	7.23	7.60	7.35
2	Temperature	^oC	27	27.4	27	27	28	27.7	28
3	Turbidity	NTU	3.2	2.2	2.4	2.8	2.6	3.1	2.7
4	Electrical Conductivity	µS/cm	426	458	509	401	495	466	449
5	Total Dissolved Solids	mg/lit	264	288	311	264	317	284	277
6	Total Suspended Solids	mg/lit	13	8	10	12	6	9	8
7	Salinity	ppt	4.5	5.6	4.9	4.4	5.9	6.1	5.1
8	Dissolved Oxygen	mg/lit	5.1	5.4	5.3	5.2	6.3	6.9	5.7
9	Chemical Oxygen Demand	mg/lit	41	60	38	42	48	68	59
10	Biochemical Oxygen Demand @ 27^oC for 3 days	mg/lit	12	17	11	12	14	26	24
11	Chlorides as Cl-	mg/lit	70	81	94	89	101	68	49
12	Sulphates as SO_4--	mg/lit	17	26	30	28	34	40	47
13	Fluoride as F^-	mg/lit	0.70	0.46	0.58	0.40	0.59	0.60	0.50
14	Total Alkalinity as $CaCO_3$	mg/lit	145	157	154	116	161	134	141
15	Nitrate as NO_3	mg/lit	5.2	4.2	6.2	6.8	3.9	5.8	4.1
16	Nitrite	mg/lit	1.33	0.02	0.18	0.03	0.65	0.02	0.02
17	Ammonia as N	mg/lit	0.35	0.21	0.19	0.24	0.24	0.27	0.20
18	Total Phosphate as PO_4	mg/lit	0.11	0.06	0.12	0.05	0.10	0.05	0.08
19	Calcium as Ca	mg/lit	32	35	37	24	28	40	31
20	Magnesium as Mg	mg/lit	20	22	19	16	18	22	24
21	Total Hardness as $CaCO_3$	mg/lit	163	179	172	127	145	192	178
22	Sodium as Na	%	2.31	0.06	2.01	0.08	0.16	0.07	0.05
23	Iron as Fe	mg/lit	NIL	NIL	NIL	NIL	0.2	NIL	NIL
24	Copper as Cu	mg/lit	NIL	NIL	NIL	NIL	NIL	NIL	NIL
25	Total Chromium as Cr	mg/lit	NIL	NIL	NIL	NIL	NIL	NIL	NIL

Sr No.	Description	Unit	Results						
			SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7
26	Chromium as Cr+6	mg/lit	NIL	NIL	NIL	NIL	NIL	NIL	NIL
27	Nickel as Ni	mg/lit	NIL	NIL	NIL	NIL	NIL	NIL	NIL
28	Cadmium as Cd	mg/lit	NIL	NIL	NIL	NIL	NIL	NIL	NIL
29	Mercury as Hg	mg/lit	NIL	NIL	NIL	NIL	NIL	NIL	NIL
30	Arsenic as Ar	mg/lit	NIL	NIL	NIL	NIL	NIL	NIL	NIL
31	Cyanide as CN	mg/lit	NIL	NIL	NIL	NIL	NIL	NIL	NIL
32	Lead as Pb	mg/lit	NIL	NIL	NIL	NIL	NIL	NIL	NIL
33	Zinc as Zn	mg/lit	NIL	NIL	NIL	NIL	0.03	NIL	NIL
34	Total Coliform	Org/ml	86	56	77	46	80	86	63
35	Fecal Coliform	Org/ml	Present	Present	Present	Present	Present	Present	Present

Note:

Remark: All samples of surface water viz. SW-1, SW-2, SW-3, SW-4, SW-5, SW-6 and SW-7, are of Class D as per Central Pollution Control Board Water Quality criteria. Accordingly, the surface water can be directly used for Propagation of Wild life and Fisheries, Irrigation, Industrial Cooling, Controlled Waste disposal.

Summary of the groundwater and surface water quality monitoring results

Table 24 Water Analysis Results

Sr. No	Parameters	Ground water		Surface water	
		Min	Max	Min	Max
1.	pH	6.77	7.34	7.12	7.60
2.	Total Dissolved Solids (mg/l)	348.1	436.8	264	317
3.	Total Hardness (mg/l)	174	321	127	192
4.	Chlorides (mg/l)	88	139	49	101
5.	Fluoride (mg/l)	0.43	0.70	0.40	0.70
6.	Sulphates (mg/l)	36	56	17	47

3.3 SOIL ENVIRONMENT

Table 25 Details of the soil sampling locations

Sr. No.	Symbol	Description	Latitude	Longitude
1	S1	Near Piliv	17°41'8.03"N	74°57'50.60"E
2	S2	Near Project Site	17°44'14.01"N	74°56'44.28"E
3	S3	Near Nimgaon lake	17°44'40.85"N	74°58'52.80"E
4	S4	Near Hanuman Mandir Chandapuri	17°43'48.34"N	74°57'33.75"E
5	S5	Near Nimgaon	17°45'48.47"N	74°59'13.88"E
6	S6	Near Kusmod	17°42'11.65"N	75° 0'19.46"E
7	S7	Near Tarangfal	17°46'29.95"N	74°55'29.43"E
8	S8	Near Bhandewasti	17°42'49.14"N	74°53'56.72"E

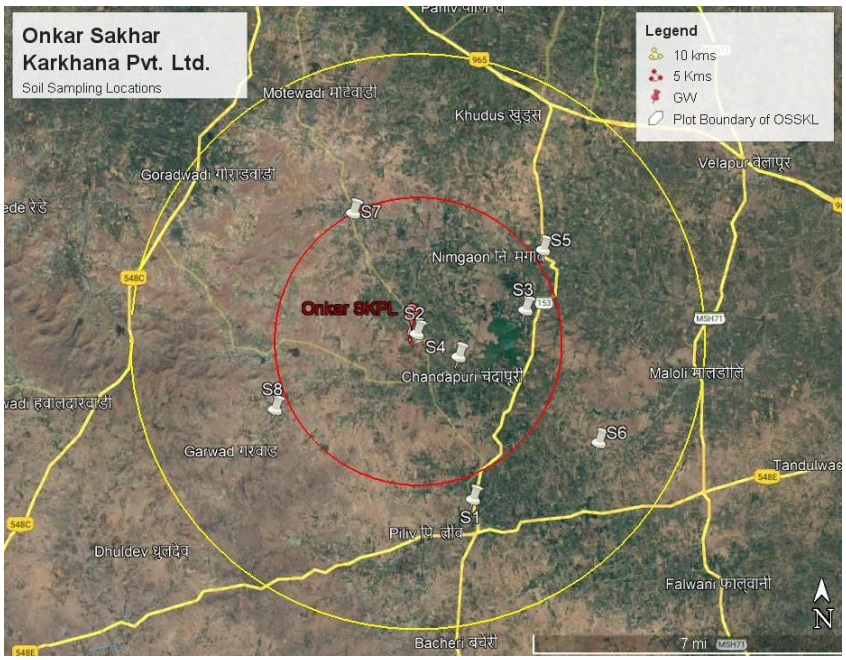

Figure 8 10 km. radius study area map indicating soil sampling location

Table 26 Soil Analysis report within 10 km radius of the study area

Sr. No.	Description	Unit	RESULT								As per Ministry of Agriculture 2011
			S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8	
1.	Colour	-	Black	Black	Black	Black	Black	Black	Black	Black	Ministry of Agriculture 2011
2.	Grain Size Distribution										
	Clay	%	17	22	10	18	16	14	10	13	Not Specified
	Sand	%	60	50	55	58	64	52	58	60	Not Specified
	Silt	%	25	28	35	24	20	34	32	27	Not Specified
3.	Texture Class	--	Sandy Loam	Sandy Clay Loam	Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam	Not Specified
4.	Bulk Density	gm/cc	1.12	1.16	1.24	1.08	1.34	1.29	1.22	1.45	Not Specified
5.	Permeability	cm/hr	4.5	4.1	4.8	3.8	4.5	4.9	3.9	4.7	Not Specified
6.	Water Holding capacity	%	45	38	48	46	50	43	40	52	Not Specified
7.	Porosity	%	45	38	48	46	50	43	40	52	Not Specified
8.	pH (1: Aq Extraction)	--	7.28	7.4	7.11	7.03	7.35	7.21	7.18	7.08	<8.5
9.	Electrical Conductivity (1: Aq Extraction)	µS/cm	586	621	610	594	612	635	605	627	150 – 650
10.	Cation Exchange Capacity	meq/ 100gm	0.7	0.62	0.57	0.73	0.68	0.61	0.79	0.74	Not Specified
11.	Sodium Absorption Ratio	----------	12.71	10.55	11.8	12.33	10.55	11	12.62	11.28	10-18
12.	Total Nitrogen Content	Kg/ha	324	357	331	340	354	318	326	348	280-560
13.	Available Phosphorous (P)	Kg/ha	40.2	53.4	45.8	61.5	70	56	44.6	65.8	10-24.60
14.	Available Potassium	Kg/ha	142	135	130	144	128	110	108	122	108-280
15.	Organic Carbon	%	0.62	0.7	0.65	0.6	0.69	0.58	0.71	0.66	Not Specified
16.	Organic Matter	%	0.68	0.61	0.7	0.54	0.57	0.62	0.5	0.6	0.5 – 0.75
17.	Total Iron (Fe)	mg/kg	3.4	3.28	3.46	3.25	3.18	3.33	3.47	3.58	Not Specified
18.	Zinc (Zn)	mg/kg	2.2	2.14	1.88	1.74	2.38	2.13	2.78	1.76	Not Specified
19.	Nickel (Ni)	mg/kg	1.2	1.44	1.63	1.58	1.75	1.52	1.37	2.35	Not Specified
20.	Copper (Cu)	mg/kg	1.78	1.56	1.88	2.32	2.14	1.7	1.55	1.23	Not Specified

Summary of the results

The soil samples were collected at total eight locations within the study area.

- Indicative of the **neutral** to slightly alkaline soil.
- The values for Nitrogen were found to be better to more than sufficient at all locations ranging between **318** to **357 kg/ha**, which is an indicative of sufficient nitrogen content in soils.
- The concentration of Phosphorous was found to be less at all the locations ranging between **40.2 to 70 kg/ha**, which is an indicative of less to on an average sufficient phosphorous in soil.
- The concentration of organic carbon was found to be medium to on an average sufficient at all the locations ranging between 0.58 to 0.71 %, which is an indicative of medium to on an average sufficient organic carbon in soil.
- It is important to note that the concentration of potassium was found to be less at all locations ranging between **108** to **144 kg/ha.** which is an indicative of medium potash content in soil This indicates it is required to use potash rich fertilizers for agriculture purposes.

Based on the above findings it can be concluded that the soil samples can be classified as per soil classification given by Tondon H.L.S. (2005). The samples fall under **medium low to Medium** fertile soils.

3.4 NOISE ENVIRONMENT

Table 27 Details of noise quality monitoring locations

Sr. No.	Symbol	Description	Latitude	Longitude
Inside Factory Premises				
1	N1	Near Entry Gate	17°44'32.52"N	74°56'43.42"E
2	N2	Near Mill House	17°44'32.08"N	74°56'40.03"E
3	N3	Near Boiler	17°44'30.99"N	74°56'40.42"E
4	N4	Near ETP	17°44'27.62"N	74°56'36.88"E
5	N5	Near Compressor	17°44'30.40"N	74°56'41.15"E
Outside Factory (Withing Study Area)				
1	N6	Near Nimgaon Lake	17°44'40.85"N	74°58'52.80"E
2	N7	Near Hanuman Mandir Chandapuri	17°43'48.34"N	74°57'33.75"E
3	N8	Near Nimgaon	17°45'48.47"N	74°59'13.88"E
4	N9	Near Kusmod	17°42'11.65"N	75° 0'19.46"E
5	N10	Near Tarangfal	17°46'29.95"N	74°55'29.43"E
6	N11	Near Bhandewasti	17°42'49.14"N	74°53'56.72"E

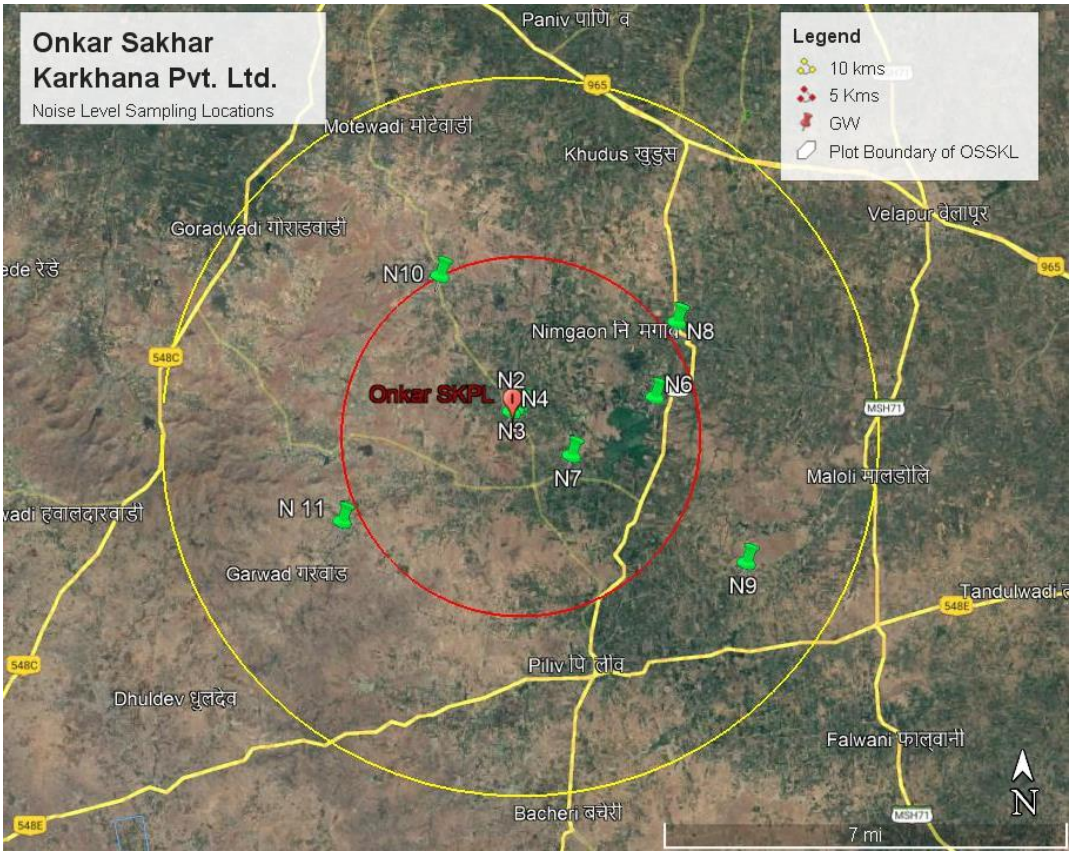

Figure 9 10 km. radius study area map indicating noise quality sampling location

Table 28 Noise levels of the study area

Sr. No.	Station	Standard Limit dB(A) Leq	Time	dB (A) Leq
Inside factory premises				
1.	Near Entry Gate	75	Day	62.0
		70	Night	50.2
2.	Near Mill House	75	Day	86.9
		70	Night	83.1
3.	Near Boiler	75	Day	85.3
		70	Night	78.4
4.	Near ETP	75	Day	61.8
		70	Night	49.3
5.	Near Compressor	75	Day	84.5
		70	Night	77.6
Outside factory (withing study area)				
1.	Near Nimgaon Lake	55	Day	45.8
		45	Night	42.1
2.	Near Hanuman Mandir Chandapuri	55	Day	48.6
		45	Night	41.0
3.	Near Nimgaon	55	Day	47.9
		45	Night	42.4
4.	Near Kusmod	55	Day	48.8

Sr. No.	Station	Standard Limit dB(A) Leq	Time	dB (A) Leq
		45	Night	42.9
5.	Near Tarangfal	55	Day	44.5
		45	Night	38.1
6.	Near Bhandewasti	55	Day	45.7
		45	Night	40.1

Summary of the results

Daytime Noise Levels $(Leq)_{day}$

Industrial Zone: The day time noise level at the Project site was found in the range of 61.80 – 86.90 dB (A), which is well below the permissible limit of 75 dB (A) except for locations Near Mill House, Near Boiler and Near Compressor.

Residential Zone: The daytime noise levels in all the residential locations were observed to be in the range of 44.50 (A) to 48.80 dB (A).

Night time Noise Levels $(Leq)_{night}$

Industrial Zone: The night time noise level in the Project site was observed in the range of 49.30 (A) to 83.10 dB (A), which is well below the permissible limit of 70 dB (A)) except for locations Near Mill House, Near Boiler and Near Compressor.

Residential Zone: The night time noise levels in all the residential locations were observed to be in the range of 38.10 dB (A) 42.90 dB (A).

The industry is making all efforts to control the noise levels within the limits by providing acoustic measures and silencer pads etc. all the employees in these work places shall be provided with ear plugs / muffs.

3.5 LAND USE/LAND COVER OF THE STUDY AREA

Table 29 Land use/ Land cover areas in km^2 around 10 km radius for project site

Sr No.	LULC Class	Area in Ha	Area in km^2	Percentage
1	Scrub Land	11702.45	117.02	35.17
2	Open Land	6946.81	69.47	20.88
3	Agriculture	13395.71	133.96	40.26
4	Fallow Land	666.74	6.67	2.00
5	Habitation	63.14	0.63	0.19
6	Waterbodies	498.76	4.99	1.50
	Total Area	**33273.61**	**332.74**	**100.00**

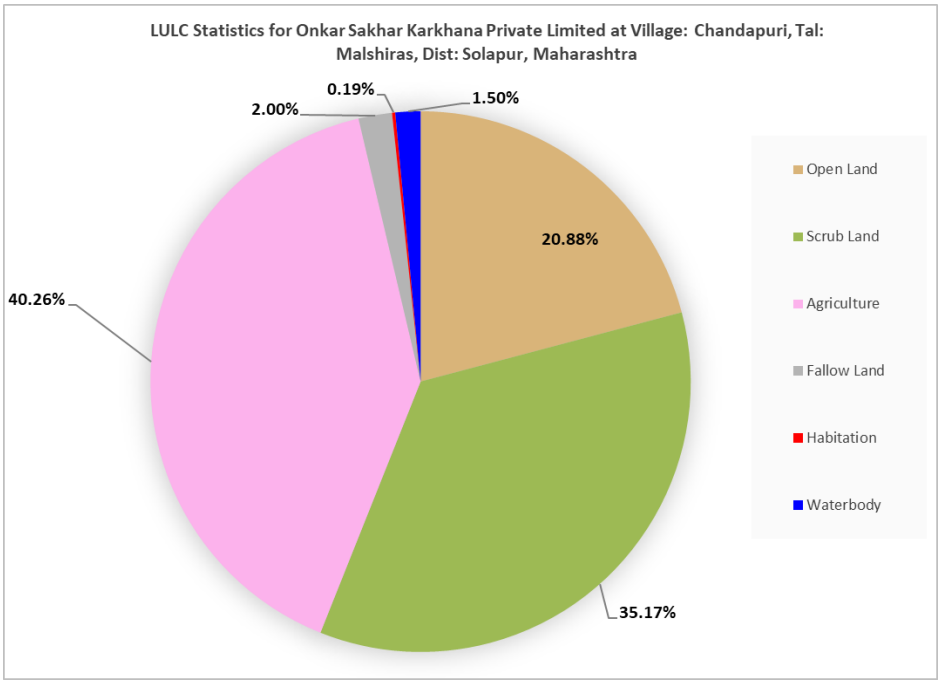

Figure 10 Pie chart of LULC classes around 10 km radius of Project site

4.0 IDENTIFICATION, PREDICTION AND MITIGATION MEASURES

The anticipated impacts during construction and operational phase due to the proposed activity on air, water, soil, noise, ecology and biodiversity, and socio-economic environment are assessed and mitigation measures to minimize the impacts on the same are suggested in Chapter 4 in this report.

5.0 ANALYSIS OF ALTERNATIVE (TECHNOLOGY AND SITE)

The technologies for the treatment and safe disposal of spent-wash, most polluting element from distilleries and the site selection criteria are discussed in the chapter 5 in this report. This is to understand the available technology options and the option selected by the project proponent. Molasses based distilleries are among the most polluting industries. Therefore, it is important to use state of the art technologies to achieve the Zero Liquid Discharge. The whole process is based on proven technology i.e., Multi Pressure distillation followed by Multi Effect Evaporation and Incineration due to following merits.

- The final spent wash converted to Potash rich ash.
- Useful as agricultural feed. The final output (i.e., Potash rich ash) is not a waste but a nutrient rich by-product.
- This technology will help in meeting the potash requirement of the soil.
- Zero Liquid Discharge Technology.

This Industry has decided to undertake an "Alternative Analysis (AA)" for this project. The various alternatives are (1) Product (2) Raw materials, (3) Technology, Engineering & Hardware, (4) Site, and (5) Project

- Availability of raw material/fuel
- Proximity of molasses as a raw material and cost-effective transportation logistics
- Availability of water supply
- The availability of water from the source is adequate to meet the requirement of the proposed sugar & distillery expansion. For proposed project water will be sourced from Neera right bank canal.
- Availability of infrastructural facility

Industrial infrastructural facilities such as roads, transport, security, water, power, administration etc. are available with existing factory. Community facilities such as quarters, medical services, education and training facility etc. are also available at site.

6.0 ENVIRONMENT MONITORING PROGRAMME

Table 30 Environment management programme

Sr. No.	Item	Parameters	Frequency Of Monitoring	Location
1.	Ambient Air quality at appropriate location for PM_{10}, $PM_{2.5}$, SO_2, and NO_x	PM_{10}, $PM_{2.5}$, SO_2, and NO_x	24 hourly, Quarterly	4 Locations 1 @ Upwind and 2@ downwind directions from stack @ 120^0 to each other 1 Near entry
2.	Stationary Emission from Stack PM, SO_2, NOx	PM, SO_2, NOx	Monthly	1 DG set Stack, 1 Boiler Stack
3.	Water	Water quality parameters as per 10500:2012	Monthly	Drinking water locations
	Waste water quality (treated and Untreated)	pH, BOD, COD, TSS, Flow, TDS etc.	Monthly	STP inlet and outlet CPU inlet and Outlet
4.	Noise	Day and Night levels Equivalent noise level - dB (A)	Quarterly or as often as required	5 Locations Upwind and downwind directions Near boilers and near main gate and CPU
5.	Soil (Qualitative and quantitative testing/analysis to check the soil fertility	pH, Cation Exchange Capacity, Total Nitrogen, Phosphorous, Potassium, moisture, Permeability, Conductivity, Texture & structure, Organic carbon	Quarterly or as often as required	1 near Greenbelt 1 near CPU Composite sample shall be taken at each location
6.	Solid waste generation monitoring / Record Keeping	Manual record keeping	To be updated daily	
7	Greenbelt and plantation monitoring	Type of species shall be decided based on soil &climatic conditions. The number of trees would be 2500 per hectare, however; the number of trees would vary depending on the type of soil	Six Monthly	

7.0 ADDITIONAL STUDIES
7.1: RISK ASSESSMENT

Hazard analysis involves the identification and quantification of the various hazards (unsafe condition) that exist in the plant during both construction and operation phases. On the other hand, risk analysis deals with the identification and quantification of the risk, the plant equipment and Personnel exposed to accidents resulting from the hazards present in the plant. Risk analysis involves the identification and assessment of risks to the population, which is likely to be exposed to as a result of hazards incidence.

This requires an assessment of failure probability, credible accident scenario, vulnerability of population, etc. Much of this information is difficult to get or generate consequently, the risk analysis in present case is confined to worst case and maximum credible accident studies and safety and risk aspect related to sulphitation process, alcohol storage and plant operations. Detailed Quantitative Risk Assessment (QRA) on potentially more hazardous and risky situations have been carried out in details and presented in the chapter 7 in the EIA report.

8.0 BUDGETARY PROVISIONS TOWARDS ENVIRONMENTAL MANAGEMENT PLAN

Table 31 EMP Budget

Sr. No.	Component	Particulars		Capital Investment (In Lakhs)	Recurring Investment (In Lakhs)
1.	Air	Construction of new stack for boiler and ESP		700	20
2.	Water	• Sugar ETP Up-gradation, Construction Sugar and distillery CPU • MEE & incineration boiler for Distillery Spentwash treatment		3500	100
3.	Noise	Acoustic enclosures, Silencer pads, ear plugs etc		15	3
4.	Environment monitoring and Management	Quarterly Environment Monitoring (Per Year)		--	10
		Ambient air monitoring	PM_{10}, $PM_{2.5}$, SO_2, NOx		
		Boiler & DG Set Monitoring	TPM, SO_2, NOx		
		Effluent (Treated &Untreated)	pH, COD, BOD, TSS, TDS, Oil & Grease		
5.	Occupational Health	Glares, Breathing Masks, Gloves, Boots, Helmets, Ear Plugs etc. & annual health-medical checkup of workers, Occupational Health (training, OH center)		40	10
6.	Greenbelt	Green belt development activity		10	3
		Maintenance of green belt		--	3
7.	Solid Waste Management	Solid Waste Management		20	7
8.	Rain water Harvesting	Rain water Harvesting		12	2
9	Stormwater Harvesting	Stormwater Harvesting		15	3
10	Solar Power & Energy Conservation	Street lights installation with Solar Systems		20	3
11	Fire and Safety	Fire and Safety Management		10	2
12	Laboratory	Testing and Analysis		10	2
		TOTAL COST (INR, LAKHS)		**4352**	**168**

9.0 GREENBELT DEVELOPMENT PLAN

Greenbelt development is undertaken in the area provided separately. As per suggestion given earlier by EAC for similar kind of proposal 2500 trees should be available per hectare of land for Greenbelt development. Total 5.413409 Hectares of land is reserved for greenbelt development; hence there should be minimum 13534 no. of trees. At present the industry has already planted about 5000 Trees, and remaining 8534 trees shall be planted within two years. The industry proposes to plant 1000 to 1500 trees per year in order to increase the greenbelt over and above 33% of the total factory area

10.0 CORPORATE ENVIRONMENT RESPONSIBILITY PLAN

The capital cost of the proposed expansion and distillery project is Rs. 313.99 Crores. The industry has reserved **Rs. 2.355 Crores** (0.75 % of the cost of the project as per Office Memorandum Vide F. No. 22-65/2017-IA.III Dated 01.05.2018) which will be spent on the activities like sanitation and health, education, and educational facilities as a cost towards corporate environment responsibility (CER).

11.0 RAINWATER AND STORMWATER HARVESTING PLAN

The industry is making efforts to conserve natural resources by adopting green technologies and as such industry proposes to adopt rain water harvesting system. With the annual rainfall of 524.9 mm there is good potential to harvest rainwater. The rainwater harvesting system will be installed at various buildings and about 20491.38 Sq.m of area. 8604.7 m3 per year water is harvested. This harvested water shall be utilized for ground water recharge in order to increase the ground water table in the surrounding area.

Stormwater management system shall be also adopted by the industry. Separate drains of minimum 0.6 m * 1.0 m will be provided for the collection and disposal of stormwater from the industry premises.

Table 32 Rain water harvesting quantity

Sr. No.	Location	Area in m2	Average Run-off Factor	Rainfall in mm	The quantity of rainwater per year m^3
1	Built-up area	Only 20491.38 m2 area use for rainwater harvesting	0.80	524.9	8604.7

Storm water harvesting

Table 33 Quantity of Storm water per annum

Sr. No	Location	Area m2	Average Run-off Factor	Rainfall in mm	The quantity of rainwater per year m^3
1	Total factory area - Built-up area	162000-20491.38= 141,508.62	0.40	524.9	29,711.15

12.0 CONCLUSIONS

As the industry has provided all the necessary pollution control measures for water, air and solid and hazardous waste disposal, the negative impacts on the environment would be minimal/ negligible. The expansion of sugar unit would help to produce good quality of sugar and establishment programme would help to produce good quality of power and RS/ENA/alcohol and has a great potential for export. Ethanol produced will mainly utilized in blending with petrol (additives) and ENA is used to manufacture liquors and medicine.