

# **EXECUTIVE SUMMARY**



**ESTABLISHMENT OF 250 KLPD GRAIN BASED  
DISTILLERY TO MANUFACTURE 125 KLPD  
ETHANOL AND 125 KLPD EXTRA NEUTRAL  
ALCOHOL (ENA)**

**AT**

**USROLI, TAL. KHALAPUR, DIST. RAIGAD  
MAHARASHTRA,**

**BY**

**M/S. ROCKING BOMBAY BEVERAGES PRIVATE  
LIMITED (RBBPL)**

**PROPOSAL FOR**

**ENVIRONMENT CLEARANCE**

**(Industry falls under 5(g) 'A' Category as per the EIA Notification, 2006 and  
amendments thereof**

**Area: 13.4 Acres Cost of the Establishment: Rs. 209.94 Cr.**

**Tors Granted: F. No. IA-J-11011/90/2022-IA-II(I), dated- 23<sup>rd</sup> March 2022**

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# EXECUTIVE SUMMARY

## 1.0 INTRODUCTION

M/s. Rocking Bombay Beverages Pvt. Ltd is a Company registered in the State of Maharashtra under the Companies Act, 2013 Vide F. No. U15235MH2020PTC342217 Dated 19.06.2020, having its registered office at Mangesh Industrial Estate, Nahur Village Road, Nahur W, Bhadup Mumbai, Maharashtra State. The industry is planning to establish 250 KLPD Grain based distillery to manufacture 125 KLPD Ethanol and 125 KLPD Extra Neutral Alcohol (ENA) at Usroli Village, Taluka Khalapur, District Raigad, Maharashtra State- 410202.

The proposed project will have 125 KLPD Ethanol Plant and 125 KLPD ENA Plant based on grains as raw material. The raw material will be sourced from open market.

The ethanol produced will be sent to petroleum industries to contribute to the Ethanol Blended with petrol programme of Government of India. The ENA will be utilized for edible purposes. The CO<sub>2</sub> generated will be scrubbed and bottled. The configuration of product after proposed establishment of 250 KLPD Distillery is as below

**Table Error! No text of specified style in document.-1 Configuration of the proposed unit**

Sr. No.	Products and By-products	Quantity
<b>A</b>	<b>Products</b>	
1	Ethanol	125 KLPD
2.	Extra Neutral Alcohol	125 KLPD
3.	Power	1*6 MW TG Set
<b>B</b>	<b>By-Products</b>	
1	CO <sub>2</sub>	239.13 TPD
2.	Fusel Oil	610 KLPA
3.	DDGS (Dry)	47916 MTPA

The command area is rich in grains and has excellent irrigation facilities. Considering the grains availability in the command area the industry proposes to establish 250 KLPD distillery.

The steam and power requirement for the proposed plant will met through proposed 1\* 50 TPH 480 deg C with 67 Kg/Cm<sup>2</sup>: (Rice husk + Coal fired) connected to 1\*6 MW TG Set.

## 1.1 PROJECT LOCATION

The salient features of the project site are:

**Table Error! No text of specified style in document.-2 Salient features of the project site**

Sr. No.	Features	Description	Direction wrt site
1.	latitude	18°44'37.87"N	
2.	Longitude	73°15'39.70"E	
3.	Elevation above MSL	90 meters	
4.	Nearest City/Town	Khalapur ~ 9.5 Km	NWW
		Raigad~ 27 Km	SEE
5.	Nearest Village	Usroli ~ 0.5 Km	W
		Khanavi ~ 1.0 Km	E
6.	Road	SH-92 (Nagothana- Khopoli) ~ 3km	SE

Sr. No.	Features	Description	Direction wrt site
7.	Nearest water body	Magva pazar talav ~ 0.5Km	SW
		Patalganga River ~ 3 Km	W
		Hetavane Dam ~ 6.5 Km	SW
8.	Railway Station	Khopoli Railway Station~ 9.5 Km	NE
		Karjat Junction ~ 19 Km	NEE
9.	Airport	Navi Mumbai Airport ~ 36 Km	NWW
10.	Protected Area	None within 10 Km	
11.	Reserved Forests	None within 10 Km	
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	2200 – 3000 mm	
17.	Seismicity	III	

## 2.0 PROJECT DESCRIPTION

The details about the manufacturing capacity of the proposed establishment are given in table below

**Table Error! No text of specified style in document.-3 Products manufacturing quantities**

Sr. No.	Product Name	Unit	Quantity
1	Ethanol	KLPD	125
2	Extra Neutral Alcohol	KLPD	125
3	Power (TG Set)	MW	1*6

## 2.1 RESOURCE REQUIREMENT AND INFRASTRUCTURE FACILITIES

### A) Raw material requirement

The details of the raw material requirement for distillery unit and its source are given in table below. The raw materials and other chemicals are transported to the site through designated vehicles by Pakka Roads.

**Table Error! No text of specified style in document.-4 Raw material requirement and its source for distillery unit**

Sr. No	Item	Quantity	Unit	Source
1	Grains	551.24	TPD	Open market
2	Utility Chemicals	250.64	TPD	Open market
3	Operating Chemicals	125.13	TPD	Open market
4	Fuel Requirement			
	Coal	240	TPD	Open market
	Rice Husk	320	TPD	Open market
	Diesel for DG Sets	225	Ltr/hr	Open market
<b>Utilities</b>				
1	Steam	40-45	TPH	Proposed 50 TPH boiler
2	Power	4.8	MW	6 MW TG Set Connected to 50TPH Boiler
3	Water	Industrial-1779.85	TPD	CGWA/ Irrigation department

Sr. No	Item	Quantity	Unit	Source
		Domestic- 40		
	Man power	249	Nos	Local

### B) Land use Details

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

**Table Error! No text of specified style in document.-5 Land-use breakup**

Sr. No.	Description	Area in Sq. m	Area in Acres	% Area
1	Built Up Area	15641.35	3.87	28.84
2	Area Under Future Expansion	4851.79	1.20	8.95
3	Parking Area	3654.8	0.90	6.74
4	Green Belt Area	18026.54	4.45	33.24
5	Area Under Road	10705	2.65	19.74
6	Area Under Vacant Land/Open Area	1348.39	0.33	2.49
	<b>Total</b>	<b>54227.8761</b>	<b>13.40</b>	<b>100</b>

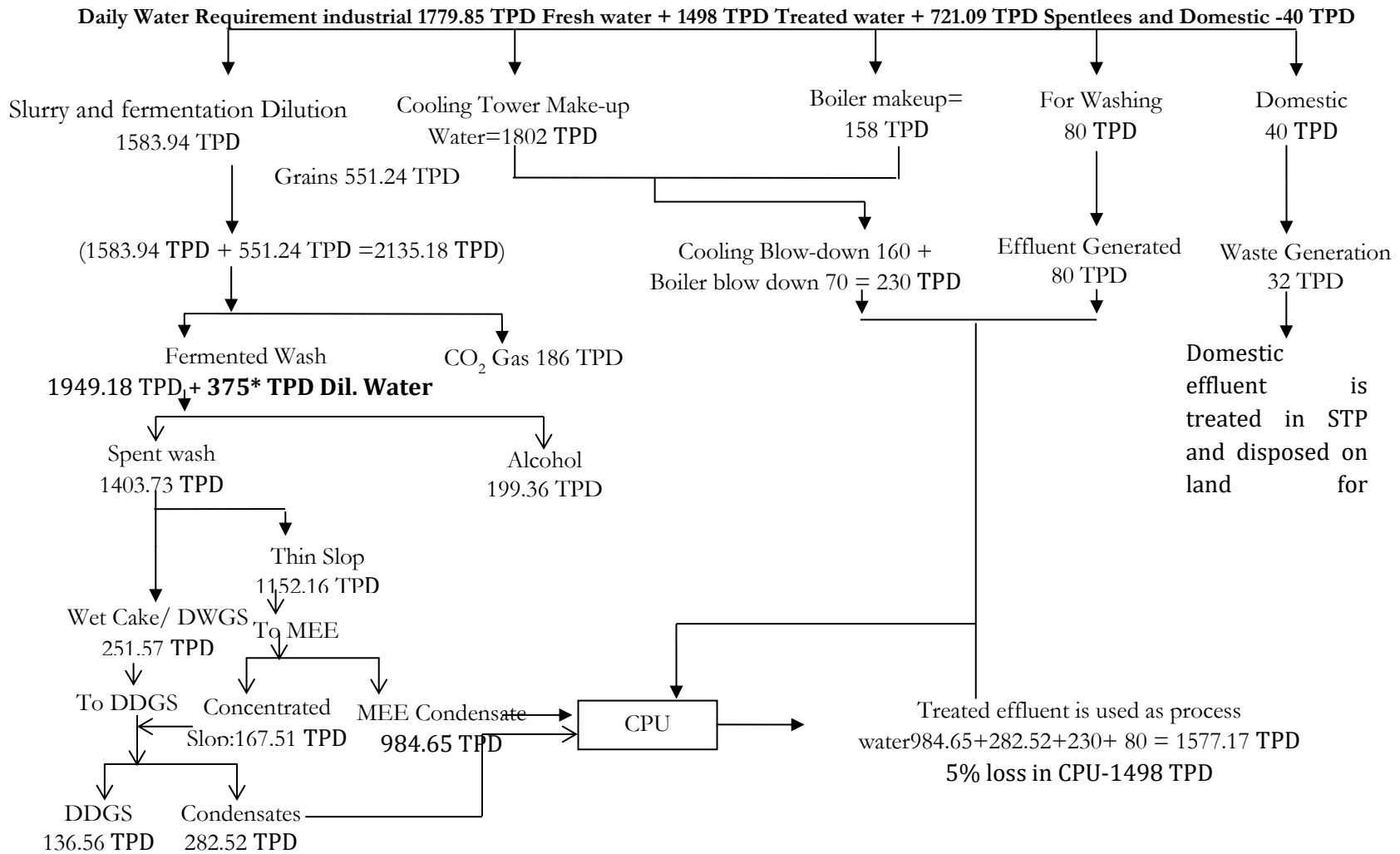
### C) Power requirement

The power requirement of the proposed distillery will be 4.8 MW. It is proposed to have a new turbo alternator of about 6.0 MW capacity. The steam produced in the new 50 TPH boiler shall be used for generating power. The exhaust produced in the new boiler will be used for generating power. The exhaust steam of turbine shall have a pressure of about 3.5 kg/cm<sup>2</sup>, which will be used for distillery purpose. Power for idle days around 600 KWH will have to be taken from state electricity board.

### D) Water requirement-

The water will be sourced from CGWA/ Irrigation department. The detailed water budget is given in below tables.

### Water Budget for 250 KLPD Distillery unit



**Figure 1 Material balance flow sheet for proposed 250 KLPD Distillery**



**Water Aspects-**

**Table Error! No text of specified style in document.-6 Water consumption details for grains as raw material**

Sr. No.	Propose	Water consumption (TPD)	
<b>Domestic</b>			
<b>1</b>	<b>Domestic</b>	40	
<b>Industrial</b>			
1	Process & Slurry and fermentation Dilution	1583.94	
	Additional water for fermentation	375	
2	Boiler make up	158	
3	Cooling tower makeup	1802	
4	Washings	80	
	<b>Total</b>	<b>Industrial – 3998.94</b>	<b>Domestic - 40</b>

**Table Error! No text of specified style in document.-7 Wastewater generation details for raw material**

Sr. No.	Propose	Wastewater Generation (TPD)	Remarks
<b>Domestic</b>			
<b>1</b>	<b>Domestic</b>	32.00	
<b>Industrial</b>			
1	Process		
a	DDGS	136.56	To Cattle Feed
b	Spentlees	721.09	To Process
c	MEE Condensates	1267.17	To CPU
2	Boiler blow down	70.00	To CPU
3	Cooling tower blow down	160.00	To CPU
4	Washings	80.00	To CPU
	<b>Total</b>	<b>2434.82</b>	

**Table Error! No text of specified style in document.-8 Treated effluent recycled from ZLD System**

Sr. No.	Propose	Wastewater Generation (TPD)	Remarks
1	Treated effluent recycled from CPU	1498	None
2	Spentlees	721.09	To process
	<b>Total</b>	<b>2219.09</b>	

**Table Error! No text of specified style in document.-9 Net freshwater requirement for raw material for industrial purpose**

Sr. No.	Propose	Water (TPD)
<b>Industrial</b>		
1	Total water consumption (Industrial)	3998.94
2	Treated effluent recycled from ZLD System	2219.09
	<b>Net fresh water requirement (Industrial)</b>	<b>1779.85 (7.12 m3/KL of Ethanol)</b>

## E) Wastewater generation and its treatment technology

### Distillery unit

Spent wash/thick slop (1403.73 TPD) (approx. 10 % w/w solids) are initially treated in decanters and Wet cake (251.57 TPD) and thin slops (1152.16 TPD) are separated. Thin slops are sent to Multiple Effect Evaporators (MEE) (Concentrated Syrup – 167.51 TPD) up to 30% solids (w/w). Concentrated Syrup is sent to DWGS drier along with wet cake generated from decanters and the output is a dry powder with 90% solids and is known as DDGS (136.56 TPD) and zero liquid discharge is achieved.

Condensates from MEE (984.65 TPD) and Drier (282.52 TPD) totaling to 1267.17 TPD are collected and treated in condensate polishing unit along with other dilute effluent (i. e. cooling tower blow down (160 TPD), Boiler blow down (70 TPD) and Fermenter washings (80 TPD) totaling to 1577.17 TPD)) and recycled back (1498 TPD) as process water or make up water for cooling tower and boiler.

### F) Air Emission Management

**Table Error! No text of specified style in document.-10 Details of boilers and its APC equipment**

Sr. No.	Stack Attached to	Type of Fuel	Minimum requirement of stack height	APC Equipment
1	1*50 TPH boiler	Coal	58.87*	ESP and stack of 60 meters height will be provided
		Rice Husk	46.84*	
2	2*750 kVA DG Set	HSD	6.5 m	Appropriate stack height with Acoustic enclosure

### G) Solid waste Management

#### a) Non-Hazardous solid wastes details

**Table Error! No text of specified style in document.-11 Details of non-hazardous waste generated and its disposal**

Sr. No.	Description of waste	Quantity (TPD)	Mode of Collection and Disposal
1	Boiler Ash (TPD)		Sold to brick manufacturers
	Coal as fuel OR	24	
	Rice husk as fuel	64	
2	CPU Sludge (TPA)	164	Disposed in composting
<b>Other Solid Wastes</b>			
Sr. No.	Description of waste	Quantity (Kg/M)	Mode of Collection and Disposal
1.	Paper waste	40	Manually collected and stored in a designated area and sold to scrap vendors
2.	Plastic waste	35	
3.	Municipal Solid waste		
	Non-Biodegradable	1120	Manually collected and sold to scrap vendors
	Bio-degradable	750	Used in Composting

**b. Hazardous Waste**

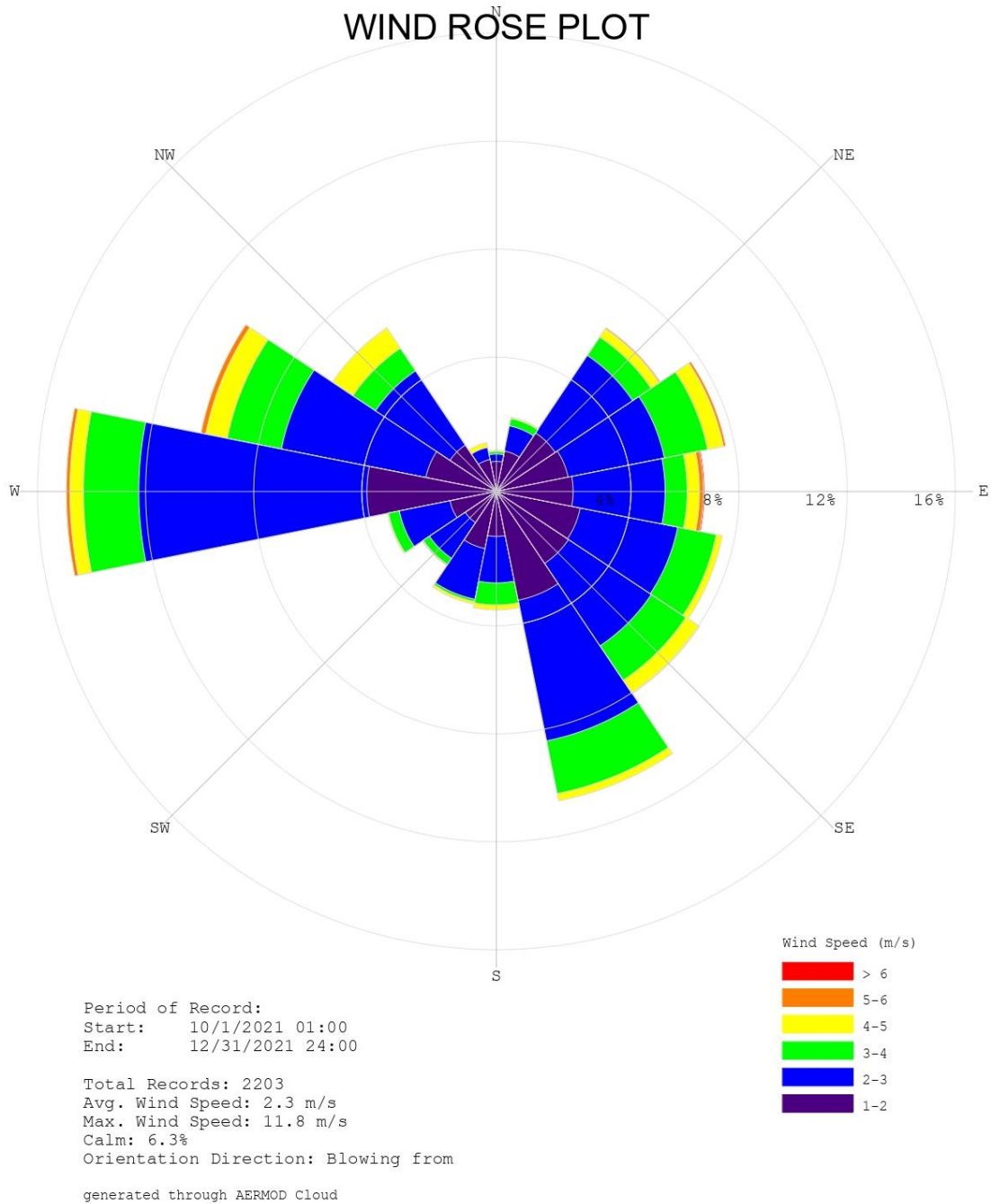
**Table Error! No text of specified style in document.-12 Details of hazardous waste generated and its disposal**

<b>Sr. No.</b>	<b>Category</b>	<b>Description</b>	<b>Quantity</b>	<b>Disposal</b>
1	5.1	Used Oil	3500 LPA	Collected in leak proof container stored at designated storage area and sent to CHWTSDF for disposal.
2	33.1	Empty barrels/ containers	10 Nos	Sold to authorized recycler

### 3.0 BASELINE ENVIRONMENTAL STATUS

### 3.1 AIR ENVIRONMENT

#### 3.1.1 METEOROLOGICAL CHARACTERISTICS OF THE STUDY AREA

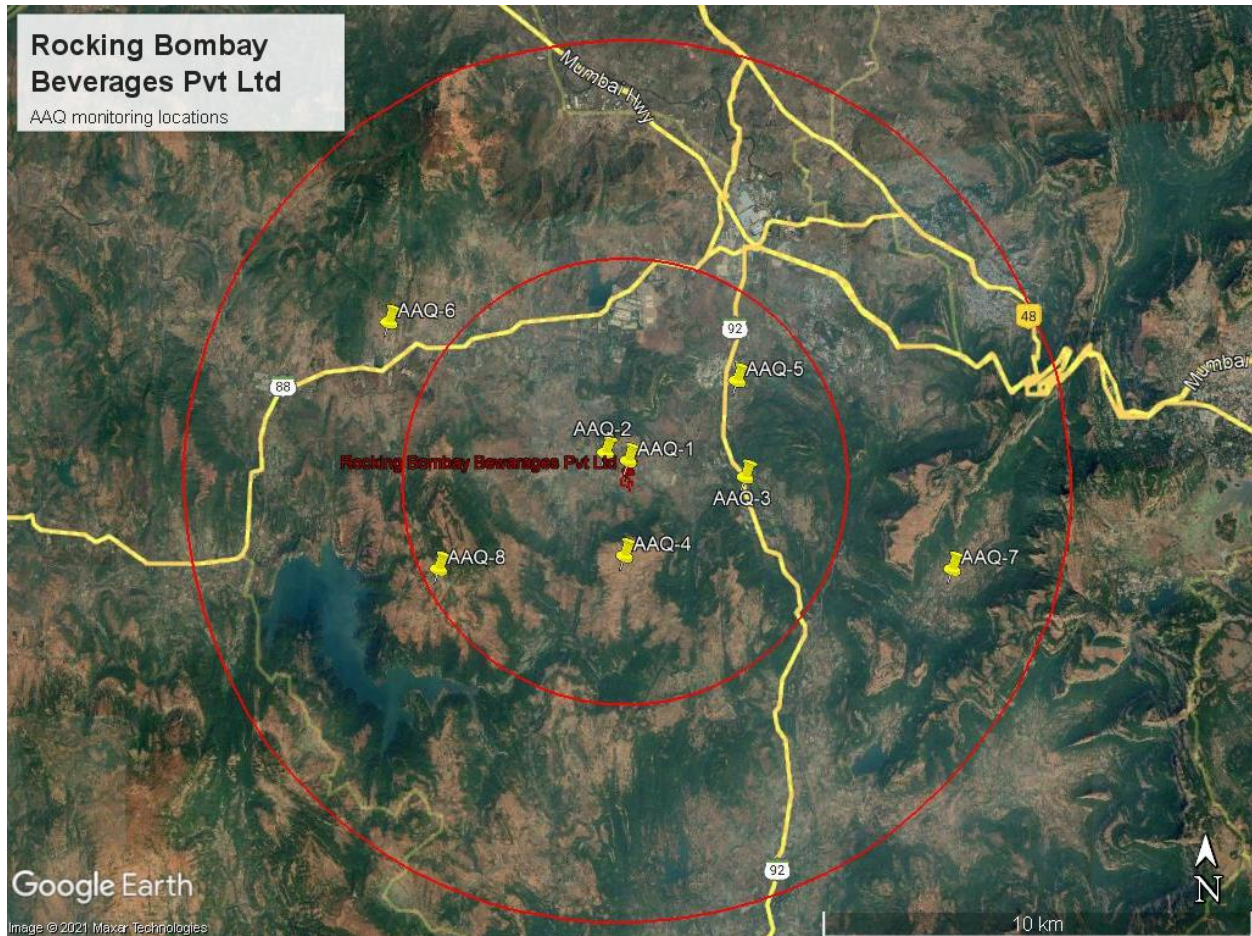


**Figure 2 Windrose diagram for the study area (blowing from)**

From **Figure 2** it can be seen that the Average wind speed of the study period is 2.3 m/s. and the predominant wind direction is from West to East direction. This has been used in selecting the receptors. A maximum number of receptors are in East direction, which is opposite to predominant wind direction.

**Table Error! No text of specified style in document.-13 Receptor summary**

Sr. No.	Symbol	Description	Latitude	Longitude
	S-1	Stack-1	18°44'36.43"N	73°15'41.50"E
1	AAQ-1	Near main gate	18°44'42.82"N	73°15'38.93"E
2	AAQ-2	Usroli	18°44'48.90"N	73°15'20.42"E
3	AAQ-3	Near Khambewadi	18°44'30.14"N	73°17'14.02"E
4	AAQ-4	Near Ujloli	18°43'29.85"N	73°15'35.88"E
5	AAQ-5	Near Sangdewadi	18°45'44.53"N	73°17'7.64"E
6	AAQ-6	Near Ransai	18°46'29.34"N	73°12'23.94"E
7	AAQ-7	Near Chavni	18°43'19.25"N	73°20'2.46"E
8	AAQ-8	Near Nada	18°43'19.73"N	73°13'5.32"E



**Figure 3 10 km. radius study area map indicating Ambient air quality monitoring locations**

**Table Error! No text of specified style in document.-14 Ambient air quality monitoring results**

Sr. No.	Description of Receptor	Receptor/ Village		Concentration				
				PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO
				µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	mg/m <sup>3</sup>
1	AAQ -1	Near main gate	Minimum	55.4	20.0	11.4	21.3	0.2
			Maximum	69.0	30.0	20.5	32.6	0.7
			Average	61.5	25.03	16.9	30.15	0.41
			Percentile 98%	68.3	29.7	20.1	32.5	0.65
2	AAQ -2	Usroli	Minimum	58.1	19.0	14.7	20.8	0.2
			Maximum	63.5	25.0	21.1	31.7	0.7
			Average	61.3	21.7	18.6	28.5	0.39
			Percentile 98%	63.35	24.8	20.85	31.5	0.65
3	AAQ -3	Near Khambewadi	Minimum	52.6	19.4	14.4	23.3	0.2
			Maximum	66.7	28.8	21.7	32.6	0.8
			Average	59.9	21.9	18.8	29.2	0.47
			Percentile 98%	65.5	26.95	21.65	32.15	0.75
4	AAQ -4	Near Ujloli	Minimum	52.1	17.0	14.5	24.0	0.2
			Maximum	65.4	25.4	22.7	32.8	0.7
			Average	58.3	19.8	19.2	29.6	0.46
			Percentile 98%	64.0	24.0	22.5	32.8	0.7
5	AAQ -5	Near Sangdewadi	Minimum	52.0	17.5	14.0	25.0	0.3
			Maximum	57.4	22.3	21.8	32.6	0.7
			Average	55.0	19.8	18.6	29.6	0.5
			Percentile 98%	57.4	22.1	21.65	32.5	0.7
6	AAQ -6	Near Ransai	Minimum	56.0	18.1	15.0	25.9	0.3
			Maximum	62.6	23.4	21.7	32.1	0.7
			Average	59.9	21.8	19.4	29.6	0.45
			Percentile 98%	62.55	23.3	21.65	32.05	0.65
7	AAQ -7	Near Chavni	Minimum	54.9	18.3	17.4	23.1	0.2
			Maximum	61.6	24.2	22.5	32.4	0.7
			Average	58.8	21.3	20.0	28.57	0.42
			Percentile 98%	61.55	24.15	22.2	32.0	0.65
8	AAQ -8	Near Nada	Minimum	53.0	16.3	16.5	24.3	0.2
			Maximum	62.3	24.3	23.9	33.3	0.7
			Average	58.6	20.4	20.6	29.3	0.43
			Percentile 98%	62.15	23.9	23.6	32.95	0.65

### 3.1.1 IMPACT ON AIR QUALITY DUE TO PROPOSED ACTIVITY

Table-Error! No text of specified style in document.-15Details of the incremental concentrations due to proposed establishment

Sr. No	Receptor/Village	PM10- 24 hour concentration ( $\mu\text{g}/\text{m}^3$ )			PM2.5- 24 hour concentration ( $\mu\text{g}/\text{m}^3$ )			SO <sub>2</sub> - 24 hour concentration ( $\mu\text{g}/\text{m}^3$ )			NO <sub>x</sub> - 24 hour concentration ( $\mu\text{g}/\text{m}^3$ )		
		Backg round	Increm ental	Total	Backgro und	Increm ental	Total	Backgr ound	Increm ental	Total	Backg round	Incre mental	Total
1	Near main gate	69.0	0.0	69.00	30.0	0.0	30.00	20.5	0.0	20.50	32.6	0.0	32.60
2	Usroli	63.5	0.0	63.50	25.0	0.0	25.00	21.1	0.001	21.10	31.7	0.001	31.70
3	Near Khambewadi	66.4	0.011	66.41	28.8	.07	28.87	21.7	0.017	21.72	32.6	0.016	32.62
4	Near Ujloli	65.4	1.154	66.55	25.4	0.769	26.17	22.7	1.89	24.59	32.8	1.772	34.57
5	Near Sangdewadi	57.4	0.016	57.42	22.3	0.01	22.31	21.8	0.025	21.83	32.6	0.024	32.62
6	Near Ransai	62.6	0.049	62.65	23.4	0.033	23.43	21.7	0.081	21.78	32.1	0.075	32.18
7	Near Chavni	61.6	0.039	61.64	24.2	0.026	24.23	22.5	0.064	22.56	32.4	0.06	32.46
8	Near Nada	62.3	1.482	63.78	24.3	0.988	25.29	23.9	2.4271	26.33	33.3	2.275	35.58

From the results, it can say that,

- At the selected 8 receptor locations, surrounded in 10 km radius around Rocking Bombay Beverages Pvt. Ltd. (RBBPL), Usroli, Taluka Khalapur, District Raigad, GLCs are well within the limits of AAQS.
- Under the working conditions of 1\*50 TPH boiler, PM<sub>10</sub>GLCs at all the 8 receptor locations are in the range of 57.42  $\mu\text{g}/\text{m}^3$  to 69.80  $\mu\text{g}/\text{m}^3$  which are within the limits of AAQS.
- Similarly, PM<sub>2.5</sub> GLCs for those receptors are in the range of 22.31  $\mu\text{g}/\text{m}^3$  to 30.00  $\mu\text{g}/\text{m}^3$  which is within the limits of AAQS.
- For SO<sub>2</sub>, GLCs are in the range of 20.50  $\mu\text{g}/\text{m}^3$  to 26.33  $\mu\text{g}/\text{m}^3$  which is within the limits of AAQS.
- NO<sub>x</sub> GLCs are in the range of 31.70  $\mu\text{g}/\text{m}^3$  to 35.58  $\mu\text{g}/\text{m}^3$  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 establishment.**

## 3.2 WATER ENVIRONMENT

The unit is located at Usroli, Taluka Khalapur, District Raigad, Maharashtra. Majority of the study area (10 km around site) is under agriculture land use. The industry is lifting fresh water from CGWA/ Irrigation department. The necessary permissions will be obtained.

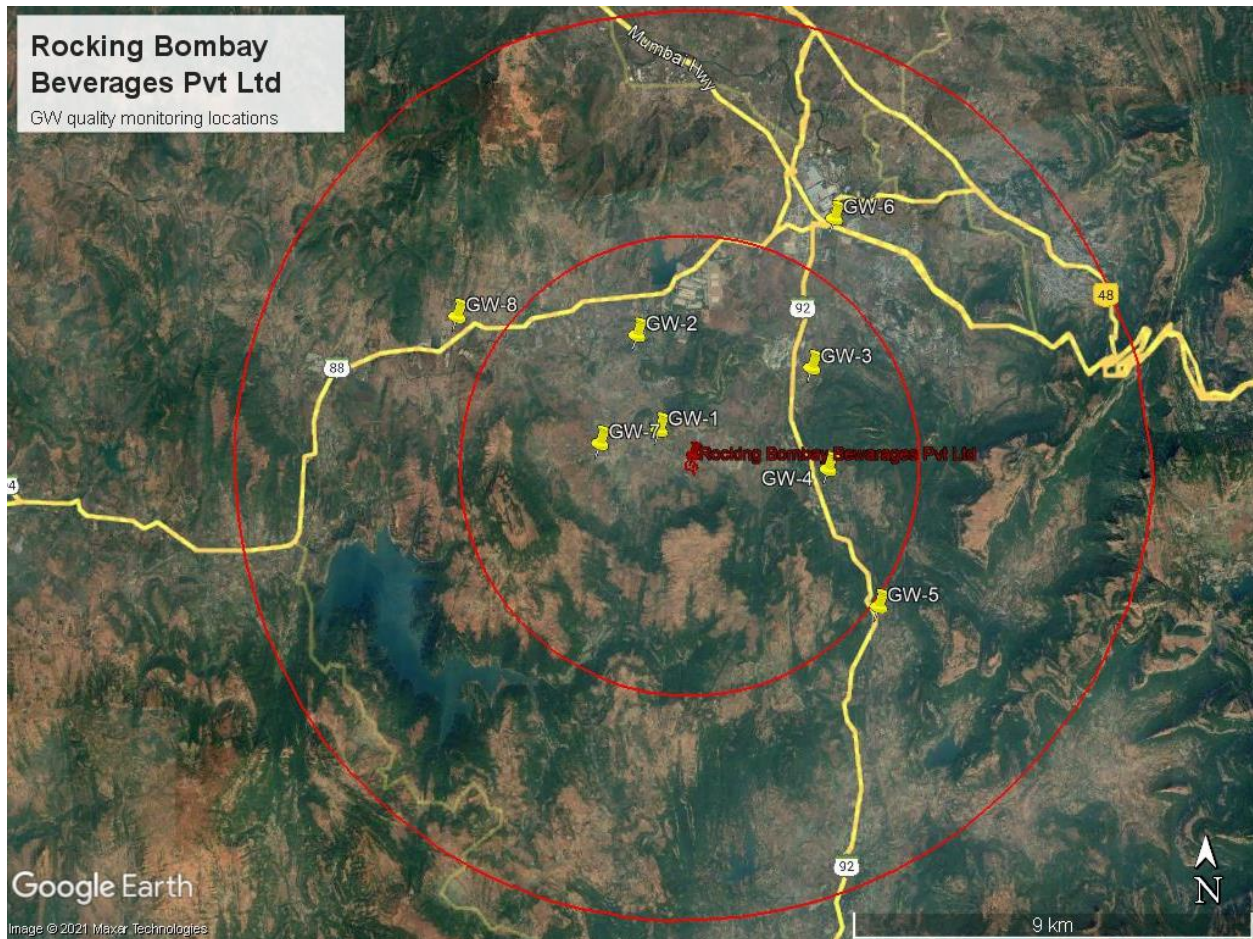
Patalganaga River, Hetavane Dam and Magva pazar talav are main source of water for agriculture use. Patalganaga River is flowing at 3.0 km towards West from the project site. Groundwater is used as an alternate source in surrounding villages for domestic and drinking purposes. Therefore, it is important 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 Error! No text of specified style in document.-16 Details of the ground water quality monitoring sampling locations**

<b>Sr. No.</b>	<b>Symbol</b>	<b>Description</b>	<b>Latitude</b>	<b>Longitude</b>
1	GW-1	Well Near Usroli	18°44'53.61"N	73°15'12.28"E
2	GW -2	Well Near Gorthan Khurd	18°46'4.54"N	73°14'54.74"E
3	GW -3	Borewell Near Sangdewadi	18°45'40.23"N	73°17'12.92"E
4	GW -4	Well Near Khambewadi	18°44'24.33"N	73°17'25.61"E
5	GW -5	Borewell Near Tuksai	18°42'41.65"N	73°18'5.68"E
6	GW -6	Borewell Near Dahivati Tarf Boreti	18°47'31.92"N	73°17'30.82"E
7	GW -7	Well Near Kharivali	18°44'43.76"N	73°14'25.49"E
8	GW -8	Borewell Near Ransai	18°46'18.67"N	73°12'32.53"E





**Figure 4 10 km. radius study area map indicating groundwater sampling location**

**Table -17 Groundwater analysis report within 10 km radius of the study area**

Sr. No.	Parameters	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	Temperature	°C	22	24	24	24	24	25	25	25	Not Specified	
2	Turbidity	NTU	<1	<1	<1	<1	<1	<1	<1	<1	1	5
3	Salinity	ppt	0.035	0.052	0.071	0.040	0.084	0.074	0.066	0.040	Not Specified	
4	pH at 25°C	--	7.68	7.43	7.72	7.6	7.8	7.6	7.5	7.68	6.5-8.5	No Relaxation
5	EC at 25°C	µS/cm	495	430	545	420	458	480	480	497	Not Specified	
6	Total Dissolved Solids (TDS)	mg/L	325	285	354	273	298	312	314	323	500	2000
7	Total Hardness (as CaCO <sub>3</sub> )	mg/L	192	183	216	180	173	192	185	200	200	600
8	Total Alkalinity (as CaCO <sub>3</sub> )	mg/L	180	154	201	160	152	162	168	175	200	600
9	Sulphate (as SO <sub>4</sub> )	mg/L	26.58	21.3	22.6	21.7	23.5	28.6	22.4	24.5	200	400
10	Chloride (as Cl)	mg/L	30.58	32.05	36.5	40.6	37.8	35.6	37.8	37.8	250	1000
11	Calcium (as Ca)	mg/L	48.05	39.7	45.8	43.3	48.6	45.6	43.2	45.6	75	200
12	Magnesium (as Mg)	mg/L	17.35	20.1	24.3	17.2	12.3	18.6	18.5	20.6	30	100
13	Total Suspended Solids (TSS)	mg/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	Not Specified	
14	Ammonia (as N)	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.5	No Relaxation
15	Fluoride (as F)	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1-1.5	No Relaxation
16	Iron (as Fe)	mg/L	0.056	0.05	0.23	0.056	0.050	0.045	0.21	0.23	0.3	No Relaxation
17	Nitrate (as NO <sub>3</sub> )	mg/L	<1	<1	<1	<1	<1	<1	<1	<1	45	No Relaxation
18	Nitrogen (as N)	mg/L	<0.05	<1	<1	<1	<1	<1	<1	<1	No Relaxation	
19	Nitrite (as NO <sub>2</sub> )	mg/L	20.0	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	Not Specified	

Sr. No.	Parameters	Unit	Results								Desirable	Permissible
			GW-1	GW-2	GW-3	GW-4	GW-5	GW-6	GW-7	GW-8	IS 10500:2012 Standards	
20	Sodium (as Na)	mg/L	20.0	15	23.0	22.0	22.0	20.0	23.0	19.0	Not Specified	
21	Phosphate (as PO <sub>4</sub> )	mg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.05	<0.2	<0.2	Not Specified	
22	Total Chromium (as Cr)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	No Relaxation
23	Chromium (as Cr+6)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	0.10	No Relaxation
24	Nickel (as Ni)	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.003	<0.02	<0.02	0.02	No Relaxation
25	Cadmium (as Cd)	mg/L	<0.003	<0.003	<0.003	<0.003	<0.003	<0.001	<0.003	<0.003	0.003	No Relaxation
26	Mercury (as Hg)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.001	0.001	No Relaxation
27	Arsenic (as As)	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	0.01	0.05
28	Cyanide (as CN)	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	0.05	No Relaxation
29	Lead (as Pb)	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	0.65	<0.01	<0.01	0.01	No Relaxation
30	Zinc (as Zn)	mg/L	0.83	0.60	0.72	0.83	0.80	<0.04	0.58	0.61	5	15
31	Copper (as Cu)	mg/L	<0.04	<0.04	<0.04	<0.04	<0.04	<0.05	<0.04	<0.04	0.05	1.5
32	Total Coliform	MPN/100ml	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	No Relaxation	
33	E. coli.	MPN/100ml	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	No Relaxation	

### 3.2.2 SURFACE WATER

Table -18 Details of surface water quality monitoring locations

Sr. No.	Symbol	Description	Latitude	Longitude
1	SW-1	Magva Pazar Talav	18°44'26.75"N	73°15'35.93"E
2	SW -2	Patalganaga River Near Golewadi	18°45'24.25"N	73°17'0.53"E
3	SW -3	Patalganga River near Khanavi	18°44'36.10"N	73°16'37.62"E
4	SW -4	Patalganga River near Khambewadi	18°44'47.92"N	73°17'3.74"E
5	SW -5	Hetavane Dam	18°43'51.96"N	73°11'39.78"E

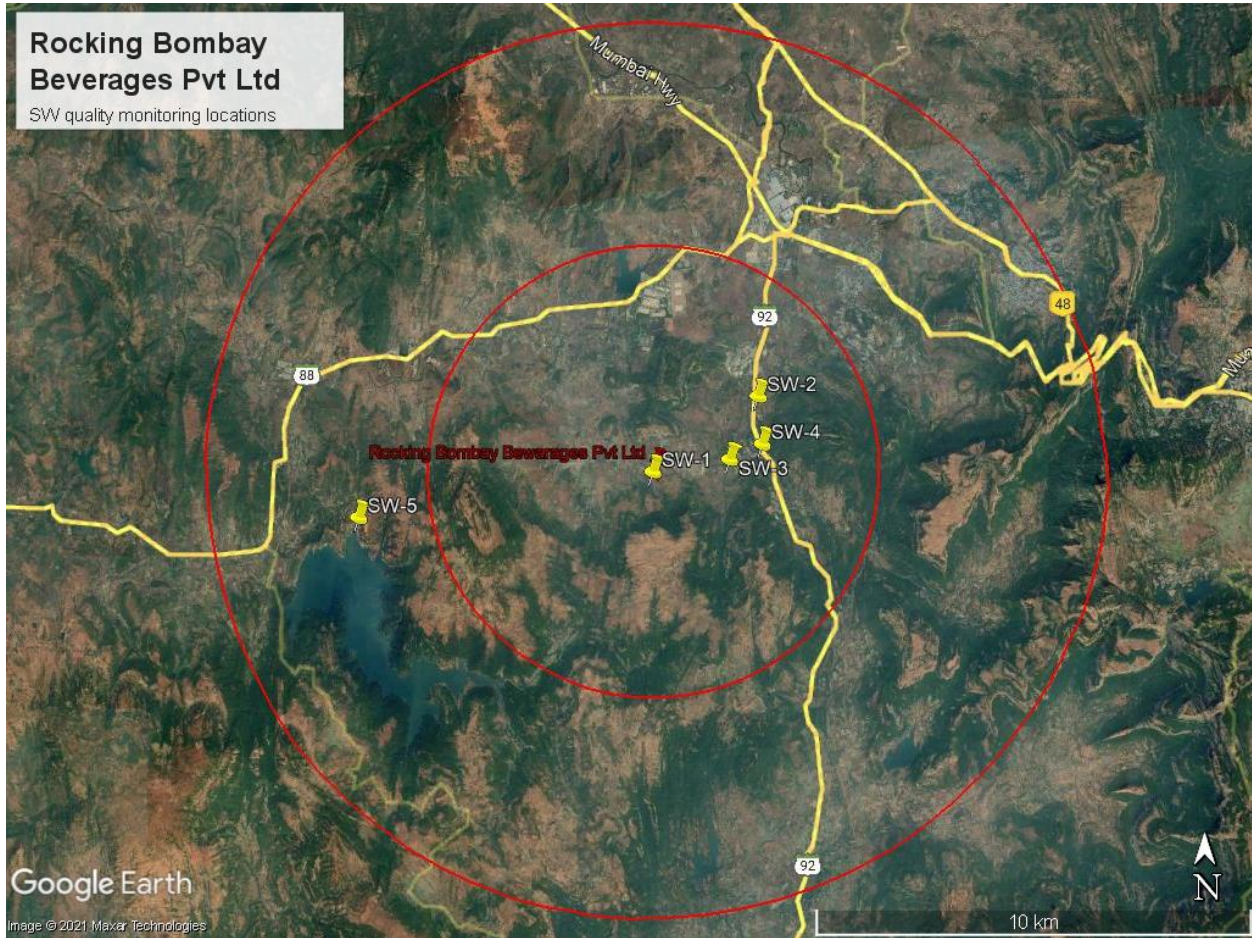


Figure 5 10 km. radius study area map indicating surface water sampling location

**Table -19 Surface water analysis report within 10 km radius of the study area**

Sr. No.	Parameters	Unit	Results					Desirable	Permissible
			SW-1	SW-2	SW-3	SW-4	SW-5	IS 10500:2012 Standards	
1	Temperature	°C	24	22	25	25	25	Not Specified	
2	Turbidity	NTU	<1	<1	<1	<1	<1	1	5
3	Salinity	ppt	0.062	0.048	0.054	0.058	0.040	Not Specified	
4	pH at 25°C	--	7.42	7.52	7.62	7.71	7.73	6.5-8.5	No Relaxation
5	EC at 25°C	µS/cm	314	334	447	417	431	Not Specified	
6	Total Dissolved Solids (TDS)	mg/L	204	217	291	271	280	500	2000
7	Total Hardness (as CaCO <sub>3</sub> )	mg/L	129	128	191	155	174	200	600
8	Total Alkalinity (as CaCO <sub>3</sub> )	mg/L	100	105	152	145	154	200	600
9	Sulphate (as SO <sub>4</sub> )	mg/L	20.6	20.5	24.6	24.3	18.6	200	400
10	Chloride (as Cl)	mg/L	26.8	31.5	36.8	31.2	35.4	250	1000
11	Calcium (as Ca)	mg/L	25.6	30.5	40.5	34.8	38.6	75	200
12	Magnesium (as Mg)	mg/L	15.8	12.5	21.6	16.3	18.6	30	100
13	Total Suspended Solids (TSS)	mg/L	<5.0	<5.0	<5.0	<5.0	<5.0	Not Specified	
14	Ammonia (as N)	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	0.5	No Relaxation
15	Fluoride (as F)	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	1-1.5	No Relaxation
16	Iron (as Fe)	mg/L	0.32	0.38	0.4	0.35	0.35	0.3	No Relaxation
17	Nitrate (as NO <sub>3</sub> )	mg/L	<1	<1	<1	<1	<1	45	No Relaxation
18	Nitrogen (as N)	mg/L	<1	<1	<1	<1	<1	No Relaxation	
19	Nitrite (as NO <sub>2</sub> )	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	Not Specified	
20	Sodium (as Na)	mg/L	14.0	16.0	14.0	18.0	14.0	Not Specified	
21	Phosphate (as PO <sub>4</sub> )	mg/L	<0.2	<0.2	<0.2	<0.2	<0.2	Not Specified	
22	Total Chromium (as Cr)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	No Relaxation
23	Chromium (as Cr+6)	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	0.10	No Relaxation

Sr. No.	Parameters	Unit	Results					Desirable	Permissible
			SW-1	SW-2	SW-3	SW-4	SW-5	IS 10500:2012 Standards	
24	Nickel (as Ni)	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	No Relaxation
25	Cadmium (as Cd)	mg/L	<0.003	<0.003	<0.003	<0.003	<0.003	0.003	No Relaxation
26	Mercury (as Hg)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	No Relaxation
27	Arsenic (as As)	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.05
28	Cyanide (as CN)	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02	0.05	No Relaxation
29	Lead (as Pb)	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	No Relaxation
30	Zinc (as Zn)	mg/L	0.72	0.70	0.68	0.78	0.84	5	15
31	Copper (as Cu)	mg/L	<0.04	<0.04	<0.04	<0.04	<0.04	0.05	1.5
32	Dissolved Oxygen (DO)	mg/L	6.7	6.7	6.6	6.4	6.7		
33	Biochemical Oxygen Demand (BOD) at 27°C for 3 days	mg/L	7.0	4.0	4.4	5.0	3.12	Not Specified	
34	Chemical Oxygen Demand (COD)	mg/L	23.4	11.7	12.8	16.2	9.36	Not Specified	
35	Total Coliform	MPN/100ml	Absent	Absent	Absent	Absent	30	No Relaxation	
36	E. coli.	MPN/100ml	Absent	Absent	Absent	Absent	12	No Relaxation	

**Note:**

Remark: -Surface water quality is found to be good, which can be directly used for irrigation purpose. However, for drinking purpose, conventional treatment suggested.

## Summary of the groundwater and surface water quality monitoring results

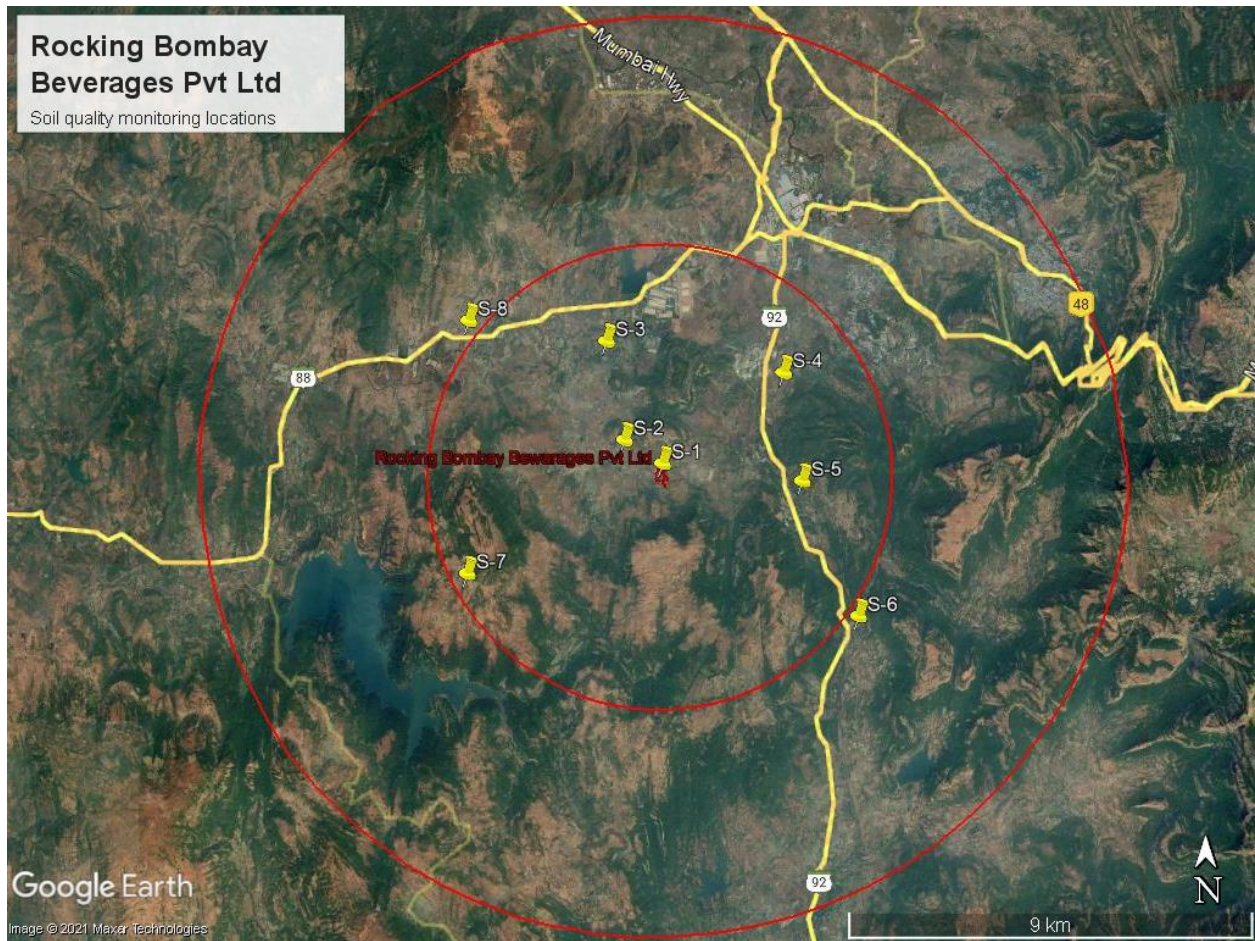
Table Error! No text of specified style in document.-20 Water Analysis Results

Sr. No	Parameters	Ground water		Surface water	
		Min	Max	Min	Max
1.	pH	7.43	7.80	7.42	7.73
2.	Total Dissolved Solids (mg/l)	273	354	204	291
3.	Total Hardness (mg/l)	173	216	128	191
4.	Chlorides (mg/l)	30.58	40.60	28.60	36.80
5.	Fluoride (mg/l)	<0.1	<0.1	<0.1	<0.1
6.	Sulphates (mg/l)	23.30	28.60	18.60	24.6

### 3.3 SOIL ENVIRONMENT

Table-21 Details of the soil sampling locations

Sr. No.	Symbol	Description	Latitude	Longitude
1	S-1	Project Site	18°44'37.14"N	73°15'38.45"E
2	S-2	Near Usroli	18°44'54.58"N	73°15'8.82"E
3	S-3	Gorthan Khurd	18°46'7.58"N	73°14'54.76"E
4	S-4	Sangdewadi	18°45'44.32"N	73°17'13.18"E
5	S-5	Near Khambewadi	18°44'24.21"N	73°17'27.57"E
6	S-6	Near Tuksai	18°42'44.26"N	73°18'11.58"E
7	S-7	Near W akrul	18°43'16.27"N	73°13'6.80"E
8	S-8	Near ransai	18°46'22.76"N	73°13'7.14"E



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



**Table-22 Soil Analysis report within 10 km radius of the study area**

Sr. No.	Description	Unit	RESULT								Standard as per Ministry of Agriculture 2011
			S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8	
1.	Colour	-	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Ministry of Agriculture 2011
2.	Grain Size Distribution										Not Specified
		Sand%	17.22	10.23	15.28	16.23	13.56	17.23	15.4	14.3	Not Specified
		Silt%	28.23	30.10	32.48	25.42	28.43	30.43	30.4	32.0	Not Specified
		Clay %	54.25	57.53	50.36	58.35	58.01	52.34	54.2	53.7	Not Specified
3.	Texture Class		Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Not Specified
4.	Bulk Density	gm/cc	1.10	1.18	1.05	1.14	1.23	1.11	1.04	1.15	Not Specified
5.	Permeability	cm/hr	0.64	0.70	0.72	0.60	0.63	0.68	0.68	0.78	Not Specified
6.	Water Holding capacity	%	40.0	42.0	38.0	44.0	43.0	41.0	42.0	38.0	Not Specified
7.	Porosity	%	39.43	21.03	26.90	33.4	23.5	28.3	27.8	21.2	Not Specified
8.	pH (1: Aq Extraction)	--	6.28	6.62	7.1	6.94	7.12	7.24	6.86	7.34	< 8.5
9.	EC (1: Aq Extraction)	µS/cm	69.0	187.0	213.0	189.3	217.3	224.3	194.3	211.2	0.15 – 0.65
10.	Cation Exchange Capacity	meq/100gm	0.72	0.68	0.76	0.68	0.73	0.70	0.60	0.79	Not Specified
11.	Sodium Absorption Ratio	-----	16.5	18.0	18.5	17.4	18.9	16.3	15.6	17.3	10-18
12.	Nitrogen (N)	Kg/ha	287.12	236.97	303.69	267.3	248.4	298.0	254.3	232.9	280 - 560
13.	Available Phosphorous (P)	Kg/ha	25.0	24.84	23.13	26.3	23.2	21.8	24.7	21.5	10- 24.60
14.	Available Potassium	Kg/ha	176.12	183.43	198.25	168.8	176.4	185.8	154.7	164.8	108-280
15.	Organic Carbon	%	0.7	0.6	0.53	0.6	0.5	0.43	0.52	0.45	0.5 – 0.75
16.	Organic Matter	%	1.0	0.94	0.86	0.93	0.89	0.82	0.90	0.82	Not Specified
17.	Total Iron (Fe)	mg/kg	2.91	2.33	2.28	3.14	2.89	3.21	2.67	2.73	Not Specified
18.	Zinc (Zn)	mg/kg	2.80	2.09	2.49	2.35	2.21	2.67	2.13	2.23	Not Specified
19.	Nickel (Ni)	mg/kg	1.12	1.22	1.32	1.23	1.35	1.18	1.18	1.24	Not Specified
20.	Copper (Cu)	mg/kg	0.89	0.94	0.87	0.76	1.12	0.93	0.83	1.02	Not Specified

## Summary of the results

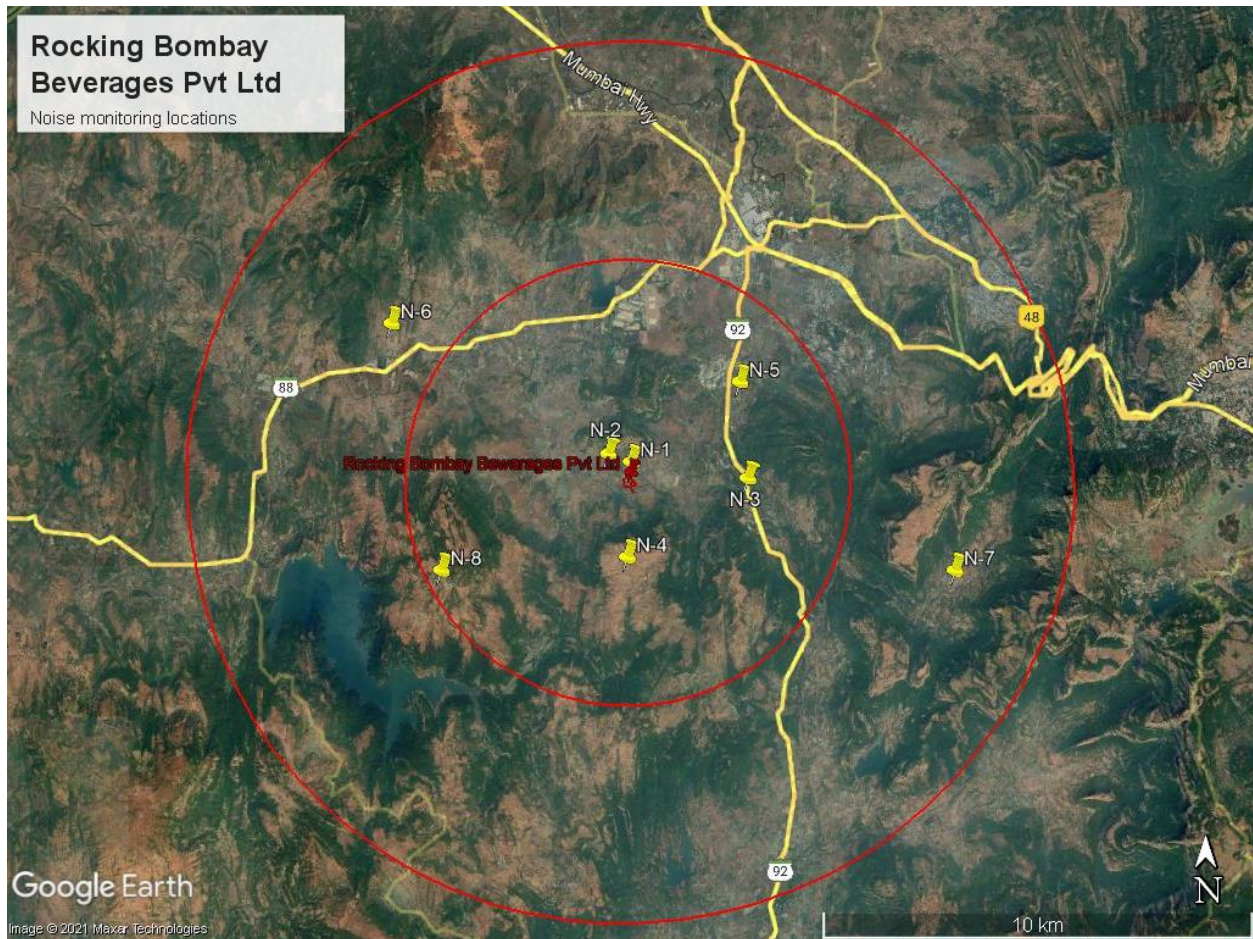
The soil samples were collected at total eight locations within the study area.

- The finding of the study reveals that pH of soil in the area ranged between 6.28 to 7.34 which is an indicative of the neutral to slightly alkaline soil.
- The values for Nitrogen was found to be better to more than sufficient at all locations ranging between 232.9 to 303.69 kg/ha.
- The concentration of Phosphorous was found to be less at all the locations ranging between 21.5 to 26.30 kg/ha.
- The concentration of organic carbon was found to be medium to on an average sufficient at all the locations ranging between 0.43 to 0.70%.
- It is important to note that the concentration of potassium was found to be less at all locations ranging between 157.70 to 198.25 kg/ha. This indicates it is required to use potash rich fertilizers for agriculture purposes.

## 3.4 NOISE ENVIRONMENT

**Table -23 Details of noise quality monitoring locations**

<b>Sr. No.</b>	<b>Symbol</b>	<b>Description</b>	<b>Latitude</b>	<b>Longitude</b>
1	N-1	Near main gate	18°44'42.82"N	73°15'38.93"E
2	N-2	Usroli	18°44'48.90"N	73°15'20.42"E
3	N-3	Near Khambewadi	18°44'30.14"N	73°17'14.02"E
4	N-4	Near Ujloli	18°43'29.85"N	73°15'35.88"E
5	N-5	Near Sangdewadi	18°45'44.53"N	73°17'7.64"E
6	N-6	Near Ransai	18°46'29.34"N	73°12'23.94"E
7	N-7	Near Chavni	18°43'19.25"N	73°20'2.46"E
8	N-8	Near Nada	18°43'19.73"N	73°13'5.32"E



**Figure 7 10 km. radius study area map indicating noise quality sampling location**

**Table Error! No text of specified style in document.-24 Noise levels of the study area**

Sr No	Location	Category Of Area	(Leq dB(A)) Average		CPCB limit (Leq dB(A))	
			Day time	Night time	Day time	Night time
1	Near main gate	Industrial Area	47.7	36.6	75	70
2	Usroli	Residential Area	49.6	36.9	55	45
3	Near Khambewadi	Residential Area	50.6	38.9	55	45
4	Near Ujloli	Residential Area	50.3	37.3	55	45
5	Near Sangdewadi	Residential Area	51.4	39.0	55	45
6	Near Ransai	Residential Area	50.6	39.5	55	45
7	Near Chavni	Residential Area	50.2	39.0	55	45
8	Near Nada	Residential Area	50.7	39.8	55	45

### Summary of the results

#### Daytime Noise Levels (Leq)<sub>day</sub>

**Industrial Zone:** The daytime noise level at the Project site was found in the range of 47.7 dB (A), because it's an establishment project having no operational work yet to start and which is well below the permissible limit of 75 dB (A).

**Residential Zone:** The daytime noise levels in all the residential locations were observed to be in the range of 49.60 dB (A) to 51.40 dB (A).

**Night time Noise Levels (Leq)<sub>night</sub>**

**Industrial Zone:** The night time noise level in the Project site was observed in the range of 36.60 dB (A), because it's an establishment project having no operational work yet to start and which is well below the permissible limit of 70 dB (A).

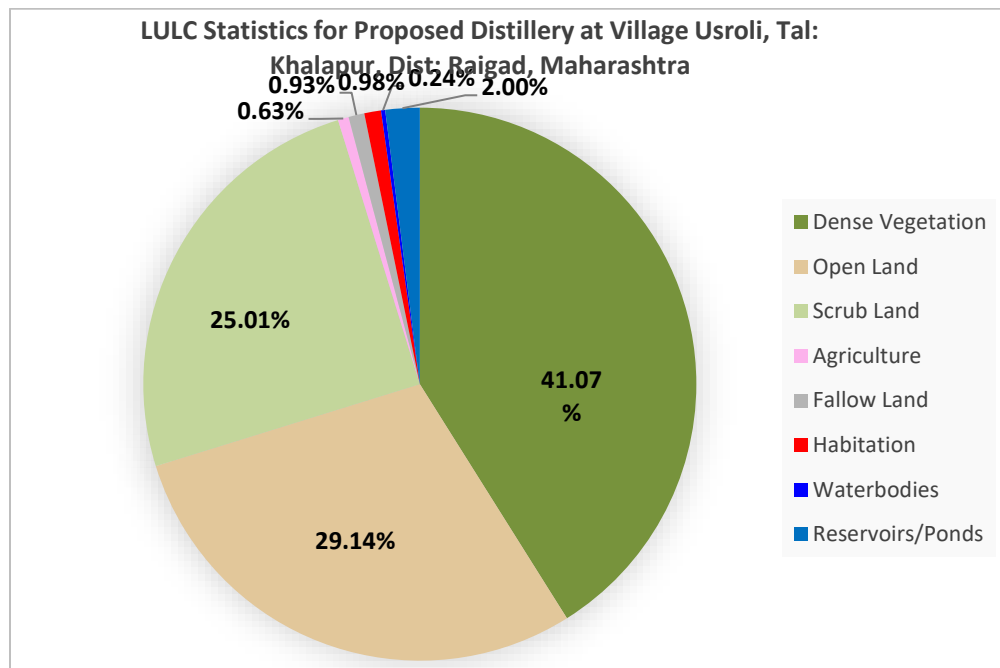
**Residential Zone:** The night time noise levels in all the residential locations were observed to be in the range of 36.9 dB (A) 39.80 dB (A)

The industry shall make 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 25 Land use/ Land cover areas in km2 around 10 km radius for project site**

Sr No.	LULC Class	Area in Ha	Area in km <sup>2</sup>	Percentage
1	Dense Vegetation	13347.47	133.47	41.07
2	Open Land	9468.73	94.69	29.14
3	Scrub Land	8127.455	81.27	25.01
4	Agriculture	204.4375	2.04	0.63
5	Fallow Land	302.0525	3.02	0.93
6	Habitation	317.59	3.18	0.98
7	Waterbodies	79.01	0.79	0.24
8	Reservoirs/Ponds	650.8	6.51	2.00
	<b>Total Area</b>	<b>32497.54</b>	<b>324.98</b>	<b>100.00</b>



**Figure 8 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 this chapter. 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. However, grain-based distilleries are considered as eco-friendly alternative for the production of alcohol. This is because the effluents generated in the process are less polluting in nature and easy to treat as well as dispose. Thus, for this project of Grain Based Distillery, no new or untested technology will be used and will be based on Zero Liquid Discharge. The whole process is based on proven technology i.e., Multi Pressure distillation followed by Multi Effect Evaporation and Dryer.

### **Analysis of alternative site**

The site has very good approachability and road connectivity. The state highway SH-92 (Nagothana-Khopoli) is 3 Km away towards SE from the project site. Village Usroli and Village Khanavi are 0.5 Km and 1.0 Km away from the site respectively. Khalapur is 9.5 Km away towards NWW of the project site which is a tehsil place. District headquarter Raigad is 27 Km away from the site. Patalganaga River is flowing at 3 Km away towards west from the project. Khopoli is a nearest railway station at 9.5 km towards NE of the project site. From all the above factors it can be seen that the site is very well connected by road and rail network.

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 grains 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 distillery establishment. Source of water will be Irrigation Department/CGWA The necessary permissions will be obtained.
- 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 Error! No text of specified style in document.-26 Environment management programme**

SR. NO.	ITEM	PARAMETERS	FREQUENCY OF MONITORING	LOCATION
1.	Ambient Air quality at appropriate location for PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , and NO <sub>x</sub>	PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , and NO <sub>x</sub>	24 hourly, Quarterly	4 Locations 1 @ Upwind and 2@ downwind directions from stack @ 120° to each other 1 Near entry
2.	Stationary Emission from Stack PM, SO <sub>2</sub> , NO <sub>x</sub>	PM, SO <sub>2</sub> , NO <sub>x</sub>	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 1500 per hectare, however; the number of trees would	Six Monthly	

SR. NO.	ITEM	PARAMETERS	FREQUENCY OF MONITORING	LOCATION
		vary depending on the type of soil		
8	Carbon and Water foot Print Monitoring	Maintain the data of raw materials consumption, steam consumption, vehicle frequency for transport of raw materials, effluent generation, air emissions, hazardous waste generation, and raw material recovery	Daily and 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 report in the later part.

## 8.0 BUDGETARY PROVISIONS TOWARDS ENVIRONMENTAL MANAGEMENT PLAN

The cost of the proposed project has been estimated at Rs 209.94 Crores which comprises of land and land development, civil and building, plant and machinery, margin money of working capital. Cost for environment management has been estimated as Rs. 3000 Lakhs and 350 Lakhs as a recurring expenditure. The estimated time of completion of project will be one year after the receipt of Environmental Clearance from the respective authority.

**Table-27 EMP Budget**

Sr. No.	Component	Particulars	Capital investment in Lakhs	Recurring Cost in Lakhs	
1	Air	Construction of new stack for boiler and ESP	700	60	
2	Water	<ul style="list-style-type: none"> <li>• <b>Distillery CPU.</b></li> <li>• <b>MEE and Drier</b></li> <li>• <b>WTP</b></li> <li>• <b>DM Plant</b></li> </ul>	1630	170	
3	Noise	Acoustic enclosures, Silencer pads, ear plugs etc.	80	15	
4	Environment monitoring and Management	Monthly Environment Monitoring (Per Year)	0	10	
		Ambient air monitoring			PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , NO <sub>x</sub>
		Boiler & DG Set Monitoring			TPM, SO <sub>2</sub> , NO <sub>x</sub>
		Effluent (Distillery CPU) (Treated & Untreated)			pH, COD, BOD, TSS, TDS, Oil & Grease
5	Occupational Health	Glases, Breathing Masks, Gloves, Boots, Helmets, Ear Plugs etc. & annual health-medical checkup of workers, Occupational Health (training, OH center)	250	25	
6	Greenbelt	Green belt development activity	25	10	
7	Solid and hazardous Waste Management	Solid and hazardous waste management	100	10	
8	Rain water harvesting	Rain water harvesting	30	5	
9	Storm water drainage	Storm water drainage design and construction	30	5	



Sr. No.	Component	Particulars	Capital investment in Lakhs	Recurring Cost in Lakhs
9	Carbon and Water Foot Print	Maintain the data of raw materials consumption, steam consumption, vehicle frequency for transport of raw materials, effluent generation, air emissions, hazardous waste generation, and raw material recovery	--	15
10	Solar Power & Energy Conservation	Street lights installation with Solar Systems	60	10
11	Fire and Safety	Fire and Safety Management	50	10
12	Laboratory	Testing and Analysis	15	5
<b>Total Cost (In Lakhs)</b>			<b>3000</b>	<b>350</b>

## 9.0 GREENBELT DEVELOPMENT PLAN

According to CPCB guidelines, 2000 trees should be available per hectare of land for Greenbelt development. Total 1.793 Hectares of land is reserved for greenbelt development; hence there should be minimum 3586 no. of trees. The required number of 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 plot area.

## 10.0 CORPORATE ENVIRONMENT RESPONSIBILITY PLAN

The capital cost of the proposed establishment project is Rs. 209.94 Crores. The industry has reserved **Rs. 3.1491 Crores** (1.5 % of the cost of the project as per Office Memorandum Vide F. No. 22-65/2017-IA.III Dated 01.05.2018) The amount will be spent on the activities like sanitation and health facilities, in ZP Schools in nearby villages based on the requirement and road repair and maintenance and Solid waste management in nearby villages in consultation with the District Collector.

## 11.0 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 establishment programme would help the farmers to buy their grains produce in time which would help to minimize the loss of weight and yield maximum financial benefits.