



P-491-JSAILEIA-DISTILLERY-32021

(Revision - 01)

**SUMMARY ENVIRONMENTAL IMPACT ASSESSMENT
(EIA) REPORT**

(IN ENGLISH AND MARATHI)

FOR

**ESTABLISHMENT OF 110 KLPD MOLASSES (B & C HEAVY) /
CANE SYRUP BASED DISTILLERY ALONG WITH 3 MW ELECTRICITY
GENERATION UNDER THE EXISTING 2,500 TCD SUGAR FACTORY
& 12.3 MW CO-GEN.**

BY

JAGRUTI SUGAR & ALLIED INDUSTRIES LIMITED

**TALEGAON(B), ACHWALA VILLAGE,
TAL.: DEONI, DIST.: LATUR, MAHARASHTRA**

PREPARED BY



Equinox Environments (India) Pvt. Ltd.

EQUINOX ENVIRONMENTS (I) PVT. LTD.,

ENVIRONMENTAL; CIVIL & CHEMICAL ENGINEERS, CONSULTANTS & ANALYSTS, KOLHAPUR (MS)

E-mail: projects@equinoxenvi.com, eia@equinoxenvi.com

An ISO 9001:2015 & QCI NABET ACCREDITED ORGANIZATION



MAY - 2021

CERTIFICATE

Declaration by Expert contributing to the Draft EIA in respect of proposed expansion of 65 to 110 KLPD Molasses (B & C Heavy) /Cane Syrup based Distillery along with 3 MW Electricity Generation by **Jagruti Sugar & Allied Industries Limited (JSAIL)**, is located Achwala village, Tal.: Deoni, Dist.: Latur, Maharashtra State.

We, hereby, certify that we were a part of the Draft EIA team in the following capacities that developed the above EIA.

EIA Outward No. P-491-JSAILEIA-DISTILLERY-32021

EIA Coordinators

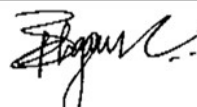
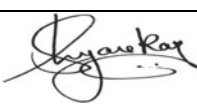
Name : Ms. Sulakshana Ayarekar


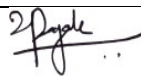



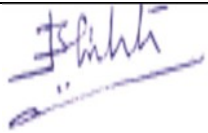



Period of Involvement : September 2019-January 2020


Contact Information : eia@equinoxenvi.com

Functional Area Expert:

Sr. No.	Functional Area	Name of the expert/s	Involvement (Period & Task)	Signature
1	WP	Dr. Sangram Ghugare	September 2019-January 2020 <ul style="list-style-type: none">• Study of process and operations• Site visit and finalization of water sampling locations• Preparation of water balance and identification of wastewater generation.• Evaluation of water pollution & control management• Identification of impacts, suggestion and finalization of mitigation measures• Study on Treatment of effluents through existing ETP and to be upgraded under proposed expansion was contemplated and designs were done accordingly.	
2	EB	Ms. Sulakshana Ayarekar	September 2019-January 2020 <p>Selection of Site for conducting ecological & biodiversity status of the study region.</p> <ul style="list-style-type: none">• Interaction with Govt. offices and agencies for certain secondary data and information pertaining to region specific issues• Study of terrestrial fauna by sighting, noting pug-marks, calls, sounds, droppings, nests and burrow etc.• Interaction with local residents for obtaining information about various species of animals and birds usually	

Sr. No.	Functional Area	Name of the expert/s	Involvement (Period & Task)	Signature
			<p>observed their existence and importance in the study region.</p> <ul style="list-style-type: none"> • Review of rules, legislation and criteria towards knowing and understanding inclusion in the study region of any eco-sensitive zones, wild lifesanctuary. • Collection, compilation and presentation of the data as well as incorporation of same into the EIA Report 	
3	SE	Mr. V. B. Jugale	<p>September 2019-January 2020 Collection of data on socio-economic aspects in study area through surveys.</p> <ul style="list-style-type: none"> • Public opinions and recording of events for future industrialization in the study area. • Study of sociological aspects like human settlement, demographic and infrastructural facilities available in study area. • Compilation of primary and secondary data and its inclusion in EIA report. 	
4	AP	Mr. Yuvraj Damugade	<p>September 2019-January 2020 Involved in detailed study of mass balance w.r.t. raw materials & products especially from view point of process emissions.</p> <ul style="list-style-type: none"> • Site visit and finalization sampling locations • Planning & identifying the most appropriate air pollution control equipment from view point of efficiencies, capital as well as O & M cost & suitability • Identification of impact and suggesting the mitigation measures. 	
5	AQ	Mr. Yuvraj Damugade	<p>September 2019-January 2020 Designing of Ambient AQM network for use in prediction modeling and micro metrological data development</p> <ul style="list-style-type: none"> • Development and application of air quality models in prediction of pollutant dispersion, • Plotting of isopleths of GLCs, Worst case scenarios prediction w.r.t. source and receptors. 	


Sr. No.	Functional Area	Name of the expert/s	Involvement (Period & Task)	Signature
6	HG	Dr. J.B. Pishte	<p>September 2019-January 2020 Hydro geological studies, data processing; analysis and evaluation, Ground water table measurement and monitoring network methodology preparation.</p>	
7	GEO		<ul style="list-style-type: none"> • Planning and scheduling of groundwater sampling stations in the region. • Study of geology & general geological configuration of the region as well as sub-surface geology. • Determination of impact and suggesting mitigation measures 	
8	SHW	Dr. Sangram Ghugare	<p>September 2019-January 2020 Detailed study of manufacturing process and mass balance.</p> <ul style="list-style-type: none"> • Solid wastes generation in different steps of manufacturing was identified and their quantification done was checked. • Identification of various hazardous wastes generated through manufacturing process. • Practices of storage and disposal of HW its impact and mitigation measures. 	
9	RH	Dr. B. N. Thorat	<p>September 2019-January 2020 All the necessary literature for processes storage of hazardous chemicals was studied before visit.</p> <ul style="list-style-type: none"> • Site visit and Verification of adequacy of on-site emergency preparedness plan for proposed unit was done. • Identification of probable emergencies and procedures for preparedness for handling the same was verified. • Worst case analysis by using ALOHA, Ware house safety measures, suggestion of mitigation measures. 	
10	NV	Mr. Vinay Kumar Kurakula	<p>September 2019-January 2020 Verification of noise levels Monitoring (both work zone and ambient) in the industrial premises and study region</p> <ul style="list-style-type: none"> • Finalization and verification of sampling locations, ambient noise 	

Sr. No.	Functional Area	Name of the expert/s	Involvement (Period & Task)	Signature
11	LU		<p>monitoring stations and the data collected.</p> <ul style="list-style-type: none"> • Land use land cover mapping using NRSC Satellite image, • Satellite image processing, Image classification, Technical analysis and study for setting up of facility, planning of storage facility. 	
12	SC	Dr. Mudaliya	<p>September 2019-January 2020</p> <ul style="list-style-type: none"> • Involvement physical analysis & characterization of the soils. • Identification of Impact and its mitigation measures • Interpretation of soil analysis, results and data including comparison of same with standard soil classification. • Collection, study and evaluation of soil information from data obtained from secondary sources & its interpretation. 	

Declaration by the Head of the Accredited Consultant Organization/authorized person:

I, **M/s. Equinox Environments (I) Pvt. Ltd. (EEIPL); Kolhapur, Environmental & Civil Engineers, Consultants and Analysts.**, hereby confirm that the above mentioned experts were involved in preparation of Draft EIA and Executive Summary in respect of proposed expansion of 110 KLPD Molasses (B & C Heavy) /Cane Syrup based Distillery along with 3 MW Electricity Generation by **Jagruti Sugar & Allied Industries Limited (JSAIL)**, is located Achwala village, Tal.: Deoni, Dist.: Latur, Maharashtra State.

I also confirm that the consultant organization shall be fully accountable for any mis-leading information mentioned in this statement.

Signature: 

Name: Dr. Sangram Ghugare

Designation: Chairman & MD

Name of the EIA Consultant Organization: M/s. Equinox Environments (I) Pvt. Ltd. (EEIPL); Kolhapur.

NABET Certificate No. & Issue Date: NABET/IA/1821/ RA 0135, Validity - 21/10/2021

INDEX

SR. NO.	DESCRIPTION	PAGE NO.
1.	SUMMARY EIA IN ENGLISH	1 - 19
2.	SUMMARY EIA IN MARATHI	20-38

**SUMMARY OF DRAFT EIA REPORT FOR
ESTABLISHMENT OF 110 KLPD MOLASSES / CANE SYRUP BASED
DISTILLERY WITH 3 MW ELECTRICITY GENERATION.
BY**

JAGRUTI SUGAR & ALLIED INDUSTRIES LIMITED (JSAIL),
Achwala village, Tal.: Deoni, Dist.: Latur, Maharashtra State.

1) THE PROJECT

Jagruti Sugar & Allied Industries Limited (JSAIL) is located at Gat Gat. No. 5 & 6, Achwala village, Tal.: Deoni, Dist.: Latur, Maharashtra State. The proposed establishment of 110 KLPD molasses/ cane syrup based distillery would be in existing sugar factory (2500 TCD) and co-gen plant (12.3 MW) premises.

As per the provision of “EIA Notification No. S. O. 1533 (E)” dated 14.09.2006 as amended vide Notification dated 13 June 2019, the proposed project comes under Category - A. Accordingly, Form -1 application is submitted to MoEFCC, New Delhi and standard ToRs granted on 07.04.2021. Proposed establishment of distillery would be formulated in such a fashion and manner so that the utmost care of Safety Norms and Environment Protection shall be taken. Details of capital investment are given in table 1.

Table 1 Project Investment Details

No.	Industrial Unit	Capital Investment (Rs. Crores)		
		Existing	Proposed	Total
1	Sugar Factory	121.29	--	121.29
2	Distillery	--	120	120
			Total	241.29

2) THE PLACE

Proposed establishment of distillery shall be carried out in existing premises of sugar factory and co-gen plant by JSAIL. Total land acquired by the JSAIL is 53.43 Ha. Out of this total built up area of proposed distillery will be 2.06 Ha and under existing sugar factory and co-gen plant is 4.04 Ha. Refer Appendix - A of Draft EIA report for plot layout plan. A No Objection Certificate (NOC) for proposed establishment project has been obtained from the Achwala Grampanchayat. Same is presented at certificates and other documents of EIA report.

Table 2 Area Break up

No.	Description	Area (Sq.M)		
		Existing	Proposed	Total
1	Total Plot Area of Industrial Complex	5,34,379		
2	Built-up Area			
	Proposed Distillery	-	20658	20658
	Sugar and Cogen Plant	40483	-	40483
	Colony, GWR area, Admin Building etc	13066	-	13066
	Total Built-up Area	53,549	20658	74,207
	Area Under Road	-	-	50200

3	Green Belt Area	33,351 (6%)	1,42,994 (27%)	1,76,345 (33%)
4	Open Space	--	--	2,33,627

3) THE PROMOTERS

JSAIL promoters are well experienced in the field have made a thorough study of entire project planning as well as implementation schedule. Names and designations of the promoters are presented at table 3.

Table 3 List of Promoters

No.	Name	Designation
1	Mr.Dileeprao Dagdujirao Deshmukh	Director
2	Mrs.Gaurawi Atul Bhosle	Chairman & Managing Director
3	Mrs.Suvarna Dileeprao Deshmukh	Director
4	Mr.Laxmanrao Nivruttirao More	Joint Managing Director
5	Mrs.Savita Laxmanrao More	Director
6	Mrs.Vandana Ganpati Morge	Director
7	Mr.Deelip Raosaheb Mane	Director
8	Mrs.Savita Deelip Mane	Director
9	Mr.Suryakant Bansilal Karwa	Director

4) THE PRODUCTS

Details of products that are manufactured under proposed distillery as well as existing sugar factory and co-gen plant are represented in Table 4.

Table 4 List of Products & By-product

Industrial Unit	Product & By-product	Unit	Quantity
Proposed Distillery Unit (110 KLPD)	Rectified Spirit (RS)/Extra Neutral Alcohol (ENA)/Ethanol	KLPD	110
	Fusel Oil	KLPD	0.19
	CO ₂	MT/D	83
	Spentwash Dry Powder	MT/D	95
	Electricity	MW	3
	Raw Materials		
	Molasses (B & C Heavy)	MT/D	407
	Sugarcane juice syrup (40 Brix)	MT/D	672
	Yeast	MT/D	0.4
	Urea	MT/D	4.5
	De-foaming Oil	MT/D	13
Existing Sugar Factory (2500 TCD)	Products		
	Sugar	MT/M	7500
	Bagasse	MT/M	22500
	Press mud	MT/M	3000
	Molasses	MT/M	3000
	Raw Materials		
	Sugarcane	MT/M	75000
Lime	MT/M	150	

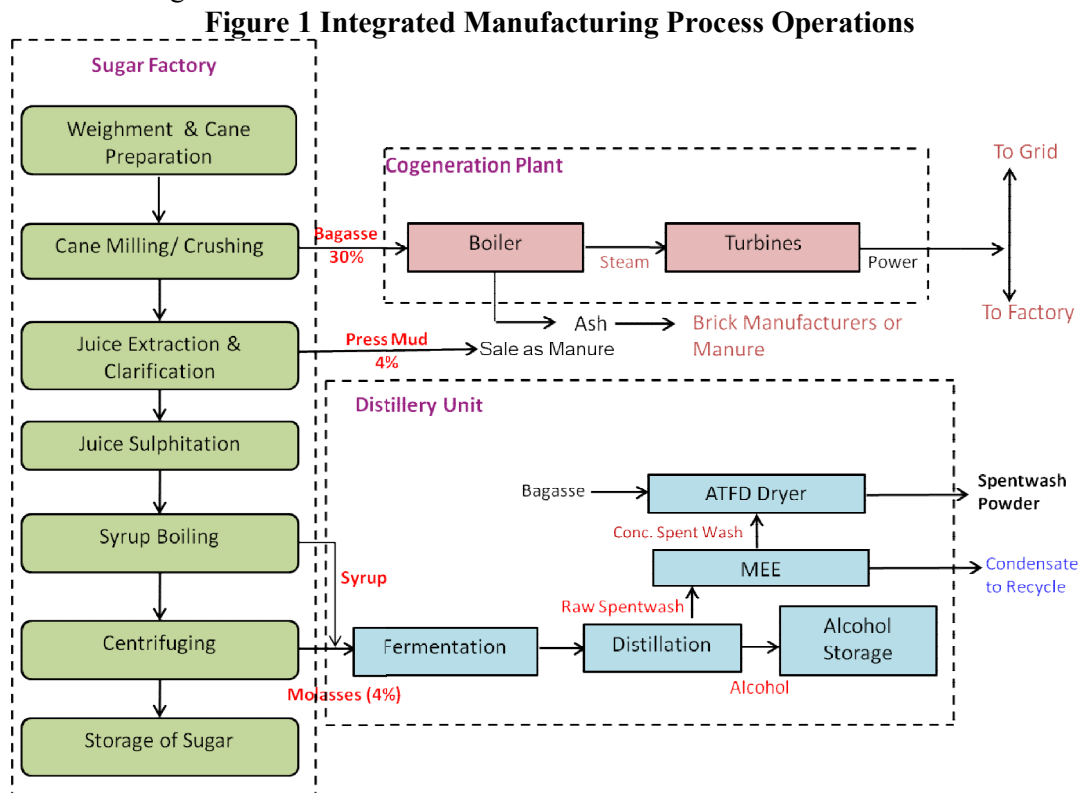
Industrial Unit	Product & By-product	Unit	Quantity
	Sulphur	MT/M	30
Co-gen Plant (Existing 12.3 MW)	Electricity	MW	12.3
	Raw Materials		
	Bagasse	MT/M	21000

5) THE PURPOSE

Alcohol has assumed very important place in the Country's economy. It is a vital raw material for a number of chemicals and also a renewable source of energy. It has been a source of a large amount of revenue by way of excise duty levied by the Govt. on alcoholic liquors. It has a potential as fuel in the form of power alcohol for blending with petrol. Also, the fermentation alcohol has great demand in countries like Japan, U.S.A., Canada, Sri Lanka etc., as the synthetic alcohol produced by these countries, from naphtha of petroleum crude, is not useful for beverages. Considering the above facts as well as availability of raw material, management of JSAIL decided for establishment of distillery.

6) MANUFACTURING PROCESS

Detailed manufacturing process and flow diagram for distillery, sugar factory and co-gen are given on Chapter 2 of EIA report. Manufacturing process of integrated project complex is presented at Figure 1.



7) ENVIRONMENTAL ASPECTS

JSAIL has implemented an effective 'Environmental Management Plan' and various aspects of the same are as follows:-

A) Water use and Effluent generation:

a. Water Requirement -

(A) Water Requirement for Distillery

Table 5(A) Details of Water Consumption for Distillery (CMD)

No.	Description	Water Consumption for Molasses Based operations	Water Consumption for Syrup based Operations
1	Domestic	# 2	# 2
2	Industrial		
	a. Process (Fermn.Dilu)	* 873	--
	b. Cooling Make up	154(*68+#86)	♣165
	c. Boiler Makeup	#72	♣72
	d. Ash quenching	*2	♣2
	e. Lab & Washing	# 5	♣5
	Ind. Total	1106(*943+#163)	*244
3	Gardening	^Ω 357	357(^Ω 81+*276)
4	Grand Total (1+2+3)	1465(*943+#165+^Ω357)	603(*520+^Ω 81+# 2)
	Fresh Water Consumption (Norm: 10 KL/KL of Alcohol)	1.5 KL/KL	0 KL/KL
	Recycle (%)	88%	100%

Note- # -Actual quantity of fresh water♣ - Distillery CPU Treated Effluent during molasses based operations ♣- Distillery CPU Treated Effluent during syrup based operations, Ω-Rain water Harvesting

(B) Water Requirement for Sugar Factory and Co-Gen Plant

Table 5(B) Details of Water Consumption for Sugar Factory and Co-Gen Plant (CMD)

No.	Description	Water Consumption (CMD)
1	Domestic	#25
2	Industrial	
	a. Manufacturing Process	*751
	b. Cooling	*325
	c. Boiler Feed	*192
	d. ROPlant	*20
	e. Ash	*2
	f. Lab & Washing	*10
	Ind. Total	*1300
3	Gardening	[§] 240
4	Grand Total (1+2+3)	1565(*1300+#25 +[§] 240)
	Fresh water consumption (Norm: 100lit. /MT of cane)	0lit. /MT of cane

-Actual quantity of fresh water, * -Cane condensate from sugar factory, §- Treated water from ETP & proposed STP

b. Effluent Treatment-

i) Domestic Effluent

Domestic effluent generated from distillery will be 1.5 M³/D. From existing sugar factory & co-gen plant about 18 M³/D is generated. Same will be treated in proposed Sewage Treatment Plant (STP) and treated water will be used for gardening or for irrigation purpose.

ii) Industrial effluent (M³/D)

Table 6 Details of Effluent Generation Proposed 110 KLPD Distillery Unit

No.	Description	Effluent Generation for Molasses Based Operations	Effluent Generation for Syrup Based Operations	Disposal
1	Domestic	1.5	1.5	To be treated in proposed STP
2	Industrial			
	Process	Raw Sp. Wash-880	Raw Sp. Wash-440	<ul style="list-style-type: none"> Raw spentwash from Molasses Based operations and Syrup based operations shall be concentrated in MEE. Further Conc. Spentwash shall be dried in Agitated Thin Film Dryer (ATFD) to form powder.
		Conc. Spentwash - 176	Conc. Spentwash - 88	
		Sp. Lees - 154	Sp. Lees - 109	Other Effluents viz. Condensate, spent lees, cooling b/d, boiler b/d, lab & washing effluent shall be treated in Proposed Condensate Polishing Unit (CPU). Treated effluent from CPU shall be fully recycled to achieve Zero Liquid Discharge (ZLD)
		Condensate-774	Condensate-387	
	Boiler blowdown	14	14	
	Cooling blowdown	15	15	
	Lab & Wash	5	5	
		Sp. Wash- 176 Other Effl.-962	Sp. Wash- 88 Other Effl.- 530	

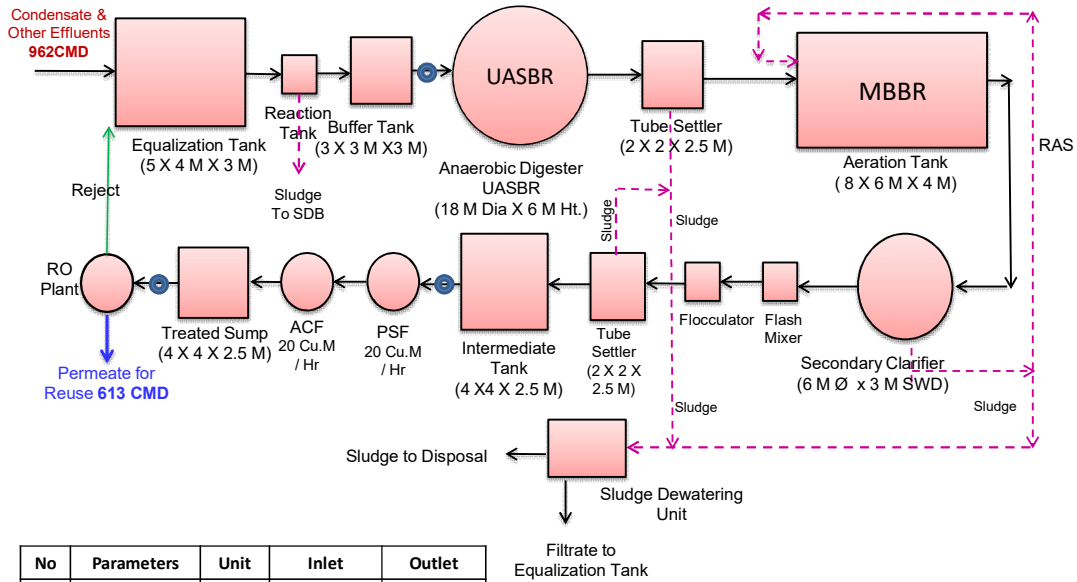
Under the proposed distillery, Raw sp. Wash of molasses based operations @ 880 CMD concentrated in MEE. Further, Conc. Spentwash @176CMD shall be dried for powder formation in ATFD. Raw sp. Wash of syrup based operations @440CMD concentrated in MEE. Further, Conc. Spentwash @88CMD shall be dried for powder formation in ATFD. Other Effl @ 962 CMD from molasses based operations shall be treated in CPU. Whereas Other Effl @ 530 CMD from syrup based operations shall be treated in CPU. Treated CPU effluent recycled to achieve ZLD

Table 7 Details of Effluent Generation in Sugar Factory & Co-gen Plant (M³/D)

No.	Description	Effluent (CMD)	Disposal
1	Domestic	18	To be treated in Proposed STP
2	Industrial		Treated in Existing Sugar Factory ETP having Primary, Secondary & Tertiary Treatment Units
	a. Process	143	
	b. Boiler	20	
	c. Cooling	33	
	d. RO Backwash	20	
	e. Lab & Wash	10	
	Ind.Total(a+b+c+d+e)	226	

Moreover, Total trade effluent generated from existing sugar and co-generation activities is 226 M³/D. Same is treated in existing Effluent Treatment Plant (ETP) provided in own factory premises comprising of primary, secondary & tertiary unit operations. Treated effluent supplied for watering plantation under the green belt in own factory.

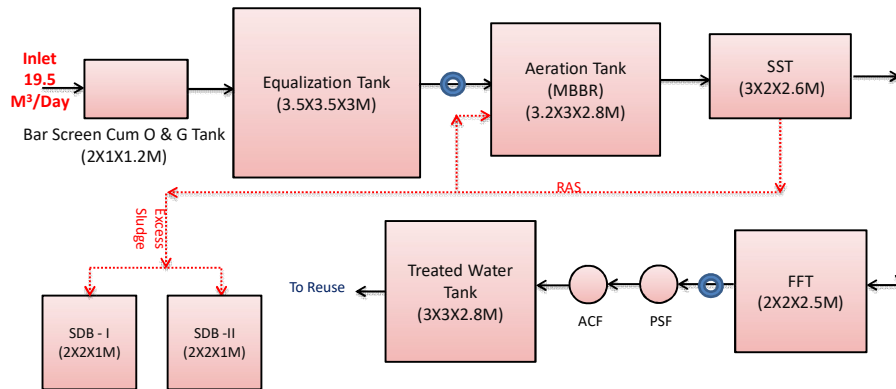
Figure 2 - Flow Chart of Proposed CPU for Distillery



No	Parameters	Unit	Inlet	Outlet
1.	pH	--	5-6	7 - 8
2.	COD	mg/lit	4000-8000	< 100
3.	BOD	mg/lit	2000-3500	< 50
4.	TDS	mg/lit	1200-1500	< 100

Note:
RAS: Return Activated Sludge
SDB: Sludge Drying Beds

Figure 3- Flow Chart of Proposed STP

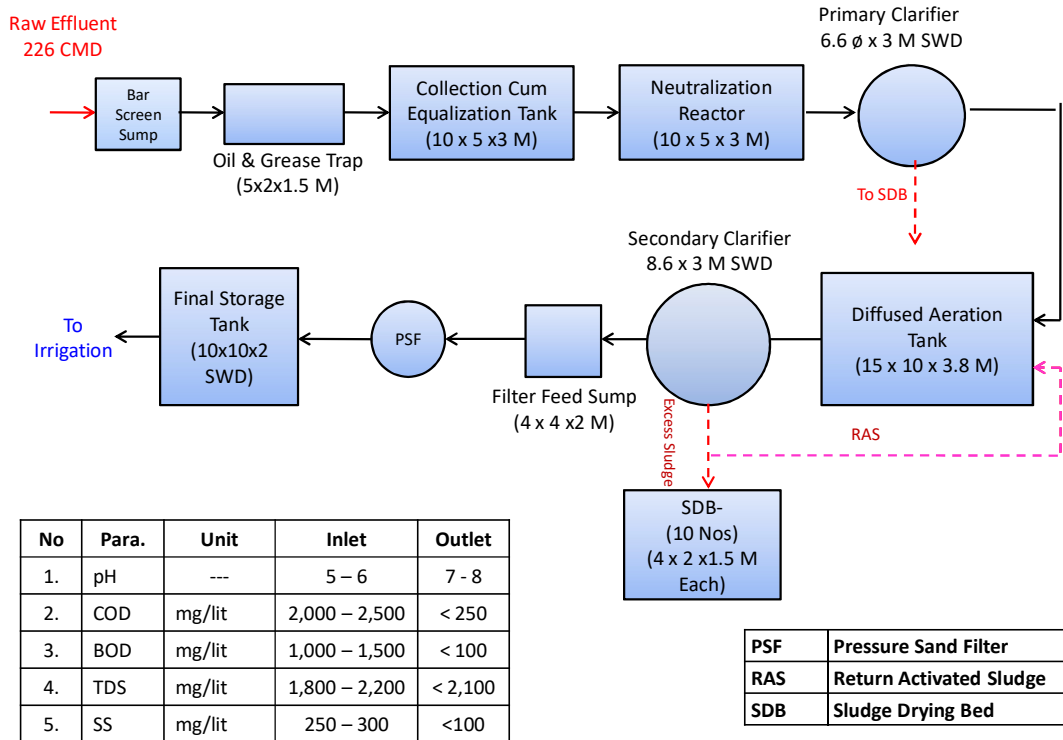


No	Parameters	Unit	Inlet	Outlet
1.	pH	---	6.5 - 7.5	7.2 - 7.5
2.	COD	mg/lit	500 - 600	< 30
3.	BOD	mg/lit	250 - 300	< 10
4.	TSS	mg/lit	250 - 400	< 5
5.	O & G	mg/lit	15 - 20	< 10

PSF	Pressure Sand Filter
ACF	Activated Carbon filter
RAS	Return Activated Sludge
FFT	Filter Feed Tank
SDB	Sludge Drying Bed

17

Figure 4 - Flow Chart of Existing Sugar Factory ETP



No	Para.	Unit	Inlet	Outlet
1.	pH	---	5 - 6	7 - 8
2.	COD	mg/lit	2,000 - 2,500	< 250
3.	BOD	mg/lit	1,000 - 1,500	< 100
4.	TDS	mg/lit	1,800 - 2,200	< 2,100
5.	SS	mg/lit	250 - 300	< 100

PSF	Pressure Sand Filter
RAS	Return Activated Sludge
SDB	Sludge Drying Bed

B) Air Emissions:

Under proposed establishment of distillery 30 TPH boiler will be installed. Bagasse(360MT/D) would be used as fuel for the same. Under Existing sugar factory 80 TPH boiler and 625 KVA DG Set is installed.

Details of Boilers are presented at table 8.

Table 8 Details of Boiler and DG Set in JSAIL

No.	Description	Boiler		DG Set
		Proposed	Existing	Existing
1	Boiler Capacity	30 TPH	80 TPH	625KVA
2	Fuel type	Bagasse	Bagasse	HSD
3	Fuel Qty	360MT/Day	700MT/Day	30 Lit/Hr
4	Shape	Round	Round	-
5	Height	60 M	70 M	4 M
6	Diameter	2 M	5.5 M	-
7	APC Equipment	Wet scrubber	Wet scrubber	-

C) Noise Pollution Aspect

1. Sources of Noise

- i. In the distillery, very high noise generating sources would not exist. Expected noise levels in the section would be about 70 dB (A) or so. Adequate noise abatement measures like silencer & maintenance of pumps, motors, and compressors would be carried out and enclosures would be provided to abate noise levels at source. Moreover, enclosures to the machinery would be provided wherever possible.
- ii. Fermentation section & distillation section would be the other minor noise generating sources. The expected noise levels in these sections would be in range of 70 to 80 dB(A).
- iii. Existing sugar factory and co-gen; noise generating sources are the boiler house, turbine rooms, cane crushing section and mill house, etc.
- iv. Adequate green would be developed in phase wise manner in and around the industry. So that it would further attenuate the noise levels.

2. Control Measures

Isolation, separation and insulation techniques to be followed, PPEs in the form of earmuffs, earplugs etc. would be provided to workers. D.G. Sets are enclosed in a separate canopy to reduce the noise levels.

D) Solid Wastes

Table 9 Solid Waste Generations, Storage and Disposal Details

No.	Industrial Unit	Type of Waste	Quantity (MT/M)	Disposal
1	Proposed Distillery Unit	Yeast Sludge	600	Used as manure
		CPU Sludge	24	
		Boiler Ash	324	To Brick manufacturer
2	Existing Sugar	Boiler	502	To Brick manufacturer

	Factory	Ash(Bagasse)		
		ETP Sludge	3.50	Used as manure

E) Hazardous Wastes

No any hazardous waste will be generated from distillery. Hazardous waste generated from existing sugar factory is presented below.

Table 10 Hazardous Waste Details

No.	Industrial Unit	Category	Quantity	Disposal
1	Proposed Distillery Unit	Spent Oil – Cat.5.1	0.2 MT/M.	Burnt in Boiler
2	Existing Sugar Factory	Spent Oil - Cat.5.1/5.2	0.9 MT/M.	Burnt in Boiler

F) Odour Pollution

There are number of odour sources such as molasses handling and storage, fermentation and distillation, secondary effluent treatment, and storage of effluents, stale cane, bad mill sanitation, bacterial growth in interconnecting pipes & unattended drains. Measures adopted under existing unit for controlling same are proper housekeeping, sludge management in biological ETP units, steaming of major pipe lines, regular use of bleaching powder in the drains, efficient handling, prompt & proper disposal of press mud. Under proposed project of distillery, spentwash shall be carried through closed pipeline for spentwash storage and handling activity shall be entirely eliminated.

G) Compliance with the Norms

All the relevant acts, rules and guidelines with respect to effluent treatment and disposal, solid & hazardous wastes handling and disposal as well as in respect of emission handling and disposal, wherever applicable, as specified by the Maharashtra Pollution Control Board (MPCB) or any other concerned authority are strictly followed in the existing set up. Same practice shall be continued after proposed establishment.

H) Environmental Management Cell

JSAIL is already having an EMC functioning under its Sugar factory. Members of EMC are well qualified and experienced in their concerned fields. This cell shall be further augmented suitably under proposed establishment of distillery. EMC members are as under-

Table 11 Environmental Management Cell

No.	Name of Member	Designation	No. of Working Person(s)
1.	Mrs.Gaurawi Atulji Bhosale	Chairman & Managing Director	1
2.	Mr.Deelip Raosaheb Mane	Director	1
3.	Mr.Suryakant Bansilal Karwa	Director	1
4.	Mr.Sunilkumar D. Deshmukh	Project Manager	1
5.	Mr. Ganesh Govardhan Yeole	Chief Chemist	1
6.	Mr. Atul Subhash Darekar	Chief Engineer	1

No.	Name of Member	Designation	No. of Working Person(s)
7.	Mr. Vilas R.Patil	Distillery Incharge	1
8.	Mr.Ramesh Sidhram Shriramwar	Lab Incharge	1

Details of capital as well as O & M costs towards environment protection under existing as well as proposed establishment is presented as follows –

Table 12 Capital as well as O & M Cost

No.	Description	Cost Component (Rs. Lakhs)	
		Capital	O & M / Year
A	Existing		
1	APC Equipments – Wet Scrubber, Stack (70 M) for boiler & OCMS(air&effluent)	225.00	35 .20
2	Sugar Factory ETP ,OCMS	101.61	15 .00
3	Noise Pollution Control	35.00	5.00
4	Environmental Monitoring & Management	15.00	1.00
5	Occupational Health & Safety	50.00	5.00
6	Green Belt Development	117.44	3.87
7	Rainwater Harvesting Infrastructure	27.84	0.25
	Total (5% of Rs. 121.29 Cr; Existing Investment)	Rs.571.89	Rs.65.07
B	Proposed		
1	APC Equipments – Wet Scrubber, Stack (60 M) for boiler & OCMS(air&effluent)	200.00	20.00
2	Water Pollution Control – Spentwash storage, MEE, CPU, ATFD ,STP & OCMS	350.00	10.00
3	Noise Pollution Control	50.00	5.00
4	Environmental Monitoring & Management	15.00	2.00
5	Occupational Health & Safety	35.00	3.00
6	Rainwater Harvesting Infrastructure	10.00	1.00
7	Green Belt Development	50.00	5.00
	Total (35% of Rs.120 Cr; Proposed Investment)	Rs. 710	Rs. 46
	Total (A+B)	Rs. 1281.89	Rs. 111.07

I) Rainwater Harvesting Aspect

Table 13 Area Taken for RWH

No.	Description	Area (Sq. M.)
1	Rooftop Area	13066
2	Green Belt Area	1,76,345
3	Area under Roads	50200
4	Open Space	2,33,627

Average annual rainfall in the area = 650 mm
= 0.654 M

Runoff Factors considered - Rooftop Area : 0.8
Green Belt : 0.3
Road Space : 0.5
Open Space : 0.3

RWH = Area x Rainfall Depth x Run off Coefficient

A Roof Top Harvesting-

$$\begin{aligned} \text{RWH Quantity} &= 13066 \text{ M}^2 \times 0.65 \text{ M} \times 0.8 \\ &= 6794.32 \text{ M}^3 \end{aligned}$$

B Surface Water Harvesting –

$$1. \text{ RWH Quantity from Green Belt} = 1,76,345 \text{ M}^2 \times 0.65 \text{ M} \times 0.3 = 34,387.27 \text{ M}^3$$

$$2. \text{ RWH Quantity from Roads} = 50200 \text{ M}^2 \times 0.65 \text{ M} \times 0.5 = 16,315 \text{ M}^3$$

$$3. \text{ RWH Quantity from Open Space} = 2,33,627 \text{ M}^2 \times 0.65 \text{ M} \times 0.3 = 45,557.2 \text{ M}^3$$

$$\begin{aligned} \text{Total RWH from Surface Area} &= 34,387.27 + 16,315 + 45,557.2 \\ &= 96,259.47 \text{ M}^3 \end{aligned}$$

Hence, the total water becoming available after rooftop and land harvesting will be

$$\begin{array}{rclcl} \text{Rooftop Harvesting} & + & \text{Surface Harvesting} & = & \text{Total RWH} \\ 6794.32 & + & 96,259.47 & = & 103,053.79 \text{ M}^3 \\ & & & = & 103 \text{ ML} \end{array}$$

J) Green Belt

Table 14 Area Details

No.	Description	Area (Sq. M.)
A	Built-up Area	
	i. Existing Sugar Factory	53,549
	ii. Proposed Distillery Unit	20658
	Total	74,207
B	Area Under Roads	
	Total	50200
C	Green belt area (Norm: 33% of Total Plot)	
	i. Existing Green Belt (6% of Total Plot)	33,351
	ii. Proposed Green Belt (27% of Total Plot)	1,42,994
	Total	1,76,345
D	Open Area	2,33,627
E	Total Plot Area(A+B+C+D)	5,34,379

Criteria for Green Belt Development Plan

Emission of SPM, SO₂ is the main criteria for consideration of green belt development. Plantation under green belt is provided to abate effects of the above emissions. Moreover, there would also be control on noise from the industry to surrounding localities as considerable attenuation would occur due to the barrier of trees provided in the green belt.

K) Socio-Economic Development

Socio economic study was carried out in 10 villages within 10 Km radius of the study area was carried out with the help of a structured close ended interview schedule, comprising of 32 questions in Marathi. The schedule was administered by using Simple Random

Disproportionate Sampling Technique. Refer Socio – economic profile in Chapter 3, Section 3.11 of EIA report for detailed information of socio economic aspect. Observations and conclusions after the socio-economic study are as follows-

- Most of the villages have basic facilities like drinking water, preliminary educational infrastructure, toilets and electricity. Good transportation & satisfactory educational facilities are present.
- A majority of the population within the sample size had a good income which is mostly due to sugarcane cultivation.
- Indirect & direct Job opportunities provided to locals by industry.
- Most villages lacked drainage system, open drainages; scattered solid waste as well as poor sanitation was visible.
- Improper, inadequate and not within close vicinity health facilities is the major problem faced by locals.

8) ENVIRONMENTAL MONITORING PROGRAM

Reconnaissance of the study area was undertaken in the month of September 2019. Field monitoring for measuring meteorological conditions, ambient air quality, water quality, soil quality and noise levels was initiated in October 2019. Report incorporates the data monitored during the period from October – November – December 2019 and secondary data collected from various sources which include Government Departments related to ground water, soil, agriculture, forest etc.

A. Land Use

Land use study requires data regarding topography, zoning, settlement, industry, forest, roads and traffic etc. Collection of this data was done from various secondary sources viz., Census books, Revenue records, State and Central Government Offices, Survey of India toposheets as well as high resolution satellite image and through primary field surveys

B. Land Use/ Land Cover Categories of Study Area

Table 15 Land Use/ Land Cover

No.	Land Use Land Cover	Area (Ha)	Percentage (%)
1	Built Up Area	702	2.23
2	Crop Land	15911	50.65
3	Fallow Land	8754	27.87
4	Water Bodies	347	1.10
5	River	74	0.24
6	Barren Land	5627	17.91
	Total	31415	100.00

C. Meteorology

Methodology adopted for monitoring surface observations is as per the standard norms laid down by Bureau of Indian Standards (BIS) and the Indian Meteorology Department (IMD). On-site monitoring was undertaken for various meteorological variables in order to generate the data, which is then compared with the meteorological data generated by IMD from the nearest station at Latur. Meteorological parameters were monitored during the period October

– November – December 2019. Details of parameters monitored, equipments used and the frequency of monitoring have been given in Chapter 3 of the EIA report.

D. Air Quality

This section describes the selection of sampling locations, includes the methodology of sampling and analytical techniques with frequency of sampling. Presentation of results for October – November – December 2019 survey is followed by observations. All the requisite monitoring assignments, sampling and analysis was conducted through the laboratory of Green Enviro safe Engineers & Consultant Pvt. Ltd., Pune which is NABL accredited and MOEFCC; New Delhi approved organization. Further, same has received certifications namely ISO 9001- 2015 and OHSAS 18001–2007 from DNV. Ambient air monitoring was conducted in the study area to assess the quality of air for PM₁₀, PM_{2.5}, SO₂, NO_x and CO. Various monitoring stations selected are shown in table 16.

Table 16 Ambient Air Quality Monitoring (AAQM) Locations

AAQM Station Code	Station Location	Name of the Station	Distance from the Site (Km)	Direction w.r.t. the Site
A1	-	Industrial Site	-	-
A2	Upwind	Talegaon	2.34	NE
A3		Kamaroddinpur	5.73	NE
A4	Downwind	Walandi	3.56	SE
A5		Ismailwadi	5.55	SE
A6	Crosswind	Chawan Hipparga	4.15	NW
A7		Achwala	1.36	SE
A8	Nearest Habitat	Darewadi	2.20	W

Table 17 Summary of the AAQM Levels for Monitoring Season [October 2019 to December 2019]

Parameter		Location							
		Project Site	Talegaon	Kamaroddinpur	Walandi	Ismail wadi	Chawan Hipparga	Achwala	Darewadi
PM ₁₀ µg/M ³	Max	63.30	56.50	56.10	55.30	56.20	55.70	56.40	57.90
	Min	56.20	47.60	47.90	47.90	47.20	47.90	46.30	47.90
	Avg	60.10	53.26	52.39	52.37	52.74	52.85	52.21	54.60
	98%	62.93	56.41	55.50	55.07	56.20	55.52	56.17	57.72
PM _{2.5} µg/M ³	Max	22.40	18.30	18.50	18.20	19.90	18.50	18.60	16.50
	Min	17.40	13.10	13.20	13.30	14.50	13.40	13.10	12.10
	Avg	20.02	16.05	16.33	16.43	17.13	16.64	16.20	14.53
	98%	22.35	18.25	18.36	18.15	19.53	18.41	18.51	16.45
SO ₂ µg/M ³	Max	21.60	18.50	19.90	18.90	18.70	18.90	17.60	21.60
	Min	17.50	17.00	14.30	13.20	12.40	12.80	12.60	18.20
	Avg	19.61	17.93	17.83	17.30	16.49	16.98	15.70	19.67
	98%	21.51	18.50	19.44	18.90	18.56	18.81	17.55	21.55

NO _x µg/M ³	Max	31.60	21.60	21.70	21.70	25.50	23.50	23.20	29.40
	Min	26.50	17.80	17.30	19.10	18.20	18.10	19.80	23.40
	Avg	28.93	19.99	19.76	20.35	21.32	20.85	21.21	25.87
	98%	31.55	21.51	21.65	21.70	25.22	23.45	22.88	28.85
CO mg/M ³	Max	0.900	0.080	0.060	0.060	0.060	0.060	0.070	0.070
	Min	0.200	0.010	0.010	0.010	0.010	0.020	0.010	0.010
	Avg	0.508	0.035	0.032	0.032	0.027	0.036	0.042	0.042
	98%	0.854	0.073	0.057	0.057	0.057	0.057	0.070	0.070

Notes: PM₁₀, PM_{2.5}, SO₂ and NO_x are computed based on 24 hourly values, CO is computed based on hourly values.

Table 18 National Ambient Air Quality Standards (NAAQS) by CPCB
(Notification No. S.O.B-29016/20/90/PCI-L by MOEFCC; New Delhi dated 18.11.2009)

Zone Station	PM ₁₀ µg/M ³		PM _{2.5} µg/M ³		SO ₂ µg/M ³		NO _x µg/M ³		CO mg/M ³	
	24 Hr	A.A.	24 Hr	A.A.	24 Hr	A.A.	24 Hr	A.A.	8 Hr	1 Hr
Industrial, Rural & Residential Area	100	60	60	40	80	50	80	40	4	4
Eco-sensitive Area Notified by Govt.	100	60	60	40	80	20	80	30	4	4

Note: A.A. represents Annual Average

E. Water Quality

Sampling and analysis of water samples for physical, chemical and heavy metals were also undertaken through the laboratory of Green Enviro safe Engineers & Consultant Pvt. Ltd, Pune. Nine locations for surface water and Eight locations for ground water were selected. Same are listed below-

Table 19 Monitoring Locations for Ground Water

Location	Location Name	Type	Distance from site (Km)	Direction w.r.t site	Latitude	Longitude
GW1	Khurdh Devni	DW	0.44	SW	18°15'12.66"N	76°59'12.64"E
GW2	Talegaon	DW	0.49	NNE	18°15'35.05"N	76°59'30.55"E
GW3	Talegaon	DW	1.32	NE	18°15'52.25"N	76°59'54.62"E
GW4	Talegaon	DW	0.40	NE	18°15'26.65"N	76°59'36.59"E
GW5	Achwala	DW	1.24	SSW	18°14'39.06"N	76°59'15.33"E
GW6	Achwala	DW	1.02	SE	18°15'2.35"N	76°59'55.05"E
GW7	Talegaon	DW	1.23	NE	18°15'30.64"N	77° 0'5.19"E
GW8	Darewadi	DW	1.29	SW	18°15'5.42"N	76°58'43.88"E

Table 20 Monitoring Locations for Surface Water

Location Code	Location Name	Type	Distance from site (Km)	Direction w.r.t. site
SW1	Achwala	Lake	0.28	E
SW2	Achwala	Lake	1.21	S
SW3	Hisamnagar	Stream	9.78	SW
SW4	Mahadev wadi	Lake	4.84	S
SW5	Anandwadi	Lake	9.59	SSE
SW6	Gurnal	Lake	9.65	SE
SW7	Nagral	Lake	7.28	NE

Location Code	Location Name	Type	Distance from site (Km)	Direction w.r.t. site
SW8	Devrajan	Lake	8.45	N

Results observed after monitoring ground water locations and surface water locations are mentioned in Chapter 3 of the EIA report.

F. Noise Level Survey

Study area of 10 Km radius with reference to the establishment project site has been covered for noise environment. Four zones viz. Residential, Commercial, Industrial and Silence Zones have been considered for noise monitoring. Some of the major arterial roads were covered to assess the noise due to traffic. Noise monitoring was undertaken for 24 hours at each location. Details of noise monitoring stations are given in table 21.

Table 21 Noise Sampling Locations

Location Code	Location Name	Distance from site (Km)	Direction w.r.t. site
N1	Project Site	-	-
N2	Talegaon	2.2	NE
N3	Neknal	4.6	NE
N4	Achola	1.3	SE
N5	Walandi	3.6	SW
N6	Darewadi	1.9	W
N7	Nagtirthwadi	3.2	NW
N8	Chawani	4	NW

Table 22 Ambient Noise Levels

No.	Location	Average Noise Level in dB(A)					
		L ₁₀	L ₅₀	L ₉₀	L _{eq(day)}	L _{eq(night)}	L _{dn}
1	Project Site	52.9	60.3	62.4	71.0	53.6	69.4
2	Talegaon	44.9	48.0	49.3	54.4	42.2	53.7
3	Neknal	43.6	46.4	48.0	52.8	40.6	52.1
4	Achola	44.8	46.7	48.0	53.8	41.2	52.1
5	Walandi	44.9	47.2	48.7	53.8	41.2	53.0
6	Darewadi	43.1	46.9	48.0	53.4	41.5	52.8
7	Nagtirthwadi	44.3	46.7	48.5	52.7	41.5	52.3
8	Chawani	44.0	48.1	49.6	52.9	44.3	53.5

G. Socio-Economic Profile

Survey of 26 villages within 10 KM study area of JSAIL, taking the reference of census 2011. Survey was carried out with the help of a Simple Random Disproportionate Sampling and Snowball Technique, comprising of 32 questions in Marathi. Chapter 3 may be referred for details of this aspect.

H. Ecology

Field survey was carried out according to random sampling method for flora, and opportunistic sighting method and standard point count method for fauna were followed. In general visual observation and estimation method was used for qualitative study of the biota. Birds and fish were studied being good indicators of local environmental change. Flora, mainly major tree species, was focused on identification and species abundance.

Conclusion

The possible impacts were considered for worst case scenario i.e. direct discharge of untreated wastewater into nearby water bodies and air pollution. The factory site is surrounded by agricultural land, human settlements, grasslands and barren land with scrubby vegetation. There are seasonal streams and River flows within 8 to 9 km from the factory and in case of accident may probably carry leachate and industrial waste through the stream on site and adjoining agriculture belt and human settlements. In case of air pollution, the industry may contribute in enhanced SPM pollution load in the nearby area. This may have negative impacts particularly on surrounding settlements, crops, wetlands and avifauna. Therefore the pollution control measures as per EMP should strictly be implemented by the industry.

9) ADDITIONAL STUDIES & INFORMATION

Risks Assessment

Risk to human health is inherent. It is safe only when the installation is dismantled at the end of its useful life. The following principles should be used as guidelines for the selection of risk criteria -

1. Increase in risk, caused by the presence of the plant to local community (i.e. neighbouring public) should be negligible in comparison to the risk they already have in their daily life.
2. Work force on the plant should be expected to accept a potentially greater risk than the members of the local community since the work force have been trained to protect themselves from the possible hazards and thus reducing the actual risk to themselves.

The risk criteria considered by Green A.G. (1982) are given as below:

1. Risk to Plant: This risk is to be given priority only when it is proved beyond doubt that the risk to life is so low that reducing this risk may not be justified. Under this consideration, the risk to economic damage may be considered.
2. Risk to Public and Employees: Scale used for risk to employee and public is Fatal Accident Rate (F.A.R.) or more commonly Fatal Accident Frequency Rate. (F.A.F.R.). F.A.R. and F.A.F.R. is defined as number of deaths from industrial injury expected in a group of 1000 men during their working period.

For more details w.r.t. this aspect, Chapter 7 may be referred.

10) ENVIRONMENTAL IMPACT AND MITIGATION MEASURES

A. Impact on Topography

No major topographical changes are envisaged in the acquired area as it is establishment of distillery plant which will take place in existing premises of JSAIL. Industrial activity would invite positive benefits in the form of land levelling and tree plantation in the plant vicinity and other premises

B. Impact on Climate

Impact on the climate conditions due to the establishment activity is not envisaged, as emissions to the atmosphere, of flue gases with very high temperatures are not expected

C. Impact on Air Quality

A study area of 10 km radius is considered for determination of impacts.

i. Baseline Ambient Air Concentrations

24 hourly 98 percentile concentrations of PM₁₀, PM_{2.5}, SO₂ and NO_x in Ambient Air, recorded during the field study conducted for the season October – November – December 2019 are considered as baseline values. They represent impact due to operations of existing nearby industries on this region. Average concentrations of above mentioned parameters, at this location, are considered to be the ‘Baseline Concentrations’ to determine the impact of proposed industrial operation on ambient air quality. The existing baseline concentrations are summarized in following table-

Table 23 Basline Concetrations at site

Parameter	PM ₁₀	PM _{2.5}	SO ₂	NO _x	CO
98 percentile	62.93µg/m ³	22.35µg/m ³	21.51µg/m ³	31.55µg/m ³	0.854mg/m ³
NAAQS	100 µg/m ³	60 µg/m ³	80 µg/m ³	80 µg/m ³	4 mg/m ³

ii. Air Polluting Sources

A New Boiler of 30 TPH capacity will be installed under establishment of distillery. Under existing activity of sugar factory and co-gen plant operations,boiler of capacity 80 TPH is already installed. New DG set of capacity 625 KVA will be installed under establishment of distillery project.

D. IMPACT ON WATER RESOURCES

i. Impact on Surface Water Resouces & Quality

Surface water along with recycled water will be used to meet water requirment of proposed distillery. Effluent from Mollases distillery in the form of spentlees (154 CMD), MEE condensate (774 CMD) and other effluents (34 CMD) will be treated in proposed CPU. Effluent from cane syrup distillery in the form of spentlees (109 CMD), MEE condensate (387 CMD) and other effluents (34 CMD) will be treated in proposed CPU.

Industrial effluent from sugar factory (226 CMD) is treated in existing ETP. Domestic effluent would be treated in proposed STP. Hence there will not be any impact on surface water resource. More details about water budget are presented at Chapter 2 under Section 2.7.1

ii. Impact on Ground Water Resources & Quality

Water required for the industry would be obtained from Devarjan project on Manjra River. Application for Permission for lifting required amount of water from the river is made and a

copy of the letter is enclosed for reference at Appendix - C. Ground water will not be a source of raw water for the proposed establishment project. Moreover, there will not be any discharge of untreated effluent so there will not be any impact on ground water level and quality.

E. Impact on Soil

Impact on the soil characteristics is usually attributed to air emissions, wastewater discharges and solid waste disposal. Under proposed distillery as well as existing sugar factory & co-gen plant, as mentioned above, there will not be discharge of any untreated effluent on land. For proposed boiler Wet Scrubber will be installed. For existing boilers Wet scrubber is already installed. Boiler ash from existing as well as proposed distillery boiler is given to brick manufacturers whereas ETP sludge is used as manure. CPU sludge and yeast sludge from distillery will be used as manure. Domestic effluent would be treated in proposed STP. Hence, there will not be any major increase in chemical constituents of soil through deposition of air pollutants/ discharge of waste water.

F. Impact on Noise Levels

Workers could get annoyance and can lose concentration during operation. It can cause disturbance during working. People working near the source need risk criteria for hearing damage while the people who stay near the industry need annoyance and psychological damage as the criteria for noise level impact analysis. Major noise emanating sources in JSAIL complex shall be Fermentation section, distillation section plant, boiler house, turbine rooms, cane crushing section and mill house and DG set etc. JSAIL is not a major noise producing industry. There shall be no any prominent effect due to Vibration at the project site.

G. Impact on Land Use

Present use of the project land is Industrial wherein the sugar factory and co-generation plant have already been established. Proposed establishment of distillery would be implemented in existing premises JSAIL. Hence no change in the land use pattern is expected. Therefore the impact on land use is non-significant.

H. Impact on Flora and Fauna

Discharge of the untreated wastewater from the industry in surrounding area can also cause significant environmental impact on the aquatic habitats and affect dependent biodiversity. In case of air pollution, the industry is going to contribute in SPM pollution load in the nearby area. This may have negative impact particularly on avifauna, surrounding crop yields and local population. The details in respect of impacts on ecology and biodiversity are described in Chapter 3.

I. Impact on Historical Places

No historical place is within the study area and the impact is nil.

11) SALIENT FEATURES OF EMP

Following routine monitoring programme as detailed in Table 22 shall be implemented at site. Besides to this monitoring, the compliances to all Environmental Clearance (EC) conditions and regular permissions from CPCB /MoEFCC shall be monitored and reported periodically.

Table 24 Plan For Monitoring of Environmental Attributes within Industrial Premises

No.	Description	Location	Parameters	Frequency	Conducted by	
1.	Air Emissions	Upwind – 1, Downwind - 2 (Near main gate, Fermentation section, Distillation section)	PM ₁₀ , PM _{2.5} , SO ₂ , NO _x , CO	Monthly	MoEFCC & NABL Approved External Laboratory	
		Study area – (Industrial Site, Darewadi, Walandi, Neknal, Achwala, Talegaon, Chawan Hipparga, Nagtirthawadi)		Quarterly		
2.	Stack Emissions	Boiler – 2 Nos., D.G Set – 1 No.	SO ₂ , SPM, NO _x	Monthly		
3.	Noise	Workzone 5 Locations - (Near Main Gate, Near Fermentation Section, Distillation section, Boiler, DG set)	Spot Noise Level recording; Leq(n), Leq(d), Leq (dn)	Monthly		
		Ambient Noise location - 8		Quarterly		
4.	Drinking water	Canteen & Colony	Parameters as per drinking water standard IS10500	Monthly		
5.	Soil	8 locations - (Industrial Site, Darewadi, Walandi, Neknal, Achwala, Talegaon, Chawan Hipparga, Nagtirthawadi)	pH, Salinity, Organic Carbon, Nitrogen, Phosphorous and Potash	Quarterly		
6.	Water Quality (Ground Water & Surface Water)	Locations in study area – Ground Water – 8 locations of GW Surface Water - (Industrial Site, Darewadi, Walandi, Neknal, Achwala, Talegaon, Chawan Hipparga, Nagtirthawadi)	Parameters as per CPCB guideline for water quality monitoring – MINARS/27/2007-08	Quarterly		
7.	Effluent	Treated, Untreated	pH, SS, TDS, COD, BOD, Cl, Sulphates, Oil & Grease	Monthly		
8.	Waste management	Implement waste management plan that Identifies and characterizes every waste associated with proposed and existing activities and which identifies the procedures for collection, handling & disposal of each waste arising.	Records of Solid Waste Generation, Treatment and Disposal shall be maintained	Twice in a year		By JSAIL
9.	Emergency Preparedness such as fire fighting	Fire protection & safety measures to take care of fire & explosion hazards, to be assessed & steps taken for their prevention.	On site Emergency Plan, Evacuation Plan, firefighting mock drills	Twice a year		By JSAIL
10.	Health Check up	Employees and migrant labour health check ups	All relevant health check-up parameters as per factories act.	Twice a Year		By JSAIL
11.	Green Belt	Within Industry premises as well as nearby villages	Survival rate of planted sapling	In consultation with DFO.	By JSAIL	
12.	CER	As per activities	--	Six Monthly	By JSAIL	