File No.: IA-J-11011/235/2018-IA-II (I), Category 'A'

EXECUTIVE SUMMARY
of
Environmental Impact Assessment Report
New 30 KLPD Molasses Based Distillery

M/s. PRASAD SUGAR & ALLIED AGRO PRODUCTS LIMITED

Village: Vambori, Tal. Rahuri, Dist. Ahmednagar, Maharashtra - 413 704

Prepared by

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October 2018

VSI/EIA/PSAAPL/DR-01/20181015

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EXECUTIVE SUMMARY

1.0 INTRODUCTION

M/s. Prasad Sugar and Allied Agro Products Ltd. (PSAAPL) is a private sugar mill (limited company) located at Vambori, Taluka Rahuri in Ahmednagar district of Maharashtra. The unit is registerd and having registration number CIN/U/15421/PN/2005/PTC/021744.Its existing installed (licensed) capacity is 2,500 TCD. This mill is in good working conditions and its overall performance is also good. The management has undertaken extensive cane development activities and therefore, it is in the process of modernizing its existing plant and machinery, so as to achieve cane crushing capacity of 4000 TCD. The production of molasses will also rise with the increase in the crushing capacity. Considering this, the management of PSAAPL has decided to establish a new molasses based distillery unit of 30 KLPD to improve its financial viability.

1.1 Features of the site

PSAAPL has 3.8 acres of land, which will be utilized for distillery as well as evaporation unit (MEE), storage lagoon, ETP/CPU, Incineration boiler, coal storage and convey, ash pond, greenbelt, etc. The existing site meets the industrial sitting guidelines of the Ministry of Environment, Forest and Climate Change (MoEFCC). This site location map is enclosed as **Annexure I** in the main EIA report. The other important aspects are highlighted in the following table.

Table 1: Features of the Project site

Geographical Location	$19^0$18’49.45” N , $74^0$42’34.49” E, Elevation 545 MSL
Road Connectivity	SH 10 (Ahmednagar- Shirdi) approx. 8 km from project site
Nearest City/Town	Rahuri (a taluka place) approx 19 km
Railway Station	Rahuri railway station on Daund-Manmad route is approx.15 km
Air Port	Pune airport is the nearest airport approx. 150 km
River (nearest)	Deo River (small tributary) – at 4.00 km towards north

1.2 Project information at a glance

1.	**Project Proponent**	**M/s. Prasad Sugar and Allied Agro Products Ltd. (PSAAPL)**		
2.	**Project**	New 30 KLPD molasses based distillery		
3.	**Location of the project**	At-Vambori, Taluka-Rahuri in Ahmednagar district of Maharashtra.		
4.	**Project categorization**	Category A [item 5g] as per EIA Notification Sep 2006		
	PROJECT DETAILS			
4.	**Working days per annum**	300		
5.	**Product KLPD**	**Rectified spirit** **Impure spirit (5%)** OR	30 (ISI Grade - I, 323, 2009)	
		ENA **Impure spirit (6 %)** OR	30 (IS: 6613 – 2002)	
		Anhydrous Alcohol **Impure spirit (5%)**	30 (IS:321–1964 & IS:15464 – 2004)	
6.	**By products**	**Fusel oil**	120 lit/day	
6.	**Effluent Treatment System**	For Spentwash: multi-effect evaporation (MEE) followed by incineration For Spent lees, condensate and other effluent: Primary treatment followed by anaerobic, aerobic followed by tertiary treatment		
7.	**Air Pollution Control Systems for flue gases**	Separate ESP for distillery boiler; Existing stack of 72 m will be increased to 75 m		
	INFRASTRUCTURE			
8.	**Land**	• Distillery, evaporation unit (MEE), storage lagoon, ETP/CPU, Incineration boiler, coal storage and convey, ash pond etc.= ~ 2.6 acre • Green belt development=1.2acres **TOTAL LAND ALLOCATED =3.8 acres**		
9.	**Main Raw Material**	**Material**	**Quantity**	**Source**
		Molasses	111 MT/d	Own sugar unit
		Nutrient N,P	100 kg/d	Pune, Ahmednagar, Mumbai
		Turkey Red Oil	150 kg/d	Pune, Ahmednagar, Mumbai

		(TRO)		
10.	**Fuel**	Spentwash: 74.40 TPD and Coal: max. 53 TPD Source: Indian coal from Wardha-Chandrapur coal blocks or as per availability		
11.	**Boiler**	New incineration boiler of 15 TPH with working @~85% efficiency & pressure of 3.5 Kg/cm2 will be installed		
12.	**Stack height and Inner diameter**	Stack of 75 m with inner diameter of 3.00 m will be used		
13.	**Steam requirement**	**Total:** Maximum 336 TPD (14 TPH) **Source:** Through proposed incineration boiler **Steam utilization:** Distillery (Max)- 120 TPD; MEE (Max): 108 TPD Boiler de-aerator & SCAPH (Max)- 108 TPD		
14.	**Power**	0.920MW/Hr Source: Captive power from 1.5MW TG Set		
15.	**Total Water Requirement**	336 cu.m/day - 329 cu.m for process (considering recycle and reuse) and 07 cu.m for domestic/drinking Source : From Irrigation Department		
16.	**Manpower**	81		
17.	**Green belt**	Proposed ~1.2 acre		
	FINANCIAL ASPECT			
18.	**Total Project Cost**	Rs. 6,813.00 lakhs		
19.	**Capital expenses for Environment management**	RS. 2,700.00 lakhs		

1.3 Resources

1.3.1 Molasses

Molasses is the chief raw material for the proposed project. It will be available from in-house only. The requirement of molasses will be 111 MT/day or around 33,300MT/annum. The factory will have its own molasses to the extent of 25,300 MT (explained in table 2.2 of EIA report). Thus, they will require about 8,000 T of molasses from market to utilize the optimum capacity. The mill will purchase the molasses of required quantity from nearby sugar mills. At present, the sugar mill is having two mild steel molasses storage tanks (each of 4,500T), thus, total molasses storage capacity 9,000 MT is available with sugar mill.

1.3.2 Land

The land required for the proposed project is ~3.8 acres. The land is flat, open and soon will be under the possession of the industry. It is adjacent to the sugar mill.

1.3.3 Water

For the proposed project, the mill has applied for water drawl permission from Irrigation Department. Fresh water will be required for molasses dilution, cooling tower and steam generation. Cooling water requirement will be for fermentation, distillation, MSDH, etc. Steam condensate will be recycled. Thus, it will reduce the freshwater demand substantially. Thereby, total freshwater requirement will be restricted to 336 m3/day. The water –mass balance is shown in **Fig. 1.** (The water balance is given in Chapter 2; Table 2.5 of EIA report)

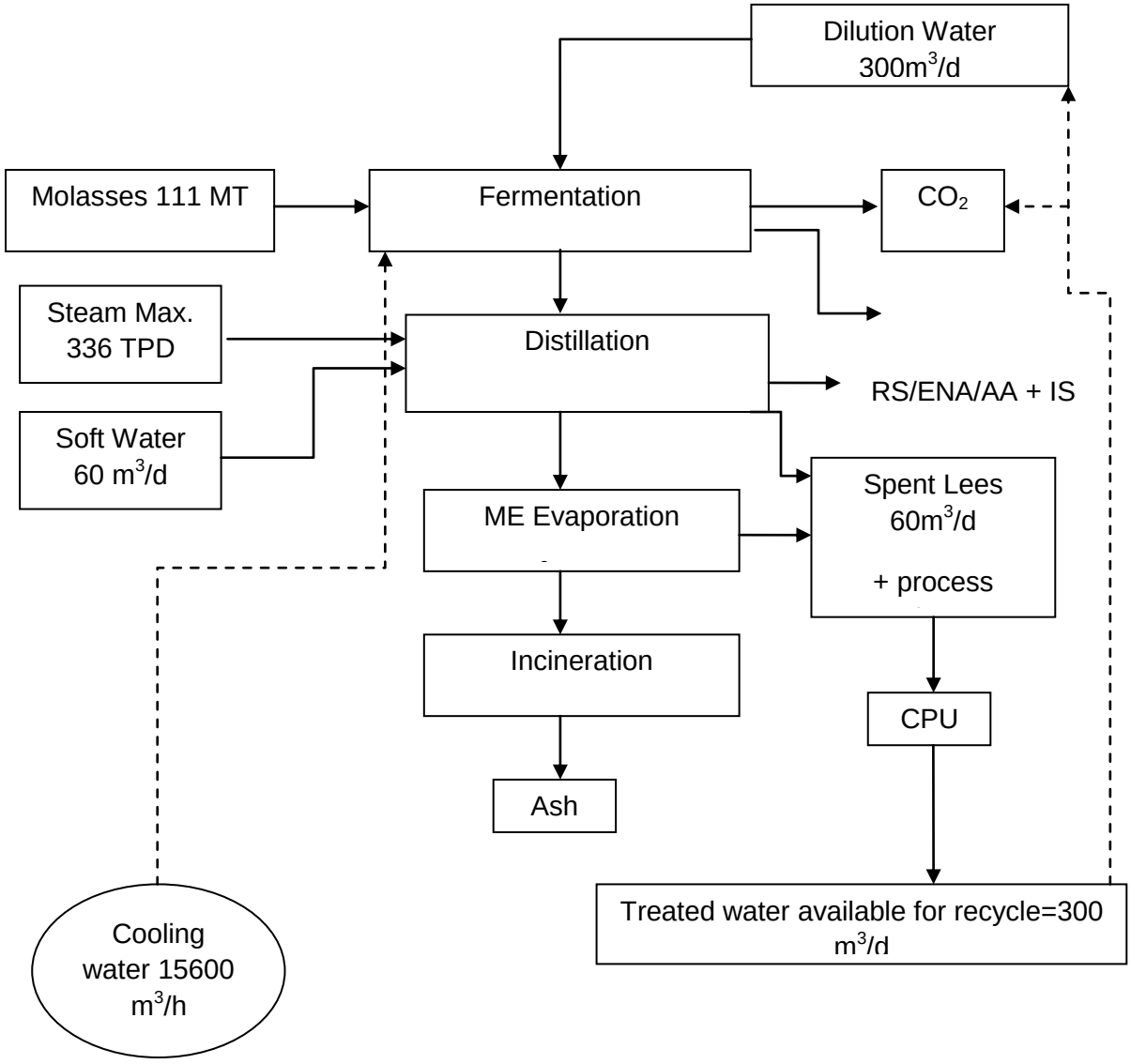

Figure 1: Water and Mass Balance (Schematic)

1.3.4 Steam & Power

Maximum steam requirement will be 5.00 TPH to produce R.S. or ENA or anhydrous alcohol. In addition, steam will also require for standalone spent wash multi-effect evaporation plant which will be about 4.50 TPH and about 4.50 TPH will be required for de-aerator and steam coil air pre-heater (SCAPH) of incineration boiler. Thus, the distillery will require maximum 14 TPH steam.

Steam Consumption: Multi-pressure distillation

a. F. Wash to Rectified spirit : 2.2 Kg /liter
b. F. Wash to ENA : 3.2 Kg /liter
c. for Anhydrous ethanol : 2.8 Kg /liter
d. Standalone evaporation: 3.5 Kg /liter.
e.

The management has proposed to install an independent incineration boiler of 15 TPH, having 45 kg/cm2 (g) pressure for the project.

1.3.5. Power

The mill has decided to install separate1.50 MW capacity turbine generator. It will fulfill the power requirement of 0.920 MW/Hr of distillery, MEE and CPU system.

1.3.6. Fuel

In the proposed project, concentrated spent wash of >55 up to 60^{o} brix (Solids) will be incinerated along with coal. Spent wash available for incineration will be 60 m^3/day and its specific gravity is 1.24. Thus, estimated spent wash availability per day will be 74.40 tons or 3.10 TPH. This quantity of spent wash with average GCV of 1700 K.cal is estimated to produce 5.27 TPH steam. In order to produce remaining 8.73 Ton steam of 14 TPH steam requirement, 2.18 TPH coal will be used.

2.0 MANUFACTURING PROCESS

The manufacturing of alcohol/spirit takes place in two stages; 1) fermentation and 2) distillation. In the process, molasses is diluted with water and sent to fermenters where yeast strains of species *Saccharomyces cerevisieae*, converts reducing sugar present in the molasses in to alcohol. The fermentation of molasses in fermenters take about 24 to 30 hours for completely exhausting the sugars in molasses. Due to technology development in the field of fermentation, yield of 265 to 280 liters of alcohol is generally produced per MT of molasses. In the proposed project, continuous fermentation process will be used. In this processes fermenters are in constant usage with little shut down and after initial inoculation of yeast culture, further inoculation is not necessary. Another advantage of the technology is it generates less volume of spentwash compared to batch process.

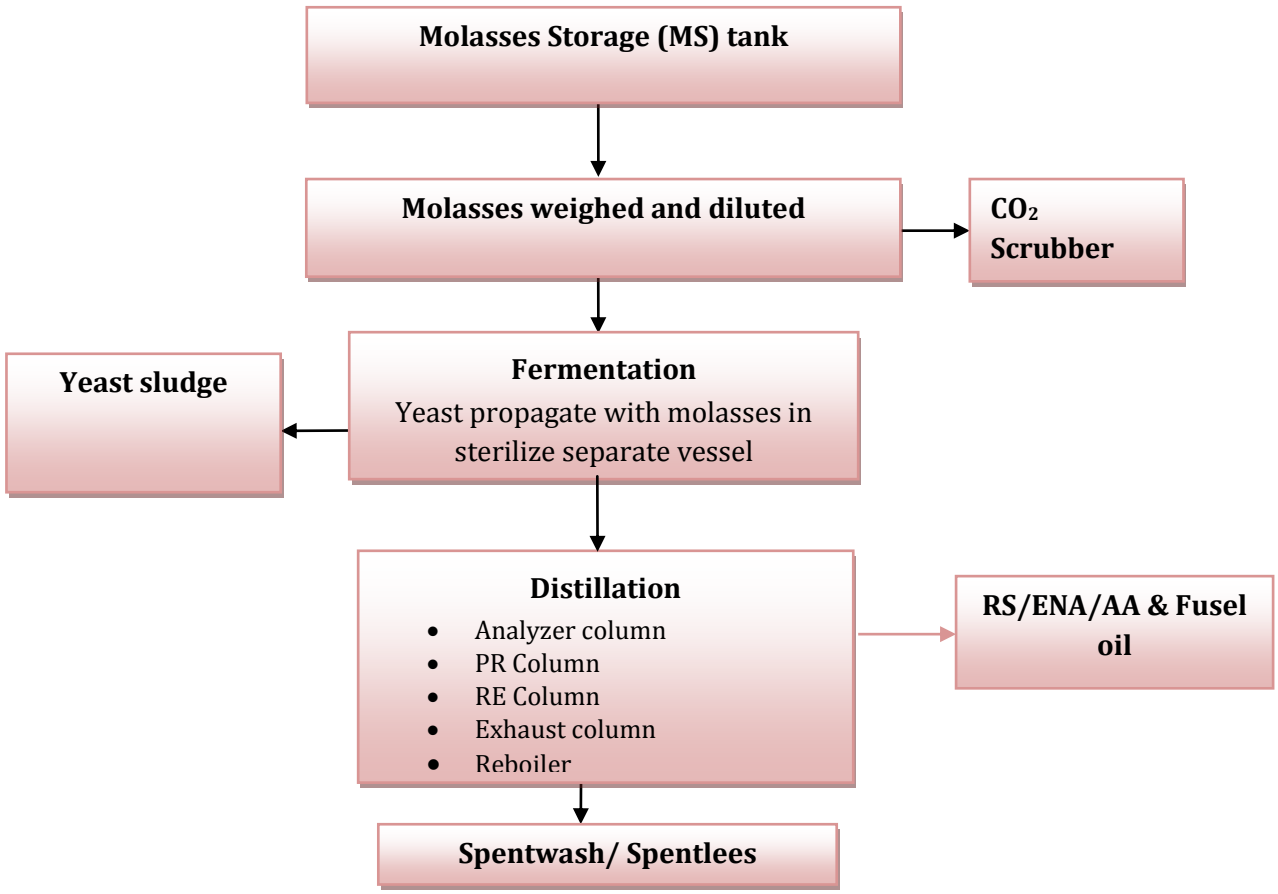

Fig. 2: Schematic of RS/ENA/AA manufacturing process

2.1 Multi-Pressure Distillation Technology

After fermentation, distillation process is carried out to separate alcohol from fermented wash. The distillation columns consist of number of bubble cap /Rh grid plates where wash is boiled and alcoholic vapours are separated and concentrated on each plate stage by stage. Rectified spirit of 95% purity is manufactured in the process.

2.1.1 Advantages of Multi-Pressure Distillation

1) Few columns operate under vacuum, few under pressure and few under atmospheric pressure; Maximum heat integration is possible.
2) Low steam consumption with reboiler (2.2 Kg/lit. of Rectified Spirit & 3.2 Kg/lit. of ENA)
3) Spentwash generation is less.
4) Pre-rectification column ensure removal of sulfur compounds /mercaptants, reduces load of lower boiling volatile compounds

Fuel ethanol is an important product. As per IS specification, it is nearly 100% pure i.e. water free alcohol. Alcohol as manufactured by Indian distilleries is rectified spirit, which is 94.68%

alcohol and rest is water. Therefore, special process for removal of water is required for manufacture of fuel (anhydrous) alcohol. The various processes used for dehydration of alcohol are Azeotropic Distillation, Molecular Sieve Dehydration (MSDH) & Pervaporation / Vapour permeation system. From these, the PSAAPL has planned to select molecular sieve dehydration (MSDH) technology.

2.2 Details of Storage tanks

At present, the factory is having 2 mild steel tanks having total molasses storage capacity of 9,000MT. Hence, it is proposed to install two additional mild steel tank of 5,000MT capacity in the distillery premises. The details of storage and receiver tank are given in **Table 2.**

Table 2: Details of storage and receiving tanks

SPECIFICATIONS FOR RECEIVERS & STORAGE TANKS – THICKNESS AS PER IS-803-1976:			
		Quantity	Capacity (in m3)
1	Rectified spirit receiver	3	40
2	ENA receiver	3	40
3	Impure spirit receivers	2	10
4	* Rectified spirit storage tanks	2	600
5	* ENA storage tanks	2	600
6	* Impure spirit storage tank	1	200
7	Fusel oil storage tank	1	10
8	Molasses storage at distillery (Tons)	2	5000
9	Vent Condenser for storage tank and necessary piping	Tube size- 25.4 mm x 1.2 mm x 3 (M) Nos.-3	-
10	Turbine type Flow meter with totalizer for issue to be approved by Weight & Measure Dept.	3	-

2.3 Cost of the Project

The proposed activity of distillery unit will required about Rs. 6813 lakhs investments. Out of which Rs. 2700 lakhs will be allocated for Environment management. The details of cost for proposed activity and EMP (Capital & Recurring) are mentioned in **Table 3 & 4.**

Table 3: Project Cost Details

#	Particular	Amount , Rs. Lac
1.	Building and Civil work	566.40
2.	Plant and machinery including taxes and duties	5493.98
3.	Miscellaneous fixed assets	29.50
4.	Preliminary and per-operative expenses	308.12
5.	Machinery stores/spares	05.00
6.	Contingencies @2%	95.92
7.	Margin money	25.00
	Sub total	6524.00
8.	Additional provision towards environment management plan	125.00
9.	Additional provision towards CSR/CER (2.5% of Capital Budget of Rs. 6524.00 lakhs)	164.00
	TOTAL	**6813.00**

Table 4: **Estimated Capital & Recurring Expenses for Environment Management**

#		Particulars	Amount (Rs. in Lakhs)
	1.	Spent wash lagoons	60.00
	2.	Incineration boiler (Civil+ Machinery) including ESP	1250.00
	3.	CPU - Treatment units for condensate and other effluent (Civil+ Machinery)	175.00
	4.	Stand alone Multi Effect Evaporator (Civil+ Machinery)	560.00
	5.	Coal handling (Civil+ Machinery)	140.00
	6.	Ash handling system	75.00
	7.	Fugitive dust control (Foggers/sprinklers, bag filters, etc.)	40.00
	8.	Chimney (If required)	76.00
	9.	Fire fighting equipments and other	70.00
	10.	Greenbelt development/Tree plantation	10.00
	11.	Laboratory shed and its glassware, equipments, etc.	10.00
	12.	DG set (As a backup - including pollution control devices)	65.00
	13.	Miscellaneous (Piezometric well, etc.)	05.00
		TOTAL	**2536.00**
A.		Additional provision towards environment management plan	125.00
B.		Additional provision towards CSR/CER (2.5% of Capital	164.00

Budget of Rs. 6524.00 lakhs)	
TOTAL for Environmental management	**2700.00**
Recurring Expenses/Annum	
1. Salaries and wages	71.80
2. Maintenance (@ 5% on capital investment of Rs. 6524.00 lakhs) of pollution control devices e.g. ESP, etc.	326.20
3. Fuel (incineration activity)	636.00
Electricity (in case of diesel generator operation)	10.00
4. Miscellaneous	05.00
TOTAL	**1049.00**

3.0 ENVIRONMENTAL ASPECTS

Table 5: Overview of Environment Management Processes

#	Waste product and source	Treatment and disposal
1.	**Effluent/Wastewater**	
	Spentwash	Multi Effect Evaporation (MEE) as a primary treatment to reduce the spentwash volumefollowed by incineration of spentwash by burning it along with coal in furnace
	Spent lees, condensate from MEE and Other effluent	Spentlees, condensate of MEE and other effluents will be treated in condensate polishing unit (CPU) and treated water will be reused for distillery activities
	Sewage: Domestic wastewater	As local acceptable practice, by septic tank and soak pit system
2.	**Gaseous emission**	
	Particulate Matter (PM) Formation of SO_2, NO_x Carbon dioxide due to fermentation, Odour due to spent wash storage	• ESP to control ash emission through stack • Stack height 75 m • Covered fermenters • Mechanized system for coal and ash handling • Fugitive dust control/suppression for coal yard will be done properly

		• Wind breaks for ash storage area • Storage of spentwash in impervious lagoons as per CREP guidelines • Development of greenbelt
	Diesel generators	It will be operational only when captive power supply failure, hence emissions anticipated to be less frequent and minor
	Fermentation unit: (CO_2)	Fermenters are covered, CO_2 scrubbed in water
3	**Solid waste**	
	Boiler ash	Sold to nearby brick manufacturing unit
	Fermented sludge: Yeast sludge, Polishing unit sludge	Sludge is degradable, organic in nature hence, mixed into soil
4	Noise	
	Increase in noise level due to operation of machines, vehicular movement etc.	• Regular maintenance of machines and factory vehicles • provisions of separate parking for goods and other vehicles • Internal roads will be either asphalted or RCC, leveled, illuminated and well be maintained • Provision of Adequate personal protective equipments for workers • Job rotation for high noise level work places, if required • Regular health check up of workers

4.0 BASELINE ENVIRONMENTAL CONDITIONS

Table 6: Summary of Environmental features of study area

#	Facet	In brief
1	General characteristics	dry and semi-arid climate
2	Rainfall	437 mm/annum (Average for last ten years) mainly during Aug-Sep
3	Temperature	In summer 28^0C to 41^0C. In winter 7^0C to 22^0C.
4	Humidity	maximum between 60 to70 percent in August and minimum humidity

		ranges from 40 to 50 percent in the months of March and April
5	Wind	Predominantly from north-east, north, during study period
6	Land use	Major- agricultural 33%; open scrub 26%; Fallow (current +long) 25 %
7	Air Quality	complies NAAQ standards of Nov. 2009 at all monitored locations
8	Noise	Complies the standard
9	Ground water	As per Central Ground Water Board report 2014 - Slightly alkaline, good for irrigation purposes throughout the district. However potability is affected at some places due to high nitrate and total hardness
10	Soil	very shallow (soil depth less than 10 cm) to deep black alluvial soils
11	Nearest sanctuary	Rehkuri Sanctuary at 60 km from the site Kalsubai Harishchandragad wildlife sanctuary at approx 108 km

5.0 IMPACT ASSESSMENT AND ENVIRONMENT MANAGEMENT PLAN

5.1 Air Environment

1) Emissions from process: It will be due to burning of coal and spent wash in incineration boiler. Coal contain 40%of ash and spent wash contain 18% ash. Sulfur in coal and spentwash respectively 0.5% and 0.62% where as Sulphate is about 15% which will generate maximum 14.28 g/s of SO_2

2) Transportation: Vehicles of employees and visitors are anticipated as the only source. Hence, this could cause negligible increase mainly in NOx, particulate matter and HC.

3) Fugitive and other sources of air pollution: Fugitive emissions from handling and storage of coal and ash; transportation activities and odour are also anticipated to cause significant negative impact Since, coal handling fly ash handling will be with mechanical equipment's and fly ash collected through ESP, hence the fugitive emission will be very less.

5.1.1 Impact Assessment

Air quality: Minor negative impact is anticipated mainly due to stack gas emissions and transportation activities of the proposed project;

Ecology and biodiversity: Minor negative impact is anticipated on avi-fauna due to stack gas temperature (approx 120-140^{o}C); minor negative impact is also envisaged on flora in close vicinity of the project due to dust (particulate matter -mainly in the form reduction in photosynthesis and its cumulative effects)

5.1.2 Air Pollutant Dispersion Modeling

Prediction of impacts on air environment has been carried out employing mathematical model -

Aermod view dispersion model 9.2 software developed by Lakes Environment Software, Canada.

Prediction

The predicted results with baseline concentrations are tabulated below in **Table 7** while incremental dispersion trend is shown as isopleths in **Figure 3 & 4**.

Table 7: Resultant Concentrations Due To Incremental GLC's

Description	**Concentration µg/m^3**	
	PM	**SO_2**
Maximum rise in GLC	1.20	3.06
Direction of Occurrence and distance	SW (0.8 Km)*	SW (0.8 Km)*
Coordinates of maximum GLC	$19^0$18'28" N	$19^0$18'28" N
	$47^0$42'2" E	$47^0$42'2" E
Baseline Concentration reported nearby GLC	48.07	10.43
(at 0.73 km NE)	(Dhamori khurd)	(Dhamori khurd)
Total Concentration (Post project scenario)	49.27	13.49
NAAQS	**PM_{10}** 100	80
*The distance is measured from stack to the receptor of maximum GLC		

* The baseline concentration (98th percentile) recorded at station Taharabad at 2.3 km East-south-East, is the nearest to the incremental GLC

5.1.3 Environmental Management Plan

- ESP will be used as air pollution control equipment (98% efficiency)
- Use of coal in incineration boiler as a fuel, transported to boiler through closed conveyer
- Fly or bottom ash will be mix in sell to brick manufacturer
- Provision of separate parking for goods and general vehicles, wide asphalted internal roads, approach road to state highway is also asphalted
- Green belt of 1.2 acre proposed around the project area
- Strict prohibition on washing and maintenance of vehicles on site or in parking area

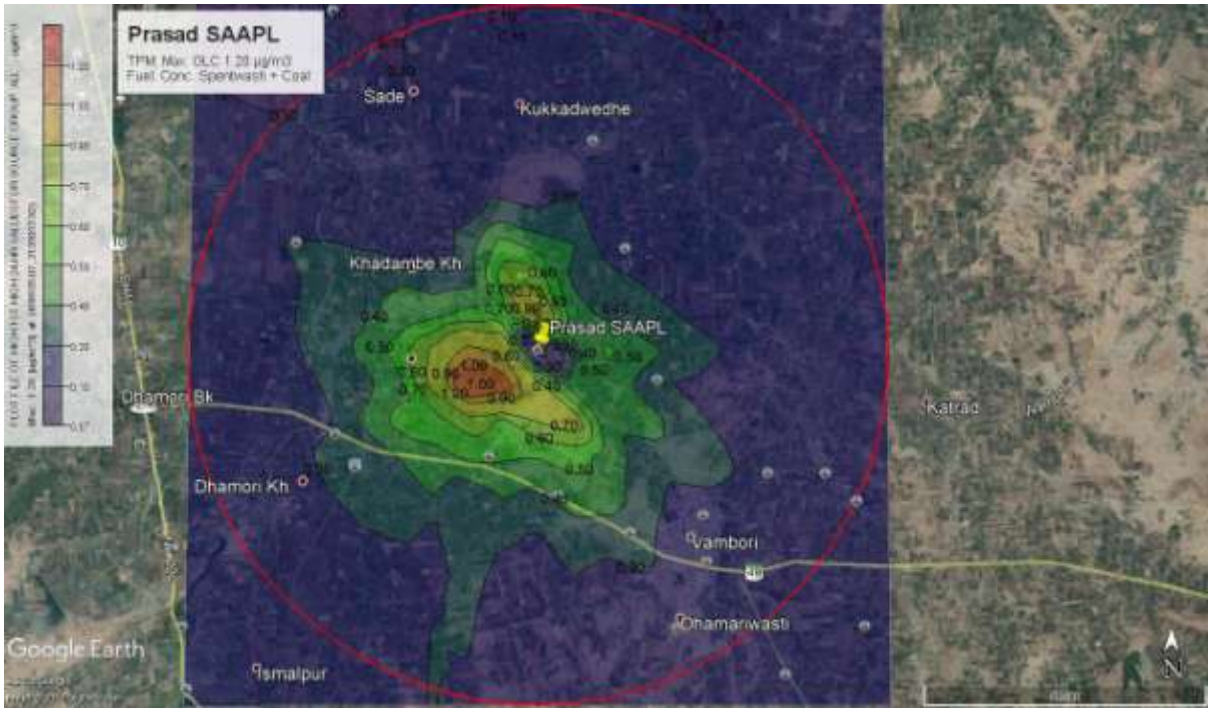

Figure 3 : Isopleths showing incremental ground level concentration of particulate matter (Short Term 24 Hourly)

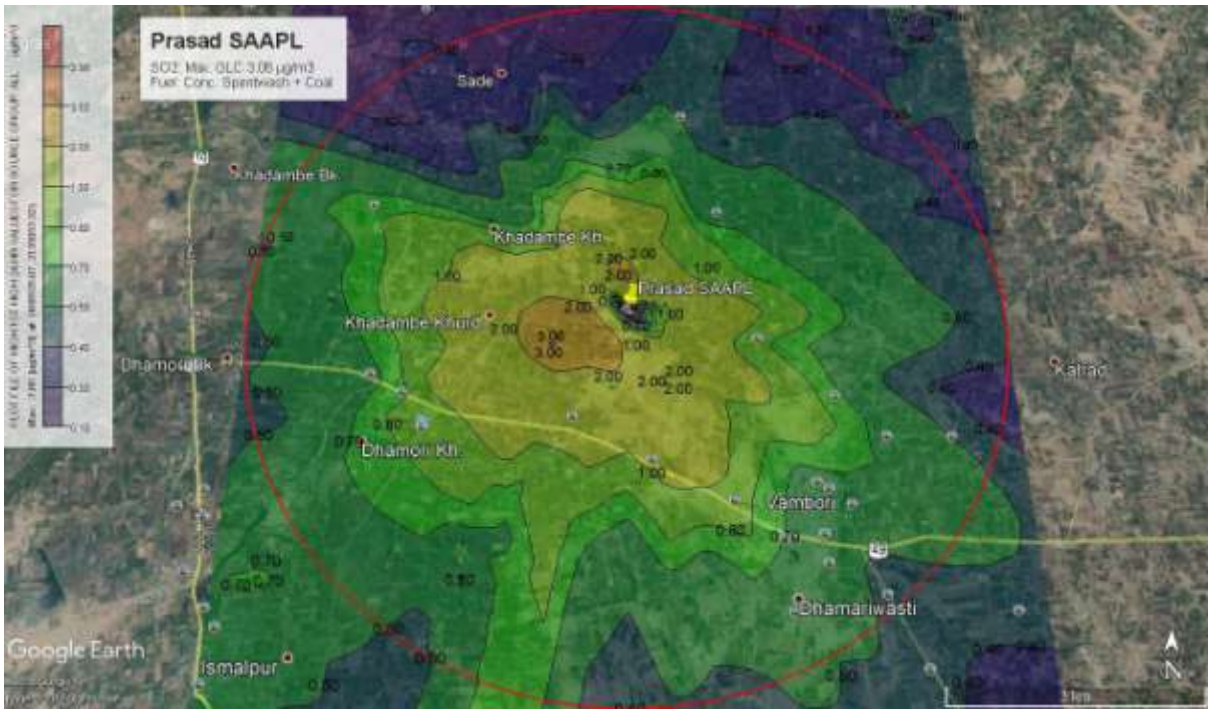

Figure 4: Isopleths showing incremental ground level concentration of SO_2 (Short Term 24 Hourly)

5.2 Noise Environment

The project activities do not involve high noise sources. Anticipated noise sources are operations of boiler, pumps, motors, distillation columns, etc.

5.2.1 Impact assessment

Ambient Noise: Noise related hazards/ailments are anticipated on persons working close to noise/vibration source. Minor negative impact is anticipated

Ecology and biodiversity: Minor negative impact of noise from transportation activity is anticipated. on particularly human population and fauna, Ahmednagar-Shirdi state highway is approx 9 km from site. In addition, there is an excellent network of *Zilla Parshad* roads in this area that connects almost all villages of study zone to the taluka headquarter. These are permanent and asphalted roads. Therefore, negative impact due to traffic congestion is anticipated to be negligible.

5.2.2 Environment management plan

- Mechanized handling of coal and ash
- Green belt development on 1.2 acres for the proposed unit
- Existing greenbelt will be enhanced by planting 5,000 trees
- Wind breaks will be developed to control PM generation from ash storage yard
- PPE will be provided to workers, working in dust prone areas
- Job rotation for workers, working in dust prone areas
- Use of economically affordable techniques for suppression of dust from handling and storage area
- Ash will be transported in closed/covered vehicles to the brick manufacturing unit
- Construction of permanent roads

5.3 Water Environment

Following wastewater sources have been identified for the proposed project

- Spent wash: major source –highly polluting in nature
- Spent lees: second major source; moderately polluting compared to spentwash
- Condensate water of MEE, Wastewater from washing/cleaning: mild to moderately polluted
- Blow down from boiler/cooling tower: water having high temperature and requires only cooling treatment

5.3.1Impact Assessment:

- Water availability: Water requirement will be met from Mula reservoir. The Mill has made an application to the Executive Engineer Irrigation department Ahmednagar to draw water from Mula reservoir. the bunds constructed for storage of rainwater run-

off from the surrounding areas; reuse, recycle of water will save significant of freshwater intake.

- Water/aquatic environment: No negative impact envisaged on water environment as well as aquatic ecosystems of the surrounding area since 'zero liquid discharge' scheme is adequate and efficient
- Air environment: Minor negative impact is envisaged due to odour of spentwash and emission of SPM and SO2 gases due to burning of coal and spentwash incinerator boiler ESP will be installed as an air pollution control equipment's hence impact is minor on air quality
- Soil Environment: Due to impervious lagoons as well as compost yard, probability of soil pollution could get reduced to zero percent. Hence, no negative impact is anticipated. Ash generated from the incinerator boiler will be sell to brick manufacturer. Sludge from CPU and fermenter is organic in nature will be used as a manure, thus positive impact is anticipated
- Ecology and biodiversity: No negative impact, food chain/web may get strengthened due to composting process as usually it attracts avifauna.

5.3.1.1 Reuse of water (after proper treatment)

Wastewater generated due to cleaning and washing, Spentlees and condensate water will be treated in CPU. This unit will comprised of primary treatment followed by aeration followed by filtration treatment in CPU unit (discussed in Chapter II); treated water will be used for dilution of molasses, cooling tower make up, irrigation, or cleaning activities, etc.

5.3.1.2 Conservation of water

Rainwater harvesting system will be installed to improve the ground water aquifer and to fulfill the requirement of the proposed unit during startup.

5.3.2Environment Management Plan

Spentwash of 300 m^3/day will be sent to multi effect evaporation unit to reduce its volume from 300m^3 to 60m^3 incinerate in boiler with coal. Condensate from MEE and other wastewater will be treated in CPU and reused; thus achieving 'zero liquid discharge'. Spentwash storage lagoons and the compost yard will be constructed as per CREP guidelines.

5.4 Soil Environment

Soil is likely to get affected due to following-

a. Percolation of spentwash, disposal of untreated solid (ash, sludge, etc) and/or hazardous waste (spent oil, etc) in soil

b. Removal of top soil layer which is usually more fertile

c. Excavation activity – particularly for spentwash storage lagoons and compost yard

5.4.1 Impact Assessment

Soil environment: Due to impervious lagoon probability of soil pollution/ground water contamination due to percolation of spent wash get reduced considerably. Hence, no negative impact is anticipated.

Ecology and Biodiversity: No negative impact envisaged due to solid waste; enhancement in micro-flora due to compost

Water environment: No negative impact envisaged due to solid waste

5.4.2 Environmental management plan

Waste Material	Type	Upshot
Ash	34.59 TPD	Sold to brick manufacturing unit
Yeast Sludge, sludge from CPU	4 - 5.5TPD (wet basis)	Mixed into soil

- Top soil layer of 15-20cm to be kept separate and use for greenbelt development
- Disposal of excavated material safely for construction of spentwash storage lagoons, compost yard, leveling of roads, etc.

5.5 Ecology and Biodiversity

Probable sources of impact identified for the project are

a) Disturbance to wild life due to project activities

b) Pollution

5.5.1 Impact assessment

Minor negative impact on flora in the close vicinity of the site, due to particulate matter and avi- fauna due to thermal pollution from flue gases; no negative impacts from other activities are anticipated; Increase in the greenbelt will help to maintain and enhance the biodiversity

5.5.2 Environmental management plan:

- Greenbelt development
- Zero Liquid discharge will be achieved
- Safe disposal of solid waste
- Adequate measures to prevent, control and mitigate air and noise pollution

5.6 Socio-economic Environment

Probable Impact causing factors	Situation for proposed project	Environment Management Plan	Impacts
Population flux	Project will provide 81 new employment opportunities	Local candidates will be preferred	No negative impact
Pressure on infrastructure such as electricity, water, road etc.	Captive power Water will be drawn from Mula reservoir with permission from Irrigation Department Minor increase in vehicle number Adequate school, college, medical facilities are available Public transport, telecommunication banks and other infrastructure already exist and adequate to support minor increase in population	Emphasis will be given on water conservation by recycling and reuse/ Rain water harvesting. Public transport facilities likely to get improved due to project. Improvement envisaged for primary school, health services and commodity market Similarly, improvement in daily utility services are also anticipated Maintenance of internal road and approach road	No negative impact
Employment	Direct employment to 81 people	Local candidates will be preferred. Indirect employment to many locals	Positive Impacts

5.7 Land Use, Geology and Hydrogeology/Drainage

5.7.1 Impact Assessment

Most of the land selected for proposed project is under rain fed agriculture and barren land. Therefore, the impact on LU is positive i.e. barren land is getting converted into future built up class which is beneficial for local population.

If we consider drainage map of the study area there is no any disturbance of natural drainage. No impact envisaged on geology and hydrogeology of the site due to the proposed project.

5.7.2 Environment management plan

- Precautions need to be taken to preserve or maintain these streams in their natural form or need to be considered while landscape development.
- Earthquake resistant construction as per national building code for seismic zone IV
- Well defined disaster management plan and proper implementation of it
- Training to the personnel for disaster situation, mock drills at periodic interval

6.0 GREENBELT DEVELOPMENT

Greenbelt will be developed on 1.2 acres of land (33% of the proposed activity plot) in and around an industrial complex. Therefore, approx. 1,000 trees are proposed for the greenbelt development. In addition, the proponent has planned to add 5000 trees in the existing greenbelt.

7.0 SAFETY, OCCUPATIONAL HEALTH MANAGEMENT

- Use of flame proof electric equipment's
- Provision of lightening arresting system, alcohol vapor condensation system
- Adequate fire fighting measures and provision of safety gears to workers
- Workers working in high noise/ high risk areas must be rotated to other areas
- Smoking and other igniting activities should be strictly prohibited in the distillery, biogas as well as bio-compost area
- Provision of a flare unit for unutilized biogas
- The plant and buildings meet the corresponding provisions of statutes regarding inter-distances, exits, ventilation, illumination, etc. Fire fighting arrangements shall be provided as per the required statutes as well as corresponding standards

8.0 ENVIRONMENTAL MONITORING PROGRAMME

The Environmental monitoring program given below-

Table 8: Summarized environmental monitoring programme

S. No.	Particulars	Parameter	Frequency[#]
1.	Stack Emissions	Particulate matter, SO_2, NO_x	Monthly
2.	Ambient Air Quality	PM_{10}, $PM_{2.5}$, SO_2, NO_x	Monthly
3.	Inlet and outlet of CPU	pH, BOD, COD, SS, TDS, Oil & Grease etc.	Monthly
4.	Bore well /ground	pH, COD, BOD, Total solids,	Quarterly/Monthly

S. No.	Particulars	Parameter	Frequency[#]
	water sample nearer to compost yard	Chlorides, Sulphate, Phosphates, and Calcium	
5.	Noise monitoring	Noise levels measurement at high noise generating places as well as sensitive receptors in the vicinity	Monthly
6.	Analysis of ready bio-compost	Moisture, Organic Carbon, and C:N ratio, Nitrogen, Phosphorous, Potassium, etc.	Each batch of compost
7.	Occupational health	Health and fitness checkup of employees get exposed to various hazards All other staff (except above) including contract and casual labour	Quarterly Once a year

9.0 PROJECT BENEFITS

- Efficient use of available resources such as spent wash to produce surplus power
- The proposed project on implementation will generate about 81 direct employment opportunities
- The project is agro based, hence there will be plenty of indirect employments to locals
- No rehabilitation/resettlement issues are involved
- Factory is already implementing several schemes/activities for the benefit of local farmers, employees and those schemes/activities will be continued
- Technology for the project and pollution control are available indigenous

10.0 CONCLUSION

Proper implementation of Environmental Management Plan, risk and disaster management plan will help to prevent, control and mitigate the negative impact of the project and allied activities. At the same time, it will help to enhance positive impact. Overall, social and economic benefits of the project envisaged being profound and therefore, the project will be beneficial to the society and overall development of the region.