EXECUTIVE SUMMARY BASED ON DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Of

Proposed 22 MW Co-gen Power Plant

with modernization cum Expansion of Sugar Unit from 3500 TCD to 5000 TCD

For

MAJALGAON SAHAKARI SAKHAR KARKHANA LTD.

Sundar Nagar, Telgaon (BU)

Tal: Majalgaon, Dist: Beed (M.S.)

June 2013

EXECUTIVE SUMMARY

1.0 INTRODUCTION

Majalgaon Sahakari Sakhar Karkhana Ltd, [hereafter being referred as MSSKL or Project proponent (PP) or simply Karkhana] is located in Sundarnagar of Beed district in state of Maharashtra. It is an existing factory manufacturing sugar with cane crushing capacity of 3500 TCD. This unit was started in year 1992-93 with capacity of 2500 TCD. It was subsequently enhanced to 3500 TCD. By product molasses was being sold to neighboring distillery units for alcohol production as PP did not have own distillery.

Subsequently MSSKL decided to have own distillery to make use of molasses produced in own sugar mill. MSSKL obtained environmental clearance from MoEF New Delhi under reference F. No. J-11011/297/2008-IA II (I) dtd. 13th April 2009 for installing 45 KLPD distillery. MSSKL installed a distillery plant in 2010. In this way Karkhana not only avoided transportation of molasses which is a hazardous chemical and but also, increased its bottom line. Additional advantage was availability of pressmud for bio-composting to ensure zero discharge from distillery unit.

Sugar mill operations also generate bagasse which has heating value and can be used as fuel in place of coal. In current times Maharashtra is suffering from power shortage and manufacturing is affected severely due to frequent power cuts which are often unscheduled. To overcome this constraint and utilize bagasse produced in sugar mill, MSSKL decided to have own cogeneration power plant.

To match the bagasse requirement for power generation and molasses production for alcohol production, it was required that MSSKL hiked the cane crushing capacity from 3500 TCD to 5000 TCD.

As per government regulation MSSKL approached MoEF New Delhi for environmental clearance for modernization cum expansion in cane crushing capacity from 3500 TCD to 5000 TCD and a captive power plant of 22 MW capacity to meet is power and steam requirement and export surplus power to MSEB. Details about the proposal were presented to EAC during 25th EAC (industry- 2) meeting on 28th

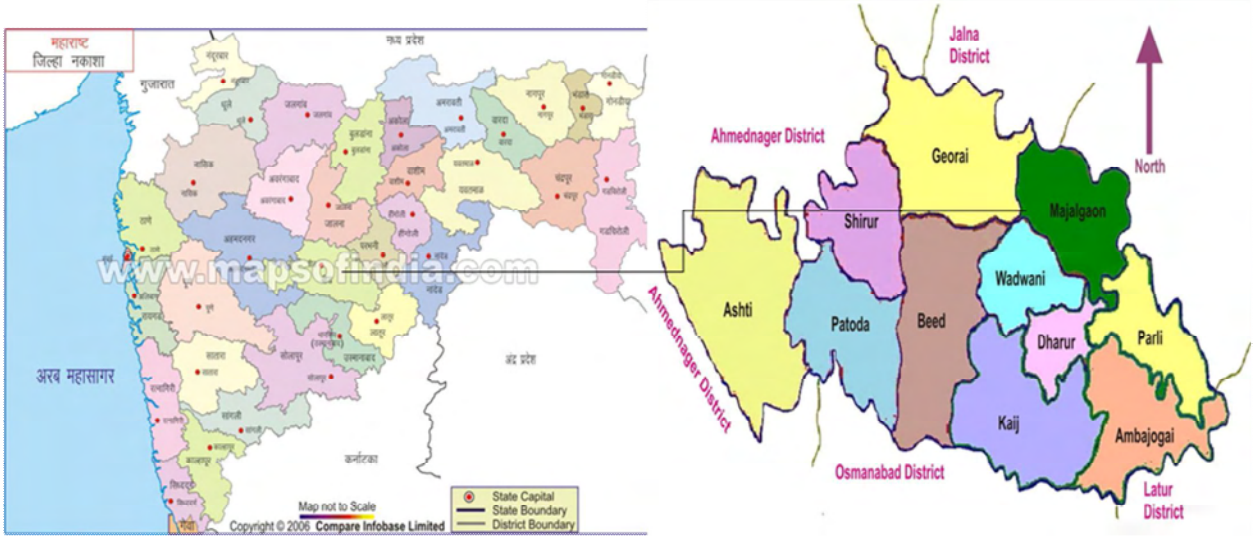
July 2011 and EAC allotted terms of reference for conducting EIA study as detailed in 1.10.

This purpose of this report is to assess the consequences of proposal along with existing activities on the overall environment in line with the TOR prescribed by the EAC.

2.0 PROJECT DETAILS:

The management of **Majalgaon Sahakari Sakhar Karkhana Ltd.,** propose co-generation power project of 22 MW installed capacity along with modernization cum expansion of sugar unit from 3500 TCD to 5000 TCD at Sy. No 168, 172,173 and 176, village Sundarnagar, Telgaon (BU), Tal- Majalgaon, District – Beed.

Mr. S. A. Solanke is founder chairman & director of MSSKL and Mr. D. S. Solanke is chairman of MSSKL. Hon'ble Shri Prakashrao Solanke (State Minister for Revenue, Co-operative and Rehabilitation) is director of MSSKL.



Majalgaon Sahakari Sakhar Karkhana Ltd. is having existing 3500 TCD sugar unit and 45 KLPD molasses based distillery in operating condition.

There is no expansion of the existing distillery of 45 KLPD capacity.

The MSSKL is located at Sundernagar, Telgaon (BU), Tal: Majalgaon, Dist: Beed, State: Maharashtra. The location map is shown above.

The proposed project is located at Sy. No 168, 172, 173 and 176 in Sundarnagar. The project falls at North Latitude $18^0$58'22.02" and East Longitude $76^0$10'26.25".

ENVIRONMENTAL SETTING OF THE PROPOSED PROJECT

Sr. No.	Particulars	Details
1	Latitude	18^0 58' 22.02" N
2	Longitude	76^0 10' 26.25" E
3	Elevation above MSL	495 M above Mean Sea Level
4	Climatic Conditions (As per IMD)	Annual Mean Maximum Temperature: 40°C Annual Mean Minimum Temperature: 10°C Annual Rainfall : 600 – 700 mm
5	Present land use at the proposed site	Industrial
6	Nearest Road	NH No.222 at 23 Km
7	Nearest Railway Station	Parali (V) at 45Km.
8	Nearest Airport	Aurangabad:-190 Kms
9	Ecologically sensitive zones within 15-km distance	Nil within 10-km radius
10	Historical/ Archaeological places	Nil within 10-km radius
11	Seismic Zone	Zone –III

3.0 AREA STATEMENT

Total plot area of the project is 4,83,100 m^2, out of which 37400 m^2 land will be utilized for proposed power project. 1,22,500 m^2 land is utilized for existing sugar unit and 13000 m^2 land is reserved for sugar mill modernization cum expansion while 68,799 m^2 land is utilized for existing distillery project.

Area Statement

Sr. No.	Particulars	Area in Sq meters
1.	Total Land Available	4,83,100
2.	Total Land utilized for Existing Sugar Factory	1,22,500
3.	Total Land utilized for Existing distillery	68799
4.	Land used for residential colony	44,825
5.	Land reserved for sugar mill modernization cum expansion	13000
6.	Land reserved for co-generation project	37400
7.	Existing Road / amenities etc	22460
8.	Utilities ETP etc	6000
9.	Open area	168116
10.	Landscape area (33 % of open area)	55478
11	No of trees existing	5600

Area utilized for co-generation unit

Description	Area (Sq. m)
Part of plot available for cogen unit	37,400
Plant & Machinery Area required	5,810
Built up area	10,720
Amenity	3,000

Description	Area (Sq. m)
Road & Open Area	19,200
33% of open area	6,336
Landscape area provided	12,342
Number of trees to be planted	618

4.0 PROJECT COST:

The total capital cost of the proposed scheme of expansion-cum-modernization from 3500 TCD to 5000 TCD along with 22.0 MW co- generation power projects of MSSKL is estimated Rs. 13,697 lacs.

When above proposal for modernization cum expansion is implemented total cost of integrated complex will be approximately Rs 215.83 crores.

PROJECT COST (Rs.in lac)

Sl. No.	Particulars	Modernization-cum-Expansion	Co-Generation	Total
1	Land and Site Development	45.00	0.00	45.00
2	Civil Works	0.00	414.93	414.93
3	Plant & Machinery	4144.66	8059.70	12204.36
4	Miscellaneous Fixed Assets	0.00	0.00	0.00
5	Preliminary & Pre-operative exp.	224.19	390.02	614.21
6	Supervision charges	0.00	10.69	10.69
7	Transmission Line	0.00	25.00	25.00
8	Contingencies	103.20	249.66	352.86
9	Margin Money	20.00	10.00	30.00
	Total	4537.05	9160.00	13697.05

5.0 WATER REQUIREMENT:

The fresh water will be sourced from Kundlika dam which at 6 Km from proposed project site. Permission for the same is obtained from irrigation department, Mumbai.

The total fresh water requirement for existing 3500 TCD sugar mill, the 45 KLPD distillery together with the proposed 22 MW cogen unit along with modernization cum expansion of sugar factory to 5000 TCD shall be 3421 m3/day.

5.1 Power Requirement

Additional power requirement for sugar plant unit shall be 750 KW and 1760 KW will be required when cogen facilities are fully operational.

Initially power will be taken from MSEDCL, thereafter power requirement will be fulfilled by own generation.

For start up two HSD fired D G sets have been proposed as standby. Rating shall be 1000 KVA each.

5.2 Manpower Requirement

The company proposes to employ additional manpower for cogeneration plant in the following manner:

Sr No	Manpower	Nos.
1	Staff	20
2	Workers	40
3	Contractual labors	40

6.0 LIST OF RAW MATERIALS:

List of raw material along with its quantity and source is given in table below

Raw Materials

S.No	Raw Material	Quantity
A.	**Sugar unit**	
	Sugarcane	5000 TCD (Source: Surrounding sugar farms)
B.	**Co-generation unit**	
	Bagasse	47.35 T/hr (Source: Own sugar factory)
C.	**Distillery**	**(Existing molasses based)**
1.	Molasses	180 MT/day (Source: Own sugar factory)
2.	Sulfuric acid	60 Lit/day
3.	Nutrients N, P	60 Kg/day
4.	Turnkey Red Oil (TRO)	150 Kg/day

7.0 LIST OF PRODUCTS :

List of products generated from exiting as well as from proposed units are given as under.

List of Products

S.No	Product	Production Capacity
A.	**Sugar unit**	
	White sugar	15000 MT/month
	Molasses	6000 MT/month
	Press mud	5000 MT/month
	Bagasse	45000 MT/month
B.	**Co-generation unit**	
	Power	22 MW
C.	**Distillery**	**(Existing molasses based)**
	RS/ ENA	45 KLPD
	Bio Compost	34000 MT/season

8.0 PROCESS DESCRIPTION:

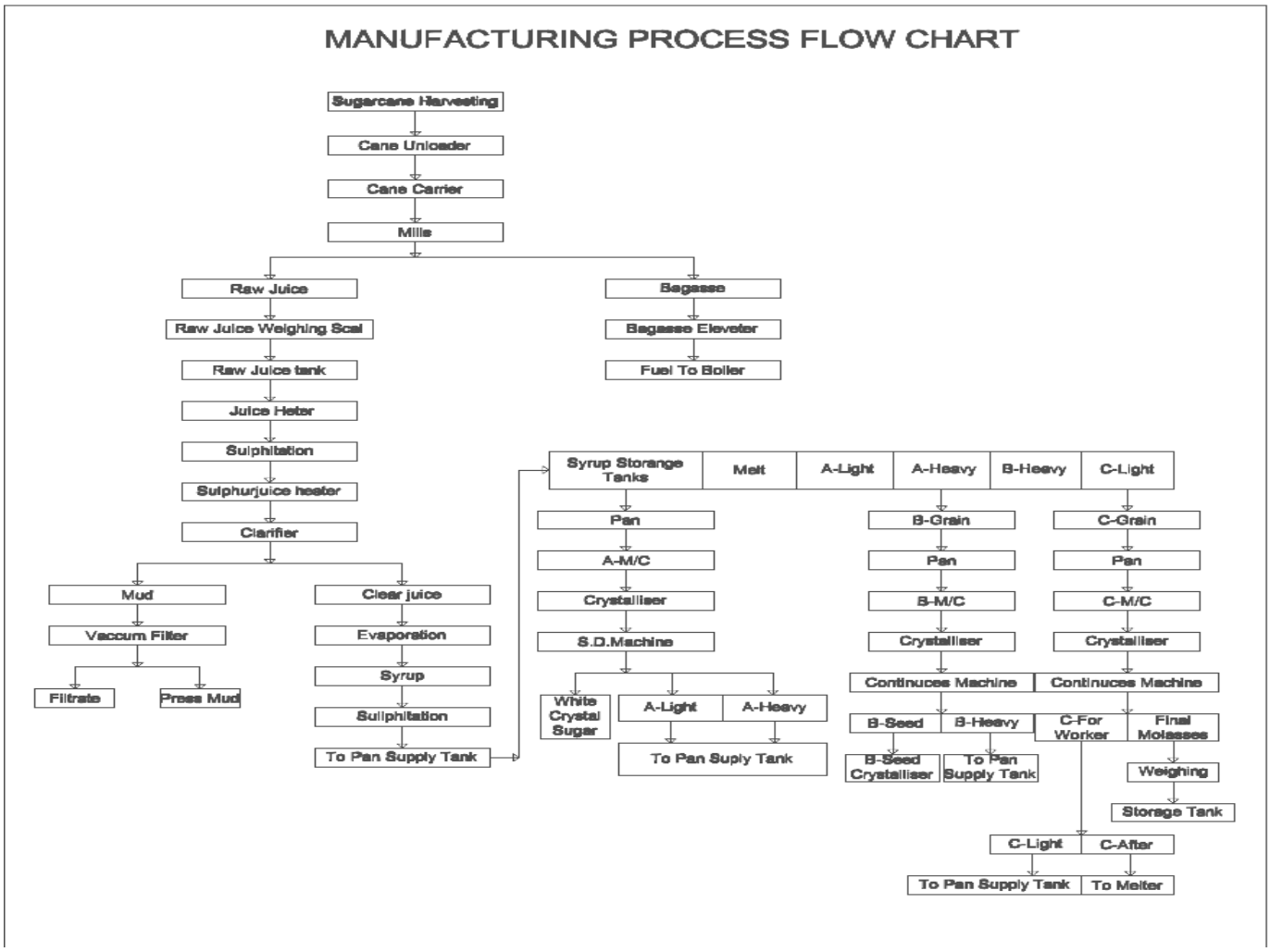
8.1 Sugar Manufacturing Process:

The Sugar cane is received from the farmlands through trucks, weighed and unloaded in the milling carrier. Series of roller mills crush the cane and extract the juice leaving the Bagasse, to be used as fuel for the Cogen boiler and pressmud for distillery. The steam generated from cogen boiler is passed through turbines and in turn power is generated. Emerging out low pressure steam is utilised in the process section.

Extracted cane juice is heated to 60 - 65^{0}C and mixed with lime water to maintain the pH of 7-7.2. Thereafter it settled in huge clarifiers for about 2-1/2 hours to settle the solid residues in it called as Pressmud. This pressmud finds use in Biocomposting and will be converted into manure. The clear settled juice is sent to the Evaporators to evaporate the water and convert it into syrup.

The syrup is further boiled in Pan and sugar crystals are formed in it. High speed centrifugal machines used to separate the sugar crystals and molasses from the syrup. This molasses finds use at distilleries to produce alcohol.

The separated sugar is dried and then subjected to further refining in the Refining House to get refined sugar. The refined sugar is marketed in 50 and 100 Kg. bags as per the requirements.

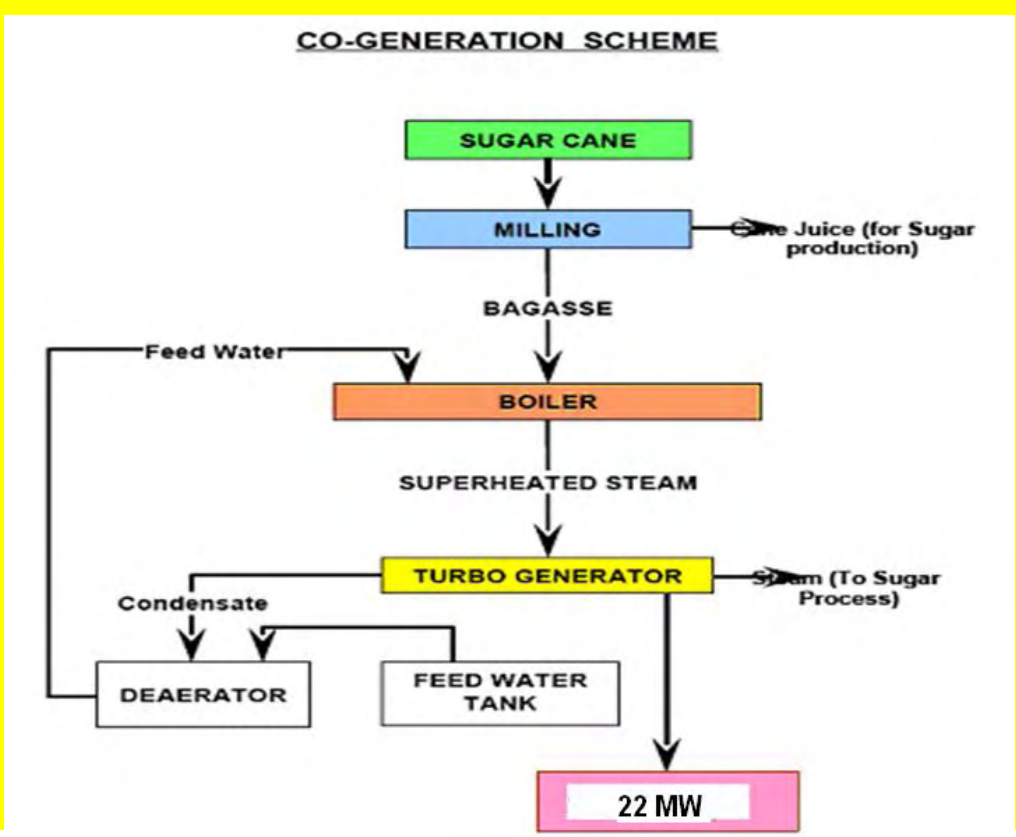


8.2 Co-generation of power

Bagasse fired travelling gate boiler of capacity 120 TPH steam will generate steam at high pressure of 87 kg/cm^2 at 515 °C . Entire steam generated will be used to run two turbines one of 16 MW DECT type & the other of 6 MW BP type of Turbo Generator set for generation of power as well as use of steam for sugar plant, distillery and deareator of power plant.

Power generation will be at 11 KV. Excess power will be stepped up to 132 KV for compatibility to MSEB grid and will be sold to MSEB.

The Auxiliaries of the biomass power plant will be supplied in house generated power & balance of power generated will be synchronized stepped up and exported to the grid. Plant steam requirement will be fulfilled by extraction at required pressure from turbine.



9.0 BASELINE STUDIES:

For studying the environmental influence due to the project proposal 10 km region around the factory site has been thought to be adequate.

Actual monitoring of air, water, soil and noise levels were carried out in the winter season to determine the realistic existing environmental conditions.

Air Environment

From the data available from the Micrometeorological Department, there were on average yearly 41 rainy days. The minimum temperature is recorded at 16.3^{o}C during November, while maximum temperature was 34.8^{o}C in November. The rainfall data reveals that the total average rainfall was 537 mm with maximum during July at 180 mm. Relative humidity during this period was minimum at 43% in November and maximum at 89% in July.

Water Environment

Water quality has been checked for 10 Km radial distance surrounding by the project area. Two samples of surface water and six samples of ground water were analyzed. Ground water mostly indicates e-coli presence and is unfit for potable consumption. Water from Kundalika dam site is found to be of excellent quality.

Water requirement for the proposed cogeneration unit will be met from the Kundlika dam which is situated at 6 Km from the project site. MSSKL have been obtained the water lifting permission from Water Irrigation Department.

Soil Environment

The majority of the soil in the area of operation of MSSKL is well irrigated and is having pH value 7 to 7.8 which is suitable for sugarcane cultivation.

The subsurface strata are heterogeneous in nature. It consists of fines upto about 1.0 to 2.5 m depth. Fines are non plastic or of lo plasticity. It is followed by coarse grained soil such as sand and gravels.

Noise Environment

A preliminary reconnaissance survey has been undertaken to identify the major noise generating sources in the area. Noise at different noise generating sources has been identified based on the activities in the village area, ambient noise due to industries and traffic and the noise at sensitive areas like hospitals and schools. The noise monitoring has been conducted for determination of noise levels at select locations in the study area. Except for occasional time noise levels have been generally within limits.

Land Environment

Satellite data for Rabi season was classified using supervised classification technique. Maximum likelihood algorithm classifier was used for the analysis. The scenes were individually classified and then were integrated to get a composite classified output where information from Rabi season is available. A truth table was generated taking 0.95 as the conversion threshold. After aggregation, the final classified output was converted in raster format. The image was then converted in

raster format, which is understood by GIS. Eight land use/ land cover classes identified in total study area and ten land use/ land cover class for 10 Sq. km area around Project Site area under each class has been calculated.

Ecological Environment

The facet of the natural environment includes vegetation and animals, flora & fauna. Human activity should not disturb the biological habitat, because then the man-kind itself will be harmed in turn. It will be necessary to know the natural existing environment as a background inventory.

The climate of Marathwada region is generally hot and dry. It receives low rainfall. Some part of Marathwada having good fertile land with climate, so this particular region shows ample bio-diversity. Other part of the region also shows its importance by producing medicinal and other useful plants. Due to the lack of adequate rainfall, vegetation cover shows its diversified nature.

Socio-Economic Environment

As per census 2001, the population of the district is 21.60 lakh. In comparison to census 1991, the annual increase in the population has been 185 per thousand (18.5%). According to census 2001 the talukawise percentage is Beed-18.21%, Georai – 12.9%, Majalgaon – 9.95%, Ambajogai – 10.90%, Kaij – 10.49%, Patoda – 4.43%, Ashti – 9.56%, Dharur – 2.88%, Parli(V) – 10.91%, Wadwani – 5.78% and Shirur(Kasar) – 4.88%.

Karkhana has contributed in handsome manner in development of the region. The factory command area comprises 188 villages from 4 Tahsils of Beed District. The Tahsil wise details of villages from where factory procure the sugarcane are given below:

Sr. No.	Name of the Tahsil	No. of Villages
1	Majalgaon.	100
2	Parali (V)	31
3	Dharur.	32
4	Wadwani.	25
	Total	**188**

The sugarcane is procured within the radius of 55 kms. The factory has its own sectional/ Gut Offices in the area of operation for the convenience of Cane Development and collection of cane from the area of operation.

Division wise cane availability is given below:

Sr. No.	Name of the Division	No. of Villages.	Area under Sugarcane (Ha.)	Average yield MT/ha.	Available cane M.T.	Remarks.
1	Majalgaon.	18	2140.98	63	135678	
2	Sawargaon.	19	1469.58	58	85321	
3	Gangamasla.	13	1605.19	61	97543	
4	Loangaon	03	650.95	59	38177	
5	Devdi.	10	782.20	70	54469	
6	Mogra	06	1072.95	61	65705	
7	Sirsala.	27	2579.57	63	163407	
8	Telgaon	14	1028.70	59	60549	
9	Kuppa	13	1457.61	60	87618	
10	Dindrud.	30	1239.25	62	76911	
11	Kitti. Adgaon.	07	1169.40	62	72514	
12	Hiwara.	08	1544.35	62	96226	
13	Umbri.	03	518.10	60	31274	
14	Laul	07	975.35	77	47782	
15	Rajegaon.	10	895.73	58	52378	
	Total	188	19129.91	62	1186054	

Performance of the Sugar Factory :

Since last 17 years i.e. from its establishment the factory is performing well in respect of crushing, sugar recovery, cane payment and excellent services to the farmers.

10.0 ANTICIPATED ENVIRONMENT IMPACTS & MITIGATION

A. Impact on air environment

a) Sugar Mill operation

Sugar mill modernization cum expansion does not involve use of equipments that are likely to generate emissions in air. Effect if any shall be due to increased duty called upon to the boiler, in form of additional steam consumption. These have been adequately addressed in mitigation equipment provided on boiler.

b) Distillery plant operation

Distillery plant operation also does not generate any pollution in air during normal operation.

c) Power Plant operation

Ash will be emitted during normal operation from the stack. Its quantity shall be 57 MT/day. It shall be trapped by the electrostatic precipitator of adequate capacity provided. Final emission from stack will not exceed 150 mg/nm3 as per CPCB/MPCB recommendations.

B. Impact on water environment

a) Sugar Mill operation

Sugar mill modernization cum expansion will involve generation of effluent @540 m^3/day. The effluent does not involve any highly objectionable constituents and will be treated in conventional effluent treatment plant upto tertiary level treatment.

Effluent after treatment confirming to MPCB levels will be used on own land for gardening/ green belt development.

b) Distillery plant operation

Distillery plant operation does generate, during normal operation two types of effluent:

i) **Lean effluent 180-m3/day** It will be mixed with sugar plant effluent and treated in same ETP.

ii) **Spent wash 450 m3/day** will be generated. It shall be treated first in biodigester to reduce COD and recover biogas, then treated spent wash will be sprayed on pressmud to generate biocompost for use of farmers associated with karkhana.

c) Power Plant operation

Power plant operation is a clean operation from water pollution point of view. Effluent is mostly blowdown due to boiler and cooling tower operations. It shall be mixed with sugar mill effluent and treated in ETP and subsequently used for irrigation.

C. Impact on soil -Solid Waste Generation

The solid waste generation from the operation phase is furnished below.

S.No.	Solid waste	Quantity generated	Method of collection	Mode of disposal
1	Boiler bottom ash	50 MT/day	Mechanical pneumatic conveyors into common silo for further disposal	Sent to cement kilns/ manure
2	Boiler fly ash	7 MT/day		
3	Sludge from ETP	10 kg/day	Sludge drying beds	Used as manure

11.0 ENVIRONMENTAL MONITORING PROGRAMME

Regular monitoring of important and crucial environmental parameters is of immense importance to assess the status of environment during plant operation.

The knowledge of baseline status and monitored data is an indicator to ascertain for any deterioration in environmental conditions due to operation of the plant. Based on these data, suitable mitigation steps could be taken in time to safeguard the environment. Monitoring is as important as that of pollution control since the efficiency of control measures can only be determined by monitoring. The routine monitoring program as indicated below will be implemented in the industry.

Gaseous Emissions Monitoring

Stack emissions shall be monitored for pollutants such as RSPM, SPM, NO_X and SO_2. Monitoring is to be done as per CPCB guidelines.

Ambient Air Quality Monitoring

Meteorological parameters such as wind velocity, wind direction, percentile variations, atmospheric pressure, dry and wet bulb temperature. humidity and rain fall shall be monitored. Ambient air quality will be monitored at select locations

Water and Wastewater Quality Monitoring

All the effluents emanating from the plant should be monitored for their physico-chemical characteristics and heavy metals. In addition, ground water samples at downstream and up stream of the compost yard shall be monitored on regular basis.

Post Project Monitoring Schedule

Post Project Monitoring Plan for monitoring waste water and flue gases discharged from the industry and the environmental parameters including meteorology, quality of ambient air, ground water and soil is given below.

Post Project Monitoring Schedule

Sr.No	Particulars	Location	Frequency
1	Ambient Air Quality for SPM, RPM, SO_2 and NOx	a. 2 samples down wind direction at 500 m and 1000m, respectively.	24 hrs. sample, Half yearly

		b. 1 sample up wind direction at 500 m.	
2	Flue gas from chimney for flow rate, SPM, SO_2 and NOx .	Sampling port of chimney	Bi-Monthly
2	Wind vel. & dir.,	At site	Quarterly
3	Temp (max & min) Humidity (max & min) Rainfall	At Site At Site At Site	
4	Ground water	Within 1 km radius from spent wash tank and compost yard. 2 locations down ward 1 location upward Additional 3 locations within 10 km radius from the site.	Half yearly
5	River water Drinking water standards	One each at downstream & up stream	Quarterly
5	Soil Org. & Inorg. Matter	At lands utilizing compost manure and treated effluent , 3 locations	Pre & Post monsoon
6	Waste water	At site	Daily
7	Bio-manure	At site	Weekly

12.0 ENVIRONMENTAL MANAGEMENT PLAN

Environmental management plan (EMP) consists of various policies and control measures planned to be adopted for abatement of critical environmental impacts arising out of the proposed project. Based on the impacts identified, an appropriate environmental management strategy is developed and presented in the form of an EMP. Environment monitoring before project and after project is set up, will be an integral part of EMP and will be actively persuied by the project proponent.

Environmental Cell

Chairman & Managing Director

Manager (EHS)

Distillery Manager

Manager (Maintenance)

General Manager (Sugar plant)

Budget Allocation for EMP

In Rs lacs

Sr. No.	Particulars	Sugar Factory		Co Generation unit		Distillery unit	
		Capital	Recurring	Capital	Recurring	Capital	Recurring
1.	Air pollution control facilities	7.00	1.5	260.00	22.00	-	-
2.	Water pollution control	65.00	0.25	-	-	-	1.00
3	Noise pollution control	-	0.25	-	0.50	-	-
4	Environment monitoring & management	0.12	0.50	-	4.00	-	-
5	Occupational health	-	0.20	-	0.10	0.50	0.15
6	Green belt	5.00	1.00	-	0.50	2.50	0.50
7	Salary & employment staff	-	5.26	-	5.25	-	7.00
8	Laboratory & chemicals	5.00	2.38	-	0.75	25.00	1.50
9	ETP maintenance	-	3.30	-	-	435.00	10.00
10	Solid waste	-	0.50	16.00	5.40	300.00	25.00
11	Acoustic enclosure	0.50	0.10	4.00	-	-	-
	TOTAL	**82.62**	**14.99**	**280.00**	**38.50**	**763.00**	**45.15**

13.0 PROJECT BENEFITS

The industry is established in the backward region of the state. The presence of the industry helps to develop road and transportation facilities in the region. The industry once established will provide direct and indirect employment to more than 100 local rural persons. This will be in addition to farmers involved in cane production and supply to the mill.

The plant nutrients are present in boiler ash. These products are rich in micro and other nutrients and therefore useful to the formers to enhance the nutrient values of the soil. Since the project proponent already has developed a strong farmers association, it is easy to market bio-composting for getting better yield of sugar cane and increase profitability of farmers and associated farm labour.

14.0 CONCLUSION

The industry is located in the rural backward region of the state. The site is about 1.6 km distance from the nearest village Telgaon and 6 km from water body. There are no sensitive locations within 25 km from the site except the Kundlika dam which is at 6 km from the site. The site and surrounding is dry land with no or poor cultivation. No forest or greenery of any worth in the region. The existing industry possesses a total of about 119 acres land area which is sufficient for the present and proposed activities.

As a substitute to petroleum, alcohol is used as fuel in automobiles and as raw material for many chemical products. Petroleum is scarce, costly and harmful to the environment. It is widely used as ingredient in beverages and thereby a source revenue to the Government. Alcohol is produced from molasses which is the by-product of the sugar industry. It is therefore a product of renewable source. The proposed agro based distillery has national priority to overcome the shortage of energy and to save foreign exchange.

Industry will utilize molasses produced in purifying sugar for alcohol production. It will avoid transportation of hazardous molasses to other alcohol producing factories and in this way achieve duel objective of increase in its profitably as well as avoid

pollution.

Press mud generated due to sugar mill operation will be utilized in bio-composting. Bio-compost so generated will have own customer base of farmers growing sugarcane associated with factory. Spent wash generated by distillery shall be effectively converted to bio-compost after biogas recovery in biodigester. In this way industry will act as zero discharge industry as far as distillery operations are concerned.

Power situation in Maharashtra is well known as serious and government is leaving no stone unturned to improve the same. In such situation proposal to have a self reliant industry producing surplus power is always welcome.

Use of bagasse as source of energy is an additional advantage. It is a renewable source and substitute for coal which is more polluting and is not renewable.

The industry on modernization cum expansion will provide direct and indirect employment to more than 100 local rural persons. With the industry, the road, communication and related facilities in the region will also improve.

Based on EIA report along with the suggested measures for pollution control and monitoring plan, the authorities can take favorable decision to accord environmental clearance for the proposed modernization cum expansion of the sugar mill with cogeneration facilities.