EXECUTIVE SUMMARY

1. INTRODUCTION

M/s Sar Senapati Santaji Ghorpade Sugar Factory Ltd has planned to establish integrated project of molasses based 30 KLPD distillery and 22 MW co-generation power plant at village Belewadi Kalamma,Tehsil : Kagal , District : Kolhapur.
Project site is situated at latitude $16^0$17'25.5.0"N and longitude $74^0$14'47.33"E. Project site and the 10 km radius study area falls in the survey of India toposheets no 47L/3, 47L/4, 47L/7 & 47L/8. The connectivity of project site is established by NH 4 which connects Mumbai to Banglore. Gadhinglaj is the nearest town from study area which is 13.10 km away. Kolhapur is nearest railway station and air port i.e. 60 KM away from the project site. (Refer Annexure 1. The project registered office is at plot no 309, Mujawar Galli, Kagal, Kolhapur.

Sugar has been historically classified as an essential commodity and has been regulated across the value chain. The heavy regulations in the sector artificially impact the demand-supply forces resulting in market imbalance. The increase in sugar consumption is mainly a function of four demand determining variables: - Population, income, consumption habit and the growth of the industrial & service sector, mainly hotels & restaurants as well as the food and beverage industries.
The growth of sugar industry in the State started prior to independence in the private sector and in the co-operative sector since 1950 onwards. The co-operative movement in the State has been witnessed mainly in the sugar industry. The growth of this industry in the co-operative sector has certainly helped improve socio-economic life of the rural parts of the State. The State co-operative sugar factories are directly administered by the office of Commissioner of Sugar, Ministry of Co-operation, and Government of Maharashtra.

The State of Maharashtra is poised for rapid industrial development and large-scale use of electricity for industrial purposes, for which the demand for electrical power is continuously increasing. The present demand for electrical power is greatly in excess of the generating capacity. The power generation scenario in the state reveals that the demand for power would continue to out-strip the available and planned generation capacity

The Seventeenth Electric Power Survey of India (draft) published by the Central Electricity Authority (CEA) projects an increase in the peak demand in Maharashtra from 19,388 MW in 2009-2010 to 21954 MW in 2011-2012. The energy demand is expected to increase from 124,961 MU in 2009-2010 to about 125,661 MU in 2011-2012. Thus

there is a deficit of 3632 MW. The peak power demand will be of 28348 MW and availability of energy 25124 MW in the year 2016-2017. Demand is expected to reach 219.9 BW by 2018. Deficit in peak demand is expected to increase substantially and there would be deficit in energy availability due to industrial growth in the subsequent years. In order to reduce power deficiency in Maharashtra Sar Senapati Santaji Ghorpade Sugar Factory Limited (SSSGSFL) trying to contribute by proposing 22 MW Bagasse Based Cogen Power plant

Report of the Committee on Development of Biofuels published by planning commission. April 16, 2003.) reflects that the estimated ethanol consumption / utilization by chemical industry (which is growing at 3.5% p.a.) rose from 527 ThKL in 2001-02 to 2054 Th KL in 2011-12. which reflects increase in the demand of ethanol by industry. Against this background SSSGSFL plans to install 30 KLPD molasses based distillery to meet the ever growing demand of ethanol for potable purposes and chemical industry.

1.1 Fuel Alternatives

Fossil energy resources consist primarily of natural gas and furnace oil. Domestic oil supply is considered negligible and natural gas resources are becoming scarce in India.. Moreover, domestic coal is very high in sulphur and ash content, which will lead to severe environmental hazards. The project's proposal for using high quality imported coal, after bagasse, is the best option for environmental and economic reasons. In the absence of any cheaper fuel, bagasse utilization is of prime importance.

1.2 Growth of Bagasse Cogen

India is blessed with an abundance of non-depleting and environment friendly renewable energy resources such as solar, wind, biomass and hydropower. Recognizing this potential, the Indian government has accorded a high priority to exploring and harnessing the potential. Over the years, the Ministry for New and Renewable Energy (MNRE) has been facilitating the implementation of broad spectrum programs. The progress since the turn of the century has been particularly marked with the total grid interactive renewable power generation capacity reaching more than 14,000 MW by March 2009 vis-à-vis a paltry 1,628 MW in 2001-02. Presently, renewable energy accounts for over 9 percent of the total installed capacity as compared to 1.5 percent in 2001-02.

2. PROJECT DESCRIPTION

2.1 Salient Features of the Project

The land required for proposed distillery of 30 KLPD and cogen project of 22 MW is in possession of project proponent. (Layout Plan is attached as *Annexure 2*). The benefit of the sites is that the raw material and water availability is within the premises.
The projects requirements are as follows:

- The land requirement for the proposed project is approximately 82 acres and is already in possession of SSSGSFL.
- The water requirement for the proposed distillery is 260 m^3/day and co-gen project is 1280 m^3/day.
- The raw material required will be in the form of molasses and bagassee respectively.
- The amount of mollesses required will be 34468 Tons/year. While the bagassee required will be 280695 Tons/year and will be sourced from own sugar factory.
- The total manpower requirement is 150 numbers.
- The source of steam will be boiler of 120 TPH capacity.

Salient Features of the proposed Distillery and cogen project are given below:

Sr. No.	**Feature**	**Particulars**
1.	Name and address of the Company	Sar Senapati Santaji Ghorpade Sugar Factory Limited village Belewadi Kalamma , Tehsil : Kagal , District : Kolhapur
2.	Project	30 KLPD distillery and cogen project of 22 MW
3.	Date of registration of Sugar Factory	22nd February 2011
4.	Working days per year	Distillery - 270/Annum Co-gen project - 160/Annum (season) - 170/Annum (off-season)
5.	Production capacity Distillery Co-generation	 30 KLPD 22 MW
6.	Main raw material Distillery Co-generation	 34468 MT of Molasses/Annum 280695 MT of Bagassee/Annum
7.	Man power requirement	150
8.	Total land area Distillery Co-generation	25 Acres 15 Acre 10 Acre
9.	Boiler capacity	120TPH
10.	Steam Generation	107TPH
11.	Power requirement	5.89 MW (season) 2.38 MW (off-season)

12.	Power export	15.51 MW (season) 19.62 MW (off-season)
13.	**Water requirement & source**	
	Source	Chikutra Dam
	Quantity	260 m^3/day (Distillery) 2200 m^3/day (Co-gen project)
14.	Investment on EMP	19.72 Crore Rs.
15.	Project Cost	259 crores Rs.

2.2 Manufacturing Process

Distillery

The process used for proposed expansion unit is Hi Ferm fermentation process is in batch mode followed by Multipressure Vacuum Distillation.

1) Fermentation

The purpose of fermentation is to convert the fermentable sugars into alcohol. The process is completed in following steps:

- **Molasses handling and Distribution-** This includes Screening of molasses, transfer to molasses receiving tanks, distribution to cell mass propagation, fermentation and sent to yeast activation section

- **Yeast propagation-** Yeast propagation section comprises molasses diluter and hygienically engineered yeast vessels equipped with heating, cooling and air sparging facility.

- **Pre-fermentation-** In the pre-fermenter vessel, molasses, process water, nutrients and additive are added for activation / growth of cell mass. Filtered air is sparged to repair the cell membranes and other cell components. Temperature is maintained at 30-32^{0}C. Cellmass is transferred to yeast activation vessel to build up cellmass required for fermentation.
- **Fermentation-** The purpose of fermentation is to convert the fermentable sugars into alcohol. The fermenter temperature is maintained at around 30 -32^{0}C by forced recirculation flow through plate heat exchangers.

2) Distillation

This step is followed to purify the product of fermentation process. In NSAIL proposed expansion project the following products are harnessed.

1. **Rectified Spirit (RS)**
2. **Extra Neutral Alcohol (ENA)**
3. **Absolute Alcohol**

SSSGSFL is proposed the storage facity for these products.

Co-generation Project

Proposed co-genneration project will generate the 22 MW electricity. It will work on the boiler 110kg/cm^2 at 540^{0}C temperature. During the season the fuel used will be bagassee it will work for 160 days. However during the offseason it will work for 170 days on bagassee, biomass and cane trash.

2.3 Pollution Control Measures

Distillery

The major pollutant from the Distillery is the Spent wash. To achieve the zero effluent discharge the SSSGSFL has proposed thee spentwash fired boiler.The benefits of this technology are:

-Ability to dispose effluent discharge of distilleries in a safe and environmentally sound way (by meeting **ZED norm**)

-Steam generation for meeting the process steam and produce electricity requirements of the distillery through STG.

Co-generation Project

-To reduce the aair pollution ESP will be installed with 99 % efficiency.

-To disperse the air pollutants chimney to the stack will be of 80 mts.

-ETP is proposed for treatment of effluent generated from the project.

-Bottam Ash generated from the co-gen project will be mixed with press mud and given in the farms where as the fly ash will be given to brick manufacturers and cement industry.

3. EIA STUDY

MITCON Consultancy & Engineering Services Ltd., Pune has been entrusted the task of carrying out EIA/EMP studies in order to obtain regulatory clearances from MoEF for the proposed 30KLPD Distillery and 22 MW co-generation project. The EIA studies were carried out for various environmental components so as to assess the anticipated adverse impacts due to the proposed facilities and to suggest suitable mitigation measures.

TOR has been issued for the preparation of the EIA report vide F.No. J-11011/268/2012-IA II (I)dated 11th January 2013. Considering the points in TOR the EIA report is prepared as per the EIA notification dated 14th September 2006 of the Ministry of Environment & Forests, New Delhi (MoEF).

Two broad types of methodologies *viz.* Field Surveys Methodology and Impact Assessment Methodology were followed for the above studies.

Salient Features of Project Site

Sr. No.	Particulars	Details
1.	Location	Village Belewadi Kalamma , Tehsil : Kagal , District : Kolhapur
2.	Latitude	$16^0$17'25.5.0"N
3.	Longitude	$74^0$14'47.33"E
4.	Total Plant Area	82 Acre
5.	Proposed Plant Capacity	Distillery 30 KLPD Cogen Power 22 MW Sugar plant 3500 TCD
6.	Nearest town	Gadhinglaj- 13.10 Km
7.	Tahsil	Gadhinglaj- 13.10 Km
8.	District	kolhapur – 60 Km
9.	Water Body	Chikutra River – 1 Km
10.	Nearest Road	NH -4 Km
11.	Nearest Railway Station	kolhapur – 60 Km
12.	Nearest Airport	kolhapur – 55 Km
13.	Religious / Historical Place	None
14.	Power Evacuation Line	MSETCL Line –Mumewadi Substation – 7 Km
15.	Archeological monuments	None
16.	Reserved Forest	Nera village Jhulpewadi, Palshivne, Kapshi, Kasari

3. BASELINE ENVIRONMENTAL STATUS

To get the idea of existing environmental conditions the survey the 10 Km radial area from project site is selected and the data collection is carried out for air & Noise quality at 5 locations, water quality at 8 locations, soil quality in 9 locations. The Ecological study is also carried out for 7 locations.

Topography

- The project site is on the table land of the hill that's why there is no need of cutting and filling
- R.L. at the project site is 660 mts.
- The elevation in the study area ranges from 560 mts to 965 mts.

Air quality

Air quality is monitored in the 5 locations viz. Project Site, Bamni, Madyal, Huda and Belewadi Kalamma.

- The concentration of PM_{10} was found to be between 10.3 to 19.1 µg/m^3. The average concentration was in the range of 13.9 to 15.8 µg/m^3.
- The concentration of $PM_{2.5}$ was between 4.5 to 10.2 µg/m^3 and the average concentrations were observed in the range of 7.1 to 8.8 µg/m^3
- The NOx concentrations were between 13.8 to 23.2 µg/m^3. The average concentrations were observed in the range between 18.4 to 19.6 µg/m^3.
- The SO_2 concentrations were between 9.2 to 19.3 µg/m^3 with average values being observed in the range of 13.7 to 16.3 µg/m^3.

At all locations the maximum values of $PM_{2.5,}$ PM_{10}, SO_2 and NO_x were found to be within the prescribed limits of CPCB.

Noise quality

Noise levels (L_{eq}) observed during daytime in the range of 48.5 (project site) to 53.2 dB (A) (Bamni) while during nighttime it is 37.2 (project site) to 41.0 dB (A).(Bamni) The L_{eq} was found to be within the prescribed limits as promulgated by CPCB.

Water quality

Ground water quality was analysed at 7 locations and surface water quality was recorded at Chikutra Dam.

Ground water parameters- The ground water quality analysis shows the following results

- pH was varying for ground waters from 6.90 (Naganwadi) - 8.04 (Belewadi Kalamma)
- The Chloride levels in the ground water samples collected in the study area were ranging from 12.0 mg/l (Kasari) to a maximum of 132 mg/lit.(Mangur)
- In the ground water samples of study area the fluoride value were in the range of 0.02 mg/l (Mumewadi) to 0.08 mg/lit.(Belewadi Kalamma)
- The TDS values varied from a minimum value of 214 mg/lit (Bahirewadi) to a maximum value of 594 mg/lit. (Mangur)
- The sulphates in the ground water varied from a minimum of 0.75 mg /lit (Bahirewadi) to a maximum value of 92.4 mg/lit.(Mangur)

Surface water parameters- The surface water quality analysis shows the following results

- The conductivity observed as 103 µmhos/cm and TDS was observed as 70 mg /lit.
- D.O, COD, BOD was observed as 6.1 mg/lit, 20 mg/lit & 9.0 mg/lit respectively.
- The sulphate was observed to be 3.0 mg/lit.

River & drainage

Krishna is a main river of the Kolhapur district. Other rivers are Dudhganga, Vedganga, Varna, Panchganga and hiranyakeshi. Chikutra river falls in the study area which confluences with river vedganga.

Seismicity

The study area falls under seismic zone III which is a moderately affected zone.

Soil quality

The soil quality parameters showing the following results:

- The pH values in the study area are varying from 6.02 (Bahirewadi) to 7.55 (Kasari) showing slightly alkaline nature during entire study period.
- The electrical conductivity in the soil samples are in the range of 32 (Bahirewadi) to 240 µmhos/cm (Belewadi Kalamma). Hence in study area the available soil is of good quality.
- The nitrogen content in the soil samples analyzed was in the range of 0.008 % (Belewadi Kalamma) to 0.02% (Project site). The Phosphorous presence in the samples analyzed was found in the range of 0.001% (Project site) to 0.002% (Kasari).The total potassium is varying between 0.001% (Dhamane) - 0.002 %.(Kasari).

Minerals

Main minerals found in the district are Bauxite, snadstobe and quartz.

Ecological Status

- **Flora-** Common tree near the villages and on the hedge of agricultural field and foorest patches are Babul, Bor, Tamrind, Karanj, Hirda, coconut, Bambu, Acacia auriculaeformis, Neem, Peepal, Vad, Teak, Mango, Palas, Ashok etc.

- **Fauna-** Some patches of reserve forest comes under the study area. The Mammals found in the study area are Five Striped palm squirrel, Common / Indian Mongoose, Common Indian Hare, Indian Field Mouse, House mouse, House Shrew. Some reptiles like water snakes, monitor lizards and common lizards were also observed near village boundary. The dominant birds in the study area are House crow, Owl, Asian koel, Common Myna.

Socio-Economic Environment

The Study area covers total 34 nos of Villages. Total population of the study area is found to be 57908. The average house hold size is 4.5. The sex ratio of the study area is found to be 1031:1000. ST and ST population is 8% and 0.4% respectively. Primary eduction facility is present in the study area. Concrete and mud roads are available and

bus facity is the main source of transport. Diring water facility is through tap, wells and handpump.

4. ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Impacts during Construction Phase

Construction phase impacts mainly related to levelling of site, construction of plant and erection of structures and other related equipment which are short term impact. The impacts are as follows.

Impact on Water- The water requirement for construction purpose will be drawn from Chikutra dam on by laying suitable pipelines.There will be erosion & turbid surface run off due to various construction activities. However provision will be made to collect this run off and treat it Since the local labour force will be deployed during construction phase, there will not be much water requirement for labour colony. Hence no significant impact on water is envisaged during this phase.

Impact on Land Use- The total land requirement for the proposed plant is 82 acres which is already in possession of the proponent. The construction activity would bring in certain immediate changes in the land use pattern of the plant area as well as in the vicinity.However the impact on land use will be long term and permanent but will be on a smaller scale.

Impact on Soil Quality- The construction activity will result in loss of top soil to some extent in the plant area. Apart from localised construction impact, no adverse impacts on the soil in the surrounding area are anticipated due to proposed plant.

Impact on Air Quality- Impact on air quality due to the proposed integrated project during the construction phase will be mainly in the form of suspended particulate matter, which will be generated due to site development activities and vehicular movement. Continuous use of diesel operated construction machinery such as concrete mixers, generators, bulldozers, cranes, trucks etc and welding activities will give rise to air emissions such as SO2, NOx and Particulate matter. The impact will be confined within the project boundary and is expected to be negligible outside the plant boundaries.

Impact on Noise Quality- The major sources of noise during the construction phase are vehicular traffic, construction equipment like dozers, scrapers, concrete mixers, cranes, etc. The noise levels expected due to operation of these equipment's range between 70-85 dB (A). The nearest habitation is more than 1.0 km away from the proposed project site and hence disturbance to local population will be insignificant.

Impact on Ecology- The proposed site is on land which is devoid of major plants and is already in the possession of SSSGSFL. The area does not harbour any fauna of importance. Hence impact on the terrestrial ecology during construction phase is not envisaged.

Socio-Economic Aspects- As the labourers required at this stage are generally un-skilled, the locals would get opportunities for employment during construction activities.

Impacts during operational phase

Land Use & Topography- About 82 acres will get converted into sugar factory, distillery and co-generation power plant, green belt and colony. The impact will be permanent and irreversible but it will be limited to project area. The change in topography will be due to erection of plant structures and related equipments.

Impact on Soil Quality- The impact on the characteristics of soil is limited to project area because of the water pollution, air pollution and ash disposal. There are two processes which has a major impact on soil of the area. The first and foremost is the dust fall. The coarser particles of ash let into atmosphere from proposed co-generation power plant ultimately settle on ground and thus affecting the soil quality in the area. The impact of this process is of minor nature but covers vast expanses of land. The other process is the solid waste disposal. The dust getting air borne will considerably affect soil in the vicinity.

Impact due to Solid waste- There will be generation of ash from burning of bagasse in season operation of co-generation power plant and bagasee / biomass in off-season operation of the co-generation power plant. This ash if dumped on the ground indiscriminately, will reault in leaching of soluble components of ash into the ground water table and blocking of interstitial pores of the soil. By virtue of the leaching characteristics of the ash, the heavy metals contained in the ash may gradually and slowly get leached from the ash and percolate to the ground water.Even though these effects seem to be very small, continuous storage of the ash at a particular location will result in cumulative effects of the exposure, leaching and percolation.

Impact on Air Quality- The proposed project will use bagasse / biomass as fuels for the proposed Boiler of the co-generation power plant.
Diesel Generator will be used for running the important equipment and street light. This will be limited to a few hours only. As such, the pollutants expected to be released in the emission will mainly be the Particulate Matter (PM), SO_2 and NO_x.
The concerning emission will be only from Point Source i.e. from Stack of Boiler, which will be released through a stack of 80 m. height.

The emissions from other point source i.e. exhausts of Diesel set will be of insignificant value.

Impact on Water Quality- During operation phase of the proposed plant, the water requirement wil be met from the Chikotra Dam. The total water requirement of plant is about 1640 m^3/day. The water from Chikotra Dam will be used for cooling water requirement. For the cooling purpose closed circulating water system, using the river water shall be used and zero effluent discharge will be implemented. This ensures there is no additional burden on the water resources of the region due to the proposed integrated project.
Waste water generated from the co-generation project will be treated in ETP and no effluent will be discharged outside the factory premises. SSSGSFL proposes to adopt spentwash fired boiler to treat the effluent generated form distillery.Rain water harvesting in factory premises will alos implemented.

Impact on noise quality- The proposed integrated project is going to have various in-house noises generating sources, such as turbines, generators, boilers, mills, fans, etc., noise level near any equipment shall be kept below 90 dBA. Considering maximum noise level of 90 dBA from major equipments, model prediction has been made for noise in plant and vicinity. Noise model has been used for predicting impacts due to proposed plant on ambient noise.

Impact on ecology- The following impacts are envisaged from the integrated project of distillery & co-generation:

- Sulfur dioxide (SO_2) is the main phytotoxic pollutant which may cause adverse impact to plants like produce acute injury in the form of foliar necrosis.
- High concentrations of sulfur dioxide can even after relatively short duration of exposure to SO_2 reduced growth and yield and increased senescence of plants.
- Fly ash contains particulate matter which disperse into the air and deposit on the leaf surface of plants affect the photosynthetic activity of plants ie .stomata get blocked by deposition of small particles resulting in lowering the rate of transpiration and carbon assimilation which causes reduction in photosynthetic rate.
- Air pollution (Due to traffic) causes injury to plants which can be evident in several ways. Injury to foliage may be visible in a short time and appear as necrotic lesions (dead tissue), or it can develop slowly as a yellowing or chlorosis of the leaf.

However in this project the particulate matter level emitted from stack is of negligible quantity as such no adverse effect can be expected. The emissions of particulates from the stacks will always remain below 50 mg/Nm^3.
Furthermore, emission of psrticulatematter through the 80 m tall stack results in a very wide dispersion of the particulates, leading to minimum annual average ground level

concentrations. Such low concentration of PM in the air and its deposition would not induce any change in the ecosystem.

Impact of Socio-economic condition- Due to the developemnet of the distillery and co-generation project there will be increase in infrastructure facility.and medical facility. Additionally the employment generation will be for local people which will improve the quality of life. This wil be major long term positive impact.

5. ENVIRONMENTAL MANAGEMENT PLAN

Environmental Management Plan includes the protection, mitigation and environmental enhancement measures to be implemented to nullify the adverse impact on the environment. The management of the SVSSKL will take all the necessary steps to control and mitigate the environmental pollution in the designing stage of the project. While implementing the project SVSSKL will follow guidelines specified by CPCB under the Corporate Responsibility for Environmental Protection (CREP) for cogen power plant & sugar industry. The EMP operation/implementation will be the responsibility of the "HSE Officer", who will be coordinating, arranging the collection and reporting of the results of all emissions, ambient air quality, noise and water quality monitoring.

7.1. EMP for Construction phase

The construction activities of the proposed activity will increase in dust concentrations and fugitive emission due to vehicles. Frequent water sprinkling in the vicinity of the construction sites will be undertaken. During construction phase SVSSKL will be taken care to provide all necessary facilities to construction workers such as water supply, sanitary facilities, temporary housing, sewage treatment facilities, drainage facilities and domestic fuels.

7.2. EMP for Operation phase

7.2.1 Air Environment

The major pollutants from boilers during operation phase are PM_{10} & $PM_{2.5}$, Sulphur Dioxide and Oxides of Nitrogen. These pollutant will be nullify by adopting following measure.

- Suitably designed ESP with efficiency of 99.9 % will be placed downstream of the stacks which will separate out the incoming dust in flue gas so as to maintain the emissions PM_{10} & $PM_{2.5}$ (50 mg/Nm3) at the outlet of the stack.
- The height of the stack will be 74 m and is of single chimney as per CPCB Norms .
- Stack emissions will be regularly monitored by SVSSKL/external agencies on periodic basis by installing online monitoring station.

- ❖ To control of the airborne fugitive emissions from the ash handling area will be achieved through regular water sprinkling in this area.
- ❖ Avenue plantation and green belt development will be undertaken in the operation phase.

7.2.2. Noise Environment

- ❖ All rotating items will be well lubricated and provided with enclosures as far as possible to reduce noise transmission. Vibration isolators will be provided to reduce vibration and noise wherever possible
- ❖ Manufacturers and suppliers of machine/equipment like compressors, STG turbines and generators will be manufactured as per OHSAS/MoEF guidelines.
- ❖ The personnel safety such as ear muffs, ear plugs and industrial helmets will also act as a noise reducers

7.2.3 Water Environment

The total fresh water requirement for the proposed activity will be 1460m^3/day during season and 1540 m^3/day during off-season and waste water generation will be 232 m^3/day during season and 227 m^3/day during off-season. The continuous efforts will be made to reduce the water consumption and thereby reduce wastewater generation. Periodic water audits will be conducted to explore the possibilities of minimizing water consumption.

100 % waste water will be recycled and reused so that plant will be operating on zero discharge concepts. Treated waste water will be used for dust suppression, green belt development, ash handling system and it will be recycled in process so that raw water consumption will be reduce.

7.2.4.Storm Water Management

Based on the rainfall intensity of the proposed area, storm water drainage system will be designed. Storm water drainage system will consist of well-designed network of open surface drains with rainwater harvesting pits.

7.2.5.Rain Water Harvesting Scheme*:*

RWH structures will be provided to harvest the rain water from roof TOP and plant area. The collected rain water will be utilized for plant uses to optimize the raw water requirement. The surface water run-off from the main plant area would be led to a sump for settling and the over flow would be collected in the common water basin for further uses in the plant to optimize the raw water requirement of the plant. The excess rain water may be discharged to the nearest surface water body through dedicated storm water drain for recharging the ground water

7.3 Solid waste management

Solid by-products such as bagasse, press mud and molasses are generated as process waste products (byproducts) from the industry. Press mud is supplied to member formers for their used as bio–manure and molasses is used in distilleries for its use as raw material in manufacture of ethanol. Bagasse produced from the Industry is used as a fuel in the boilers. Solid wastes such as boiler ash & ETP sludge are also produced from the proposed unit. These are disposed to farmers for their use as soil conditioner in land

7.3.1 Other solid waste

During operation some scrape will be generated it will be recycled by selling to authorized vendor. Dust bins will be placed at requisite locations. Solid waste generated from offices, canteens will be disposed in ecofrendly manner.

Sewage : Sewage from various buildings in the Project area will be conveyed through separate drains to the septic tank. The effluent from the septic tank will be disposed in soil, by providing disposing trenches. Oily water, if any, will be treated separately to remove oil / grease, before discharge into the effluent pond. The oily water collection in the plant is basically due to floor cleaning, leaky oil filters, etc. Provision for oil/grease separators will be made to skim oil / grease, if present in the waste water.

7.4 Occupational Health & Safety

During operation stage, dust is the main health hazard. Other health hazards are due to gas cutting, welding, noise and high temperature and micro ambient conditions especially near the boiler and platforms which may lead to adverse effects (Heat cramps, heat exhaustion and heat stress reaction) leading to local and systemic disorders.

- Adequate arrangements for preventing generation of dust by providing the chutes at transfer points to reduce the falling height of material, preventing spillage of material by maintaining the handling equipment, isolating the high dust generating areas by enclosing them in appropriate housing and appropriately de-dusting through high efficiency bag filters
- All workers engaged in material handling system will be regularly examined through PFT (Pulmonary Function Test) tests for lung diseases;

7.5 Ecology

Flora and fauna inventories within the project area will be monitored on a twice yearly basis, as well as before and during the construction and early operating activities. This may involve the use of specific indicators, such as the occurrence of nests or nesting bird species of importance. It is intended that the implementation of the monitoring program will be conducted on a co-operative basis by the various stakeholders in the area

7.6 Green Belt Development

The main objective of the green belt is to provide a buffer zone between the sources of pollution and the surrounding areas. The green belt helps to capture the fugitive emissions and attenuate the noise apart from improving the aesthetics quality of the region. An area of about 27 acres is proposed for greenbelt and trees will be planted in consultation with the local Forest Department.

7.7 Fire Fighting & Protection System

The fire fighting system will be designed in conformity with the recommendations of the Tariff Advisory Committee (TAC) of Insurance Association of India. . While designing the fire protection systems for this proposed project its extreme ambient conditions need special attention. Codes and Standards of National Fire Protection Association (NFPA) will be followed, as applicable. The different types of fire protection / detection system envisaged for the proposed activity.

EMP Cost

The cost of environmental protection measures is given in Table 6.

Table 6 - Cost of environmental protection measures

Sr. No.	Parameter	Capital Cost (Rs lakh)	O & M cost per annum (Rs. lakh)
1.	Effluent Treatment Plant (ETP) for the co-generation power plant	100	18
2.	Solid waste management / Ash handling system	**750**	20
3.	Gardening & Landscaping i.e. Green belt development	**22**	2.5
4.	Spentwash fired boiler	**500**	18
5.	Air pollution control	**500**	12
6.	Noise pollution control	**100**	6.50
Total Cost		**1972**	**77**

The capital cost for the environmental protection measures is Rs. 1972 Lakhs and recurring cost per annum is Rs. 77 Lakhs.

7. Environmental Monitoring

Environmental Monitoring is a tool to check the implementation of the Environmental Management Plan. It involves formation of a committee involving experts in various fields as well as Govt. officials for checking the implementation of the environmental management plan. The following monitoring plan is suggested for the project. The regular Environmental monitoring will be carried out to check the impact of the project on air, water, soil noise quality. Effluent from the distillery will also be monitored.

8. Project Benefits

The proposed sugar, distillery & co-generation project will have overall positive impact owing to the following benefits due to the project.

- The captioned project will have major socio-economic benefits including Employment generation, Infrastructure Development
- The benefits also include the socio-economic welfare measures viz. Advanced Soil Testing Laboratory Facility, Sugarcane Development Schemes.
- R & D facility plan including Adsali cane plantation Programme, encouraging reward for highest yield programme.
- Provision of Educational facilities.
- The proponent has allocated a total of Rs 6.20 crores for the socio-economic welfare of the people in the study area. The details of the same is tabulated below:

Budget for CSR activities

Sr. No.	Details	Financial provision (Rs in INR lacs)
1.	Soil testing for farmers	35
2.	Education facility on concessional rate	90
3.	PHC at campus for adjacent villages	40
4.	Ambulance and fire brigade	15
5.	Irrigation facility (Drip Irrigation) & seed distribution	200
6.	Training to farmers	10
7.	Providing of Bullock carts to farmers	150
8.	Pension scheme to parents of employees	80
Total		**620**

9.0 CONCLUSION

This industry will provide sugar, power as useful material for India, which will save foreign exchange in these days. This will not disturb the present landuse because our area occupied will be only small % of Influence zone 10 km. Compatible Architecture will be adopted and No Prime Agriculture Land will be put to this industrial use. Trees will be maintained and not razed down. No Rehabilitation is involved. The problematic waste materials of sugar mills like molasses, press mud and bagasse will be utilized within the existing project. People will get some jobs here and the sugar, power and organic compost generated here will be useful for farming, and some incidental small employment like eatery, canteen, tyre repairs, garage too will become available to genuine people. This will be beneficial to the society. Due to this project, farmer will get more prices for sugarcane.

- This project is very necessary in view of converting waste bagasse, molasses into useful steam, power and foreign exchange saver product.
- The local people desire that this industry will be welcome in their area.
- The candidate site is suitable from general MoEF expectations.
- Water, power, Raw material and Market is assured and found available with ease.
- Full precautions will be taken for Pollution Control, Resource Conservation and Environmental Protection.
- This is cost effective and Sustainable Development.