Executive Summary

for

190 KLPD Grain based Distillery

At

Survey No. 165, 168 & 169 Village Kolari, Tahsil Chimur, District Chandrapur (Maharashtra)

Proposed By

Manas Agro Industries & Infrastructure Limited- Unit 2,

5th Floor, Gupta Tower, Civil Lines,

NAGPUR – 440 001, Maharashtra

EXECUTIVE SUMMARY

1.0 INTRODUCTION

Manas Agro Industries & Infrastructure Ltd. (MAIIL) is a limited company registered under the Companies Act, 1956 having certificate of incorporation Corporate Identification Number (CIN): U15122MH2012PTC235369 of September 06, 2012.

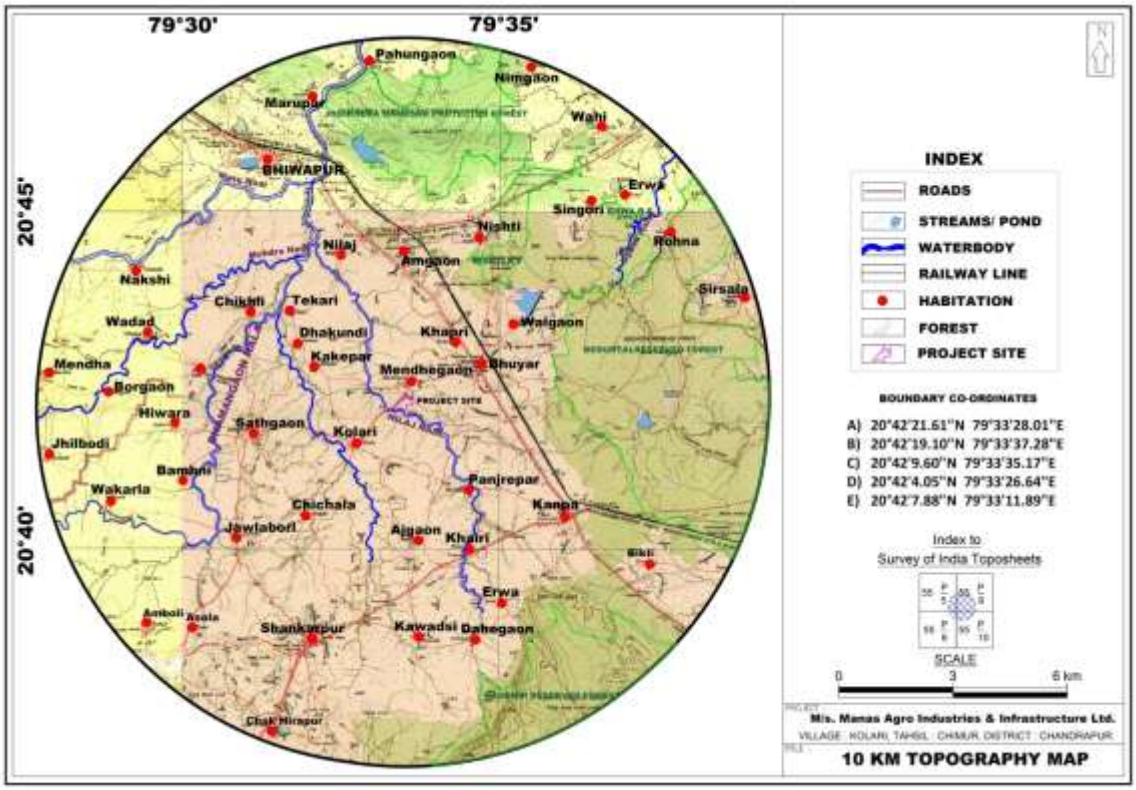
Manas Agro Industries & Infrastructure Limited has proposed 190 KLPD Grain Based Distillery at Unit 2, Survey No. 165, 168 & 169, Village Kolari, Tahsil Chimur, District Chandrapur Maharashtra.

The Industry shall process about broken rice (460-465 TPD) /Sorghum (517 - 520 TPD)/Corn (500-503 TPD)/Bajra (500-503 TPD) as raw material to produce the above products. The total cost of proposed project is estimated as Rs 150 Crores.

2.0 PROJECT DESCRIPTION

Manas Agro Industries & Infrastructure Limited has proposed 190 KLPD Grain Based Distillery at Unit 2, Survey No. 165, 168 & 169, Village Kolari, Tahsil Chimur, District Chandrapur Maharashtra. The unit is located at 2km away from SH-9. The latitude and longitude of the site are as follows:

S. No.	Latitude	Longitude
A	20°42'21.61"N	79°33'28.04"E
B	20°42'15.72"N	79°33'32.06"E
C	20°42'19.61"N	79°33'36.69"E
D	20°42'9.61"N	79°33'35.22"E
E	20°42'4.11"N	79°33'26.71"E
F	20°42'7.87"N	79°33'11.92"E
G	20°42'13.37"N	79°33'18.65"E
H	20°42'16.15"N	79°33'26.95"E



Source: SOI Toposheet

Topographical Map (10 km Radius)

Salient Features of the Proposed Project

1	Name of the project	Manas Agro Industries & Infrastructure Limited-Unit 2
2	Schedule	As per EIA Notification dated 14th September 2006, the project activity falls under Category 'B', S. No. 5 (g)
3	Registered office	5th Floor, Gupta Tower, Civil Lines, NAGPUR – 440 001, Maharashtra
4	Area of plant	14.16 Ha
5	Coordinates	A 20°42'21.61"N 79°33'28.04"E B 20°42'15.72"N 79°33'32.06"E C 20°42'19.61"N 79°33'36.69"E D 20°42'9.61"N 79°33'35.22"E E 20°42'4.11"N 79°33'26.71"E F 20°42'7.87"N 79°33'11.92"E G 20°42'13.37"N 79°33'18.65"E H 20°42'16.15"N 79°33'26.95"E
6	Units	Existing: 8 MW Biomass based Power Plant Proposed: 190 KLPD Grain Based Distillery

7	Water requirement & Source	The make up water requirement of 1570-1630 m^3/day for distillery shall be met from Nilaj Nadi.
8	Fuel requirement	MSEDCL, Captive Source

Production Scenario

Manas Agro Industries & Infrastructure Limited Unit 2 proposes 190 KLPD Grain Based Distillery

PROCESS DESCRIPTION

GRAIN STORAGE SILOS, CLEANING, HANDLING AND MILLING SECTION:

Grain is received from various sources and is pre-cleaned off Stones, husk, straws and iron metals etc. and then Stored in specially designed Storage Silos. Grains are continuously lifted from the bottom of the Silos and screened followed by removal of stones in De-stoner and iron metals in Magnetic Separators. Cleaned Grains are then milled using dry milling process in Hammer Mills. The flour is fed through the bucket elevator and conveyed to the Batch Machine through a Screw Conveyor.

2. SLURRY PREPARATION / LIQUEFACTION

Slurry from pre-masher is taken to Initial liquefaction tank where liquefying enzyme is added. The mixture of slurry and steam is then passed through the retention vessel (cook tube) having sufficient capacity to provide the desired retention time at a given flow rate. The cooked mash is discharged to a flash tank for liquefaction.

The gelatinized mash from the flash tank is further liquefied in a final liquefaction tank where liquefying enzyme is added. Then the liquefied mash is passed through plate heat exchanger and cooled slurry transferred to Fermentation section.

3. FERMENTATION SECTION

The purpose of fermentation is to convert the fermentable substrate into alcohol. At the start of the cycle, the fermenter is charged with mash and contents of the Yeast Activation Vessel. Significant heat release takes place during fermentation and Co2 is generated as by Product. This is removed by passing cooling water through the Fermenter PHE's to maintain an optimum temperature. The recirculating pumps also serve to empty the fermenter into Beer Well.

4. DISTILLATION SECTION

Wash to ENA Multi-pressure: -

Pre-heated fermented wash is fed into a series of Distillation Columns to increase the alcohol concentration and remove various impurities including Fusel oil as by product. The columns are termed as below:

a. Analyzer
b. Degasifier
c. Pre Rectifier
d. Extractive Distillation
e. Rectifier cum Exhaust
f. Recovery
g. Simmering

ENA drawn from the Simmering Column is taken to the receiver after cooling in ENA cooler.

5. EVAPORATION SECTION

The Spent Wash discharged from the Analyzer column bottom is taken to the Decanter for separation of suspended solids then thin slop to evaporation section for concentrating the slop up to 40%w/w solids.

Treatment scheme is a series of evaporation effects working on the principle of falling film Evaporation & Forced circulation.

6. DRYER SECTION

The concentrated syrup is mixed with the wet cake from the decantation section .This mixture is termed as DWGS which either sold as cattle feed or fed in Dryer to reduce the moisture up to 10%. This by product is termed as DDGS which is in a powder form.

7. PROCESS CONDENSATE TREATMENT SECTION

The process condensate from the evaporation section is partially recycled in making Grain Slurry and balance quantity treated in this unit and this treated condensate is then recycled back to process thus reducing the fresh water consumption.

PRODUCT SPECIFICATION

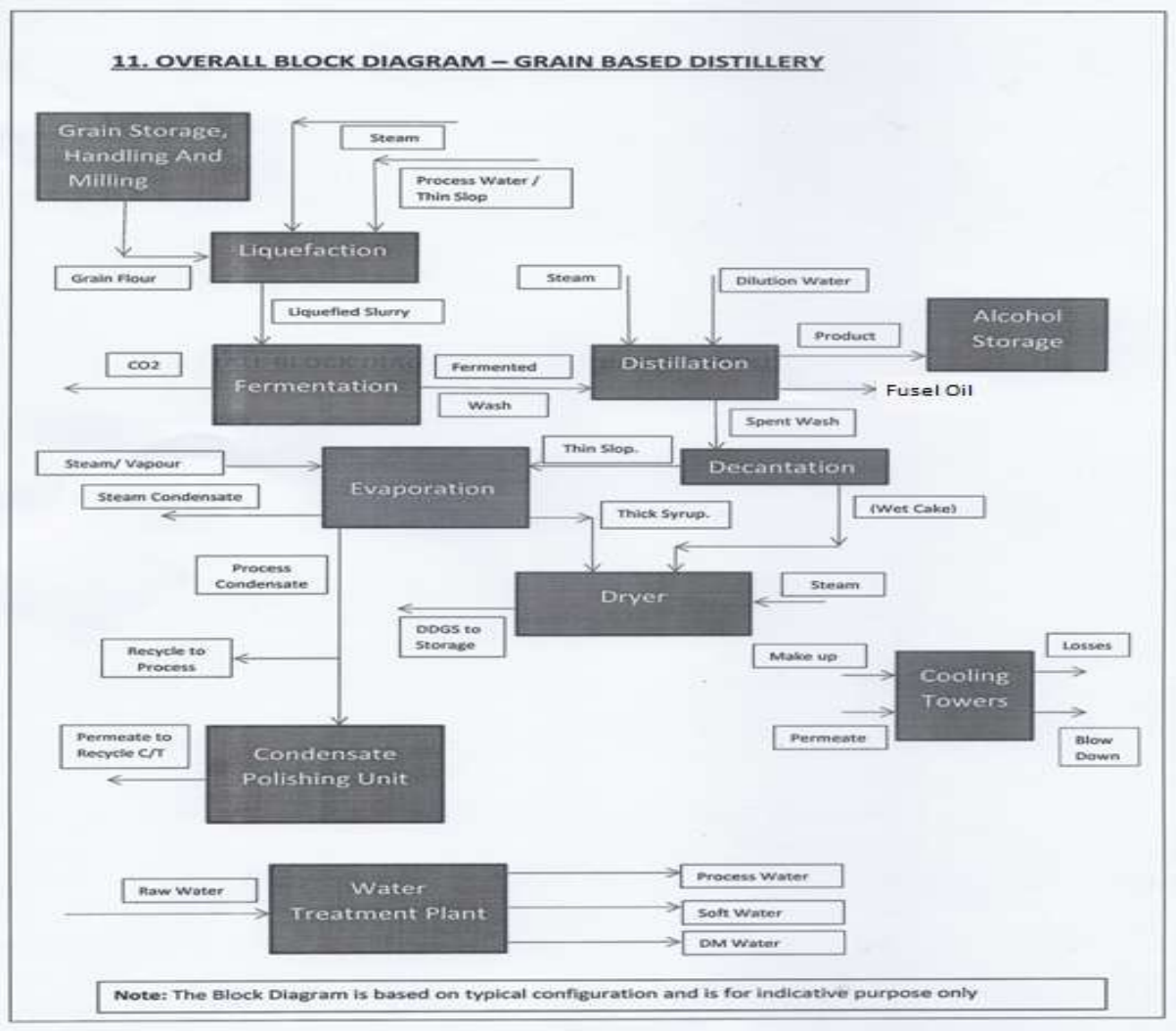
EXTRA NEUTRAL ALCOHOL (ENA):

S.NO	PARAMETER	UNIT	VALUE
1.	Specific Gravity at 15.6 deg C		0.80692
2.	Ethanol content at 20 deg C	% v/v	96
3.	Acid as acetic acid by GC Analysis	ppm	≤ 3
4.	Butanol	ppm	Nil
5.	Diacetal	ppb	200 max
6.	Aldehyde as acetaldehyde,	ppm	<1
7.	Esters as ethyl acetate	ppm	<1
8.	Copper	ppm	Nil
9.	Lead as Pb,	ppm	Nil
10.	Methanol	ppm	<2
11.	Furfural	ppm	Nil
12.	N-Propanol &iso-Propanol	ppm	Nil
13.	Dry Extract	ppm	Negligible
14.	Permanganate Time at 15 Deg C IS 1049	minutes	50

Typical DDGS Product Specification

Crude Protein, wt. percent, dry basis, min	30.0
Crude Fat, wt. percent, dry basis, min	6.0
Crude Fiber, wt. percent, dry basis, min	8.5
Ruminant TDN, wt. percent, dry basis, min	88.0

Note: This may vary depending on the quality of raw material.



PROCESS FLOW CHART FOR GRAIN BASED OPERATION

3.0 DESCRIPTION OF THE ENVIRONMENT

Air Environment

The ambient air quality monitored at 08 locations selected based on predominant wind direction, indicated the following ranges;

PM_{10}: 40.5 to 55.9 µg/m^3.

$PM_{2.5}$: 20.3 to 32.3 µg/m^3

SO_2 : 6.0 to 14.6 µg/m^3

NO_x : 9.0 to 26.8 µg/m^3

Industrial Area Residential, Rural Area (CPCB Norms)	PM_{10}	$PM_{2.5}$	SO_2	NOx
	100 μg/m^3	60 μg/m^3	80 μg/m^3	80 μg/m^3

The concentrations of PM_{10}, $PM_{2.5}$, SO_2 and NO_x were found within the National Ambient Air Quality Standards (NAAQ).

Water Environment

A total 16 samples including eight surface & eight ground water samples were collected and analyzed. The water samples were analyzed as per Standard Methods for Analysis of Water and Wastewater, American Public Health Association (APHA) Publication.

The data indicates that the ground water as well as the surface water quality are below the stipulated standard for drinking water (BIS 10500 – 2012) except high concentration of total coli form in surface water, which may be due to the human activities.

Noise Environment

Noise levels measured at eight stations are within limit of 55.0 dB (A) for Residential Area or 75.0 dB (A) for Industrial Area as given in MoEF Gazette notification for National Ambient Noise Level Standard.

Area Code	**Category of Area**	**Limits in dB(A) Leq**	
		Day time	**Night time**
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone**	50	40

**** Silence zone is defined as area up to 100 meters around premises of hospitals, educational institutions and courts. Use of vehicle horns, loud speakers and bursting of crackers are banned in these zones

Land Environment

The observations of soil characteristics are discussed parameter wise below;

a) Texture of all soil samples are Silty Clay Loam, Silt Loam and sandy Loamy in Texture Classification.

b) Colour of soil samples from is yellow & grey in color.

c) The bulk density of soil samples are in the range of 1.54 to1.98 gm/cc.

d) Soil samples have pH values in the range of 7.1 to 7.8. The pH values are indicating nature of soil samples as neutral.

e) Soil samples have conductivities between 0.054 to 0.152 mmhos/cm.

f) Soil samples have Organic Matter between 0.72 to 1.2 %. These values represent average fertility of soils.

g) Soil samples have concentration of Available Nitrogen values ranged between 212.0 to 433.0 kg/ha.

h) Soil sample have concentration of Available Phosphorous values ranged between 37.4 to 62.0 kg/ha.

i) Soil sample have concentration of Available Potassium values range between 263.4 to 463.6 kg/ha.

4.0 ANTICIPATED IMPACTS & MITIGATION MEASURES

Impact on Air Quality

Operational phase activities may have impacts minor or major, positive or negative on environmental discipline such as soils, surface and ground water hydrology, micro meteorology, water use, water and air quality, ecology, socio economics & noise environment. This phase includes following activities:

- Raw material storage
- Product manufacturing
- Product storage
- Transportation
- Gaseous emission
- Effluent discharge
- Solid waste generation

- Occasional equipment failure/ process upset and related problems
- Industrial development
- Chemical hazards

Mitigation Measures

The operational phase of the project comprises of various activities each of which will have an impact on air quality. The impact on air quality can be due to:

- The source of dust emissions is loading/unloading, transportation and storage of raw material& finished product.
- Adequate pollution control measures will be taken to keep the emissions from all sources within the statutory norms. Spraying of water on roads will be done to control such emissions.
- In a plant, the major emission from stack is Particulate Matter (PM) emissions.

Efficient Air Pollution Control Equipment (APCE) like ESP are installed at stack to keep the emissions within the permissible limits. Proper upkeep and maintenance of vehicles will be done. Hence, the overall quality of the ambient air will be maintained within the limit prescribed by CPCB/SPCB after the commencement of the operation of proposed project. ESP as air pollution control measure to existing boiler. Also, stack of adequate height, 60 m is installed to disperse the flue gas.

Noise Levels

During the operation phase noise will be generated from noise generating sources. The principle source of noise from industry are from fans, centrifuge, steam traps, steam vents etc. Exposure to excessive noise produces varying degree of damage to human hearing system which is initially reversible. Speech interference, sleep interference annoyance, mental fatigue and headache are few of the other effects which are caused by the high level exposure of long duration noise. In certain circumstances noise can cause decreased electrical resistance in the skin and a reduction in gastric activity.

Mitigation Measures

The ambient noise levels in the study area within permissible limits and will remain stipulated/prescribed limit even after commissioning of the proposed project.

The general mitigation for the attenuation of the noise are given below:

- Noise level can be reduced by stopping leakages from various steam lines, compressed air lines and other high pressure equipment
- By providing padding at various locations to avoid rattling due to vibration
- Encasement of noise generating equipment where otherwise noise cannot be controlled
- Providing noise proof cabins to operators where remote control for operating noise generating equipment is feasible.
- In all the design/installation precautions are taken as specified by the manufacturers with respect to noise control will be strictly adhered to;

Impact on Water

During operation, Grain Slops will be taken through Centrifuge Decanters for separation of suspended solids.

Disposal of liquid effluent

- "Zero Effluent Discharge system shall be provided with basic principle of concentration and evaporation of effluent. The DDGS shall be sold to purchaser as Cattle Feed, Poultry & Fisheries.
- Industrial liquid waste like DM plant effluent shall be neutralized.
- Domestic sewage shall be treated in STP.

Impact on Land

The proposed project site of 14.16 ha. area is identified for distillery unit. Along with implementation of project, 33 % of the land area will be covered with greenery. The land is owned by the company.

Pollutants from the proposed activity damage the porosity, oxygen transfer is hampered and the degradation of the effluent organics in soil depletes of nitrogen. These factors cause germination disorders in seeds that are planted. Prolonged land irrigation using effluent, may cause soil sickness. Soil quality may be affected by accidental leakage and spillage of hazardous chemicals/oils during handling. Improper segregation and disposal of solid waste generated during operation of the proposed project.

Mitigation measures:

- DDGS (by product) will be sold as Cattle Feed, Poultry & Fisheries.
- Appropriate measures are adopted for slope stabilization to reduce land erosions.
- Used oil from D.G. Set shall be sold to recyclers.
- All hazardous wastes shall be securely stored, under a shed for eventual transportation and disposal to the authorized dearler by MPCB.

Solid Waste Generation

Solid & Hazardous Waste Management

Type of Waste	Quantity	Storage	Utilization/ Disposal
DDGS – (by product)	117 to 135 TPD	Covered shed	Sold as Cattle Feed, Poultry & Fisheries
Waste papers/Boxes	0.01TPD	Covered shed	To recyclers
Used Oil	0.01TPD	HDPE drums in covered shed	Given to re-cycler authorized by MPPCB/MoEF
Spent Resin from DM Plant	0.01TPD	HDPE drums in covered shed	Given to re-cycler authorized by MPPCB/MoEF

Impact on Socio-Economic Environment

The proposed project is expected to have several positive impacts on demography and socio-economic condition which are listed below:

- Increase in employment opportunities so as people will not migrate outside for employment.
- Increase in literacy rate.
- Growth in service sectors
- Improvement in prices of indigenous produce and services benefiting local people such as increase in land value, house rent rates and labour wages.
- Improvement in socio-cultural environment of the area.
- Improvement in transport, communication, health and educational services.

- Increase in employment due to increased business, trade, commerce and service sector.

5.0 ENVIRONMENTAL MONITORING PROGRAMME

Attributes	Sampling Network	Frequency	Measurement Method
Air Environment			
Meteorological • Wind speed • Wind direction • Dry bulb temperature • Wet bulb temperature • Relative humidity • Rainfall	Project impact area	Continuous Hourly	Mechanical/automatic weather station
Pollutants (PM10, PM2.5, SO2, NOx)	4 locations in the project impact area. Two stations along the boundary of unit in upwind and down wind direction and two station at village	Once in Month	Gravimetric
Water	Set of grab samples during for ground and surface water for 5km distance	Pre and post monsoon	Samples for water quality should be collected and analysed as per : 1. IS : 3025 methods for Methods of sampling and test (physical and chemical) for water and wastewater 2. Standard methods for examination of water and wastewater analysis published by American Public Health Association.
Noise	At premises of boundary (04 samples)	Quarterly	Instrument : Noise level meter IS:4954-1968 as adopted by CPCB
Soil	06 locations around the plant	Yearly	As CPCB protocol For parameters viz pH, conductivity, Organic matter, organic C, NPK, WHC, moisture, particle size distribution, Fe, Cu, Zn,
Socio-economic	Socio-economic survey is based on		Regular meeting with local gram Panchayat

	proportionate, stratified and random sampling method		Need base programme may be prepared with the help of Gram panchayat under CSR activity.
Land	Land Use Pattern	Once in three year	-

6.0 CAPITAL COST

The total cost of proposed project is estimated as Rs 150 Crores

7.0 CER PLAN

Manas Agro Industries & Infrastructure Ltd. is equally conscious for the all-round socio-economic development and is committed to raise the quality of life and social well-being of communities where it operates. Its CER initiatives will be prioritized on local needs, which focus on Health, Education and Environment Conservation.

8.0 OCCUPATIONAL HEALTH MEASURES

A medical facility with qualified doctor and clinical facilities will be created in the industry to meet the factory and residential colony requirement of the health services. Higher medical services shall be availed from the hospitals present in Chandrapur. Health care aspects to be practiced in the industry are indicated below.

- Health and safety related displays will be exhibited at strategic locations in the industry.
- Workers will be educated and trained in occupational health safety.
- Regular health check-up of the workers will be carried out and health records of individual workers will be maintained.
- Spirometry, X-rays and other routine and specific tests will be conducted and submitted to authorities
- Utility rooms provided will be provided with facilities and properly maintained.
- First aid facilities will be provided at different locations. Further first aiders will be trained.
- Housekeeping in the industry, sanitation in utility rooms, canteen, Rest rooms and other places will be given top priority.

9.0 ENVIRONMENTAL MANAGEMENT

Various purposes of the environmental management plan are:

- To treat with appropriate technology and dispose-off all the pollutants viz. liquid, gaseous and solid waste in accordance with statutory requirements (Relevant Pollution Control Acts).
- To support the environmental management system to achieve environmental standards and to improve the methods of environmental management.
- To promote green-belt development.
- To encourage good working conditions for employees.
- To reduce fire and accident hazards.
- To prepare budget for environment management system.
- To adopt cleaner production technology and waste minimization program.

Environmental Management Cell will chalk out a site-based strategy to control pollution. The strategy will include formulation of code of action for controlling air, water, noise, soil pollution, phase wise afforestation, and also actions to be taken in respect of socio-economic development. Frequency of monitoring/sampling and inspection of various parameters/factors will also be planned.

- Planning of conservation programmes with to respect of water, waste and energy
- Identify and record the constraints in respect of environmental planning and implementation
- Proper documentation of all the field monitoring and laboratory analysis results.
- EMC will prepare periodic progress reports, which will include the analysis and inspection results. Environmental audit results and action taken should also be properly documented.
- Planning of management responsibilities defined for various environmental matters.

10.0 CONCLUSION

It can be concluded that there would be negligible impact in the buffer zone due to the proposed expansion. The project shall contribute to the socio-economic development, strengthening of infrastructural facilities like medical, educational etc. The plant shall be operated keeping "Sustainable Development" of the region in mind.

Further, management is committed to contribute towards improving socio-economic status of

the surrounding local community.

Environmental monitoring is a successful tool for the management for implementation of adequate & effective environmental measures. It also helps the management to take mid-course correction, if required based on the environmental monitoring results. Considering the above overwhelming positive impact on the community, there shall be overall development of the area.