EXECUTIVE SUMMARY

of

25 MW Captive Power Plant

At Plot No A- 23 MIDC Area, Tadali Growth Centre,
District – Chandrapur, Maharashtra

Project Proponent:

M/s. Grace Industries Limited.

Prepared By

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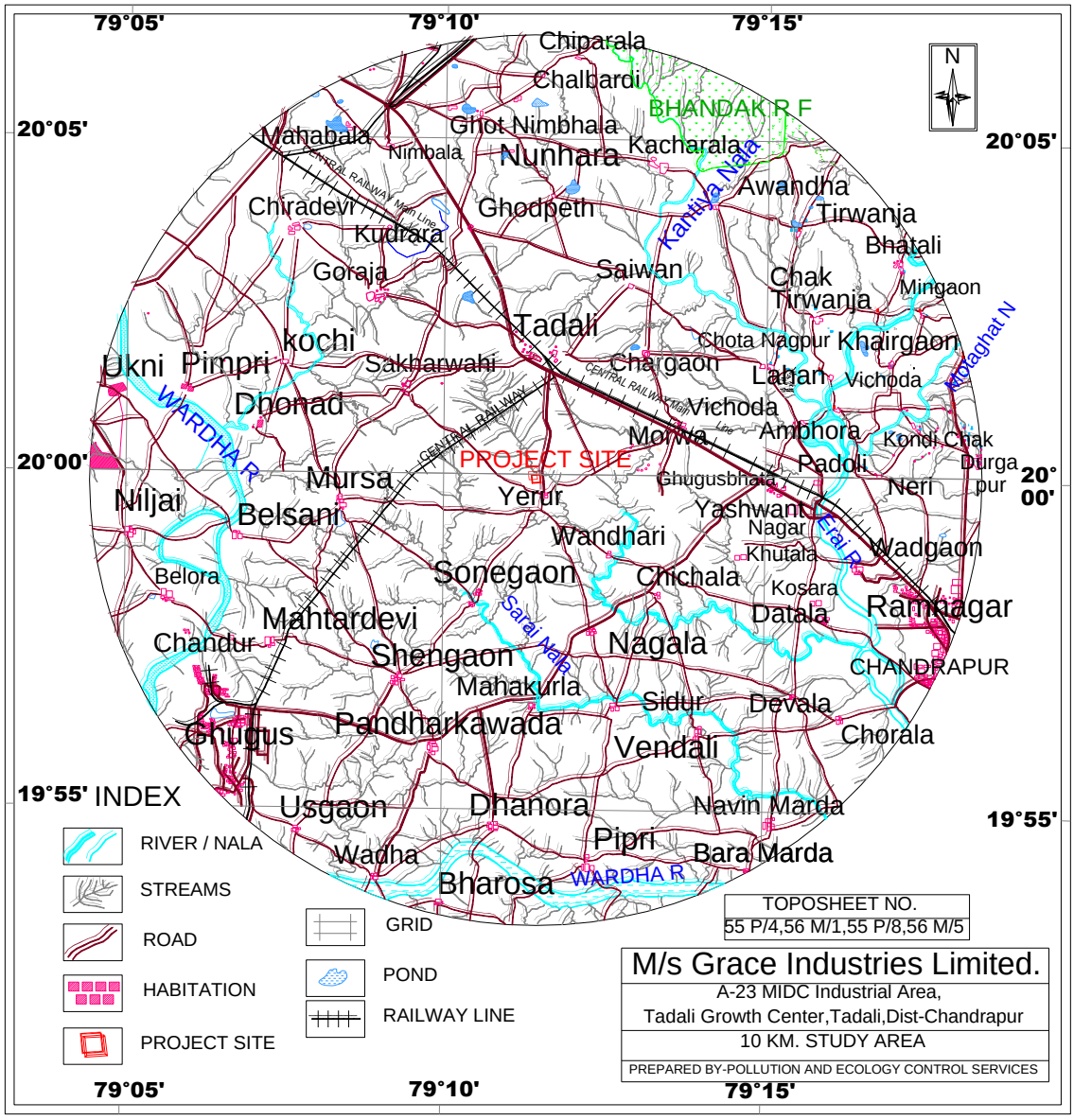
NABET No. : QCI/NABET/EIA/ACO/18/0684

EXECUTIVE SUMMARY

INTRODUCTION

M/s. Grace Industries Limited (GIL) incorporated in August 2003 is operating Sponge Iron Plant (4x100TPD) and 8MW WHRB based CPP at Plot No. A-23, MIDC, Tadali Industrial Area, Village - Tadali, Taluka & Dist. -Chandrapur. The construction of 25 MW CPP is almost 80% completed and hence applied under notification dated 8th March 2018 for violation cases. Proposed project cost is estimated to be Rs. 95 Crores. M/s. Grace Industries Limited was taken over by new management i.e M/s. Sanvijay Rolling & Engineering Limited in the year 2008. Soon after taking over new management applied for Environmental Clearance for 25 MW CPP dated 15/01/2009 in SEAC and same has been considered and recommended by the Committee in the 19th SEAC Meeting held on 18/11/2009 for the grant of Prior Environmental Clearance.

Meanwhile, the Ministry of Environment Forest and Climate Change vide office memorandum imposed moratorium No. J-11013/5/2010-IA.II (I) in 2010 for Environmental clearance of project located in 43 critically polluted area including Chandrapur. As per this moratorium, there was no scope for any expansion, modernization or value addition to Sponge Iron Plant and CPP. Ministry of Environment Forest and Climate Change has lifted moratorium on 20th May 2016. In view of lifted moratorium, M/s. Grace Industries Limited applied vide proposal no. IA/MH/IND/56327/2016 dated 17th June 2016 for Installation of Induction Furnace , Rolling Mill and Ferro Alloys (SAF) Captive Power Plant 33MW including 8MW (WHRB) and same has been considered in the 9th EAC (Industry - I) Meeting held on 27th July to 29th July for grant of TOR. Ministry of Environment, Forest & Climate Change intimated vide letter no. F.No. J-11011/206/2016.IA.II (I) dated 13th January 2017, 25MW CPP is a case of violation as the construction activity started by previous management prior to issue of Environmental Clearance & not considered for TOR till appropriate Notification is issued for cases of Violation. As per the MoEF & CC Notification dated 8th March 2018 amending the notification of 14th March 2017, all category B projects fall under violation category are dealt by respective states SEAC and SEIAA. So the proposed project of 25 MW power plant was presented in the 151st SEAC meeting held on 23rd May 2018 for the grant of TOR.



Source: SOI Toposheet

10 Km Study Area of Project Site

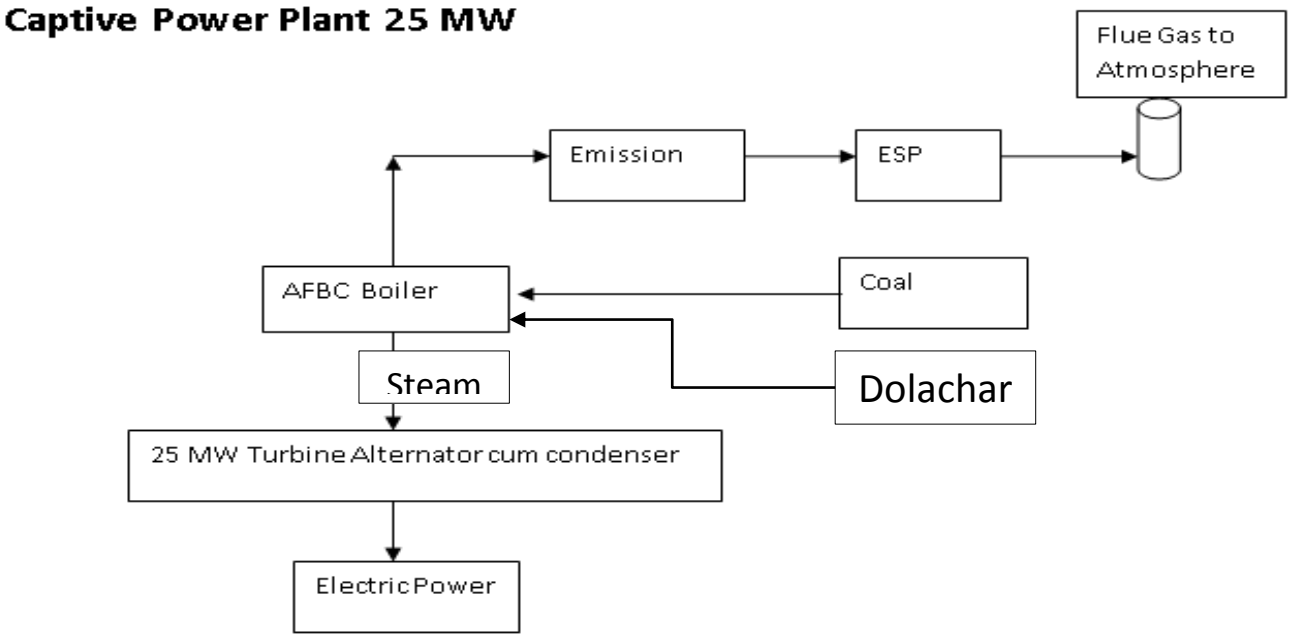
DESCRIPTION OF PROCESS

The manufacturing process details are given below:

Captive Power Plant

The CPP comprises of WHR Boiler (8MW) and coal based AFBC boiler for 25MW, TG Sets and other power plant related auxiliaries such as cooling tower and boiler feed

pumps. Steam requirement of the CPP are fulfilled from one WHR Boiler and one FBC boiler .The waste gases from the DR plant, kiln exhaust are passed through WHR Boiler that is top supported and is a three pass natural circulation boiler. WHR Boiler utilizes heat for generating steam. FBC boiler consumes as fuel the by-products of DR Plant such as DRI ash, ESP dust, coal fines coal, Dolachar etc. The steam exhausted from the turbines is condensed in air cooled steam condenser and thereafter taken through ejectors, vent steam and gland steam condensers for de-aeration and feed storage with the help of condensation extraction pumps. A cooling tower is provided for exhausting the heat generated during the process of condensation.



Captive Power Plant 25 MW

DESCRIPTION OF ENVIRONMENT

Air Environment

The baseline environmental quality for the September, October, November, and December 2017 was assessed in an area of 10 km radius around the proposed project site.

The predominant wind directions are from E and S.

The ambient air quality monitored at 8 locations selected based on predominant wind direction, indicated the following ranges;

PM_{10} - 38.3 to 63.4 µg/m^3.

$PM_{2.5}$ - 18.6 to 32.4 µg/m^3

SO_2 - 7.1 to 21.4 µg/m^3

NO_x - 14.5 to 38.5 µg/m^3

Industrial Area Residential, Rural Area (CPCB Norms)	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 11 samples including six surface & five 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 (IS 10500 – 1993 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 soil samples from agriculture lands and waste land are silty loam.

(b) Colour of soil samples from agriculture and waste lands are gray.

(c) The bulk density of soil samples from waste land are in the range of 1.43 to 1.47 g/cc and sample from agriculture land (S-2) are in the range of 1.45 to 1.51 g/cc and sample from agricultural land (S-3) are in the range of 1.46 to 1.51 g/cc.

(d) Soil samples from waste land have pH values between 6.80 to 7.10 and sample from agriculture land (S-2) have 7.4 to 7.7 and sample from agricultural land (S-3) have 7.2 to 7.4 ranges of pH values. The pH values are indicating nature of soil samples is neutral to alkaline.

(e) Soil samples from waste land have conductivities between 0.486 to 0.619mmhos/cm and conductivities of soil sample from agriculture land (S-2) ranges between 0.196 to 0.218mmhos/cm and conductivities of soil sample from agricultural land(S-3) ranges between 0.199 to 0.220 mmhos/cm.

(f) Soil samples from waste land have Organic Matter between 0.05 to 0.10 % and sample from agriculture land(S-2) have between 0.30 to 0.39 % Organic Matter and sample from agricultural land(S-3) have between 0.34 to 0.44%. These values represent moderate fertility of soils.

(g) Soil samples from waste land have concentration of Available Nitrogen values ranged between 20 to 40 kg/ha and samples from agriculture land (S-2) range between 120 to 160 kg/ha and samples from agricultural land (S-3) range between 140 to 180 kg/ha Available Nitrogen value.

(h) Soil sample from waste land have concentration of Available Phosphorous values ranged between 37.7 to 44.6 kg/ha and soil samples from agriculture land (S-2) have concentration values ranges from 46.2 to 68.5 kg/ha and samples from agricultural land (S-3) have concentration values ranges from 24.6 to 45.4 kg/ha.

(i) Soil sample from waste land have concentration of Available Potassium values range between 919.4 to 1162.3 kg/ha and sample from agriculture land (S-2) concentration of

Available Potassium as its values range between 423.5 to 514.2 kg/ha and sample from agricultural land (S-3) have values range between 378.2 to 394.6 kg/ha.

(j) Characteristic of Waste land soil is a little deficient in nutrients concentration. Whereas, agricultural land soils are moderately suitable for cultivation of climatic crops and have average fertility.

ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

Construction Phase

During construction phase, dust will be the main pollutant, which will be generated from the site development activities and vehicular movement on the road. Further, concentration of NO_x and CO may also slightly increase due to increase in vehicular traffic movement.

Mitigation Measures

- It is necessary to control the dust emissions particularly during dry weather. This will be achieved by regular water sprinkling all over the exposed area, at least twice a day using truck-mounted sprinklers. The nose-mask will be provided to workers in dust prone area.
- Ambient NO_x and CO levels will increase due to operation of construction machinery such as excavators, trucks etc. However, increase in levels of these pollutants is expected to be insignificant since these machines will be operated intermittently.
- Equipment are not stationary and would be moving from one place to other, hence there will not be increase in concentration of emissions at a single location. Nevertheless, it will be ensured that both gasoline and diesel powered construction vehicles are properly maintained to minimize exhaust emissions.
- The construction will not be carried out in night time.

Operation phase

Air Environment

The impacts on air quality due to source of the air pollutant in the proposed facilities have been identified.

Sources of Emissions

Emissions released from the stack during operation phase will get dispersed in the atmosphere and finally reach the ground at a specified distance from the sources. From the proposed activities the possible environmental impact on air quality has been envisaged due to the following sources.

In this case the source emission is envisaged from furnace. One Stack of height of 90 m are proposed for proper dispersion of gases.

Raw Material Handling / Transport System

The possible pollutants are fugitive dust emissions from raw materials handling areas viz. loading / unloading, fuel stockyard, crushing units etc. The major sources of pollution from proposed units can be classified under the following heads:

- Pollutants in the waste gases namely, particulate matter (PM_{10} and $PM_{2.5}$), sulphur dioxide, NOX and Carbon monoxide, etc.
- Fugitive dust generated during vehicular movement.

Mitigation Measures

- M/s. Grace Industries shall provide the dust suppression system in the form of water sprinklers.
- All bins are totally packed and covered so that there is no chance of dust leakage.
- All discharge and feed points wherever the possibility of dust generation is there is provided with dust suppression system.
- All material transfer points are connected with dust suppression water nozzles to avoid air pollution.

- ESP followed by Stack of 90m height

Prediction of Air quality

The mathematical model used for predictions on air quality impact in the present study area is ISC-AERMOD View. It is the next generation air dispersion model, which incorporates planetary boundary layer concepts. These models are used extensively to assess pollution concentration and deposition from a wide variety of sources. The predicted values in respect to PM_{10}, $PM_{2.5,}$ SOx and NOx were found to be below the Ambient Air Quality Standard of CPCB.

Impact on Water Environment

Construction phase

The water requirement during construction for the proposed plant will be met from MIDC. Water will be required for construction activities, sprinkling on pavements for dust suppression and domestic & non domestic usages. Runoffs from the construction yards and worker's camps during monsoon may affect the quality of water bodies in the project area. Impact on water quality during the construction phase may arise due to non-point discharges of sewage from the workers camp stationed at the project site.

Mitigation Measures

- ❖ Stone pitching on the slopes and construction of concrete drains for storm water to minimize soil erosion in the area will be undertaken.
- ❖ The development of green belt will be undertaken during the monsoon season.
- ❖ Soil binding and fast growing vegetation will be grown within the plant premises to arrest the soil erosion.

The overall impact on water environment during construction phase of the proposed plant will be temporary and insignificant.

Operation phase

The total water requirement for the proposed activities is 150 m^3/day. There will not be any impact on the water quality as no wastewater will be generated from the process.

The sewage generated from the toilets and bathroom of the proposed facility will be 2 m^3/day which will be disposed through septic tank.

Impact on Noise Environment

Operation phase

During operation, the major noise generating sources are crushing mill, auto loading section, electric motors etc. These sources will be located far off from each other. Under any circumstances the noise level from each of these sources will not exceed 85 dB (A).

Noise levels generated in the project site will be confined to the noise generating plant units hence the impact of noise levels on surroundings will be insignificant.

Mitigation Measures

The noise levels stipulated by Central Pollution Control Board at any point of time will not exceed the standards. The equipments will have inbuilt noise control devices. The measured noise level produced by any equipment will not exceed 85 dB(A) at a distance of 1.0-m from its boundary in any direction under any load condition. The noise produced in valves and piping associated with handling compressible and incompressible fluids will be attenuated to 75 dB(A) at a distance of 1.0 m from the source by the use of low noise trims, baffle plate silencers/line silencers, acoustic lagging (insulation), thick-walled pipe work as and where necessary. The general mitigation for the attenuation of the noise are given below:

- By providing padding at various locations to avoid sharp noise 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;

- ❖ High noise generating sources will be insulated adequately by providing suitable enclosures;
- ❖ Use of lagging with attenuation properties on plant components / installation of sound attenuation panels around the equipment
- ❖ Other than the regular maintenance of the various equipment, ear plugs/muffs are recommended for the personnel working close to the noise generating units;
- ❖ All the openings like covers, partitions will be designed properly
- ❖ Inlet and outlet mufflers will be provided which are easy to design and construct.
- ❖ All rotating items will be well lubricated and provided with enclosures as far as possible to reduce noise transmission. Extensive vibration monitoring system will be provided to check and reduce vibrations. Vibration isolators will be provided to reduce vibration and noise wherever possible;
- ❖ The insulation provided for prevention of loss of heat and personnel safety will also act as noise reducers.

Impact on Terrestrial ecology

The reserved forest in the study area is in patches. There is no designated ecological park or Bio Reserve/Wild life sanctuary in the 10 km radius of the proposed plant site. The impact on terrestrial ecology will be negligible and shall be insignificant.

SOLID WASTE

Operation phase

The solid waste generation in the proposed activities is given in following Table

Solid Waste Generation & Mitigation Measures

Waste	Quantity	Mitigation Measures
Ash	220T/day	Sold to brick manufacturers

Mitigation Measures

- Solid waste of ash generated will be about 220T/day in the proposed project.
- Solid waste is non hazardous and non-toxic in nature.
- Solid waste is sold to brick manufacturers.
- The Dolachar generated from the existing Sponge Iron Plant will be used in the Proposed 25 MW Power Plant.

SOCIO-ECONOMIC ENVIRONMENT

Operation phase

The impacts of the proposed project, during its operation, on demography and socio-economic condition can be identified as follows.

- Negative impacts can be depletion of natural resources like water and land, depletion in air quality if proper mitigative measures are not taken.
- Increase in employment opportunities and Reduction in migrants to outside for employment.
- Growth in service sectors.
- During operation phase 100 technical and non technical people will be employed.
- Increase in consumer prices of indigenous produce and services, land prices, house rent rates and Labour prices.
- Improvement in socio-economic environment of the study area.
- Improvement in transport, communication, health and educational services.
- Increase in employment due to increased business, trade commerce and service sector.
- The overall impact on the socio economic environment will be significant.

The management of M/s Grace Industries Limited has proposed to give preference to local people for recruitment in semi skilled and unskilled categories.

ENVIRONMENT MONITORING PROGRAMME

The environmental monitoring is important to assess performance of pollution control equipment installed in the proposed power plant of M/s Grace Industries Ltd. The

sampling and analysis of environmental attributes including monitoring locations will be as per the guidelines of the Central Pollution Control Board/ State Pollution Control Board.

Environmental monitoring will be conducted on regular basis by M/s Grace Industries Ltd. to assess the pollution level in the proposed plant as well in the surrounding area. Therefore, regular monitoring program of the environmental parameters is essential to take into account the environmental pollutant of the study area. The objective of monitoring is:

- To verify the result of the impact assessment study in particular with regards to new developments;
- To follow the trend of parameters which have been identified as critical;
- To check or assess the efficiency of the controlling measures;
- To ensure that new parameters, other than those identified in the impact assessment study, do not become critical due to the commissioning of proposed facilities;
- To check assumptions made with regard to the development and to detect deviations in order to initiate necessary measures;
- To establish a database for future Impact Assessment Studies for new projects.

The attributes, which needs regular monitoring, are specified below:

- Air quality
- Water and wastewater quality;
- Noise levels;
- Soil quality;
- Ecological preservation and afforestation; and
- Socio Economic aspects and community development

ENVIRONMENT MANAGEMENT PLAN

Overview of Pollution Control Management

SOURCE	POLLUTANTS	CONTROL MEASURES
A. Air pollution Power Plant	$PM_{10,}PM_{2.5}$	ESP
B. Solid waste	Ash	Manufacturing of Bricks.

Air Environment

The sources of air pollution are raw material handling system, materials transportation, raw materials feeding to the operating equipments. Stacks of adequate height of 90 m is proposed for proper dispersion of gases. The following Environmental Management Plan will be implemented to control air emissions. Stack of 90.m height for Boiler of 25 MW CPP for proper dispersion of pollutants will be installed.

Diesel Generators: Emissions from the DG Set during operation phase may cause some localized impact on ambient air quality for emergency, as it will be operated during power failure only. Stack of adequate height and acoustic enclosure will be provided with the DG Set as per guidelines of CPCB.

Action Plan to Control of Fugitive Emission

- The dust generated from coal handling plant will be suppressed by providing adequate water spraying systems
- Periodic checking of vehicles and machinery to ensure compliance to emission standards
- Jet Pulse bag filters will be provided at all the points like material conveying and transfer points;
- The control of the airborne fugitive emissions from the ash pond will be achieved through maintaining a permanent blanket of water cover on the ash pond
- Attenuation of pollution/protection of receptor through green belts/green cover
- Avenue plantation and green belt development will be undertaken in the operation phase.

Stack Gas Monitoring

The emissions from the stack will be monitored continuously for exit concentration of the PM_{10} and $PM_{2.5}$, SO_X and NOx. The probes will indicate if the concentration of the pollutants if exceeds the limits, necessary control measures will be taken by management. Sampling ports will be provided in the stacks as per CPCB guidelines.

Noise Environment

- By providing padding at various locations to avoid sharp noise due to vibration.
- Other than the regular maintenance of the various equipment, ear plugs/muffs are recommended for the personnel working close to the noise generating units;
- All the openings like covers, partitions will be designed properly
- Inlet and outlet mufflers will be provided which are easy to design and construct.
- All rotating items will be well lubricated and provided with enclosures as far as possible to reduce noise transmission.
- The insulation provided for prevention of loss of heat and personnel safety will also act as noise reducers.

Water Environment

The total water requirement for the proposed activities will be 500 KLD for 25 MW CPP. Water will be sourced from MIDC Tadali Growth Center. Because of the technology of electricity production the degree of water pollution caused by waste water is relatively low. The major pollutants are lubricating oil, grease and dust in the water. Care will therefore, be exercised to design feeding and draining of water for all machinery on close circuit basis so that no waste water is discharged from the plant during normal operation and the same is recirculated after proper treatment

The major sources of liquid effluents, which may induce water pollution are as follows:

- Blow down water from boiler
- DM Plant washing
- Cooling tower blow down

Above effluent will be treated separately before leading the same to Guard pond for recycle & reuse.

Land Environment

Green belt

Land is already used for industrial purpose. The existing sponge iron plant is in operation. The proposed project will be constructed within the existing project and there is a well-developed green belt all around the boundary of the plots as well as all around the various units.

Total land of the proposed project is 12.5 Ha. Green belt will be developed in 30% (3.79 Ha) of the total land.

Management Plan of Solid waste

The fly ash generated from the proposed power plant unit will be used for brick manufacturing.

Ash Handling System

Fly ash and bed ash collected from various points of Boilers/ESPs will be pneumatically transported to independent steel hoppers for storage. These hoppers will be provided with separate/ independent ash transmitters / dense phase system for transporting fly ash, bed ash to brick manufacturers, so that fugitive emissions can be eliminated to the maximum extent.

Socio Economic Environment

M/s. Grace Industries Limited would aid in the overall social and economic development of the region. The plant will give direct employment to about it will require over 100 including direct & indirect employees of local area. In order to mitigate the adverse impacts likely to arise in the proposed project activities and also to minimize the apprehensions to the local people, it is necessary to formulate an affective EMP for smooth initiation and functioning of the project. The suggestions are given below:

- Communication with the local people will be established regular basis by project authority to provide an opportunity for local youth.
- Project authorities will undertake regular environmental awareness program on environmental management.
- Job opportunities are the most demanding factor, the local people as per their education will be employed.

- For social welfare activities to be undertaken by the project authorities, collaboration should be sought with the local administration, gram panchayat, block development office etc for better coordination.

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 power station 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 entire power plant are given below.

Hydrant System for entire area of power plant.

High Velocity Water Spray System (HVWS) for Generator Transformer (GT), Unit Auxiliary transformer (UAT), Station Transformer (ST), and turbine lube oil canal pipe lines in main plant, Boiler burner front, diesel oil tank of DG set, main lube oil tank, clean and dirty lube oil tanks.

Foam Injection System

This system will be provided for extinguishing fire inside tanks containing flames/combustible liquid. Firefighting foam will be produced by mixing foam concentrates with water in required proportion and generating the resulting solution.

Cranes, Hoists and Elevators

To handle the main turbo-generator set and its auxiliaries housed in the station building One EOT crane of main and auxiliary hook capacity will be to lift the single heaviest component i.e. the stator of generator.

Occupational Safety & Health Management

M/s. Grace Industries Limited will provide all necessary provisions under Factory Act. In addition a Safety officer will be appointed as per Factory Act. All personal protect equipments like Safety shoes, helmet & uniform will be issued to each employee based on the nature of job involved.