EXECUTIVE SUMMARY

PROPOSED 70 MW (2 x 35 MW)
THERMAL POWER PLANT
&
66,000 TPA ROLLING MILL

AT MOUZA UKKERWAHI, VILLAGE HETI
TAL. UMRER, DISTRICT NAGPUR

M/s Shree Virangana Steels Limited
Nagpur

EXECUTIVE SUMMARY

INTRODUCTION

Shree Virangana Steels Limited (SVSL), Nagpur have proposed to construct and operate a 70 MW (2 x 35 MW) Power Plant near Village Ukkerwadi, Tal. Umrer, District Nagpur, Maharashtra and 66000 TPA TMT Bars Rolling Mills.

The proposal is covered under category B of the Environmental Impact Assessment Notification 2006 and requires an Environmental Clearance from State Environmental Impact Assessment Authority (SEIAA).

Shree Virangana Steels Limited (SVSL), Nagpur are having 200 TPD Sponge Iron Plant. They are also Installing 30 MW Power Plant and 210 TPD Billets Plant. They proposed to Install additional 2 x 35 MW (Total 70 MW) Power Plant with 66,000 TPA of Rolling Mill in Umrer Tehsil of Nagpur District at the place adjoining the existing facilities.

The purpose of this Environmental Impact Assessment (EIA) study is to provide information on the surroundings and the extent of environmental impact likely to arise on account of the proposed power project program for 70 MW(2x35MW) Power Plant and 66,000 TPA of Rolling Mill.

The objectives of the EIA study are:

- To assess the present status (baseline) of air, water, land, noise, biological and socio-economic components of environment including parameters of human interest;
- To identify and quantify significant impacts of various activities of the generation of power
- To evaluate existing pollution controls measures and suggest modifications, if required;
- To prepare Environmental Management Plan (EMP) outlining control measures for mitigation of adverse impacts; and

- To delineate post project environmental quality monitoring program for management of emissions from the Power plant with increased capacity.

- To prepare risk assessment and disaster management plan.

METHODOLOGY OF THE STUDY

Keeping in view the nature of activities, the process of power plant and various environmental guidelines, the area covering a radial distance of 10 Km from the centre of the plant site was selected as study area for the purpose of EIA study. To establish baseline status of air, water, noise, land, biological and socio-economic environment in the study area, extensive field studies were undertaken in and around power plant during the one season.

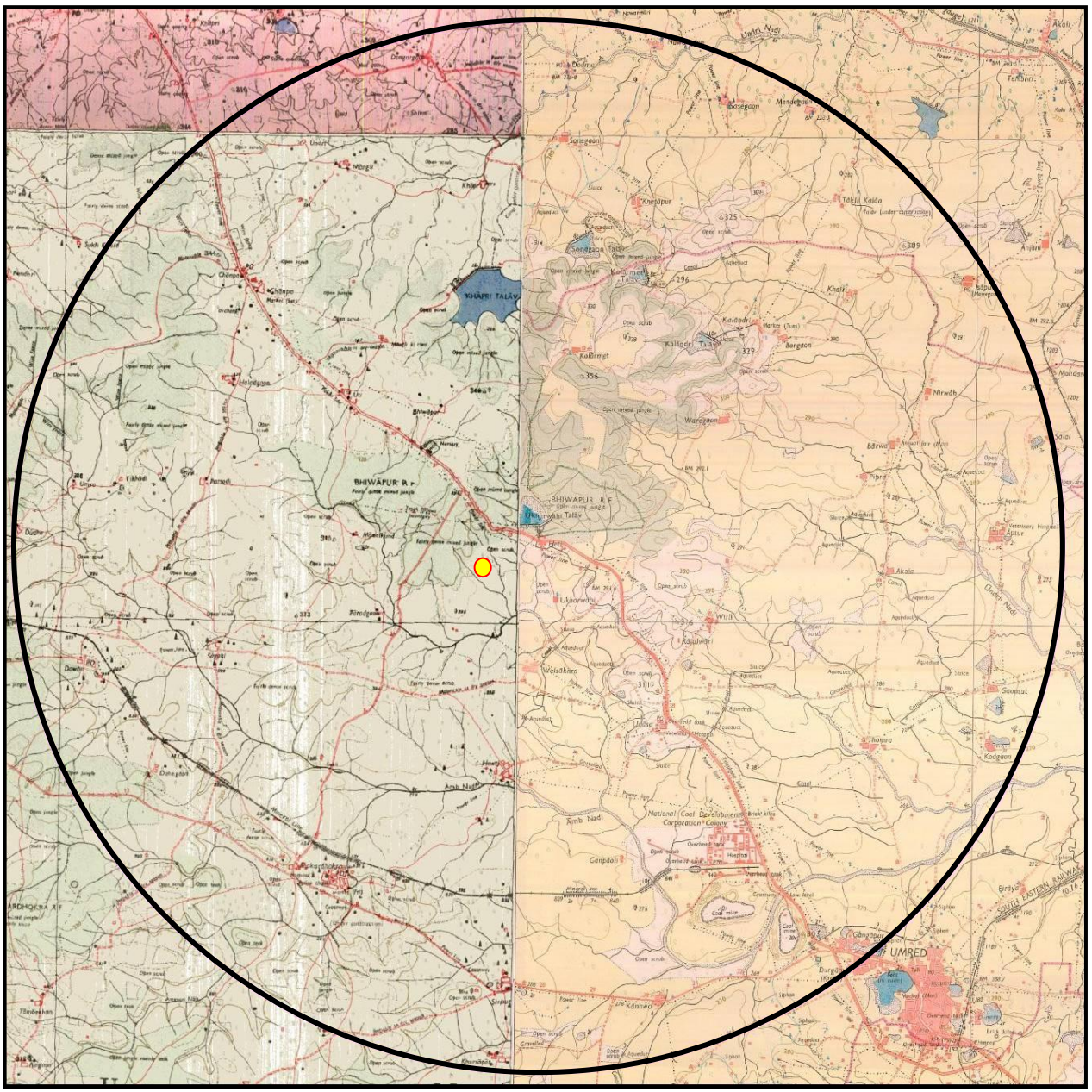
(March 2010 to May 2010)

PROJECT LOCATION

The Proposed Power plant project site is about 30 Kms. away from the city of Nagpur, which is the district head quarter and near Village Heti, Mouza Ukkerwahi in Umrer Tehsil of Nagpur district of Maharashtra State, and is located between Latitude - 20^0 55′ 50" N and Longitude –79^0 15′ 20" E. The site is well approachable by road which is connected to Nagpur - Umred State Highway.

The Plant area is 100 acres and falls in Survey Nos. 67, 68/1, 68/2, 69, 70, 71/1, 71/2, 60, 73/1, 73/2, 73/1/A, 73/1/B, 74,75,76/1, 76/2 ,82/1, 82/2, 82/3, 82/4, 83/1, 83/2 , 85/1 and 85/2. The proposed unit of the power falls in Survey of India Topo Sheet No. 55 P / 1, 55 P / 5. Details of the adjacent area required for watershed and drainage pattern studies can be seen from following Survey of Indian topographical sheets. The location map of the power plant is shown in figure 1.

Figure 1: Location Map of the Project Area



PROJECT

DESCRIPTION

The project involves Installation of stream of machinery and equipments to generate (2 x 35 MW) 70 MW of power and 66000 TPA TMT Bars. During the establishment of the Power Plant and Rolling Mills two numbers of Stack of 109 m for power plant (2nd 35 MW Power Plant and provision for future 35 MW power Plant) and 30 m for Rolling Mill is required. One stack of 105 metres height is already constructed for the existing 30 MW Power Plant project and the 1st 35 MW Power Plant will also be connected to this stack of 105 metres height and the provision for the same has already been provided in this stack. This stack of 105 metres has been constructed considering the existing 30 MW Power Plant and also the 1st 35 MW Power Plant expansion. The details are as is given bellow:

Sr. No	Particulars	For Proposed Power Project
1	Year of Establishment	Proposed in 2010
2	Power Plant	70 MW (2 x 35 MW)
3	Rolling Mill	66,000 TPA
4	Manpower (Workmen + Staff)	100 persons for Power Plant and 160 persons for Rolling Mill
5	Coal Consumption / day	1300 T/d for Power Plant and 90 T/d for Rolling Mills.
6	Water Consumption / day	775 m^3
7	Fuel consumption / hour	56.199 T/hr for Power Plant and 3.75 T/hr for Rolling Mills.
8	Stack height	105 meters (existing) and 109 Metres for 2nd 35 MW and & 30
9	Stack diameter at top	3.1 and 3.31 Metres for Power Plant and 2 metres for Rolling Mills.

STATEMENT FOR PROPOSED POWER PROJECT

DETAILS OF THE PROCESS

Coal from the coal yard is crushed in a crusher and conveyed to coal storage bunkers of Boilers through a system of conveyor belts, crusher and vibrating screens and is fed to the furnace. The coal burns inside the furnace so as to maintain a furnace temperature of 880-900°C.

De-mineralised water from the storage tank is pumped to the boiler with the aid of boiler feed pump. The boiler feed water through an economizer enters the steam drum and water walls where it is heated and converted to saturated steam. The saturated steam is then heated to a temperature of 585 °C ± 5 °C with a pressure of 66 Kg/cm^2 (g) in the super heaters and carried to common steam header. Hot air from the boiler furnace is drawn by an induced draft fan through economizer, air heater and ESP and vented out through a chimney of 105 meters height for 1st 35 MW and through 109 metres height Chimney for 2nd 35 MW Power Plant.

The steam from the main steam header at 585 °C ± 5 °C with a pressure of 66 Kg/cm^2 (g) is taken to the turbo–generators. After rotating the turbine the exhaust steam is condensed in the Air Cooled Condensers and the condensed water is pumped to the de-aerator and fed back to the boilers.

2.4.1 ROLLING MILL

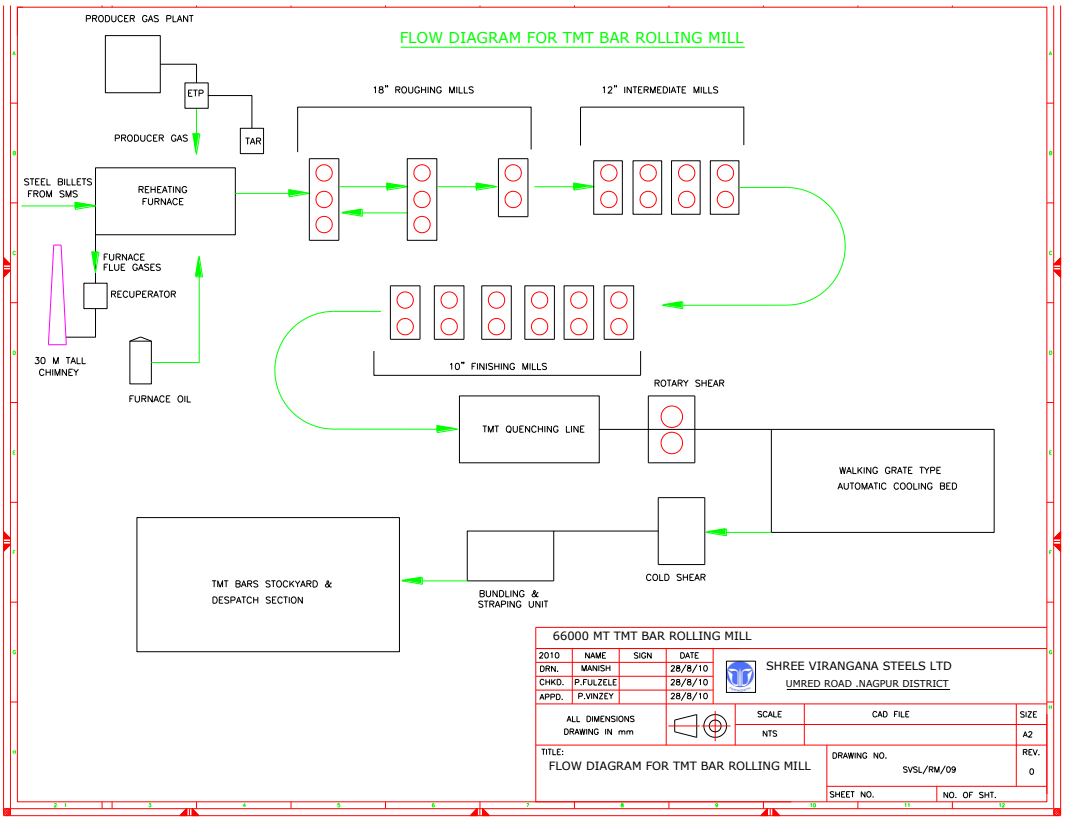
Manufacturing Process

The major stages in manufacturing long products (TMT Bars) includes

- Reheating of the sized Billets
- Roughing, Intermediate and Finishing Mill for stage reduction
- Cooling bed with Thermo Mechanical Treatment facility

Process Description

Below indicates the process flow diagram for TMT bar Mill.



PROJECT COST: The total cost of project is 388.36 Crores

RESOURCE REQUIREMENT:

Water: The source of cooling water will be from the Paradgaon dam which is near to the proposed site. The irrigation department of Maharashtra has reserved 0.5 Million CuM metres per annum of water for the proposed unit. A dedicated intake system and pipeline shall be laid for this purpose. Water requirement for (2 x 35 MW) 70 MW unit and 66,000 TPA rolling mill are 775 m^3/day.

Fuel: Indian coal of E / F Grade has been considered as main fuel. With lot of coal mines operating around Nagpur it shall be considered as main fuel for operation of the power plant. Fuel is available within 150 km of the proposed power plant from WCL and also can be made available from SECL/MCL

through rail –N- road mode of transportation. SVSL has also applied for coal linkage.

Coal requirement for 70 MW units considering GCV of 3500 kCal/kg &100 % PLF is as follows.

- Coal requirement per day 1300 Tonnes / day for 2 x 35 MW Power Plant.
- Coal requirement for Rolling Mills will be 90 MT/day for Producer gas for firing in the Reheating Furnace.

Startup Fuel

The boiler will be designed for cold start-up and initial warm-up using light diesel oil (LDO)/ Heavy Fuel Oil (HFO). We will also used Charcoal for initial light up as a substitute for LDO/HFO. About 600 Kgs of Charcoal would be required for one lightup.

Infrastructure

At present no rail link is existing for the transportation of coal from mines to site. The nearest railway siding is at Butibori which is 35 km away. SVSL is in the process of obtaining necessary clearance for laying a rail line to site. This is expected to be completed within 40 month from date of start of construction. Hence infrastructure requirement for transportation for initial period is limited to roads. Apart from this, facilities for unloading, weighing and storage will be established at plant side.

Storage capacity of stockpile is envisaged 20000 Tonnes of which at least 50% will be mechanized storage.

HFO/LDO shall be received by 12KL road tankers. Facility will be provided at site to receive, unload and store HFO/LDO

BASELINE ENVIRONMENTAL QUALITY

The climate of the Power Plant area is characterized by a hot summer and well distributed rainfall during the monsoon. The temperature shoots

up to
45 - 48^0 C in summer and comes down to the minimum of 8 - 10 °C in winter.

The EIA study includes: 1) Assessment of prevailing baseline environmental quality within the impact zone based on one season field studies. 2) Identification, qualification and evaluation of significant impact due to proposed plan on various environmental components. 3) Evaluation of proposed pollution control measure and preparation of environmental management plan (EMP) outlining additional control technologies to be adopted for mitigation of adverse impacts. 4) Delineation/strengthening of post project environmental quality monitoring program to be pursued by the Thermal Power Plant. 5) preparation of risk assessment and disaster management plan.

Air quality was monitored at ten numbers of air-quality stations and it was observed that the levels of SPM, SO_2 and Nox are well within the standards prescribed by CPCB. AAQ Measure is as follows:

SPM : 82-170 (µg/m^3)
RSPM: 44 - 77(µg/m^3)
SO_2 : 6-17 (µg/m^3)
Nox : 6 – 131 (µg/m^3)

Noise levels were monitored in the villages within the study area and for inplant noise sources. The levels were well within the permissible limits for residential areas and also for occupational exposure of workers as prescribed by CPCB. Noise level for residential area were found to be 37-50 dBA However for commercial locations noise levels were found in the range of 68-70 dBA.

Water samples of water (8 Locations) sources, were analyzed and compared with IS:10500 limits. The water from surface water source is found to be fit for drinking purposes after convention treatment.

Biological Environment: The results on Aquatic Flora and Fauna in and

around existing Steel and Power Plant area reveal that the Nallah in the study area were found to contain the zooplankton organisms, which help in the self-purification of these surface water resources.

Socio Economic Environmental study of the area has pointed out that though primary and secondary educational facilities have reached to some far distant villages, employment and poverty are the severe constraints in overall development of region. Educational status and male: female population of inhabitants is at par with national status. Their economical status is semi - moderate to poor. With industrialization in the rural areas general awareness has increased considerably and few families in each village has improved their status from poor to moderate by business or employment in Govt. / Private companies.

LAND USE PATTERN:

Location around the project sites studied is scarcely populated except in some clusters and a part of the terrain is agricultural land. Scattered villages like, Heti, Welsakhara are located within a radius of 10km of site which do not have sizable population.

The land requirement for the project is as follows:

No new land uses, as the existing land use is industrial and we have purchased 70 acres non agriculture land adjacent to existing unit. Total land required for the project is 100 acres.

PHYSICO-CHEMICAL PROPERTIES OF SOIL: These soils have clay content with some amount of fine sand and silt. The texture of these soils is clayey sandy soil. The soil samples show medium porosity and higher bulk density.

IMPACT ASSESSMENT: "Environmental Impact" can be defined as any alteration of environmental conditions or creation of a new set of

environmental conditions, adverse or beneficial, caused or induced by the action or set of actions under consideration.

IDENTIFICATION OF IMPACTS

AIR ENVIRONMENT: The existing mean SPM levels in the study area vary between 82 - 170 µg/m^3 and are below 200 µg/m^3 (air quality standards for 24 Hrs.) at all the AAQM stations except at power plant terrace, ropeway unloading station, near limestone crusher and AAQM station behind gypsum gantry which are in the premises of the industry, at these three stations the emission levels are below 500 µg/m^3 i.e. the standard promulgated for industrial area. Thus SPM levels are well within the permissible standards promulgated for residential and industrial zone.

The prediction of impact of stationary sources on the ambient air quality has been calculated using Oak Ridge Air Quality Index (ORAQI). For calculating the index, baseline data collected were analyzed and maximum concentration was determined for three pollutants viz. SPM, SO_2 and NOx. The results on evaluation of Oak Ridge Air Quality Index (ORAQI) show that there is no impact on surrounding area.

WATER ENVIRONMENT: The total water requirement of the Power Plant and Rolling mill with associated facilities will be 775 m^3/day. The proposed power plant will meet its process water requirement from Paradgaon Dam. There will not be any impact on surface or ground water characteristics due to power plant. The surface and ground water characteristics of the samples monitored within the study area are well within the permissible limits.

The treated effluents for discharge would meet the MINAS standards. The quality of the treated wastewater will be suitable for horticulture/irrigation

LAND USE: The proposed Power plant is not expected to change the land use, soil characteristics and landscape in the region.

NOISE ENVIRONMENT: The impact of noise generated from the proposed expansion on its workers is expected to be insignificant except for the employees working near Rolling Mills, Cold Shears, compressors, FD fans, ID fan, turbines and Blower. For these sources the workers can be protected using earplugs and arranging their duties in cycles. The impact of noise generated due to proposed expansion is insignificant on the human settlements in the area.

BIOLOGICAL ENVIRONMENT: The impact on terrestrials and aquatic ecology due to the expansion of the power plant are insignificant. With the green belt development around the plant as suggested in EMP the terrestrial environment of the region will be having positive improvement and will further mitigate fugitive emissions as well as attenuated noise impact.

ECOLOGY: As the study area does not provide habitation to any rare and endangered species of flora and fauna, impact on ecology will be mainly due to removal of green cover. This will be compensated, by the tree plantation programs being implemented by the management of the Power plant.

SOCIO-ECONOMICS: The impact of the project on socio-economic status of the region would be predominantly positive, if proper implementations of the measures suggested in the EMP are made.

OVERALL IMPACT: The overall impact of the power plant project is beneficial as the impact on the air, noise, water, land and biological environments are not very significant and the socio-economic benefits are predominantly positive.

ENVIRONMENTAL MANAGEMENT PLAN: The proposed Power Plant and Rolling Mill shall have two significant phases. The first phase shall be the constructional phase, which would continue for a period of 16 to 18

months and the second phase i.e. operational phase, which may continue for a period extending to 25-30 years or even more.

EMP for Constructional phase: The constructional phase comprises various activities which are rather transient in nature and prevail for shorter duration. The following measures are considered desirable:-

Necessary facilities such as sanitation, water supply, rest rooms, etc. shall be provided for the construction staff.

The site excavation, movement of earthen materials, etc. shall be planned and executed properly to avoid any nuisance / hazard.

The site shall be provided with suitable trenches for draining of the rain water and construction water effectively. The electrical equipments and instruments shall be properly and carefully handled. The fuels such as petrol, diesel, the lubricating oils, various gases, paints, varnishes, etc. shall be properly stored as per the standard practices.

EMP for Operational phase: Various standard practices have been evolved to manage the Power Plant and Rolling Mills operations efficiently to cause least possible concern to the environment.

Coal Handling Scheme: In a typical coal based power plant, the stack emissions are obviously expected to comprise SPM, SO_2, NO_X. Similarly, the fugitive emissions on account of coal dust and ash particles are very common and rather unavoidable. However, in present power plant practices, the coal dust emissions are taken care of by way of providing dust suppressing equipments and sprinkling of water every day.

Ash handling system: The percentage of ash in coal, has a bearing on the quantum of ash produced. Fly ash is collected in the closed hoppers. Fly ash will be used for the manufacture of pozzolona cement and will be (as being) transported with the help of pneumatic transport systems to the Fly ash and Bed Ash hoppers from where it will be ecologically transported to the end users or the ash dump area.

Flue gases: The plant shall be provided with electrostatic precipitators having high efficiency (above 99.98%) for collection of the fly ash that would be produced from the process of coal combustion in boiler furnace. An Electro Static Tar Precipitator would be provided for the cleaning / detarring of the Producer gas and the flue gases of the

Water Pollution: During operational phase, the likely sources of water pollution and the measures to be taken for their managements are described hereunder

Effluents from water treatment plant: The effluents from cation/anion resins are combined with the filter back wash in the neutralizing pit and by way of giving additional treatment as may be necessary, the effluents are treated to make them hazard free. This neutralized water will be used for Ash moistening and spraying on roads and coal for dust suppression.

Various drains in the plant area: The storm water (rain water) collected from the building roofs and various exposed plant areas is let through the open channels and conveyed to the storm water drain which in turn lets out the water into a suitable low lying area. For this purpose, suitable slope shall be provided to avoid any type of flooding in the power plant or rolling mill complex. Efforts could also be made to harvest the rain water to the possible extent for its use.

Waste water disposal in the power plant : The waste water collected from cooling tower, boilers, ash handling, domestic waste and D.M. plant is collected in neutralization-cum-settling tank and then to the collection-cum-storage tank from where it is further used for fly ash wetting, dust suppression in coal yard, as fire hydrant and for gardening.

Sewage disposal: The disposal of the domestic sewage from the plant would be through the closed drainage system sewage treatment plant**.**

Air Pollution:

Source emission will be controlled by installing ESP followed by Stack of 105 m and 109 metres in Power Plant and Stack of 30 m in Rolling Mill.

Fugitive emission in CHP, Coal storage area, Crushing area, will be controlled by installing high pressure foggers.

On internal transportation road regular water spraying will be carried out by installing water sprinklers. (Rain Guns)

Noise Pollution: The power plant process involves various machineries and equipments and while in operation, these machineries tend to produce noise, which is rather unavoidable. Efforts are always made to maintain minimal possible noise levels on all these accounts. The endeavors would be aimed at maintaining the noise levels below 85-90 dB(A) or even lesser at a distance of about 1.5 meters from the equipment, using stable foundation for machines and appropriate noise absorbing sheets in control cabins.

Biological Environmental Management Plan: Efforts shall be made to avert any adverse impact on flora and fauna in the area of proposed plant or at least to minimise the impact to the possible extent. To this effect, Green belts (30 meter width) shall be suitably developed around the boundry of the power plant with selected locally grown plant species**.**

Socio-economic Environment: In order to provide employment to the local people, efforts shall be made to employ the work force from the surrounding area. Various social activities to be undertaken by the project shall be confirming to the local needs and these activities shall be planned in coordination with local representatives of the public, government officials.

IMPACTS ON LAND ENVIRONMENT: To minimize disruption of soil and for conservation of topsoil, the topsoil should be taken out and stacked separately and stockpile it. Topsoil should be utilized for landscaping activity. Other measures, which would be followed to prevent soil erosion and contamination include: 1) Maximize use of organic fertilizer for landscaping and green belt development. 2) Selection of the plant species

should be on the basis of their adaptability to the existing geographical conditions and the vegetation composition of the region. 3) The species should be fast growing and providing optimum penetrability. 4) The species should form a dense canopy. 5) Trees with high foliage density, leaves with larger leaf area and hairy on both the surfaces.

Suggested Post-project Monitoring Program

Sr. No.	Environmental attribute	Locations	Parameters	Period and Frequency
1.	Ambient Air Quality	In each active rolling mill plant field • One at centre • One Upwind &	Criteria Pollutants: SO_2, NOx, RPM, PM, CO	***24-hr average sampling except for CO, which will be 8- hr sampling. (Twice a week)***
2.	Stack emission monitoring	Stacks of operating cement plant.	SO_2, NOx, SPM, CO	***Daily during functional phase***
3.	Drinking water (potablity	• Dug well wells core zone • Drinking water tank, rolling mill plant	Drinking water parameters as per IS 10500.	***Twice in a year during Functional phase***
4.	Ambient Noise	Main gate of Site Nearest village	dB(A) levels • SPL (dBA) • L_{eq}(Night + Day)	***L_{eq} (day) and L_{eq} (Night) should be monitored once in a month.***
5.	Treated Effluent	ETP of Power Plant	Parameters for horticulture use - BOD, pH, S.S, pathogens	***Every month during functional Phase***
6.	Soil quality	Greenbelt area	Organic matter, C, H, N, Alkalinity, Acidity, heavy metals and trace	***Pre-monsoon and post-monsoon during functional phase.***
7.	Ground water	4 wells	Drinking water parameters as per IS 10500	***Once every year in April***
8	Occuptional exposure	Coal handling plant, feed cycle plant, main plant	Lung test, Audiometer test.	***Once in a six month***
9	Meteorology	Plant site at suitable location	Wind speed, direction, Solar radiation, relative	***Continuous on hourly basis***

RISK ASSESSMENT & DISASTER MANAGEMENT PLAN: The risk assessment helps one in taking care of probable hazards on account of faulty / defective operations of various plants, machinery, equipment, etc. Such risk assessment proves helpful in foreseeing the risks involved in various operations to prevent the likely accidents.

As far as the power plant is concerned, it involves risk both in constructional phase and operational phase of the project Hazardous Fuel oils and Chemical

Storage Facilities: The power plant operation involves extensive use of various lubricants and limited use of fuel oils. The fuel oils usually used are light diesel oil (LDO), furnace oil (FO), low sulphur heavy stock oil (LSHS) etc. necessary risk analysis shall very well be done and the storage facilities shall be suitably developed. Storages of acids and alkalies viz. hydrochloric acid, sulphuric acid, caustic soda, etc. should be designed properly. Various gases used in power plant should be stored in the suitably designed cylinders and the cylinders are placed in the proper positions.

Occupational Safety: Since the process do not call for release of any inflammable or toxic substances, it is considered desirable to provide a safe working environment to the operational staff. Suitable casings to all the moving parts will be provided and perfect encasing to the electrical installation will be made to prevent any electrical accident.

Fire protection System: The power plants which are operating on various kinds of fossil-fuels such as coal, oil, gas, etc. are prone to fires. The fires are of various kinds and these need to be quenched by way of resorting to various protection systems. The plant area shall be provided with smoke detection system which could detect any kind of smoke likely to arise on account of fires.

Protective equipments for working personnel: In order to take care of the working personnel, they would be provided with various protective devices, which shall broadly comprise respirators (face pieces, walls, sweat traps, head bands, filters, etc.), goggles, rubber gloves, gum shoes, etc

DISASTER MANAGEMENT PLAN: Disaster is an undesirable occurrence of events of such magnitude and nature, which adversely affects production and/or causes damage to environment. Risk assessment forms an integral part of disaster management and any realistic “Disaster Management Plan” could only occur through a scientific risk assessment studies and involves

1) Requirement of fire extinguisher at all the fire prone sides.

2) Mock drill should be carried out periodically for emergency preparedness.

3) Effective communication systems at all the parts of the plant should be maintained.

Risk Analysis: Risk analysis consists of two parts viz. i) Risk identification and ii) Risk assessment.

Risk Assessment: Risk assessment techniques are:

1) Hazard and Operatability Study (HAZOP) 2) Fault Tree Analysis (FTA)

3) Monte Carlo Simulation 4) Safety Audits 5) Safety Indices 6) Above risk assessment techniques are discussed in the subsequent paragraphs.

Hazard and Operatability Study (HAZOP) study involves identification of Hazards or operatability problem of the process and envisages possible deviations from normal operating conditions.

PROCEDURE FOR FIRE / GAS LEAKAGE CONTROL:

When fire on account of gas leakage is noticed, it is desirable to take following measures:

a) Break the nearest fire-glass.

b) Immediately inform to concerned plant control room.

c) Follow the instructions of control room.

d) Act to control the incident as per the instructions.

e) Reach to the assembly point, located at right angle to be wind direction.