Executive Summary of EIA
For

Proposed Modernization by Replacement of Old Second Hand Turbines by New Higher Efficiency Turbines, resulting in increase in Power Generation of CPP from Consented 81.5 MW to 98.7 MW without Increasing Number and Capacity of Boilers, Raw material, Water and Land Requirement.

AND

Expansion of Steel Division by adding:
A. 4x15T Induction Furnace (2,25,000 TPA), with LRF (30T) & CCM (3Strand)
B. 2,00,000 TPA Rolling Mill

Of

SARDA ENERGY & MINERALS LIMITED,at
Phase-I, Siltara Industrial Growth Centre,
Disitrict– Raipur (C.G.)
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Prepared By

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Executive Summary

Project Description

Modernization of Power Plant

The existing established Captive Power Plant have a power generation capacity is 81.5 MW (60 MW Coal based and 21.5 MW WHRB based) with 7 Boilers (3 Coal Fired and 4 WHRB) and 3 TG Sets. The steam from 7 boilers is fed to 3 Turbines Sets connected to inter connected common steam receivers. The turbines were purchased secondhand. The turbines were purchased secondhand.

Two Turbines (Turbine#2 and Turbine#3) have low efficiencies as there is a mismatch between the rated (design) Input steam parameters of the existing turbines and the parameters of the input steam supplied by the boilers.

Rated/Design Input steam parameter of existing Turbine	**Parameter of Input Steam supplied by the boilers**
90Kg/cm^2& 520^{o}C	**59.7 kg/cm^2& 496 ^{o}C**

As a result of this the turbine operates at lower efficiency i.e. with higher Specific Steam Consumption (SSC) [Ton of Steam Consumed per MW of output] (Ton/MW) i.e. output of turbines is less.

The existing old turbines operate with an average SSC of 5 Ton/MW as against this, the New BHEL Turbines have a guaranteed SSC of 3.8/3.82 Ton/MW.

This is achieved by designing the NEW BHEL turbines with improved blade design along with their rated input steam parameters (pressure and temp) matching the parameters of input steam supplied by the available boilers. The resultant higher efficiency of turbines enhances the power generation capacity by 17.2 MW without any increase in steam consumption and hence, Coal Consumption.

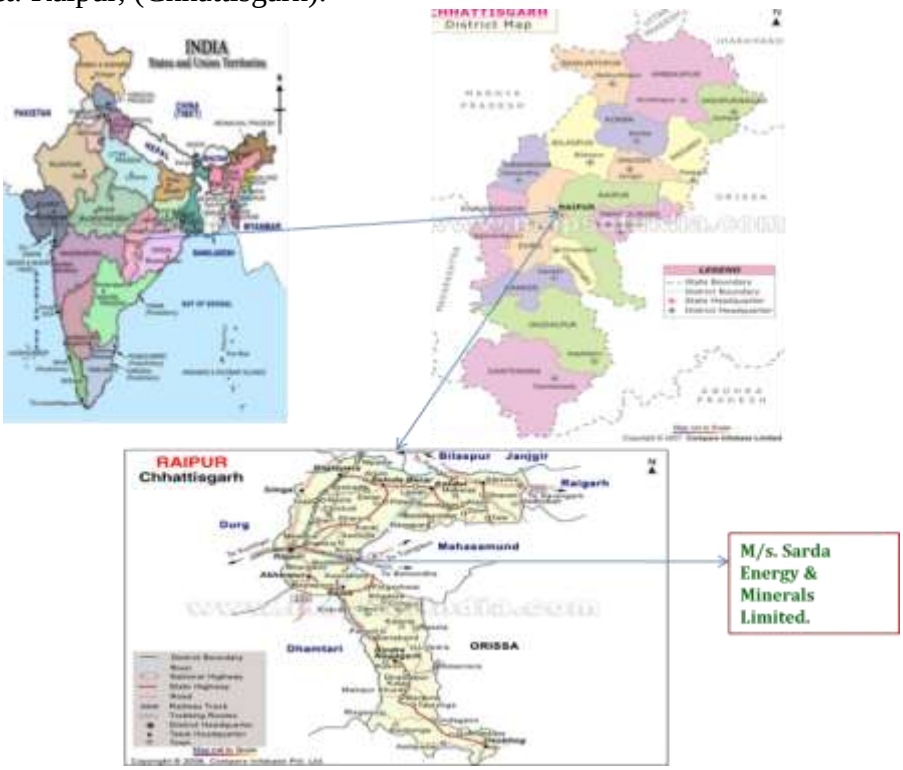
This Modernization would result in increase in power generation of CPP without increasing Number and Capacity of Boilers, Raw material, Water and Land Requirement

Expansion of Steel Division:

Steel consumption has been steadily growing in the country. The main areas of consumption are in the field of housing, infrastructure, automobiles and consumer durables, engineering goods and applications. With the introduction of NATIONAL STEEL POLICY 2017 the Government of India is giving a boost to steel industries by "Encourage industry to be a world leader on energy and raw material efficient steel production, in a safe and sustainable manner".Looking into above, the Company has now envisaged of expansion of its existing steel plant by addition of:

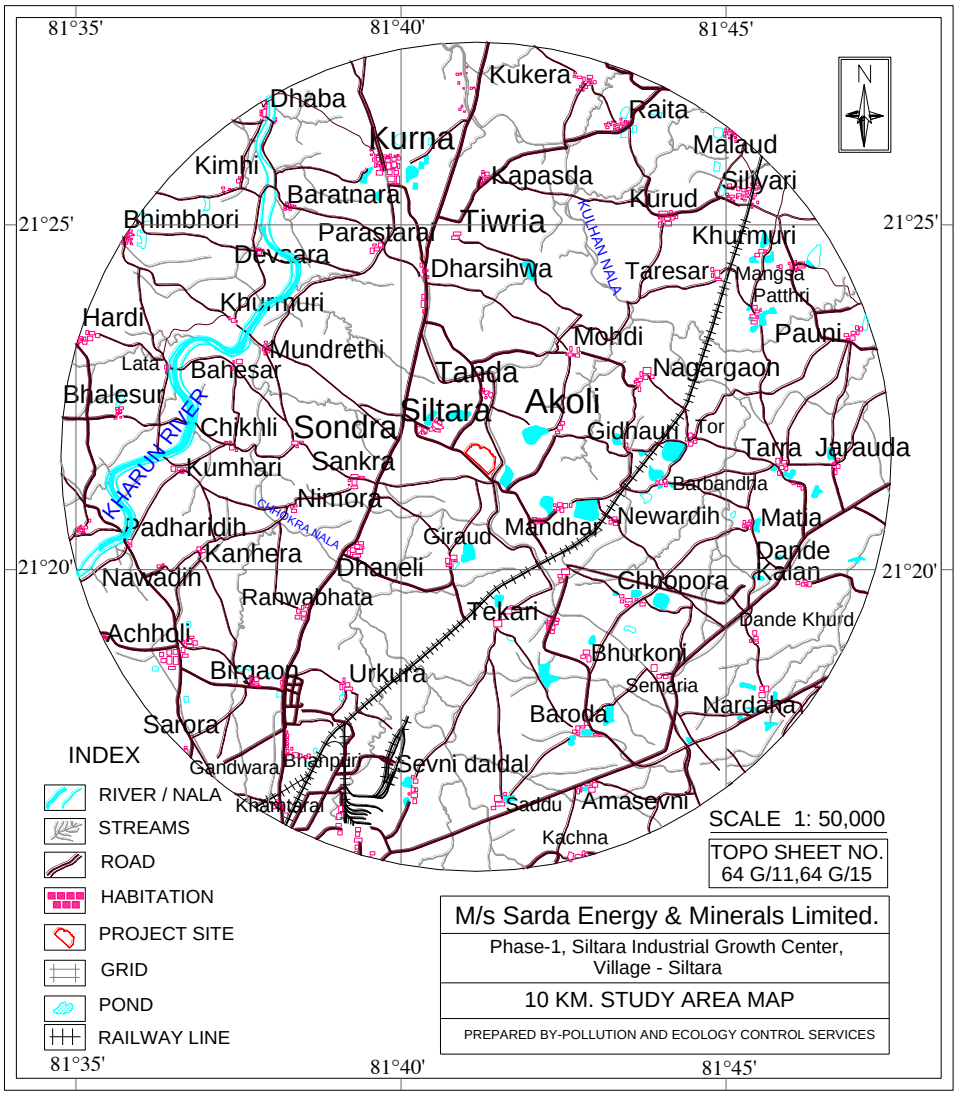
1. 4x15 T Induction Furnaces (2,25,000 TPA Steel Billets)
2. Ladle Refining Furnace (30 Tons)
3. 3 Strand Continuous Casting (2,40,000 TPA)
4. Rolling Mill [2,00,000 TPA Finished Steel (Wire Rod/TMT)]

The proposed project is at Phase 1, Industrial Growth Centre,Siltara, Village Siltara, District: Raipur, (Chhattisgarh).



Source: mapsofindia.com

Location of the Project



Source: SOI Toposheet

Topographical Map (10 km Radius)

Process Description

Induction Furnace

Induction furnace works on the principle of Induction melting of scrap/sponge iron with the help of electric power. An alternating electromagnetic field induces eddy current in the metal so that the electrical energy converts into heat whose quantity depends on the resistively of the charge. If the charge consists of metal scrap, chips and other metal

rejections then the eddy currents arise between separate pieces of charge because of high contact resistance. So small charge pieces required increase frequency of current that feeds the induction heater in order to speed up melting of the charge. Induction furnaces operate on current of commercial frequencies (50Hz) or on current of higher frequencies from 500 to 2000 Hz. Induction furnaces are beneficial in steel making for low melting loss.

An induction furnace constitutes a single larger primary coil made of water-cooled copper tube. The working voltage is impressed across the terminals of the coil. These furnaces have a great much application for melting of Iron, Steel and Nonferrous.

This type of furnace has a rammed lining. The ramming material silica mass contains should more than 96% silica and minimum of Al2O3 & Fe2O3. Before ramming the material a steel template kept inside the furnace and rammed the material between the template and the insulated coil of the induction heater. To minimize the consumption of electric power and cut down the melting period the crucible wall must be as thin as possible. During running the furnace one must keep watch on the state of lining because it operates under most unfavorable condition. The inside of crucible lining is in contact with liquid metal while its outside surface contacts the water-cooled induction.

Charging: - The pieces of scrap should be kept on the bottom gently to avoiding impacts into a compact heap. The scrap pieces/ sponge iron should be in small size that provides good compaction of the batch without leaving spacing between the charge and crucible wall. This offer an advantage of quick melting of the charge with a minimum power spent in the stage for the heat. The zone of a highest temperature during the meet lies in the power part of the crucible therefore it is practical to place first high melting scrap on the crucible bottom. Large and high melting pieces should stand parallel and close to the crucible was while low melting components should be in the middle of the crucible. Small capacity furnaces are loaded manually and the large capacity furnaces with the aid of buckets.

Melting: - At the beginning of melting the furnace works for 5 to 10 minutes on low power until the surge of current fed from the generator disappear. The furnace power is then brought up to a maximum. The charge melts with the crucible held closed. When the charge approaches the fluid stages then the solid pieces are pressed back with a crow bar.

The furnaces is then loaded to its capacity by adding small size of scrap as soon as the charge melted, the slag is formed to protect the metal from oxidation and to avoid reduce the melting loss. If the slag generates in excess it should be skimmed off periodically, at the last to deoxidised the metal with Ferromanganese, Silico-manganese and Ferro-silicon. Now the metal is ready to tap for either in ingot or billet casting.

Casting in ingot mould: - For casting Ingot the metal temperature should be around 1560^{o}C / 1570^{o}C in ladle. Liquid metal tapped from furnace to ladle by the help of crane then the ladle in centered on the trumpet metal flows from the ladle bottom and filled the ingot mould. Thus the ingot is ready.

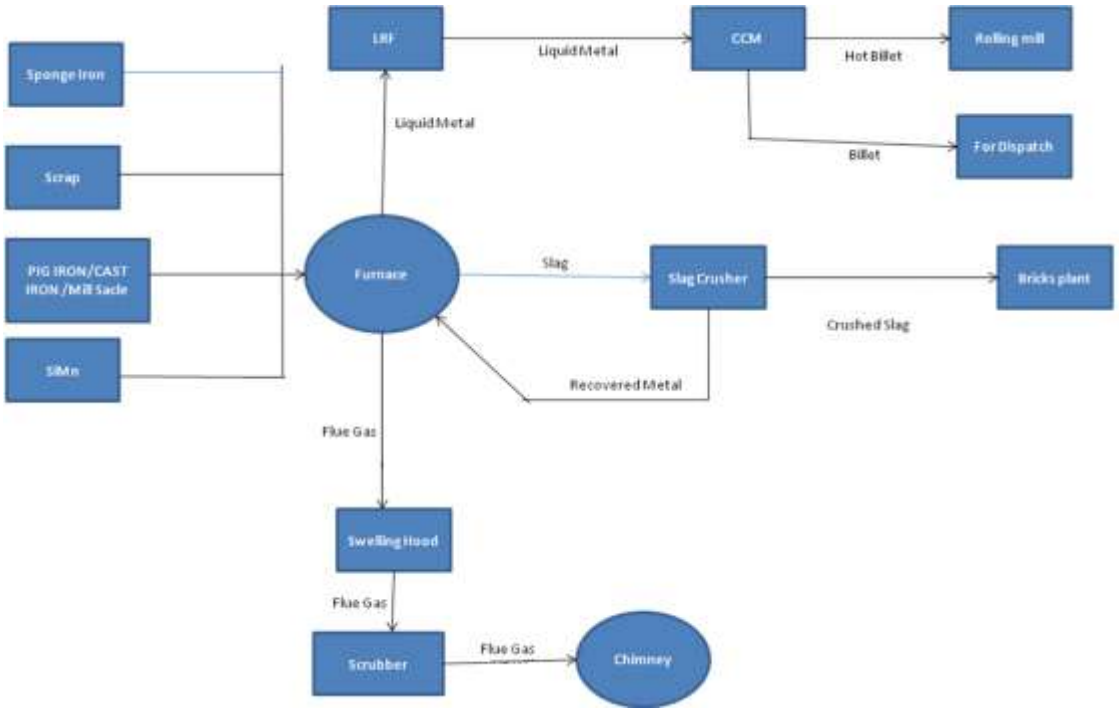
Casting in B.C.M: **-** Steel for making billet, the temperature of liquid metal from furnace to ladle, the final metal temperature in ladle should be 80^{o}C superheat from liquidious. Liquid metal is storage in tundish through ladle then the tundish metal passes from the various section of mould jacket that is as per requirement (100 X 100 mm, 125 X 125 mm, 160 X160 mm 200 X 200 mm) this is a continuous process, length of billet is cut as per requirement. Process flow chart is enclosed.

Ladle Refining Furnace

The LF installation will be single station system with provision for arc heating, inert gas stirring, and addition of ferroalloys and additives. The LF will be complete with the transformer, Ladle stirring System Aluminum wire feeder, Carbon injecting device, additives storage and addition system, Sampling and temperature measuring device .A fume extraction and cleaning system consisting of bag filters, ID fan and chimney with the related ductwork will be provided.

Billet caster:

The billet caster shall be complete with ladle stand, mould assembly, Strand guide segments and supports withdrawal and straightening system, mould cooling system, Cut-off equipment incl. length measuring device, Marking machine etc. Requisite dummy bar and facilities for Dummy bar disconnecting and a dummy bar receiver will be included.



PROCESS FLOW CHART OF INDUCTION FURNACE

Rolling Mill

The billets casted through the continuous casting machine will be send directly to rolling mill through high speed roller tables so as to charge direct hot billets for rolling without reheating the billets. The billets will be rolled through a series of roughing and finishing stands and then passed through quenching unit (Thermax) to produce TMT bars with defined physical properties and size.

The TMT rebars will be hot rolled from steel billets of 110-130 sqmm section, entering into roughing stands and then passing through a series of continuous stands and finishing stands with intermediate shears and loopers to achieve the final size of TMT bar.

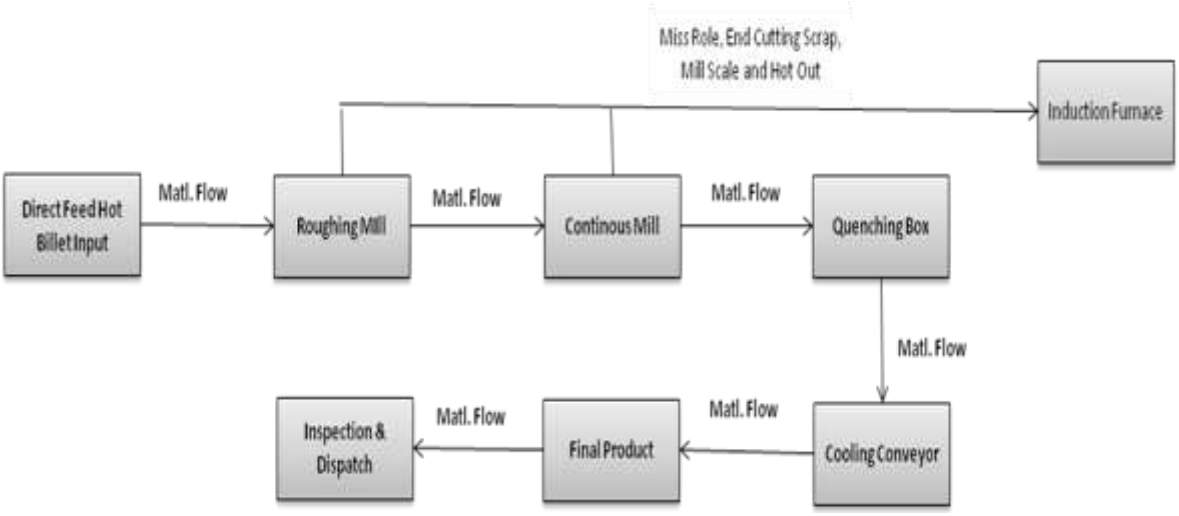
The three major stages of conversion of steel billets into TMT rebars are:

1) **Quenching**: When a hot rolled bar leaves the final mill stand, it is instantaneously quenched using a special water spray system (Thermax) at very high pressure in the quenching box. This is done to harden the surface while the core still remains hot and soft. This is a microprocessor based controlled cooling process

2) **Self tempering**: After leaving the quenching box, the core continues to supply heat to the surface since it is relatively at a higher temperature. This causes the tempering of the outer layer into a tampered structure.

3) **Atmospheric Cooling**: Atmospheric cooling of the bars are done in cooling bed for normal cooling of the TMT bars to achieve ductile core and a strong outside layer

The final finished TMT bar will be carried to the shearing area where the TMT bars will be cut into desired length. Then it will be forwarded through roller tables to counting and tying/packing area where bundles of TMT bars will be made and then transferred to stock yard for dispatch.



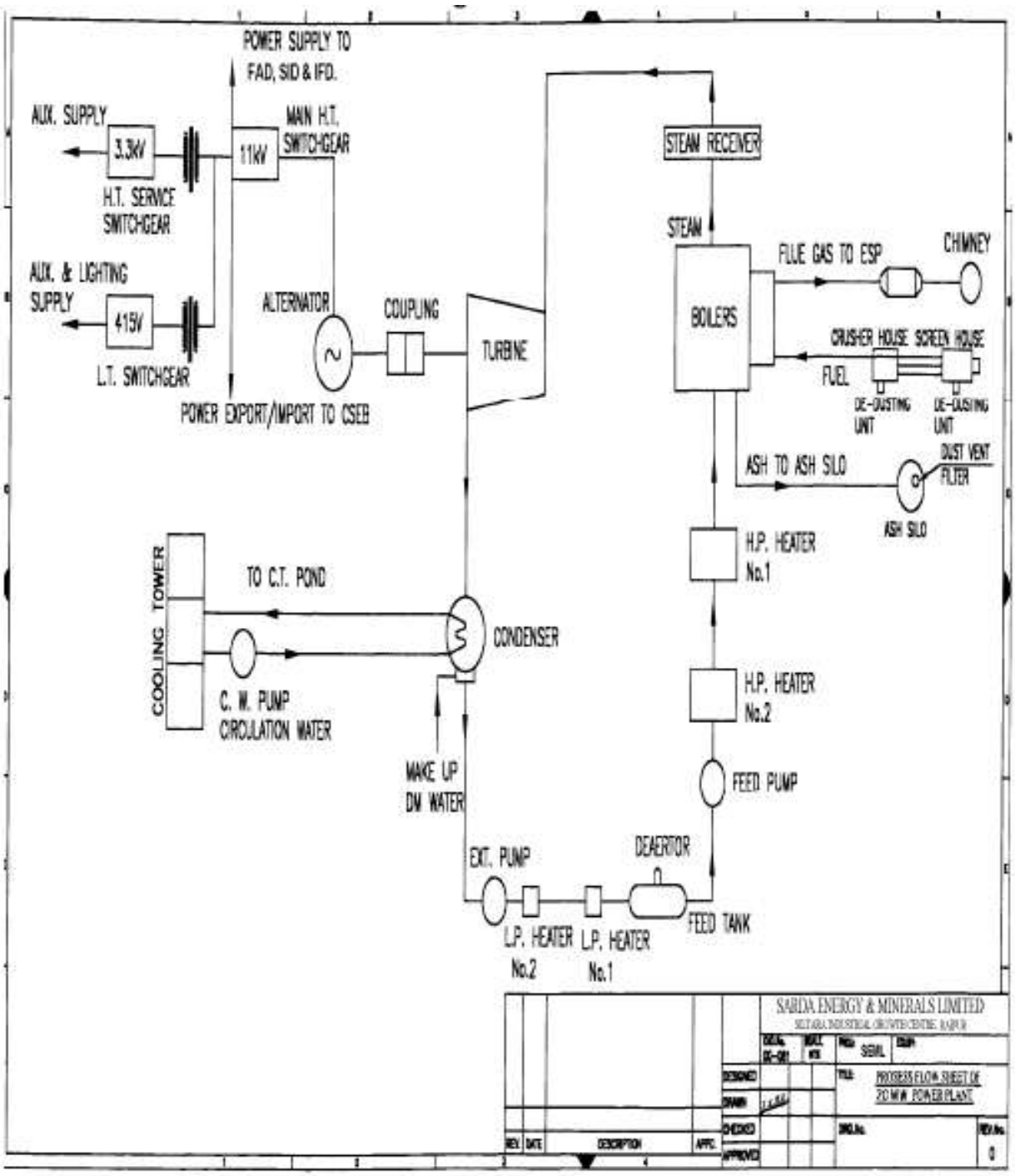
Process Flow Diagram of Rolling Mill

POWER PLANT

Coal Based Power Generation:

The Thermal Power Plant requires coal, char/dolachar as a raw material and water.The requirement of coal is met from M/s South Eastern Coalfields Limited, char/dolachar is supplied from own sponge iron plant and water is supplied by M/s Chhattisgarh State Industrial Development Corporation Limited. In the Power Plant, (-) 200 mm size coal is received from M/s South Eastern Coalfields Limited. The coal is crushed in coal handling plant from 0 to 6 mm size. The steam generating equipment is called as Boiler. The Boiler erected at this station is natural circulation type, Fluidized Bed

Combustion system. The coal is burnt in fluidized state. The steam leaving from Boiler drum is further heated in connective Super Heater, Primary and Secondary Super Heater by the hot Flue gas. The Flue gas temperature discharge after E.S.P. is 145^{o}C. The Steam leaving the Boiler is 61.5Kg/cm^{2}pressure and 496^{o}C temperature. The Flue gas is discharge in atmosphere after E.S.P. through Chimney. The Steam leaving the Boiler is passed through Turbine. The Turbine erected at this station is a two-cylinder machine. The heat energy available in the steam is converted in to mechanical energy, thereby rotating the Turbine at 3000 R.P.M. The Turbine is directly coupled to a generator which generates A.C. Power at 11 KV, 50 cycles / seconds. The process flow diagram for power generation is given in Figure.



Power Generation Process Flow Chart

Description of the Environment

The baseline environmental quality for the period of November, December & January 2017-18 was assessed in an area of 10 km radius around the proposed project site**.**

Air Environment

The predominant wind directions were from NE from NNE and from ENE . Average wind speed was 5.9 km/hr during monitoring period and most of the time wind speed was between calm to 10 km/hr.The ambient air quality monitored at 8 locations selected based on predominant wind direction, indicated the following ranges;

PM_{10} : 39.4 to 90.6µg/m^3.

$PM_{2.5}$: 21.1 to52.7µg/m^3

SO_2 : 11.3to 25.2µg/m^3

NO_x : 13.6 to 34.8 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 14 samples including six 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 Coliforms in surface water, which may be due to the human activities.

Noise Environment

Recorded Noise Levels in the buffer zone of proposed project site, are in the range of 29.1 (night time) to 59.8 dB (A) (day time) at all eight monitoring stations. Maximum levels of noise have recorded in day hours which are natural as our most of activities have done in day hours.

Noise levels measured at all eight stations (N-1, N-2, N-3, N-4, N-5, N-6, N-7 and N-8) are very low and well within limit of either 65.0 dB(A) for Commercial 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

Three Soil samples were collected analyzed for physico-chemical characteristics at selected locations in the study area to assess the existing soil conditions around the proposed project site. The relevant parameters show the following characteristics.

a) Texture of soil samples from barren land is silt Clay loam and sample from agricultural land are Clay loam and sample from waste lands are silt clay –loam and clay loam.

b) Colour of soil samples from agriculture land is gray and sample from waste land and Barren land is yellowish in colour.

c) The bulk density of soil samples from agriculture land is in the range of 1.6 to1.7gm/cc and sample from waste land is of 1.65 to 1.71gm/cc and sample from Barren land is of 1.57-1.61gm/cc.

d) Soil samples from agriculture land have pH values between 7.9 to 8.21 and sample from waste land have 7.3 to 7.8 and sample from Barren land have 7.1 to 7.2 ranges of pH values. The pH values are indicating nature of soil samples as between slightly neutral to slightly alkaline.

e) Soil samples from agriculture land have Organic Matter between 1.6 to 1.7 % and sample from waste land have between 0.8 to 1.3 % and sample from Barren land have between 1.2 to 1.4 Organic Matter. These values represent average fertility of soils.

f) Soil samples from agriculture land have concentration of Available Nitrogen values ranged between 587.3 to 742.5 kg/ha and samples from waste land have range between 313.1 to 473.5 samples from Barren land range between 487.3 to 582.3 kg/ha.

g) Soil samples from agricultural land have concentration of Available Phosphorous values ranged between 85.1 to 109.0 kg/ha, waste land values ranged between 27.4 to 43.7 kg/ha and Barren land have concentration values ranges from 84.2 to 132.3 kg/ha.

h) Soil sample from agriculture lands have concentration of Available Potassium values range between 228.3 to 301.4 kg/ha, it have good concentration of available Potassium, whereas sample from waste land have concentration of Available Potassium values range between 169.7 to 194.3 kg/ha and sample from Barren lands concentration of Available Potassium as its values range between 194.9 to 268.4 kg/ha.

i) Characteristic of Barren land and waste land soil is average in nutrients concentration. Whereas, agricultural land soil is moderately suitable for cultivation of climatic crops and have good fertility.

Anticipated Environmental Impacts and Mitigation Measures

For Modernization of Power Plant:

Modernization involves only the replacement of old second hand low efficiency turbines of Unit no.2 and 3 by New BHEL make High Efficiency Turbines, resulting in enhancement in Power Generation Capacity from 81.5 MW to 98.7MW (without any increase in Coal consumption).

There will be No change in any other equipment/ component of the Captive Power plant including existing civil foundation of turbines.

Capacity enhancement shall be achieved without any increase in:

1. Steam Generation (Boilers).
2. Coal and Water Consumption.
3. Land Requirement.

Thus, the Modernization does not result any increase in Pollution Load [Air, Water and Land (Solid Waste)] for the existing 81.5MW CPP.

As there will be no addition in the pollution load (Air, Water and Soil) from the Modernization project for enhancement of generation capacity of the Power Plant from 81.5 MW to 98.7 MW, no change/upgardation in existing installed pollution control equipment is proposed.

Air Environment

The following Environmental Management Plan has been implemented to control air emissions from Power Plant.

There are two sources of Air Emissions.

1. Burning of Fuel
2. Transportation and Handling of Fuel.

As no additional fuel is required there will be no incremental impact on environment.

Existing Pollution Control Measure (Air)

Sl. No	Equipment	Purpose	Qty. Installed
1	Electrostatic Precipitator	Collection of Dust	3 (Three Field)
2	Bag Filters	Collection of Dust	8
3	Water Sprinkling System	Dust Suppression	Lot
4	Dry Fogging System	Dust Suppression	2
5	Stack 90m Height	For Proper Dispersion of Gas in the Atmosphere	2

To control fugitive emission in the Power Plant, following effective steps have been implemented:-

a) Eight nos. of Bag Filters & Cyclone are provided in various transfer points of coal handling, silos, stock house etc. & working very effectively.
b) All raw materials transfer points, conveyor belt & junction points are made covered through GI Sheets.
c) Forty nos. of water sprinklers installed at various location in the plant.
d) Water sprinkling is being done by moving vehicle, which spray water on the roads to minimize the fugitive emission inside the plant.
e) All internal roads have been made high ash content concrete

Impact on Water

The Water in a Power plant is for Generation of Steam and Cooling. The existing Boilers will be utilized for steam generation. The quantum of Steam Generation/Requirement will remain the same. The number and capacity of boilers will not change, there is no change in cooling water requirement as there is no change in cooling water system. Hence, there will be no additional water requirement. The water Balance for enhanced production capacity of 98.7 MW will remain same as for the existing production capacity of 81.5MW.The total water requirement for power plant is 8147 KLD

Out of the total water requirement of 8147 KLD in Power Plant, 224 KLD of waste water is being/will be generated. The Waste Water Generation and the method of its disposal are as under:

Units/Purpose	Waste Water Generation	Disposal Method
Cooling	59	Dust Suppression & plantation
Boiler Feed	23	Dust Suppression & plantation
DM unit & Softner	70	Dust Suppression & plantation
Domestic	72	Soaked in soak pit
Total	224	-

Solid Waste Generation

Ash is generated as a result of burning of Coal and Char/Dolochar for heating the boilers. As increase in power generation capacity is achieved only by installing higher efficiency turbines without in quantity of fuel fired. No additional Solid Waste will be generated. The solid wastes to be/is being generated and scheme for their Management/disposal are as under:

Name of Solid Waste	**Quantity TPA**	**Method of Collection**	**Utilization**
Fly Ash	172200	Pneumatic conveying system followed by silos	Utilized as Raw material in Captive Fly Ash Brick Block and Tiles Manufacturing Plant and is also being Sold to Cement Plant.
Bed Ash	43050	Pneumatic conveying system followed by silos	Utilized as Raw material in Captive Fly Ash Brick Block and Tiles Manufacturing Plant

Expansion of Steel Plant

Air Environment

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 order to control the air pollution in the induction furnace, dust extraction system is installed. It consists of suction hood, cyclone, wet scrubber etc. Suction hood mounts on the head of furnace; the flue gases will be sucked through the hood. The blower sucks the flue gases through hood along with pipe, which connected to the cyclone and wet scrubber. The wet scrubber cools the hot gases of furnace through water spray. The nozzles spray water uniformly and perform the fog. The cyclone and scrubber separates the solid particles, dust and its fall down in the bottom of the water tank. The cool and fresh air will be dispersed through the 2 number of Air Vent of height 30 MtrsEach.The junction / transfer points of material will be provided with adequate capacity of de-dusting system (cyclones) to control the fugitive emission.

Noise Levels

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 Water

The total water required for expansion of steel plant will be 343 m^3/day. The source of water will be met from Kharoon River. The total wastewater generated from the steel plant will be 28 m^3/day. Soft water Generated from water softener will be used for Furnace Cooling and Mould Cooling. The water is 100% re-circulated after proper treatment, so that there is no disposal of effluent. The wastewater from the cooling process will be treated in settling tank and recycled in the process.

Solid Waste Generation

Steel Plant

The Major Solid waste Generated will be IF slag from Induction Furnace .Slag will be crushed in Slag crusher for recovery of metal and the non-metallic crushed IF slag will be used in making of blocks, Tiles, etc at our Block and Tiles manufacturing unit and also IF slag will be sold in the market

The solid wastes to be generated and scheme for their Management/disposal are as under:

S.No.	Solid Waste	Source	Quantity TPA	Utilization/Disposal
1.	Slag	IF	28845	As Above
2.	Miss Role	Rolling Mill	414	Reused as Raw Material in Induction Furnace
3.	End Cutting Scrap	Rolling Mill	2898	
4.	Mill Scale	Rolling Mill	2898	
5.	Hot Out	Rolling Mill	1449	

Socio Economic Environment

The project proponent would aid in the overall social and economic development of the region. The plant will give employment to about 396 people 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.

The overall impact on the socio economic environment will be significant.

The management of M/s Sarda Energy & Minerals Ltd has proposed to give preference to local people for recruitment in semi skilled and unskilled categories.

Environmental Monitoring Programme

The environmental monitoring is important to assess performance of pollution control equipment installed in the proposed expansion project of M/s Sarda Energy and Minerals Limited. The sampling and analysis of environmental attributes including monitoring locations will be as per the guidelines of the Central Pollution Control Board.

Environmental monitoring will be conducted on regular basis by of M/s Sarda Energy and Minerals Limited. SEML has established setup laboratory facility for collection and analysis of environment samples under the supervision of competent technical personnel within the premises of the proposed Modernization and Expansion Project. The company will also have tie up with MoEF recognized laboratory for the routine monitoring of air, water, soil and noise. 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 pollutants;
- 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;

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

- Air quality
- Water and wastewater quality;
- Noise levels;
- Soil quality;

Environment Management Plan

Liquid effluents, air emissions and solid wastes generated are the major pollutants from the process operations and utilities. Pollution control measures proposed to mitigate the emissions and effluents are described as follows:

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There will be No change in any other equipment/ component of the Captive Power plant including existing civil foundation of turbines.

Capacity enhancement shall be achieved without any increase in:

1. Steam Generation (Boilers).
2. Coal and Water Consumption.
3. Land Requirement.

Thus, the Modernization does not result any increase in Consented Pollution Load [Air, Water and Land (Solid Waste)] for the existing 81.5MW CPP.

As there will be no addition in the pollution load (Air, Water and Soil) from the Modernization project for enhancement of generation capacity of the Power Plant from 81.5 MW to 98.7 MW, no change/upgardation in existing installed pollution control equipment is proposed.

For Expansion of Steel Plant:

Waste water Generation and its Control

The water requirement for the proposed plant is mainly for the essential purpose like for equipment cooling as well as for drinking and sanitary purposes. The water is 100% re-circulated after proper treatment, so that there is no disposal of effluent. The wastewater from the cooling process will be treated in settling tank and recycled in the process.

Air Pollution and its Control

Sources of Emissions and Mitigation Measures

There will be two major source of air pollution in the plant, fugitive emission from material handling & transfer points and Flue Gas from Stack.

In order to control the air pollution in the induction furnace, dust extraction system will be installed. It consists of suction hood, cyclone, Bagfilters etc. Suction hood mounts on the head of furnace; the flue gases will be sucked through the hood.

The blower sucks the flue gases through hood along with pipe, which is connected to the cyclone and Bagfilters. The cyclone and Bagfilter separates the solid particles, dust and its fall down in the bottom. The cool and fresh air will be exhausting through 2 nos Stack of 30 Mtr height each, in which the dust concentration will be less than 50 mg/Nm^3.

Direct Charging of Hot Billet is proposed in the Rolling mill i.e. there will be no reheating arrangement in the proposed rolling mill. As reheating is not required there will be no incremental impact on air environment.

The junction / transfer points of material will be provided with adequate capacity of de-dusting system (cyclones) to control the fugitive emission..

Existing Internal roads shall be utilized for movement of man and material which is equipped with water sprinkling systems so that free dust does not become air-borne.

Solid Waste generation and its Management

The Major Solid waste Generated will be IF slag from Induction Furnace.

Slag will be crushed in Slag crusher for recovery of metal and the non-metallic crushed IF slag will be used in making of blocks, Tiles, etc at our Block and Tiles manufacturing unit and also IF slag will be sold in the market

Noise Pollution &Control Measures

In plant, workers particularly working near higher noise sources, may be exposed to higher level upto 75 dB(A) for longer durations. These exposures are well below the exposure limits of occupational safety and health administration, (OSHA) i.e. 90 dB(A) for 8 hour shift and 6 working days. However, provision of ear plugs or ear muffs shall be made for in-plant workers working at such locations in order to avoid exposure to high levels whenever they come near the high noise generating sources.

Further, all noise generating equipment shall be housed within acoustic enclosure (wherever possible), to ensure attenuation of noise. The employees shall be trained in the mitigation measures and personal protection measures to be taken to prevent noise related health impacts.

RESOURCE CONSERVATION

Rain Water Harvesting

RWH structures will be provided to harvest the rain water around the plant area and roof top. The collected rain water shall be utilized for plant uses to minimize the raw water requirement from the source. 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.

Green Belt Development

The plantation will helps to capture the fugitive emissions and attenuate the noise apart from improving the aesthetics quality of the region. Avenue plantation within the plant and green belt development area will be further strengthen. An area of 33% of the total plot area has been reserve i.e. 55.42 acre as green belt in the total Plant premises as per norms, out of which 53.90 acre has been developed. Greenbelt has been developed as per CPCB guidelines and in consultation with local forest department.

Fire Fighting System

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

Health and Sanitation Facilities

To ensure optimum hygienic conditions in the plant area, proper drainage network has been provided to avoid water logging and outflow. Adequate health related measures and a well-equipped Safety and Environment Department have been established to ensure clean and healthy environment. Drinking water facility and toilets has been provided for the labour force in the existing facilities.