EXECUTIVE SUMMARY

INTRODUCTION

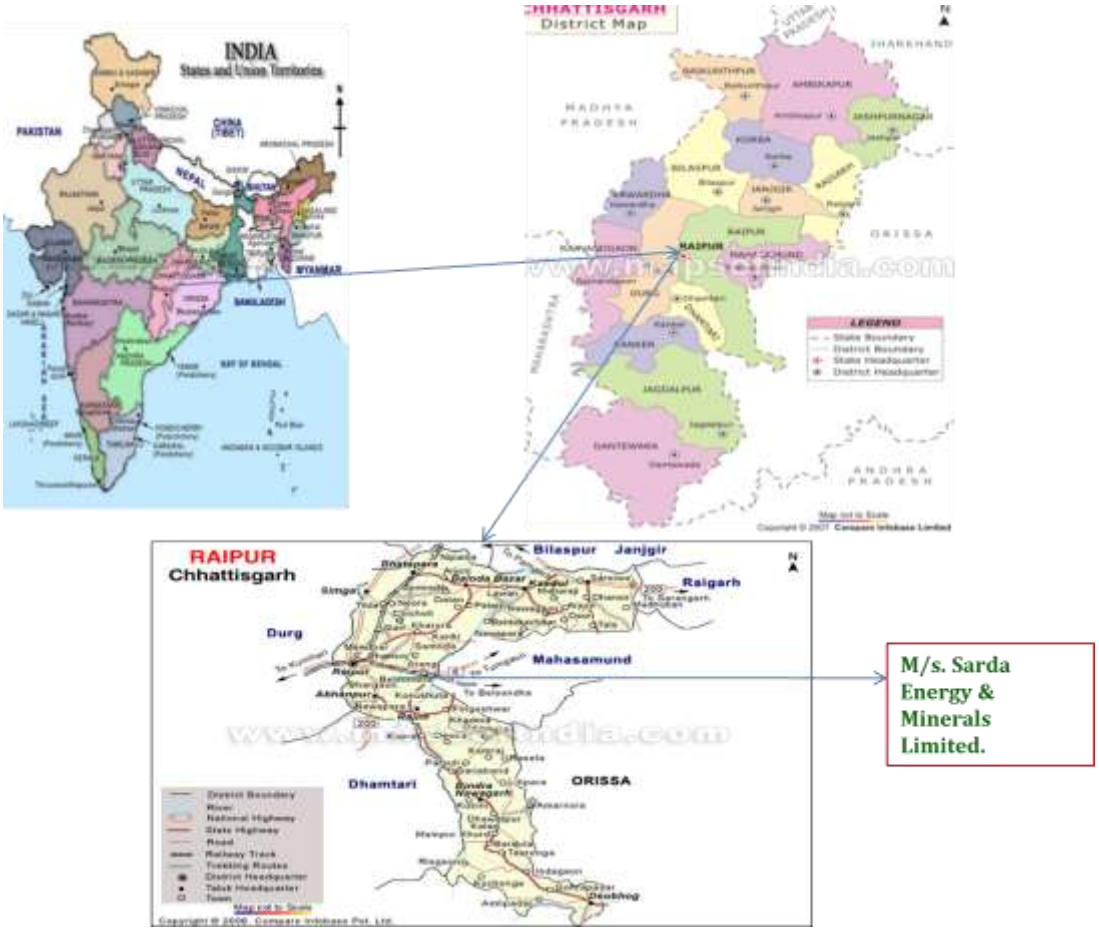
M/s.Sarda Energy & Minerals Ltd. (Formerly M/s Chhattisgarh Electricity Company) had established a 0.6 MTPA Iron Ore Pellet plant at Phase – I of Siltara Industrial Growth Center at village Mandhar, Raipur which is under operation since 07.10.2009. The Environment Clearance for the Operational 0.6 MTPA Iron Ore Pellet Plant was regularized by MoEF&CC, New Delhi vide F. N0 J-11011/45/2012-IA II (I) dated 28.10.2016. Off late, it was observed that our plant is capable of achieving a higher production capacity of 8,00,000 TPA without changing any other plant & machinery.

Further the company has envisaged the following:

A. Upgradation of 0.7 MTPA Existing Iron Ore Grinding Unit to 1.0 MTPA Iron Ore Beneficiation and Grinding Unit.
B. Establishment of 1.2 MTPA Integrated Steel Plant.
C. 260 MW Power Plant (110 MW WHRB + 150 MW Thermal)

Company has been allotted 204.452 Hectares of land at village Mandhar, Phase-I of Siltara Industrial Growth Centre, Raipur for installation of Integrated Steel Plant and power plant. About 67.469 out of the above 204.452 Ha has been earmarked for Green Belt. The site is located within 21^{o}20’ 9.74” North to 21^{0} 20’ 42.57” North Latitude, and 81^{o} 41’ 10.57” East to 81^{0} 42’02.48” East Longitude. It is located centrally vis-à-vis source of raw material as well as Sponge Iron consuming industry.

The map showing general Location of the proposed Project and specific location of Project site (10 km and 5 km)and google image is given in theFigures below**.**



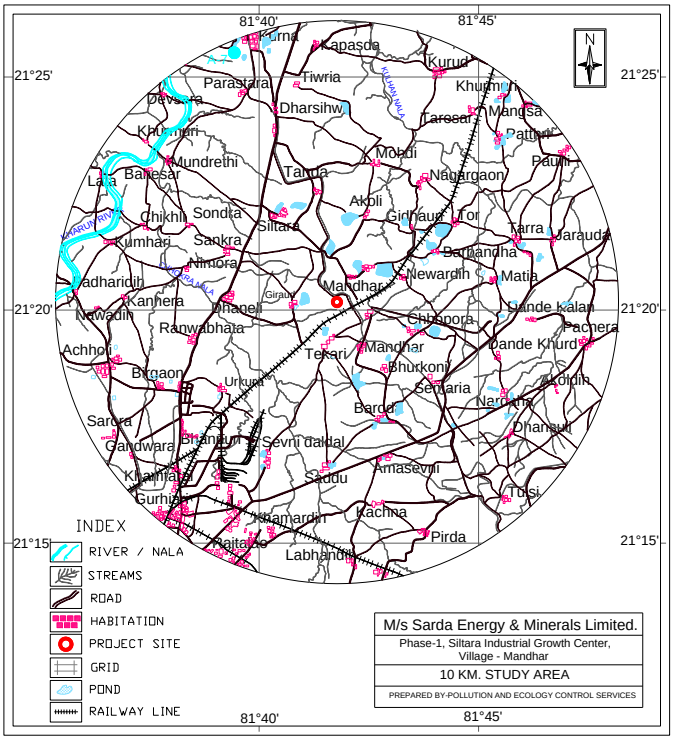
Source:mapsofindia.com

Location of the Project Site

Project Highlights

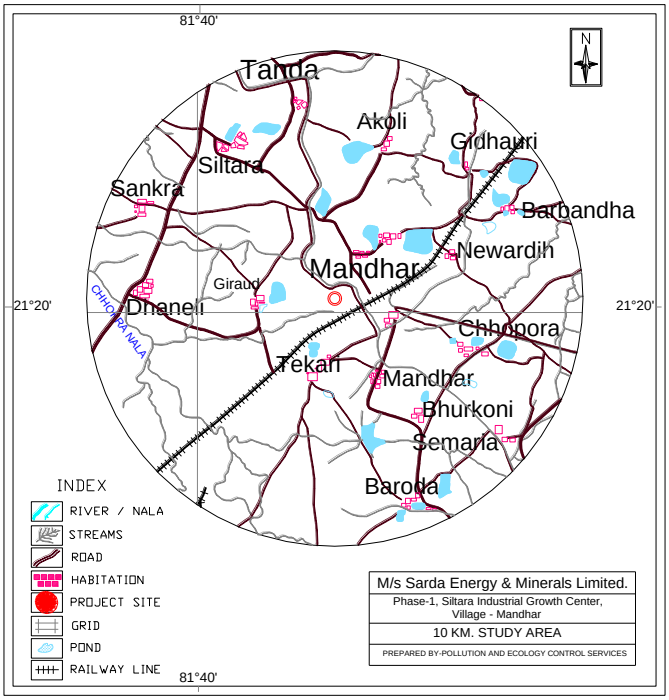
Sr. No.	Particulars	Details
1	Project Site	Phase-I of Siltara Industrial Growth Centre, Village Mandhar, Raipur (CG)
2	Site Co-ordinates	Latitude: Between .: N 21^0 20’ 9.74” – N 21^0 20’ 42.57” Longitude: Between E $81^0$41’10.57” - E81^0 42’02.48”
3	Topo sheet No.	64G/11, 64G/15
4	Elevation above MSL	282 m

5	Present Land use	Industrial
6	Climatic Conditions	Ambient Air Temp 7°C to 46°C Average annual Rainfall 1200 mm
7	Nearest Highway	NH 200 (5 km-W)
8	Nearest Airport	Raipur 25 Km ESE
9	Nearest Railway Station	Mandhar 1.5 Km SE
10	Nearest Village	Mandhar 1.0 Km SE
11	Nearest Town	Raipur 20 Km ESE
12	Nearest water body	Kharoon River (8.0 km-NW) KulhanNala (6.5 km –N)



Source: SOI Toposheet

Specific Location of the Project Site (10 km radius)



Source: SOI Toposheet

Specific Location of the Project Site (5 km radius)

Source: Google Earth

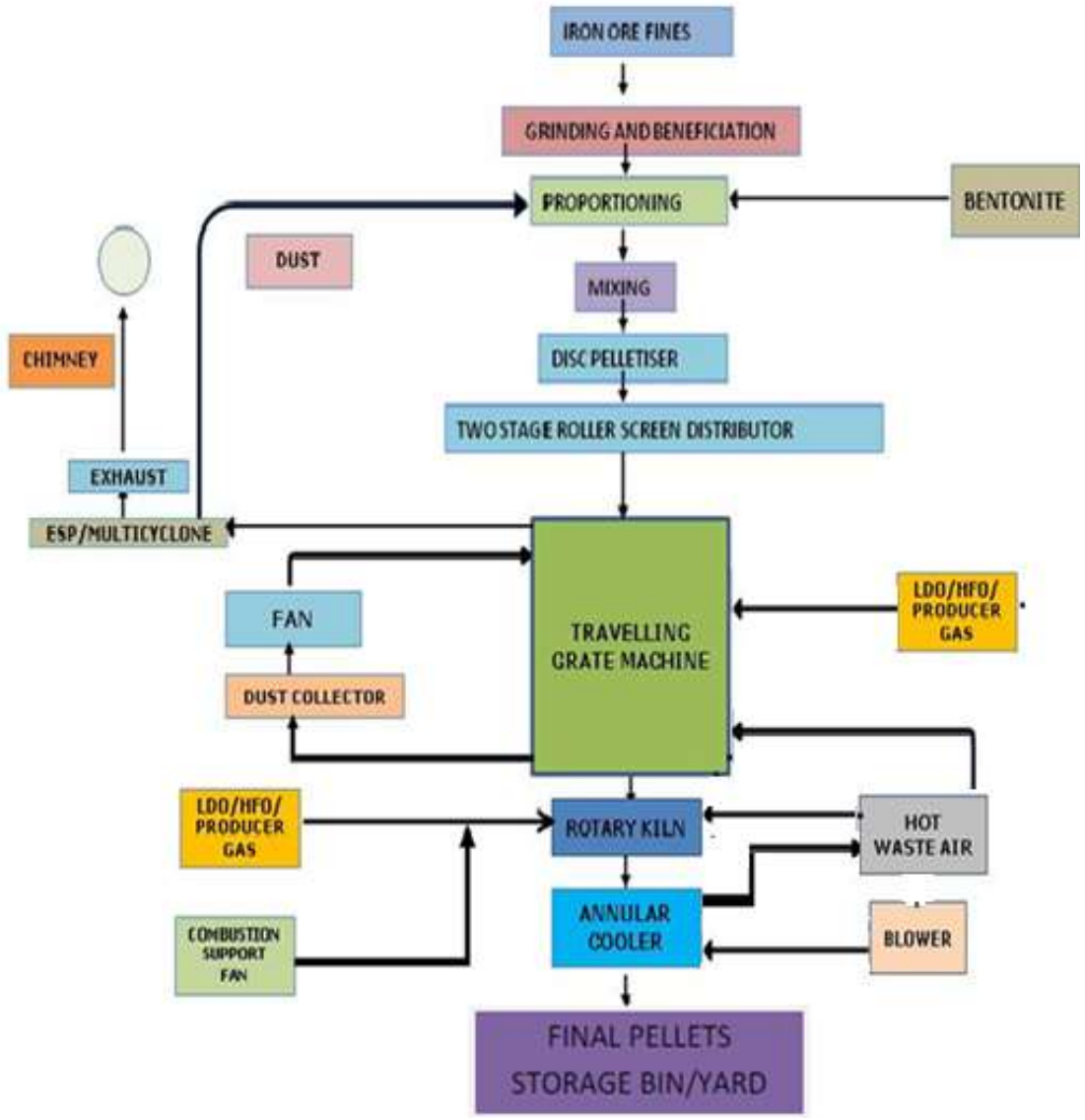
Google Image

DESCRIPTION OF PROCESS

TECHNOLOGY AND PROCESS DESCRIPTION

Manufacturing Process of Pellet

Pelletization essentially consists of formation of green balls by rolling fine iron ore(Hematite)/Concentrate with critical amount of water and bentonite as binder. These green balls of nearly 8-16 mm size are then dried, preheated and fired, all under oxidising conditions, to a temperature of around 1200 - 1250 deg. C. The sensible heat of the exhaust gases is recovered and is fed back in the Indurations operation. The main workshops of pelletizing production line include: concentrate storage, bentonite storage, proportion building, drying building-damp mill building/Mixer building, pelletizing, green ball screening & distributing system, traveling graterotary kiln-annular cooler system, main I.D. fan system, product storing & transportation system and etc. The Process of Pellet plant is given in Figure below



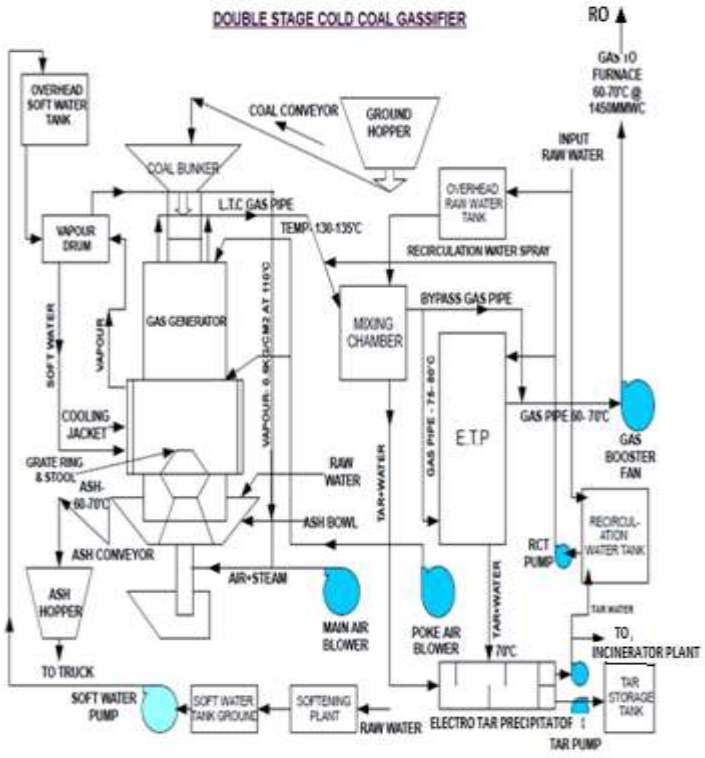
Process Flow Diagram for Pellet Plant

Manufacturing Process of Proposed Coal Gasifier Plant

These Extended Shaft Gasifier are of distinctly improved design over the conventional 19th Century old design single stage Gasifier with respect to quality and consistency of gas, smooth and trouble free operation without interruptions, higher calorific value,

adaptability to lower grades of coal, safety and operation friendliness, ecology and pollution control, easily controllable and flexibility of operation etc.

The object of the New Technology is to produce a clean consistent quality Producer Gas of high Calorific Value from majority of grades of Indian Coal from 'A' to 'G' grade and with faster rate of gasification or more coal through-put per unit grate area. With this objective in view a deep coal bed was introduced with extension of shaft over the conventional generator proper of the single stage design and the product gas has been fully diverted to the top to come out from the top of the Gasifier. The process flow chart of Coal Gasifier is given in figure below**.**



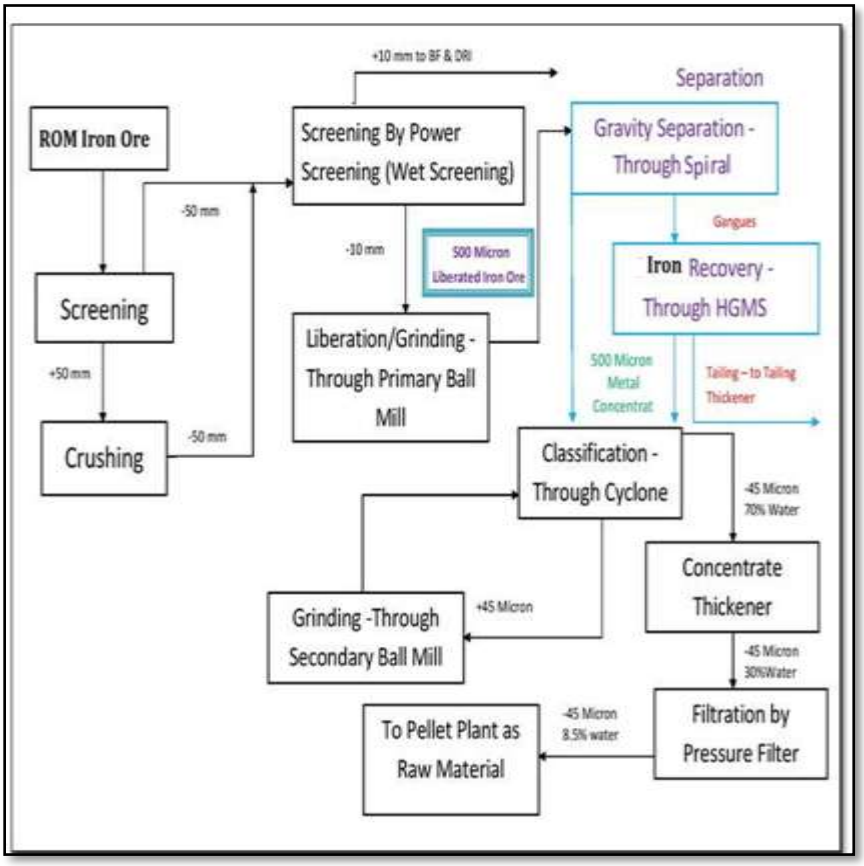
Process Flow Diagram for Coal Gasifier

Upgragation of Existing Iron Ore Grinding Unit to 1.0 MTPA Iron Ore Grinding and Beneficiation Unit.

The Iron ore fines which are being fed to the existing 0.6 MTPA Pellet Plant is being grinded through an Iron Ore Grinding Unit. SEML has envisaged upgrading this Iron

Ore Grinding Unit to Iron Ore Grinding & Beneficiation Plant in order to utilize the low grade iron ore from the captive mines at Rajnandgaon.

The above upgardation will also result in enhancing the throughput capacity from 0.7 MTPA Iron Ore Grinding Unit to 1.0 MTPA Iron Ore Grinding and Beneficiation Plant. The process flow chart for Iron Ore Grinding& Beneficiation Plant is given in Figure below .



Process Flow Diagram for I/O Grinding& Beneficiation Plant

Power Plant (WHRB from Blast Furnace and Coke Oven)

It is proposed to install 2 x 35 MW Waste Heat Recovery based Power Plant in phases with 64 kg/cm^2 steam pressure and 490^{0}C temperature. It is proposed to install four

numbers of 70 TPH Waste Heat Recovery Boiler utilizing Blast Furnace Gas & Coke Oven flue Gas. The steam generated from BF fired boiler & Waste Heat Recovery Boiler of Coke Oven will be utilized for generation of 2 x 35MW Power. Approximate 45% of the flue gas leaving from Blast Furnace through Gas Cleaning Plant will be utilized in stoves and balance gas will be utilized in the boilers for steam generation.

STEAM GENERATION

There will be Two numbers 70 TPH Blast Furnace Gas Fired Boiler & Two numbers 70 TPH Waste Heat Recovery Boilers where recovery of sensible heat will done from Coke Oven waste gas / flue gas. The Boilers are of natural circulation, balanced draft, single drum type. All Boilers will generate steam at 64kg/cm2 pressure and 4900C temperature.

The Waste Heat Recovery Boilers will be provided with Electrostatic Precipitator. Over all efficiency of ESP will be around 99.50% to control particulate emission at chimney outlet within 50mg/Nm3.

Process for Power Generation

The steam generated from WHR Boiler will be sent to the turbine for generation of power. The steam leaving from Boiler drum is further heated in convective Super Heater, Primary and Secondary Super Heater by the hot Flue gas. The steam leaving the Boilers will have 64 kg/sq. cm pressure and 490oC temperature. The Flue gas is discharged in atmosphere after separation of particulate matter with the help of E.S.P. through Chimney. The Flue gas discharge temperature after E.S.P. will be 145 oC. The heat energy available in the steam will be converted in to mechanical energy, thereby rotating the Turbine at 3000 R.P.M.

DESCRIPTION OF ENVIRONMENT

Air Environment

The baseline environmental quality for the February, March, April& May2018 was assessed in an area of 10 km radius around the proposed project site.

The predominant wind directions are W, SW and WSW.

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

PM_{10} - 41.6 to 90.8µg/m3.
$PM_{2.5}$ - 24.3 to 46.7 µg/m3
SO2 - 11.3 to 38.1µg/m3
NOx - 19.2 to 44.7µg/m3

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 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 (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 waste lands and agriculture land are sandy loam, loamy sand, loam and silt loam respectively.

(b) Colour of soil samples from waste and agriculture lands are Yellowish, Reddish and Yellow respectively.

(c) The bulk density of soil samples from waste land are in the range of 1.51 to 1.58 g/cc and sample from agriculture land are in the range of 1.42 to 1.54 g/cc.

(d) Soil samples from waste land have pH values between 6.8 to 7.22 and sample from agriculture land have 7.16 to 7.28. The pH values are indicating nature of soil samples is neutral to alkaline.

(e) Soil samples from waste land have conductivities between 0.256 to 0.358 mmhos/cm and conductivities of soil sample from agriculture land ranges between 0.267 to 0.292 mmhos/cm.

(f) Soil samples from waste land have Organic Matter between 0.26 to 0.40 % and sample from agriculture land have between 0.66 to 0.72 % Organic Matter. These values represent moderate fertility of soils.

(g) Soil samples from waste land have concentration of Available Nitrogen values ranged between 105.0 to 161.0 kg/ha and samples from agriculture land range between 266 to 294 kg/ha.

(h) Soil sample from waste land have concentration of Available Phosphorous values ranged between 7.6 to 10.8 kg/ha and soil samples from agriculture land have concentration values ranges from 26.8 to 28.2 kg/ha.

(i) Soil sample from waste land have concentration of Available Potassium values range between 48.2 to 70.4 kg/ha and sample from agriculture land concentration of Available Potassium as its values range between 180.7 to 190.4 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

Air Environment

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

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 various sources. 20 Stacks of different heights are proposed for proper dispersion of gases. 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, suspended particulate matter (PM), Sulphur Dioxide, NO_x and Carbon Monoxide, etc.
- Fugitive dust generated during vehicular movement.

Mitigation Measures

- ➢ Dust extraction system will be provided for areas like Raw Material Handling.
- ➢ Dust will be collected with the help of suction hood and cleaned with the help of cyclones and bag filters and cleaned air will be discharged through stacks and air

vents. Flue gases will be generated from Pellet Plant, Coke Oven, Sinter Plant, Blast Furnace Stove, Blast Furnace Gas Steam Generation Unit, Electric Arc Furnace & power plant.

- These gases will be cleaned in the Electrostatic Precipitator (ESP) / GCP / Bag Filters having efficiency of 99.95% and discharged through stack, so that the dust concentration will be well within the prescribed standard.
- Emission of NOx will be controlled by designing Low NOx Burners in power plant, sponge iron plant, coke oven and blast furnace.
- Flue gas desulphurization will be used to reduce SO_2 emission from exhaust gases of Power Plant, Sponge Iron and Blast Furnace and from the emission of other SO_2 emitting processes.
- All the flue gas discharge facilities i.e. Chimney and Air went will be designed as per CPCB norms for adequate dispersion.

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 Kharoon river. 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 company has been allotted 2 + 1.25 MGD water from Kharoon River. SEML has already laid down its own 10 KM long pipe line from river to the proposed plant.
The average make-up water requirement of the plant estimated at 47,635 cum per day, which includes domestic water requirement of 58 cum per day. Out of the 47,635 cum per day, 1838 will be recycled treated waste water to be utilized for Quenching, Green Belt Development and Dust Suppression etc.

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

Solid Waste Generation				
Sl. No	**Plant**	**Waste Type**	**Quantity (TPA)**	**Mode of Disposal/Utilization**
1	Iron Ore Pellet Plant (Enhancement)	ESP/Bag filter Dust	19,200	Will be Reused in Pellet Plant as Raw Material
2	Coal Gasifiers Plant (Underway)	Ash (as Cinder)	48,900	Will be Crushed With slag Crusher and Utilized in Fly ash bricks, Blocks and Tiles Manufacturing Plant and also sold in local market
3		Tar	2,600	Will be Sold to authorized recycler
4	Iron Ore Grinding & Beneficiation Plant (Upgradation)	Tailing	300,000	Will be Sold to Cement Plant and also utilized in fly ash Brick manufacturing plant
Proposed Expansion (1.2 MTPA ISP & 150 MW PP)				
5	Iron Ore Pellet Plant	ESP/Bag filter Dust	28800	Will be Reused in Pellet Plant as Raw Material
6	Coal Gasifiers Plant	Ash (as Cinder)	97,800	Will be Crushed With slag Crusher and Utilized in Fly ash bricks, Blocks and Tiles Manufacturing Plant and also sold in local market

7		Tar	5,200	Will be Sold to authorized recycler
8	Sinter Plant	ESP Dust	1,580	Will be Reused in Sinter Plant as Raw Material
9	Blast Furnace	Slag	300,000	
10		GCP Dust	1,200	Will be Reused in Sinter Plant as Raw Material
11	Electric Arc Furnace	Slag	84000	Will be Crushed With slag Crusher for recovery of metal and non metallic slag will be utilized in Fly ash bricks, Blocks and Tiles Manufacturing Plant and also sold in local market
12	CCM -Cast Billets	Spillage & Waste Scrap	34950	Will be Reused as Raw material in EAF
13	Rolling Mill (TMT, Wire Rod, Section & other long products)	Miss Role	2,000	Will be Reused as Raw material in EAF
14		End Cutting Scrap	14,000	Will be Reused as Raw material in EAF
15		Mill Scale	15,000	Will be Reused as Raw material in EAF
16		Hot Out	7,000	Will be Reused as Raw material in EAF
17	Sponge Iron Plant	Char &Dolochar	270,000	Will be Reused as Raw material in Power Plant
18		Back Flow	12,000	Will be Sold to Cement plant
19		ESP & Bag Filter Dust	299,400	
20		Kiln Accretion	45,000	will be utilized in Fly ash bricks, Blocks and Tiles Manufacturing Plant and also sold in local market
21	Thermal Power Plant	Fly Ash	327,782	Will be Sold to Cement plant
22		Bed Ash	81,946	will be utilized in Fly ash bricks, Blocks and Tiles Manufacturing Plant and also sold in local market
23	Ductile pipe with Induction furnace	Furnace Recycled scrap	16,275	Will be recycled in back in process
24		Scrap pipe	4,114	Will be recycled in back in process
25		Convertor Slag	3,084	Will be utilized for Road making and filling of low lying areas.

26		IF Slag	1,782	Will be Crushed With slag Crusher for recovery of metal and non metallic slag will be utilized in Fly ash bricks, Blocks and Tiles Manufacturing Plant and also sold in local market
27		Waste	26,861	Will be utilized for Road making and filling of low lying areas.
28		Recycled material	735	Will be recycled in back in process

SOCIO-ECONOMIC ENVIRONMENT

Operation phase

The project proponent would aid in the overall social and economic development of the region. The plant will give employment to about 1914 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.

ENVIRONMENT MONITORING PROGRAMME

The environmental monitoring is important to assess performance of pollution control equipment installed in the proposed project of M/s Sarda Energy and Minerals Ltd. The sampling and analysis of environmental attributes including monitoring locations Sarda Energy and Minerals Ltd. 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 Sarda Energy and Minerals 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

Budget for Implementation of Environmental Management Plan

The total Project cost (Existing + Expansion) is Rs.4674.74 Cr .Budgetary provision of Rs.194 Crores during construction and Rs. 19.12 Crores during operation has been made for implementation of Environmental Management Plan. The breakup of the same is given in Tablebelow.

EMP Budget

Pollution control Equipment	**Capital Cost (INR Lac)**	**Recurring Cost (INR Lac)**
Air pollution Control System	15000	1500
Wastewater Treatment System	2000	200
Solid Waste Management	1250	65
Green Belt Development	250	5
Environment Monitoring	700	140
Rain water harvesting project	200	2
Total	**19400**	**1912**

ENVIRONMENT MANAGEMENT PLAN

Air pollution

There will be two major source of air pollution in the plant, fugitive emissions from various material handling and transfer points and from flue gases generated from various combustion units. Dust extraction system will be provided for areas like Raw Material Handling. Dust will be collected with the help of suction hood and cleaned with the help of cyclones and bag filters and cleaned air will be discharged through stacks and air vents. Flue gases will be generated from Pellet Plant, Coke Oven, Sinter Plant, Blast Furnace Stove, Blast Furnace Gas Steam Generation Unit, Electric Arc Furnace & power plant. These gases will be cleaned in the Electrostatic Precipitator (ESP) / GCP / Bag Filters having efficiency of 99.5% and discharged through stack, so that the dust concentration will be well within the prescribed standard.

Height of the all the flue gas discharge facilities will be designed as per CPCB norms. The various places where the flue gases will be discharge are shown in the table.

FLUE GAS DISCHARGE FACILITIES

S.No	Plant	Facility	Number
1	Pellet Plant (8,00,000 TPA - Enhancement)	Chimney	1
Proposed Expansion			
2	Pellet Plant (12,00,000 TPA)	Chimney	1
3	Sponge Iron Plant	Chimney	4
4	Coke Oven	Chimney	5
5	Sinter Plant	Chimney	2
6	Blast Furnace	Chimney	2
7	Electric Arc Furnace	Air Vent / Chimney	2
8	Power Plant	Chimney	1
10	Ductile Pipe (With Induction Furnace)	Chimney	2

Various Air Pollution Control System

S.No	Process	Air Pollution Control System	Stack Height
1	Pellet Plant (8,00,000 TPA - Enhancement)	ESP, Multiclone, Bag Filter, Deduster	60 Mtrs.
Proposed Expansion			

2	Pellet Plant (12,00,000 TPA)	ESP, Multiclone, Bag Filter, Deduster	70 Mtrs
3	Sponge Iron Plant	ESP, Wet Scrapper, Multiclone, Bag Filter, Deduster	66 Mtrs.
4	Coke Oven	Bag Filter,/ Deduster	60 Mtrs.
5	Sinter Plant	ESP	42 Mtrs.
6	Blast Furnace	GCP (Dust catcher and wet cleaning system)	98 Mtrs.
7	Electric Arc Furnace	Fumes Extraction System with Cyclone & bag Filter	30 Mtrs.
8	Power Plant	ESP, Bag Filter	120 Mtrs.
10	Ductile Pipe (With Induction Furnace)	Fumes Extraction System with Cyclone & bag Filter	30 Mtrs.

Action Plan to Control of Fugitive Emission

- Proper Dust Suppression is proposed in stock yard of Iron Ore Fines, sprinkling on internal roads, regular check up& maintenance of vehicles, it will be ensured that all trucks/dumper caring Iron Ore Fines ore covered by Tarpaulin.
- 10 stacks of different heights have been provided in Plant.
- Spraying of water on the stockyard stockpiles controls any fugitive emissions from this area.
- An ESP is installed near the travelling grate does the process de-dusting of the drying & induration area.
- Plant de-dusting system for all the material transfer points and screens is carried out by a bag filter system. Dust collected from the bag filters is re-circulated
- Pulverised coal is used as fuel for induration of pellets in rotary kiln of Induration area. Coal is pulverized in vertical roller mill.
- The dried waste gas will be discharged into the air through the chimney.
- The vehicle movement striclty limited to 16 Km/hr.

However, in order to meet the statutory ground level concentration limits for SO_2, NOx and other gaseous pollutants, suitable stack heights are provided for proper dispersion. All stacks are provided with port holes and working platform so that stack monitoring is being done as per norms of statutory authority.

Water pollution

Water is required in the plant mainly for the purpose of equipment cooling, steam generation, process and quenching. Water is also required for drinking, sanitary, and fire fighting purposes. In order to conserve water and minimize the make-up water requirement, it is proposed to adopt re-circulating systems for equipment cooling. In re-circulating system same water re-circulates again and again after proper treatment and bleed off.

The total waste water generation will be 2,188 cum per day. In addition to this 43 KLD waste water will be generated. The source of waste waster generation, its treatment and mode of utilization is detailed here under.

Waste Water Generation			
Plant	**Facility**	**Quantity**	**Utilization/Disposal**
Coal Gasifier Underway	Softening Plant	20.00	Neutralization Pit
	Gas Cleaning	2	To ABC of Existing Sponge Iron Plant at Siltara
Coal Gasifier Expansion	Softening Plant	40	Neutralization Pit
	Gas Cleaning	4	Phenolic water generated will be utilized for making green ball in Disc Pelletizers of Pelletization Plant/ABC of Proposed Sponge Iron Plant
Blast Furnace	Cooling (Make-up)	186	ETP
	GCP	3	ETP
Electric Arc Furnace & Oxygen Plant	Cooling (Make-up)	66	ETP
Sponge Iron Plant	Cooling (Make up)	23	ETP
	Wet Scraper	9	ETP
Rolling Mill	DM Softener	26	Neutralization Pit
	Cooling (Make-up)	5	ETP
Power Plant	Cooling	1492	ETP
	DM	312	Neutralization Pit
Total Waste Water Generation		**2,188.00**	
Treatment measures			

Treatment	Input Quantity	Output Quantity	Remark
Package STP of Capacity 50 KL	43	0	Treated in Packaged Type STP.
Neutralization Pit	398	378	Water from Neutralization Pit will be taken to ETP for further treatment.
ETP	2162	1838	Recycled and reused in process
Total Treated Water		**1838**	

Treated Waste Water Utilization		
Plant	**Facility**	**Quantity**
Electric Arc Furnace & Oxygen Plant	Slag Quenching From ETP	45
Sponge Iron Plant	Wet Scraper From ETP	20
Coke Oven	Coke Quenching From ETP	301
Blast Furnace	Quenching From ETP	63
	GCP	45
All Units	Plantation	40
All Units	Dust Suppression	45
DIP	Cooling & Quenching	1279
Total Recycled waste Water		**1838**

Noise Pollution

The physical description of sound concerns its loudness as a function of frequency. Noise in general is sound which is composed of many frequency components of various loudness distributed over the audible frequency range. Various noise scales have been introduced to describe, in a single number, the response of an average human to a complex sound made up of various frequencies at different loudness levels. The most common and universally accepted scale is the 'A' weighted network dB (A). The scale has

been designed to weigh various components of noise according to the response of a human ear. The major sources of noise generation in the pellet plant are from fixed plant installations and external transport movements. The common noise generating sources from the fixed installations are screens, vibrators, conveyors and rotary kiln and the ball mills. Apart from these, another noise generating source is DG set which will be operated occasionally i.e. used as a standby source of electricity. However, ID Fans are the major noise-generating source.

Trucks carrying the raw material into the plant premises and the finished product from the industry are the main sources of noise pollution.

Mitigation Measures

Various measures to reduce noise pollution include reduction of noise at source, provision of acoustic lagging for the equipment and suction side silencers, selection of low noise equipment. In some areas where due to technological process, it is not feasible to bring down the noise level within acceptable limits, personnel working in these areas are provided with noise reduction aid such as ear muffler and also the duration of exposure of the personnel are limited as per the norms.

Solid Waste Management

For the overall pellet plant, the pelletizing process practically generates no solid waste. A very small quantity of coal fines and iron ore fines will be generated and also dry dust from air pollution control equipment, which will be reused, in the industrial process. Hence there is no solid waste generation.

The fine ore beneficiation process however will generate tailing to the extent of about 30% of the input iron ore, it will be sold to Cement Plant and also utilized in fly ash Brick manufacturing plant.

Green Belt

The plantation and green belt development will also be taken care in the plant and the space reserved for plantation will be more than 33% of the total plant area. SEML will take-up massive green belt development by planting about 600 trees per acre. In view of

above, SEML proposed to develop 15-20 meters wide green belt along the boundary wall inside the factory premises. Adequate plantation will substantially abate the dust pollution, filter the polluted air, reduce the noise and ameliorate the plant environment.Total Plant Area is 204.452 ha. Approx. 67.47 ha with 1500 trees/ha is under greenbelt development SEML has already planted 67,948 trees in its plant area. Presently, total plantation at the premises is spread over an area of 45.30 Ha.