SUMMARY ON

ENVIRONMENTAL IMPACT ASSESSMENT

REPORT

OF

Maa Beriwali Steel & Power Pvt. Ltd.

[Establishment of Greenfield steel plant comprising of DRI Kilns (2,31,000 TPA), Induction Furnace with matching LRF & CCM (HotBillets / Billets / Ingots – 1,98,000TPA), Rolling Mills (TMT bars / Structural Steel)(85% Hot charging with Hot Billets and remaining 15% through RHF with gasifier as fuel – 1,98,000 TPA),Coal Gasifier (1782 Nm^3/Hr), Ferro Alloy Unit 2 x 9 MVA (FeSi – 14,000 TPA/FeMn – 40,000 TPA/SiMn – 28,000 TPA/FeCr – 30,000 TPA/ Pig Iron-48,000 TPA), Briquetting Plant (200 Kg/Hr),WHRB based Power Plant –16 MW, FBC based Power Plant - 8 MW & Brick Manufacturing unit (15,000 Bricks / Day)]

at

Lakhana & Sankara Villages, Tilda Tehsil,
Raipur District, Chhattisgarh

Category – A Project
Schedule -3(a) Metallurgical Industries (ferrous and non-ferrous),1(d) Thermal Power Plants

Submitted to

CHHATTISGARH ENVIRONMENT CONSERVATION BOARD
Chhattisgarh

1.0 PROJECT DESCRIPTION

Maa Beriwali Steel & Power Pvt. Ltd.is proposing to establish a Steel Plant, a Greenfield Project, at Lakhana& Sankara Villages, Tilda Tehsil, Raipur District, Chhattisgarh, comprising of Establishment of Greenfield steel plant comprising of DRI Kilns (2,31,000 TPA), Induction Furnace with matching LRF & CCM (Hot Billets / Billets / Ingots – 1,98,000TPA), Rolling Mills (TMT bars / Structural Steel)(85% Hot charging with Hot Billets and remaining 15% through RHF with gasifier as fuel – 1,98,000 TPA), Coal Gasifier (1782 Nm^3/Hr), Ferro Alloy Unit 2 x 9 MVA (FeSi – 14,000 TPA/FeMn – 40,000 TPA/SiMn – 28,000 TPA/FeCr – 30,000 TPA/ Pig Iron-48,000 TPA), Briquetting Plant (200 Kg/Hr), WHRB based Power Plant –16 MW, FBC based Power Plant - 8 MW & Brick Manufacturing unit (15,000 Bricks / Day).

Total land identified for the proposed project is 17.553 Ha. (43.373 Acres). The land earmarked for the proposed project is Private Land (Agriculture Land).

The estimated project cost for the proposed project is Rs. 320 Crores.

As per the Ministry of Environment, Forests & Climate Change, New Delhi, EIA notification 14th September 2006 & its subsequent amendments, all Primary metallurgical processing industries are listed under S.No. 3(a) & 1(d) Thermal Power Plants under Category 'A'.

In order to obtain Environmental Clearance for the proposed Steel plant, proposal is submitted to Ministry and accordingly TOR letter was accorded by Ministry vide no. F.No. IA-J-11011/294/2022-IA-II(IND-I) dated 6th October, 2022& 7th November 2023 (TOR amendment).

Pioneer Enviro Laboratories & Consultants Private Limited, Hyderabad, which is accredited by NABET, Quality Council of India, vide certificate No. NABET/ EIA/ 2225/RA 0282, for preparing EIA report for Metallurgical Unit, have prepared Environmental Impact Assessment (EIA) report for the proposed project by incorporating the TOR approved by Ministry of Environment, Forests & Climate Change, New Delhi. The report contains detailed description of the following:

- Characterization of status of environment with in an area of 10 km radius from the plant for major environmental components including air, water, noise, soil, flora, fauna and socio-economic environment.
- Assessment of air emissions, liquid waste and solid waste from the proposed project along with the noise level assessment.

- Environmental Management Plan comprising of emission control measures proposed to be adopted in the proposed project, solid waste management, Greenbelt development.
- Post Project Environmental Monitoring & Budget for Environmental Protection Measures.

1.1 ENVIRONMENTAL SETTING WITHIN 10 Km. RADIUS OF THE PLANT SITE

The following is the environmental setting within the 10 Km. radius of the Project site:

Table No. 1.1: Environment Setting within 10 Kms. radius of the site

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
1.	Type of Land	Private Agriculture Land
2.	Type of Land (Study Area)	As per LULC the land use within 10 Km. is as follows: Settlements –4.6%, Industrial Area –2.7%, Tank/ River/Major Canal etc. –10.6%, Scrub Forest –3.3%, Single Crop –58.8%, Double Crop –8.7%, Plantation –3.8%, Land with scrub –5.2%, Land without scrub –2.3%
3.	National Park/ Wildlife sanctuary / Biosphere reserve / Tiger Reserve / Elephant Corridor / migratory routes for Birds	There are no notified National Park/ Wild life sanctuary / Biosphere reserve / Tiger Reserve/ migratory routes for Birds within 10 Km. radius of the plant.
4.	Historical places / Places of Tourist importance / Archeological sites	Nil
5.	Critically polluted area as per MoEF&CC Office Memorandum dated 13th January 2010	None And also the Plant area does not fall in the areas given in Hon'ble NGT order issued vide dated 10th July 2019.
6.	Defence Installations	Nil
7.	Nearest village	Lakhana Village – 1.7Kms.(N)
8.	No. of Villages in the Study Area	43 nos.
9.	Nearest Hospital	Nearest Hospital is at Baikunth at 11 Kms.
10.	Nearest School	Nearest School is Govt. Primary School Sungeraat Sungera Village at 1.8 Kms
11.	Forests	Bilari RF (7.8 Kms._ NE) are present within 10 Kms. radius of the project site.
12.	Water body	Kulhan Nallah - Seasonal (0.23 Kms – West Direction), Deorani Jethani Nallah - Seasonal (0.23 Kms – South Direction), Kharun river (1.6 Kms. – NW Direction), Shivnath river (3.8 Kms. – E Direction) are present within 10 Kms. radius of the project site.

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
13.	Nearest Highway	NH#130 (NH# 200) at 2.2Kms. E (Aerial)
14.	Nearest Railway Station	Baikunth Railway Station –11Kms.(By road)
15.	Nearest Port facility	Nil within 15 Km. Radius.
16.	Nearest Airport	Nil within 15 Kms. Radius [Raipur Airport – 40 kms (by Aerial)]
17.	Nearest Interstate Boundary	Nil within 15 Kms. Radius
18.	Seismic zone as per IS-1893	Seismic zone – II MSL of the Project area – 277 m to 283 m
19.	R & R	There is no rehabilitation and resettlement issue, as there are no habitations present in the site area.
20.	Litigation / court case is pending against the proposed project / proposed site and or any direction passed by the court of law against the project	Nil
21.	HT Line	Passing through the site (50m Corridor will be maintained on either side of HT line. No activity will be taken up in the corridor area)

1.2 PLANT CONFIGURATION AND PRODUCTION CAPACITY

Following is the proposed plant configuration and proposed production capacities:

Table No.1.2: Proposed Plant Configuration & Production Capacities

S.No.	Units (Products)	Plant configuration & Production capacities
1.	DRI Kilns (Sponge Iron)	2,31,000 TPA (2 x 350 TPD)
2.	Induction Furnaces with LRF & CCM (Hot Billets / MS Ingots / Ingots)	1,98,000 TPA (4 x 15 T)
3.	Rolling mills (TMT bars / Structural Steel) (85% Hot charging with Hot Billets and remaining 15% through RHF with gasifier as fuel)	1,98,000 TPA (2 x 300 TPD)
4.	Coal Gasifier	1782 Nm^3/Hr.
5.	Ferro Alloys Unit (FeSi / FeMn / SiMn / FeCr / Pig Iron)	FeSi-14,000 TPA / FeMn-40,000 TPA / SiMn-28,000 TPA / FeCr-30,000 TPA / Pig Iron-48,000 TPA (2 x 9 MVA)
6.	Briquetting Plant (Briquettes)	200 Kg/Hr.
7.	Brick Manufacturing Unit (Bricks)	15,000 Bricks/ day
8.	WHRB based Power Plant (Electricity)	16 MW
9.	FBC based Power Plant (Electricity)	8 MW

1.3 RAW MATERIAL REQUIRMENT

The following will be the raw material requirement for the proposed project:

Table No.1.3: Raw Material Requirement, Source &Mode of Transport

S.No.	Raw Material		Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
1.	**DRI Kilns (Sponge Iron) – 2,31,000 TPA**					
a)	Pellets (100 %)		3,34,950	Barbil, Orissa NMDC, Chhattisgarh	~ 500 Kms.	By rail & road (through covered trucks)
	OR					
b)	Iron ore (100%)		3,69,600	Barbil, Orissa NMDC, Chhattisgarh	~ 500 Kms.	By rail & road (through covered trucks)
c)	Coal	Indian	3,00,300	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)
		Imported	1,92,192	Indonesia / South Africa / Australia& any other country	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered trucks)
d)	Dolomite		11,550	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
2.	**Steel Melting Shop (Hot Billets/ Billets / Ingots) – 1,98,000 TPA**					
a)	Sponge Iron		2,00,000	Own generation	---	By road (through covered trucks)
b)	MS Scrap / Pig Iron		30,000	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
c)	Ferro alloys		10,000	Own generation	---	By road (through covered trucks)
3.	**Rolling Mill through Hot charging (Rolled Products) – 1,98,000 TPA**					
a)	Hot Billets (for Hot charging)		1,75,032	Own generation	---	----
b)	Billets / Ingots (for Reheating furnace)		32,670	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
c)	LDO		962 Kl/annum	Nearby IOCL Depot	~ 100 Kms.	By road (through Tankers)
d)	Gasifier (1782 $Nm^3/Hr.$)	Indian Coal	5346	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)

S.No.	Raw Material		Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
		Imported Coal	3421	Indonesia / South Africa / Australia& any other country	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered trucks)
4.	**FBC Boiler [Power Generation - 1 x 8MW]**					
a)	Indian Coal (100 %)		47,520	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)
	OR					
b)	Imported Coal (100 %)		30,413	Indonesia / South Africa / Australia& any other country	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered trucks)
	OR					
c)	Dolochar + Indian Coal	Dolochar	46,200	In plant generation	---	through covered conveyors
		Indian Coal	24,420	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)
	OR					
d)	Dolochar + Imported Coal	Dolochar	46,200	In plant generation	---	through covered conveyors
		Imported Coal	7,313	Indonesia / South Africa / Australia& any other country	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered trucks)
5.	**For Ferro Alloys (2 x 9 MVA)**					
5 (i)	*Ferro Silicon – 14,000 TPA*					
a)	Quartz		30,800	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
b)	Char Coal / Coke		21,700	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	Mill Scale & M.S. Scrap		6,300	Inhouse Generation	---	By road (through covered trucks)
d)	Electrode paste		1,400	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
e)	Briquetted Bag filter dust		980	Inhouse Generation	---	By road (through covered trucks)
5 (ii)	*Ferro Manganese –40,000TPA*					

S.No.	Raw Material	Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
a)	Manganese Ore	96,000	MOIL / OMC	~ 500 Kms.	By Rail & Road (throughcovered trucks)
b)	coke	12,000	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	MS Scrap / Mill scales	8,000	Inhouse Generation	---	By road (through covered trucks)
d)	Electrode Paste	880	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
5 (iii)	*Silico Manganese –28,000TPA*				
a)	Manganese Ore	56,000	MOIL / OMC	~ 500 Kms.	By Rail & Road (throughcovered trucks)
b)	Coke	8,400	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	FeMn. Slag	12,600	In house generation	---	----
d)	Dolomite	8,400	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
e)	Electrode paste	560	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
f)	Quartz	9,800	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
g)	BriquettedBagfilter dust	420	Own generation	---	---
5 (iv)	*For Ferro Chrome – 30,000 TPA*				
a)	Chrome Ore	72,000	Sukinda, Odisha Imported	~ 500 Kms. ~ 600 Kms. (from Vizag Port)	By road (through covered trucks) From Port By Road (through covered Trucks)
b)	Coke	15,000	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	Quartz	1,830	Chhattisgarh / Andhra	~ 500 Kms.	By road (through covered

S.No.	Raw Material	Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
			Pradesh		trucks)
d)	MS Scrap / Mill Scale	4,500	Inhouse Generation	---	By road (through covered trucks)
e)	Magnetite / Bauxite	4,500	Chhattisgarh / Maharashtra	~ 500 Kms.	By road (through covered trucks)
f)	Electrode Paste	600	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
g)	Bagfilter dust	600	Own generation	---	---
5 (v)	*For Pig Iron – 48,000 TPA*				
a)	Iron ore	52,560	Barbil, Orissa NMDC, Chhattisgarh	~ 500 Kms.	By road (covered trucks)
b)	Coke	30,144	Andhra Pradesh	~ 500 Kms.	By road (covered trucks)
c)	Lime stone	7,200	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (covered trucks)
d)	Mill Scale	31,200	Inhouse Generation	---	By road (through covered trucks)
e)	Fluorspar	1,200	Maharashtra / Gujarat	~ 500 Kms.	By road (through covered trucks)
f)	Dolomite	7,200	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)

1.4 MANUFACTURING PROCESS

1.4.1 Sponge Iron (DRI)

The proposal consists of 2 x 350 TPD to manufacture 2,31,000 TPA of Sponge Iron with 2x8 MW WHRB facility. Refractory lined rotary kilns will be used for reduction of iron ore in solid state.

Refractory lined rotary kilns will be used for reduction of iron ore in solid state. A central Burner located at the discharge end will be used for initial heating of the kiln.

Iron ore will be continuously fed into the kiln along with coal which has dual role of fuel as well as reductant. Dolomite will be added to scavenge the sulphur from the coal. A number of air tubes will be provided along the length of the kiln. The desired temperature profile will be maintained by controlling the volume of the combustion air through these tubes. The Carbon monoxide generated due to the combustion of coal, reduces the iron ore and converts it into sponge iron. The rotary kiln is primarily divided into two zones viz. the pre heating zone and the reduction zone. The preheating zone extends over 30 to 50 % of the length of the kiln and in this the moisture in the charge will be driven off and the volatile matter in the coal will be burnt with the combustion air supplied through the air tubes. Heat from the combustion raises the temperature of the lining and the bed surface. As the kiln rotates, the lining transfers the heat to the charge. Charge material, pre-heated to about 1000^0C enters the reduction zone. Temperature of the order of 1050^0C will be maintained in the reduction zone, which is the appropriate temperature for solid state reduction of iron oxide to metallic iron.

This hot material will be transferred to Heat exchanger. In Heat exchanger the material will be cooled to 160^0C. The cooler discharge material consists of sponge iron lumps, sponge iron fines and char. Magnetic and non-magnetic material will be separated through magnetic separators and stored in separate bins. The hot flue gases will be taken to a Waste Heat Recovery Boilers and after heat recovery they will be treated in high efficiency ESP and discharged into the atmosphere through stack whose height will be in accordance with CPCB norms.

1.4.2 Steel Melting Shop

It is proposed to install 4 x 15 T Induction Furnace to produce Hot Billets / Billets / Ingots of 1,98,000 TPA considering 330 days of operation.

In Steel Melting Shop (SMS), Sponge Iron will be melted along with melting scrap and fluxes to make pure liquid steel and then to mould it in required size billets. The SMS will consist of Induction furnace, Ladles, Cranes & Continuous Casting Machine (CCM). Either the Hot Billets produced from LRF will be directly sent to Rolling Mill without using Re-heating Furnace through Hot charging method (or) M.S. Billets / M.S. Ingots will be sent to Re-heating Furnace to reheat the Billets and then sent to Rolling Mill to manufacture Rolled Products.

1.4.3 Rolling Mill

Establishment of 2 x 300 TPD of Rolling Mills to manufacture 1,98,000 TPA of (TMT bars / Structural Steel)(85% Hot charging with Hot Billets and remaining 15% through RHF with gasifier as fuel)

The Rolled products i.e. TMT / Structural steel will be manufactured using the following methods:

i. Direct Hot Rolling / Hot Charging
ii. Rolling Mill With Re-Heating Furnace / Conventional Rolling Mill

Direct Hot Rolling / Hot Charging

Raw Material i.e. Hot Billets from Ladle in red hot condition is cut by automatic hot metal Shearing Machine. In the proposed plant automatic hot metal shear machines are going to be installed with each strand. The gas cutting facility will be maintained as a backup to the hot metal shearing machine.

After the Hot Metal is cut into required length, then pushed out to rolling stands for re-rolling. Steel Pieces are rolled through all stands in order to get required shape of finished goods i.e.Rolled products.

1.4.4 Power Generation

Through WHRB Boiler

The hot flue gases from proposed 2 x 350 TPDDRI kilns will pass through waste heat recovery Boiler to recover the heat and to generate (2x8 MW)electricity. The gases after heat recovery will pass through ESP and then discharged through chimneys into the atmosphere for effective dispersion of emissions into the atmosphere through stacks of adequate height.

Through FBC Boiler

Coal (Imported / Indian) along with dolochar will be used as fuel in FBC Boilers to generate 1 x 8 MW of electricity. The flue-gases will be treated in high efficiency ESP and then discharged through a stack of adequate height into the atmosphere.

1.4.5 Submerged Electric Arc Furnace

Submerged Electric Arc Furnace (2 x 9 MVA) will be setup in the proposed project. Ferro Manganese, Silicon Manganese will be produced using manganese ore as main raw material, Ferro Silicon will be produced using Quartz as main raw material & Ferro Chrome will be produced using Chrome Ore as main raw material in a sub-merged arc furnace using reducer (Coke) under high voltage. Flue gases will be extracted through 4^{th} hole and then treated in bag filters.

1.4.6 Fly Ash Brick Manufacturing Unit

It is proposed to establish Fly Ash brick making unit of 15,000 bricks/day capacity. Fly ash (70%), Gypsum (5%), cement (10%) and Stone dust (15%) are manually feed into a pan mixer where water is added to the required proportion for homogeneous mixing. The proportion of raw material may vary depending upon quality of raw materials.

1.4.7 COAL GASIFIER

The technology will be conversion of coal into coal gas through the process of coal gasification. In coal gasification process, air and steam are passed through hot bed of coal and combustible parts of coal are converted in to gases and resultant gas is called “Producer Gas”, which is having calorific value of 1200 – 1400 Kcal/Nm^3 and adequate for use of its gases as a convenient fuel.

New technologies for gas cleaning have also been evolved which eliminate the generation of liquid pollutants by using indirect cooling of Gas.

1.5 Water Requirement

- Water required for the proposed project will be **1140 KLD**. This includes make up water for DRI Kilns, Induction Furnaces, Gasifier, Rolling Mill, Ferro Alloys Unit, Brick manufacturing unit, Briquetting unit& for Domestic requirement.
- Water required for proposed project (for process and domestic) will be met from partly from Water Reservoir at the site and partly from Kharun river (which is at a distance of 1.87 Kms. from the project site). A dedicated pipeline will be laid from the river to the project site.
- Water drawl permission from Water Resource Department, Govt. of Chhattisgarh will be obtained.
- Air cooled condensers will be provided to FBC Power plant instead of water cooled consdensers to reduce the water consumption significantly.

Table No.1.4: Water Requirement Breakup

S.No.	Unit	Quantity in KLD
1.	DRI Kilns	230
2.	Induction Furnaces	140
3.	Rolling Mills	180
4.	Gasifier	10
5.	Ferro Alloys	60
6.	Power Plant (WHRB &FBC)	480
	• Cooling tower makeup	231
	• Boilers make up	173
	• DM plant Regeneration	76
7.	Brick Manufacturing unit	10
8.	Briquetting Plant	10
9.	Domestic	20
	Total	**1140**

1.6 Wastewater Generation

- Total wastewater generated from the proposed project will be 232 KLD.
- There will be no wastewater discharge in DRI Kilns as closed-circuit cooling system will be adopted.
- Wastewater from Induction Furnace, Gasifier, Rolling Mill, Ferro Alloys, power plant will be treated in ETP and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development.

- Wastewater from Rolling Mill will be treated in oil separator followed by settling tank and will be recycled through closed circuit cooling system Air Cooled condensers will be provided in the power plant, which will be reduce the water consumption significantly. Hence wastewater generation will also be minimized.
- Wastewater from Gasifier will be used in ABC chamber of DRI Kilns.
- RO rejects will be utilised for Flushing in Toilets, Cleaning of Toilets, Floor washings, etc.
- Sanitary waste water will be treated in STP and will be utilised for greenbelt development.
- Garland drains will be provided around all the raw material stacking areas
- During monsoon the treated effluent will be utilized as makeup water in Rolling Mill. Accordingly, the makeup water for Rolling mill also reduces during the rainy period.
- Zero Liquid Discharge (ZLD) will be maintained in the proposed project.

Table No.1.5: Breakup of Wastewater Generation

S.No.	Source	Generation (KLD)
1.	Sponge Iron	---
2.	Induction Furnace	7
3.	Rolling Mill	20
4.	Ferro Alloys	4
5.	Gasifier	2
6.	Power Plant	183
	a) Cooling Tower blowdown	58
	b) Boilers blowdown	49
	c) D.M. plant regeneration water	76
7.	Sanitary Wastewater	16
	Total	**232**

1.7 Wastewater Characteristics

The following are the Characteristics of wastewater.

Table No.1.6: Characteristics of Effluent

PARAMETER	CONCENTRATION			
	Cooling Tower blowdown	DM Plant Regeneration	Boiler Blowdown	Sanitary waste water
pH	7.0 – 8.0	5.0 – 10.0	9.5 – 10.5	7.0 – 8.5
BOD (mg/l)	--	--	--	200 – 250
COD (mg/l)	--	--	--	300 – 400
TDS (mg/l)	1000	5000 – 6000	1000 mg/l	800 – 900
Oil & Grease (mg/l)	--	10	--	5 - 10
TSS (mg/l)	--	--	--	150-200

2.0 DESCRIPTION OF ENVIRONMENT

Base line data has been collected on ambient air quality, water quality, noise levels, flora and fauna and socio-economic details of people within 10 km radius of the plant.

2.1 Ambient air quality

Ambient air quality was monitored for $PM_{2.5}$, PM_{10}, SO_2, NOx & CO at 8 stations including project site during ***1st March 2022 to 31st May 2022***. The following are the concentrations of various parameters at the monitoring stations:

Table No.2.1 : AAQ Data Summary

S.No.	Parameter	Concentration range ($\mu g/m^3$)	Standard as per NAAQS ($\mu g/m^3$)
1.	$PM_{2.5}$	27.8 to 41.7	60
2.	PM_{10}	46.5 to 69.8	100
3.	SO_2	8.7 to 17.5	80
4.	NO_X	10.2 to 20.5	80
5.	CO	380 to 1135	2000

2.2 Water Quality

2.2.1 Surface Water Quality

4 no. of samples i.e. Kharun river (60m Upstream & 60m Downstream), Kulhan Nallah &Shivnath river are flowing at a distance of 1.6 Kms._North, 0.3 Kms._W& 3.8 Kms._E. from the project site have been collected and analyzed for various parameters. The analysis of samples shows that all the parameters are in accordance with BIS-2296 specifications.

2.2.2 Ground Water Quality

8 No. of ground water samples from open wells / bore wells were collected from the nearby villages to assess ground water quality impacts and analyzed for various Physico-Chemical parameters. The analysis of samples shows that all the parameters are in accordance with BIS: 10500 specifications.

2.3 Noise Levels

Noise levels were measured at 8 locations during daytime &Night time. The equivalent day-night noise levels in the study zone are ranging from 47.5 dBA to 65.4dBA.

3.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

3.1 Prediction of impacts on air quality

The likely emissions from the proposed project are PM_{10}, SO_2, NOx & CO. The predictions of Ground level concentrations have been carried out using Industrial Source Complex (ISC-3) model. Meteorological data such as wind direction, wind speed, max. and min. temperatures collected at the site have been used as input data to run the model.

Table No.3.1: NET RESULTANT MAXIMUM CONCENTRATIONS DURING THE OPERATION OF THE PROPOSEDPROJECT (APCS WORKING SCENARIO)

Item	$PM_{2.5}$ ($\mu g/m^3$)	PM_{10} ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_X ($\mu g/m^3$)	CO ($\mu g/m^3$)
Maximum baseline conc. in the study area	41.7	69.8	17.5	20.5	1135
Maximum predicted incremental rise in concentration due to proposed project (Point Sources)	0.99	1.65	3.78	10.28	0.48
Maximum predicted incremental rise in concentration due to proposed project (Vehicular emissions)	0.17	0.30	---	2.27	1.46
Net resultant concentrations during operation of the proposed project	**42.86**	**71.75**	**21.28**	**33.05**	**1136.94**
National Ambient Air Quality Standards	**60**	**100**	**80**	**80**	**2000**

The net resultant Ground level concentrations during operation of the proposed project are within the NAAQS. Hence, there will not be any adverse impact on air environment due to the proposed project.

3.2 Prediction of impacts on Noise quality

The major sources of noise generation in the proposed project will be STG, boilers, compressors, DG set, etc. Acoustic enclosures will be provided to the STG. The ambient noise levels will be within the standards prescribed by MoEF vide notification dated 14-02-2000 under the Noise Pollution (Regulation & Control), Rules 2000 i.e. the noise levels will be less than 75 dBA during day time and less than 70 dBA during night time. **5.973 Ha. (14.76 Acres)**of extensive greenbelt will be developed to further attenuate the noise levels. Hence there will not be any adverse impact due to noise on population in surrounding areas due to the proposed project.

3.3 Prediction of impacts on Water Environment

- There will be no wastewater discharge in DRI Kilns as closed-circuit cooling system will be adopted.
- Wastewater from Induction Furnace, Gasifier, Rolling Mill, Ferro Alloys, power plant will be treated in ETP and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development.
- Wastewater from Rolling Mill will be treated in oil separator followed by settling tank and will be recycled through closed circuit cooling system Air Cooled condensers will be provided in the power plant, which will be reduce the water consumption significantly. Hence wastewater generation will also be minimized.
- Wastewater from Gasifier will be used in ABC chamber of DRI Kilns.
- RO rejects will be utilised for Flushing in Toilets, Cleaning of Toilets, Floor washings, etc.
- Sanitary waste water will be treated in STP and will be utilised for greenbelt development.
- Garland drains will be provided around all the raw material stacking areas
- During monsoon the treated effluent will be utilized as makeup water in Rolling Mill. Accordingly, the makeup water for Rolling mill also reduces during the rainy period.
- Zero Liquid Discharge (ZLD) will be maintained in the proposed project.

3.4 Prediction of Impacts on Land Environment

The effluent will be treated to achieve SPCB standards. Zero effluent discharge will be adopted. All the required air pollution control systems will be provided to comply with CPCB / SPCB norms. All solid wastes will be disposed / utilized as per CPCB / SPCB norms **5.973 Ha. (14.76 Acres)**of extensive greenbelt will be developed as per guidelines. Hence, there will not be any adverse impact on land environment due to the proposed project.

3.5 Socio - Economic Environment

There will be certain upliftment in Socio Economic status of the people in the area & development of the area due to the proposed project. Due to this the economic conditions, the educational and medical standards of the people living in the study area will certainly

move upwards which will result in overall economic development, improvement in general aesthetic environment and increase in business opportunities.

4.0 ENVIRONMENTAL MONITORING PROGRAMME

Post project monitoring will be conducted as per the guidelines of SPCB and MoEF&CC are tabulated below:

TABLE NO.4.1: MONITORING SCHEDULE FOR ENVIRONMENTAL PARAMETERS

S.No.	Particulars	Frequency of Monitoring	Duration of sampling	Parameters required to be monitored
1. Water & Waste water quality				
A.	Water quality in the area	Quarterly Once	Grab sampling	As per IS: 10500
B.	Effluent at the inlet & outlet of the ETP	Once in a month	Composite Sampling	As per EPA Rules, 1996
C.	Sanitary Wastewater (inlet & outlet of STP)	Once in a month	Composite Sampling	As per EPA Rules, 1996
2. Air Quality				
A.	Stack Monitoring	CEMS (all Stacks) Once in a month	-- --	PM, SO_2& NOx PM, SO_2& NOx
B.	Ambient Air quality	CAAQMS Quarterly Once	continuously 24 Hourly	$PM_{2.5}$, PM_{10}, SO_2, NOx $PM_{2.5}$, PM_{10}, SO_2, NOx & CO
C.	Fugitive emissions	Once in a Month	8 hours	PM
3. Meteorological Data				
A.	Meteorological data to be monitored at the plant.	Daily	Continuous monitoring	Temperature, Relative Humidity, rainfall, wind direction & wind speed.
4. Noise level monitoring				
A.	Ambient Noise levels	Once in a month (Hourly)	Continuous for 24 hours with 1-hour interval	Noise levels
5. Soil quality Monitoring				
A.	Soil quality to detect any contamination in nearby 2 villages	Once in 6 months	Core drilling	Soil quality for pH, SAR, Texture, N, P, K, etc.

5.0 ADDITIONAL STUDIES

Draft EIA report is being submitted for Public Hearing.

No Rehabilitation and Resettlement is involved in the proposed project as there are no habitations in the project site. Hence no R & R study has been carried out.

6.0 PROJECT BENEFITS

With the establishment of the proposed project employment potential will increase. Land prices in the area will increase. The economic status of the people in the area will improve due to the proposed project. Periodic medical checkups will be carried out. Top priority will be given to locals in employment.

The proposed project creates direct employment to about 500 persons (skilled, semiskilled & unskilled) and indirect employment of about 600 persons.

As per MoEF&CC Office Memorandum vide F.No.22-65/2017-IA.III dt. 30th September 2020, the budgetary allocation for commitment made by Project Proponent to address the concern raised during public hearing & based on Social Impact Assessment (SIA). Hence A separate budget will be allocated for **Social welfare measures** after completion of Public Hearing.

7.0 ENVIRONMENT MANAGEMENT PLAN

7.1 Air Environment

The following are air emission control systems proposed in the proposed project:

Table No.7.1: Air Emission Control Systems Proposed

S.No.	Source	Control Equipment	Emission at the outlet
1.	DRI kilns with WHRB's	Electro Static Precipitators (ESP)	PM <30 mg/Nm^3
2.	Induction Furnaces	Fume Extraction system with PTFE bag filters	PM < 30 mg/Nm^3
3.	Re-heating furnaces attached to Rolling Mill	Stack	PM < 30 mg/Nm^3
4.	Submerged Electric Arc Furnaces	4th Hole Fume Extraction system with bag filters	PM < 30 mg/Nm^3
5.	FBC Boiler	Electro Static Precipitators (ESP)	PM < 30 mg/Nm^3
		Lime dosing will be done	SOx<100 mg/Nm^3
		Combustion temperature will be around 800-850^{0}C, which is not conducive for thermal NOx formation. Low NOx burners with 3-stage combustion, flue gas recirculation and auto combustion control system will be provided.	NOx <100 mg/Nm^3
Note : Apart from the above Dry fog system with dust suppression at transfer points, crushing plant , dust extraction system with bagfilters at other dust emanating areas , covered conveyers, mechanical dust sweepers, etc. will also be provided.			

Apart from the above the following air emission control systems/ measures are proposed in the Plant:

- All conveyors will be completely covered with G.I. sheets to control fugitive dust.
- All bins will be totally packed and covered so that there will not be any chance for dust leakage.
- All the dust prone points material handling systems will be connected with de-dusting system with bag filters.
- All discharge points and feed points, wherever the possibility of dust generation is there a de-dusting suction point will be provided to collect the dust.

7.2 Water Environment

- Total wastewater generated from the proposed project will be 232 KLD.
- There will be no wastewater discharge in DRI Kilns as closed-circuit cooling system will be adopted.
- Wastewater from Induction Furnace, Gasifier, Rolling Mill, Ferro Alloys, power plant will be treated in ETP and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development.
- Wastewater from Rolling Mill will be treated in oil separator followed by settling tank and will be recycled through closed circuit cooling system Air Cooled condensers will be provided in the power plant, which will be reduce the water consumption significantly. Hence wastewater generation will also be minimized.
- Wastewater from Gasifier will be used in ABC chamber of DRI Kilns.
- RO rejects will be utilised for Flushing in Toilets, Cleaning of Toilets, Floor washings, etc.
- Sanitary waste water will be treated in STP and will be utilised for greenbelt development.
- Garland drains will be provided around all the raw material stacking areas
- During monsoon the treated effluent will be utilized as makeup water in Rolling Mill. Accordingly, the makeup water for Rolling mill also reduces during the rainy period.
- Zero Liquid Discharge (ZLD) will be maintained in the proposed project.

EFFLUENT TREATMENT PLANT

pH of the boiler blowdown will be between 9.5 to 10.5. Hence a neutralization tank will be constructed for neutralizing the boiler blow down. DM plant regeneration water will be neutralized in a neutralization tank. After neutralization, these two effluent streams will be mixed with Cooling Tower blowdown in a Central Monitoring Basin (CMB). Service water will be treated in an oil separator and after treatment it will be taken to CMB. The treated effluent will be utilized for dust suppression, ash conditioning and for Greenbelt development. No effluent will be let out of the plant premises. Hence Zero discharge concept will be implemented.

The following will be treated combined effluent characteristics.

- pH - 6.5 - 8.5
- TSS - < 100 mg/l
- Oil & Grease - < 10 mg/l
- Free available chlorine - < 1.0 mg/l
- Copper - <1.0 mg/l
- Iron - < 1.0 mg/l
- Zinc - < 1.0 mg/l
- Chromium - < 0.2 mg/l
- Phosphates - < 5.0 mg/l

Treated Sewage Characteristics

S.No.	Parameters	Parameters limit
1.	pH	6.5 – 8.0
2.	BOD (mg/ L)	Not more than 10
3.	COD (mg/ L)	Not more than 50
4.	TSS (mg/ L)	Not more than 20
5.	NH_4-N (mg/ L)	Not more than 5
6.	N-Total (mg/ L)	Not more than 10
7.	Fecal Coliform (MPN/100 ml)	Less than 100

TREATED EFFLUENT DISPOSAL

Effluent quantity to be used for ash conditioning	:	30 m^3/day
Effluent to be used for dust suppression	:	20 m^3/day
Effluent to be used for Greenbelt development	:	150 m^3/day
Effluent to be used in ABC Chamber of DRI Kiln	:	2 m^3/day
Effluent to be used for Floor Washing, Toilet cleaning & Flushing	:	30 m^3/day

5.973 Ha. of greenbelt will be developed within the plant premises by using the treated effluent. A dedicated pipe distribution network will be provided for using the treated effluent for greenbelt development.

7.3 Noise Environment

The major sources of noise generation in the proposed project will be STG, boilers, compressors, DG set, etc. Acoustic enclosure will be provided. All the machinery will be manufactured in accordance with MoEF&CC norms on Noise levels. The employees working near the noise generating sources will be provided with earplugs. The extensive greenbelt development proposed within the plant premises will help in attenuating the noise levels further. Noise barriers in the form of trees are recommended to be grown around administrative block and other utility units.

7.4 Land Environment

The wastewater generated from the proposed project will be treated in the Effluent Treatment Plant to comply with the SPCB standards and will be used for dust suppression, ash conditioning and for greenbelt development. All the required Air emission control systems will be installed and operated to comply with SPCB norms. Solid wastes will be disposed off as per norms. Extensive greenbelt will be developed in the plant premises. Desirable beautification and landscaping practices will be followed. Hence there will not be any impact due to the proposed project.

Table No.7.2: Solid Waste Generation and Disposal

S.No.	Waste / By product	Quantity (TPA)	Proposed method of disposal
1.	Ash from DRI	41,580	Will be utilised in the proposed Brick Manufacturing Unit
2.	Dolochar	46,200	Will be used in proposed FBC power plant as fuel.
3.	Kiln Accretion Slag	2,079	Will be used in road construction &utilised in the proposed brick manufacturing unit.
4.	Wet scrapper sludge	9,240	Will be used in road construction &utilised in the proposed brick manufacturing unit within the premises.
5.	SMS Slag	19,800	Slag from SMS will be crushed and iron will be recovered & then remaining non -magnetic material being inert by nature will be used as sub base material in road construction.
6.	End Cuttings from	5,049	Will be reused in the SMS

S.No.	Waste / By product	Quantity (TPA)	Proposed method of disposal
	Rolling Mill		
7.	Mill scales from Rolling Mill	594	Mill scales will be utilized in the proposed Ferro alloys manufacturing units.
8.	Ash from Power Plant (with Indian Coal + dolochar)	21,384	Will be utilized in the proposed brick manufacturing unit within the premises.
9.	Slag from FeMn	40,000	Will be reused in manufacture of SiMn as it contains high SiO_2 and Silicon.
10.	Slag from FeSi	1,960	Will be given to Cast iron foundries
11.	Slag from SiMn	28,000	will be used for Road construction / will be given toslag cement manufacturing
12.	Slag from FeCr	27,000	Will be processed in jigging plant for Chrome recovery. After Chrome recovery, the left-over slag will be analysed for Chrome content through TCLP test, if the Chrome content in the slag is within the permissible limits, then it will be utilised for Road laying /brick manufacturing. If Chrome content exceeds the permissible limits, it will be sent to nearest TSDF.
13.	Slag from Pig Iron	28,800	Will be given to Slag cement manufacturing unit

Waste oil: 1.0 KL / Annum

This will be stored in covered HDPE drums in a designated area and will be given to SPCB approved vendors.

7.5 Greenbelt Development

- Out of total 17.553 Ha. of land, 5.973 Ha. i.e. 34% of land is envisaged for greenbelt development.
- Local DFO will be consulted in developing the green belt.
- The tree species will be selected for the plantation are pollutant tolerant, fast growing, wind firm, deep rooted.
- 3- tier plantation will be taken up all around the periphery of the plant premises.
- Greenbelt will be developed as per CPCB guidelines.
- 2500 plants will be planted per hectare as per CPCB norms.
- Total no. of plants will be 14,935 nos. The following will be the greenbelt development plan.

1st year - 6,275 nos.
2nd year - 5,230 nos.

3rd year - 3,430 nos.

7.6 Cost for Environment Protection

Capital Cost for Environment Protection for proposed plant : Rs. 33.47 Crores

Recurring Cost per annum for Environmental protection : Rs. 6.3963 Crores

7.7 Implementation of CREP Recommendations

All the CREP recommendations will be strictly followed.

- Continuous stack monitoring system is proposed for stack attached to all the Stacks.
- Online Ambient Air Quality Monitoring Stations will be established in consultation with SPCB during operation of the plant.
- Fugitive emission monitoring will be carried out as per CPCB norms.
- Energy meters will be installed for all the pollution control systems.
- Rain water harvesting pits are being constructed in consultation with CGWB.