SUMMARY ON

ENVIRONMENTAL IMPACT ASSESSMENT

REPORT

OF

Sky Steel and Power Private Limited

(Proposed Steel Plant)

at

Kesda(V), Simga (T),
Baloda bazar(D), Chhattisgarh

Submitted to

CHHATTISGARH ENVIRONMENT CONSERVATION BOARD

1.0 PROJECT DESCRIPTION

Sky Steel & Power Power Pvt. Ltd. has proposed to establish Steel Plant, a Greenfield Project, comprising of establishment of Iron ore beneficiation plant (Beneficiated iron ore – 1.3 MTPA), Pellet plant (Pellets - 1.0 MTPA), DRI Kilns (Sponge iron - 3,30,000 TPA), Induction Furnace with LRF & CCM (Hot Billets / MS Billets / Ingots - 2,64,000 TPA), Rolling Mill (Rolled products - 2,97,000 TPA), Submerged Electric Arc Furnaces (FeSi – 17,955 TPA / FeMn- 45,144 TPA / SiMn-23,940 TPA / FeCr-26,600 TPA), WHRB based Power Plant – 22 MW, CFBC based Power Plant - 16 MW & Brick Manufacturing unit (56,000 Bricks/day) at Khasra nos. 219, 220/1, 220/2, 221, 222/1, 222/2, 223, 225, 296, 297, 298/1, 298/2, 299, 300, 305/1, 305/2, 306, 307, 308, 316, 317, 318, 319, 322/2, 326/2, 328/2, 334, 335, 346, 347, 1713, 1718, 1719, 1720, 1721, 1722, 1725, 1726, 1727, 1728, 1748, 1749, 268/1760 at Kesda Village, Simga Tehsil, Balodabazar District, Chhattisgarh

Total land envisaged for the proposed project is 24.88 Ha. (61.48 Acres). Agreements have been entered with landowners for entire land.

The project cost envisaged for the proposed project is Rs. 494 Crores.

As per the Ministry of Environment, Forests & Climate Change, New Delhi notification, dated 14th September, 2006 and its subsequent amendments, all Primary metallurgical processing industries are classified under Category 'A'. The Ministry of Environment, Forests & Climate Change, New Delhi has accorded Terms of Reference (TOR) for the proposed project vide letter no. J-11011 / 339 / 2021 – IA II (IND-I), dated 23rd September 2021. The EIA Report has been prepared by incorporating the TOR stipulated by the MoEF&CC.

Pioneer Enviro Laboratories & Consultants Private Limited, Hyderabad, which is accredited by NABET, Quality Council of India, vide certificate No. NABET/ EIA/ 1922/ SA 0148, valid up to 21st September 2022 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:

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
1.	Type of Land	Agricultural Land
2.	Type of Land (Study Area)	As per LULC the land use within 10 Km. is as follows: Settlements – 4.7 %, Industrial Area – 2.3 %, Tank / River / Major Canal etc. – 5.8%, Scrub Forest – 4.9%, Single Crop – 62.5%, Double Crop – 7.6%, Plantation – 1.6 %, Land with scrub – 6.1%, Land without scrub – 4.5%.
3.	National Park/ Wildlife sanctuary / Biosphere reserve / Tiger Reserve / Elephant Corridor / migratory routes for Birds	Nil
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	Kesda Village at 1.25 Kms.
8.	No. of Villages in the Study Area	55 no.s
9.	Nearest School	Kesda School at 1.8 Kms.
10.	Forests	BilariGhughua RF - 0.35 kms. (W) Bilari RF – 6.2 Kms (SSW)are present within 10 Km. radius of the project site
11.	Water body	Seasonal Nala is Passing through the site to the

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
		West to Eastern direction. Mahanadhibhatapara Canal - 0.15 km (SE) Shivnath River – 9.5 Kms (W) JamuniyaNadhi – 5.1 Kms. (SE) Otgan Pond – 3.3 Kms (SW) Hatbandh Pond – 3.8 Kms.(E) Khilora Pond – 7.6 Kms (NEE) Parsada Pond – 7.4 Kms. (SSW) are present within 10 Km. radius of the project site
12.	Nearest Highway	NH # 130 – 6.5 Kms. (NWW)
13.	Nearest Railway Station	Hathband R.S. – 5.1 Kms.
14.	Nearest Port facility	Nil within 10 Km. Radius.
15.	Nearest Airport	Nil within 10 Kms. Radius [Raipur Airport – 72.0 Kms. (by road)]
16.	Nearest Interstate Boundary	Nil
17.	Seismic zone as per IS-1893	Seismic zone – II
18.	R & R	There is no rehabilitation and resettlement issue, as there are no habitations present in the site area.
19.	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

1.2   PLANT CONFIGURATION AND PRODUCTION CAPACITY

Following is the proposed plant configuration and proposed production capacities

TABLE NO. 11.1.1: PROPOSED PLANT CONFIGURATION & PRODUCTION CAPACITIES

S.No.	Units (Products)	Plant Configuration	Production Capacity
1.	Iron ore Beneficiation (Beneficiated ore)	1 x 1.3 MTPA	1.3 MTPA (throughput)
2.	Pellet Plant (Pellet)	1 x 1.0 MTPA	1.0 MTPA
3.	DRI Kilns (Sponge Iron)	2 x 350 TPD 3 x 100 TPD	3,30,000 TPA
4.	Induction Furnace (Billets / Ingots / Hot Billets)	4 x 20 T	2,64,000 TPA
5.	Rolling Mill (Rolled products) (85 % Hot charging with Hot Billets and remaining 15% through RHF with LDO/LSHS as fuel)	3 x 300 TPD	2,97,000 TPA
6.	Ferro Alloys Unit (FeSi / FeMn / SiMn / FeCr)	3 x 6 MVA	FeSi – 17,955 TPA / FeMn-45,144 TPA / SiMn-23,940 TPA / FeCr-26,600 TPA

7.	Brick Manufacturing Unit		56000 Brick/ day	56000 Brick/ day
8.	Power Plant (38 MW)	WHRB Power Plant	2 x 8 MW 3 x 2 MW	22 MW
		CFBC Power Plant	1 x 16 MW	16 MW

Note : For better utilization of slag from Ferro alloy unit we will install 200 Kg/hour Briquetting unit

1.3   RAW MATERIAL REQUIRMENT

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

TABLE NO. 11.1.2: RAW MATERIAL REQUIREMENT, SOURCE & MODE OF TRANSPORT

S.No.	Raw Material		Quantity (TPA)	Sources	Distance from site (in Kms.	Mode of Transport
1.	**For Iron Ore Beneficiation Plant (13, 00,000 TPA)**					
a)	Iron ore fines		13,00,000	Chhattisgarh / Orissa	~ 600 Kms.	By rail & road (through covered trucks)
2.	**For Pellet Plant (Pellets) –10,00,000 TPA**					
a)	Iron Ore Concentrate		10,40,000	Own generation	---	Through covered conveyers
b)	Bentonite		8,000	Gujarat	~ 600 Kms.	By rail & road (through covered trucks)
c)	Lime powder		15,000	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
d)	Anthracite Coal		44,000	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)
	OR					
	(OR) LDL /LSHS		13,300 KL/Annum	Chhattisgarh	~ 100 Kms.	By road (through tanker)
3.	**For DRI Kilns (Sponge Iron) – 3,30,000 TPA**					
a)	Pellets (100 %)		4,95,000	Own generation	---	Through covered conveyers
	or					
	Iron ore (100%)		5,28,000	Barbil, Orissa NMDC, Chhattisgarh	~ 500 Kms.	By rail & road (through covered trucks)
b)	Coal	Indian	4,29,000	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)
		(or)				
		Imported	2,74,560	Indonesia / South	~ 600 Kms.	Through sea route, rail

				Africa / Australia	(from Vizag Port)	route & by road (through covered trucks)
c)	Dolomite		16,500	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
4.	**For Steel Melting Shop (Billets/ Ingots/Hot Billets) – 2,64,000 TPA**					
a)	Sponge Iron		2,67,000	Inhouse Generation	---	Through covered conveyers
b)	MS Scrap / Pig Iron		40,000	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
c)	Ferro alloys		13,000	Inhouse Generation	---	By road (through covered trucks)
5.	**For Rolling Mill through Hot charging (Rolled Products) – 2,52,450 TPA**					
a)	Hot Billets		2,61,361	Inhouse Generation	---	---
6.	**For Rolling Mill through Reheating Furance (Rolled Products) – 44,550 TPA**					
b)	M.S. Billets (External Purchase)		49,000	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
c)	LDO / LSHS		218 KL/annum	Nearby IOCL Depot	~ 100 Kms.	By road (through Tankers)
7.	**For CFBC Boiler [Power Generation 16 MW]**					
a)	Dolochar + Indian Coal	Dolochar	66,000	Inhouse Generation	---	through covered conveyors
		Indian Coal	73,920	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)
			OR			
b)	Dolochar + Imported Coal	Dolochar	66,000	Inhouse Generation	---	through covered conveyors
		Imported Coal	35,536	Indonesia / South Africa / Australia	~ 600 Kms. (from VizagPort)	Through sea route, rail route & by road (through covered trucks)
8.	**For Ferro Alloys (3 x 6 MVA)**					
7 (i)	*For Ferro Silicon - 17,955 TPA*					
a)	Quartz		27,292	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
b)	MS Scrap		4,219	Andhra Pradesh	~ 500 Kms.	By road (through covered

					trucks)
c)	Mill scales	628	Inhouse Generation	---	By road (through covered trucks)
d)	LAM coke	10,055	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
e)	Electrode paste	359	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
f)	Bagfilter dust	682	Inhouse Generation	---	---
7 (ii)	*For Ferro Manganese – 45,144 TPA*				
a)	Manganese Ore	1,02,703	MOIL / OMC	~ 500 Kms.	By Rail & Road (through covered trucks)
b)	LAM coke	16,478	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	Dolomite	7,674	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
d)	MS Scrap / Mill scales	6,772	Inhouse Generation	---	By road (through covered trucks)
e)	Electrode Paste	587	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
f)	Bagfilter dust	2,257	In house generation	---	---
7 (iii)	*For Silico Manganese – 23,940 TPA*				
a)	Manganese Ore	39,022	MOIL / OMC	~ 500 Kms.	By Rail & Road (through covered trucks)
b)	FeMn Slag	20,349	In house generation	---	----
c)	LAM Coke	8,978	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
d)	Dolomite	5,387	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
e)	Electrode paste	479	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)

f)	Quartz	5,746	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
g)	Bag filter dust	359	In house generation	---	---
7 (iv)	*For Ferro Chrome – 26,600 TPA*				
a)	Chrome Ore	53,200	Sukinda, Odisha Import, South Africa	~ 500 Kms. ~ 600 Kms. (from Vizag Port)	By road (through covered trucks) From Port By Road (through covered Trucks)
b)	LAM Coke	8,778	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	Quartz	4,655	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
d)	MS Scrap / Mill Scale	3,990	Inhouse Generation	---	By road (through covered trucks)
e)	Magnetite / Bauxite	4,495	Chhattisgarh / Maharashtra	~ 500 Kms.	By road (through covered trucks)
f)	Electrode Paste	798	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
g)	Bagfilter dust	1,702	Own generation	---	---

1.4   MANUFACTURING PROCESS
1.4.1   Iron Ore Beneficiation

Beneficiation is a process which removes the gang particle like Alumina, Silica from the Iron Ore. Basically, it separates Fe_2O_3 or Fe_3O_4 from other impurities in the iron ore. In this process the Fe content is improve to maximum possible extent. The highest can be 70% i.e. purest form.

1.4.2   Pelletization

Iron ore fines will be grinded in Ball mills. The concentrate will be fed to thickener and subsequently to filtering unit. The filter cake will be sent to pellet plant comprising of Travelling grate kiln. Green pellets will be produced from this process. The flue gases from grate kiln will be treated in ESP and discharged through a stack.

1.4.3 Sponge Iron (DRI)

The proposal consists of 2 x 350 TPD and 3 x 100 TPD of DRI kilns to produce 3,30,000 TPA of Sponge Iron with 2 x 8 MW & 3 x 2 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.

1.4.4 Steel Melting Shop

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 ofInduction furnace, Ladles, Cranes & Continuous Casting Machine (CCM). There will be 4 x 20 T Induction furnaces to manufacture Hot Billets/ Billets of 2,64,000 TPA. Either the Hot Billets produced from LRF will be directly sent to Rolling Mill without using Re-heating Furnace through Hot charging method (or) Billets / Ingots will be sent to Re-heating Furnace to reheat the Billets and then sent to Rolling Mill to manufacture Rolled Products.

1.4.4 Rolling Mill

The Hot Billets produced from Induction Furnaces will be directly sent to Rolling Mill to produce Rolled Products (OR) Hot Billetswill be cooled and stored will be sent to reheating furnaces for the heating and will be sent to Rolling Mill. Furnace will be heated with LDO / LSHS. A Rolling mill will be installed in the plant to produce 2,97,000 TPA of TMT Bars / Structural Steels.

1.4.5 Submerged Electric Arc Furnace

3 no.s of Submerged Electric Arc Furnace each of 6 MVA will be setup in the proposed plant. 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.

1.4.6 Power Generation

Through WHRB Boiler

The hot flue gases from proposed 2 x 350 TPD & 3 x 100 TPD TPD DRI kilns will pass through waste heat recovery Boiler to recover the heat and to generate 22 MW (2 x 8 MW & 3 x 2 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 CFBC Boiler

Coal (Imported / Indian) along with dolochar will be used as fuel in CFBC Boilers to generate 16 MW (1 x 16 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.

1.5 Water Requirement

- Water required for the proposed project will be 2697 KLD. This includes make up water for I/O Benefication, Pellet Plant, DRI Kiln, Induction Furnace, Rolling Mill, Ferro Alloys & Domestic.

- Air cooled condensers will be provided for Power plant.

- Water required for proposed project will be sourced from Shivnath River (which is at a distance of 9.5 Kms. from the project site). Dedicated pipeline will be laid upto the site.

- Water drawl permission from Water Resource Department, Chhattisgarh is under process.

Table No.11.1.4: Water Requirement Breakup

S.No.	Unit	Quantity in KLD
1.	Make-up water for I/O beneficiation unit	520
2.	Make-up water for Pellet Plant	400
3.	Make-up water for DRI plant	330
4.	Make-up water for SMS plant	185
5.	Make-up water for Rolling mill	270
6.	Make-up water for Ferro Alloy plant	60
7.	Captive Power Plant	
	• Cooling Tower Make-up	320
	• Boiler make-up	455
	• D.M. plant regeneration water	137
8.	Domestic	20
	Total	**2697**

1.6 Wastewater Generation

- Total wastewater generation will be 324 KLD.

- There will be no effluent discharge in the I/O ore beneficiation unit, Pelletisation plant, Sponge Iron, Induction Furnaces, Ferro Alloys unit as closed-circuit cooling system will be adopted.

- Thickener over flow from I/ O beneficiation process will be recycled along with with makeup water after treatement in settling tank. Thickener under flow will be taken to filter press an after dewatering the filter cake will be stored in the storage yard.

- 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.

- Effluent from Rolling Mill will be sent to settling tank & will be recycled through closed circuit cooling system.

- Effluent from 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.

- Sanitary wastewater will be treated in STP.

- Garland drains will be provided around all the raw material stacking areas.

- During monsoon the treated effluent after ensuring compliance with norms, will be used as makeup water for Rolling mill & SMS.

Breakup Of Wastewater Generation

S.No.	Source	Generation (KLD)
1.	Power Plant	
	a) Cooling Tower blowdown	80
	b) Boilers blowdown	91
	c) D.M. plant regeneration water	137
2.	Sanitary Wastewater	16
	Total	**324**

1.7 Wastewater Characteristics

The following are the Characteristics of wastewater.

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 October 2021 to 31st December 2021 (for 8 nos. of Stations)**. The following are the concentrations of various parameters at the monitoring stations:

Parameter		Concentration
$PM_{2.5}$	:	23.3 to 32.1 $\mu g/m^3$
PM_{10}	:	38.5 to 53.6 $\mu g/m^3$
SO_2	:	7.4 to 15.2 $\mu g/m^3$
NO_X	:	9.2 to 20.5 $\mu g/m^3$
CO	:	415 to 1225 $\mu g/m^3$

2.2   Water Quality
2.2.1 Surface Water Quality

Seasonal Nala is Passing through the site to the West to Eastern direction, Mahanadhi bhatapara Canal - 0.15 km (SE), Shivnath River – 9.5 Kms (W), Jamuniya Nadhi – 5.1 Kms. (SE), Ghughua Water Reservoir – 2.9 Kms (SW), Hatbandh Pond – 3.8 Kms.(E), Khilora Pond – 7.6 Kms (NEE), Parsada Pond – 7.4 Kms. (SSW) are present within 10 Km. radius of the project site. 2 no. of samples i.e. 60m Upstream & 60 m Downstream from Shivnath River & each and one sample from Ghughua Water Reservoir, Bhatapara Branch canal have been collected and analyzed for various parameters. No other surface water samples have been collected as the study period. 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 day time & Night time. The noise levels at the monitoring stations are ranging from 48.64 dBA to 52.82 dBA.

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.

The predicted max. Incremental PM_{10} concentrations (24 hourly) due to the proposed project will be 2.96 $\mu g/M^3$ at a distance of 1700 m from the stack in the down wind direction over the baseline concentrations.

The predicted incremental rise in Particulate Matter concentration due to the Vehicular emission will be 1.22 $\mu g/m^3$.

Hence the total predicted incremental rise in Particulate Matter concentration due to the emission from proposed project and due the vehicular emissions will be 2.96 $\mu g/m^3$ + 1.22 $\mu g/m^3$ =4.18 $\mu g/m^3$.

The predicted max incremental SO_2 concentrations (24 hourly) due to the emissions from operation of proposed project will be 10.44 $\mu g/m^3$ at a distance of 2300 m from the stack in the down wind direction over the baseline concentrations.

The predicted max incremental NOx concentrations (24 hourly) due to the proposed project will be 7.67 $\mu g/m^3$ at a distance of 1300 m from the stack in the down wind direction over the baseline concentrations.

The predicted incremental rise in NOx concentration due to the Vehicular emission will be 7.34 $\mu g/m^3$.

Hence the total predicted incremental rise in NOx concentration due to the emission from project and due the vehicular emission will be 7.67 $\mu g/m^3$ + 7.34 $\mu g/m^3$ = 15.01 $\mu g/m^3$

The predicted incremental rise in CO concentration due to the Vehicular emissions will be 4.89 $\mu g/m^3$.

NET RESULTANT MAXIMUM CONCENTRATIONS DUE TO PROPOSED PROJECT

Item	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	53.6	15.12	20.5	1225
Maximum predicted incremental rise in concentration due to proposed project (Point Sources)	2.96	10.44	7.67	--
Maximum predicted incremental rise in concentration due to proposed project (Vehicular emissions)	1.22	--	7.34	4.89
Net resultant concentrations during operation of the proposed project	**57.78**	**25.56**	**35.51**	**1229.89**
National Ambient Air Quality Standards	**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. 8.3 Ha. (20.5 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

Closed loop cooling water system will be adopted in Pellet Plant, DRI, SMS, and Rolling Mill units. Effluent from power plant will be treated and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development. Sanitary wastewater will be treated in STP. Treated sewage will be used for Greenbelt development. There will not be any effluent discharge outside the premises. ZLD will be followed. Hence there will not be any adverse impact on environment due to 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. 8.3 Ha. (20.5 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:

MONITORING SCHEDULE FOR ENVIRONMENTAL PARAMETERS

S.No.	Particulars	Frequency of Monitoring	Duration of sampling	Parameters required to be monitored
1. Water & Wastewater quality				
A.	Water quality in the area	Once in a month except for heavy metals which will be monitored on quarterly basis.	Composite sampling (24 hourly)	As per IS: 10500
B.	Effluent at the outlet of the ETP	Once in a month	Grab sampling (24 hourly)	As per EPA Rules, 1996
C.	STP Inlet & Outlet	Once in a month	Grab sampling (24 hourly)	As per EPA Rules1996
2. Air Quality				
A.	Stack Monitoring	Online monitors (all major stacks) Once in a month		PM PM, SO_2 & NOx
B.	Ambient Air quality (CAAQMS)	Continuous Quarterly Once	Continuous 24 hours	PM_{10}, SO_2 & NOx $PM_{2.5}$, PM_{10}, SO_2, NOx

S.No.	Particulars	Frequency of Monitoring	Duration of sampling	Parameters required to be monitored
				& CO
C.	Fugitive emissions	Quarterly Once	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	Quarterly Once	Continuous for 24 hours with 1 hour interval	Noise levels

5.0   ADDITIONAL STUDIES

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.

7.0   ENVIRONMENT MANAGEMENT PLAN

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

S.No.	Source	Control Equipment	Particulate emission at the outlet
1.	I/O Beneficiation plant	Bagfilters	<30 mg/Nm^3
2.	Pellet Plant	Electro Static Precipitators (ESP)	< 30 mg/Nm^3
3.	DRI kilns with WHRB's	Electro Static Precipitators (ESP)	< 30 mg/Nm^3
4.	Induction Furnaces with CCM	Fume Extraction system with bag filters	< 30 mg/Nm^3
5.	Submerged Electric Arc Furnace	4th Hole Fume Extraction system with bag filters	< 30 mg/Nm^3
6.	Re-heating furnaces attached to Rolling Mill	---	< 30 mg/Nm^3

S.No.	Source	Control Equipment	Particulate emission at the outlet
7.	FBC Boiler	Electro Static Precipitator	< 30 mg/Nm^3
		Lime dosing	SOx < 100 mg/Nm^3
		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 Fume extraction system with bagfilters, dust suppression system, covered conveyers etc. will also be installed

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 generation will be 324 KLD.

- There will be no effluent discharge in the I/O ore beneficiation unit, Pelletisation plant, Sponge Iron, Induction Furnaces, Ferro Alloys unit as closed-circuit cooling system will be adopted.

- 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.

- Effluent from Rolling Mill will be sent to settling tank & will be recycled through closed circuit cooling system.

- Effluent from 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.

- Sanitary wastewater will be treated in STP.

- Garland drains will be provided around all the raw material stacking areas.
- During monsoon the treated effluent after ensuring compliance with norms, will be used as makeup water for Rolling mill & SMS.

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 Green belt 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	:	94 KLD
Effluent to be used for dust suppression in CHP	:	130 KLD
Effluent to be used for Fly ash brick making	:	10 KLD
Effluent to be used for Greenbelt development	:	90 KLD

20.5 Acres 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.

Solid waste generation and disposal

Sr. No.	Waste	Quantity (TPA)	Proposed method of disposal
1.	Tailings from I/O beneficiation	2,60,000	Will be taken to filter press & recovered the water. Cake of tailing will be stored in tailing yard & it will given to nearby Ceramic Unit.
2.	Ash / dust from Pellet plant	30,000	Will be utilized in the proposed Brick Manufacturing Unit
3.	Ash from DRI	59,400	Will be utilized in the proposed Brick Manufacturing Unit
4.	Dolochar	66,000	Will be used in proposes CFBC power plant as fuel.
5.	Kiln Accretion Slag	2,970	Will be utilized in the proposed Brick Manufacturing Unit
6.	Wet scrapper sludge	15,180	Will be utilized in the proposed Brick Manufacturing Unit
7.	SMS Slag	26,400	Slag from SMS will be crushed and iron will be recovered & then remaining non -magnetic material being inert by nature will be used in proposed Brick Manufacturing Unit
8.	End Cuttings from Rolling Mill	8,911	Will be reused in the SMS
9.	Mill scales from Rolling Mill	891	Mill scales will be recycled to Ferro alloys unit.
10.	Ash from Power Plant	72,864	Will be utilized in the proposed Brick Manufacturing Unit
11.	Bagfilter Dust	2,300	Will be utilized in the proposed Brick Manufacturing Unit
12.	Slag from FeMn	27,294	Will be reused in manufacture of SiMn as it contains high SiO_2 and Silicon.
	(or)		
13.	Slag from FeSi	4,324	Will be given to Cast iron foundries
	(or)		
14.	Slag from SiMn	20,080	will be used for Road construction / will be given to slag cement manufacturing
	(or)		
15.	Slag from FeCr	15,449	Will be processed in Zigging 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.

7.5   Greenbelt Development

- 8.3 Ha. (20.5 Acres) of Greenbelt will be developed within the project site.

- 2500 plants will be planted per Hectare as per CPCB norms.

- 10 m to 90 m wide greenbelt will be developed all around the project site.

7.6   Cost for Environment Protection

Capital Cost for Environment Protection for proposed plant   : Rs. 54.1 Crores

Recurring Cost per annum for Environmental protection   : Rs. 6.46 Crores

7.7   Implementation of CREP Recommendations

All the CREP recommendations will be strictly followed.

- ➢ Continuous stack monitoring system is proposed for major 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.

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