SUMMARY ON

ENVIRONMENTAL IMPACT ASSESSMENT

REPORT

OF

RAGHU NANDAN
SPONGE AND POWER PVT. LTD.

(Proposed Steel Plant)

at

Akaltara Village, Simga Tehsil, Balodabazar District, Chhattisgarh

Submitted to

CHHATTISGARH ENVIRONMENT CONSERVATION BOARD

1.0 PROJECT DESCRIPTION

Raghu Nandan Sponge And Power Pvt. Ltd. has proposed to establish Mini Steel Plant, a Greenfield Project comprising of establishment of Iron ore beneficiation plant (Beneficiated iron ore – 0.9 MTPA), Pellet plant (Pellets – 0.72 MTPA), DRI Kilns (Sponge iron - 3,30,000 TPA), Induction Furnace with LRF & CCM (Hot Billets / MS Billets / Ingots – 3,16,800 TPA), Rolling Mill (Rolled products – 3,30,000 TPA), Submerged Eletric Arc Furances of 3 x 9 MVA (FeSi – Fe-Mn - 67,700 TPA / Si-Mn - 33,860 TPA / Fe-Si - 25,400 TPA / Fe-Cr - 37,600 TPA / Pig iron - 71,050 TPA), Briquetting plant of 300 Kg/hr, WHRB based Power Plant – 22 MW, CFBC based Power Plant - 20 MW & Brick Manufacturing unit of 55,000 Brick/ day at Khasra nos. 529, 530, 1307, 1210, 1211, 1212, 1213, 1214, 1215, 1216, 1217, 1218, 1219, 1220, 1221, 1222, 1223, 1224, 1225, 1226/1, 1226/2, 1228, 1229, 1230, 1231, 1232, 1233, 1234, 1235, 1236/2, 1237, 1238, 1239/1, 1239/2, 1240, 1241, 1242, 1243, 1244, 1245, 1246, 1247, 1248, 1249, 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1259, 1260, 1261/1, 1261/2, 1262, 1263, 1264, 1265, 1266, 1267, 1268, 1269, 1270, 1271, 1272, 1274/1, 1274/2, 1274/3, 1274/4, 1275/1, 1275/2, 1275/3, 1275/4, 1275/5, 1276, 1277, 1278, 1279/1, 1279/2, 1280, 1281, 1282, 1283, 1284, 1285, 1286, 1287, 1288, 1289/1, 1289/2, 1290, 1291, 1292, 1293, 1294, 1295, 1296, 1297, 1298, 1299, 1300, 1301/1, 1301/2, 1302, 1303, 1304, 1305, 1306, 1308, 1309, 1310, 1311, 1312, 1313/1, 1313/2, 1313/3, 1313/4, 1314, 1315, 1316, 1317, 1318, 1320, 1321/1, 1321/2, 1322, 1323, 1324, 1325, 1328, 1329, 1330, 1331, 1332, 1333, 1334, 1335, 1336, 1337, 1338, 1339, 1340, 1341, 1342, 1343, 1344, 1345/1, 1345/2, 1345/3, 1346, 1347, 1348, 1349, 1350, 1351, 1352, 1356, 1358, 1359, 1360/1, 1360/2, 1360/3, 1360/4, 1361, 1362/1, 1362/2, 1363, 1364, 1365, 1366, 1367, 1368, 1369, 1370, 1371, 1372, 1374/1, 1374/2 of Akaltara Village, Simga Tehsil, Balodabazar District, Chhattisgarh.

Total land envisaged for the proposed project is **62.8 Ha. (155.18 Acres).** Out of total land, Registered – 7.72 Ha., Agreements – 21.40 Ha. Joint inspection done for Govt. land of 12.37 Ha. & acquisition of balance 21.31 Ha. is under process. The project cost envisaged for the proposed project is **Rs. 498 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 / 154 / 2021 – IA II (I), dated 17th May 2021. The EIA Report has been prepared by incorporating the TOR stipulated by the Hon'ble EAC.

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	Partly Govt. barren land & Partly Agricultural Land
2.	Type of Land (Study Area)	As per LULC the land use within 10 Km. is as follows: Settlements – 4.6%, Industrial Area – 1.2 %, Tank / River / Major Canal/Reservoir – 7.5%, Scrub Forest – 1.9%, Single Crop – 65.3%, Double Crop – 7.8%, Plantation – 3.3%, Land with scrub – 5.9%, Land without scrub – 1.4%, Stone Quarry – 1.1%.
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	Akaltara – 0.25 kms. (N)
8.	No. of Villages in the Study Area	62 nos.(as per CENSUS 2011)
9.	Forests	Bilari Ghughua RF - 8.8 kms. (SSW)
10.	Water body	Seasonal Nala is Passing through the site to the Eastern direction.

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
		Unnamed Canal is passing across the site in South Direction. Canal will be diverted along the boundary. Shivnath River – 5.9 Kms (N) Silari Nala – 1.5 Kms. (E) Akaltara village Pond – 0.1 Km. (N) Chourenga Pond – 1.0 Km. (NWW) Manohara Pond – 0.7 Km. (S) Darchura Village Pond – 1.0 Km. (NWW) Kohlia Village Pond – 3.6 km. (NE) & few other seasonal are flowing within 10 Km. radius of the plant site. Few ponds exist within 10 Km. Radius.
11.	Nearest Highway	NH # 130 – 3.6 Kms. (NWW) – Aerial
12.	Nearest Railway Station	Hathband R.S. – 7.3 Kms. (SSE) - Aerial
13.	Nearest Port facility	Nil with in 10 Km. Radius.
14.	Nearest Airport	None within 10 Kms. [Raipur Airport (36kms.)
15.	Nearest Interstate Boundary	Nil with in 10 Km. Radius. (MP – 93 Kms.)
16.	Seismic zone as per IS-1893	Seismic zone – II
17.	R & R	There is no rehabilitation and resettlement issue, as there are no habitations present in the site area.
18.	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 0.9 MTPA	0.9 MTPA (throughput)
2.	Pellet Plant (Pellet)	1 x 0.72 MTPA	0.72 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)	8 x 15 T	3,16,800 TPA
5.	Rolling Mill (Rolled products) (85 % Hot charging with Hot Billets and remaining 15% through RHF with LDO/LSHS as fuel)	2 x 500 TPD	3,30,000 TPA
6.	Ferro Alloys Unit	3 x 9 MVA	Fe-Mn - 67,700 TPA (or)

S.No.	Units (Products)		Plant Configuration	Production Capacity
	(FeSi / FeMn / SiMn / FeCr)			Si-Mn - 33,860 TPA (or) Fe-Si - 25,400 TPA (or) Fe-Cr - 37,600 TPA (or) Pig iron – 71,050 TPA
7.	BRIQUETTING PLANT		300 Kg/hr	300 Kg/hr
8.	Oxygen Plant		250 TPD (7,500 m^3/hr)	250 TPD (7,500 m^3/hr)
9.	Brick Manufacturing Unit		55,000 Brick/ day	18.15 Million Bricks/ Annum
10.	Power Plant	WHRB Power Plant (2 x 32 TPH & 8 TPH)	2 x 8 MW 3 x 2 MW	22 MW
		CFBC Power Plant	1 x 20 MW	20 MW

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 (9, 00,000 TPA)**					
a)	Iron ore fines		9,00,000	Chhattisgarh / Orissa	~ 600 Kms.	By rail & road (through covered trucks)
2.	**For Pellet Plant (Pellets) –7,20,000 TPA**					
a)	Iron Ore Concentrate		7,20,000	Own generation	---	Through covered conveyers
b)	Bentonite		5,760	Gujarat	~ 600 Kms.	By rail & road (through covered trucks)
c)	Lime powder		10,800	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
d)	Anthracite Coal		31,680	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)
	OR					
	(OR) LDL /LSHS		9,600 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 Africa / Australia	~ 600 Kms. (from Vizag Port)	Through sea route, rail 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) – 3,16,800 TPA**					
a)	Sponge Iron		3,20,000	Inhouse Generation	---	Through covered conveyers
b)	MS Scrap / Pig Iron		48,000	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
c)	Ferro alloys		16,000	Inhouse Generation	---	By road (through covered trucks)
5.	**For Rolling Mill through Hot charging (Rolled Products) – 2,80,500 TPA**					
a)	Hot Billets		2,90,400	Inhouse Generation	---	---
6.	**For Rolling Mill through Reheating Furance (Rolled Products) – 49,500 TPA**					
b)	M.S. Billets (In-house)		26,400	Inhouse Generation	---	Through covered conveyers
c)	M.S. Billets (External Purchase)		28,100	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
d)	LDO / LSHS		1618 KL/annum	Nearby IOCL Depot	~ 100 Kms.	By road (through Tankers)
7.	**For CFBC Boiler [Power Generation 20 MW]**					
a)	Dolochar + Indian Coal	Dolochar	66,000	Inhouse Generation	---	through covered conveyors
		Indian Coal	1,00,650	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	52,670	Indonesia / South Africa / Australia	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered trucks)
8.	**For Ferro Alloys (3 x 9 MVA)**					
7 (i)	*For Ferro Silicon – 25,400 TPA*					
a)	Quartz		38,608	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
b)	LAM coke		14,224	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	Mill scales		5,969	Inhouse Generation / Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
d)	MS Scrap		889	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
e)	Electrode paste		508	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
f)	Bagfilter dust		965	Inhouse Generation	---	---
7 (ii)	*For Ferro Manganese – 67,700 TPA*					
a)	Manganese Ore		1,54,018	MOIL / OMC	~ 500 Kms.	By Rail & Road (through covered trucks)
b)	LAM coke		24,711	Andhra Pradesh	~ 500 Kms.	By road

					(through covered trucks)
c)	Dolomite	11,509	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
d)	MS Scrap / Mill scales	10,155	Inhouse Generation / Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
e)	Electrode Paste	880	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
f)	Bagfilter dust	3,385	In house generation	---	---
7 (iii)	*For Silico Manganese – 33,860 TPA*				
a)	Manganese Ore	55,192	MOIL / OMC	~ 500 Kms.	By Rail & Road (through covered trucks)
b)	FeMn Slag	28,781	In house generation	---	----
c)	LAM Coke	12,698	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
d)	Dolomite	7,619	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
e)	Electrode paste	677	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
f)	Quartz	8,126	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
g)	Bag filter dust	508	In house generation	---	---
7 (iv)	*For Ferro Chrome – 37,600 TPA*				
a)	Chrome Ore	75,200	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	12,408	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	Quartz	6,580	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
d)	MS Scrap / Mill Scale	5,640	Inhouse Generation / Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
e)	Magnetite / Bauxite	6,354	Chhattisgarh / Maharashtra	~ 500 Kms.	By road (through covered trucks)
f)	Electrode Paste	1,128	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
g)	Bagfilter dust	2,406	Inhouse Generation	---	---
7 (iv)	*For Pig iron – 71,050 TPA*				
a)	HG Iron ore	1,03,471	Chhattisgarh / Orissa	~ 600 Kms.	By rail & road (through covered trucks)
b)	LAM Coke	34,023	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	Lime stone	8,769	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
d)	Quartz	4,209	Chhattisgarh /	~ 500 Kms.	By road

			Andhra Pradesh		(through covered trucks)
e)	Bag filter dust	2,105	Inhouse Generation	---	---
f)	Electrode Paste	1,403	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)

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.

1.4.2 Manufacturing of 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.

1.4.3 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 of Induction furnace, Ladles, Cranes & Continuous Casting Machine (CCM). There will be 8 x 15 T Induction furnaces to manufacture Hot Billets/ Billets of 3,16,800 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 Manufacturing of Rolled products through Rolling Mill

The Hot Billets produced from Induction Furnaces will be directly sent to Rolling Mill to produce Rolled Products (OR) Hot Billets will 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 3,30,000 TPA of TMT Bars / Structural Steels.

1.4.5 Manufacturing of Ferro Alloys through SEAF

3 no.s of Submerged Electric Arc Furnace each of 9 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 20 MW (1 x 20 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 **2728 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 Power plant.**
- Water required for proposed project will be sourced from Shivnath River (which is at a distance of 5.9 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. 11.1.3: BREAK-UP OF WATER REQUIREMENT

S.No.	Unit	Quantity in KLD
1.	Make-up water for I/O beneficiation unit	355
2.	Make-up water for Pellet Plant	220
3.	Make-up water for DRI plant	330
4.	Make-up water for SMS plant	220
5.	Make-up water for Rolling mill	300
6.	Make-up water for Ferro Alloy plant	270
7.	Captive Power Plant	
	• Cooling Tower Make-up	388
	• Boiler make-up	504
	• D.M. plant regeneration water	116
8.	Domestic	25
	Total	**2728**

1.6 Waste Water Generation

- There will be no effluent discharge in the Pellet Plant, Sponge Iron, Induction Furnace, 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.
- Effluent from Rolling Mill will be sent to settling tank & oil seperator 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, brick making and for greenbelt development.
- Sanitary waste water 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.
- The following will be the total wastewater & it's break-up.

TABLE NO. 11.1.4: BREAKUP OF WASTE WATER GENERATION

S.No.	Source	Generation (KLD)
1.	Power Plant	
	a) Cooling Tower blowdown	78
	b) Boilers blowdown	126
	c) D.M. plant regeneration water	116
2.	Sanitary Wastewater	20
	Total	**340**

1.7 Wastewater Characteristics

The following are the Characteristics of waste water

TABLE NO. 11.1.5: 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 **15th October 2021 to 15th January 2022**. The following are the concentrations of various parameters at the monitoring stations.

Parameter		Concentration
$PM_{2.5}$	:	19.7 to 30.6 $\mu g/m^3$
PM_{10}	:	38.1 to 53.5 $\mu g/m^3$
SO_2	:	7.0 to 10.1 $\mu g/m^3$
NO_X	:	8.3 to 14.8 $\mu g/m^3$
CO	:	402 to 715 $\mu g/m^3$

2.2 Water Quality

2.2.1 Surface Water Quality

Shivnath river (5.9 Kms. in North), Silari Nala (1.5 Kms. – East) are present within 10 Km. radius of the project site. 2 no. of samples i.e. 60m Upstream & 60 m Downstream from Shivnath River & one sample from Silari Nala & also One sample each from Akaltara village Pond (0.1 Km. - N), Manohara Pond (0.7 Km. -S), Darchura Village Pond (1.0 Km. -NWW) 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 **44.90 dBA to 51.59 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 emissions from operation of proposed project will be **1.30 μg/m^3** at a distance of 1200 m from the stack in the down wind direction over the baseline concentrations.

The predicted incremental rise in PM concentration due to the Vehicular emission will be **0.96 μg/m^3**.

The predicted max incremental SO_2 concentrations (24 hourly) due to the emissions from operation of proposed project will be **7.42 μg/m^3** at a distance of 1200 m from the stack in the down wind direction over the baseline concentrations.

The predicted max incremental NOx concentrations (24 hourly) due to the emissions from operation of proposed project will be **7.68 μg/m^3** at a distance of 1200 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 **9.07 μg/m^3**.

The predicted incremental rise in CO concentration due to the Vehicular emission will be **3.13 μg/m^3**.

NET RESULTANT MAXIMUM CONCENTRATIONS DUE TO PROPOSED PROJECT

Item	PM_{10} (μg/m^3)	SO_2 (μg/m^3)	NO_X (μg/m^3)	CO (μg/m^3)
Maximum baseline conc. in the study area	53.5	10.1	14.8	715
Maximum predicted incremental rise in concentration due to proposed project of **GSPPL**	1.30	7.42	7.68	--
Maximum predicted incremental rise in concentration due to **Vehicular Emissions from the proposed project**	0.96	--	9.07	3.13
Net resultant concentrations during operation of the plant	**55.76**	**17.52**	**31.55**	**718.13**
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. **20.94 Ha. (51.8 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, Ferro Alloy 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. **20.94 Ha. (51.8 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 & CO
C.	Fugitive emissions	Quarterly Once	8 hours	PM
3. Meteorological Data				
A.	Meteorological data to be monitored at	Daily	Continuous monitoring	Temperature, Relative Humidity, rainfall,

S.No.	Particulars	Frequency of Monitoring	Duration of sampling	Parameters required to be monitored
	the plant.			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	Emission at the outlet
1.	I/O Beneficiation plant	Bagfilters	<30 mg/Nm^3
2.	Pellet Plant	Electro Static Precipitators (ESP) (high performance rigid electrodes with transformer)	<30 mg/Nm^3
3.	DRI kilns with WHRB's	Electro Static Precipitators (ESP) (high performance rigid electrodes with transformer)	<30 mg/Nm^3
4.	Induction Furnaces with CCM	Fume Extraction system with with PTFE membrane bag filters	< 30 mg/Nm^3
5.	SEAF	4th Hole Fume Extraction system with PTFE membrane bag filters	< 30 mg/Nm^3
6.	CFBC Boiler	Electro Static Precipitator (high performance rigid electrodes with transformer)	PM < 30 mg/Nm^3
		Automatic lime dosing control system	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

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

- There will be no effluent discharge in the Pellet Plant, Sponge Iron, Induction Furnace, Ferro Alloys unit as closed circuit cooling system will be adopted.
- Thickener over flow from I/ O beneficiation process will be recycled along with makeup water after treatment 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.
- Effluent from Rolling Mill will be sent to settling tank & oil separator 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, brick making and for greenbelt development.
- Sanitary waste water 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

Net Effluent generation after recycling	:	340 KLD
Effluent quantity to be used for ash conditioning	:	96 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	:	104 KLD

20.94 Ha. (51.8 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

S.No.	Waste	Quantity (TPA)	Proposed method of disposal
1.	Tailings from I/O beneficiation	1,80,000	Will be taken to filter press & Dewatered filter cake will be stored in tailing yard & it will given to nearby Ceramic Units.
2.	Ash / dust from Pellet plant	21,600	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	31,680	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 & utilized as base material for Road laying.
8.	End Cuttings from Rolling Mill	9,900	Will be reused in the SMS
9.	Mill scales from Rolling Mill	990	Mill scales will be recycled to Ferro alloys unit.
10.	Ash from Power Plant	84,893	Will be utilized in the proposed Brick Manufacturing Unit
11.	Bagfilter Dust	750	Will be utilized in the proposed Brick Manufacturing Unit
12.	Slag from FeMn	40,930	Will be reused in manufacture of SiMn as it contains high SiO_2 and Silicon.
	(or)		
	Slag from FeSi	6,116	Will be given to Cast iron foundries
	(or)		
	Slag from SiMn	28,400	will be used for Road construction / will be given to slag cement manufacturing
	(or)		
	Slag from FeCr	21,838	Will be processed in Jigging plant for Chrome recovery. After Chrome recovery, the left-over slag will be analyzed for Chrome content through TCLP

S.No.	Waste	Quantity (TPA)	Proposed method of disposal
			test, if the Chrome content in the slag is within the permissible limits, then it will be utilized for Road laying /brick manufacturing. If Chrome content exceeds the permissible limits, it will be sent to nearest TSDF.
	(or)		
	Slag from Pig iron	30,165	will be given to slag cement manufacturing.

7.5 Greenbelt Development

- **20.94 Ha. (51.8 Acres)** of Greenbelt will be developed within the project site.
- It is proposed to plant **52,350 nos.** of saplings with in the plant premises.
- 2500 plants will be planted per Hectare as per CPCB norms.
- 8 m to 150 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. 55 Crores**

Recurring Cost per annum for Environmental protection : **Rs.6.55 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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