

**SUMMARY ON
ENVIRONMENTAL IMPACT ASSESSMENT
REPORT**

OF



B.S. Sponge Pvt. Ltd.

Expansion of Steel Plant
at
Taraimal (Village), Tamnar (Tehsil),
Raigarh (District), Chhattisgarh

Submitted to

CHHATTISGARH ENVIRONMENT CONSERVATION BOARD

1.0 PROJECT DESCRIPTION

B. S Sponge Pvt. Limited is operating steel plant at village: Taraimal, Tehsil: Tamnar, District: Raigarh [C.G.]. Existing plant has obtained Environment Clearance from MoEF&CC vide F.No. J-11011/313/2008 -IA II (I) dt. 1stJanuary 2009 and 12thAugust 2016 (Validity Extension). Accordingly obtained Consent to Establish and Consent to Operate from the Chhattisgarh Environment Conservation Board (CECB) for few units and same are under operation with valid consents.

Proposed Project

Now as part of expansion, company proposed to the steel plant i.e. DRI Kilns (Sponge Iron from 1,80,000 TPA to 6,75,000 TPA), Induction Furnace with matching LRF & CCM (MS Billets / Ingots from 1,20,000 TPA to 5,16,000TPA), Rolling Mill (Rolled Products from 1,05,000 TPA to 4,35,000 TPA, with 2 x 10,000 NM³/Hr Coal Gasifier), Mini Rolling Mill with Coal Gasifier (33,000 TPA with 1 x 2000 NM³/Hr.), New Ferro Alloy Unit 2 x 9 MVA (FeMn 45,000 TPA/SiMn 30,000 TPA / FeSi 15,000 TPA / FeCr 30,000 TPA), WHRB based Power Plant from 18 MW to 48 MW, FBC based Power Plant 4 MW to 34 MW, New Fly Ash brick manufacturing unit (80,000 Bricks/day) & Slag Crusher & Beneficiation Unit (66,000 TPA).

Existing plant is located in 36.43 Ha. (90.00 acres) of land. Proposed expansion will be taken up in existing plant and 7.31 Ha. (18.06 acres) of land adjacent to the existing plant. Total land after proposed expansion will be 43.74 Ha. (108.06 acres). The estimated project cost for the proposed expansion project is **Rs. 384 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 Standard Terms of Reference (TOR) for the proposed project vide letter no. **J-11011/313/2008-IA II (I)** dated **16th July 2020**. The EIA Report has been prepared by incorporating the Standard ToR stipulated by the Hon'ble MoEF&CC, New Delhi.

Pioneer Enviro Laboratories & Consultants Private Limited, Hyderabad, which is accredited by NABET, Quality Council of India, vide certificate No. NABET/ EIA/ 1922/ RA 0149, for preparing EIA report for Metallurgical Unit, have prepared Draft Environmental Impact Assessment (EIA) report for the proposed expansion 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 within 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 expansion 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 Plant site:

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
1.	Type of Land	Existing Plant (Industrial land)
2.	Type of Land (Study Area)	As per LULC the land use within 10 Km. is as follows: Settlements – 3.5 %; Industrial Area- 6.5 %; , Water Bodies – 9.6 %; Scrub Forest & Dense Forest area – 43.5 %; Single crop land –12.5 %; Double Crop Land – 3.2 %; Plantation-0.3 %; Land with scrub – 17.4 %; Land without scrub – 3.2 % ; Gullied land – 0.2 % & Mining area – 0.1 %.
3.	National Park/ Wild life 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. However, movement of Elephants is observed within 10 Kms. radius of the plant, as per the

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
		secondary source. Conservation plan is prepared.
4.	Historical places / Places of Tourist importance / Archeological sites	Banjari Mata Temple (Near Main Gate) Ram Jharna&Singhanpur Caves (9.8 Kms.)
5.	Critically polluted area as per MoEF&CC Office Memorandum dated 13 th January 2010	Nil And also the Plant area does not fall in the areas given in Hon'ble NGT order issued vide dated 10 th July 2019.
6.	Defence Installations	Nil
7.	Nearest village	Nearest Habitation is at Village Taraimal (1.4 Kms.)
8.	No. of Villages in the Study Area	36 nos.
9.	Nearest Hospital	Nearest Hospitals is at Jindal Trauma Centre at 2.3 Kms.
10.	Nearest School	Nearest School is at Taraimal at 1.4 Kms.
11.	Forests	Taraimal RF (adjacent to plant boundary), Barkachaar RF (3.7 Kms.), Rabo RF (6.8 Kms), Samaruna RF (5.4 Kms), Amaghat RF (5.8 Kms.), Lakha PF (5.2 Kms.), Kharidungri PF (5.8 Kms.), Dungapani PF (7.7 Kms) &Urdana RF (4.8 Kms.) exists within 10 Km. radius of the plant site.
12.	Water body	Kelo river (3.2 Kms.), Kurket River (9.2 Kms.), Dewanmunda Nallah (1.2 Kms.) & Few seasonal nalas, ponds exist within study area.
13.	Nearest Highway	Raigarh – Ambikapur State Highway (Adjacent)
14.	Nearest Railway Station	Kirodimalnagar Railway Station – 12.5 Kms. (Aerial)
15.	Nearest Port facility	Nil
16.	Nearest Airport	Nil [Jharsiguda Airport – 72.0 Kms. (Aerial)]
17.	Nearest Interstate Boundary	Nil(Nearest State Boundary in Chhattisgarh – Orissa at 40.0 Kms.)
18.	Seismic zoneas per IS-1893	Seismic zone – II
19.	R & R	Not applicable as there are no habitations in the additional land proposed for expansion.
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

Following is list of industries (Major) presently located within 10 Km radius of the site:

S.No.	Name of Industry	Type of Industry
1.	M/s. Shree ShyamIspatPvt. Ltd.	Steel & Power Plant
2.	M/s. Nalwa steel & Power Ltd.	Steel & Power Plant
3.	M/s. Shree Ambika Sponge (P) Ltd.	Steel Plant
4.	M/s. Salasar Sponge & Power Pvt. Ltd.	Steel & power Plant

S.No.	Name of Industry	Type of Industry
5.	M/s. Singhal Energy Ltd.	Steel & power Plant
6.	M/s. Singhal Enterprises Pvt. Ltd.	Steel & power Plant
7.	M/s. Scania Steels & Powers Ltd.	Steel Plant
8.	M/s. Anjani Steels Ltd	Steel Plant
9.	M/s. RaigarhIspat & Power (P)Ltd.	Steel Plant
10.	M/s. Maa Kali Alloys Udyog Pvt. Ltd.	Steel Plant
11.	M/s. Nav Durga Fuel Pvt Ltd	Steel & power Plant
12.	M/S. Seleno Steels	Steel Plant
13.	M/S. NR IspatPvt. Ltd.	Steel & power Plant
14.	M/s. Agroha Iron & Steel Industries	Steel Plant
15.	M/s. Shri Rupanadham Steel Pvt. Ltd.	Steel Plant

1.2 Plant Configuration and Production Capacity

Following is plant configuration and production capacity proposed now

S.No.	Units (Product)	Existing Operating Plant	Consent Obtained from CECB	Proposed Expansion Project	After Expansion Project	
1.	DRI Kilns (Sponge Iron)	1,80,000 TPA (6 x 100 TPD)	---	4,95,000 TPA (6 x 250 TPD)	6,75,000 TPA (6 x 100 TPD & 6 x 250 TPD)	
2.	Induction Furnace (MS Billets / Ingots)	1,20,000 TPA (2 x 8 T & 2 x 12 T)	---	3,96,000 TPA (8 x 15 T) [with matching LRF & CCM]	5,16,000 TPA (2 x 8 T, 2 x 12 T & 8 x 15 T)	
3.	Rolling Mill with Hot Charging / Conventional (Rolled Products)	1,05,000 TPA (1 x 350 TPD)	---	3,30,000 TPA (2 x 500 TPD) with 2 x 10,000 NM ³ /Hr Coal Gasifier for both rolling mills	4,35,000 TPA (1 x 350 TPD & 2 x 500 TPD)	
4.	Mini Rolling Mill with Coal Gasifier	---	---	33,000 TPA (1 x 100 TPD) with 1 x 2000 NM ³ /Hr Coal Gasifier	33,000 TPA (1 x 100 TPD) with 1 x 2000 NM ³ /Hr Coal Gasifier	
5.	Ferro Alloys	---	---	2 x 9 MVA (FeMn 45,000 TPA / SiMn 30,000 TPA / FeCr – 30,000 TPA / FeSi – 15,000 TPA)	2 x 9 MVA (FeMn 45,000 TPA / SiMn 30,000 TPA / FeCr – 30,000 TPA / FeSi – 15,000 TPA)	
6.	Power Plant	WHRB	12 MW	Upgradation	30 MW	48 MW

S.No.	Units (Product)	Existing Operating Plant	Consent Obtained from CECB	Proposed Expansion Project	After Expansion Project
		(6 x 10 TPH)	from 12 MW to 18 MW (6 x 10 TPH to 6 x 12 TPH)	(6 x 25 TPH)	(6 x 12 TPH & 6 x 25 TPH)
	AFBC / CFBC	---	4.0 MW AFBC	2 x 15 MW (2 x 75 TPH) CFBC	34 MW
7.	Fly Ash brick manufacturing unit	---		80,000 Bricks / Day	80,000 Bricks / Day
8.	Slag crusher & Beneficiation Unit	---		66,000 TPA (1 x 200 TPD)	66,000 TPA (1 x 200 TPD)

The proposed Steel Plant will produce the following products:

Unit	: Description
Sponge Iron	: Production of Sponge Iron from Iron Ore /Pellets, coal & Dolomite. The waste flue gases from the kiln will pass through WHRB and power will be generated.
Induction Furnace	: Manufacturing of MS and SS Ingots/ billets/ blooms using Sponge Iron, Scrap, Ferro Alloys as raw materials
Rolling Mill	: Manufacturing of Rolled Product using MS Ingots / Steel Billets as raw materials.
Gasifier + PCI	: Producer Gas + PCI generation utilizing Coal as raw material for supplying fuel for Rolling Mill.
Submerged Electric Arc Furnace	: Manufacturing of Ferro Alloys using Manganese Ore, Quartz, Scrap, LAM coke, Electrode paste, etc. as raw materials.

1.3 Raw Materials (For Expansion project)

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

S.No.	Raw Material	Quantity (TPA)	Sources	Mode of Transport	
1.	For DRI Kilns (Sponge Iron) – 4,95,000 TPA				
a)	Pellets (100 %)	6,93,000	Odisha & Chhattisgarh	By rail & road (through covered trucks)	
	or				
b)	Iron ore (100%)	7,92,000	Biladila Mines, NMDC, OMC, Odisha	By rail & road (through covered trucks)	
c)	Coal	Indian	6,43,500	SECL Chhattisgarh	By rail & road (through covered trucks)

S.No.	Raw Material		Quantity (TPA)	Sources	Mode of Transport
		Imported	4,11,840	South Africa	Through sea route, rail route & by road
d)	Dolomite		24,750	Chhattisgarh	By road (through covered trucks)
2.	For Steel Melting Shop (MS Billets/ Ingots) – 3,96,000 TPA				
a)	Sponge Iron		4,00,000	Own generation	----
b)	MS Scrap / Pig Iron		59,000	Chhattisgarh	By road (through covered trucks)
c)	Ferro alloys		20,000	Own generation	By road (through covered trucks)
3.	For Rolling Mill through Hot charging (Rolled Products) – 3,60,000 TPA				
a)	Hot Metal / MS Billets / Ingots		3,53,100	Own generation	----
b)	Coal for Gasifiers (2 x 10000 NM ³ /Hr)	Indian Coal	60,000	SECL Chhattisgarh	By rail & road (through covered trucks)
		Imported coal	38,000	South Africa	Through sea route, rail route & by road
	OR	LDO / LSHS	10,800 KL	Chhattisgarh	By road (through Tankers)
4.	For Rolling Mill (Rolled Products) – 33,000 TPA				
a)	Hot Metal / MS Billets / miss rolls and unrolled billets		35,300	Own generation	----
b)	Coal for Gasifiers (2000 NM ³ /Hr)	Indian Coal	6,000	SECL Chhattisgarh	By rail & road (through covered trucks)
		Imported coal	3,800	South Africa	Through sea route, rail route & by road
	OR	LDO / LSHS	1060 KL	Chhattisgarh	By road (through Tankers)
5.	For CFBC Boiler [Power Generation 2 x 15 MW]				
a)	Indian Coal (100 %)		2,22,750	SECL Chhattisgarh	By rail & road (through covered trucks)
	OR				
b)	Imported Coal (100 %)		1,40,000	South Africa	Through sea route, rail route & by road
	OR				
c)	Dolochar + Indian Coal	Dolochar	1,48,500	In plant generation	through covered conveyors
		Indian Coal	1,48,500	SECL Chhattisgarh	By rail & road (through covered trucks)
	OR				
d)	Dolochar + Imported Coal	Dolochar	1,48,500	In plant generation	through covered conveyors
		Imported Coal	95,040	South Africa	Through sea route, rail route & by road

S.No.	Raw Material	Quantity (TPA)	Sources	Mode of Transport
6.	For Ferro Alloys (2 x 9 MVA)			
6 (i)	<i>For Ferro Silicon – 15,000 TPA</i>			
a)	Quartz	24300	Chhattisgarh / Andhra Pradesh	By road (through covered trucks)
b)	LAM coke	18900	Andhra Pradesh	By road (through covered trucks)
c)	MS Scrap / Mill scales	4230	Inhouse Generation	By road (through covered trucks)
d)	Electrode paste	360	Maharashtra / West Bengal	By road (through covered trucks)
6 (ii)	<i>For Ferro Manganese – 45,000 TPA</i>			
a)	Manganese Ore	68400	MOIL / OMC	By Rail & Road (through covered trucks)
b)	LAM coke	19800	Andhra Pradesh	By road (through covered trucks)
c)	Dolomite	8100	Chhattisgarh / Andhra Pradesh	By road (through covered trucks)
d)	MS Scrap / Mill scales	7200	Inhouse Generation	By road (through covered trucks)
e)	Electrode Paste	630	Maharashtra / West Bengal	By road (through covered trucks)
6 (iii)	<i>For Silico Manganese – 14400 TPA</i>			
a)	Manganese Ore	48600	MOIL / OMC	By Rail & Road (through covered trucks)
b)	LAM Coke	16200	Andhra Pradesh	By road (through covered trucks)
c)	FeMn. Slag	30294	In house generation	----
d)	Dolomite	7380	Chhattisgarh / Andhra Pradesh	By road (through covered trucks)
e)	Electrode paste	630	Maharashtra / West Bengal	By road (through covered trucks)
f)	Quartz	7740	Chhattisgarh / Andhra Pradesh	By road (through covered trucks)
6 (iv)	<i>For Ferro Chrome – 30,000 TPA</i>			
a)	Chrome Ore	56700	Sukinda, Odisha Import, South Africa	By road (through covered trucks) From Port By Road (through covered Trucks)
b)	LAM Coke	19800	Andhra Pradesh	By road (through covered trucks)
c)	Quartz	8100	Chhattisgarh / Andhra Pradesh	By road (through covered trucks)
d)	MS Scrap / Mill Scale	2700	Inhouse Generation	By road

S.No.	Raw Material	Quantity (TPA)	Sources	Mode of Transport
				(through covered trucks)
e)	Magnetite / Bauxite	5400	Chhattisgarh / Maharashtra	By road (through covered trucks)
f)	Electrode Paste	540	Maharashtra / West Bengal	By road (through covered trucks)

1.4 Manufacturing Process

1.4.1 Manufacturing of Sponge Iron (DRI)

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°C enters the reduction zone. Temperature of the order of 1050°C 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°C. 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

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 nos. of Induction Furnaces in the SMS plant, each of 15 T capacity to produce M.S. Billets / M.s. Ingots / Hot Metal. The Hot Metal produced from LRF will be directly sent to Rolling Mill without using Re-heating Furnace through Hot charging method (OR) Hot metal will be sent to CCM and thereby M.S. Billets / M.s. Ingots will be produced.

1.4.3 Manufacturing of Rolled products through Rolling Mill

The Hot Metal produced in Induction Furnace will be directly sent to Rolling Mill to produce Rolled Products (OR) if M.S. Billets / M.s. Ingots produced in Induction Furnace will be sent to reheating furnace for the heating and will be sent to Rolling Mill. Furnace will be heated with Pulverized Coal / Furnace oil. A bar and round mill will be installed in the plant to produce 1,53,000 TPA of TMT Bars / Structural Steels / Rolled Products.

1.4.4 Manufacturing of Ferro Alloys through SEAF

2 no. of Submerged Electric Arc Furnaces each of 9 MVA will be setup in the existing 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 as main raw material & Ferro Chrome will be produced using Chrome Ore as a main raw material in a sub-merged arc furnace using reducer (Coke) under high voltage.

1.4.5 Producer Gas plant (Gasifier)

Producer gas plant is proposed to be established for supply fuel to Rolling Mill units. Coal is lifted to the coal storage bin by lifting system; the coal is added in the carbonation stage of two-stage coal gasifier by a programmable control feeding system. Air is blown in the bottom of furnace by air blower, at the same time, low pressure steam goes through the

blending bin and blends with air, becomes the gasification agent, which will carry on the gasification reaction with 1200 Celsius degree semi coke in the gasification stage.

1.4.6 Power Generation

Through WHRB Boiler

The hot flue gases from existing DRI Kiln (2x 100 TPD) & proposed DRI kiln (1x350 TPD) will pass through waste heat recovery Boiler to recover the heat and to generate 1 x 4 MW & 1x8 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 CFBC Boiler

Coal (Imported / Indian) and dolochar will be used in FBC Boiler to generate 6 MW electricity. The flue-gases will be treated in high efficiency ESP and then discharged through stack into the atmosphere.

1.4.7 FLY ASH BRICK MANUFACTURING UNIT

It is proposed to establish Fly Ash brick making unit of 80,000 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

1.4.8 SLAG CRUSHER & BENEFICIATION UNIT

Steel slag sent for processing such as crushing, grinding, grading, magnetic separation by using Steel slag iron separation process, Steel slag water quenching process, Wind quenching method & Steel slag powder processing.

1.5 Water Requirement

Water required in the existing plant is 630 KLD and same being sourced from Ground Water source. Water required for up gradation of WHRB power plant and FBC power, for which consent is applied to CECB, is 80 KLD. Water required for the proposed expansion project will be **1650 KLD** and same will also be sourced from Dewanmunda Nallah. This

includes Make-up water for DRI Kiln, Induction Furnace, Rolling Mill, Ferro Alloy unit & Power Plant. Air cooled condensers will be provided in the power plant to reduce the water requirement significantly. Water drawl permission from Water Resource Department, Chhattisgarh will be obtained for proposed expansion.

The following is the break-up of the water requirement for proposed expansion project.

BREAK-UP OF WATER REQUIREMENT

S.No.	Unit	Quantity in KLD			
		Existing Plant	Consent received from SPCB	Proposed Expansion	Total after Expansion
1.	DRI Kilns	280	---	400	680
2.	Induction Furnaces	160	---	210	370
3.	Rolling Mills	180	---	320	500
4.	Coal Gasifiers	---	---	10	10
5.	Submerged Electric Arc Furnaces	---	---	60	60
6.	Power Plant (FBC)	---			
	• Cooling tower makeup		45	340	385
	• Boiler make up		25	188	213
	• DM plant Regeneration		10	72	82
7.	Fly Ash brick manufacturing unit	---		30	30
8.	Slag crusher & Beneficiation unit	---		10	10
9.	Domestic	10	---	10	20
	Total	630	80	1650	2360

1.6 Waste Water Generation

From Existing Plant

- There is no wastewater discharge from the existing Sponge Iron Unit & Induction Furnace as Closed circuit cooling system is being adopted.
- Effluent from Rolling Mill is being sent to settling tank & is being recycled through closed circuit cooling system.
- Only wastewater is sanitary wastewater, which is being treated in Septic tank followed by Soak pit.
- Zero liquid effluent discharge is being maintained in the existing plant.

From Proposed Expansion project

- There will be no effluent discharge in the Sponge Iron, Induction Furnace, Ferro Alloys unit as closed circuit cooling system will be adopted.
- Air Cooled condensers will be provided in the power plant, which will 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 Gasifier will have mainly phenolic compounds and will be used in After Burning Chamber of existing DRI kilns for quenching and to regulate the temperature of the hot flue gas in accordance with inlet requirement of waste heat recovery boiler.
- 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 waste water will be treated in STP.
- Garland drains will be provided around all the raw material stacking areas

BREAKUP OF WASTE WATER GENERATION

S.No.	Source	Generation (KLD)			
		Existing Plant	Consent received from SPCB	Present Proposal	Total after present proposal
1.	Power Plant				
	a) Cooling Tower blowdown		8	60	68
	b) Boilers blowdown		7	56	63
	c) D.M. plant regeneration water		10	72	82
2.	From Coal Gasifier	---	---	4	4
3.	Sanitary Wastewater	8	---	8	16
	Total	8	25	200	233

1.7 Wastewater Characteristics

PARAMETER	CONCENTRATION			
	DM plant regeneration	Boiler blowdown	Cooling Tower blowdown	Sanitary waste water
pH	4 – 10	9.5 – 10.5	7.0 – 8.0	7.0 – 8.5
BOD (mg/l)	--	--	--	200 – 250
COD (mg/l)	--	--	--	300 – 400
TDS (mg/l)	5000 -6000	1000	1000	800 – 900

Oil & Grease (mg/l)	--	10	--	--
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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}, PM₁₀, SO₂, NO_x & CO at 8 stations including project site during 1st December 2019 to 29th February 2020. The following are the concentrations of various parameters at the monitoring stations:

Parameter		Concentration
PM _{2.5}	:	22.2 to 49.8 µg/m ³
PM ₁₀	:	37.6 to 85.8 µg/m ³
SO ₂	:	6.8 to 24.9 µg/m ³
NO _x	:	6.6 to 33.6 µg/m ³
CO	:	354 to 1571 µg/m ³
PAH in PM ₁₀ was BDL		

2.2 Water Quality

2.2.1 Surface Water Quality

Kelo River (3.2 Kms.), Dewanmunda Nallah (1.2 Kms.) & Gerwani nala (1.7 Kms.) are exists within 10 Km. radius of the plant site. Two samples (Upstream and Downstream) from Kelo River, one sample from Dewanmunda Nallah & one sample from Gerwani nala 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 day time & Night time. The noise levels at the monitoring stations are ranging from **42.58 dBA to 67.40 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 PM₁₀, SO₂, NO_x & 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 PM₁₀ concentrations (24 hourly) due to the emissions from operation of proposed project will be **1.43 µg/m³** at a distance of 1400 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 **0.68 µg/m³**.

The predicted max incremental SO₂ concentrations (24 hourly) due to the emissions from operation of proposed project will be **14.3 µg/m³** at a distance of 1400 m from the stack in the down wind direction over the baseline concentrations.

The predicted max incremental NO_x concentrations (24 hourly) due to the emissions from operation of proposed project will be **9.17 µg/m³** at a distance of 1400 m from the stack in the down wind direction over the baseline concentrations.

The predicted incremental rise in NO_x concentration due to the Vehicular emission will be **3.35 µg/m³**.

The predicted incremental rise in CO concentration due to the Vehicular emission will be **2.6 µg/m³**.

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	85.8	24.9	33.6	1571
Maximum predicted incremental rise in concentration due to BSSPL	1.43	14.3	9.17	--
Maximum predicted incremental rise in concentration due to Vehicular Emissions from the proposed project	0.68	--	3.35	2.60
Net resultant concentrations during operation of the plant	87.91	39.2	45.52	1573.6
National Ambient Air Quality Standards	100	80	80	2000

The net resultant Ground level concentrations during operation of the expansion project are within the NAAQS. Hence there will not be any adverse impact on air environment due to the proposed expansion 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. **36 Acres (14.57 Ha.)** of extensive greenbelt will be developed (inclusive of existing) 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 expansion project.

3.3 Prediction of impacts on Water Environment

There will be no effluent discharge in the Sponge Iron, Induction Furnace, Ferro Alloys unit as closed-circuit cooling system will be adopted. Effluent from Rolling Mill will be sent to settling tank & will be recycled through closed circuit cooling system. Effluent from Gasifier will have mainly phenolic compounds and will be used in After Burning Chamber of existing DRI kilns for quenching and to regulate the temperature of the hot flue gas in accordance with inlet requirement of waste heat recovery boiler. 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 waste water will be

treated in STP. 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. **36 Acres (14.57 Ha.)** of extensive greenbelt will be developed (inclusive of existing) as per guidelines. Hence, there will not be any adverse impact on land environment due to the proposed expansion project.

3.5 Socio - Economic Environment

There will be further upliftment in Socio Economic status of the people in the area. Hence, there will be further development of the area due to the proposed expansion 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 & Waste water quality				
A.	Water quality in the area	Once in a month	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)	--	PM

		Once in a month		PM, SO ₂ & NO _x
B.	Ambient Air quality	CAAQMS	continuously	PM _{2.5} , PM ₁₀ , SO ₂ , NO _x & 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

5.0 ADDITIONAL STUDIES

No Rehabilitation and Resettlement is involved in the proposed project as there are no habitations in the additional land proposed for expansion. 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. **An amount of Rs.3.84 Crores will be allocated for Social welfare activities activities to develop the surrounding villages.**

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	Maximum Emission at the outlet
1.	DRI kilns with WHRBs	Electro Static Precipitators (ESP) – 6 nos.	PM - 30 mg/Nm ³
2.	Induction Furnaces with CCM	Fume Extraction system with bag filters – 8 nos.	PM - 30 mg/Nm ³
3.	Rolling mill	Stacks of Adequate height – 3 nos.	PM - 30 mg/Nm ³
4.	Ferro Alloys	4 th Hole Fume extraction system with bag filters – 2 nos.	PM - 30 mg/Nm ³
5.	CFBC Boiler	Electro Static Precipitator for control of PM – 2 nos.	PM - 30 mg/Nm ³ SO _x - 100 mg/Nm ³

			NOx - 100 mg/Nm ³
Note: Adequate Stacks & bagfilters will be provided to Brick manufacturing & Slag Crusher units.			

Note: Apart from the above Fume extraction system with bagfilters, dust suppression system, covered conveyers etc. will also be installed

The following air pollution 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 Sponge Iron, Induction Furnace, 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 Gasifier will have mainly phenolic compounds and will be used in After Burning Chamber of existing DRI kilns for quenching and to regulate the temperature of the hot flue gas in accordance with inlet requirement of waste heat recovery boiler.
- 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 waste water will be treated in STP.

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 in Holding Tank. Service water will be treated in an oil separator and after treatment it will also be taken to Holding Tank. The treated effluent will be utilized for dust suppression, ash conditioning and for Green belt development. Sanitary waste water will be treated in STP.

TREATED EFFLUENT DISPOSAL

Total Effluent generation from Existing & from proposed expansion: 233 m³/day

Effluent quantity to be used for ash conditioning	:	75 m ³ /day
Effluent to be used for dust suppression in CHP	:	38 m ³ /day
Effluent to be used for Greenbelt development	:	120 m ³ /day

36.0 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. The characteristics of the treated effluent will comply with the SPCB Standards for onland irrigation. There will not be any effluent discharge outside the premises. ZLD will be followed.

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 waste water 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 expansion project.

Solid waste generation and disposal

S.No	Waste	Quantity (TPD)		Method of disposal
		Existing	Proposed	
1.	Ash from DRI	108	270	Is being given to nearby Cement plant and Brick manufacturing unit. Now it is proposed to be utilized in the Brick manufacturing proposed in the present proposal.
2.	Dolochar	180	450	Is being given to nearby FBC based Power plant. Now it is proposed to be utilised in the proposed FBC power plant as a fuel.
3.	Kiln Accretion Slag	5.4	13.5	Is being utilised in road construction & given to brick manufacturer and now it is proposed to be utilized in the Brick manufacturing proposed in the present proposal.
4.	Wet Scraper Sludge	27.6	69.0	Is being utilised in road construction & given to brick manufacturer and now it is proposed to be utilized in the Brick manufacturing proposed in the present proposal..
5.	SMS Slag	40	120	Slag from SMS is being crushed and iron is being recovered & remaining non -magnetic material being inert by nature is used as sub base material in road construction/ used for brick manufacturing and now it is proposed to be utilized in the Brick manufacturing proposed in the present proposal.
6.	Mill scales from Rolling Mill	7	22	Is being given to nearby Ferro Alloys units. However now it will be utilized in the proposed Ferro Alloys units.
7.	End cutting from Rolling Mill	10.5	33	Is being recycled back as Raw material in Induction Furnace and same practiced will be continued after the expansion also.
8.	Slag from SiMn	--	94.0	Will be utilised in road construction
9.	Slag from FeMn	--	92.0	Will be used in manufacture of Silico manganese as it contains high MnO ₂
10.	Slag from FeSi	--	3.0	Will be given to cast iron foundries
11.	Slag from FeCr	--	85.0	Will be further processed in Zigging plant for Chrome recovery and the non-chrome contents will be sent for land filling.

12.	Ash from Power Plant (with 100 % Indian Coal)	--	304	Will be given to nearby cement plant and brick manufacturing units.
	OR			
	Ash from Power Plant (with 100 % Imported Coal)	--	51	Will be given to nearby cement plant and brick manufacturing units.
	OR			
	Ash from Power Plant (with Dolochar + Indian Coal)	--	473	Will be given to nearby cement plant and brick manufacturing units.
	OR			
Ash from Power Plant (with Dolochar + Imported Coal)	--	305	Will be given to nearby cement plant and brick manufacturing units.	

7.5 Greenbelt Development

Greenbelt of 36 Acres (14.57 Ha.) of extensive greenbelt will be developed (inclusive of existing) in the plant premises. 10m (minimum) wide greenbelt will be developed all around the plant. 33000 no. of trees have been planted till date, out of which 27000 nos. of trees have been survived. Another 6000 nos. of sapling will be planted by next monsoon.

7.6 Cost for Environment Protection

Capital Cost for Environment Protection for proposed plant : Rs. 42.5 Crores
Recurring Cost per annum for Environmental protection : Rs. 4.3 Crores

7.7 Implementation of CREP Recommendations

All the CREP recommendations will be implemented & followed strictly.

- Continuous stack monitoring system is proposed for stack attached to WHRB & FBC Boiler.
- 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.

- Additional Rain water harvesting pits will be constructed outside the plant premises in consultation with CGWB.