SUMMARY ON

ENVIRONMENTAL IMPACT ASSESSMENT

REPORT

OF

N.R. ISPAT AND POWER PVT. LTD.

Expansion of Steel Plant

at

Gourmudi Village, Tamnar Tehsil, Raigarh District, Chhattisgarh

Submitted to

CHHATTISGARH ENVIRONMENT CONSERVATION BOARD

1.0 PROJECT DESCRIPTION

N.R. ISPAT AND POWER PVT. LTD. (NRIPPL) is an existing plant located at Gourmudi Village, Tamnar Tehsil, Raigarh District, Chhattisgarh. Existing plant has obtained Environment Clearance from MoEF, New Delhi vide F.No. J-11011/225/2008/ IA II (I) dated 8th June 2009. Accordingly obtained Consent to Establishment (CTE) from Chhattisgarh Environment Conservation Board (CECB) vide No. 2853/TS/CECB/2009 dt. 4th August 2009. Subsequently obtained Consent to Operate from the CECB for few units and same are under operation. CTO is valid 31st March 2024.

Proposed Project

Now as part of expansion, company proposed to the expand the existing capacity of steel plant i.e. DRI Kilns (Sponge Iron from 60,000 TPA to 4,56,000 TPA), Induction Furnaces along with CCM & LRF (MS Ingots / Billets/ Hot Charging from 48,000 TPA to 7,08,000 TPA), WHRB based Power Plant from 4 MW to 34 MW, AFBC based Power Plant from 4 MW to 24 MW, New 12,50,000 TPA of I/O Beneficiation plant, New 9,00,000 TPA of I/O Pellet Plant, New Rolling Mill (TMT bars / Structural Steel) (85 % Hot charging with Hot Billets and remaining 15% through RHF with LDO as fuel) 6,60,000 TPA, New 2 x 9 MVA Ferro Alloys (FeSi-14,000 TPA / FeMn- 50,400 TPA / SiMn – 28,800 TPA / Fecr-30,000TPA / Pig Iron - 50,400 TPA) & Brick Manufacturing unit (66,000 Brick /day).

Proposed expansion will be taken up in existing land of 21.31 Ha. (52.65 Acres) of land and adjoining additional land of 48.46 Ha. (119.75 Acres). Total land after the proposed expansion will be 69.77 Ha. (172.40 Acres).

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-11011/225/2008-IA.II(I)** dated **15th August 2021**. 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 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 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) Additional land will be converted to Industrial purpose.
2.	Type of Land (Study Area)	As per LULC the land use within 10 Km. is as follows: Settlements – 4.2 %; Industrial Area- 8.4 %; , Tanks / River/ Major canal/ Reservoir etc – 9.7 %; Scrub Forest & Dense Forest area – 43.1 %; Single crop land –17.5 %; Double Crop Land – 5.2 %; Land with scrub – 8.7 %; Land without scrub – 2.1 % ; Mining area – 0.6 % & Ash pond –0.5 %.
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 with in 10 Km. radius of the plant. However, movement of Elephants is observed

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
		within 10 Kms. radius of the plant, as per the secondary source. Conservation plan is prepared.
4.	Historical places / Places of Tourist importance / Archeological sites	Banjari Mata Temple – 3.0 Kms. Ram Jharna & Singhanpur Caves (7.3 Kms.)
5.	Critically polluted area as per MoEF&CC Office Memorandum dated 13th January 2010	Nil And also the Plant area does not fall in the areas given in Hon'ble NGT order issued vide dated 10thJuly 2019.
6.	Defence Installations	Nil
7.	Nearest village	Gourmudi village at 0.25 Kms (N)
8.	Forests	Urdana RF (South Direction), Taraimal RF (North Direction), Barkachhar PF (East Direction), Khardungari PF (East Direction), Rabo RF (West Direction), Samaruma RF (North Direction) exist within the plant site
9.	Water body	Kelo River - 4.7 Kms. (East), Gerwani Nala (shivpuri nala) - 0.8 Kms. (NE), Korpali nala - 1.6 Kms. (N), Dewanmunda Nala - 1.9 Kms.(N), Barade Nala – 3.8 Kms. (NWW), Banjari Nala – 1.2 Kms. (West), etc. exists with in the study area of 10 Km. radius.
10.	Nearest Highway	Raigarh – Ambikapur Highway (4.6 Kms.)
11.	Nearest Railway Station	Bhupdeopur Railway Station – 8.1 Kms. (aerial) Kirodimalnagar Railway Station – 9.2 Kms. (Aerial)
12.	Nearest Port facility	Nil
13.	Nearest Airport	O.P. Jindal Air Strip – 8.0 Kms. (aerial) [Jharsiguda Airport – 72.0 Kms. (Aerial)]
14.	Nearest Interstate Boundary	Nil within 10 Km. radius
15.	Seismic zoneas per IS-1893	Seismic zone – II
16.	R & R	Not applicable as there are no habitations in the additional land proposed for expansion.
17.	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 Existing & proposed plant configuration and production capacity proposed now

S.No.	Units (Product)	Existing plant (In operation)	Proposed Expansion	After Proposed Expansion
1.	Iron ore Beneficiation (Beneficiated ore)	---	12,50,000 TPA (throughput capacity)	12,50,000 TPA (throughput capacity)
2.	Pellet Plant	---	9,00,000 TPA	9,00,000 TPA

	(Pellet)				
3.	DRI Kilns (Sponge Iron)		60,000 TPA (2 x 100 TPD)	3,96,000 TPA (2 x 600 TPD)	4,56,000 TPA (2 x 100 TPD & 2 x 600 TPD)
4.	Induction Furnace with LRF & CCM (Hote Billets / MS Ingots / Billets)		48,000 TPA (2 x 8 T)	6,60,000 TPA (8 x 25 T) with 2 x 40 T LRF	7,08,000 TPA
5.	Rolling Mill (TMT bars / Structural Steel) (85 % Hot charging with Hot Billets and remaining 15% through RHF with LDO as fuel)		--	6,60,000 TPA (2 x 1000 TPD)	6,60,000 TPA (2 x 1000 TPD)
6.	Ferro Alloys Unit (FeSi / FeMn / SiMn / FeCr / Pig Iron)		---	2 x 9 MVA (FeSi-14,000 TPA / FeMn- 50,400 TPA / SiMn – 28,800 TPA / FeCr-30,000 TPA / Pig Iron - 50,400 TPA)	2 x 9 MVA (FeSi-14,000 TPA / FeMn- 50,400 TPA / SiMn – 28,800 TPA / FeCr-30,000 TPA / Pig Iron - 50,400 TPA)
7.	Brick Manufacturing unit		---	66,000 Brick/day	66,000 Brick/day
8.	Power Plant (58 MW)	WHRB based	4 MW	2 x 15 MW	34 MW
		AFBC based	4 MW	1 x 20 MW	24 MW

1.3 Raw Materials (For Expansion project)

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

S.No.	Raw Material		Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
1.	**For Iron Ore Beneficiation Plant (12,50,000 TPA – throughput capacity)**					
a)	Iron ore fines		12,50,000	Chhattisgarh / Orissa	~ 600 Kms.	By rail & road (through covered trucks)
2.	**For Pellet Plant (Pellets) - 9,00,000 TPA**					
a)	Iron Ore Concentrate		10,00,000	Own generation	---	By rail & road (through covered trucks)
b)	Bentonite		7,200	Gujarat	~ 600 Kms.	By rail & road (through covered trucks)
c)	Limestone		13,000	Chhattisgarh	~ 100 Kms.	By road (covered trucks)
d)	Anthracite Coal		39,600	SECL Chhattisgarh /MCL Odisha	~ 500 Kms.	By road (through covered trucks)
e)	LDO		12,000 KL/Annum	IOCL Dept. Chhatisgarh	~ 100 Kms.	Through tankers
3.	**For DRI Kilns (Sponge Iron) 3,96,000 TPA (2 x 600 TPD)**					
a)	Pellets		5,74,200	Own generation	---	Through covered Conveyers
b)	Coal	Indian (100%)	5,14,800	SECL Chhattisgarh /MCL Odisha	~ 500 Kms	By rail & road (through covered trucks

S.No.	Raw Material		Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
		Imported (100%)	3,29,472	Indonesia / South Africa / Australia	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered trucks)
c)	Dolomite		19,800	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
4.	**For Steel Melting Shop (Hot Billets / MS Ingots / Billets) –6,60,000 TPA (8 X25 T) with 2 x 40 T LRF)**					
a)	Sponge Iron		6,67,000	Own generation & purchased from outside	--- ~ 100 Kms.	Through covered conveyers & By road (covered trucks)
b)	MS Scrap/ Pig Iron		99,000	Chhattisgarh	~ 100 Kms.	By road (covered trucks)
c)	Ferro alloys		36,000	Own generation	---	through covered conveyors
5.	**For Rolling Mill through Hot charging & RHF (TMT bars / Structural Steel) – 6,60,000 TPA**					
a)	Hot Billets / Billets / Ingots		7,06,250	Own generation	----	----
b)	LDO / LSHS (for 15 % RHF)		3240 Kl/annum	Nearby IOCL Depot	~ 100 Kms.	By road (through Tankers)
6.	**For FBC Boiler [Power Generation 1 x 20 MW]**					
a)	Indian Coal (100%)		2,00,475	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks
	OR					
b)	Imported Coal (100%)		1,28,504	Indonesia / South Africa / Australia	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered trucks)
	OR					
c)	Dolochar + Indian Coal	Dolochar	71,280	In plant generation	---	through covered conveyors
		Indian Coal	1,64,835	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (in covered trucks)
	OR					
d)	Dolochar + Imported Coal	Dolochar	71,280	In plant generation	---	---
		Imported Coal	92,864	Indonesia / South Africa / Australia	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered trucks)
7.	**For Ferro Alloys (2 x 9 MVA)**					
7 (i)	*For Ferro Silicon – 14,000 TPA*					
a)	Quartz		24,300	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
b)	LAM coke		18,900	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	MS Scrap / Mill scales		4,230	Inhouse Generation	---	By road (through covered trucks)
d)	Electrode paste		360	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)

S.No.	Raw Material	Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
e)	Bagfilter dust	200	Own generation	---	---
7 (ii)	*For Ferro Manganese – 50,400 TPA*				
a)	Manganese Ore	68,400	MOIL / OMC	~ 500 Kms.	By Rail & Road (through covered trucks)
b)	LAM coke	19,800	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	Dolomite	81,00	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
d)	MS Scrap / Mill scales	7,200	Inhouse Generation	---	By road (covered trucks)
e)	Electrode Paste	630	Maharashtra / West Bengal	~ 300 Kms.	By road (covered trucks)
f)	Bagfilter dust	1,000	Own generation	---	---
7 (iii)	*For Silico Manganese – 28,800 TPA*				
a)	Manganese Ore	48,600	MOIL / OMC	~ 500 Kms.	By Rail & Road (through covered trucks)
b)	LAM Coke	16,200	Andhra Pradesh	~ 500 Kms.	By road (covered trucks)
c)	FeMn. Slag	30,294	In house generation	---	----
d)	Dolomite	7,380	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (covered trucks)
e)	Electrode paste	630	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
f)	Quartz	7,740	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
g)	Bagfilter dust	200	Own generation	---	---
7 (iv)	*For Ferro Chrome – 30,000 TPA*				
a)	Chrome Ore	56,700	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	19,800	Andhra Pradesh	~ 500 Kms.	By road (covered trucks)
c)	Quartz	8,100	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
d)	MS Scrap / Mill Scale	2,700	In-house Generation	---	By road (through covered trucks)
e)	Magnetite / Bauxite	5,400	Chhattisgarh / Maharashtra	~ 500 Kms.	By road (through covered trucks)
f)	Electrode Paste	540	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
g)	Bagfilter dust	1,200	Own generation	---	---
7 (v)	*For Pig Iron (50,400 TPA)*				
a)	Iron Ore / Sinter	74,340	Barbil, Odisha NMDC, C.G.	~ 500 Kms.	By Road (Covered trucks)
b)	LAM Coke	24,444	Chhattisgarh / Bihar	~ 100 Kms.	By Road (Covered trucks)

S.No.	Raw Material	Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
			Imported from Australia, China	~ 480 Kms. (from Vizag Port)	From Vizag Port by Road (Covered Trucks)
c)	Dolomite	6,300	Chhattisgarh	~ 300 Kms.	By Road (Covered trucks)
d)	Quartz	3,024	Chhattisgarh / Andhra Pradesh	100 – 300 Kms.	By Road (Covered trucks)
e)	Bagfilter dust	1,512	Own generation	---	---
f)	Electrode Paste	1008	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)

1.4 Manufacturing Process

1.4.1 Manufacturing Process of Iron Ore Beneficiation

Beneficiation is a process which removes the gang particle like Alumina, Silica from the Iron Ore. Basically, it separates Fe2O3 or Fe3O4 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 Manufacturing Process of Pellets

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 Manufacturing of Sponge Iron (DRI)

The proposal consists of 2 x 600 TPD of DRI kilns to produce 3,96,000 TPA of Sponge iron with 2 x 15 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 of Induction furnace, Ladles, Cranes & Continuous Casting Machine (CCM). There will be 8 x 25 T Induction furnaces to manufacture Hot Billets/ M.S. Billets of 6,60,000 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) M.S. Billets / M.s. Ingots will be sent to Re-heating Furnace to reheat the Billets and then sent to Rolling Mill to manufacture Rolled Products.

1.4.5 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 6,60,000 TPA of Rolled Products /TMT Bars / Structural Steels.

1.4.6 Power Generation

Through WHRB Boiler

The hot flue gases from proposed 2 x 600 TPD of DRI kilns will pass through waste heat recovery Boiler to recover the heat and to generate 30 MW (2 x 15 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 AFBC Boiler

Coal (Imported / Indian) along with dolochar will be used as fuel in AFBC Boiler to generate 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.

1.4.7 FLY ASH BRICK MANUFACTURING UNIT

It is proposed to establish Fly Ash brick making unit of 66,000 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

1.5 Water Requirement

- Water required in the existing plant is **260 KLD** and same being sourced from Ground Water. Water permission for existing plant is obtained vide NOC no. CGWA/NOC/IND/ORIG/2018/4469.
- Water required for the **proposed expansion** project will be 2800 KLD and same will be sourced from Gerwani / Shivpuri Nallah.

- Air cooled condensers have been provided in existing power plant. In expansion also Air cooled condensers will be provided.
- Total water requirement after the proposed expansion will be **3,060 KLD.**
- Water drawl permission for expansion proposal from Water Resource Department, Chhattisgarh will be obtained for proposed expansion project.

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	Proposed Expansion	Total after Expansion
1.	Iron Ore Beneficiation & Pellet Plant	--	440	440
2.	DRI Kilns	60	360	420
3.	Induction Furnace	30	400	430
4.	Rolling Mill with RHF	--	500	500
5.	Ferro Alloy Plant	--	60	60
6.	Power Plant (WHRB & AFBC)	160	1000	1160
7.	Brick Manufacturing plant	--	20	20
8.	Domestic	10	20	20
	Total	**260**	**2800**	**3,060**

1.6 Waste Water Generation from Proposed Expansion project

Existing

- There is no wastewater discharge from the existing Sponge Iron & Induction Furnace as Closed circuit cooling system is being adopted.
- Boiler blowdown & DM plant regeneration wastewater is being treated in Neutralization tanks and is being mixed in a Central Monitoring Basin (CMB). The treated effluent from CMB is being utilized for dust suppression, ash conditioning and for greenbelt development.
- Sanitary wastewater, which is being treated in Septic tank followed by Soak pit.
- Zero liquid effluent discharge is being maintained in the existing plant.

Proposed

- There will be no wastewater discharge in the I/O Beneficiation, Pellet Plant, DRI Unit, Induction Furnace Unit, Ferro Alloys as closed circuit cooling system will be adopted.
- Effluent from Rolling mill will be sent to oil seprator followed settling tank and will be recycled through closed circuit cooling system.
- Effluent from power plant will be treated inETP and after ensuring compliance with CECB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development.
- Air cooled condenser will be provided in the power plant, which will reduce the water consumption significantly. Hence wastewater generation will be also be minimized.
- Sanitary waste water will be treated in STP and after treatment it will be utilized for greenbelt development.
- Zero liquid effluent discharge practice will be continued in the proposed expansion also.
- During monsoon the treated effluent will be utilized as makeup water in Rolling Mill. Accordingly the makeup water for Rolling mill also reduces during the rainy period.

BREAKUP OF WASTE WATER GENERATION

S.No.	Source	Generation (in KLD)		
		Existing Operating plant	Proposed Expansion	After Proposed Expansion
1.	Iron Ore Beneficiation & Pellet Plant	---	---	---
2.	DRI Kilns	---	---	---
3.	Induction Furnaces	---	---	---
4.	Rolling Mill	---	---	---
5.	Ferro Alloys Unit	---	---	---
6.	Brick manufacturing plant	---	---	---
7.	Power Plant	60	380	440
	a) Cooling Tower blowdown	19	120	139
	b) Boilers blowdown	16	102	118
	c) D.M. plant regeneration water	25	158	183
8.	Sanitary Wastewater	8	16	24
	Total	**68**	**396**	**464**

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	--	--

2.0 DESCRIPTION OF ENVIRONMENT

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

2.1 Ambient air quality

Ambient air quality was monitored for $PM_{2.5}$, PM_{10}, SO_2, NOx & CO at 8 stations including project site during 1st March 2021 to 31st May 2021. The following are the concentrations of various parameters at the monitoring stations:

TABLE NO. 11.2.1: AAQ DATA SUMMARY

Parameter		Concentration
$PM_{2.5}$	:	21.9 to 48.8 µg/m^3
PM_{10}	:	38.5 to 84.4 µg/m^3
SO_2	:	6.6 to 21.4 µg/m^3
NO_X	:	6.4 to 33.4 µg/m^3
CO	:	326 to 1388 µg/m^3

2.2 Water Quality

2.2.1 Surface Water Quality

Kelo River (4.7 Kms.), Dewanmunda Nallah (1.9 Kms.) & Gerwani nala / Shivpuri nala (0.8 Kms.), Korpali nala (1.6 Kms.), Banjari Nala (1.2 Kms.), Barade Nala (3.8 Kms.) are exists within 10 Km. radius of the plant site. Two samples (Upstream and Downstream) from Kelo River, one sample from Gerwani Nallah (Shivpuri 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 **42.86 dBA to 64.72 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 **1.06 $\mu g/m^3$** at a distance of 1550 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 **1.19 $\mu g/m^3$**.

The predicted max incremental SO_2 concentrations (24 hourly) due to the emissions from operation of proposed project will be **5.72 $\mu g/m^3$** at a distance of 1550 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 **6.22 $\mu g/m^3$** at a distance of 1550 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 **3.53 $\mu g/m^3$**.

The predicted incremental rise in CO concentration due to the Vehicular emission will be **2.47 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	84.4	21.4	33.4	1388
Maximum predicted incremental rise in concentration due to **NRIPPL**	1.06	5.72	6.22	---
Maximum predicted incremental rise in concentration due to **Vehicular Emissions from the proposed expansion project**	1.19	---	3.53	2.47
Net resultant concentrations during operation of the plant	86.65	27.12	43.12	1390.47
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.				

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. **23.02 Ha. (56.89 acres)** 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 I/O Beneficiation, Pellet Plant, 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 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. **23.02 Ha. (56.89 acres)** 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 except for heavy metals which will be monitored on quarterly basis.	Composite sampling (24 hourly)	As per IS: 10500
B.	Effluent at the outlet	Twice in a month	Grab sampling	As per EPA Rules, 1996

	of the ETP		(24 hourly)	
C.	STP Inlet & Outlet	Twice in a month	Grab sampling (24 hourly)	As per EPA Rules1996
2. Air Quality				
A.	Stack Monitoring	Online monitors (all 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 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 additional land proposed for expansion. Hence no R & R study has been carried out.

6.0 PROJECT BENEFITS

With the proposed expansion 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	Air Emission at the outlet
1.	Pellet Plant	Electro Static Precipitator (ESP) (high performance rigid electrodes with transformer)	PM <30 mg/Nm^3
2.	DRI kilns with WHRB's	Electro Static Precipitators (ESP) (high performance rigid electrodes with transformer)	PM <30 mg/Nm^3
3.	Induction Furnaces	Fume Extraction system with PTFE membrane bag filters	PM < 30 mg/Nm^3
4.	Re-heating furnaces attached to Rolling Mill	Stack	PM < 30 mg/Nm^3
5.	Submerged Electric Arc Furnaces	4th Hole Fume Extraction system with PTFE membrane bag filters	PM < 30 mg/Nm^3
6.	FBC Boiler	Electro Static Precipitator (high performance rigid electrodes with transformer)	PM < 30 mg/Nm^3
		Limestone will be used as bed material and act as sulphur absorbent. Lime dosing will also be done	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 Dry fog system with dust suppression at transfer points, crushing plant, dust extraction system with bag filters at other dust emanating areas, covered conveyers, mechanical dust sweepers, etc. will also be provided.			

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 I/O Beneficiation, Pellet Plant, 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 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 of 20 KLD capacity.
- During monsoon the treated effluent will be utilised as makeup water in Rolling Mill . Accordingly the makeup water for Rolling mill also reduces during the rainy period.

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 proposed STP.

TREATED EFFLUENT DISPOSAL

Effluent quantity to be used for ash conditioning	:	64 m^3/day
Effluent to be used for dust suppression in CHP	:	250 m^3/day
Effluent to be used for Greenbelt development	:	150 m^3/day

23.02 Ha. (56.89 acres) of greenbelt (inclusive of existing) will be developed by using the treated effluent. Treated effluent which is proposed to be utilized for greenbelt during non-monsoon period, will be used as make up water for Rolling Mill, during monsoon.

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 (TPA)			Method of disposal
		Existing	Proposed	After expansion	
1.	Tailing from Beneficiation plant	--	2,50,000	2,50,000	Tailings from thickener will be taken to filter press and the dewatered tailings cake be stored in the yard with 30 days capacity. This will be given to Ceramic industries/cement plants.
2.	Pellet Plant (ESP & Bagfilter dust from dedusting system)	--	27,000	27,000	Will be utilised in proposed Brick manufacturing units.

3.	Ash from DRI	10,800	55,440	66,240	Is being given to near by brick manufacturing units and now it will be utilized in the proposed brick manufacturing unit.
4.	Dolochar	18,000	71,280	89,280	Is being utilized in the existing FBC boiler based power plant. The same practice will be continued after expansion also.
5.	Kiln Accretion Slag	540	3,564	4,104	Is being given to road contractors for road construction & given to brick manufacturer and after proposed expansion will be utilized in the proposed brick manufacturing unit.
6.	Wet Scraper Sludge	2,760	18,216	20,976	Is being given to road contractors for road construction & given to brick manufacturer and after proposed expansion will be utilized in the proposed brick manufacturing unit.
7.	SMS Slag	4,800	66,000	70,800	Slag from SMS will be crushed and iron will be recovered & then remaining non - magnetic material being inert by nature will be given to road contractors for road laying and will also be utilized in proposed brick manufacturing unit.
8.	Mill Scales	---	1980	1980	Will be used in proposed Ferro Alloys plant captively
9.	End cuttings	---	19,800	19,800	Will be reused in SMS.
10.	Ash from Power Plant	12,028	86,872	98,300	Is being given to near by brick manufacturing units and now it will be utilized in the proposed brick manufacturing unit.
11.	Slag from FeMn	---	30,294	30,294	Will be reused in manufacture of SiMn as it contains high SiO_2 and Silicon.
12.	Slag from FeSi	---	1,010	1,010	Will be given to Cast iron foundries
13.	Slag from SiMn	---	30,888	30,888	will be used for Road construction / will be given to slag cement manufacturing
14.	Slag from FeCr	---	27,918	27,918	Will be processed in Zigging plant for Chrome recovery. After Chrome recovery, the left-over slag will be analyzed for Chrome content through TCLP 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.
15.	Slag from Pig Iron	---	34,452	34,452	Will be given to slag based cement manufacturing units

7.5 Greenbelt Development

- **23.02 Ha. (56.89 acres)** of Greenbelt (inclusive of existing) will be developed within the plant premises.
- 12,500 no. of plants are exists till date (survival rate 85%).
- Another 46,000 nos. of saplings will be planted as part of expansion.
- There are around 500 nos. of trees exists in the additional land proposed now. It is proposed to remove these trees to establish proposed expansion units. As a compensatory measure, it is proposed to plant additional 2500 nos. (5 times more) of trees in the entire premises.
- Hence a total 48,500 nos. of saplings will be planted as part of expansion project.
- Width of greenbelt ranges from 10 m to 120 m.

7.6 Cost for Environment Protection

Capital Cost for Environment Protection for proposed plant : Rs. 39 Crores

Recurring Cost per annum for Environmental protection : Rs. 8.0 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.

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