SUMMARY ON

ENVIRONMENTAL IMPACT ASSESSMENT

REPORT

OF

Satya Power & Ispat Ltd.

Expansion of Steel Plant

at

Gatori & Sendri Villages, Bilha Tehsil, Bilaspur District, Chhattisgarh

Submitted to

CHHATTISGARH ENVIRONMENT CONSERVATION BOARD

1.0 PROJECT DESCRIPTION

Satya Power & Ispat Ltd. is operating a Sponge Iron plant and Coal washery unit at Gatori & Sendri Villages, Bilha Tehsil, Bilaspur District, Chhattisgarh.

- Existing plant has obtained CTE from Chhattisgarh Environment Conservation Board vide order no. 5062/TS/CECB/2004 dated 14/12/2004 for establishment of 2 x 100 TPD DRI kilns with production capacity 60,000 TPA.

- Later company has obtained Environmental clearance for expansion of Sponge iron unit from 60,000 TPA to 3,00,000 TPA and new Induction furnace unit – 2,16,000 TPA and new Rolling mill – 90,000 TPA and new Ferro alloys unit – 30,000 TPA along with Coal washery unit of 14,40,000 TPA and captive power plant 44 MW (WHRB – 20 MW & FBC – 24 MW) from the Honourable Ministry vide order J-11011/780/2008-IA II (I) dated 30/12/2010and accordingly CTE has been obtained from Chhattisgarh Environment Conservation Board vide order no. 3294/TS/CECB/2015 dated 14/10/2015.

- Out of which only 100 TPD DRI Kiln (Sponge Iron – 30,000 TPA) and 14,40,000 TPA of Coal washery unit has been installed and obtained CTO from Chhattisgarh Environment Conservation Board vide order no. 10329/TS/CECB/2021 dated 24/02/2021. CTO for coal washery unit is valid up to 31/08/2025 and 100 TPD DRI kiln is up to 28/02/2022.

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 90,000 TPA to 4,86,000 TPA), New Induction Furnace with matching LRF & CCM (Billets / Ingots / Hot Billets) 2,97,000 TPA, New Rolling Mill (TMT Bars / Structural Steel) 2,64,000 TPA, New Ferro Alloys Unit 2 x 9 MVA (FeMn- 50,400 TPA / SiMn- 28,800 TPA / FeCr – 30,000 TPA / FeSi – 14,000 TPA), New WHRB based Power Plant - 34 MW & New FBC based Power Plant - 30 MW, New Brick manufacturing unit - 50,000 bricks/day, New Slag crushing unit - 100 TPD, New Briquetting unit - 200 Kg/hour.

Proposed expansion will be taken up in existing land of 24.29 Ha. (60 Acres) of land and adjoining additional land of 14.69 Ha. (36.28 Acres). Total land after the proposed expansion will be 38.98 Ha. (96.28 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 expansion project vide letter no. **J-11011/780/2008-IA.II(I)** dated **6th November 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/ SA 0148, 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 – 7.9%; Industrial Area-2.3 %; Water Bodies – 12.6 %; Scrub Forest area – 1.8 %; Single crop land – 54.3 %; Double Crop Land – 11.4 %; Land with scrub – 7.3%; Land without scrub – 2.4 %.
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 Ratanpur Protected Forest is situated at distance of 9.5 Kms. from the plant site.
4.	Historical places / Places of Tourist importance / Archeological sites	Nil
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	Kachhar & Sendri Villages at 0.60 Kms
8.	Forests	Ratanpur Protected Forest is situated at distance of 9.5 Kms. from the plant site.
9.	Water body	Arpa River (1.6 Kms.), Kurung Right Bank Canal (3.5 Kms.), Kurung Nallah (8.0 Kms.) and few ponds exists within 10 Km. radius of the plant site.
10.	Nearest Highway	National Highway 130 (2.5 Kms. – By Road)
11.	Nearest Railway Station	Ghutku R.S. -4.0 Kms.
12.	Nearest Port facility	Nil
13.	Nearest Airport	Bilaspur Airport – 21.0 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

S. No.	Units (Products)	Existing (TPA)	Proposed Expansion	After Proposed Expansion
1.	DRI Kilns (Sponge Iron)	3 x 100 TPD (90,000 TPA)	2 x 100 TPD & 2 x 500 TPD (3,96,000 TPA)	5 x 100 TPD & 2 x 500 TPD (4,86,000 TPA)
2.	Induction Furnace (Billets / Ingots / Hot Metal)	---	6 x 15 T (2,97,000 TPA)	6 x 15 T (2,97,000 TPA)
3.	Rolling Mill (TMT bars / Structural Steel)	---	2 x 400 TPD (2,64,000 TPA)	2 x 400 TPD (2,64,000 TPA)
4.	Ferro Alloys (FeMn / SiMn / FeCr / FeSi)	---	2 x 9 MVA (FeMn 50,400 TPA / SiMn 28,800 TPA / FeCr – 30,000 TPA / FeSi – 14,000 TPA)	2 x 9 MVA (FeMn 50,400 TPA / SiMn 28,800 TPA / FeCr – 30,000 TPA / FeSi – 14,000 TPA)
5.	WHRB Power Plant (Electricity)	---	34 MW (2 x 5 MW & 2 x 12 MW)	34 MW (2 x 5 MW & 2 x 12 MW)
6.	AFBC Power Plant (Electricity)	---	30 MW (1 x 10 MW & 1 x 20 MW)	30 MW (1 x 10 MW & 1 x 20 MW)
7.	Brick manufacturing unit	--	50,000 bricks/day	50,000 bricks/day
8.	Slag crushing unit	--	100 TPD	100 TPD
9.	Briquetting unit	--	200 Kg/hour	200 Kg/hour
10.	Coal Washery (Washed Coal)	200 TPH (14,40,000 TPA)	---	200 TPH (14,40,000 TPA)

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	Mode of Transport
1.	**For DRI Kilns (Sponge Iron) – 3,96,000 TPA**				
a)	Pellets (100 %)		5,54,400	Orissa & Chhattisgarh	By rail & road (through covered trucks)
			or		
b)	Iron ore (100%)		6,33,600	NMDC Mines	By rail & road (through covered trucks)
c)	Coal	Indian	5,14,800	SECL Chhattisgarh /	By rail & road

S.No.	Raw Material		Quantity (TPA)	Sources	Mode of Transport
				MCL Odisha	(through covered trucks)
		Imported	3,29,472	Indonesia / South Africa / Australia	Through sea route, rail route & by road
d)	Dolomite		19,800	Chhattisgarh	By road (through covered trucks)
2.	**For Steel Melting Shop (MS Billets/ Ingots) – 2,97,000 TPA**				
a)	Sponge Iron		3,00,000	Own generation	----
b)	MS Scrap / Pig Iron		45,000	Chhattisgarh	By road (through covered trucks)
c)	Ferro alloys		15,000	Own generation	---
3.	**For Rolling Mill through Hot charging (TMT bars / Structural Steel) –2,64,000 TPA**				
a)	Hot Billets / MS Billets / Ingots		2,82,500	Own generation / Purchased from outside	---- / By road (through covered trucks)
b)	LDO		14,446 TPA	Chhattisgarh	By road (throughTankers)
4.	**For AFBC Boiler [Power Generation 1 x 10 MW & 1 x 20 MW]**				
a)	Indian Coal (100 %)		2,00,475	SECL Chhattisgarh / MCL Odisha	By rail & road (through covered trucks)
			OR		
b)	Imported Coal (100 %)		1,30,000	Indonesia / South Africa / Australia	Through sea route, rail route & by road
			OR		
c)	Dolochar + Indian Coal	Dolochar	1,18,800	Own generation	through covered conveyors
		Indian Coal	1,41,075	SECL Chhattisgarh / MCL Odisha	By rail & road (through covered trucks)
			OR		
d)	Dolochar + Imported Coal	Dolochar	1,18,800	Own generation	through covered conveyors
		Imported coal	90,288	Indonesia / South Africa / Australia	Through sea route, rail route & by road
5.	**For Ferro Alloys (2 x 9 MVA)**				
5 (i)	*For Ferro Silicon – 14,000 TPA*				
a)	Quartz		24,300	Chhattisgarh / Andhra Pradesh	By road (through covered

S.No.	Raw Material	Quantity (TPA)	Sources	Mode of Transport
				trucks)
b)	LAM coke	18,900	Andhra Pradesh	By road (through covered trucks)
c)	MS Scrap / Mill scales	4,230	Own generation	--
d)	Electrode paste	360	Maharashtra / West Bengal	By road (through covered trucks)
e)	Bagfiler dust	200	Own generation	--
5 (ii)	*For Ferro Manganese – 50,400TPA*			
a)	Manganese Ore	68,400	MOIL / OMC	By Rail & Road (through covered trucks)
b)	LAM coke	19,800	Andhra Pradesh	By road (through covered trucks)
c)	Dolomite	8,100	Chhattisgarh / Andhra Pradesh	By road (through covered trucks)
d)	MS Scrap / Mill scales	7,200	In-house Generation	--
e)	Electrode Paste	630	Maharashtra / West Bengal	By road (through covered trucks)
f)	Bagfilter dust	1,000	Own generation	--
5 (iii)	*For Silico Manganese – 28,800 TPA*			
a)	Manganese Ore	48,600	MOIL / OMC	By Rail & Road (through covered trucks)
b)	LAM Coke	16,200	Andhra Pradesh	By road (through covered trucks)
c)	FeMn. Slag	30,294	In house generation	----
d)	Dolomite	7,380	Chhattisgarh / Andhra Pradesh	By road (through covered trucks)
e)	Electrode paste	630	Maharashtra / West Bengal	By road (through covered trucks)
f)	Quartz	7,740	Chhattisgarh / Andhra Pradesh	By road (through covered trucks)
g)	Bagfilter dust	200	Own generation	--

S.No.	Raw Material	Quantity (TPA)	Sources	Mode of Transport
5 (iv)	*For Ferro Chrome – 30,000TPA*			
a)	Chrome Ore	56,700	Sukinda, Odisha Import, South Africa	By road (through covered trucks) From Port By Road (through covered Trucks)
b)	LAM Coke	19,800	Andhra Pradesh	By road (through covered trucks)
c)	Quartz	8,100	Chhattisgarh / Andhra Pradesh	By road (through covered trucks)
d)	MS Scrap / Mill Scale	2,700	In-house Generation	--
e)	Magnetite / Bauxite	5,400	Chhattisgarh / Maharashtra	By road (through covered trucks)
f)	Electrode Paste	540	Maharashtra / West Bengal	By road (through covered trucks)
g)	Bagfilter dust	1200	Own generation	---

1.4   Manufacturing Process

1.4.1   Manufacturing of Sponge Iron (DRI)

The proposal consists of 2 x 100 TPD & 2 x 500 TPD of DRI kilns to produce 3,96,000 TPA of Sponge iron with 2 x 5 MW & 2 x 12 MW WHRB facility. Refractory lined rotary kilns will be used for reduction of iron ore in solid state.

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

Iron ore will be continuously fed into the kiln along with coal which has dual role of fuel as well as reductant. Dolomite will be added to scavenge the sulphur from the coal. A number of air tubes will be provided along the length of the kiln. The desired temperature profile will be maintained by controlling the volume of the combustion air through these tubes. The Carbon monoxide generated due to the combustion of coal, reduces the iron

ore and converts it into sponge iron. The rotary kiln is primarily divided into two zones viz. the pre heating zone and the reduction zone. The preheating zone extends over 30 to 50 % of the length of the kiln and in this the moisture in the charge will be driven off and the volatile matter in the coal will be burnt with the combustion air supplied through the air tubes. Heat from the combustion raises the temperature of the lining and the bed surface. As the kiln rotates, the lining transfers the heat to the charge. Charge material, pre-heated to about 1000^0C enters the reduction zone. Temperature of the order of 1050^0C will be maintained in the reduction zone, which is the appropriate temperature for solid state reduction of iron oxide to metallic iron.

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

1.4.2 Steel Melting Shop

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 6 x 15 T Induction furnaces to manufacture Hot Billets/ M.S. Billets of 2,97,000 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.

1.4.3 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 2,64,000 TPA of TMT Bars / Structural Steels.

1.4.4   Submerged Electric Arc Furnaces

2no.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 sub-merged arc furnaces using reducer (Coke) under high voltage. Flue gases will be extracted through 4th hole and then treated in bagfilters.

1.4.5   Power Generation

Through WHRB Boiler

The hot flue gases from proposed 2 x 100 TPD & 2 x 500 TPD of DRI kilns will pass through waste heat recovery Boiler to recover the heat and to generate 34 MW (2 x 5 MW & 2 x 12 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 30 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.

1.4.6   Fly Ash Brick Manufacturing Unit

It is proposed to establish Fly Ash brick making unit of 50,000 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 **400 KLD** and same being sourced from Ground Water.

- Water required for the **proposed expansion** project will be 2240 KLD and same will be sourced from Arpa river.

- Air cooled condensers will be provided for power plant.

- Total water requirement after the proposed expansion will be **2,640 KLD.**

- Water drawl permission from Water Resource Department, Chhattisgarh will be obtained before the operation of the expansion project.

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

BREAK-UP OF WATER REQUIREMENT

S.No.	Unit	Quantity in KLD		
		Existing Plant	Proposed Expansion	Total after Expansion
1.	DRI Kilns	90	400	490
2.	Induction Furnaces	--	210	210
3.	Rolling Mills	--	240	240
4.	Submerged Electric Arc Furnaces	---	60	60
5.	Power Plant (FBC)	---	1280	1280
	• Cooling tower makeup		616	616
	• Boiler make up		462	462
	• DM plant Regeneration		202	202
6.	Coal Washery	300	---	300
7.	Brick manufacturing unit	--	10	10
8.	Slag crushing unit	--	10	10
9.	Briquetting unit	--	10	10
10.	Domestic	10	20	30
	Total	**400**	**2240**	**2640**

1.6   Waste Water Generation from Proposed Expansion project

Existing

- There is no wastewater discharge from the existing Sponge Iron Unit & Coal washery unit as Closed circuit cooling system is adopted.

- 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.

Proposed

- 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 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	**Proposed Expansion**	**Total after Expansion**
1.	Power Plant	--	486	486
	a) Cooling Tower blowdown	--	154	154
	b) Boilers blowdown	--	130	130
	c) D.M. plant regeneration water	--	202	202
2.	Sanitary Wastewater	8	16	24
	Total	**8**	**502**	**510**

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 plant 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
$PM_{2.5}$	:	21.1 to 40.1 $\mu g/m^3$
PM_{10}	:	34.5 to 67.4 $\mu g/m^3$
SO_2	:	11.2 to 15.7 $\mu g/m^3$
NO_X	:	12.1 to 19.8 $\mu g/m^3$
CO	:	405 to 750 $\mu g/m^3$

2.2 Water Quality

2.2.1 Surface Water Quality

Arpa River (1.6 Kms.), Kurung Right Bank Canal (3.5 Kms.), Kurung Nallah (8.0 Kms.) and few ponds exists within 10 Km. radius of the plant site. Two samples (Upstream and Downstream) from Arpa River & 1 sample from Kurung right bank canal 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 **47.69 dBA to 60.39 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 expansion project will be **0.6 µg/m³** at a distance of 1500 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 **0.1 µg/m³**.

The predicted max incremental SO_2 concentrations (24 hourly) due to the emissions from operation of proposed expansion project will be **5.5 µg/m³** at a distance of 1500 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 **3.3 µg/m³** at a distance of 1500 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 **1.1 µg/m³.**

The predicted incremental rise in CO concentration due to the Vehicular emission will be **0.7 µg/m³.**

NET RESULTANT MAXIMUM CONCENTRATIONS DUE TO PROPOSED EXPANSION 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	67.4	15.7	19.8	750
Maximum predicted incremental rise in concentration due to **SP&IL (Expansion)**	0.6	5.5	3.3	--
Maximum predicted incremental rise in concentration due to **Vehicular Emissions from the proposed expansion project**	0.1	--	1.1	0.7
Net resultant concentrations during operation of the plant	**68.1**	**21.2**	**24.2**	**750.7**
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. **18.2 Ha. (45.01 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 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 expansion 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. **18.2 Ha. (45.01 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 of the ETP	Twice in a month	Grab sampling (24 hourly)	As per EPA Rules, 1996
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 expansion 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 expansion project:

S.No.	Source	Control Equipment	Air Emission at the outlet
1.	DRI kilns with WHRB's	Electro Static Precipitators (ESP) (high performance rigid electrodes with transformer)	PM <30 mg/Nm^3
2.	Induction Furnaces	Fume Extraction system with PTFE membrane bag filters	PM < 30 mg/Nm^3
3.	Re-heating furnaces attached to Rolling Mill	Stack	PM < 30 mg/Nm^3
4.	Submerged Electric Arc Furnaces	4th Hole Fume Extraction system with PTFE membrane bag filters	PM < 30 mg/Nm^3
5.	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 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 30 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   :   50 m^3/day

Effluent to be used for dust suppression in CHP   :   100 m^3/day

Effluent to be used for Greenbelt development   :   360 m^3/day

18.2 Ha. (45.01 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 expansion 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 expansion 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	Total	
1.	Dolochar	27,000	1,18,800	1,45,800	Is being given to nearby Cement plant and Brick manufacturing unit. After proposed expansion, it will be utilized in the proposed Brick manufacturing unit
2.	Ash from DRI	16,200	71,280	87,480	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	810	3,564	4,374	Is being given to Road Contractor for road construction & given to brick manufacturer. After proposed expansion, it will be utilized in the proposed Brick manufacturing unit
4.	Wet Scraper Sludge	4,140	18,216	22,356	Is being given to Road Contractor for road construction & given to brick manufacturer. After proposed expansion, it will be utilized in the

S.No.				
				proposed Brick manufacturing unit
5.	SMS Slag	---	29,700		Slag from SMS will be crushed and iron will be recovered & remaining non - magnetic material being inert by nature will be used as sub base material in road construction/ used for brick manufacturing.
6.	Mill scales from Rolling Mill	---	5,280		will be utilized in the proposed Ferro Alloys units.
7.	End cutting from Rolling Mill	---	7,920		Will be recycled back as Raw material in Induction Furnace
8.	Slag from SiMn	--	30,888		Will be given to Road Contractor for road construction / slag cement manufacturing unit
9.	Slag from FeMn	--	30,294		Will be used in manufacture of Silico manganese as it contains high MnO_2
10.	Slag from FeSi	--	1,010		Will be given to cast iron foundries
11.	Slag from FeCr	--	27,918		Will be further processed in Zigging plant for Chrome recovery and the non-chrome contents will be sent for land filling.
12.	Washery rejects	3,60,000	---		Is being given to rejects based power plant
13.	Ash from Power Plant (with 100 % Indian Coal)	--	90,214		will be utilized in the proposed Brick manufacturing unit
			OR		
	Ash from Power Plant (with100 % Imported Coal)	--	15,600		will be utilized in the proposed Brick manufacturing unit
			OR		
	Ash from Power Plant (withDolochar + Indian Coal)	--	1,34,764		will be utilized in the proposed Brick manufacturing unit
			OR		
	Ash from Power Plant (withDolochar + Imported Coal)	--	82,115		will be utilized in the proposed Brick manufacturing unit

7.5   Greenbelt Development

- **18.2 Ha. (45.01 acres)** of Greenbelt (inclusive of existing) will be developed within the plant premises.

- 12,130 no. of plants are exists till date (survival rate 85%).

- Another 32,870 nos. of saplings will be planted as part of expansion.

- Width of greenbelt ranges from 10 m to 140 m.

7.6   Cost for Environment Protection

Capital Cost for Environment Protection for proposed plant   : Rs. 56.95 Crores

Recurring Cost per annum for Environmental protection   : Rs. 11.89 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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