

# **SUMMARY ON ENVIRONMENTAL IMPACT ASSESSMENT REPORT**

**OF**

## **Shree Rupanadham Steel Pvt. Ltd.**

[Expansion of Steel Plant – DRI Kilns (Sponge Iron from 1,20,000 TPA to 6,48,000 TPA), Induction Furnaces along with CCM & LRF (Hot Billets / Billets / Ingots from 1,23,500 TPA to 4,53,000TPA), Rolling Mills (TMT bars / Structural Steel / Wire Rod Mill with HB Wire cooled Roll & Strip Mill with Pipe Mill)(85 % Hot charging with Hot Billets and remaining 15% through RHF with LDO as fuel from 94,800 TPA to 5,30,400 TPA), WHRB based Power Plant from 8 MW to 44 MW, FBC based Power Plant from 4 MW to 54 MW, Brick Manufacturing unit from 80,000 Brick /day to 1,50,000 Bricks/day, New 2 x 9 MVA& 4 x 6 MVA Ferro Alloys (FeSi - 38900 TPA or FeMn- 1,40,000 TPA or SiMn– 80,000 TPA or FeCr-83,500 TPA or Pig Iron-1,40,000 TPA), New Briquetting Unit (1000 Kg/hr) & New Coal washery unit (6,00,000 TPA)]

**at**

**Village: Saraipali, Tehsil: Tamnar,  
District: Raigarh, Chhattisgarh**

**Submitted to**

**CHHATTISGARH ENVIRONMENT CONSERVATION BOARD**

## 1.0 PROJECT DESCRIPTION

**Shree Rupanadham Steel Private Limited** is proposed to expand the existing steel plant at Saraipali Village, Tamnar Tehsil, Raigarh District, Chhattisgarh.

### Chronology of permission obtained:

- Existing plant of 33,500 TPA of MS Ingots (only 16,750 TPA is commissioned) & 4800 TPA of TMT Bar has obtained Consent from Regional Office - Raigarh, Chhattisgarh Environment Conservation Board (CECB) vide letter no. 153/RO/TS/CECB/2008 Raigarh dt. 16<sup>th</sup> May 2008.
- Obtained Environment Clearance for 90,000 TPA Sponge Iron, 33,500 TPA to 1,23,500 TPA of MS Billets, 90,000 TPA TMT Bars / Structural Steel / Wire Rod Mill, WHRB Power Plant (6 MW) & FBC Power Plant (12 MW) from MoEF, New Delhi vide F.No. J-11011/308/2009/ IA II (I) dated 29<sup>th</sup> March 2011 & 9<sup>th</sup> July 2018 (Validity Extension).
- Obtained Consent for Establishment for 90,000 TPA Sponge Iron, 33,500 TPA to 1,23,500 TPA of MS Billets, 90,000 TPA TMT Bars / Structural Steel / Wire Rod Mill, WHRB Power Plant (6 MW) & FBC Power Plant (12 MW) from CECB vide 4291/TS/CECB/2014 dated 21<sup>st</sup> October 2014.
- Obtained No Increase in Pollution Load (NIPL) certificate under section 7(ii)c of EIA notification, 2006 from CECB for additional 30,000 TPA Sponge Iron, WHRB Power Plant 2 MW & 80,000 Brick/day vide letter no. 6172/TS/CECB/2020 dt. 13<sup>th</sup> October 2020 and subsequently obtained amendment in CTE from CECB vide letter no. 6313/TS/HO/CECB/2020 dt. 19<sup>th</sup> October 2020.
- Existing plant of 3 x 100 TPD Sponge Iron, 6.0 MW WHRB Power, 4.0 MW FBC Power Plant & 1,23,500 TPA of MS Billets / MS Ingots is having Consent to Operate from CECB vide 8709/TS/CECB/2022 dt. 28<sup>th</sup> February 2022 and same is valid till 28<sup>th</sup> February 2023.

Existing plant is located in 11.141 Ha. (27.529 Acres) of land. Additional 21.749 Ha. (53.745 Acres) of land is envisaged by management adjacent to the existing plant. Proposed expansion will be taken up partly in the existing land and partly in the additional land adjacent to the existing plant premises. *Total land for the proposed expansion will be 32.89 Ha. (81.274 Acres).* Out of Total land 32.89 Ha. (81.274 Acres), 20.926 Ha. (51.71 Acres) is in possession of management and remaining land of 11.964 Ha. (29.56 Acres) is in the name of

sister concern company & Directors and merging of same into Shree Rupanadham Steel Pvt. Ltd. is under process.

Proposed Project

Now company proposed to expand the existing steel plant comprising of DRI Kilns (Sponge Iron from 1,20,000 TPA to 6,48,000 TPA), Induction Furnaces along with CCM & LRF (Hot Billets / Billets / Ingots from 1,23,500 TPA to 4,53,000 TPA), Rolling Mills (TMT bars / Structural Steel / Wire Rod Mill with HB Wire cooled Roll & Strip Mill with Pipe Mill)(85 % Hot charging with Hot Billets and remaining 15% through RHF with LDO as fuel from 94,800 TPA to 5,30,400 TPA), WHRB based Power Plant from 8 MW to 44 MW, FBC based Power Plant from 4 MW to 54 MW, Brick Manufacturing unit from 80,000 Brick /day to 1,50,000 Bricks/ day, New 2 x 9 MVA & 4 x 6 MVA Ferro Alloys (FeSi - 38,900 TPA or FeMn - 1,40,000 TPA or SiMn - 80,000 TPA or FeCr - 83,500 TPA or Pig Iron - 1,40,000 TPA), New Briquetting Unit (1000 Kg/hr) & New Coal washery unit (6,00,000 TPA).

As per the Ministry of Environment, Forests & Climate Change, New Delhi, EIA notification dated 14th September, 2006 & its subsequent amendments, all Primary metallurgical processing industries are listed under S.No. 3(a), under Category 'A'.

In order to obtain Environmental Clearance for the proposed expansion of Steel plant, Form-I, proposed TOR along with Pre-Feasibility Report were submitted to the Honourable Ministry of Environment, Forests & Climate Change (MoEF&CC), New Delhi on 16<sup>th</sup> November 2021. Accordingly, Standard TOR has been issued for the proposed expansion of steel plant vide No. **J-11011/308/2009-IA.II(I)** dated **24<sup>th</sup> November 2021**. Subsequently, Draft EIA report has been prepared incorporating the Terms of Reference issued & report is being submitted to Chhattisgarh Environment Conservation Board (CECB) for conducting Public hearing / consultation.

**Pioneer Enviro Laboratories & Consultants Private Limited, Hyderabad**, which is accredited by NABET, Quality Council of India, vide certificate No. NABET/EIA/1922/SA0148, for preparing Environmental Impact Assessment (EIA) report for Metallurgical Unit, has prepared EIA report for the proposed project.

This report furnishes the details of location of Site, Description of the project, prevailing baseline status w.r.t Air Environment, Water Environment, Noise Environment, Land Environment, Flora & Fauna and Socio-economic environment. This report also helps in identification of environmental impacts and suggesting mitigation measures to be followed during Construction and Operation of the proposed project as a part of Environmental Management Plan. This report also acts as guidance manual for the proponent for following the Environmental Management Plan (EMP) and for adopting post project Environmental Monitoring Program as per statutory norms.

### 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:

**Table No.11.1.1: Environment Setting Within 10 Kms. 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 – 3.1 %; Industrial Area- 7.8 %; , Tanks / River/ / Reservoir – 9.8 %; Dense Forest / Scrub Forest – 38.9 %; Single crop land – 24.3 %; Double Crop Land – 6.6 %; Land with scrub – 7.2 %; Land without scrub – 2.3 %
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 within 15 Kms. radius of the plant, as per the secondary source. Conservation Plan is prepared.
4.	Historical places / Places of Tourist importance / Archeological sites	Ram Jharna&Singhanpur Caves (6.1 Kms.)
5.	Critically polluted area as per MoEF&CC Office Memorandum dated 13 <sup>th</sup> January 2010	Nil And also the Plant area does not fall in the areas given in Hon'ble NGT order issued vide dated 10 <sup>th</sup> July 2019.
6.	Defence Installations	Nil
7.	Nearest village	Barpali village (NW direction) at 0.50 Kms
8.	No. of Villages in the Study Area	53 nos.
9.	Nearest Hospital	Nearest Hospital is at Raigarh Town at 12.0 Kms.
10.	Nearest School	Nearest School is at Govt. Schoolat Saraipali

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
		Village at 0.73 Kms.
11.	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), Pajhar PF (North Direction) exist within study area.
12.	Water body	Kelo River – 8.0 Kms. (East), BardehJharna Nallah - 1.6 Kms. (West), Gerwani Nallah – 3.2 Kms. (NE), Korpali nala - 1.5 Kms. (North), Dewanmunda Nallah – 2.5 Kms.(NE), Banjari Nala – 5.4 Kms. (West), Kurket River (Rabo Dam) – 7.0 Kms. (NW) exists within the study area.
13.	Nearest Highway	Raigarh – Ambikapur Highway (8.5 Kms.)
14.	Nearest Railway Station	Kirodimal Nagar Railway Station (30.0 Kms.)By Road
15.	Nearest Port facility	Nil
16.	Nearest Airport	Jindal Airstrip – 9.6 Kms. (Aerial)
17.	Nearest Interstate Boundary	Nil within 15 Km. radius
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

## 1.2 PLANT CONFIGURATION AND PRODUCTION CAPACITY

Following is plant configuration and production capacity proposed now

**TABLE NO.1.2: Plant Configuration and Production Capacity (Existing & Proposed)**

S.No.	Units (Products)	Permitted capacity as per EC & Consents [1]	Operating Plant [2]	Status of Implementation of Expansion Project for which EC accorded in 2011 & its (amendments on 2018) thereof [3]	Total Capacity in operation / under implementation as on Current Date [4] = [1] + [3]	Proposed Expansion [5]	Total after Proposed Expansion [6] = [4] + [5]
1.	DRI Kilns (Sponge Iron)	4 x 100 TPD (1,20,000 TPA)	3 x 100 TPD (90,000 TPA)	1 x 100 TPD (30,000 TPA) (Under Construction)	4 x 100 TPD (1,20,000 TPA)	1 x 200 TPD & 4 x 350 TPD (5,28,000 TPA)	4 x 100 TPD, 1 x 200 TPD & 4 x 350 TPD (6,48,000 TPA)
2.	Induction Furnaces with CCM (Hot Billets/ Billets / Ingots)	1,23,500 TPA	46,750 TPA	76,750 TPA (In Operation)	1,23,500 TPA	4 x 25 T (with 30 T LRF) (3,30,000 TPA)	<b>4,53,300 TPA</b>
3.	Rolling Mills (TMT bars / Structural Steel / Wire Rod Mill with HB Wire cooled Roll & Strip Mill with Pipe Mill) (85 % Hot charging with Hot Billets and remaining 15% through RHF with LDO as fuel)	94,800 TPA	---	94,800 TPA (Under Construction)	94,800 TPA	2 x 660 TPD (4,35,600 TPA)	<b>5,30,400 TPA</b>
4.	Ferro Alloys Units (FeSi or FeMn or	---	---	---	---	2 x 9 MVA & 4 x 6 MVA	2 x 9 MVA & 4 x 6 MVA



S.No.	Units (Products)	Permitted capacity as per EC & Consents [1]	Operating Plant [2]	Status of Implementation of Expansion Project for which EC accorded in 2011 & its (amendments on 2018) thereof [3]	Total Capacity in operation / under implementation as on Current Date [4] = [1] + [3]	Proposed Expansion [5]	Total after Proposed Expansion [6] = [4] + [5]	
	SiMn or FeCr or Pig Iron)					(FeSi - 38,900 TPA or FeMn- 1,40,000 TPA or SiMn-80,000 TPA or FeCr-83,500 TPA or Pig Iron - 1,40,000 TPA)	<b>(FeSi - 38,900 TPA or FeMn- 1,40,000 TPA or SiMn-80,000 TPA or FeCr-83,500 TPA or Pig Iron - 1,40,000 TPA)</b>	
5.	Coal Washery	---	---	---	---	6,00,000 TPA	6,00,000 TPA	
6.	Power Plant	WHRB Power Plant	8 MW	---	6 MW (In operation) & 2 MW (Under construction)	8 MW	36 MW (1 x 4 MW & 4 x 8 MW)	<b>44 MW</b>
		FBC Power Plant	4 MW	---	4 MW (In operation)	4 MW	50 MW (2 x 25 MW)	<b>54 MW</b>
7.	Brick Manufacturing Unit	80,000 Bricks/day	---	80,000 Bricks/day (Under Construction)	80,000 Bricks / Day	70,000 Bricks/day	<b>1,50,000 Bricks/day</b>	
8.	Briquetting Plant	---	---	---	---	1000 kg/hr.	<b>1000 kg/hr.</b>	

### 1.3 RAW MATERIALS (FOR EXPANSION PROJECT)

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

**TABLE NO.1.3: RAW MATERIAL REQUIREMENT, SOURCE & MODE OF TRANSPORT**

S.No.	Raw Material	Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
1.	<b>For DRI Kilns (Sponge Iron) 5,28,000 TPA (1 x 200 TPD &amp; 4 x 350 TPD)</b>				
a)	Pellets	7,92,000	Purchased From Outside	---	Through covered conveyers
or					
b)	Iron Ore	8,44,800	Barbil, Orissa NMDC, Chhattisgarh	~ 500 Kms.	By rail & road (through covered trucks)
c)	Coal	Indian (100%)	SECL Chhattisgarh / MCL Odisha	~ 500 Kms	By rail & road (through covered trucks)
		Imported (100%)	Indonesia / South Africa / Australia	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered trucks)
d)	Dolomite	26,400	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
2.	<b>For Steel Melting Shop (Hot Billets / MS Ingots / Billets) –3,30,000 TPA (4x25 T) with 1x30 T LRF)</b>				
a)	Sponge Iron	3,33,000	Own generation & purchased from outside	--- ~ 100 Kms.	Through covered conveyers & By road (through covered trucks)
b)	MS Scrap/ Pig Iron	50,000	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
c)	Ferro alloys	17,000	Own generation	---	By road (through covered trucks)
3.	<b>For Rolling Mill through Hot charging &amp; RHF (TMT bars / Structural Steel) – 4,35,600 TPA</b>				
a)	Hot Billets / Billets / Ingots	4,66,100	Own generation & purchased from outside	----	----
b)	LDO / LSHS	3800 KI/annum	Nearby IOCL Depot	~ 100 Kms.	By road (through Tankers)



S.No.	Raw Material	Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport	
4.	<b>For FBC Boiler [Power Generation 2 x 25 MW]</b>					
a)	Indian Coal (100%)	2,97,000	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)	
<b>OR</b>						
b)	Imported Coal (100%)	1,90,377	Indonesia / South Africa / Australia	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered trucks)	
<b>OR</b>						
c)	Dolochar + Indian Coal	Dolochar	1,05,600	In plant generation	---	through covered conveyors
		Indian Coal	2,44,200	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)
<b>OR</b>						
d)	Dolochar + Imported Coal	Dolochar	1,05,600	In plant generation	---	---
		Imported Coal	1,37,577	Indonesia / South Africa / Australia	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered trucks)
5.	<b>For Ferro Alloys (2 x 9 MVA) (4 x 6 MVA)</b>					
5 (i)	<i>For Ferro Silicon – 38,900TPA</i>					
a)	Quartz	56,700	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)	
b)	LAM coke	44,100	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)	
c)	MS Scrap / Mill scales	9,870	Inhouse Generation	---	By road (through covered trucks)	
d)	Electrode paste	840	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)	
e)	Bagfilter dust	467	Own generation	---	---	
5 (ii)	<i>For Ferro Manganese – 1,40,000 TPA</i>					
a)	Manganese Ore	1,59,600	MOIL / OMC	~ 500 Kms.	By Rail & Road (through covered trucks)	

S.No.	Raw Material	Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
b)	LAM coke	46,200	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	Dolomite	18,900	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
d)	MS Scrap / Mill scales	16,800	Inhouse Generation	---	By road (through covered trucks)
e)	Electrode Paste	1,470	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
f)	Bagfilter dust	2334	Own generation	---	---
5 (iii)	<i>For Silico Manganese – 80,000 TPA</i>				
a)	Manganese Ore	1,13,400	MOIL / OMC	~ 500 Kms.	By Rail & Road (through covered trucks)
b)	LAM Coke	37,800	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	FeMn. Slag	70,686	In house generation	---	----
d)	Dolomite	17,220	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
e)	Electrode paste	1470	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
f)	Quartz	18,060	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
g)	Bagfilter dust	467	Own generation	---	---
5 (iv)	<i>For Ferro Chrome – 83,500 TPA</i>				
a)	Chrome Ore	1,32,300	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	46,200	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	Quartz	18,900	Chhattisgarh /	~ 500 Kms.	By road

S.No.	Raw Material	Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
			Andhra Pradesh		(through covered trucks)
d)	MS Scrap / Mill Scale	6,300	Inhouse Generation	---	By road (through covered trucks)
e)	Magnetite / Bauxite	12,600	Chhattisgarh / Maharashtra	~ 500 Kms.	By road (through covered trucks)
f)	Electrode Paste	1,260	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
g)	Bagfilter dust	2,800	Own generation	---	---
5 (v)	<i>For Pig Iron – 1,40,000 TPA</i>				
a)	Iron ore / Sinter	214200	Barbil, Orissa NMDC, Chhattisgarh	~ 500 Kms.	By rail & road (through covered trucks)
b)	LAM Coke	100800	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	Dolomite	13860	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
d)	Quartz	7140	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
e)	Bagfilter dust	2334	Own generation	---	---

## 1.4 MANUFACTURING PROCESS

### 1.4.1 DRI Kiln (Sponge Iron)

It is proposed to install 1 x 200 TPD & 4 x 350 TPD DRI Kilns to manufacture 5,28,000 TPA of Sponge Iron, along with WHRB facility.

It is a coal-based plant for converting Iron Ore to Iron through direct reduction. The Oxide Ore  $Fe_2O_3$  (Hematite) is reduced to 'Fe' by using Carbon as reductant. The process can take place at 900-1000°C. Coal provides the heat as well as reducing gases. Dolomite chips of size (-3 mm) are used as flux to Scavenge Sulphur content from coal and preventing the combining of this impurity with iron. The process is carried out in a Rotary Kiln.

The Direct Reduced Iron (DRI) plant will comprise of 1 x 200 TPD & 4 x 350 TPD kilns and related accessories including Waste Heat Recovery power generating unit.

The major plant facilities for the Sponge Iron plant envisaged are as follows:

- Day bins
- Rotary Kiln & Cooler
- Central Control Room
- Product processing and product storage
- Off gas system including waste heat recovery power generation

There will be one day bin building for kiln. The day bin building will have bins for meeting raw material required for kiln. This bin will have the storage facility for pellets, feed coal, dolomite etc.

A refractory lined rotary kiln 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. Sized 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 rises 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 rotary cooler. In rotary cooler the material will cool from 1000°C to 100°C in cooler by spraying water. 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

#### **1.4.2 Steel Melting Shop**

It is proposed to install 4 x 25 T Induction Furnace along with 30 T LRF to produce Steel Billets of 3,30,000 TPA.

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). 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 Rolling Mills**

It is proposed to install 2 x 660 TPD Rolling Mill Units to manufacture 4,35,600 TPA of TMT bars / Structural Steel / Wire Rod Mill with HB Wire cooled Roll & Strip Mill with Pipe 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 4,29,000 TPA of Rolled Products /TMT Bars / Structural Steels.

#### **1.4.4 Submerged Electric Arc Furnaces**

Submerged Electric Arc Furnace (2 x 9 MVA & 4 x 6 MVA) will be setup in the proposed plant. Ferro manganese, silicon-manganese will be produced using manganese ore as main raw material, Ferro silicon will be produced using Quartz as main raw material & Ferro Chrome will be produced using Chrome Ore as main raw material in a sub-merged arc furnace using reducer (Coke) under high voltage. Flue gases will be extracted through 4<sup>th</sup> hole and then treated in bag filters.

#### **1.4.5 Power Generation**

##### **Through WHRB Boiler**

The hot flue gases from proposed 1 x 200 TPD & 4 x 350 TPD DRI Kilns will pass through waste heat recovery Boiler to recover the heat and to generate 36 MW (1 x 4 MW & 4 x 8

MW)electricity. The gases after heat recovery will pass through ESP and then discharged through chimneys into the atmosphere for effective dispersion of emissions into the atmosphere through stacks of adequate height.

#### **Through CFBC Boiler**

Coal (Imported / Indian) along with dolochar will be used as fuel in FBC Boiler to generate 2 x 25 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 Coal Washery**

Coal washery comprises of coal crushing & screening and washing of coal to produce clean coal with ash content less than 34%. Wet type of coal washery is proposed as it will have lesser environmental problems compared to the dry type of washery and to suit to client's specific requirement of lower ash content. Closed loop water system is proposed in the process. Zero effluent discharge will be maintained in the proposed project.

The process consists of crushing of the ROM coal in a single toothed roll crusher. The crushed coal is then washed in Zig to produce clean coal and middling with the help of water stream and air pressure.

#### **1.5 Water Requirement**

- Water required in the operating plant & permitted capacity is 645KLD and same being sourced from Ground water source. Water permission for existing operating plant is obtained vide NOC no. CGWA/NOC/IND/REN/1/2021/6205 and same is valid till 11.04.2024.
- Water required for the proposed expansion project will be 3170 KLD and same will be sourced from BardehJharna Nallah.
- Air cooled condensers have been provided in existing power plant. In expansion project also Air-cooled condensers will be provided.
- Total water requirement after the proposed expansion will be 3815 KLD.
- Application has been submitted to Water Resource Department, Chhattisgarh for drawl of water from BardehJharna Nallah and same is under process.

**TABLE NO.11.1.4: Break Up of Water Consumption (Existing & Proposed)**

S.No.	Unit	Quantity in KLD		
		Operating plant & Permitted capacity	Proposed Expansion	Total after Proposed Expansion
1.	DRI Kilns	150	530	680
2.	Induction Furnace	150	230	380
3.	Rolling Millwith RHF	125	390	515
4.	Ferro Alloy Plant	---	140	140
5.	Power Plant (WHRB &FBC)	200	1720	1920
6.	Brick Manufacturing plant	10	15	25
7.	Coal washery	---	125	125
8.	Domestic	10	20	30
	<b>Total</b>	<b>645</b>	<b>3170</b>	<b>3815</b>

## 1.6 Waste Water Generation

### Existing

- There is no wastewater discharge from the existing plant 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.
- Effluent from Rolling mill is being treated in an oil separator followed by settling tank. The treated effluent is recycled back.
- 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 from the DRI Unit, Induction Furnace Unit, Ferro Alloys& Coal Washery as closed-circuit cooling system will be adopted.
- Effluent from Rolling mill will be sent to oil separator followed settling tank and will be recycled through closed circuit cooling system.
- Effluent from power plant will be treated in ETP 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.

**TABLE NO.11.1.5: BREAKUPOF WASTE WATER GENERATION**

S.No.	Source	Generation (KLD)		
		Operating plant & Permitted capacity	Proposed Expansion	After Proposed Expansion
1.	DRI Kilns	---	---	---
2.	Induction Furnaces	---	---	---
3.	Rolling Mill	---	---	---
4.	Ferro Alloys Unit	---	---	---
5.	Brick manufacturing plant	---	---	---
6.	Coal Washery	---	---	---
7.	Power Plant	76	654	730
	a) Cooling Tower blowdown	24	207	231
	b) Boilers blowdown	20	175	195
	c) D.M. plant regeneration water	32	272	304
8.	Sanitary Wastewater	8	16	24
	<b>Total</b>	<b>84</b>	<b>670</b>	<b>754</b>

### 1.7 Wastewater Characteristics

The following are the Characteristics of waste water

**TABLE NO.11.1.6: CHARACTERISTICS OF WASTEWATER**

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<sub>2.5</sub>, PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>x</sub> & CO at 8 stations including project site during **15<sup>th</sup> October 2021 to 15<sup>th</sup> January 2022**. The following are the concentrations of various parameters at the monitoring stations:

**TABLE NO.11.2.1: AAQ DATA SUMMARY**

S.No.	Parameter		Concentration
1.	PM <sub>2.5</sub>	:	21.9 to 45.3µg/m <sup>3</sup>
2.	PM <sub>10</sub>	:	38.6 to 75.6µg/m <sup>3</sup>
3.	SO <sub>2</sub>	:	6.9 to 18.2µg/m <sup>3</sup>
4.	NO <sub>x</sub>	:	7.1 to 25.4µg/m <sup>3</sup>
5.	CO	:	330 to 1025µg/m <sup>3</sup>

## 2.2 Water Quality

### 2.2.1 Surface Water Quality

Kelo river (8.0 Kms.), BardehJharna Nallah (1.6 Kms.) & Rabo Dam (Kurket River 7.0 Kms.) are flowing within 10 Kms. radius of the plant site. 2 No. of samples are collected from Kelo River, 1 no. sample collected from each BardehJharna Nallah & Rabo Dam (Kurket River 7.0 Kms.). No other water sample is collected as water is not available during the study period 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 **46.8 dBA to 67.9dBA**.

### 3.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

#### 3.1 Prediction of impacts on air quality

The predicted max. incremental PM<sub>10</sub> concentrations (24 hourly) due to the emissions from operation of proposed expansion project will be **1.7 µg/m<sup>3</sup>** at a distance of 2800 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/m<sup>3</sup>**.

Hence the total predicted incremental rise in Particulate Matter concentration due to the emission from proposed expansion project and due the vehicular emissions will be  $1.7 \mu\text{g}/\text{m}^3 + 0.68 \mu\text{g}/\text{m}^3 = \mathbf{2.38 \mu\text{g}/\text{m}^3}$ .

The predicted max incremental SO<sub>2</sub> concentrations (24 hourly) due to the emissions from operation of proposed expansion project will be **20.5 µg/m<sup>3</sup>** at a distance of 2500 m from the stack in the down wind direction over the baseline concentrations.

The predicted max incremental NO<sub>x</sub> concentrations (24 hourly) due to the emissions from operation of proposed project will be **10.7 µg/m<sup>3</sup>** at a distance of 2900 m from the stack in the down wind direction over the baseline concentrations.

The predicted incremental rise in NO<sub>x</sub> concentration due to the Vehicular emission will be **5.2 µg/m<sup>3</sup>**.

Hence the total predicted incremental rise in NO<sub>x</sub> concentration due to the emission from project and due the vehicular emission will be  $10.7 \mu\text{g}/\text{m}^3 + 5.2 \mu\text{g}/\text{m}^3 = \mathbf{15.9 \mu\text{g}/\text{m}^3}$

The predicted incremental rise in CO concentration due to the Vehicular emission will be **3.3 µg/m<sup>3</sup>**.

**TABLE NO.3.1**

**NET RESULTANT MAXIMUM CONCENTRATIONS DURING THE OPERATION OF THE PROPOSED EXPANSION PROJECT**

Item	PM <sub>10</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>x</sub> (µg/m <sup>3</sup> )	CO (µg/m <sup>3</sup> )
Maximum baseline conc. in the study area	75.6	18.2	25.4	1025
Maximum predicted incremental rise in concentration due to proposed expansion of <b>SRSPL</b>	1.7	20.5	10.7	3.3
Maximum predicted incremental rise in concentration due to <b>Vehicular Emissions from the proposed expansion project</b>	0.68	---	5.2	---
<b>Net resultant concentrations during operation of the plant</b>	77.98	38.7	41.3	1028.3
<b>National Ambient Air Quality Standards</b>	<b>100</b>	<b>80</b>	<b>80</b>	<b>2000</b>

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. **10.93 Ha. (27.0 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 DRI Unit, Induction Furnace Unit, Ferro Alloys & Coal Washery 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. **10.93 Ha. (27.0 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:

**Table no. 11.4.1: 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	Quarterly Once	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) Once in a month	-- --	PM, SO <sub>2</sub> & NO <sub>x</sub> PM, SO <sub>2</sub> & NO <sub>x</sub>
B.	Ambient Air quality	CAAQMS	continuously	PM <sub>2.5</sub> , PM <sub>10</sub> , SO <sub>2</sub> , NO <sub>x</sub>

		Quarterly Once	24 Hourly	PM <sub>2.5</sub> , PM <sub>10</sub> , SO <sub>2</sub> , NO <sub>x</sub> & CO
C.	Fugitive emissions	Once in a Month	8 hours	PM
<b>3. Meteorological Data</b>				
A.	Meteorological data to be monitored at the plant.	Daily	Continuous monitoring	Temperature, Relative Humidity, rainfall, wind direction & wind speed.
<b>4. Noise level monitoring</b>				
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. Separate budget will be allocated for social welfare & developmental 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 expansion project:

**TABLE NO. 11.7.1: AIR EMISSION CONTROL SYSTEM PROPOSED**

S.No.	Source	Control Equipment	Emission at the outlet
1.	DRI kilns with WHRB's	Electro Static Precipitators (ESP) (High performance rigid electrodes with transformer)	PM < 30 mg/Nm <sup>3</sup>
2.	Induction Furnaces with CCM & LRFs	Fume Extraction system with PTFE membrane bag filters	PM < 30 mg/Nm <sup>3</sup>
3.	Submerged Electric Arc Furnace	4 <sup>th</sup> Hole Fume Extraction system with bag filters	PM < 30 mg/Nm <sup>3</sup>
4.	Re-heating furnaces attached to Rolling Mill	Stack	PM < 30 mg/Nm <sup>3</sup>
5.	Coal Washery	Fume Extraction system with PTFE	PM < 30 mg/Nm <sup>3</sup>

S.No.	Source	Control Equipment	Emission at the outlet
		membrane bag filters	
6.	FBC Boiler	Electro Static Precipitators (ESP) (High performance rigid electrodes with transformer)	PM < 30 mg/Nm <sup>3</sup>
		Automatic lime dosing control system	SOx < 100 mg/Nm <sup>3</sup>
		Combustion temperature will be around 800-850 <sup>0</sup> C, which is not conducive for thermal NOx formation. Low NOx burners with 3-stage combustion, flue gas recirculation and auto combustion control system will be provided.	NOx < 100 mg/Nm <sup>3</sup>

**Note :** Apart from the above Dry fog system with dust suppression at transfer points, crushing plant, dust extraction system with bagfilters at other dust emanating areas , covered conveyers, mechanical dust sweepers, etc. will also be provided.

Apart from the above the following air emission control systems/ measures are proposed in the Plant:

- All conveyors will be completely covered with G.I. sheets to control fugitive dust.
- All bins will be totally packed and covered so that there will not be any chance for dust leakage.
- All the dust prone points material handling systems will be connected with de-dusting system with bag filters.
- All discharge points and feed points, wherever the possibility of dust generation is there a de-dusting suction point will be provided to collect the dust.

## 7.2 Water Environment

- There will be no wastewater discharge from the DRI Unit, Induction Furnace Unit, Ferro Alloys & Coal Washery as closed-circuit cooling system will be adopted.
- Effluent from Rolling mill will be sent to oil separator followed settling tank and will be recycled through closed circuit cooling system.
- Effluent from power plant will be treated in ETP 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.

#### **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 Greenbelt development. Sanitary waste water will be treated in proposed STP.

#### **TREATED EFFLUENT DISPOSAL**

Effluent quantity to be used for ash conditioning	:	200 m <sup>3</sup> /day
Effluent to be used for dust suppression in CHP	:	404 m <sup>3</sup> /day
Effluent to be used for Greenbelt development	:	150 m <sup>3</sup> /day

**10.93 Ha.(27.0 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.

**TABLE NO. 11.7.2: SOLID WASTE GENERATION & ITS DISPOSAL**

S.No.	Waste / By Product	Quantity (TPA)			Method of disposal
		Operating plant & Permitted capacity	Proposed Expansion	After Proposed Expansion	
1.	Ash from DRI	21,600	95,040	1,16,640	Is being given to nearby brick manufacturing units and now it will be utilised in the proposed brick manufacturing unit.
2.	Dolochar	24,000	1,05,600	1,29,600	Is being utilized in the existing FBC boiler-based power plant. The same practice will be continued after expansion also.
3.	Kiln Accretion Slag	1,080	4,752	5,832	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.
4.	Wet Scraper Sludge	5,520	24,288	29,808	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.
5.	SMS Slag	12,350	33,000	45,350	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.
6.	Mill Scales	948	4,356	5,304	Will be used in proposed Ferro Alloys plant captively



7.	End cuttings	1,896	8,712	10,608	Will be reused in SMS.
8.	Ash from Power Plant (Indian Coal + Dolochar)	19,692	1,73,250	1,92,942	Is being given to nearby brick manufacturing units and now it will be utilized in the proposed brick manufacturing unit.
9.	Slag from FeMn	---	70,686	70,686	Will be reused in manufacture of SiMn as it contains high SiO <sub>2</sub> and Silicon.
10.	Slag from FeSi	---	2,356	2,356	Will be given to Cast iron foundries
11.	Slag from SiMn	---	72,072	72,072	will be used for Road construction / will be given to slag cement manufacturing
12.	Slag from FeCr	---	65,142	65,142	Will be processed in Zigging plant for Chrome recovery. After Chrome recovery, the left-over slag will be analysed for Chrome content through TCLP test, if the Chrome content in the slag is within the permissible limits, then it will be utilised for Road laying /brick manufacturing. If Chrome content exceeds the permissible limits, it will be sent to nearest TSDF.
13.	Slag from Pig Iron	---	80,388	80,388	Will be given to slag cement manufacturing units
14.	Coal rejects	---	1,50,000	1,50,000	Will be given to existing and proposed FBC Power plant.
15.	Dust from Bagfilters of SEAF & during tapping	---	10,000	10,000	will be used in Briquetting Plant and briquets made will be reused in Ferro Alloys process.

## 7.5 Greenbelt Development

- **10.93 Ha.(27.0 acres)**of Greenbelt (inclusive of existing) will be developed within the plant premises.
- 8120 nos. of plants are existing till date (survival rate 85%).
- 15 m wide greenbelt is being maintained all around the plant.
- Local DFO will be consulted in developing the green belt.
- The tree species to be selected for the plantation are pollutant tolerant, fast growing, wind firm, deep rooted. A three-tier plantation is proposed comprising of an outer most belt of taller trees which will act as barrier, middle core acting as air cleaner and the

innermost core which may be termed as absorptive layer consisting of trees which are known to be particularly tolerant to pollutants.

- 1000 plants will be planted per acre as per CPCB norms.

#### **7.6 Cost for Environment Protection**

Capital Cost for Environment Protection for proposed expansion : Rs. 74.45 Crores

Recurring Cost per annum for Environmental protection : Rs. 12.16 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.