

# **SUMMARY ON ENVIRONMENTAL IMPACT ASSESSMENT REPORT**

**OF**

## **Salasar Steel & Power Ltd.**

[Expansion of Steel Plant 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 97,000 TPA to 4,27,000 TPA), WHRB based Power Plant from 4.5 MW to 34.5 MW, New 8,00,000 TPA of I/O Pellet Plant along with New Coal Gasifier 30,000 NM<sup>3</sup>/Hr, New Rolling Mill (TMT bars / Structural Steel) (85 % Hot charging with Hot Billets and remaining 15% through RHF) 4,12,500 TPA along with New Coal Gasifier 3700 NM<sup>3</sup>/Hr., New 4 x 15 MVA Ferro Alloys (FeSi- 46,600 TPA /FeMn- 1,68,000 TPA / SiMn- 96,000 TPA / FeCr- 1,00,000 TPA), New Briquetting Plant - 670 Kg/Hr. & Brick Manufacturing unit (60,000 Bricks/day to 1,27,000 Bricks/day)]

**at**

**Gerwani Village, Raigarh Tehsil,  
Raigarh District, Chhattisgarh**

Submitted to

**CHHATTISGARH ENVIRONMENT CONSERVATION BOARD**

### 1.0 PROJECT DESCRIPTION

**Salasar Steel & Power Ltd.** is an existing Steel Plant at Gerwani Village, Raigarh Tehsil, Raigarh District, Chhattisgarh.

#### Chronology of permission obtained:

- Consent to Establishment (CTE) has been obtained from CECB vide No. 4708/TS/CECB/2003 Raipur, dt. 24.12.2003 for Sponge Iron (60,000 TPA) & Captive Power Plant - WHRB & FBC (8.0 MW).
- Later Consent to Establishment (CTE) has been obtained from CECB vide 5922/TS/CECB/2005 Raipur dt. 19.12.2005 for expansion of existing plant comprising of FBC Power Plant (7.0 MW) & Coal Washery (3,90,000 TPA).
- Subsequently obtained Environment Clearance (EC) from SEIAA, CG vide 248/SEIAA-CG/EC/BPP/RGH/15 Raipur dt. 21.07.2010 for Steel Melting Shop (97,000 TPA) and CFBC Power Plant (65 MW).
- Accordingly obtained Consent to Operate for FBC Power Plant (65 MW) & Steel Melting Shop (97,000 TPA) vide letter no. 530/TS/CECB/2018 Naya Raipur dt. 11.04.2018, same was valid upto 13.05.2020 and for Sponge Iron (60,000 TPA), WHRB Power Plant (4.5 MW), FBC Power Plant (10.5 MW) & Coal Washery (3,90,000 TPA) Naya Raipur dt. 03.01.2020, same was valid upto 31.12.2020.
- In November 2019, Salasar Steel & Power Ltd. went into bankrupt and later it is been purchased by us i.e. M/s. Singhal Enterprises Pvt. Ltd., through National Company Law Tribunal (NCLT) on 08.11.2021.
- Consent to Operate (CTO) has been obtained for Sponge Iron (60,000 TPA), Steel Melting Shop (97,000 TPA), WHRB Power Plant (4.5 MW), FBC Power Plant (10.5 MW + 65 MW) vide letter no. 8949/TS/CECB/2022 Naya Raipur dt. 08.03.2022, same is valid upto 30.04.2023.

#### 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 97,000 TPA to 4,27,000 TPA), WHRB based Power Plant from 4.5 MW to 34.5 MW, New 8,00,000 TPA of I/O Pellet Plant along with New Coal Gasifier 30,000 NM<sup>3</sup>/Hr, New Rolling Mill (TMT bars / Structural Steel) (85 %

Hot charging with Hot Billets and remaining 15% through RHF) 4,12,500 TPA along with New Coal Gasifier 3700 NM<sup>3</sup>/Hr., New 4 x 15 MVA Ferro Alloys (FeSi- 46,600 TPA /FeMn- 1,68,000 TPA / SiMn- 96,000 TPA / FeCr- 1,00,000 TPA), New Briquetting Plant - 670 Kg/Hr. & Brick Manufacturing unit (60,000 Bricks/day to 1,27,000 Bricks/day).

SalasarSteel& Power Ltd. is an existing plant is located at Khasra no. **2, 3, 5/1, 5/2, 27/1, 27/2, 27/3, 30/1, 30/3, 30/4, 30/5, 30/6, 30/7, 89/3, 89/4, 90/2, 91/2** at Gerwani Village, Raigarh Tehsil, Raigarh District, Chhattisgarh. Existing plant is located in **27.85 Ha. (i.e. 68.79 acres)** of land and same is in possession of management. Proposed expansion will be taken up in the existing plant premises only.

As per the Ministry of Environment, Forests & Climate Change, New Delhi notification, dated 14<sup>th</sup> September, 2006 and its subsequent amendments, all Primary metallurgical processing industries are classified 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 **8<sup>th</sup> April 2022**. Accordingly, Standard TOR has been issued for the proposed expansion of steel plant vide No. **J-11011/93/2022-IA-II (IND-I)** dated **08<sup>th</sup> April 2022**. Subsequently, Draft EIA report has been prepared incorporating the Terms of Reference & being submitted to 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/ SA 0148 (Rev.01), 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:

**Table No.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) Proposed expansion will be carried out in the existing plant premises only.
2.	Type of Land (Study Area)	As per LULC the land use within 10 Km. is as follows: Settlements – 4.9 %; Industrial Area – 7.8 %; , Tanks / River/ Major canal etc. – 6.9 %; Scrub Forest & Dense Forest area – 41.2 %; Single crop land – 23.4 %; Double Crop Land – 3.4 %; Land with scrub – 10.02 %; Land without scrub – 1.6 % ; Mining area – 0.6 %
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 10 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 – 9.0 Kms. Banjari Mata Temple – 4.75 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.	Defense Installations	Nil
7.	Nearest village	Nearest habitation is at Gerwani village at 0.6 Kms.
8.	No. of Villages in the Study Area	50
9.	Nearest Hospital	Nearest Hospital is at PHC near to the Gerwani 0.95 Kms.
10.	Nearest School	Nearest School is at Delari at 1.2 Kms.
11.	Forests	Taraimal RF (2.0 Kms. – N Direction), Barkachhar RF (4.0 Kms. – NE Direction), Rabo RF (6.8 Kms. –

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
		W Direction), Urdana RF (0.8 Kms. – SW Direction), Lakha PF (2.2 Kms. – SE Direction), Dungapani PF (4.0 Kms. – SE Direction), Kharidungri PF (4.6 Kms. – E Direction), Barila PF (5.5 Kms. – SE Direction), Junwani PF (7.8 Kms.), Chirwani PF (7.8 Kms. – SE Direction), Keradungri PF (5.5 Kms. – E Direction), Punjipathra PF (7.5 Kms. – N Direction), Pajhar PF (8.5 Kms. – N Direction) exists within the study area.
12.	Water body	Kelo river (2.0 Kms. – E Direction), Gerwani Nala (2.4 Kms. – N Direction), Dewanmunda Nallah (3.2 Kms. – NW Direction), Korpali nallah (3.5 Kms. – NW Direction), Jam Nallah (2.6 Kms. – N Direction), Banjari Nallah (5.2 Kms.), BardehJharna Nallah (7.6 Kms. – WNW Direction), Ratrot Nallah (7.1 Kms. – NE Direction), Karanara Nallah (6.5 Kms. – NE Direction) Kokritaral Pond (7.1 Kms. – SW Direction), Tipakhol Pond (6.5 Kms. – S Direction) exists within the study area.
13.	Nearest Highway	Raigarh – Ambikapur Highway (0.9 Kms.)
14.	Nearest Railway Station	Kirodimal Nagar Railway Station – 24.5 Kms. (by road)
15.	Nearest Port facility	Nil
16.	Nearest Airport	Jindal Air strip – 6.5 Kms. (Aerial)
17.	Nearest Interstate Boundary	Nil within 10 Km. radius
18.	Seismic zones as 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)	Existing Plant	Proposed Expansion	After Proposed Expansion
1.	Pellet Plant (Pellet)	---	1 x 0.8 MTPA	8,00,000 TPA
2.	Gasifier for Pellet Plant	---	30,000 NM <sup>3</sup> /Hr.	30,000 NM <sup>3</sup> /Hr.
3.	DRI Kilns (Sponge Iron)	2 x 100 TPD (60000 TPA)	2 x 600 TPD (3,96,000 TPA)	4,56,000 TPA
4.	Induction Furnaces with LRF	97,000 TPA	4 x 25 MT	4,27,000 TPA

S.No.	Units (Products)	Existing Plant	Proposed Expansion	After Proposed Expansion	
	& CCM (Hot Billets / MS Ingots / Ingots)		(3,30,000 TPA)		
5.	Rolling mill (TMT bars / Structural Steel) (85% Hot charging with Hot Billets and remaining 15% through RHF with LDO & Coal Gasifier as fuel)	---	1250 TPD (4,12,500 TPA)	4,12,500 TPA	
6.	Gasifier for Rolling Mill	---	3700 NM <sup>3</sup> /Hr.	3700 NM <sup>3</sup> /Hr.	
7.	Ferro Alloys Unit (FeSi / FeMn / SiMn / FeCr)	---	4 x 15 MVA (FeSi- 46,600 TPA / FeMn- 1,68,000 TPA / SiMn- 96,000 TPA / FeCr- 1,00,000 TPA)	4 x 15 MVA (FeSi- 46,600TPA/ FeMn-1,68,000 TPA/ SiMn- 96,000 TPA / FeCr- 1,00,000 TPA)	
8.	Coal Washery	3,90,000 TPA	---	3,90,000 TPA	
9.	Brick Manufacturing Unit	60,000 Brick / Day	67,000 Brick / Day	1,27,000 Brick / Day	
10.	Briquetting Plant	----	670 Kg/Hr.	670 Kg/Hr.	
11.	Power Plant	WHRB based	4.5 MW	30 MW (2 x 15 MW)	34.5 MW
		FBC based	10.5 MW & 65.0 MW	---	75.5 MW

### 1.3 RAW MATERIALS (FOR EXPANSION PROJECT)

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

**TABLE NO. 11.1.3: 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 Pellet Plant (Pellets) - 8,00,000 TPA</b>				
a)	Iron Ore Concentrate	8,80,000	Chhattisgarh / Orissa	~ 500 Kms.	By rail & road (through covered trucks)
b)	Bentonite	6,400	Gujarat	~ 600 Kms.	By rail & road (through covered trucks)
c)	Limestone	12,000	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
d)	Anthracite Coal	28,000	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By road (through covered trucks)
e)	LDO	20,411	IOCL Dept.	~ 100 Kms.	Through tankers

S.No.	Raw Material		Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
			KL/Annum	Chhattisgarh		
f)	Coal for Gasifier	Indian	90000 TPA	SECL Chhattisgarh / MCL Odisha	~ 500 Kms	By rail & road (through covered trucks)
		Imported	57600 TPA	Indonesia / South Africa / Australia	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered trucks)
2.	<b>For DRI Kilns (Sponge Iron) 3,96,000 TPA (2 x 600 TPD)</b>					
a)	Pellets		5,74,200	Own generation	---	Through covered conveyers
OR						
b)	Iron ore		6,33,600	Chhattisgarh / Orissa	~ 500 Kms.	By rail & road (through covered trucks)
c)	Coal	Indian (100%)	5,14,800	SECL Chhattisgarh / MCL Odisha	~ 500 Kms	By rail & road (through covered trucks)
		Imported (100%)	3,29,472	Indonesia / South Africa / Australia	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered trucks)
d)	Dolomite		19,800	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
3.	<b>For Steel Melting Shop (Hot Billets / MS Ingots / Billets) –3,30,000 TPA (4 x 25 T)</b>					
a)	Sponge Iron		3,33,000	Own generation	---	Through covered conveyers
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)
4.	<b>For Rolling Mill through Hot charging &amp; RHF (TMT bars / Structural Steel) – 4,12,500 TPA</b>					
a)	Hot Billets (Through Hot Charging)		3,64,650	Own generation (from Existing & Proposed units)	----	----
b)	Billets / Ingots		68,000	Chhattisgarh	~ 100 Kms.	By road

S.No.	Raw Material		Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
	(Through Reheating Furnace)					(through covered trucks)
c)	LDO / LSHS		2000 Kl/annum	Nearby IOCL Depot	~ 100 Kms.	By road (through Tankers)
d)	Coal for Gasifier	Indian	11,100	SECL Chhattisgarh / MCL Odisha	~ 500 Kms	By rail & road (through covered trucks)
		Imported	7100	Indonesia / South Africa / Australia	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered trucks)
5.	<b>For Ferro Alloys (4 x 15 MVA)</b>					
7 (i)	<i>For Ferro Silicon – 46,600 TPA</i>					
a)	Quartz		70,832	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
b)	LAM coke		26,096	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	Mill scales		10,951	Inhouse Generation	---	By road (through covered trucks)
d)	MS Scrap		1631	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
e)	Electrode paste		932	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
f)	Bagfilter dust		1,771	Own generation	---	---
7 (ii)	<i>For Ferro Manganese – 1,68,000 TPA</i>					
a)	Manganese Ore		3,82,200	MOIL / OMC	~ 500 Kms.	By Rail & Road (through covered trucks)
b)	LAM coke		61,320	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	Dolomite		28,560	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
d)	MS Scrap / Mill scales		25,200	Inhouse Generation	---	By road (through covered trucks)



S.No.	Raw Material	Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
e)	Electrode Paste	2,184	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
f)	Bagfilter dust	8,400	Own generation	---	---
7 (iii)	<i>For Silico Manganese – 96,000 TPA</i>				
a)	Manganese Ore	1,56,480	MOIL / OMC	~ 500 Kms.	By Rail & Road (through covered trucks)
b)	LAM Coke	36,000	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	FeMn. Slag	1,01,573	In house generation	---	----
d)	Dolomite	21,600	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
e)	Electrode paste	1,920	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
f)	Quartz	23,040	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
g)	Bagfilter dust	1,440	Own generation	---	---
7 (iv)	<i>For Ferro Chrome – 1,00,000 TPA</i>				
a)	Chrome Ore	2,00,000	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	33,000	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	Quartz	17,500	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
d)	MS Scrap / Mill Scale	15,000	Inhouse Generation	---	By road (through covered trucks)
e)	Magnetite / Bauxite	16,900	Chhattisgarh / Maharashtra	~ 500 Kms.	By road (through covered trucks)

S.No.	Raw Material	Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
f)	Electrode Paste	3,000	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
g)	Bagfilter dust	6,400	Own generation	---	---

## 1.4 MANUFACTURING PROCESS

### 1.4.1 Process of Pelletization

Iron ore fines will be grinded in Ball mills. The concentrate will be fed to thickener and subsequently to filtering unit. The filter cake will be sent to pellet plant comprising of Travelling grate kiln. Green pellets will be produced from this process. The flue gases from grate kiln will be treated in ESP and discharged through a stack.

### 1.4.2 Manufacturing of Sponge Iron (DRI)

The proposal consists of 2 x 600 TPD of DRI kilns to produce 3,96,000TPA 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<sup>0</sup>C enters the reduction zone. Temperature of the order of 1050<sup>0</sup>C will be maintained in the reduction zone, which is the appropriate temperature for solid state reduction of iron oxide to metallic iron.

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

### 1.4.3 Steel Melting Shop

It is proposed to install 4 x 25 T Induction Furnace along with LRF to produce Hot Billets / MS Billets / Ingots 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) MS Billets / MS Ingots will be sent to Re-heating Furnace to reheat the Billets and then sent to Rolling Mill to manufacture TMT bars / Structural Steels.

### 1.4.4 Manufacturing of Rolled products through Rolling Mill

The Hot Billets produced from Induction Furnaces will be directly sent to Rolling Mill to produce Rolled Products (OR) Hot Billets will be cooled and stored will be sent to reheating furnaces for the heating and will be sent to Rolling Mill. Furnace will be heated with LDO / Producer Gas. A Rolling mill will be installed in the proposed expansion to produce 4,12,500 TPA of TMT Bars / Structural Steels.

### 1.4.5 Manufacturing of Ferro Alloys through SEAF

Submerged Electric Arc Furnace (4 x 15 MVA) will be setup in the proposed expansion. 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. Pig Iron will be produced in SEAF using HG Iron Ore, Limestone

&Coke as Raw Materials. Flue gases will be extracted through 4<sup>th</sup> hole and then treated in bag filters.

### 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.

### 1.4.7 Fly Ash Brick Manufacturing Unit

It is proposed to establish Fly Ash brick making unit of 67,000 bricks/day capacity. Fly ash / Slag (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 1930 KLD and same being sourced from Gerwani Nallah.
- Water required for the proposed expansion project will be 2,400 KLD and same will be sourced from Gerwani 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 4,330 KLD.
- Water drawl permission has already been obtained from Water Resource Department, Chhattisgarh vide letter no. 7105/F4-76/31/S-2/Ind./07 Raipur dt. 30<sup>th</sup> November 2009 for drawl of 3.65 MCM per year.

**TABLE NO.1.4: Break Up of Water Consumption (Existing & Proposed)**

S.No.	Unit	Quantity in KLD		
		Existing Plant	Proposed Expansion	Total after Expansion
1.	Pellet Plant	--	280	280
2.	Coal Gasifier for Pellet plant	--	20	20

	&Rolling Mill			
3.	DRI Kilns	60	360	420
4.	Induction Furnaces	70	400	470
5.	Rolling Mill with RHF	--	500	500
6.	Ferro Alloy Plant	--	200	200
7.	Power Plant (WHRB & AFBC)	1600	600	2200
	Cooling Tower makeup	770	289	1059
	Boiler makeup	577	217	794
	DM plant regeneration	253	95	348
8.	Brick Manufacturing plant	10	10	20
9.	Coal Washery	180	--	180
10.	Briquetting Plant	---	10	10
11.	Domestic	10	20	20
	<b>Total water requirement</b>	<b>1930</b>	<b>2400</b>	<b>4330</b>

### 1.6 Waste Water Generation

#### Existing

- There is no wastewater generated from DRI Units, as closed-circuit cooling system is adopted.
- Wastewater generated from Induction Furnaces & Power Plant being treated in ETP and after ensuring compliance with SPCB norms, it 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 DRI Kilns as closed-circuit cooling system will be adopted.
- Wastewater from Pellet Plant, Induction Furnace, Ferro Alloys unit will be treated in ETP and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for green development.
- Wastewater from Rolling Mill will be treated in oil separator followed by settling tank and will be recycled through closed circuit cooling system.
- 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.
- Wastewater from Gasifier will be used in ABC chamber of DRI Kilns.

- WTP rejects will be used for dust suppression & ash conditioning.
- Sanitary waste water will be treated in STP.
- Garland drains will be provided around all the raw material stacking areas
- During monsoon the treated effluent will be utilized as makeup water in Rolling Mill. Accordingly, the makeup water for Rolling mill also reduces during the rainy period.
- Zero Liquid Discharge (ZLD) will be maintained in the proposed project.

**TABLE NO.11.1.5: BREAKUP OF WASTE WATER GENERATION**

S.No.	Sources	Quantity in KLD		
		Existing Plant	Proposed Expansion	Total after Expansion
1.	Pellet Plant	---	14	14
2.	Coal Gasifier for Pellet plant & Rolling Mill	---	16	16
3.	DRI Kilns	---	---	---
4.	Induction Furnaces	7	40	47
5.	Rolling Mill with RHF	---	25	25
6.	Ferro Alloy Plant	---	14	14
7.	Power Plant (WHRB & AFBC)	607	228	835
	Cooling Tower blowdown	192	72	264
	Boiler blowdown	162	61	223
	DM plant regeneration	253	95	348
8.	Brick Manufacturing plant	--	--	--
9.	Coal Washery	--	--	--
10.	Briquetting Plant	--	--	--
11.	Sanitary wastewater	8	16	24
	<b>Total</b>	<b>622</b>	<b>353</b>	<b>975</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.

### 11.2.1 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 1<sup>st</sup> March 2022 to 31<sup>st</sup> May 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 (in µg/m <sup>3</sup> )	Standard as per NAAQS (in µg/m <sup>3</sup> )
1.	PM <sub>2.5</sub>	21.9 to 45.3 µg/m <sup>3</sup>	60
2.	PM <sub>10</sub>	38.6 to 75.6 µg/m <sup>3</sup>	100
3.	SO <sub>2</sub>	6.9 to 18.2 µg/m <sup>3</sup>	80
4.	NO <sub>x</sub>	7.1 to 25.4 µg/m <sup>3</sup>	80
5.	CO	345 to 1025 µg/m <sup>3</sup>	2000

### 11.2.2 Water Quality

#### 11.2.2.1 Surface Water Quality

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 **48.3 dBA to 67.9 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<sub>10</sub>, SO<sub>2</sub>, NO<sub>x</sub> & 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<sub>10</sub> concentrations (24 hourly) due to the proposed project will be 0.57 µg/m<sup>3</sup> at a distance of 1600 m from the stack in the down wind direction over the baseline concentrations.

The predicted incremental rise in Particulate Matter concentration due to the Vehicular emission will be 0.72 µg/m<sup>3</sup>.

Hence the total predicted incremental rise in Particulate Matter concentration due to the emission from proposed project and due the vehicular emissions will be 0.57 µg/m<sup>3</sup> + 0.72 µg/m<sup>3</sup> = 1.29 µg/m<sup>3</sup>.

The predicted max incremental SO<sub>2</sub> concentrations (24 hourly) due to the emissions from operation of proposed project will be 5.06 µg/m<sup>3</sup> at a distance of 1200 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 proposed project will be 3.66 µg/m<sup>3</sup> at a distance of 1600 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 5.38 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 3.66 µg/m<sup>3</sup> + 5.38 µg/m<sup>3</sup> = 9.04 µg/m<sup>3</sup>

The predicted incremental rise in CO concentration due to the Vehicular emissions will be 3.36 µg/m<sup>3</sup>.



**TABLE NO.3.1: NET RESULTANT MAXIMUM CONCENTRATIONS DUE TO PROPOSED EXPANSION**

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 <b>SSPL</b>	0.57	5.06	3.66	---
Maximum predicted incremental rise in concentration due to <b>Vehicular Emissions from the proposed expansion project</b>	0.72	---	5.38	3.36
<b>Net resultant concentrations during operation of the plant</b>	76.89	23.26	34.44	1,028.36
<b>National Ambient Air Quality Standards</b>	<b>100</b>	<b>80</b>	<b>80</b>	<b>2000</b>
<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.</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. **9.30 Ha.** of extensive greenbelt will be developed (inclusive of existing) to further attenuate the noise levels. Hence there will not be any adverse impact due to noise on population in surrounding areas due to the proposed expansion project.

### 3.3 Prediction of impacts on Water Environment

- There will be no wastewater discharge in DRI Kilns as closed-circuit cooling system will be adopted.
- Wastewater from Pellet Plant, Induction Furnace, Ferro Alloys unit will be treated in ETP and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for green development.

- Wastewater from Rolling Mill will be treated in oil separator followed by settling tank and will be recycled through closed circuit cooling system.
- Air Cooled condensers will be provided in the power plant, which will reduce the water consumption significantly. Hence wastewater generation will also be minimized.
- Wastewater from Gasifier will be used in ABC chamber of DRI Kilns.
- WTP rejects will be used for dust suppression & ash conditioning.
- Sanitary waste water will be treated in STP.
- Garland drains will be provided around all the raw material stacking areas
- During monsoon the treated effluent will be utilized as makeup water in Rolling Mill. Accordingly, the makeup water for Rolling mill also reduces during the rainy period.
- Zero Liquid Discharge (ZLD) will be maintained in the proposed project.

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. 9.30 Ha. of extensive greenbelt will be developed (inclusive of existing) as per guidelines. Hence, there will not be any adverse impact on land environment due to the proposed expansion project.

### 3.5 Socio - Economic Environment

There will be further upliftment in Socio Economic status of the people in the area. Hence, there will be further development of the area due to the proposed expansion project.

Due to this the economic conditions, the educational and medical standards of the people living in the study area will certainly move upwards which will result in overall economic development, improvement in general aesthetic environment and increase in business opportunities.

### 4.0 ENVIRONMENTAL MONITORING PROGRAMME

Post project monitoring will be conducted as per the guidelines of SPCB and MoEF&CC are tabulated below:

**Table no. 11.4.1: MONITORING SCHEDULE FOR ENVIRONMENTAL PARAMETERS**

S.No.	Particulars	Frequency of Monitoring	Duration of sampling	Parameters required to be monitored
<b>1. Water &amp; Waste water quality</b>				
A.	Water quality in the area	Once in a month except for heavy metals which will be monitored on quarterly basis.	Grab Sampling	As per IS: 10500
B.	Effluent at the outlet of the ETP	Twice in a month	Composite Sampling	As per EPA Rules, 1996
C.	STP Inlet & Outlet	Twice in a month	Composite Sampling	As per EPA Rules 1996
<b>2. Air Quality</b>				
A.	Stack Monitoring	Online monitors (all stacks) Once in a month	---	PM, SO <sub>2</sub> , NO <sub>x</sub> , CO PM, SO <sub>2</sub> , NO <sub>x</sub> , CO
B.	Ambient Air quality	Continuous  Quarterly Once	Continuous  24 hours	PM <sub>10</sub> , SO <sub>2</sub> & NO <sub>x</sub> PM <sub>2.5</sub> , PM <sub>10</sub> , SO <sub>2</sub> , NO <sub>x</sub> & CO
C.	Fugitive emissions	Quarterly Once	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	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 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 project:

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

S.No.	Source	Control Equipment	Emission at the outlet
1.	Pellet Plant	Electro Static Precipitator (ESP) (High Performance rigid electrodes)	PM <30 mg/Nm <sup>3</sup>
2.	DRI kilns with WHRB's	Electro Static Precipitator (ESP) (High Performance rigid electrodes)	PM <30 mg/Nm <sup>3</sup>
3.	Induction Furnaces	Fume Extraction system with PTFE membrane 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.	Submerged Electric Arc Furnaces	4 <sup>th</sup> Hole Fume Extraction system with PTFE membrane bag filters	PM < 30 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 in DRI Kilns as closed-circuit cooling system will be adopted.
- Wastewater from Pellet Plant, Induction Furnace, Ferro Alloys unit will be treated in ETP and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for green development.

- Wastewater from Rolling Mill will be treated in oil separator followed by settling tank and will be recycled through closed circuit cooling system.
- Air Cooled condensers will be provided in the power plant, which will reduce the water consumption significantly. Hence wastewater generation will also be minimized.
- Wastewater from Gasifier will be used in ABC chamber of DRI Kilns.
- WTP rejects will be used for dust suppression & ash conditioning.
- Sanitary waste water will be treated in STP.
- Garland drains will be provided around all the raw material stacking areas
- During monsoon the treated effluent will be utilized as makeup water in Rolling Mill. Accordingly, the makeup water for Rolling mill also reduces during the rainy period.
- Zero Liquid Discharge (ZLD) will be maintained in the proposed project.

Hence there will not be any adverse impact on environment due to the proposed project.

### 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

Treated wastewater quantity to be used for dust suppression in CHP	: 350 m <sup>3</sup> /day
Treated wastewater quantity to be used for ash conditioning	: 192 m <sup>3</sup> /day
Treated wastewater quantity to be used in ABC of DRI Kiln	: 16 m <sup>3</sup> /day
RO rejects from RO plant will be used for Floor washing, Toilet Cleaning & Flushing	: 189 m <sup>3</sup> /day
Treated wastewater to be used for Greenbelt development	: 230 m <sup>3</sup> /day

**9.30 Ha.** of greenbelt (inclusive of existing) will be maintained 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 wastewater generated from the proposed project will be treated in the Effluent Treatment Plant to comply with the SPCB standards and will be used for dust suppression, ash conditioning and for greenbelt development. All the required Air emission control systems will be installed and operated to comply with SPCB norms. Solid wastes will be disposed off as per norms. Extensive greenbelt will be developed in the plant premises. Desirable beautification and landscaping practices will be followed. Hence there will not be any impact due to the proposed expansion project.

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

S.No	Waste / By Product	Quantity (TPA)			Method of disposal
		Existing	Proposed	After expansion	
1.	Pellet Plant (ESP & Bagfilter dust from dedusting system )	--	24,000	24,000	Will be utilised in proposed Brick manufacturing units.
2.	Ash from DRI	10,800	71,280	82,080	Is being given to near by brick manufacturing units and now it will be utilized in the proposed brick manufacturing unit.
3.	Dolochar	12,000	79,200	91,200	Is being utilized in the existing FBC boiler based power plant. The same practice will be continued after expansion also.
4.	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.
5.	Wet Scraper Sludge	2,400	15,840	18,240	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.	SMS Slag	9,700	33,000	42,700	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.
7.	Mill Scales	---	1,238	1,238	Will be captive used in proposed Ferro Alloys plant.
8.	End cuttings	---	12,375	12,375	Will be reused in SMS.
9.	Washery Rejects	97,500	---	97,500	Is being utilized in existing Power plant
10.	Ash from Power Plant	2,11,950	---	2,11,950	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	---	1,01,573	1,01,573	Will be reused in manufacture of SiMn as it contains high SiO <sub>2</sub> and Silicon.
12.	Slag from FeSi	---	11,221	11,221	Will be given to Cast iron foundries
13.	Slag from SiMn	---	85,513	85,513	will be used for Road construction / will be given to slag cement manufacturing
14.	Slag from FeCr	---	58,079	58,079	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.

### 7.5 Greenbelt Development

The plantation and green belt development will also be taken care in the plant and the space reserved for plantation will be more than 33% of the total plant area i.e. 9.30 Ha. which is inclusive of existing greenbelt. Salasar Steel & Power Ltd. will take-up extensive green belt development by planting about 2500 trees per Ha. it has been proposed to develop 15-20 meters wide green belt along the periphery inside the factory premises.

#### **Details of tree translocation & compensatory afforestation**

Plantation exists in the vacant land, where some units of expansion are proposed now. Tree enumeration plan is carried out and it is proposed to translocate few trees accordingly. As a compensatory measures, it is proposed to plant to develop 1 : 5 plantation in the entire premises.

Total number of trees existing in the project site is 425 nos. Entire existing plantation along the periphery will be retained as it is.

Plantation in South West direction (leaving peripheral plantation) will be translocated to peripheral plantation in NE direction

Total Trees to be Retained : 325

Total Trees to be Translocated : 100

Compensatory afforestation @ 1:5 : 500 nos.

- Local DFO will be consulted in developing the green belt.
- 9.30 Ha. 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 10,750 nos. of saplings will be planted as part of expansion.
- 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.
- Greenbelt will be developed as per CPCB guidelines.
- 2500 plants will be planted per hectare as per CPCB norms.



### 7.6 Cost for Environment Protection

Budget allocated for Environment Management Plan : Rs. 37.16 Crores

Recurring Cost per annum for Environmental protection : Rs. 3.17 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 WHR 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.