

# **SUMMARY ON ENVIRONMENTAL IMPACT ASSESSMENT REPORT**

**OF**

## **Maa Kali Alloys Udyog Private Limited**

[Expansion of Steel Plant – DRI Kilns (Sponge Iron from 60,000 TPA to 4,06,500 TPA), WHRB based Power Plant from 4 MW to 34 MW, FBC based Power Plant from 4 MW to 24 MW, Induction Furnaces along with CCM & LRF (Hot Billets / MS Billets / Ingots from 56,000 TPA to 3,72,800 TPA), New Rolling Mill (Rolled Product) – 3,96,000 TPA, Coal Gasifier for Reheating Furnace – 3,500 NM<sup>3</sup>/Hr., New Ferro Alloys Unit (2 x 9 MVA) to produce FeSi - 14,000 TPA / FeMn – 40,000 TPA / SiMn -28,000 TPA / FeCr - 30,000 TPA / Pig Iron - 48,000 TPA, Brick Manufacturing unit - 10,000 Bricks /day to 50,000 Bricks/ day, New Briquetting unit 200 Kg/ Hr, Dry Coal washery Unit - 3,30,300 TPA, Slag Crushing Unit - 40,000 TPA]

**Category – A Project**

**Schedule - 3(a) Metallurgical Industries (ferrous and non-ferrous), 2(a) Coal washeries and 1(d)**

**Thermal Power Plants**

at

**Villages: Pali & Delari, Tehsil & District: Raigarh, Chhattisgarh**

Submitted to

**CHHATTISGARH ENVIRONMENT CONSERVATION BOARD**



## 1.0 PROJECT DESCRIPTION

Maa Kali Alloys Udyog Pvt. Ltd. is an existing plant located at Pali Village, Raigarh Tehsil & District, Chhattisgarh.

### Chronology of permission obtained & Implementation Status:

- Consent to Establishment (CTE) has been obtained from Chhattisgarh Environment Conservation Board (CECB) vide No.3657/TS/CECB/2005 Raipur, dt. 04.08.2005 for Sponge Iron Plant (2 x 100 TPD DRI Kilns) capacity of – 60,000 TPA, WHRB Power Plant -4.0 MW, FBC Power Plant - 4.0 MW & Induction Furnace – 56,000 TPA. (Prior Environment Clearance was not applicable to the project which were having project cost less than Rs. 100 Crores as per EIA notification 1994 and Project cost of above consented project was Rs. 64 Crores).
- Consent to Operate obtained from CECB Vide No. 8711/TS/CECB/2022 Raipur, dt 28/02/2022 and same is valid upto 28/02/2025 for Sponge Iron Plant (2x 100 TPD DRI Kilns) capacity of – 60,000 MTPA, WHRB Power Plant - 4.0 MW, FBC Power Plant - 4.0 MW, Induction Furnace – 56,000 MTPA, Bricks manufacturing Unit Capacity - 10,000 Bricks /day.

### Proposed Project

Now company proposed to enhance the existing steel plant along with new facilities i.e. Expansion of Steel Plant–DRI Kilns (Sponge Iron from 60,000 TPA to 4,06,500 TPA), WHRB based Power Plant from 4 MW to 34 MW, FBC based Power Plant from 4 MW to 24 MW, Induction Furnaces along with CCM & LRF (Hot Billets / MS Billets / Ingots from 56,000 TPA to 3,72,800 TPA), New Rolling Mill (Rolled Product) – 3,96,000 TPA, Coal Gasifier for Reheating Furnace – 3,500 NM<sup>3</sup>/Hr., New Ferro Alloys Unit (2 x 9 MVA) to produce FeSi - 14,000 TPA / FeMn – 40,000 TPA / SiMn -28,000 TPA / FeCr - 30,000 TPA / Pig Iron - 48,000 TPA, Brick Manufacturing unit - 10,000 Bricks /day to 50,000 Bricks/ day, New Briquetting unit 200 Kg/ Hr, Dry Coal washery Unit - 3,30,300 TPA, Slag Crushing Unit - 40,000 TPA.

Existing plant is located over an extent of **14.220 Ha.** of land and same is in possession management. Proposed expansion will be taken up in the existing plant premises & partly in additional land of **48.427 Ha.** which is adjacent to the existing plant. Total land after proposed expansion project will be **62.647 Ha.** Total land of 62.647 Ha. is diverted for Industrial Purpose.



The estimated project cost for the proposed project is **Rs. 480 Crores**.

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 (Part A, B), proposed TOR along with Pre-Feasibility Report were submitted to the Honourable Ministry of Environment, Forests & Climate Change (MoEF&CC), New Delhi vide proposal No. IA/CG/IND1/448966/2023 dated on 24<sup>th</sup> November 2023.

Presentation was made before the 56<sup>th</sup> meeting of the Expert Appraisal Committee (Industry - 1) held on 15<sup>th</sup> March 2024 for the approval of TOR (Terms of Reference) for EIA study. Subsequently TOR letter was issued vide letter No. J-11011 / 382 / 2023– IA II (IND-I), dated 22<sup>nd</sup> April 2024. Draft EIA report is 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/ 2225/ RA 0282, 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 Kms. 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 land is Industrial land and Proposed land is also converted for Industrial purpose.
2.	Type of Land (Study Area)	As per LULC the land use within 10 Km. is as follows: Settlements – 4.3%; Industrial Area- 8.2%; Water Bodies / Tank / River etc.– 9.5%; Scrub Forest area –38.1 %; Single crop land –23.3 %; Land with scrub – 11.3%; Land without scrub –3.2%, Ash Pond / Yash storage yard – 1.7% & Mining Area – 0.4%.
3.	National Park/ Wild life sanctuary / Biosphere reserve / Tiger Reserve / Elephant Corridor / migratory routes for Birds	There are no notified National Park/ Wild life sanctuary / Biosphere reserve / Tiger Reserve/ migratory routes for Birds with in 10 Km. radius of the plant. However, 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 – 9.3 Kms Banjari Mata Temple – 4.00 Kms.
5.	Critically polluted area as per MoEF&CC Office Memorandum dated 13 <sup>th</sup> January 2010	None 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 Pali Village at 0.17 Kms. (SE Direction)
8.	No. of Villages in the Study Area	60 nos.
9.	Nearest Hospital	PHC is near to the Gerwani (2.6 Kms. - E Direction)
10.	Nearest School	Govt. Primary School, Pali (0.25 Kms. – SE Direction)
11.	Forests	<b>Reserved Forests: -</b> Urdana RF – 0.60 Kms., Taraimal RF – 1.7 Kms., Barkachhar RF – 5.7 Kms., Rabo RF – 4.1 Kms. <b>Protected Forests: -</b> Unnamed PF – Adjacent the site, Keradungri PF – 6.2 Kms., Lakha PF – 3.0 Kms., Punjipathra PF – 8.0 Kms., Pajhar PF – 8.5 Kms., Junwani PF -8.4 Kms., Chhirwani PF – 7.0 Kms., Dungapani PF – 5.8 Kms., Barlia PF – 7.9 Kms. etc. are exists within the study area.



S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
		Letter is issued by District Forest Officer (DFO), Raigarh vide letter no. Tech. Off./923/2024 Raigarh dt. 16.02.2024 confirming that Project site is adjacent to the Forest land and Project site does not comes under any forest land.
12.	Water body	Delaripali Nallah (Kharkhari Nallah) (0.2 Kms. – South Direction), Gerwani Nallah (1.6 Kms. – North direction), Kelo River (3.0 Kms. – East direction), Dewanmunda Nallah (3.9 Kms. – NNW direction), Barade Nallah (6.1 Kms. – NW direction), Kokritarai pond (6.5 Kms. – SW direction) are flowing within the study area.
13.	Nearest Highway	Raigarh – Ambikapur State Highway – 2.6 Kms.
14.	Nearest Railway Station	Raigarh RS – 17.4 Kms. – By Road
15.	Nearest Port facility	Nil within 10 Km. Radius.
16.	Nearest Airport	O.P Jindal Airport– 6.3 ms. (by Aerial)
17.	Nearest Interstate Boundary	Nil within 10 Km. Radius. (Chhattisgarh – Odisha Interstate border – 19.0 Kms.)
18.	Seismic zone as per IS-1893	Seismic zone – II
19.	R & R	There is no rehabilitation and resettlement issue, as there are no habitations in the additional land adjoining to the existing plant. The expansion will be taken up partly in the existing plant & partly in adjoining land.
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	<ul style="list-style-type: none"> <li>• A notice was issued by Chhattisgarh Environment Conservation Board (CECB) vide letter no. 1778/RO/Env. No./2023 Raigarh dt. 10.10.2023 regarding Environmental Compensation Fee of Rs.9,80,000/- pertaining to disposal of fly ash.</li> <li>• Accordingly, we have paid fees vide our letter no. MKAUPL/RO/CECB/Raigarh/172/2023-24 dt. 29.11.2023. Subsequently the Show Cause Notice was closed.</li> </ul>

## 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 (Product)	Existing plant in operation	Proposed expansion proposal	After Proposed expansion proposal
1.	DRI Kilns (Sponge Iron)	60,000 TPA (2 x 100 TPD)	3,46,500 TPA (3 x 350 TPD)	4,06,500 TPA



S.No.	Units (Product)		Existing plant in operation	Proposed expansion proposal	After Proposed expansion proposal
2.	Induction Furnace (Hot Billets / MS Billets / Ingots)		56,000 TPA (2 x 10 MT)	3,16,800 TPA (8 x 12 MT)	3,72,800 TPA
3.	Rolling Mills (Rolled products) (85 % Hot charging with Hot Billets and remaining 15% through RHF with LDO / Producer Gas as fuel)		---	3,96,000 TPA (2 x 600 TPD)	3,96,000 TPA
4.	Coal Gasifier for Reheating Furnace		---	3,500 NM <sup>3</sup> /Hr.	3,500 NM <sup>3</sup> /Hr.
5.	Ferro Alloys (FeMn / SiMn / FeCr / FeSi / Pig Iron)		---	FeMn - 40,000 TPA / SiMn - 28,000 TPA / FeCr - 30,000 TPA / FeSi - 14,000 TPA / Pig Iron - 48,000 TPA (2 x 9 MVA)	FeMn - 40,000 TPA / SiMn - 28,000 TPA / FeCr - 30,000 TPA / FeSi - 14,000 TPA / Pig Iron - 48,000 TPA (2 x 9 MVA)
6.	Power Plant (58 MW)	WHRB	4 MW (2 x 2 MW)	30 MW (3 x 10 MW)	34 MW
		FBC	4 MW (1 x 4 MW)	20 MW (1 x 20 MW)	24 MW
7.	Dry Coal Washery		--	3,30,000 TPA	3,30,000 TPA
8.	Brick manufacturing unit (Bricks)		10,000 Bricks/day	40,000 Bricks/day	50,000 Bricks/day
9.	Briquetting plant		---	200 Kg/Hr.	200 Kg/Hr.
10.	Slag Crushing Unit		---	130 Kg/Hr.	130 Kg/Hr.

### 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 3 x 350 TPD DRI Kilns (Sponge Iron) – 3,46,500 TPA</b>				
a)	Pellets (100 %)	5,02,425	Odisha & Chhattisgarh	~ 500 Kms.	By rail & road (through covered trucks)
	or				



S.No.	Raw Material		Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
	Iron ore (100%)		5,54,400	Odisha, Chhattisgarh & Jharkhand	~ 600 Kms.	By rail & road (through covered trucks)
b)	Coal	Indian	4,50,450	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)
(or)						
		Imported	2,88,288	Indonesia / South Africa / Australia	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered trucks)
c)	Dolomite		17,325	Maharashtra	~ 100 Kms.	By road (through covered trucks)
<b>2.</b>	<b>For 8 x 12 T Steel Melting Shop (Hot Billets /MS Billets/ Ingots) – 3,16,800 TPA</b>					
a)	Sponge Iron		3,20,000	Inhouse Generation	---	Through covered conveyers
b)	MS Scrap / Pig Iron		48,000	Odisha, Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
c)	Ferro alloys		16,000	Inhouse Generation	---	By road (through covered trucks)
<b>3.</b>	<b>For Rolling Mill through Hot charging (Rolled Products) – 3,96,000 TPA</b>					
a)	Hot Billets		4,15,404	Inhouse Generation &	---	---
	Billets/Ingots		55,920	Purchased from outside (Chhattisgarh)	~ 100 Kms.	By road (through covered trucks)
b)	LDO / LSHS		1924 KL/annum	Nearby IOCL Depot	~ 100 Kms.	By road (through Tankers)
c)	Coal for gasifier (producer Gas) 3600 Nm <sup>3</sup> /Hr	Indian	10,692	SECL, Chhattisgarh /MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)
		Imported	6,843	Indonesia / South Africa / Australia	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road
<b>4.</b>	<b>For FBC Boiler [Power Generation 20 MW]</b>					
a)	Indian Coal (100 %)		1,18,800	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)



S.No.	Raw Material		Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
b)	Imported Coal (100 %)		76,000	Indonesia / South Africa / Australia	~ 600 Kms. (from Vizag Port)	Through sea route, rail route & by road (through covered trucks)
c)	Dolochar + Indian Coal	Dolochar	81,300	Inhouse Generation	---	through covered conveyors
		Indian Coal	78,150	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)
<b>OR</b>						
d)	Dolochar + Imported Coal	Dolochar	81,300	Inhouse Generation	---	through covered conveyors
		Imported Coal	50,000	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)</b>					
5 (i)	<i>For Ferro Silicon – 14,000 TPA</i>					
a)	Quartz		30,800	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
b)	Mill Scale & MS Scrap		6,300	Inhouse Generation & Chhattisgarh	--- ~ 100 Kms.	--- By road (through covered trucks)
c)	Coke		21,700	Gujarat / Bihar	~ 500 Kms.	By road (through covered trucks)
d)	Electrode paste		1,400	West Bengal	~ 300 Kms.	By road (through covered trucks)
e)	Briquetted Bag filter dust		980	Inhouse Generation	---	---
5 (ii)	<i>For Ferro Manganese – 40,000 TPA</i>					
a)	Manganese Ore		96,000	MOIL / OMC	~ 500 Kms.	By road (through covered trucks)
				Imported	~ 600 Kms. (from Vizag Port)	From Port By Road (through covered Trucks)



S.No.	Raw Material	Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
b)	Coke	12,000	Gujarat / Bihar	~ 500 Kms.	By road (through covered trucks)
c)	Mill Scale & MS Scrap	8,000	Inhouse Generation Chhattisgarh	--- ~ 100 Kms.	--- By road (through covered trucks)
d)	Electrode paste	880	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
5 (iii)	<i>For Silico Manganese – 28,000 TPA</i>				
a)	Manganese Ore	56,000	MOIL / OMC Imported	~ 500 Kms. ~ 600 Kms. (from Vizag Port)	By road (through covered trucks) From Port By Road (through covered Trucks)
b)	FeMn Slag	12,600	In house generation	---	----
c)	Coke	8,400	Gujarat / Bihar	~ 500 Kms.	By road (through covered trucks)
d)	Dolomite	8,400	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
e)	Electrode paste	560	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
f)	Quartz	9,800	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
g)	Briquetted Bag filter dust	420	In house generation	---	---
5 (iv)	<i>For Ferro Chrome – 30,000 TPA</i>				
a)	Chrome Ore	72,000	Odisha Imported	~ 500 Kms. ~ 600 Kms.	By road (through covered trucks) From Port By Road



S.No.	Raw Material	Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
				(from Vizag Port)	(through covered Trucks)
b)	LAM Coke	15,000	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	Quartz	1,830	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
d)	MS Scrap / Mill Scale	4,500	Inhouse Generation	---	By road (through covered trucks)
e)	Bauxite	4,500	Chhattisgarh / Maharashtra	~ 500 Kms.	By road (through covered trucks)
f)	Electrode Paste	600	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
g)	Briquetted Bag filter dust	600	Own generation	---	---
5 (v)	<b>For Pig Iron – 48,000 TPA</b>				
a)	Iron Ore	52,560	Odisha, Chhattisgarh, Jharkhand & Imported	~ 500 Kms.	By rail & road (through covered trucks)
b)	Mill Scale	31,200	Inhouse Generation	---	By road (through covered trucks)
c)	Coke	30,144	Gujarat / Bihar	~ 500 Kms.	By road (through covered trucks)
d)	Lime Stone	7,200	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
e)	Fluorspar	1,200	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
f)	Dolomite	7,200	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
6.	<b>Dry Coal washery-3,30,300 TPA</b>				
a)	ROM Coal	3,30,000	SECL Chhattisgarh / MCL Odisha	~ 500 Kms.	By rail & road (through covered trucks)



## **1.4 MANUFACTURING PROCESS**

### **1.4.1 Sponge Iron (DRI)**

The Direct Reduced Iron (DRI) plant will comprise of 3 x 350 TPD kilns and related accessories including Waste Heat Recovery power generating unit. Refractory lined rotary kilns will be used for reduction of iron ore in solid state.

A central Burner located at the discharge end will be used for initial heating of the kiln.

Iron ore will be continuously fed into the kiln along with coal which has dual role of fuel as well as reductant. Dolomite will be added to scavenge the sulphur from the coal. A number of air tubes will be provided along the length of the kiln. The desired temperature profile will be maintained by controlling the volume of the combustion air through these tubes. The Carbon monoxide generated due to the combustion of coal, reduces the iron ore and converts it into sponge iron. The rotary kiln is primarily divided into two zones viz. the pre heating zone and the reduction zone. The preheating zone extends over 30 to 50 % of the length of the kiln and in this the moisture in the charge will be driven off and the volatile matter in the coal will be burnt with the combustion air supplied through the air tubes. Heat from the combustion raises the temperature of the lining and the bed surface. As the kiln rotates, the lining transfers the heat to the charge. Charge material, pre-heated to about 1000°C enters the reduction zone. Temperature of the order of 1050°C will be maintained in the reduction zone, which is the appropriate temperature for solid state reduction of iron oxide to metallic iron. This hot material will be transferred to Heat exchanger. In Heat exchanger the material will be cooled to 160°C. The cooler discharge material consists of sponge iron lumps, sponge iron fines and char. Magnetic and non-magnetic material will be separated through magnetic separators and stored in separate bins. The hot flue gases will be taken to a Waste Heat Recovery Boilers and after heat recovery they will be treated in high efficiency ESP and discharged into the atmosphere through stack whose height will be in accordance with CPCB norms.

### **1.4.2 Steel Melting Shop**

It is proposed to install 8 x 12 T Induction Furnaces. Hot Billets / MS Billets / Ingots of 3,16,800 TPA will be produced in Continuous Casting Machine.

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.

#### **1.4.3 Rolled products**

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 Coal Gasifier / LDO. A Rolling mill will be installed in the proposed expansion to produce 3,96,000 TPA of Rolled products.

#### **1.4.4 Power Generation**

##### Through WHRB Boiler

The hot flue gases from proposed 3 x 350 TPD DRI kilns will pass through waste heat recovery Boiler to recover the heat and to generate (3 x 10 MW) electricity, in addition to the existing 4 MW WHRB. 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 FBC Boiler

Coal (Imported / Indian) along with dolochar will be used as fuel in FBC Boiler to generate 20.0 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.

#### **1.4.5 Submerged Electric Arc Furnaces**

Submerged Electric Arc Furnace of 2 x 9 MVA will be setup in the proposed plant. Ferro manganese, silicon-manganese will be produced using manganese ore as main raw material, Ferro silicon will be produced using Quartz as main raw material as main raw material in submerged arc furnaces using reducer (Coke) under high voltage. Pig Iron will be also produced from SEAF using iron ore, dolomite as raw material. Flue gases will be extracted through 4<sup>th</sup> hole and then treated in bag filters.



#### 1.4.6 Coal Washery (Dry Air Jig Process)

Run-Of-Mine Coal transported by Tipping Trucks shall be received at the Coal Washery premises and dumped in the areas adjacent to the Ground Hopper from where the same shall be fed to the Ground Hopper by dozing.

Basic Principle of Dry Air Jig Process:

This Process stratifies the feed material by specific gravity and subsequently measures and discharges the high density (and high ash) strata. To stratify the material, Dry Air Jig process uses pulsating and constant air flow through a perforated jig bed. Vibrating mechanisms assist the transport of material across the bed. The feed gate provides an even feed distribution over the width of the bed, and the discharge gate provides an even removal of the heavy particles from the jig, thereby maintaining a residual layer of refuse below the light particles (coal).

#### 1.5 Water Requirement

- Water required for existing plant is 228 KLD and same being sourced from Ground water resource.
- NOC from CGWA is obtained for 350 KLD vide NOC No. CGWA/NOC/IND/REN/2/2023 /8048 dt. 27.07.2023 and same is valid till 09.10.2026.
- Water required for the proposed expansion project will be 1544 KLD and same will be sourced from Delaripali Nallah (Kharkhari Nallah), flowing at a distance of 0.20 Kms. from the project site.
- Total water requirement after the proposed expansion will be 1772 KLD.
- Application has been submitted to Water Resource Department, Govt. of Chhattisgarh and application is in the process.

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

S.No.	Unit	Quantity in KLD		
		Existing Plant	Proposed Expansion	Total after Proposed Expansion
1.	DRI Kilns	55	305	360
2.	Induction Furnace	30	165	195
3.	Rolling Mill	0	170	170
4.	Gasifier	0	10	10
5.	Ferro alloys unit	0	50	50



6.	Power Plant (WHRB & FBC)	128	795	923
	a) Cooling Towerblowdown	62	383	445
	b) Boilers blowdown	46	288	334
	c) D.M. plant regeneration water	20	124	144
7.	Briquetting Unit	0	5	5
8.	Brick Manufacturing plant	5	10	15
9.	Slag Crushing Unit	0	4	4
10.	Domestic	10	30	40
	<b>Total</b>	<b>228</b>	<b>1544</b>	<b>1772</b>

## 1.6 Waste Water Generation

### Existing

- There was no effluent discharge from the existing DRI Unit as Closed-circuit cooling system adopted.
- The wastewater generated from SMS Unit & Power plant is being treated in ETP and is being utilized for Dust suppression in CHP, for Ash Conditioning, for Greenbelt development.
- Sanitary wastewater is being treated in septic tank followed by soak pit.
- Zero liquid effluent is being maintained in the existing plant.

### Proposed

- There will be no wastewater discharge from the DRI Unit, as closed-circuit cooling system will be adopted.
- Effluent from Coal gasifier (phenolic effluent) will be used in ABC chamber for quenching in DRI Units.
- Effluent from Rolling mills will be sent to oil separator followed settling tank and will be recycled through closed circuit cooling system.
- Effluent from Induction Furnace, Ferro Alloys & Power Plant will be treated in ETP and after ensuring compliance with SPCB norms, the treated effluent 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.
- RO rejects will be utilised for flushing in toilets, toilet cleaning, floor washing, etc.



- 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. 1.5: BREAKUP OF WASTE WATER GENERATION**

S.No.	Source	Generation (KLD)		
		Existing Plant	Proposed Expansion	Total after Proposed Expansion
1.	DRI Kilns	---	---	---
2.	Induction Furnaces	3	16	19
3.	Rolling Mill	---	8	8
4.	Coal Gasifier For RHF	---	8	8
5.	Ferro Alloys Unit	---	4	4
6.	Brick manufacturing plant	---	---	---
7.	Briquetting Plant	---	---	---
8.	Slag Crushing Unit	---	---	---
9.	Power Plant	48	300	348
	a) Cooling Tower blowdown	15	96	111
	b) Boiler blowdown	13	80	93
	c) DM Plant regeneration water	20	124	144
10.	Sanitary Wastewater	8	24	32
	<b>Total</b>	<b>59</b>	<b>360</b>	<b>419</b>

### 1.7 Wastewater Characteristics

The following are the Characteristics of waste water

**TABLE NO. 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 *1<sup>st</sup> December 2023 to 29<sup>th</sup> February 2024*. The following are the concentrations of various parameters at the monitoring stations:

**TABLE NO. 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>	22.5 to 47.1	60
2.	PM <sub>10</sub>	38.7 to 79.8	100
3.	SO <sub>2</sub>	7.4 to 23.2	80
4.	NO <sub>x</sub>	9.3 to 34.4	80
5.	CO	409 to 1360	2000

### 2.2 Water Quality

#### 2.2.1 Surface Water Quality

Two samples (Upstream and Downstream) from Kelo River 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 equivalent day-night noise levels in the study zone are ranging from **49.73 dBA to 67.15 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>2.5</sub>, 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.

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

Item	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	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	47.1	79.8	23.2	34.4	1360
Maximum predicted incremental rise in concentration due to proposed project (Point Sources)	1.39	2.52	7.28	15.69	0.79
Maximum predicted incremental rise in concentration due to proposed project (Vehicular emissions)	0.33	0.59	----	4.30	2.78
<b>Net resultant concentrations during operation of the proposed project</b>	<b>48.82</b>	<b>82.91</b>	<b>30.48</b>	<b>54.39</b>	<b>1363.57</b>
<b>National Ambient Air Quality Standards</b>	<b>60</b>	<b>100</b>	<b>80</b>	<b>80</b>	<b>2000</b>
The net resultant Ground level concentrations during operation of the proposed project are within the NAAQS. Hence, there will not be any adverse impact on air environment due to the proposed 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. **20.7 Ha. (51.150 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 wastewater discharge from the DRI Unit, as closed-circuit cooling system will be adopted.
- Effluent from Coal gasifier (phenolic effluent) will be used in ABC chamber for quenching in DRI Units.
- Effluent from Rolling mills will be sent to oil separator followed settling tank and will be recycled through closed circuit cooling system.
- Effluent from Induction Furnace, Ferro Alloys & Power Plant will be treated in ETP and after ensuring compliance with SPCB norms, the treated effluent 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.
- RO rejects will be utilised for flushing in toilets, toilet cleaning, floor washing, etc.
- 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.

Hence there will not be any adverse impact on water 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. **20.7 Ha. (51.150 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. 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; Wastewater quality</b>				
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
<b>2. Air Quality</b>				
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  Quarterly Once	continuously  24 Hourly	PM <sub>2.5</sub> , 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	Once in a Month	8 hours	PM
<b>3. Meteorological Data</b>				
	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>				
	Ambient Noise levels	Once in a month (Hourly)	Continuous for 24 hours with 1 hour interval	Noise levels
<b>5. Soil Quality monitoring</b>				
	Soil quality	Half Yearly	Core drilling samples	Soil quality for pH, SAR, Texture, N, P, K, etc.
<b>Note:</b> PM <sub>2.5</sub> , PM <sub>10</sub> , SO <sub>2</sub> , NO <sub>x</sub> and CO are monitored as per Ministry notification vide G.S.R. No. 826(E) dated 16th November, 2009				



## 5.0 ADDITIONAL STUDIES

No rehabilitation and resettlement is required as the additional land shown is not having any habitations.

## 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.

The proposed project creates direct employment to about 500 persons (skilled, semiskilled & unskilled) and indirect employment of about 750 persons.

As per MoEF&CC Office Memorandum vide F.No.22-65/2017-IA.III dt. 30<sup>th</sup> September 2020, the budgetary allocation for commitment made by Project Proponent to address the concern raised during public hearing & based on Social Impact Assessment (SIA). Hence A separate budget will be allocated for Social welfare measures after completion of Public Hearing.

## 7.0 ENVIRONMENT MANAGEMENT PLAN

### 7.1 Air Environment

The following are air emission control systems proposed in the proposed project:

**TABLE NO. 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)	PM <30 mg/Nm <sup>3</sup>
2.	Induction Furnaces	Fume Extraction system with PTFE bag filters	PM < 30 mg/Nm <sup>3</sup>
3.	Re-heating furnaces attached to Rolling Mill	Stack	PM < 30 mg/Nm <sup>3</sup>
4.	Submerged Electric Arc Furnace	4 <sup>th</sup> Hole Fume Extraction system with bagfilters	PM < 30 mg/Nm <sup>3</sup>
5.	FBC Boiler	Electro Static Precipitators	PM < 30 mg/Nm <sup>3</sup>
		Lime dosing will also be done	SOx<100 mg/Nm <sup>3</sup>
		Combustion temperature will be around 800-850°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>



S.No.	Source	Control Equipment	Emission at the outlet
<b>Note:</b> Apart from the above Fume extraction system with bagfilters, dry fog system, dust suppression system, covered conveyers, water cannon spray, Wheel washing at entry and exit gates 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, as closed-circuit cooling system will be adopted.
- Effluent from Coal gasifier (phenolic effluent) will be used in ABC chamber for quenching in DRI Units.
- Effluent from Rolling mills will be sent to oil separator followed settling tank and will be recycled through closed circuit cooling system.
- Effluent from Induction Furnace, Ferro Alloys & Power Plant will be treated in ETP and after ensuring compliance with SPCB norms, the treated effluent 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.
- RO rejects will be utilised for flushing in toilets, toilet cleaning, floor washing, etc.
- 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



<b>Total Effluent generation after the expansion project</b>	<b>:</b>	<b>419 KLD</b>
Treated effluent to be used for Floor washing, Toilet cleaning and Flushing	:	70 KLD
Treated effluent to be used for Ash conditioning	:	25 KLD
Treated effluent to be used for Dust suppression	:	40 KLD
Treated effluent to be used for Greenbelt development	:	276 KLD
Effluent from Coal gasifier to be use in ABC of DRI Kiln	:	8 KLD

**20.7 Ha. (51.150 Acres)** of greenbelt will be developed within the plant premises by using the treated effluent. A dedicated pipe distribution network will be provided for using the treated effluent for greenbelt development. 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. 7.2: SOLID WASTE GENERATION & ITS DISPOSAL**

S.No.	Waste	Quantity (TPA)			Proposed method of disposal
		Existing	Expansion	Total	
1.	Ash from DRI	10,800	62,370	73,170	Will be utilized in the proposed Brick Manufacturing Unit
2.	Dolochar	12,000	69,300	81,300	Is being used in existing FBC Power Plant as fuel and same practice will be followed after expansion also.
3.	Kiln Accretion Slag	540	3,119	3,659	Is being used in existing brick manufacturing unit and same practice will be followed after expansion also.
4.	Wet scrapper sludge	2,400	13,860	16,260	Is being used in existing brick manufacturing unit and same practice will be followed after expansion also.
5.	SMS Slag	5,600	31,680	37,280	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.
6.	End Cuttings from Rolling Mill	---	11,286	11,880	Will be reused in the SMS
7.	Mill scales from Rolling Mill	---	1,188	1,188	Mill scales will be recycled to Ferro alloys unit.
8.	Ash from Power Plant (Indian Coal + Dolochar)	14,220	79,448	93,668	Will be utilized in the proposed Brick Manufacturing Unit
9.	Coal Washery Rejects	---	82,500	82,500	Will be used in proposed FBC power plant as fuel.
10.	Slag from FeMn	---	40,000	40,000	Will be reused in manufacture of SiMn as it contains high SiO <sub>2</sub> and Silicon.
	(or)				
11.	Slag from FeSi	---	1,960	1,960	Will be given to Cast iron foundries
	(or)				
12.	Slag from SiMn	---	28,000	28,000	Will be given to road contractor for road laying / given to slag cement manufacturing unit.
	(or)				
13.	Slag from FeCr	---	27,000	27,000	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 given to road contractor for road laying.





S.No.	Waste	Quantity (TPA)			Proposed method of disposal
		Existing	Expansion	Total	
					If Chrome content exceeds the permissible limits, it will be sent to nearest TSDF.
	(or)				
14.	Slag from Pig Iron	---	28,800	28,800	Will be given to slag based cement manufacturing unit.

## 7.5 Greenbelt Development

- Existing Plantation in the plant premises: 2000 nos.
- Additional land: 48.427 Ha. Greenbelt requirement for additional land: 16.00 Ha.
- Total greenbelt area requirement: 4.70 Ha. + 16.00 Ha.: 20.70 Ha.
- 20.7 Ha. (inclusive of existing) of greenbelt will be developed as part of expansion.
- 15-20 m wide greenbelt will be maintained all around the plant.
- Local DFO will be consulted in developing the additional green belt.
- 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.
- 2500 plants will be planted per Ha. as per CPCB norms.
- Total number of plants required after expansion @2500 nos. per Ha. will be 51,750 nos.
- Plantation already existing in additional land: 1,000 nos.
- Remaining plantation to be developed after deducting existing plantation: 48,750 nos.
- Total no. of plants will be 48,750 nos. The following will be the greenbelt development plan.
 

1 <sup>st</sup> year	-	20,800 nos.
2 <sup>nd</sup> year	-	14,700 nos.
3 <sup>rd</sup> year	-	13,250 nos.

### Trees Translocation details:

- Number of trees to be translocated due to expansion proposal : 100 nos.
- Additional plantation @ 5 nos. of plants per plant to be translocated : 500 nos.
- This will be in addition to the 33% greenbelt.
- Accordingly Total greenbelt area will be 20.90 Ha.



Letter from District Forest Officer (DFO) issued vide letter no. Tech. Off./967/2024 Raigarh dt. 19.02.2024, wherein they have mentioned that said land is private land and no objection for translocation of trees in the project site.

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

Budget allocated for Environment Management Plan : Rs. 46.85 Crores

Recurring Cost per annum for Environmental protection : Rs. 8.79 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.