

## EXECUTIVE SUMMARY FOR PUBLIC HEARING

For

GREENFIELD PROJECT FOR A DRI BASED STEEL PLANT TO PRODUCE SPONGE IRON 198,000 TPA; MILD STEEL BILETS 345,800 TPA; REROLLED STEEL PRODUCTS THROUGH HOT CHARGING AND THROUGH REHEARING FURNACE 342,144 TPA; FERRO ALLOYS 35,000 TPA AND/OR PIG IRON 70,000 TPA FROM 9 MVA X 2 NOS SAF; CAPTIVE POWER OR 20 MW (12 MW THROUGH WHRB AND 8 MW THROUGH AFBC); PIPES 150,000 TPA; GALVANIZING PRODUCTS 100,000 TPA; AND FLY ASH BRICKS 34,600 TPA

Terms of Reference File No. IA-J-11011/486/2021-IA-II(IND-I), dated 10<sup>th</sup> January, 2022  
Category A, Schedule 3 (a) Metallurgical Industries, 1(d) Thermal Power Plant  
Baseline period: Post Monsoon Season (15<sup>th</sup> October, 2021 to 15<sup>th</sup> January, 2022)

### Project Proponent

**M/s. GAURI GANESH ISPAT PRIVATE LIMITED**

At

VILLAGE - MADHI, TEHSIL TILDA,  
DISTRICT - RAIPUR, CHHATTISGARH

*Environmental Consultant*



**M/s Anacon Laboratories Pvt. Ltd., Nagpur**

QCI-NABET Accredited EIA Consultant for Metallurgical Industries (Sector 8 3(a)),  
1(d) Thermal Power Plant

MoEF&CC (GOI) and NABL Recognized Laboratory

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Report No. ANqr /PD/20A/2022/190

**FEBRUARY 2022**

**EXECUTIVE SUMMARY**

**1.0 INTRODUCTION**

M/s. Gauri Ganesh Ispat Private Limited (Hereafter referred as GG IPL) has proposed greenfield project for implementation of new manufacturing facilities for production of Sponge Iron, MS Billets, Steel Rerolled products, Ferro Alloys and/ or Pig Iron; MS Black pipe mill; Galvanizing unit and Fly Ash brick products along with captive power generation plant comprising of Waste Heat Recovery Boilers (WHRB) and Atmospheric Fluidized Bed Combustion (AFBC) Boiler along with Steam Turbine & Generator. The proposed Greenfield project will be established in 26.93 Hectare total land area.

The DRI Kilns will be implemented along with WHRB boilers. The Sponge Iron production capacity of 198,000 TPA through 2 nos. of 100 TPD DRI kiln & 2 nos. of 200 TPD DRI kiln along with 12 MW WHRB power is proposed to be implemented. WHRB power plant will generate (12 MW) captive power without combustion of fossil fuel Whereas AFBC of capacity 8 MW is also proposed. The MS Billets production of 345,800 TPA through 06 Nos. of Induction Furnaces with CCMs having 20 MT capacities each will be implemented. Rerolling Mill for production of 342,144 TPA Rerolled Steel out of which 174,636 TPA Rerolled Steel will be produced thru Hot Charging Facility and 167,508 TPA Rerolled Steel will be produced through use of Billet Reheating Furnace along with coal gassifier. The production of Ferro Alloys [\*FeSi-22600TPA, FeMn-70000 TPA, SiMn-35000 TPA] and/ or Pig Iron (70,000 TPA) will be done by electrically operated Sub-Merged Arc Furnace (9 MVA x 2 Nos.). It is proposed to produce MS Pipes by implementing pipe mill with 454 TPD capacity and Galvanizing unit will be implemented for GI Pipes & other galvanized products( 100,000 TPA) and Fly Ash brick product making facilities of capacity 34,600 TPA is proposed.

As per Environmental Impact Assessment Notification dated 14<sup>th</sup> September, 2006 and subsequent amendments thereof, the Sponge Iron and Steel Melting Shop (Induction Furnace) falls under **Sector 3(a)** (Metallurgical industries (ferrous & non-ferrous)) and the WHRB based power plant falls under **Sector 1(d)** (Thermal Power Plants). The overall project activity is categorized as **Category "A"**; therefore, it will require Environmental Clearance (EC) to be obtained from EAC, Industry – I, MoEF & CC, New Delhi.

The application for prior Environmental Clearance (Form-1) for proposed metallurgical project was submitted to EAC, MoEF & CC (Online Proposal No. IA/CG/IND/239481/2021, File No. **IA-J-11011/486/2021-IA-II(IND-I)** on 18<sup>th</sup> Nov 2021. The proposal was considered by the EAC49th Meeting of the Re-Constituted EAC dtd. 16<sup>th</sup> Dec. 2021 and ToR was granted on dtd.10<sup>th</sup> January 2022 (vide. F. no. **IA-J-11011/486/2021-IA-II (IND-I)**), which is enclosed as **Annexure-I**.

Anacon Laboratories Pvt. Ltd., Nagpur, is QCI-NABET accredited in 'Category A' environment consultant organization has been assigned to undertake an Environmental Impact Assessment (EIA) study and preparation of Environment Management Plan (EMP) for various environmental components, which may be affected due to the impacts arising out of the proposed project.

The Environmental Impact Assessment (EIA) report is prepared for obtaining Environmental Clearance (EC) from Ministry of Environment, Forest and Climate Changes (MoEF&CC), New Delhi and the Consent for Establishment from the Chhattisgarh Environment Conservation Board (CECB) for the proposed greenfield project.

**1.1 IDENTIFICATION OF PROJECT**

The company "Gauri Ganesh Ispat Private Limited" is a newly incorporated private limited company with an objective to set up an DRI based Steel plant along with Captive power plant. The Greenfield project will be established at Village- Madhi, Tahsil- Tilda, District- Raipur (Chhattisgarh) Pin Code – 493116. The proposal is to seek Environment Clearance based on energy efficient as well as well proven technology process. The proposed Greenfield project is implementation of new manufacturing facilities for production of Sponge Iron, MS Billets, Steel Rerolled products, Ferro Alloys or Pig Iron;

MS Black pipe mill; Galvanizing unit and Fly Ash products along with captive power generation plant comprising of Waste Heat Recovery Boilers (WHRB) and Atmospheric Fluidized Bed Combustion (AFBC) Boiler along with Steam Turbine & Generator.

The details of proposed plant facilities is as follows.

**TABLE 1  
PROPOSED PLANT DETAILS WITH CAPACITY**

S. No.	Process plant	Proposed configuration of the plant	Product Name	Capacity (in TPA)
1	DRI Kiln (Coal Fired)	200TPD X 2No. & 100TPD X 2No.	Sponge Iron	198,000
2	Induction Furnace along with CCM and LRF	Induction Furnace (20Tons X 6 Nos) and LRF (20ton x 1 No)	MS Billet	345,800
3	Hot Rolling Mill			342,144
	Hot Charging Rolling Mill	Electrical driven Rolling Mill about 529TPD	Rerolled Steel product (Wire Rod, TMT bar, Structure Steel etc.)	174,636
	Billet Reheating Furnace	Reheating Furnace based Rolling Mill about 507TPD	Rerolled Steel products (Sheets, Strips and Rerolled Structural Steel etc.)	167,508
4	Sub-Merged Arc Furnace	Electrically operated Sub-Merged Arc Furnace 9 MVA x 2 nos	Ferro Alloys (FeSi, FeMn, SiMn) (FeSi, FeMn, SiMn)* [*FeSi-22600TPA, FeMn-70000 TPA, SiMn-35000 TPA]	35,000
			And/or Pig Iron	70,000
5	Captive Power Plant (Boiler and TG based)	Waste Recovery Heat Boilers (WHRB)	Captive Power	12 MW
		Atmospheric fluidized bed combustion (AFBC)		8 MW
6	Pipe Mill Unit	Pipe mill with 454 TPD capacity	Pipes	150,000
7	Galvanizing unit	Galvanizing unit	GI Pipes & other galvanized products	100,000
8	Fly Ash Bricks/ Block making unit	Fly Ash product making facilities	Fly Ash Bricks/ Blocks	34,600

## 1.2 LOCATION OF THE PROJECT

Total 26.93 Hectare land has been acquired by company for implementation of project. The land is located at Kh. No. 111/1, 111/2, 111/3, 111/4, 111/5, 111/6, 111/7, 111/8, 111/9, 111/10, 111/11, 111/12, 112, 113/1, 114, 115, 110/1, 110/2, 109/1, 109/2, 109/3, 109/4, 109/5, 117, 118/1, 118/2, 118/3, 118/4, 118/5, 108/1, 108/2, 107/1, 107/2, 107/3, 107/4, 107/5, 106/1, 106/2, 104, 105, 100/1, 100/2, 100/3, 101, 102, 67, 68, 69/1, 71/1, 52/1, 52/2, 52/3, 52/4, 52/5, 52/6, 49/1, 74/1, 73, 74/2, 74/3, 98/1, 98/2, 95/1, 97, 96/1, 96/2, 96/3, 96/4, 96/5, 94, 99, 89, 90, 91/1, 91/2, 91/3, 92/1, 92/2, 93/1, 93/2, 78, 88/1, 88/2, 83/1, 84/1, 85/1, 83/1, 84/1, 85/2, 83/1, 84/1, 85/3, 83/1, 84/1, 85/4, 87, 86, 82, 81, 80, 79/1, 79/2, 45/1, 45/2, 45/3, 46, 47/1, 47/2, 47/3, 48/1, 48/2, 48/3, 48/4, 49/2, 71/4, 76, 103, 55, 53, 77, 75/1, 75/2, 71/2, 54/1 at Village - Madhi, Tahsil – Tilda, District - Raipur (CG). Green belt will be developed in 8.93 Ha. (i.e.33.16 %). The proposed site is having clear land without vegetation and not used for cultivation. Sufficient flat land, free from major undulations is available for construction.

The study area of 10 km radial distance from the project site is shown in **Figure 1**.

1.3 EIA/EMP REPORT

In line with the approved ToR obtained from EAC (Industry –I), MoEFCC, New Delhi, baseline environmental monitoring was conducted during Post monsoon season (15<sup>th</sup> October 2021 to 15<sup>th</sup> January 2022) for determining the status of ambient air quality, ambient noise levels, surface and groundwater quality, soil quality, status of flora, fauna and eco-sensitive areas and socio-economic status of the villages within 10 km radius study area from the project site (Figure 1). The observations of the studies are incorporated in the draft EIA/EMP report. Impacts of the proposed project activities during construction and operation stages were identified and duly addressed in the draft.

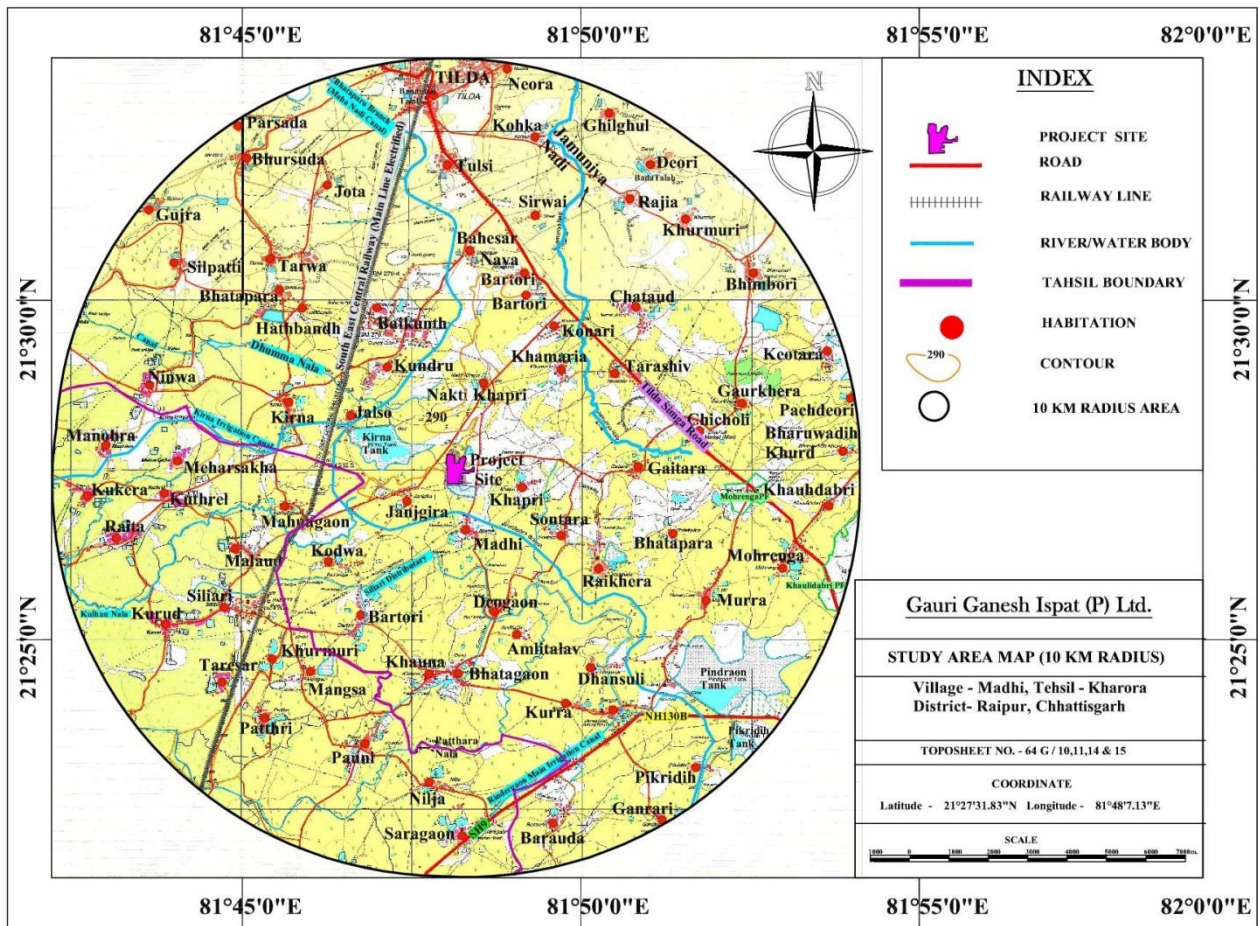


FIGURE 1: STUDY AREA (10 KM RADIAL DISTANCE)

TABLE 2  
DETAILS OF ENVIRONMENTAL SETTINGS

Sr. No.	Particular	Details		
1	Plant Location	Village- Madhi, Tahsil- Tilda, District- Raipur (Chhattisgarh) Pin Code – 493116		
2	Coordinates	Point	Latitude	Longitude
		BP1	21°27'18.12"N	81°48'0.59"E
		BP2	21°27'43.59"N	81°48'3.93"E
		BP3	21°27'41.39"N	81°48'16.77"E
		BP4	21°27'28.86"N	81°48'26.95"E
		BP5	21°27'27.77"N	81°48'19.18"E
		BP6	21°27'18.79"N	81°48'13.04"E

Sr. No.	Particular	Details																																						
		BP7	21°27'27.81"N	81°48'6.69"E																																				
		BP8	21°27'31.83"N	81°48'7.13"E																																				
3	Topo sheet no.	64G/10, 64G/11, 64G/14 & 64G/15																																						
4	Elevation	Min 291 m. – Max 297 m.																																						
5	Nearest representative IMD station	IMD Raipur – 30.78 KM, SSW																																						
6	Nearest highway	NH130B – 7.6 km/SSE (Baloda Bazar to Raipur) NH 30- 11.7, W (Simga to Raipur)																																						
7	Nearest railway station	1. Siliari Railway Station, Distance – 5.5 km, SW 2. Baikunth Railway Station Distance – 4.5 KM, NW																																						
8	Nearest airport	1. Swami Vivekananda International Airport, Raipur – 30.56 KM, SSW																																						
9	District Headquarters	Raipur District Collectorate – 28.41 KM, SW																																						
10	Nearest State/National boundaries	Madhya Pradesh, – 111.0 KM, W																																						
11	Seismic Zone	Zone-II [As per IS :1893 (Part-I): 2002]																																						
12	Nearest major city with 2,00,000 population	Raipur- 28.86 KM, SW																																						
14	Nearest Habitation	1. Madhi, 1.0 KM, S 2. Khapri, 1.5 KM, E																																						
15	Hills/valleys	None within 10 Kms																																						
16	Nearest tourist place	<ul style="list-style-type: none"> <li>• Indira Priyadarshini Nature Safari &amp; Mohrenga Jungle Lake - 9.3/ESE</li> <li>• Jalso Dam – 1.5/W</li> <li>• Lakhani Mishra Jalasay - Water park, Nardha – 7.8/SE</li> <li>• Jheel Garden , Baikunth – 4.0/NNW</li> <li>• Atal Sagar , Tilda – 11/N</li> <li>• Chhota Talab, Tilda – 9.2/N</li> </ul>																																						
17	Archaeologically important places	Indira Priyadarshini Nature Safari, Mohrenga Jungle Lake - 9.3/ESE																																						
18	Protected areas as per Wildlife Protection Act, 1972 (Tiger reserve, Elephant reserve, Biospheres, National parks, Wildlife sanctuaries, community reserves and conservation reserves)	Nil																																						
19	Forests land	Khaulidabri PF – 9.2 km/SE, Mohrenga PF – 6.0 km/E																																						
20	Defence Installations	Nil																																						
21	Notified ECO-Sensitive Zone	Nil																																						
22	Water Bodies	<table border="1"> <thead> <tr> <th>S. No.</th> <th>Name of the Water Body</th> <th>Distance (KM)</th> <th>Direction</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Kirna Tank / Jalso dam</td> <td>1.0</td> <td>W</td> </tr> <tr> <td>2</td> <td>Dhumma Nala</td> <td>1.4</td> <td>NW</td> </tr> <tr> <td>3</td> <td>Kirna Irrigation Canal</td> <td>2.6</td> <td>W</td> </tr> <tr> <td>4</td> <td>Kulhan Nala</td> <td>2.2</td> <td>WSW</td> </tr> <tr> <td>5</td> <td>Rindergaon Main Irrigation Canal</td> <td>7.4</td> <td>SSE</td> </tr> <tr> <td>6</td> <td>Siliari Distributary</td> <td>1.7</td> <td>S</td> </tr> <tr> <td>7</td> <td>Jamuniya Nadi</td> <td>3.5</td> <td>E</td> </tr> <tr> <td>8</td> <td>Bhatapara Branch (Maha Nadi</td> <td>1.9</td> <td>NW</td> </tr> </tbody> </table>			S. No.	Name of the Water Body	Distance (KM)	Direction	1	Kirna Tank / Jalso dam	1.0	W	2	Dhumma Nala	1.4	NW	3	Kirna Irrigation Canal	2.6	W	4	Kulhan Nala	2.2	WSW	5	Rindergaon Main Irrigation Canal	7.4	SSE	6	Siliari Distributary	1.7	S	7	Jamuniya Nadi	3.5	E	8	Bhatapara Branch (Maha Nadi	1.9	NW
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Sr. No.	Particular	Details			
			Canal)		
		9	Pikridih Tank	9.6	SE
		10	Jheel garden	4.0	NNW
		11	Khambha Talab	4.1	W
		12	Pindraon Tank	8.0	SE
		13	Bannubai Talab	9.7	N
		14	Dalal Talab	9.6	N
		15	Lakhan lal Mishra Jalasay (Bangoli tank)	7.5	SE
23	Nearest Industries	<b>S. No.</b>	<b>Name of the Site</b>	<b>Distance (KM)</b>	<b>Direction</b>
		1	Adani GMR Chhattisgarh Power Project	4.9	ESE
		2	Neel Kamal Rice Industries	10.2	NNW
		3	Shree Hardeo industries	9.0	SSE
		4	Vimla Infrastructure (India) Pvt. Ltd.	4.7	WSW
		5	Agrasen Rice Industries	10.3	NNW
		6	Sambhav Sponge Power Pvt. Ltd.	13.5	NNW
		7	Hi Tech Power & Steel Ltd.	11.4	NNW
		8	Chaitanya Solvex Pvt. Ltd	6.0	NNE
		9	Sachdev Scientific Equip Pvt. Ltd.	8.8	SSE
		10	Century Cement	4.0	NW
		11	Stone Crushers – Quarry, Dhansuli1	6.0	SE
		12	BPCL LPG Bottling Plant, Raipur -	1.3	E
		13	Gindlani Rice Mill	8.3	N
		14	JD Industries	8.4	N
		15	Maa Mahamaya industries	10.0	NNE
		16	Ananya Paper Industries Pvt. Ltd.	11.4	NW
		17	Shri. Bajrang Power & Ispat Limited (Tilda division)	3.7	NW
24	Areas occupied by sensitive man-made land uses (hospitals, schools, places of worship, Universities, Community Hall etc.) and Vulnerable groups who could be possibly be affected.*	<b>S. No.</b>	<b>Name of the Site</b>	<b>Distance (KM)</b>	<b>Direct ion</b>
		1.	Professional Institute Of Engineering & Technology	9.4	SE
		2.	ICAR-National Institute of Biotic Stress Management - Research institute, BARONDA	8.3	S
		3.	aadarsh government higher secondary school, Kirna	4.1	WNW
		4.	ABC Public School, saragaon	8.2	S
		5.	AAFT University	11.4	SE
		6.	Amity University, Raipur - Private university	11.0	SE
		7.	Vimla Devi Public School, Silyari	5.9	SW
		8.	Dr. K.C. Baghel Hr. Sec. School Silyari	6.1	SW
		9.	Gyan Vatika Public School Silyari Kurud	6.2	SW
		10.	Govt Primary School, Raita	8.0	WSW
		11.	Samudayik bhawan, Tilda	9.5	N
		12.	Government Primary School, Tandwa	6.6	NW
		13.	ITI Silyari	5.4	SW

Sr. No.	Particular	Details			
		14.	Govt. ITI ,Kohka	9.3	NNE
		15.	Praathmik Swaasthya Kendra Bangoli	7.6	SE
		16.	Government Hospital Tilda	9.6	N
		17.	Community Health Centar Tilda	9.7	N
		18.	Kanha children hospital tilde	9.8	N
		19.	Evangelical Mission Hospital	10.1	NNW
		20.	Hospital, BAIKUNTH	3.6	NNW
		21.	upswathya kendra, Tandwa	6.4	NW

## 2.0 PROJECT DESCRIPTION

### 2.1 PROCESS DESCRIPTION

#### 2.1.1 Manufacturing process of Sponge Iron (DRI)

- Iron ore, coal, dolomite/limestone is fed in the weighed quantity and the kiln is rotated at 0.5 RPM speed. A temperature between 1000°C to 1050 °C is maintained in about 70% of the kiln length towards discharge end side for required reaction.
- After the reaction, the product is taken into an indirect cooling drum cooler. The product is cooled to 100°C and taken for product separation and then taken for final use.
- The kiln has three functions; heat exchange, chemical reaction in vessel and conveying solids.

#### 2.1.2 Manufacturing process of Steel Melting Shop with CCM and Hot Charging Rolling Mill

- Induction Furnaces with medium power input capacity of 6 to 7.5 MVA each will be setup with automatic charging facility and Power Sharing software.
- The melting process involves taking sample of Sponge Iron & Pig Iron; Iron Powder and mild steel scrap, end cutting from rolling mills or scrap from user units is taken from raw material storage.
- Homogeneous molten mass is poured hydraulically into the ladle.

#### LRF (Ladle Refining Furnace):

The production of molten steel the production of quality requires refining of the same for which one Ladle Refining Furnace

#### CCM:

The ladle containing liquid steel is placed on the Continuous Casting Machine platform and continuous casting of hot billet is carried out in the same.

#### 2.1.3 Manufacturing process of Rolling mill

Raw Material i.e. Billet procured from outside is cut to size; either by Gas Cutting. The sized billets are then pushed into Billet reheating furnace fired with Coal Producer Gas. After the Billet is Red Hot then pushed out to rolling stands for re-rolling. Steel Pieces are rolled through all stands in order to get required shape of finished goods i.e. MS Channel, Structures and other rerolled product are produced.

#### 2.1.4 Manufacturing process of Ferro Alloys Plant

High Carbon Ferro/ Silico Manganese as a finished product produced through a conventional submerged arc electric furnace.



Pig Iron is also proposed to produce alternately from the same submerged arc furnace by using lower grades Iron ore and Magnetite Iron ores and takes the liquid Iron (Hot Metal) to Induction Furnaces for production of steel.

#### **2.1.5 WHRB based Power Generation**

The Waste heat Recovery boilers are attached with DRI Kiln. The flue gases released from DRI Kilns will be passed through Waste Heat Recovery Boiler, where waste heat will be recovered and steam will be generated in required temperature and pressure. The source of energy is the heat content in waste flue gases released from DRI Kilns.

#### **2.1.6 AFBC Based Power Generation**

- In an AFBC boiler, the fluidized bed media, which consists of ash, sand, limestone and other such materials is heated to the ignition temperature of the fuel.
- Fuel, such as char, is continuously supplied to the bed as it burns very quickly in the high bed temperatures of almost 1000°C.
- The heat generated from this combustion is used to produce steam which, like in WHRB systems, will produce power through a steam generator.

#### **2.1.7 Process of brick making from waste**

- To make Fly ash bricks Fly ash, Lime, Sand and Gypsum along with slag from the induction and arc furnaces are fed into a pan mixer, where water is added in the appropriate proportion before mixing it all together.
- After mixing; the mixture is shifted to hydraulic presses for where the mixture is given its brick like shape.
- The molded bricks are then carried into the open area where they are air dried and cured in an autoclave to give them its rigidity.

#### **2.1.8 Manufacturing process of Galvanising Unit**

Following process involved in galvanizing of steel;

- Pickling/cleaning of MS Pipe or Tube to remove surface oxides and impurities
- Mechanical Scraping of the surface
- Annealing of strips if required
- Pre-treatment, cleaning and degreasing by special solvent like sodium hydroxide solution and followed by pickling
- Galvanizing of MS Strips/Pipes by immersing of Rerolled product/ Pipe or Tubes in the molten bath of Zinc followed by water quenching
- Inspection of Galvanized
- Dispatch to market

## **2.2 LAND REQUIREMENT**

Total 26.93 Hectare land has been acquired by company for implementation of project. Green belt will be developed in 8.93 Ha. (i.e.33.16 %). The proposed site is having clear land without vegetation and not used for cultivation. Sufficient flat land, free from major undulations is available for construction. The land details are provided as follows:



**TABLE 3  
AREA STATEMENT**

Land Use	Area (In Hectare)	IN %
Built Up Area	12.81	47.57%
Road and Paved area	3.93	14.59%
Green Belt area	8.93	33.16%
Open Area	1.26	5.42%
<b>Total</b>	<b>26.93</b>	<b>100.00%</b>

### 2.3 RAW MATERIALS REQUIREMENT, SOURCE & MODE OF TRANSPORT

The raw material will be transported through rail and truck. Coal from SECL or imported as well as Iron Ore from NMDC will be transported through rail up to nearest railway siding at Siliari and Baikunth; thereby it will be transported by Road to the proposed plant through covered truck. Overall **1566107.804 TPA** materials (Raw material, products and waste will be transported through road (considering 330 working days) for the plant. It is estimated that approx. 226 trips per day (452 trucks per day movement) required for transportation of raw materials and finished products of the plant

#### 2.3.1 Solid and Hazardous waste generation

The details of solid and hazardous waste generations are given in **Table 4** and **5**, respectively.

**TABLE 4  
SOLID WASTE GENERATION AND ITS DISPOSAL**

Name of Solid Waste generated	Qty (TPA)	Proposed Disposal Plan
Char / Dolochar (SID)	49,500	Captive use in Captive Power plant
Kiln Accretion & Refractory waste (SID)	300	Sold to authorized recyclers
Bottom Flue Dust Ash (SID)	39,600	Used for Road making and Land filing.
Mill Scale (IF)	5,346	Captive use in Ferro Alloys Plants
Refractory & Ramming Mass waste (IF)	446	Sold to authorized recyclers
Defective Billets (IF)	5,346	Reused in own Induction furnace
Slag from Induction Furnace	64,598	Captive use in own Fly Ash Brick unit and remaining (after recovery of metal) used for Road making and Land filing
Defective and Miss Roll (RM)	8,019	Reused in own Induction furnace
Mill Scale (RM)	6,238	Captive use in Ferro Alloys Plants
Ash from Coal firing in PG Plant (RM)	6,237	Used in own Fly Ash Brick making unit
Slag from Ferro Alloys Plant	39,789	Used for Road making and Land filing.
Fluidized Bed Material (PP)	150	Used in own Fly Ash Brick making unit
Fly Ash from Char / Dolochar (PP)	37,125	Captive use in own Fly Ash Brick unit
Ash From Coal (PP)	11,087	Sold to nearby Cement plants.
MS Scrap Generated	10,500	Reused in own Induction furnace
Mill Scale Generated in Pickling	1,000	Used in own Ferro Alloys Plants.
<b>Total</b>	<b>285,281</b>	

**TABLE 5  
HAZARDOUS WASTE GENERATION**

Name of Hazardous Waste generated	Qty (TPA)	Proposed Disposal Plan
Zinc dross Generated	3,500	Sold to registered recyclers
Acid Neutralization Lime Sludge Generated	7,000	Sold to registered recyclers
Lead Dross generation	13	Sold to registered recyclers
<b>Total</b>	<b>10,513</b>	

**TABLE 5(A)  
HAZARDOUS WASTE GENERATION**

Type of Hazardous Waste	H. W. Category	Quantity	Disposal
Waste Oil/Used Oil	5.1(as per HWM Schedule I)	6 KL/annum	Will be given to authorized recycler having authorization from competent authority.

Type of Hazardous Waste	H. W. Category	Quantity	Disposal
ETP Sludge	34.3(as per HWM Schedule I)	70 tons/year	Composted and applied on green Belt
Used Lead acid batteries	Haz. Waste Management Rule 2016, Sch. IV, Sr No.17	30 Batteries/ annum	The lead acid battery or dry battery will be given to authorized recycler having authorization from competent authority

## 2.4 WATER REQUIREMENT & SOURCE

Estimated water requirement will be 1700 KLD. The water will be sourced from surface water point i.e. Bangoli Tank. Application for allotment of water from Bangoli Tank has already been submitted to Chhattisgarh Water Resource Department. Online Application copy enclosed as **Annexure III**

Total Yearly water requirement will be 1700 KLD \* 330 days = 561,000 KLA. which will be sourced from Surface Water i.e. from nearest source, for which application for allotment of water from Jalso Dam has already been submitted to Chhattisgarh Water Resource Department.

Further, the management had decided to implement a 50,000 KL Rain water collection Tank which will be able to collect sufficient rain water during rainy days which would continuously be collecting rain water during the rainy days. Which extends to almost 75 days. Thus water requirement will be met through rain water collections from it for 75 days. The balance water after the rain days will be sufficient to cater water requirement of 29 days. Therefore, it is considered that about 104 days (177,500 KL) water requirement will be met through rain water and rain water collection. Therefore, the net requirement from surface source per annum will be about 383,500 KLA. However, we are seeking permission for the gross quantity i.e. 561,000 KLA.

## 2.5 POWER REQUIREMENT & SUPPLY

Total power requirement will be 60 MW out of which 20 MW will be met through captive power plant and 40 MW will be sourced through State Grid (CSPDCL) In addition to this total 2 Nos. of 3300 kVA DG sets are proposed for emergency backup.

## 2.6 MANPOWER REQUIREMENT

M/s. GG IPL will provide employment to 550 peoples as direct employment which includes 50 people as administrative staff and 500 people will be production staff. Preference will be given to local people, depending upon their qualification and skill.

## 2.7 FIRE FIGHTING FACILITIES

In order to combat any occurrence of fire in plant premises, fire protection facilities are envisaged for the various units of the plant. All plant units, office buildings, laboratories, etc. will be provided with adequate number of portable fire extinguishers to be used as first aid fire appliances.

## 2.8 PROJECT COST

The project cost of the project is estimated as Rs. 27,875 Lakhs

## 3.0 EXISTING ENVIRONMENTAL SCENARIO

### 3.1 BASELINE ENVIRONMENTAL STUDIES

Baseline environmental studies were conducted at project site along with 10 km radial distance from the project site. The baseline environmental quality data for various components of environment, viz. Air, Noise, Water, and Land were monitored during Post monsoon season (15<sup>th</sup> October 2021 to 15<sup>th</sup> January 2022).

### 3.2 METEOROLOGY & AMBIENT AIR QUALITY

#### Summary of the Meteorological Data Generated At Site (15<sup>th</sup> October 2021 to 15<sup>th</sup> January 2022)

Predominant Wind Direction	Post monsoon season
First Predominant Wind Direction	NE (21.47%)
Second Predominant Wind Direction	NNE (19.29%)
Calm conditions (%)	1.45
Avg. Wind Speed (m/s)	2.11

The status of ambient air quality within the study area was monitored for post-monsoon season at 9 locations. All these 9 sampling locations were selected based on the meteorological conditions considering upwind and downwind, cross wind directions and reference point. The levels of Respirable Particulate Matter (PM<sub>10</sub>), Fine Particulates (PM<sub>2.5</sub>), Sulphur Dioxide (SO<sub>2</sub>), Oxides of Nitrogen (NO<sub>x</sub>) and carbon monoxide (CO), Ammonia, Ozone, Benzene and BAP were monitored. The details of Ambient Air Quality Monitoring Results are summarized and given in **Table 6**.

**TABLE 6  
SUMMARY OF AMBIENT AIR QUALITY MONITORING RESULTS**

Sr. No.	Location		PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>2</sub>	CO	Ozone	NH <sub>3</sub>
			µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	mg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>
1	Project Site (AAQ-1)	1. Min	52.3	19.7	7.2	12.6	0.296	5.8	4.8
		2. Max	64.8	25.9	9.7	17.8	0.367	7.8	6.5
		3. Avg	58.6	23.2	8.4	15.2	0.329	6.8	5.7
		4. 98 <sup>th</sup>	64.3	25.7	9.7	17.6	0.365	7.7	6.5
2	Madhi (AAQ-2)	1. Min	55.7	22.5	8.0	14.4	0.324	6.6	5.9
		2. Max	70.6	30.0	11.2	18.8	0.384	9.4	8.9
		3. Avg	63.2	25.7	9.4	17.0	0.361	8.1	7.3
		4. 98 <sup>th</sup>	69.5	29.1	11.2	18.8	0.384	9.3	8.7
3	Janjira (AAQ-3)	1. Min	63.6	24.3	8.6	16.9	0.362	6.5	5.6
		2. Max	77.6	32.5	11.5	21.7	0.448	10.7	8.5
		3. Avg	71.8	28.3	10.0	19.1	0.409	8.5	6.9
		4. 98 <sup>th</sup>	77.1	31.9	11.4	21.3	0.443	10.4	8.4
4	Bartori (AAQ-4)	1. Min	60.9	22.1	7.6	15.8	0.358	5.9	4.7
		2. Max	74.5	29.6	11.8	20.8	0.401	8.4	8.0
		3. Avg	67.9	26.8	9.7	18.4	0.381	7.4	6.5
		4. 98 <sup>th</sup>	73.7	29.3	11.6	20.8	0.399	8.4	7.8
5	Nakti Khapri (AAQ-5)	1. Min	57.3	21.3	7.2	14.4	0.273	5.2	4.9
		2. Max	74.5	27.5	10.7	18.2	0.369	7.7	7.0
		3. Avg	65.6	24.4	8.8	16.7	0.326	6.7	5.9
		4. 98 <sup>th</sup>	73.6	27.5	10.6	18.2	0.365	7.6	6.9
6	Tarashiv (AAQ-6)	1. Min	59.0	21.3	9.0	15.0	0.382	5.0	4.1
		2. Max	72.8	29.2	12.2	22.5	0.500	8.7	7.9
		3. Avg	68.4	25.2	10.6	18.9	0.424	7.0	6.5
		4. 98 <sup>th</sup>	72.7	29.0	12.1	22.1	0.489	8.6	7.9
7	Kundru (AAQ-7)	1. Min	48.9	19.2	5.8	12.6	0.290	4.2	4.3
		2. Max	66.9	26.4	9.7	18.2	0.390	8.4	6.7
		3. Avg	56.6	22.8	7.9	16.1	0.347	6.3	5.4
		4. 98 <sup>th</sup>	66.2	26.2	9.7	18.2	0.389	8.3	6.5
8	Khapri (AAQ-8)	1. Min	61.6	21.3	7.6	15.0	0.300	5.3	5.0
		2. Max	76.5	36.4	10.8	19.9	0.476	11.5	8.8
		3. Avg	70.2	27.6	9.5	17.6	0.395	8.4	6.2
		4. 98 <sup>th</sup>	76.0	35.8	10.8	19.9	0.470	11.3	8.3
9	Deogaon (AAQ-9)	1. Min	58.4	20.9	7.3	14.1	0.324	5.9	5.2
		2. Max	70.5	27.2	10.4	17.1	0.412	8.5	7.5

Sr. No.	Location		PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>2</sub>	CO	Ozone	NH <sub>3</sub>
			µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	mg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>
		3. Avg	63.9	24.2	9.1	15.8	0.370	7.3	6.6
		4. 98 <sup>th</sup>	70.2	27.0	10.4	17.0	0.409	8.4	7.4
<b>CPCB Standards</b>			<b>100 (24hr)</b>	<b>60 (24hr)</b>	<b>80 (24hr)</b>	<b>80 (24hr)</b>	<b>2 (8hr)</b>	<b>100 (8hr)</b>	<b>400 (24hr)</b>

From the above results, it is observed that the ambient air quality at all the monitoring locations was within the permissible limits specified by CPCB.

### 3.3 AMBIENT NOISE LEVELS

Ambient noise level monitoring was carried out at the 8 monitoring locations. The monitoring results are summarized in **Table 7**.

**TABLE 7  
SUMMARY OF AMBIENT NOISE LEVEL MONITORING RESULTS**

Sr. No.	Location	Results dB(A)	
		Leq <sub>day</sub>	Leq <sub>night</sub>
<b>Industrial Area</b>			
N1	Project Site	53.1	40.6
<b>Commercial Area</b>			
N2	Madhi	59.2	43.8
N3	Janjgira	57.7	44.5
<b>Residential Area</b>			
N4	Bartori	50.8	38.9
N5	Nakti Khapri	52.6	40.3
N6	Tarashiv	54.1	42.7
<b>Silence Zone</b>			
N7	Jalso	46.5	37.4
N8	Khapri	48.2	38.3
<b>CPCB Standards- dB(A)</b>			
<b>Commercial Area</b>		<b>65</b>	<b>55</b>
<b>Residential Area</b>		<b>55</b>	<b>45</b>
<b>Silence Zone</b>		<b>50</b>	<b>40</b>

Source: Field monitoring and analysis by Anacon Laboratories Pvt. Ltd., Nagpur

### 3.4 SURFACE AND GROUND WATER RESOURCES & QUALITY

#### 3.4.1 Regional geology

##### Regional Geology:

10 km radius study area is mainly comprised of sedimentary rock formations, like stromatolitic limestone, argillaceous dolomites, shale. All these formations are of Proterozoic age. There are no major geological structure present in study area as far as concern with construction of buildings and other structure. Study area falls in seismic zone-II i.e. low damage risk zone.

##### Site specific Geology:

Project area is mostly covered by soil cover which is having thickness of around 0.8-1.2m. Outcrops are very rare in project site.

#### 3.4.2 Hydrogeology

##### Regional Hydrogeology:

Entire study area is comprises of calcareous sedimentary rock formations of Proterozoic age and belongs to Chhattisgarh supergroup. The primary porosity and permeability of these formations is very poor. The ground water in these formations occurs under water table, semi confined and

confined conditions. The weathered and the cavernous part of the formation and also the fractured zones constitute the aquifers in the area. The maximum thickness of the weathered formation in the area is around 25m. The cavernous zones are occurring mostly in the depth range of 10 to 70 m.

Depth to water level scenario in the study area:

Pre-monsoon Water levels- 2.75 to 15 m bgl

Post-monsoon water levels: 0.60 to 2.90 m bgl

### 3.4.3 Geomorphology

Study area is comprises of gently sloping plains on Proterozoic age. Flood plains are observed along River courses. There are no major geomorphological structures present in study area.

### 3.4.4 Water Quality

Groundwater and surface water quality was assessed by identifying 8 groundwater (Borewell/ handpump) locations in different villages and 5 surface water samples.

#### A. Groundwater Quality

The analysis results indicate that the pH ranged 7.21 – 7.64. The TDS was ranging from 254 – 498 mg/l. Total hardness was found to be in the range of 176 – 297 mg/l. The fluoride concentration was found to be in the range of BDL (DL-0.1) – 0.62 mg/l. The nitrate and sulphate were found in the range of 3.81 – 12.46 mg/l and 6.74 – 23.32 mg/l respectively. The chloride concentration was found in the range of 41.64 to 98.79 mg/l. The Total suspended solid concentration was found below detection limit (DL -10 mg/l) at all sampling location. Heavy metals like As, Pb, Ni was found below detection limit i.e. BDL (DL-0.01), BDL (DL-0.001), BDL (DL-0.1) respectively and Iron was found in the range of 0.09 to 0.21 mg/l.

Sr. No.	Locations	WQI	Quality	Remark
1	Project Site	57.75	Good	<b>Water quality assessed based upon above physico-chemical parameters and samples were found to be physico-chemically good and excellent.</b>
2	Madhi Village	62.17	Good	
3	Janjira Village	64.52	Good	
4	Bartori	63.01	Good	
5	Natki Khapri	51.26	Good	
6	Tarashiv	43.62	Excellent	
7	Jalso	46.98	Excellent	
8	Khapri	47.23	Excellent	

#### B. Surface Water Quality

The analysis results indicate that the pH ranged between 7.71 – 7.84 which is well within the specified standard of 6.5 to 8.5. The TDS was observed to be 342 – 538 mg/l which is within the permissible limit of 2000 mg/l. The total hardness recorded was in the range of 153.92 – 395.76 mg/l. The levels of chloride and sulphate were found to be in the range of 88.52 – 159.56 mg/l and 19.28 – 36.83 mg/l respectively.

DO reported value of range of 6.0 – 6.4 mg/l. PO<sub>4</sub> concentration was found to be in the range of 0.19 – 0.26 mg/l. COD ranges from 9.24 –16.48 mg/l and BOD ranges from 2.91 – 5.33 mg/l.

Heavy metals content (i.e. As, Al, Cd, Cr, Cu, Pb, Fe, Mn, Zn and Hg) were found to be very low and within specified standards.

#### C. Bacteriological Characteristics

Coliform group of organisms are indicators of faecal contamination in water. Bacteriologically, all surface water samples were contaminated and water treatment followed by chlorination or disinfection treatment is needed before use for domestic purpose whereas groundwater samples were not bacteriologically contaminated.

### 3.5 LAND USE LAND COVER CLASSIFICATION

The land-use & land cover map of the 10 km radial study area from the periphery of project site has been prepared using Resource SAT-1 (IRS-P6), sensor-LISS-3 having 23.5m spatial resolution and date of pass 15<sup>th</sup> April 2021 satellite image with reference to Google Earth data. In order to strengthen the baseline information on existing land use pattern, the following data covering 10 km radius is approximate about 21°22'02.50"N to 21°32'46.80"N latitude and 81°42'21.60"E to 81°53'56.69"E longitude and elevation 250 – 305 meters are used as per the project site confined within that area.

The Land Cover classes and their coverage are summarized in **Table 8**.

**TABLE 8**  
**LU/LC CLASSIFICATION SYSTEM**

S.No.	Level-I	Level-II	Area (Sq. Km)	Percentage (%)
1	Built-up land	Settlement	35.52	11.29
		Industrial Settlement	1.23	0.39
		Road Infrastructure	3.28	1.04
2	Agricultural Land/ Crop Land	Double Crop	183.65	58.38
		Single Crop	38.69	12.30
3	Scrubs/Wastelands	Barren Land	6.88	2.19
		Land with scrub/Open Scrub	18.21	5.79
4	Waterbodies	River/Nala/Stream	12.41	3.95
		Pond/Tank	9.85	3.13
5	Others	Mining/Stone Quarry	4.28	1.36
6	Forest	Reserve Forest	0.57	0.18
		<b>Total</b>	<b>314.57</b>	<b>100.00</b>

### 3.6 SOIL QUALITY

For studying soil quality of the region, sampling locations were selected to assess the existing soil conditions in and around the proposed project site representing various land use conditions. The physical, chemical properties and heavy metals concentrations were determined. The samples were collected by ramming a core-cutter into the soil up to a depth of 30 cm. Total 8 samples within the study area were collected and analyzed.

#### Physical Characteristics of Soil

From the analysis results of the soil samples, it was observed, the bulk density of the soil in the study area ranged between 1.527 - 1.721 g/cc which indicates favourable physical condition for plant growth. The water holding capacity is between 31.59 - 33.64%. Infiltration rate, in the soil is in the range of 19.52 – 22.64 mm/hr.

#### Chemical Characteristics of Soil

pH is an important parameter indicative of alkaline or acidic nature of soil. It greatly affects the microbial population as well as solubility of metal ions and regulates nutrient availability. Variation in the pH of the soil in the study area was found to be neutral (6.88-7.66) in reaction. Electrical conductivity, a measure of soluble salts in the soil is in the range of 492-1538  $\mu$ S/cm. The important soluble cations in the soil are calcium and magnesium whose concentration levels ranged from 472.12 – 1245.42 mg/Kg and 72.32 – 295.42 mg/Kg respectively. Chloride is in the range of 335.86 – 537.48 mg/Kg.

#### Fertility status of Soil

The soil quality within 10 km radius from the project site was found be ranging from moderate to fertile with NPK values ranging as 264.49 – 378.87 kg/ha (quality better to sufficient), 12.79 – 25.01

kg/ha (quality less) and 22.24 – 779.44 kg/ha (quality very less to more than sufficient) respectively. Organic carbon were found in the range of 0.32% – 0.62% (quality less to average).

### 3.7 BIOLOGICAL ENVIRONMENT

#### Floral composition in Study Area

Floral characteristics within project site and surrounding areas including various villages were studied during post-monsoon season. Total 122 floral species were observed in the study area. The details about the floral composition are as follows.

- a. **Trees:** Total 51 species were found in the study area
- b. **Shrubs (small trees):** Total 26 species were enumerated from the study area.
- c. **Herbs:** In the study area 11 species were observed.
- d. **Bamboo & Grasses:** 20 species were enlisted from the study area
- e. **Climbers and Twiners:** Total 13 species of climbers/ twiners were recorded in the study area.
- f. **Parasite/epiphytic plant :** Each 1 species enlisted in the area

#### RET (Rare, Endangered and Threatened species) STATUS

According to IUCN Status report 2013 out of total 122 plant species identified with study area. Among the observed species most of the species belongs to the least concern (LC), Data Deficient (DD) and Not Assessed (NA), as per IUCN status. Thus, none of reported species in study area belongs to Rare, Endangered or Threatened category.

#### Fauna Details:

Total 80 faunal species was recorded through primary and secondary sources. Out of which 7 species belongs to class mammalian, 7 species belongs to class Reptilians and Amphibians, 47 species belongs to class Aves, 8 species belongs to class Insecta (Butterflies) and 11 species belongs to class Pisces.

#### As per IUCN RED (2013) list

The IUCN Red List is the world's most comprehensive inventory of the global conservation status of plant and animal species. It uses a set of criteria to evaluate the extinction risk of thousands of species and subspecies. These criteria are relevant to all species and all regions of the world. With its strong scientific base, the IUCN Red List is recognized as the most authoritative guide to the status of biological diversity.

Among the reported animals, all are categorized under least concern category as per IUCN list.

#### As per Indian Wild Life (Protection) Act, 1972

Wild Life (Protection) Act, 1972, as amended on 17<sup>th</sup> January 2003, is an Act to provide for the protection of wild animals, birds and plants and for matters connected therewith or ancillary or incidental thereto with a view to ensuring the ecological and environmental security of the country.

Some of the sighted fauna were given protection by the Indian Wild Life (Protection) Act, 1972 by including them in different schedule. Among the Avifauna in the study area, All birds observed in the study area are protected in schedule IV as per Wild life protection Act (1972) and subsequent amendments thereof.

Among mammals; *Canis aureus* (Jackal), Common Langur, *Herpestes edwardsi* (Common Mongoose), *Vulpes bengalensis* (Indian fox), are protected in schedule –II. whereas, *Lepus nigricollis* (Black-naped hare), *Funambulus pinnati* (Palm squirrel) protected in Schedule IV and Rats protected in Schedule V.



Among the Herpetofauna, Indian Cobra (*Naja naja*), and Common Rat Snake (*Ptyas mucosa*) were provided protection as per Schedule-II of Wild life protection act, (1972) and Common Indian Krait (*Bungarus caeruleus*), Indian Toad (*Bufo parietalis*) were provided as per Schedule – IV of Wildlife protection act 1972 and as amended.

Among the Avifauna: All birds were observed in the study are included in schedule IV as per wildlife protection act.

### 3.8 SOCIO-ECONOMIC ENVIRONMENT

Information on socio-demographic status and the trends of the communities in the 10 km radius was collected through primary social survey and secondary data collection from census 2011 & District census handbook 2011. Summary of the socio-economic status of the study area is given in **Table9**. Details regarding infrastructure 2011 are presented in Table 9.

**TABLE 9**  
**SUMMARY OF SOCIO-ECONOMIC ENVIRONMENT OF VILLAGES WITHIN 10 KM RADIUS AREA**

No. of villages	64
Total households	22155
Total population	107830
Male Population	54154
Female population	53676
SC Population	20008
ST Population	4828
Total literates	68600
Total Illiterates	39230
Total workers	47707
Total main workers	31692
Total marginal workers	16015
Total non-workers	60123

Source: Primary census abstract 2011, District Raipur State Chhattisgarh..

**TABLE 10**  
**IN PERCENTAGE DETAILS REGARDING INFRASTRUCTURE FACILITIES WITHIN 10 KM RADIUS STUDY AREA**

Education	Medical	Drinking water	Drainage	Communication	Transportation	Banks/Society	Roads	Recreation	Electricity
100	38.09	100	52.38	79.36	87.30	20.63	96.82	98.41	100

Source: Primary census abstract 2011, District Raipur State Chhattisgarh..

### SALIENT OBSERVATION OF THE SOCIO-ECONOMIC SURVEY

- **House pattern:** Types of housing varied from thatched to pucca (pakka) houses 80% houses were in pucca (pakka) form 15% in semi pakka and 5% houses were observed in kaccha form
- **Employment:** Main occupation in the study area was Labour Work and Agricultural its allied activities eg. Cattle rearing, dairy farming etc. Other income generation sources of the area, small business; private jobs etc. The labours were getting daily wags in the range of 300-400 Rs, depending on type of work they set
- **Fuel:** The primary sources of cooking fuel were LPG, cow dung etc.
- **Main crops:** The principal crops grown in agricultural Commodities (first) were Paddy sugarcane, Tiwas and Vegetables etc. Manufacture commodities (first) plastic Products and Handicrafts commodities (first) Mat, fishing Net and Second Bamboo during discussion with

villagers/farmers it was revealed that crop productivity of the study area is good and two to three times multi crop production was performing in the study area.

- **Migration from other states:** During survey it was found that local population were not migrating for employment purpose, they prefer only local employment
- **Language:** Chhattisgarh the mother tongue of most of the Chhattisgadi population, Along with Chhattisgarh Hindi and English are all official languages. Hindi and English are official languages because they are official languages of India's central government. .
- **Sanitation:** Toilet facility is one of the most basic facilities required in a house. It was observed that more than 95% of the households were having toilet facilities in their houses. There was proper drainage line in the villages.
- **Drinking water Facilities:** During the survey it was observed diverse sources of drinking water supply in villages. Major source of drinking water in the study area were hand pumps, tap water and dug wells and canal. During survey people from some villages reported Water Quality are not good.
- **Education facilities:** The Primary & secondary data reveals that literacy levels in all the villages is varying from 60 to 80 %.
  - ❖ Most of the students in Villages in the study area are going to Raipur for their study which is Raipur- 28.86 KM, SW. from the plant.
  - ❖ The schools are also not having proper infrastructure facilities.
  - ❖ College facility is available in Tilda & Raipur in the study area.
- **Transportation facility:** For transportation purpose auto, jeep and private bus services were available in the study area; however villagers reported that transportation facilities were not frequently available. Private vehicles like bicycles & motor cycles were also used by villagers for transportation purpose.
- **Communication facilities:** For communication purpose mainly mobile phones, news papers & post offices were present in the villages
- **Medical facilities:** The Primary & secondary data reveals that there are only 17 nos. of Sub Health Centers & 01 nos. of PHC's in the Study area.
  - ❖ During FGD villagers made various issues in health care facilities, such as health facilities available at PHCs, Laboratory testing and Delivery facilities at Government Health Centers, availability of clean toilet and drinking water at PHCs, and distance of the nearest health center from the Village.
  - ❖ To control the spread of diseases (Malaria & Dengue cases) and reduce the growing rates of mortality due to lack of adequate health facilities, special attention needs to be given to the health care in rural areas. The key challenges in the healthcare sector are low quality of care, poor accountability, lack of awareness, and limited access to facilities.
  - ❖ It is also observed that Malnutrition is the common in most of the villages.
- **Electricity:** All villages were availing electricity facility for domestic and agriculture purposes. Solar Street lights were seen in some of the villages.
- **Market facility:** Study area was predominantly rural. In villages, small shops were available for daily need things. Weekly market facility was available in some villages. Wholesale market was available Tilda villages The basic amenities exist at all villages

- **Recreation facilities:** Television and radio are the main recreation facilities in the study area. News paper/magazine facilities are also used by villagers.

### 3.8.1 Awareness and opinion of the respondents about the project

Public opinion is the aggregate of individual attitudes or beliefs. It is very important to take opinion of the villagers about the project. The awareness will not only promote community participation but also enable them to understand the importance of the project and encourage them to express their view. To know the awareness and opinion of the villagers about the project, group discussion, meeting with school teachers/village leaders were carried out in the study area.

Almost all respondents were aware about the M/s GGIPL Project area but some respondents were unaware about the project activity. During the Site visit, the affected villages residents demanded to know the details.

- ❖ The respondents were happy to know about the project and they opined positively because the activity would definitely contribute development in the study area.
- ❖ Most of the villages Complained that Project will hamper and Damage the rain –fed irrigation system in the roject Area So they demanded Proper Drainage facilities in their repective villages
- ❖ Main demands of villagers in study area were for Pucca Roads.
- ❖ Village leaders asked to give employment opportunities to local people
- ❖ They also demanded for Water Spray by panchayat to curb down the effects of air pollution in the area due to the project.
- ❖ Main demands of villagers in study area were for medical facility and Sport Ground.
- ❖ They Demanded plantation on the both Side of the road to prevent Pollution due to the Proposed Project.

While giving information about project of M/s GGIPL respondents gave positive opinion and they strongly believe that it will help to develop quality of life in the study area with employment opportunities.

### 3.8.2 Interpretation

Socioeconomic survey was carried out to know the infrastructural activities amenities available 10 km Radius project Site. The information regarding facilities available and the opinion of the people was sought by floating questionnaires and interaction with the people. This is done for observing the impact due to the project wrt social aspects so that proper actions / measures could be taken up for the benefit of the people (economically and wrt quality of life) and the project.

During the primary survey it was observed that almost pakka road facility is available in all villages 10 km Radius project Site. The sanitation coverage has increased from 70 % in 2011 to 85 % in 2021. Literacy rate of the study region is from 63.62%. On the basis of survey for literacy rate data it is interpreted that there is need to promote educate more and more people. Almost all the villages have more than 55.75 % people as non-workers. It indicates that the problem of unemployment can be solved by providing proper training and education. There is also need to establish more industries so that maximum number of employment can be generated. Basic amenities like Education facilities Health care facilities, water supply, electric power supply, mode of transportation etc. are available in all villages.

The proposed project shall generate direct/indirect employment and indirect service sector enhancement in the region and would help in the socioeconomic upliftment of the state as well as the local area.

## 4.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

### Air Environment

The implementation of proposed project will have slight impact on the air quality due to contribution of pollutant parameters like PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>x</sub> and CO. The raw material handling plant along with proposed Sponge Iron; Power Plant; Induction Furnaces, steel melting shops and submerged arc furnaces process, will emit dust and fumes. Apart from the above, there will be fugitive dust emissions due to transportation, storage and processing of raw materials.

The mathematical Model ISCST-3, was used for predicting the GLCs, which is entirely in line with the requirement of Central Pollution Control Board, New Delhi. The maximum ground level concentrations (GLCs) for particulate matter and gaseous emission of SO<sub>2</sub>, NO<sub>2</sub> due to proposed installations were carried out. The predicted 24 hourly maximum contribution in AAQ concentrations from main process unit facilities for particulate matter, SO<sub>2</sub> and NO<sub>2</sub> are found to be 1.0 µg/m<sup>3</sup>, 4.8 µg/m<sup>3</sup> and 3.6 µg/m<sup>3</sup> occurring at a distance of about 1.4 km each respectively in SW and SSW direction and emissions from standby DG sets for particulate matter, SO<sub>2</sub> and NO<sub>2</sub> are found to be 0.34 µg/m<sup>3</sup>, 0.34 µg/m<sup>3</sup> and 5.5 µg/m<sup>3</sup> occurring at a distance of about 1.4 km each respectively in SW and SSW direction.

The resultant concentration levels (Ambient + proposed incremental) revealed that the concentration levels for particulate matter (PM<sub>10</sub> & PM<sub>2.5</sub>), SO<sub>2</sub> and NO<sub>2</sub> likely to be encountered in the operation of the project are respectively occurring at a distance of about 1.4 km each in the SW and SSW directions with a concentration levels (resultant) of 78.6 µg/m<sup>3</sup>, 32.54 µg/m<sup>3</sup>, 16.3 µg/m<sup>3</sup>, 25.3 µg/m<sup>3</sup> respectively and details are given in **Table 4.5 A**, which is well within the NAAQS levels prescribed by CPCB. Hence it is inferred that considering cumulative concentration levels, the pollution load exerted due to proposed project will be insignificant.

### Details of Air Pollution Control System

- The main pollutants discharged from the Induction Furnace, Sponge Iron Plant; Power Plant and Ferro Alloys Plants will be particulate matter. In case of power failure DG set will be used and emissions generated from DG set operation will be PM, SO<sub>2</sub> and NO<sub>x</sub>. Other gaseous emissions due to pig iron plant which is considered maximum consumption of raw material i.e. worst condition considered but all the predicted values well within the standard.
- The Particulate emission is mainly emitted out through Induction furnaces. To control air pollution company will install Bag Filters with 33 meter stack and ID/FD fan capacity to cater the future requirement to control emission less than 30 mg/Nm<sup>3</sup>.
- The emission level within 30 mg/Nm<sup>3</sup> from pig iron plant (SAF) will be controlled with 45 m height stack. Submerged Arc Furnace will be provided with Flue gas cooler and dust extraction system, ESP with Chimney.
- The emission level within 30 mg/Nm<sup>3</sup> from billet reheating furnace will be controlled with 40 m height stack. BRF will be provided with Waste heat recuperator with Wet Scrubber/Bag Filter
- The emission level within 30 mg/Nm<sup>3</sup> from AFBC boiler will be controlled Electro Static Precipitators (ESP) with a Chimney 42m and Bag Filters at Coal conveyors, lime dosing adopted for control SO<sub>2</sub> emission, and for control NO<sub>x</sub> emission Low NO<sub>x</sub> burners with 3-stage combustion, flue gas recirculation and auto combustion control system will be provided
- Water spraying will be carried out in order to control fugitive emissions in the internal open storage yards.
- Adequate dust suppression system in the form of water sprinklers shall be provided at raw material yard, temporary solid waste dump site and along the vehicular roads.

- There will be dedicated roads for vehicles carrying raw materials and products.
- Stacks will be provided with porthole and working platform so that stack monitoring can be done as per norms of statutory authority.

#### **Noise Environment:**

During the normal operation of manufacturing process noise will be generated due to Induction Furnaces, ID Fan, Blower/air Fan, Cutting/Shearing Machine, SAF process, CPP, Galvanizing unit, pipe mill and DG Set, etc. the ambient noise levels are expected to increase significantly with the attributes of the respective equipment, but this noise will be restricted close to the concerned equipment. The maximum predicted noise level within the plant boundary (0.2 km radius) is 57.5 dB (A).

The preventive measures are given below:

- Equipment should be standard and equipped with silencer. The equipment should be in good working conditions, properly lubricated and maintained to keep noise within permissible limits.
- High noise zone should be marked and earplugs shall be provided to the workmen near high noise producing equipment. The workmen should be made aware of noise and vibration impacts on their health and mandatory use earplugs.
- Proper shifting arrangement shall be made to prevent over exposure to noise and vibration.
- Tall trees with heavy foliage shall be planted along the boundary / project site / plantation area, which will act as a natural barrier to propagating noise.
- Silent DG sets shall be used at project site.
- Speed limits shall be enforced on vehicle.
- Use of horns / sirens shall be prohibited.
- Use of loud speakers shall comply with the regulations set forth by CPCB.
- Regular noise monitoring shall be carried at construction camp / project site to check compliance with prevailing rules.

#### **Water Environment**

The various control measures that will be adopted are:

- Closed circuit water system implemented in DRI Division, Ferro Alloys, SMS and power plant division. Hence there will not be any waste water generation from process and cooling in the steel plant.
- Moreover, Total wastewater generation from the WHRB and AFBC Captive power plant is 48 cum/day. The boiler blow down & DM Plant regeneration water and all other waste water will be treated in a neutralization tank and filtration system. 100% waste water will be recycled and reused. As the proposed plant will be Zero effluent discharge plant, there will not be any provision of water getting mixed with solid particulates. Total 122 KLD treated water generated through neutralization will be recycled and utilized in Coal Quenching; Dust suppression and in Ash/Slag Quenching
- Domestic waste water generated through sanitary/toilet activities will be 20 KLD. This will be treated in STP and treated water will be used for plantation purposes.
- It is proposed to install 30 KLD STP based on MBBR technology.
- Rain water harvesting will be carried out.
- All stock piles will be on pucca flooring to prevent for any ground water contamination.

## **Vehicular Movement**

All the major raw materials and finished products will be transported through covered trucks by road to the plant either from source or from nearby railway siding.

## **Biological Environment**

There is no ecological sensitive area like national park, sanctuary, biosphere reserve, within 10 km radial distance from the project site. No forest land involved in the project activities. Thus, no significant impact envisaged on biological environment.

The total plant area is 26.93 Ha. The total plantation is about 22325 nos. will be carried out on 8.93 Ha. (33.16 %) @ 2500 trees/ha, some trees shall be planted along approach road side in proposed project area. It is proposed to develop 3 - tier green belt will be planned within the plant premises.

## **Socio-economic Impacts:**

The present land use will change from agriculture to industry. Moreover, the land is mostly low fertile barren land. The Increase in direct/indirect job opportunity shall take place. Services in the locality shall be used and accordingly growth in economic structure of the area will take place.

## **5.0 ANALYSIS OF ALTERNATIVES (SITE AND TECHNOLOGY)**

### **ALTERNATIVE SITES**

The proposal is for implementation of facilities for production of Sponge Iron, MS Billet, Steel Rerolled products such as wires rods, etc., and rerolled structural steel products; Ferro Alloys or Pig Iron, Fly Ash Bricks along with captive power plant (WHRB and AFBC) as a Greenfield project.

The proposed site at Village - Madhi, Tehsil - Tilda, District - Raipur, Chhattisgarh was selected after considering a number of alternative locations.

### **SELECTION OF ALTERNATIVE TECHNOLOGY**

The entire project related activities is already discussed in **Chapter 2**. The following aspects of the project are dealing with the study of alternative technology in brief involved in each of the proposed products and choice of the technology based on environmental applicability, technical and financial viability. The selected technology is most energy efficient and least polluting as it is not based on any fossil fuel but it is based on electrical energy mainly.

## **6.0 ENVIRONMENTAL MONITORING PROGRAM**

An Environmental Management Cell (EMC) will be established for the proposed project under the control of Executive Director followed by General Manager. The EMC will be headed by an Environmental Officer having adequate qualification and experience in the field of environmental management. Environmental monitoring of ambient air quality, surface and ground water quality, ambient noise levels, etc. will be carried out through MoEF&CC accredited agencies regularly and reports will be submitted to CECB/MoEF&CC. A provision of Rs. 35.00 lakhs will be made available towards recurring cost for environmental monitoring programme.

## **7.0 ADDITIONAL STUDIES**

### **7.1 PUBLIC CONSULTATION**

The Draft EIA-EMP report for greenfield project for a DRI based Steel plant to produce Sponge Iron 198,000TPA; Mild Steel Billets 345,800TPA; Rerolled Steel Products through Hot Charging and through Reheating Furnace 342,144TPA; Ferro Alloys 35,000 TPA and/ or Pig iron 70,000 TPA from 9 MVA x 2Nos SAF; Captive Power of 20MW (12MW through WHRB and 8MW through AFBC); Pipes 150,000 TPA; Galvanizing products 100,000 TPA; and Fly Ash Bricks 34,600 TPA located at Villages - Madhi, Tehsil - Tilda, District - Raipur, Chhattisgarh State is prepared as per the TOR

issued by EAC (Industry-I), MoEF&CC, New Delhi and the report is submitted for public consultation process as per the provisions of EIA Notification 2006 and amendments thereof.

After completing the public consultation process, the points raised and commitment of project proponent during the public hearing will be incorporated in the final EIA-EMP report for final submission to Environmental Clearance.

## **7.2 RISK ASSESSMENT & DISASTER MANAGEMENT PLAN**

The assessment of risk in the proposed project has been estimated for fire, explosion and toxicity and corresponding mitigation measures are suggested in the EIA/EMP report.

Hazard analysis involves the identification and quantification of the various hazards (unsafe conditions) that exist in the project site. On the other hand, risk analysis deals with the identification and quantification of risks occurring due to the plant equipment and personnel exposed, due to accident resulting from the hazards in the plant. The occupational and safety hazards and preventive measures, process hazards and their preventive measures, and storage hazards and preventing measures are provided in details in Chapter 7 of the EIA report.

The main objective of the risk assessment study is to determine damage due to major hazards having damage potential to life and property and provide a scientific basis to assess safety level of the facility. The secondary objective is to identify major risk in manufacturing process, operation, occupation and provide control through assessment and also to prepare on-site, off site plans to control hazards.

The assessment of risk in the proposed project has been estimated for material handling, movement of Trucks/Tippers, Dust hazards, Hazards, shock hazards, etc. and corresponding mitigation measures are suggested in the EIA/EMP report.

## **8.0 PROJECT BENEFITS**

### **Proposed Social Welfare Arrangement**

The proposed project would provide development of area and consequent indirect and direct job opportunities which would finally result in improvement in the quality of life of people in the central region. M/s. GGIPL will carry community welfare activities in the following areas:

- Community development
- Education
- Health & medical care
- Drainage and sanitation
- Roads

The project proponent will comply with its obligation for CSR as per Company's Act too.

As per MoEF&CC vide its OM dated 30<sup>th</sup> September 2020 has provided that the CER value for the project would be based on Public Hearing outcome and as per the commitments made by the project promoters during the Public hearing. Thus, CER budget along with proposed physical work and time line are made in the proposal as per TOR which required considering O.M. dated 01/05/2018 and 30.09.2020 issued by MoEF&CC, New Delhi proposals regarding Corporate Environment Responsibility (C.E.R.). A CER budget of Rs.135 Lakhs will be spent.

## **9.0 ENVIRONMENTAL MANAGEMENT PLAN**

An Environmental Management Plan comprising following set of mitigation, management, monitoring and institutional measures to be taken during implementation and operation of the project, to eliminate adverse environmental impacts or reduce them to acceptable levels.

- Overall conservation of environment.
- Minimization of natural resources and water.



- Ensure effective operation of all control measures.
- Monitoring of cumulative and longtime impacts.
- Ensure effective operation of all control measures.
- Control of waste generation and pollution.

Judicious use of the environmental management will be implemented with addressing of components of environment, which will be likely affected during construction and operation of the proposed project. The Estimated capital cost required to implement the EMP for proposed project is estimated to be Rs.40.69 Crores. Some of these equipment are accounted for as Plant and Machinery and some of the civil works are accounted for as Building and Civil works. The annual recurring expenses mainly on repair; maintenance; consumable etc. will be about Rs.2.44525 crores has been allocated for implementation of the Environmental Management Plan for proposed project.

## **10.0 CONCLUSION**

The proposed project of M/s. GGIPL will be beneficial for the overall development of the nearby villages. Some environmental aspects like dust emission, noise, wastewater, traffic density, etc. will have to be controlled better than the permissible norms to avoid impacts on the surrounding environment. Necessary pollution control equipment like bag house, water sprinklers, enclosures, etc. form integral part of the plant infrastructure. Additional pollution control measures and environmental conservation measures will be adopted to control/minimize impacts on the environment and socio-economic environment of the area. Measures like development of green belt and plantation in nearby village and along transport road, adoption of rainwater harvesting/recharging in the plant and in nearby villages will be carried out. The proposed CSR/CER activities to be initiated by the industry will be helpful to improve the social, economic and infrastructure availability status of the nearby villages.

Thus, it can be concluded that with the judicious and proper implementation of the pollution control and mitigation measures, the proposed project will not add adverse pollution levels to the environment, moreover, it will be beneficial to the society and will help to reduce the demand-supply gap of steel to some extent and will contribute to the economic development of the region and thereby the country.

## **11.0 DISCLOSURE OF CONSULTANTS**

The Environmental studies for proposed project of M/s GGIPL are carried out by M/s Anacon Laboratories Pvt. Ltd., Nagpur (M/s ALPL). Anacon established in 1993 as an analytical testing laboratory and now a leading Environmental Consultancy firm backed by testing lab for environment and food in Central India region. M/s ALPL is a group of experienced former Scientists from the Government Institutions and excellent young scientist of brilliant career with subject expertise. It is recognized by Ministry of Environment & Forests, New Delhi for carrying out environmental Studies & accredited by Quality Council of India (QCI) for conducting Environmental studies having Accreditation Certificate No.: NABET/EIA/1922/RA 0150 dtd. 03 Feb 2020 Valid till September 30, 2022.