EXECUTIVE SUMMARY

1.0   INTRODUCTION

M/s. GR Integrated Steel Private Limited (hereafter referred as GRISPL) has proposed Greenfield project for a DRI based Steel plant to produce several products which included: Beneficiated Iron Ore throughput 1,200,000 TPA; Iron Ore Pellets 1,800,000TPA; Sponge Iron 198,000 TPA; Mild Steel Billets 194,040 TPA; Rerolled Steel Products through Hot Charging and through Reheating Furnace 224,070 TPA; Ferro Alloys 20,000 TPA and/ or Pig iron 40,000 TPA from 2.5 MVA x 4Nos. SAF; Captive Power of 32MW (16MW through WHRB and 16MW through CFBC); Cement (clinker grinding unit PPC, PSC or OPC) 100,000TPA and Fly Ash Bricks 138,600TPA.

As per Environmental Impact Assessment Notification dated 14th September, 2006 and subsequent amendment thereof, the Sponge Iron, Steel Melting Shop (Induction Furnace) and Ferro Alloys Plants falls under Sector 3 (a) and the AFBC based power plant falls under Sector 1 (d), Sector 2(b) Mineral Beneficiation and sector 3(b) Cement plants. The overall project activity is categorized as **Category "A"**; therefore, it will require Environmental Clearance (EC) to be obtained from Reconstituted EAC (Industry I Sector), MoEF&CC, New Delhi.

The application for prior Environmental Clearance (Form-1) for proposed project was submitted to EAC (Industry I sector), MoEF&CC, New Delhi (Online Proposal No. IA/CG/IND/236777/2021) on 1st November, 2021. The proposal was considered by the Reconstituted Expert Appraisal Committee (EAC) on 48th REAC meeting dated 12th November 2021 and ToR was granted on 29th November 2021 (vide. file no. : IA-J-11011/455/2021-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

M/s. GRISPL proposes Greenfield project for implementation of new manufacturing facilities for production of Beneficiated Iron Ore, Iron Ore Pellets, Sponge Iron, MS Billets, Steel Rerolled products, Ferro Alloys or Pig Iron; Cement Grinding Unit (PPC, PSC or OPC) and Fly Ash products along with captive power generation plant comprising of Waste Heat Recovery Boilers (WHRB) and Circulating Fluidized Bed Combustion (CFBC) Boiler along with Steam Turbine & Generator at Village- Mudpar, Tehsil- Berla, District- Bemetara (C.G.).

. 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	Iron ore Beneficiation throughput	1.2 MTPA x 1 No.	Beneficiated Iron ore	8,38,000
2	Pellet plant	0.9 MTPA x 2 Nos.	Pellets	1,800,000
3	DRI Kiln (Coal Fired)	300TPD X 2 No.	Sponge Iron	198,000
4	Induction Furnace along with CCM and LRF	Induction Furnace (15Tons X 4 Nos) and LRF (15ton x 1 No)	MS Billet	194,040
5	Hot Rolling Mill			224,070
	Hot Charging Rolling Mill	Electrical driven Rolling Mill about 514TPD	Rerolled Steel product (Wire Rod, TMT bar, Structure Steel etc.)	169,785

S. No.	Process plant	Proposed configuration of the plant	Product Name	Capacity (in TPA)
	Billet Reheating Furnace	Reheating Furnace based Rolling Mill about 164TPD	Rerolled Steel products (Rerolled Structural Steel etc.)	54,285
6	Sub-Merged Arc Furnace	Electrically operated Sub-Merged Arc Furnace 2.5Mva x 4 nos	Ferro Alloys (FeSi, FeMn, SiMn)	20,000
			And/or	
			Pig Iron	40,000
7	Captive Power Plant (Boiler and TG based)	Waste Recovery Heat Boilers (WHRB)	Captive Power	16 MW
		Circulating fluidized bed combustion (CFBC)		16 MW
8	Cement Grinding Unit	300 Tones per day	PPC, PSC or OPC	100,000
9	Fly Ash Bricks/ Block making unit	Fly Ash product making facilitites	Fly Ash Bricks/ Blocks	138,600

* Ferro Alloys Plant with 4 Nos of 2.5 MVA submerged arc furnaces will be set up to produce Mn Based Ferro Alloys or Pig Iron. Production Capacity of the same is estimated to be as follows;

a.Ferro Manganese: 40,000/ TPA or, b. Silico Manganese: 20,000/TPA or c. Ferro Silicon: 12,600/ TPA or, d. Pig Iron : 40,000/ TPA

1.2   LOCATION OF THE PROJECT

Total 45.95 Hectare land has been acquired by company for implementation of project. The proposed Greenfield project located at Kh. No. 118, 119, 120, 121, 156, 157, 158, 161, 162, 105,101,130, 13, 43, 44, 48/1, 48/3, 49, 106/1, 106/3, 106/4, 117, 122, 123/3, 123/1, 127/1, 127/3, 151/2, 48/2, 48/4, 48/5, 50/1, 50/3, 51/1, 52/5, 102, 104, 106/2, 106/5, 109, 110, 111, 114, 127/2, 127/4, 127/5, 128, 148, 149, 150, 153/1, 159, 12, 14, 45, 46, 47, 42, 50/4, 50/5, 50/6, 51/2, 52/6, 103, 107, 108, 112, 113/1, 113/2, 123/2, 124, 125, 126, 129, 151/1, 151/3, 152, 153/2 & 160 at Village- Mudpar, Tehsil-Berla, District- Bemetara (C.G.). The area is although located in the lands belonging to revenue Village- "Mudpar", Tahsil- Berla, District- Bemetara (C.G.) but the village is in border of District Durg which is an Industrially advanced district. The project site can be reached from through internal District roads which connects to SH-7 which is approx. 9.4Kms in West direction from the site.

The Site can also be reached to Nearest city Raipur and from District headquarters Bemetara through National highway namely NH-130. The project is well connected to all weather road.

Ahiwara Railway Siding district Durg is the nearest railway siding which is about 7.0 KMs in SW direction for transportation of major raw materials while Kumhari Railway Station district Durg is the nearest railway station at 21.6Kms/SE and Nearest Airport is Raipur Airport which is about 40KMs in SE direction.

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), MoEF&CC, New Delhi, baseline environmental monitoring was conducted during Post monsoon season (15th October 2021 to 15th 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.
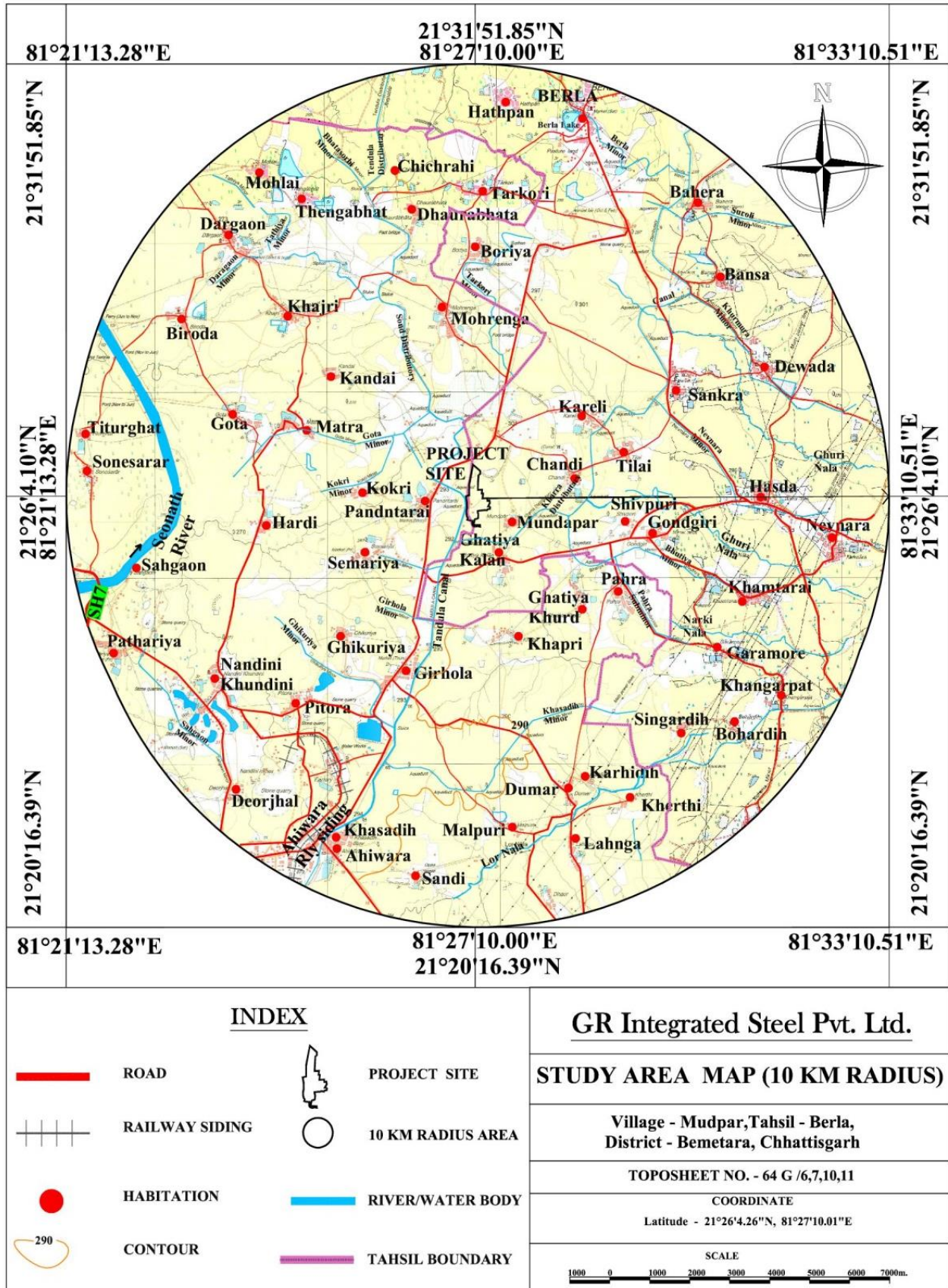
FIGURE 1: STUDY AREA (10 KM RADIAL DISTANCE)

TABLE 2
DETAILS OF ENVIRONMENTAL SETTINGS

Sr. No.	Particular	Details		
1	Plant Location	Villages – Mudpar, Tehsil - Berla, District – Bemetara (CG)		
2	Coordinates	**Point**	**Latitude**	**Longitude**
		BP1	21°26'32.31"N	81°27'5.61"E
		BP2	21°26'9.36"N	81°27'11.38"E
		BP3	21°26'2.39"N	81°27'16.40"E
		BP4	21°25'51.67"N	81°27'12.56"E
		BP5	21°25'54.04"N	81°27'0.96"E
		BP6	21°26'5.14"N	81°27'3.65"E
		BP7	21°25'47.31"N	81°27'11.15"E
3	Topo sheet no.	64G/6, 64G/7, 64G/10 & 64G/11		
4	Elevation	Min 286 m. – Max 301m.		
5	Nearest representative IMD station	IMD Raipur – 32.3 km/SE		
6	Nearest highway	1. State Highway 7- 9.4 km/W 2. NH 30 , 22.87 KM, E		
7	Nearest railway station	Ahiwara Railway siding – 7.0 km/SW Kumhari Railway Station – 21.6 km/ SE		
8	Nearest airport	Raipur Airport – 40 km/SE		
9	District Headquarters	Bemetara – 31.2 km/ N		
10	Nearest State/National boundaries	Madhya Pradesh – 75.7 km/ W		
11	Seismic Zone	Zone-II [As per IS :1893 (Part-I): 2002]		
12	Nearest major city with 2,00,000 population	Raipur - 26.0 km/SE and Bhilai City South West 26 KM		
14	Nearest village	Mudpar – 0.7 Kms/ESE		
15	Hills/valleys	None within 10 Kms		
16	Nearest tourist place	1. Nandan Van Zoo - 19.0 km/SE 2. Sangni Ghat – 15.2 km/SW		
17	Archaeologically important places	1. Swami Vivekanand Sarovar (Budha Talab), Distance - 28.4 km/ SE 2. Dev Baloda Shiv Temple : 24 KM South 3. Jain temple, Kumhari – 21.6 km/S 4. Somnath Temple : 26.5 KM North East		
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	Forest's land	Nil		
20	Defence Installations	Nil		
21	Notified ECO- Sensitive Zone	Nil		
22	Water Bodies	**S.No.**	**Name of the Water Body**	**Distance(KM)**	**Direction**
		1	Dry Water Pond (21°26'32.20"N 81°27'21.40"E)	Adjoining	NE
		2	Dry Water Pond (21°26'44.31"N 81°26'19.37"E)	1.38	NW
		3	Dry Water Pond (21°27'39.10"N 81°27'13.10"E)	2.06	N
		4	Dry Water Pond (21°27'21.97"N 81°27'58.02"E)	2.14	NE
		5	Ahiwara Talab	8.2	SSW

Sr. No.	Particular	Details			
		6	Berla Lake	8.7	NNE
		7	Shivnath River	7.1	W
		8	Sheetla Talab	9.0	SSW
		9	Nava Lake	9.6	NNE
		10	Shitala Lake	10.1	NNE
23	Nearest Industries	**S.No.**	**Name of the Site**	**Distance (KM)**	**Direction**
		1.	JK Lakshmi Cement Ltd., Ahiwara	6.1	S
		2.	Nandini Limestone Mines & Crushing Plant – Ahiwara	7.0	SW
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.*	**S.No.**	**Name of the Site**	**Distance (KM)**	**Direction**
		1	Ghatiyakala School	1.00	SE
		2	Govt. Higher Secondary School, Semariya	1.70	SW
		3	Hanuman Mandir	4.70	WNW
		4	Mini Giridpuri Satnam Dham – Gurudwara	5.30	SSW
		5	Shetal Temple Khajri	5.70	NW
		6	Sub Health Centre, Dumar	6.60	SSE
		7	Jai Maa Karokanya – temple,Berla	6.60	NNE
		8	Shree Swaminarayan Gurukul International School Raipur - Basna	6.60	NE
		9	Govt. high school dumar	6.70	SSE
		10	Durg Rajnandgaon Gramin Bank, Hasda	6.90	E
		11	Radha soami satsang beas, Kukurmuda	7.70	SSW
		12	Govt.High School Dargaon	7.80	NW
		13	Community Health Center (CHC) Girhola	8.00	SSW
		14	Health Centre, Hasda	8.00	E
		15	Govt. ITI – Berla	8.00	NE

2.0 PROJECT DESCRIPTION

2.1 PROCESS DESCRIPTION

2.1.1 Manufacturing Process of Iron Ore Beneficiation

Ore Beneficiation process is a combination of crushing, screening, washing, grinding, classifying by gravity separation, magnetic separation, floatation processes. The final concentrate slurry is filter pressed to get a dry enriched ore quality with Fe > 63% and moisture ~10%. The water is recycled in the process. The tailings are processed in a thickener & Filter pressed and the excess water will be recovered and circulated in the process. The tailings filter cake is of low value with Fe <36.5% and moisture content ~10%. This Filter cake will be stored in storage yard earmarked within the plant premises.

2.1.2 Manufacturing Process of Iron Ore Palletisation

Iron Ore Pellet Plant produces Pellets using Iron ore and additives such as limestone, bentonite, coke, anthracite coal, quartzite which are passed through balling disc/drum and the green pellets so formed are passed through a furnace either straight grate or rotary kiln to produce High Grade Pellet which are used in Steel making in Blast furnace or Direct reduction plants for steel making.

Pelletizing plant includes five processes, after Raw material receiving:

1) Pre-treatment

2) Additive and Binder proportionating and Mixing

3) Balling

4) Indurating

5) Pellet screening /HL Segregation

2.1.3 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 1000^0C to $1050\ ^0$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 iscooled to 100^0C 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.

2.1.4 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.

2.1.5 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.

2.1.6 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.

2.1.7 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.

2.1.8 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.

2.1.9 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.

2.1.10 Process and flow diagram of Cement Grinding unit (for PPC, PSC or OPC)

A) Portland Slag Cement (PSC)

- ❖ The clinker is carried to Clinker Hopper in the Cement Mill Section.

- ❖ Gypsum, after crushing, is also conveyed to a Hopper in the Cement Mill Section.

- ❖ Granulated furnace slag is dried in a slag dryer and is sent to a dry slag yard

- ❖ Clinker and Gypsum are then fed, in pre-determined proportions with the help of electronic weigh feeder in to the Cement Mill where thorough grinding takes place to produce final cement.

- ❖ Cement so produced is conveyed to large storage silos. From there cement after being conveyed is packed semi-automatically in bags for dispatch through trucks

B) Ordinary Portland Cement (OPC)

Here the clinker is finely ground along with gypsum. Clinker (95%) is cooled by air and subsequently grind with gypsum (5%) to form Ordinary Portland Cement ("OPC").

C) Portland Pozzolona Cement (PPC)

Up to 35% fly ash in activated form can be used for manufacturing blended cements as per Indian standard.

2.2 LAND REQUIREMENT

Total 45.95 Hectare land has been acquired by company for implementation of project. Green belt will be developed in 15.61 Ha. (i.e. 33.97 %). 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	19.64	42.74%
Road and Paved area	5.90	12.84%
Green Belt area	15.61	33.97%
Open Area	4.80	10.45%
Total	**45.95**	**100.00%**

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 upto nearest railway siding at Ahiwara; thereby it will be transported by Road to the proposed plant through covered truck. It is estimated that approx. 784 trips per day (1540 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 Waste generated	Qty (TPA)	Proposed Disposal Plan
Tailings (Iron Ore - 36.5% Fe)	362,000	Sold to nearby Cement plants.
Coal Ash from Pellet plant	63,000	Captive use in own Fly Ash Brick unit
Char / Dolochar (SID)	49,500	Captive use in own 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)	1,980	Captive use in Ferro Alloys Plants
Refractory & Ramming Mass waste (IF)	248	Sold to authorized recyclers
Defective Billets (IF)	1,980	Reused in own Induction furnace
Slag from Induction Furnace	35,888	Captive use in own Fly Ash Brick unit
Defective and Miss Roll (RM)	4,331	Reused in own Induction furnace
Mill Scale (RM)	2,600	Captive use in Ferro Alloys Plants
Ash from Coal firing in PG Plant (RM)	2,426	Used in own Fly Ash Brick making unit
Slag from Ferro Alloys Plant	22,105	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)	36,661	Captive use in own Cement (PSC) Unit
Total	**659,894**	

TABLE 5
HAZARDOUS WASTE GENERATION

Type of Hazardous Waste	H. W. Category (as per HWM Schedule I)	Quantity	Disposal
Waste Oil/Used Oil	5.1	6KL/annum	Will be given to authorized recycler having authorization from competent authority.
Used Lead Acid batteries		30 Nos/Annum	Will be given to authorized recycler having authorization from competent authority

2.4   WATER REQUIREMENT & SOURCE

The water requirement is estimated to be 2400 KLD.Total Yearly water requirement will be 2400 KLD * 330 days = 792,000 KLA, which will be sourced from Surface Water i.e. from Shivnath River, for which application for allotment of water has already been submitted to Chhattisgarh Water Resource Department enclosed as **Annexure –III.**

Further, the management had decided to implement a 72,000 KL Rain water collection Tank which will be able to collect sufficeint rain water during rainy days which would continously be collecting rain water during the rainy days. This extends to almost 75 days. Thus water requirement will be met through rain water collections from it for 75 days. The balnce water after the rain days will be sufficient to cater water requirement of 25 days. Therefore, it is considered that about 100 days (240,000 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 552,000 KLA.

2.5 POWER REQUIREMENT & SUPPLY

Total power requirement will be 59 MW out of which 32 MW will be met through captive power plant and 27 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. GRISPL will provide employment to 1140peoples as direct employment which includes 70 people as administrative staff and 1070 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. 44200 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 (15th October 2021 to 14th January 2022).

3.2 METEOROLOGY & AMBIENT AIR QUALITY

Summary of the Meteorological Data Generated At Site (15th October 2021 to 15th January 2022)

Predominant Wind Direction	Post monsoon season
First Predominant Wind Direction	NE (25.8%)
Second Predominant Wind Direction	ENE (18.3%)
Calm conditions (%)	1.99
Avg. Wind Speed (m/s)	2.13

The status of ambient air quality within the study area was monitored for post-monsoon season at 8 locations. All these 8 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_{10}), Fine Particulates ($PM_{2.5}$), Sulphur Dioxide (SO_2,), Oxides of Nitrogen (NO_X) 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_{10}	$PM_{2.5}$	SO_2	NO_2	CO	Ozone	NH_3
				$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	mg/m^3	$\mu g/m^3$	$\mu g/m^3$
1	Project Site (AAQ-1)	1.	Min	51.8	18.8	5.3	11.7	0.236	3.7	5.3
		2.	Max	64.6	28.4	8.3	17.8	0.311	7.8	8.3
		3.	Avg	58.5	23.6	6.4	14.8	0.276	5.8	6.7
		4.	98th	64.5	28.0	7.9	17.7	0.308	7.8	8.3
2	Mudpar (AAQ-2)	1.	Min	53.8	22.2	6.0	12.6	0.245	4.9	5.4
		2.	Max	69.5	30.0	9.7	18.8	0.351	9.3	9.8
		3.	Avg	62.2	26.5	7.5	15.8	0.302	7.2	7.5
		4.	98th	69.0	29.9	9.4	18.6	0.345	9.2	9.7
3	Girhola (AAQ-3)	1.	Min	54.8	21.3	8.2	14.7	0.270	5.7	5.7
		2.	Max	76.4	36.3	11.3	24.2	0.392	9.8	9.9
		3.	Avg	67.1	28.4	9.6	18.7	0.341	7.6	8.2
		4.	98th	75.4	35.2	11.2	23.8	0.386	9.7	9.8
4	Semariya (AAQ-4)	1.	Min	46.4	16.7	6.9	12.1	0.281	4.2	5.2
		2.	Max	66.5	27.1	10.5	21.6	0.346	8.2	8.3
		3.	Avg	57.2	21.7	8.7	17.3	0.320	6.1	6.9
		4.	98th	65.9	26.5	10.3	21.1	0.346	8.0	8.2
5	Kareli (AAQ-5)	1.	Min	50.4	17.1	5.8	12.5	0.228	4.1	4.3
		2.	Max	63.6	24.7	9.4	17.8	0.294	8.2	9.0
		3.	Avg	56.1	20.7	7.2	15.7	0.262	5.6	6.3
		4.	98th	63.4	24.1	9.1	17.7	0.293	8.0	8.6
6	Chandi (AAQ-6)	1.	Min	48.8	17.1	7.2	14.1	0.238	4.3	6.0
		2.	Max	73.4	28.4	11.8	23.4	0.352	8.8	9.5
		3.	Avg	59.4	22.6	9.2	18.1	0.296	6.3	7.6
		4.	98th	72.9	27.6	11.3	22.6	0.351	8.5	9.4
7	Kandai (AAQ-7)	1.	Min	49.5	19.6	5.8	14.1	0.249	4.0	4.7
		2.	Max	72.8	29.2	10.8	20.0	0.410	9.6	10.3
		3.	Avg	64.5	24.2	7.9	16.8	0.326	6.8	7.2
		4.	98th	72.6	28.3	10.5	20.0	0.404	9.2	9.8
8	Mehrenga (AAQ-8)	1.	Min	50.7	18.4	6.7	13.1	0.222	4.6	5.8
		2.	Max	70.6	31.3	12.0	20.8	0.339	9.4	10.4
		3.	Avg	61.5	25.2	8.9	17.5	0.286	6.5	7.7
		4.	98th	69.4	30.9	11.7	20.7	0.338	9.1	10.1
	CPCB Standards			100 (24hr)	60 (24hr)	80 (24hr)	80 (24hr)	2 (8hr)	100 (8hr)	400 (24hr)

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_{day}	Leq_{night}
Industrial Area			
N1	Project Site	51.6	38.4

Sr. No.	Location	Results_dB(A)	
		Leq day	Leq night
Commercial Area			
N2	Mundapar	56.5	41.3
N3	Pandntarai	60.4	43.6
N4	Mohrenga	58.8	42.7
Residential Area			
N5	Semariya	52.2	39.5
N6	Ghatia Kalan	53.1	40.3
Silence Zone			
N7	Kareli	48.5	38.2
N8	Chandi	47.9	37.6
Commercial Area			
CPCB Standards- dB(A)			
Commercial Area		**65**	**55**
Residential Area		**55**	**45**
Silence Zone		**50**	**40**

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

3.4 SURFACE AND GROUND WATER RESOURCES & QUALITY

3.4.1 Regional geology

10 km radius study area is mainly comprised of sedimentary rock formations, like stromatolitic limestone, shale with chert with clay bands and laterites are observed in flat areas. 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 1.2-1.9m. Outcrops are very rare in project site.

3.4.2 Hydrogeology

Entire study area is comprises of calcareous sedimentary rock formations of Proterozoic age and belongs to Chattisgarh 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 19m. 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- 4 to 11.5 m bgl
Post-monsoon water levels: 1.5 to 5.50 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 6.98 – 7.76. The TDS was ranging from 236 – 565 mg/l. Total hardness was found to be in the range of 118 – 364 mg/l. The fluoride concentration was found to be in the range of 0.20 – 0.90 mg/l. The nitrate and sulphate were found in the range of

11.46 – 36.25 mg/l and 20.44 – 52.98 mg/l respectively. The chloride concentration was found in the range of 40.12 to 152.0 mg/l. The Total suspended solid concentration was found below detection limit (DL -10mg/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 0.04 to 0.24 mg/l. Heavy metals content (i.e. As, Al, Cd, Cr, Cu, Pb, Mn, Zn and Hg) were found to be below detection limit and within specified standards.

Sr. No.	Locations	WQI	Quality	Remark
1	Project site-	52.01	Good	
2	Mundapar	56.90	Good	
3	Pandntarai	53.99	Good	**Water quality assessed based upon above physico-chemical parameters and samples were found to be physico-chemically good and excellent.**
4	Semariya	79.59	Good	
5	Kareli	47.36	Excellent	
6	Chandi	46.09	Excellent	
7	Ghatia Kalan	58.75	Good	
8	Mohrenga	53.91	Good	

B. Surface Water Quality

The analysis results indicate that the pH ranged between 7.36 – 7.94 which is well within the specified standard of 6.5 to 8.5. The pH of water indicates whether the water is acid or alkaline. The TDS was observed to be 248 – 562 mg/l which is within the permissible limit of 2000 mg/l. The total hardness recorded was in the range of 124.8 – 345.6 mg/l as $CaCO_3$ which is also within the permissible limit of 600 mg/l. The levels of chloride and sulphate were found to be in the range of 13.25 – 83.51 mg/l and 6.48 – 87.94 mg/l respectively.

DO is reported value of range of 5.9 – 6.5 mg/l. Phosphorus (as PO_4) concentration was found to be in the range of 0.23 – 0.38 mg/l. COD ranges from 7.68 –27.64 mg/l and BOD ranges from BDL (DL-2) – 9.14 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 15th Nov 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°20'13.72"N to 21°31'52.714"N latitude and 81°21'18.982"E to 81°33'09.536"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

Sl. No.	Level-I	Level-II	Area (Sq. Km)	Percentage (%)
1	Built-up land	Settlement	33.26	10.58
		Industrial Settlement	6.89	2.19
		Road Infrastructure	3.28	1.04
2	Agricultural Land/ Crop Land	Single Crop	177.23	56.35

Sl. No.	Level-I	Level-II	Area (Sq. Km)	Percentage (%)
		Double Crop	42.2	13.42
4	Scrubs/Wastelands	Barren Land	6.88	2.19
		Land with scrub/Open Scrub	18.21	5.79
5	Waterbodies	River/Nala/Stream	12.41	3.95
		Pond/Tank	9.85	3.13
6	Others	Mining/Stone Quarry	4.28	1.36
		Total	**314.49**	**100**

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 1.521 - 1.716 g/cc which indicates favourable physical condition for plant growth. The water holding capacity is between 30.96 - 34.23%. Infiltration rate, in the soil is in the range of 18.51 – 24.41 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 (7.08-7.26) in reaction. Electrical conductivity, a measure of soluble salts in the soil is in the range of 215.10 – 320.24 µS/cm. The important soluble cations in the soil are calcium and magnesium whose concentration levels ranged from 205.05 – 266.08 mg/Kg and 55.12 – 125.08 mg/Kg respectively. Chloride is in the range of 66.11 – 264.08 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 152.29 – 182.69 kg/ha (quality better), 31.73 – 50.36 kg/ha (quality medium) and 39.36 – 112.39 kg/ha (quality very less), respectively, and organic carbon ranging from 1.20% – 1.98%.

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 98 floral species were observed in the study area. The details about the floral composition are as follows.

a. **Trees:** Total 44 species were found in the study area

b. **Shrubs (small trees):** Total 30 species were enumerated from the study area.

c. **Herbs:** In the study area 13 species were observed.

d. **Bamboo & Grasses:** 07 species were enlisted from the study area

e. **Climbers and Twiners:** Total 03 species of climbers/ twiners were recorded in the study area.

f. **Parasite :** Each 1 species enlisted in the area

RET (Rare, Endangered and Threatened species) STATUS

According to IUCN Status report 2013 out of total 98 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 82 faunal species was recorded through primary and secondary sources. Out of which 8 species belongs to class mammalian, 10 species belongs to class Reptelians and Amphibians, 45 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 17th 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 Avifuana 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), 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 caerulus), Indian Toad (Bufo parietalis) were provided as per Schedule – IV of Wildlife protection act 1972 and as amended. The details faunal lists provided in Annexure VI C.

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 hand book 2011. Summary of the socio-economic status of the study area is given in **Table 9**. Details regarding education and infrastructure facilities 2011 are presented in **Table 10** respectively

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

No. of villages	52
Total households	15047
Total population	74529
Male Population	37258
Female population	37271

SC Population	20660
ST Population	3155
Total literates	45572
Total Illiterates	28957
Total workers	36795
Total main workers	26160
Total marginal workers	10635
Total non-workers	37734

Source: Primary census abstract 2011, District Durg 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	48.08	100	42.31	80.77	76.92	15.38	98.08	82.69	100

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

SALIENT OBSERVATION OF THE SOCIO-ECONOMIC SURVEY

➢ **Employment:** The agricultural related activities are the main occupation in the study area. Farming and agricultural activities generates the maximum employment in the study area. In Berla Tehsil and Durg District agricultural related workforce is predominant in the villages of study area. Male and female equally counts its growth. Agricultural related activities are generally seasonal. Therefore, these agricultural workers may not be employed during all seasons. The services of agricultural labourers can be potentially utilized for the construction phases of the project and also Labour Work While Fishing 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 350-450 Rs, depending on type of work they set.

➢ **Fuel:** The primary sources of cooking fuel were LPG, cow dung etc.

➢ **Main crops:** About 60% of the study area, as per site survey, belongs to the agricultural land category. Both (Rabi and Kharif) type of cropping practice is prevailing in this area. The main crop of the study area is paddy. The other crops grown in the study area are wheat, jowar, maize, kutki, arhar, chana, moong, urad, tiwara, soyabeen, sugarcane, groundnut, vegetables and fruits. People are either working as agricultural labour or as cultivators. Agro-climatic condition of the area provide a range of potentialities for growing cash crops like off seasonal vegetable i.e. Tomato, chilly, brinjal, tomato, potato, Radish, bitter guard and fruits. Most of the agricultural land in the study area is rain fed. While discussion with villagers it was revealed that per acre paddy production was 10-12 quintal.

➢ **Migration from other states**: During survey it was found that local population were not migrating for employment purpose, they prefer only local employment

➢ **Sanitation:** Toilet facility is one of the most basic facilities required in a house. It was observed that more than 90% 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 the survey, people of some villages reported water scarcity during the summer season.

➢ **Education facilities**: The Primary & secondary data reveals that literacy levels in all the villages is between 60 to 80 %. Most of the students in Villages in the study area are going to Berla and

Dhamdha. The schools are also not having proper infrastructure facilities. Government college facility is available in the study area in Gondgiri.

- **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.

- **Road connectivity**: Most of the roads were pucca and the very few pucca roads were badly in need of repair and maintenance. More than half the households reported that roads they frequently used were semi pucca

- **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 11 nos. of Sub Health Centers & 1 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.

- **Electricit**y: 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 Semaria villages The basic amenities exist at most of villages

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

- **Improved Standard of Living** Employment opportunities created by the project will increase income and therefore improve the overall standards of living in the area. Increase in surrounding land value the value of land around project has already increased significantly with the announcement of the project. It is expected that the value of surrounding land will further enhance once the implementation of project starts Villagers around the project site will reap the benefit of enhanced value of the land the project will also bring in many workers of different categories who will be looking for accommodation outside the project boundary. Local people will have continuous source of earning by letting out their house for accommodation to these families.

3.7.1   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 there 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 G.R. Integrated Steel Private Limited Project area but some respondents were unaware about the project activity.

Major problems in study area are employment opportunities, Water, Medical, and Irrigation facility. Village leaders suggested the development in needy areas which will improve village conditions.

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

3.7.2 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.

The pakka road facility is available in almost villages 10 km Radius project Site. The sanitation coverage has increased from 60 % in 2011 to 90 % in 2021. Literacy rate coverage has increased from 61.15 % in 2011 to 80% in 2021%. 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 50.63 % 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 most of 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_{10}, $PM_{2.5}$, SO_2, NO_X and CO. The raw material handling plant along with proposed Sponge Iron; Power Plant; Induction Furnaces, steel melting shops and submerged arc furnaces process, cement grinding 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_2, NO_2 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_2 and NO_2 are found to be 2.4 µg/m^3, 5.6 µg/m^3 and 5.2 µg/m^3 occurring at a distance of about 1.4 km each respectively in SW and WSW direction and emissions from standby DG sets for particulate matter, SO_2 and NO_2 are found to be 0.19 µg/m^3, 0.19 µg/m^3 and 3.2µg/m^3 occurring at a distance of about 1.4 km each respectively in SW and WSW direction. No significant incremental concentration was found due to proposed installation activities.

The resultant concentration levels (Ambient + incremental) revealed that the concentration levels for particulate matter (PM_{10} & $PM_{2.5}$), SO_2 and NO_2 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 WSW directions with a concentration levels (resultant) of 68.9 µg/m^3, 28.5 µg/m^3, 16.1 µg/m^3 , 26.8 µg/m^3 respectively and details are given in **Table 4.5** & 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.

The mitigation measures adopted are:

- The main pollutants discharged from the Induction Furnace, Sponge Iron Plant; Power Plant and Ferro Alloys Plants, cement grinding unit, pellet plant 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_2 and NOx. 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/Nm³.

- The emission level within 30 mg/Nm3 from pig iron plant (SAF) will be controlled with 38 m height stack. Submerged Arc Furnace will be provided with Flue gas cooler and dust extraction system, ESP with Chimney.

- Particulate matter at Cement grinding unit will be maintained less than 30 mg/Nm³. 3 Sets of Bag Filter will be installed with Chimney 30m

- 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, Cement Mill, Ball Mill, SAF process, CPP 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 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 Iron ore beneficiation, Iron ore Palletization Plant 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 225 cum/day. The boiler blow down & DM Plant regeneration water treated in a neutralization tank. As the proposed plant will be Zero effluent discharge plant, there will not be any provision of water getting mixed with solid particulates. Total 225 KLD treated water generated through neutralization will be recycled and utilized in Dust suppression and in Ash/Slag Quenching

- Total wastewater generated from process and domestic will be 225 KLD including SID, beneficiation, CPP, Induction plant, Rolling mill, ferro alloy plant, will treated through neutralization and used for dust suppression, and ash quenching.

- Domestic waste water generated through sanitary/toilet activities will be 46 KLD. This will be treated in STP and treated water will be used for plantation purposes.

- It is proposed to install 51 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 roadto 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 45.95 Ha whereas greenbelt area of 15.61Ha. (33.97 %) will be kept for the proposed project with local species with broad leaves and higher canopy and fast growing tree species. The proposed plantation within plant premises will be 39025 nos. undertaken (considering @ 2500 trees/ha). It is proposed to developed 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 company was offered a number of locations near to Siltara, Raipur. But these sites were not found suitable as there was not enough source of water for the project requirement. Also these lands were just within 30 Kilometers radius from Raipur City. Siltara region has been considered as severally polluted area hence the further sponge iron and coal based activity are restricted by State Govt. of CG.

The company had to choose the available land near to Bemetara region which is a newly formed district. Further, as per Chhattisgarh State Industrial Policy 2019-24, the area is categorized under Backward Area and the State is promoting investments in the said District to uplift the Backward District.

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 a DRI based Steel plant to produce Beneficiated Iron Ore throughput 1,200,000TPA; Iron Ore Pellets 1,800,000TPA; Sponge Iron 198,000TPA; Mild Steel Billets 194,040TPA; Rerolled Steel Products through Hot Charging and through Reheating Furnace 224070 TPA; Ferro Alloys 20,000 TPA and/ or Pig iron 40,000 TPA from 2.5 MVA x 4 Nos SAF; Captive Power of 32 MW (16 MW through WHRB and 16MW through CFBC); Cement (PPC, PSC or OPC) 100,000 TPA and Fly Ash Bricks 138,600 TPA located at Villages - Mudpar, Tehsil- Berla, District- Bemetara, 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. GRISPL 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[th]Septmber 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 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. 221 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.43.751 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.2.4453 crores has been allocated for implementation of the Environmental Management Plan for proposed project.

10.0   CONCLUSION

The proposed project of M/s. GRISPL 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 GRISPL 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.