

EXECUTIVE SUMMARY OF DRAFT EIA-EMP REPORT

For

EXPANSION PROJECT TO PRODUCE MS BILLETS 3,20,000 TPA, REROLLED STEEL PRODUCTS 3,38,000 TPA (THROUGH HOT CHARGING 1,88,000 TPA; AND THROUGH REHEATING FURNACE FROM EXISTING 30,000 TPA TO 1,50,000 TPA); MS BLACK PIPE (30,000 TPA TO 2,10,000 TPA); GALVANIZING PLANT (51,000 TPA TO 1,00,000 TPA) WITH ADDITION OF SAF - 3.6 MVA (TO PRODUCE SIMN/FEMN/FESI/PIG IRON)

LOCATED AT

Village - Raikheda, Tehsil - Kharora, District - Raipur (C.G.)

Terms of Reference File No. IA-J-11011/255/2023-IA-II(IND-I) dated 29th Sep 2023
Category A, Schedule 3 (a) Metallurgical Industries (Ferrous & Non-Ferrous),
Baseline Monitoring Period: Pre-Monsoon Season (1st March 2023 to 31st May 2023)

PROJECT PROPONENT

M/s. Blackrock Steel & Power Private Limited

ENVIRONMENTAL CONSULTANT



M/s. ANACON LABORATORIES PVT. LTD., NAGPUR

QCI - NABET Accredited EIA Consultant for
3 (a) Metallurgical Industries (Ferrous & Non-Ferrous)

MoEF&CC (GOI) Recognized Laboratory

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Report No. ANqr /PD/20A/2023/230

OCTOBER - 2023

EXECUTIVE SUMMARY

1.0 INTRODUCTION

M/s. Blackrock Steel and Power Private Limited (hereafter referred as BSPPL) has proposed Brownfield project for implementation of new manufacturing facilities for production of MS Billets, Hot-rolled Steel Rerolled products, Ferro Alloys (SiMn/FeMn/FeSi/Pig Iron); along with expansion of Reheating Furnace based Rerolling Mill, MS Black pipe mill; Galvanizing unit. The proposed expansion project activities will be carried out within existing plant premises of 4.51 Ha.

As per Environmental Impact Assessment Notification dated 14th September, 2006 and subsequent amendment thereof Steel Melting Shop (Induction Furnaces, with CCM) falls under S. No. 3(a) of schedule EIA Notification 2006. The overall project activity is categorized as **Category “A”**; therefore, it will require Environmental Clearance (EC) to be obtained from EAC (Industry –I), MoEFCC, New Delhi.

The application for prior Environmental Clearance (Form-1) for proposed expansion project was submitted to EAC, MoEF&CC, New Delhi (Online Proposal No IA/CG/IND1/435159/2023 dated 28.07.2023). The ToR was granted for proposed expansion by EAC (Industry – I), MoEF&CC, New Delhi vide file no. IA-J-11011/255/2023-IA-II(IND-I) on dtd. 29th September 2023.

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 Change (MoEF&CC), New Delhi and the Consent for Establishment from the Chhattisgarh Environment Conservation Board (CECB) for the proposed expansion project.

1.1 IDENTIFICATION OF PROJECT

M/s. BSPPL has proposed expansion of production of Mild Steel Billet 320,000TPA and/or Rerolled Steel Products through Hot Charging 188,000 TPA; Rerolled Steel Product through Reheating Furnace from existing 30,000TPA to 150,000 TPA; MS Black Pipe Mill from existing 30,000TPA to 140,000 TPA; Galvanizing plant from existing 51,000TPA to 100,000 TPA; Ferro Alloys (SiMn/FeMn/FeSi/Pig Iron) from Submerged Arc Furnace of 3.6 MVA in an area of 4.51 Ha. at Raikheda Village, Tehsil Kharora, District Raipur (Chhattisgarh). The proposal is to seek Environment Clearance based on energy efficient as well as proven technology process.

**TABLE 1.1
EXISTING AND PROPOSED CAPACITY DETAILS OF THE PLANT**

S. No.	Details	Existing Capacity (TPA)	Proposed Addition in Capacity(TPA)	Final Capacity after Expansion\ (TPA)
1	Induction Furnace along with CCM		3,20,000	3,20,000
2	Hot Rolling Mill	30,000	3,08,000	3,38,000
	(i) Hot Charging based		1,88,000	1,88,000
	(ii) Billet Reheating Furnace	30,000	1,20,000	1,50,000

S. No.	Details	Existing Capacity (TPA)	Proposed Addition in Capacity(TPA)	Final Capacity after Expansion\ (TPA)
3	Pipe Mill	30,000	180,000	210,000
4	Sub-Merged Arc Furnace			
	Ferro Alloys (SiMn)		7,000	7,000
			And/or	
	Ferro Alloys (FiMn)		9,000	9,000
			And/or	
	Ferro Alloys (FeSi)		4,000	4,000
			And/or	
	Pig Iron		14,000	14,000
5	Galvanizing unit (GI Pipes & other galvanized products)	51,000	49,000	1,00,000
6	Fabrication Steel	90,000		90,000

1.2 LOCATION OF THE PROJECT

The proposed expansion project activities will be carried out over an area of 4.51 Ha. (industrial diverted land). The proposed plant is located at Khasara No. 42, 43/3, 43/3, 43/6 and 43/7, Raikheda Village, Tehsil Kharora, District Raipur, State Chhattisgarh. The Site can be reached to Nearest city Raipur through National highway namely NH-130B at 6.5 Kms in SSE direction through connecting road Tilda - Simga. Nearest airport is Swami Vivekananda International Airport, Raipur– 31.41 KM, South South West direction. The nearest railway station is Baikunth Railway station - 7.30 Km in North West direction and Siliari Railway Station - 8.93 Km, West South West direction.

1.3 EIA - EMP REPORT

As per Standard ToR obtained from EAC (Industry – I), MoEF&CC, New Delhi, baseline environmental monitoring was already conducted during Pre - Monsoon Season (15th March 2023 – 15th June 2023) 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 1.1**). The observations of the studies are incorporated in the EIA-EMP report. Impacts of the project activities during construction and operation stages were identified and duly addressed in the EIA- EMP report.

EIA - EMP report along with the proposed management plan to control/ mitigate the impacts. Environmental Management Plan is suggested to implement the pollution control in the project.

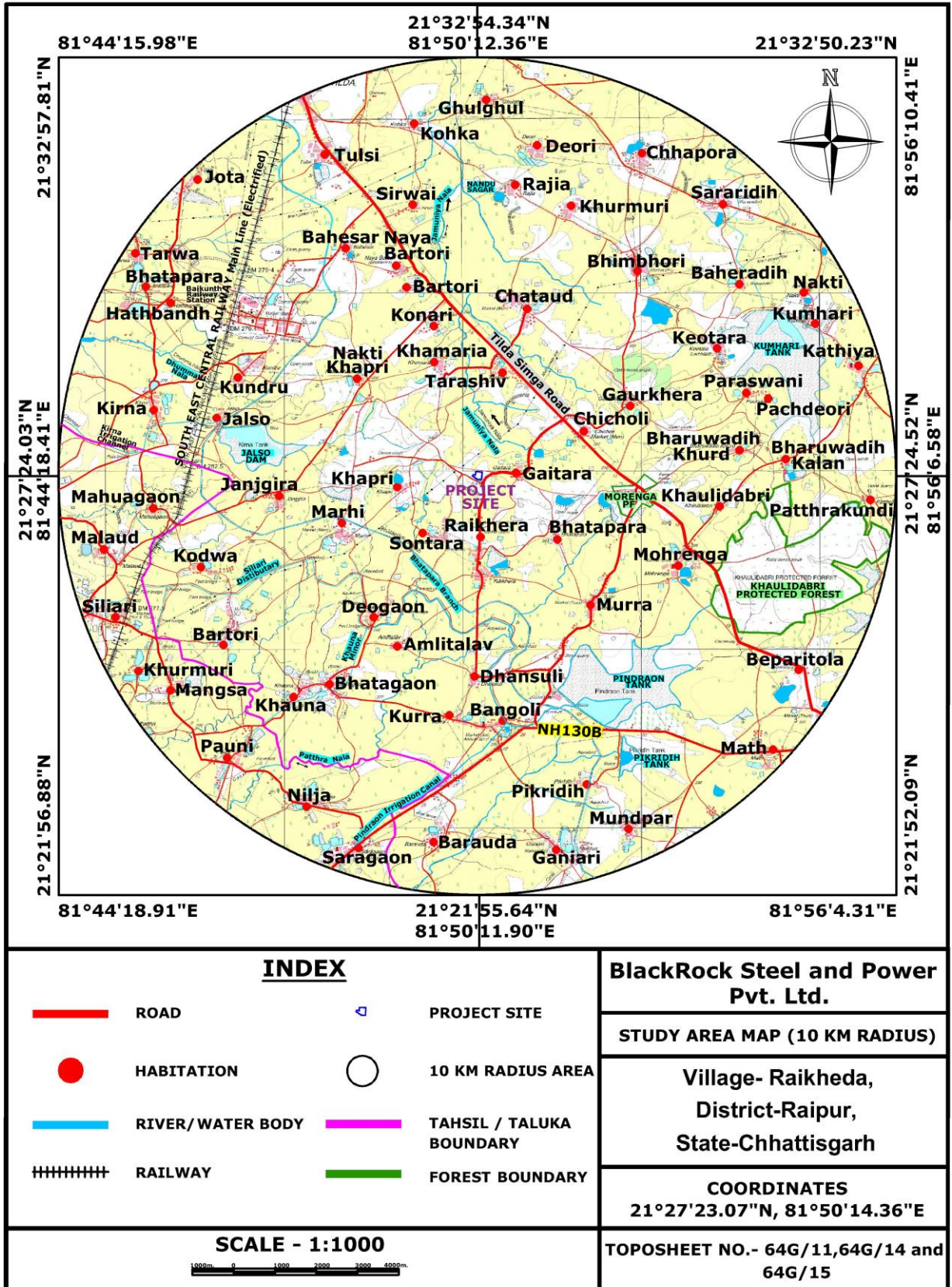


FIGURE 1.1: STUDY AREA (10 KM RADIAL DISTANCE)

TABLE 1.2
DETAILS OF ENVIRONMENTAL SETTINGS

Sl.	Particulars	Details		
1.	Project Location	Khasra No. 42, 43/3, 43/3, 43/6 and 43/7, Village Raikheda, Tehsil Kharora, District Raipur, State – Chhattisgarh		
2.	Registered Office	306-A, 3rd floor, Dolphin Chamber New Cloth Market, Pandri, Raipur (C.G.)		
3.	Geographical Locations	Points	Latitude	Longitude
		01	21°27'26.11"N	81°50'7.90"E
		02	21°27'25.66"N	81°50'9.32"E
		03	21°27'28.04"N	81°50'10.16"E
		04	21°27'27.96"N	81°50'15.56"E
		05	21°27'21.84"N	81°50'15.55"E
		06	21°27'19.11"N	81°50'15.34"E
		07	21°27'23.29"N	81°50'9.50"E
		08	21°27'21.75"N	81°50'8.45"E
09	21°27'23.14"N	81°50'5.94"E		
4.	Toposheet No.	64G/11, 64G/14 and 64G/15		
5.	Climatic Conditions	Mean annual rainfall is 1252.8 mm Temperature: Pre monsoon 20.60 C (Min.) 41.70 C (Max.) : Winter 13.30 C (Min.) 31.00 C (Max.) : Post monsoon 17.30 C (Min.) 31.80 C (Max.) Source: IMD, Raipur		
6.	Nearest representative IMD station	IMD Raipur - 32.71 Km/SW		
7.	Land Form, land Use and Ownership	The land is existing industrial land; total involved land is 4.51 Ha. Proposed addition of 1.42 ha land. Greenbelt area 33% (i.e., 1.5 Ha.) will be kept unchanged. The land already diverted to industrial purpose.		
8.	Site topography	Project site located at min. 319 m, max. 328 m (above MSL)		
9.	Nearest roadway	1) Road Connecting Raikheda to Gaitara-0.06km/E 2) Tilda Simga Road - 2.45 Km/NE NH130B - 6.5 Km/SSE		
10.	Nearest Railway Station	1) Baikunth Railway station - 7.30 Km/NW Siliari Railway Station - 8.93 Km/WSW		
11.	Nearest Air Port	<ul style="list-style-type: none"> Swami Vivekananda International Airport, Raipur, Atal Nagar-Nava Raipur, Chhattisgarh -31.41 Km/SSW 		
12.	Nearest Port	1) Gopalpur Port - 403.72 Km/SE Paradeep Port - 520.17 Km/ESE		
13.	Nearest lake	NA		
14.	Nearest State/National Boundaries	1) Madhya Pradesh-108.93Km/NW 2) Maharashtra-120.90Km/SW 3) Odisha-82.33Km/SE		
15.	Nearest major city with 2,00,000 population	Raipur - 23.83 Km/SW		
16.	Nearest village/major town	<ul style="list-style-type: none"> Gaitara - 0.73 Km/E Raikheda - 1.5 Km/S 		

Sl.	Particulars	Details			
17.	Hills/valleys	Nil			
18.	Nearest tourist place	Pt. Lakhan Lal Mishra Reservoir (Pendraavan) 5.23km SE Bajrang Garden 8.03km NW Elephant Garden 6.15km NW Baikuntheswar Temple 6.31km NW Indira Priyadarshini Nature Safari, Raipur 6.21km ESE Jheel Garden 6.60km NW Mohrenga Nature Safari Watch Tower 7.90km ESE			
19.	Archaeologically important places	Nil			
20.	Nearest Reserved/ Protected forests	Khaulidabri Protected Forest - 6.23 Km/ESE Morenga PF - 3.22 Km/E			
21.	Nearest water bodies	Sr. No.	Name	Distance (Km)	Direction
		1	Jalso Dam	4.8	WNW
		2	Pindraon Tank	5.23	SE
		3	Kumhari Tank	7.55	ENE
		4	Nandu Sagar	7.17	NNE
		5	Pikridih Tank	7.45	SW
		6	Jamuniya Nala	1	NE
		7	Patthra Nala	4.60	SSW
		8	Dhumma Nala	6.82	WNW
		9	Bhatapara Branch	2.39	SW
		10	Pindraon Irrigation Channel	6.95	S
		11	Siliari Distributary	3.17	SSW
		12	Khauna Minor	4.62	SSW
		13	Kirna Irrigation Channel	6.78	WNW
22.	Nearest Industries	Sr. No.	Name	Distance (Km)	Direction
		1	Adani GMR Chhattisgarh Power Project	1.30	ESE
		2	BPCL LPG Bottling Plant, Raipur	1.38	NNW
		3	Baikunth Cement Works Unit of Ultratech Cement	6.76	SSE
		4	Shri Bajrang Power & Ispat Ltd. (Tilda division)	8.35	WSW
		5	Aditya Birla Renewables Pvt. Ltd.	6.07	NNW
		6	Avinash Solar Plant Gaurkheda	3.53	NNW
		7	Passive Infra Project Private Limited	8.54	NNW
		8	Shri Bajrang Power & Ispat Ferro Plant	8.02	NNE
		9	Aakar Polyplast Pvt. Ltd.	7.43	SSE
		10	Shree Hardeo Industries	7.86	NW
		11	Tirupati Balaji Foods Pvt. Ltd.	8.64	SE
		12	Nakoda Pipe Impex	2.44	E

Sl.	Particulars	Details			
		13	Godrej Agrovet Ltd.	3.97	N
		14	Umashree Rice Mills Pvt. Ltd.	7.16	N
		15	Sarda Dairy Kharora	8.86	NNE
		16	Salasar Pipes Pvt. Ltd. - Unit 2	3.71	NW
		17	Agrawal Oil Extractions Ltd.	7.82	NW
		18	Chaitanya Solvex Pvt. Ltd.	6.79	
		19	Hector Pipes	2.45	
		20	Arvind Inorganics Pvt. Ltd. Works	1.92	
		21	Ecorex Buildtech Pvt. Ltd.	4.61	
		22	Bebo Agree Processing Unit - Rice mill	3.87	
		23	Mahamaya Stone Pvt. Ltd. (Crusher Plant)	4.68	
		25	Ramdoot Stones Pvt. Ltd.	5.11	
		26	Arogya Knitting Pvt. Ltd.	4.76	
		29	Century Cement Limestone Mine	6.46	
23.	Areas occupied by sensitive man- made land uses (hospitals, schools, places of worship, Universities, Community Hall etc.)	EDUCATIONAL INSTITUTIONS			
		Sr. No.	Name	Distance (Km)	Direction
		1	Amity University, Raipur	8.77	SE
		2	AAFT University	8.73	SE
		3	Carmel Public School	9.78	NNW
		4	Century Cement College Baikunth (Raipur)	6.27	WNW
		5	ICAR-National Institute of Biotic Stress Management - Research Institute	8.47	SSW
		6	The Aditya Birla Public School Baikunth, Raipur	6.16	WNW
		7	Satyanarayan Agrawal Art & Comm. College Kohka Tilda	9.87	NNW
		8	Helping Hands School	9.11	SE
		9	Government Higher Secondary School Tandwa	8.70	WNW
		10	Professional Institute of Engineering & Technology	7.43	SSE
		11	Late Ramprasad Dewangan Govt. College Kharora	9.47	SE
		12	Govt. Higher Secondary School, Mohrenga	5.12	ESE
		13	ABC Public School	8.42	SSW
		14	Rashtriya Higher Secondary School Chhatod	4.11	NNE
		15	Middle School Bahesar	7.36	NNW
		16	Govt Hr Sec School Bangoli	6.27	SSE
		17	Govt School Raikheda	1.40	S

Sl.	Particulars	Details			
		18	Primary School Ghulghul	9.83	NNE
		19	Govt. High School Tarashiv	2.51	NE
		20	Primary School Bhibhauri	6.57	NE
		21	Aadarsh Government Higher Secondary School	7.74	WNW
		22	Primary School Khamhariya	3.0	NNW
		23	Primary school Dhansuli 1 -	5.01	S
		24	Bapu ji vidya mandir	7.37	NNE
		25	Primary School Pachdeori	7.18	ENE
		26	Dr. K.C. Baghel Hr. Sec. School Silyari	9.55	WSW
		27	Govt. Primary School Ganiyari	9.95	SE
		28	Govt H.S. School Saragaon	9.74	SSW
		29	Government Primary School Tandwa	9.46	NW
HOSPITALS					
		Sr. No.	Name	Distance(Km)	Direction
		1	Praathmik Swaasthya Kendra Bangoli	6.30	SSE
		2	Maa Mahamaya Medical Raikheda	2.17	SSW
RELIGIOUS PLACES					
		Sr. No.	Name	Distance (Km)	Direction
		1	Radha Krishna Temple	7.39	NNE
		2	Banjari Mata Mandir GSP	4.58	NE
		3	Shiv Mandir Gaitra	0.97	ENE
		4	Bamleshwari Temple	9.52	ENE
		5	Mehar Vanshi Sankat Mochan Mandir	7.75	SSE
		6	Ma Sharda Temple	6.01	SSE
		8	Radha Krishna Temple	1.98	WNW
		9	Ranbaur Mata Temple	5.40	WNW
		10	Government Higher Secondary School Tandwa	8.68	NW
		12	Baikuntheswar Temple	6.31	NW
COMMUNITY PLACE					
		Sr. No.	Name	Distance (Km)	Direction
		1	Khauli Dabri - Village Hall	5.74	ESE
		2	Baikunth Cement Works Play Ground	6.40	NW
24.	Seismic zone	The project site falls in Zone-II as per IS 1893 (Part-I): 2002. Hence, seismically it is a stable zone.			

2.0 PROJECT DESCRIPTION

2.1 PROCESS DESCRIPTION

2.1.1 Manufacturing Process of Steel Melting Shop with CCM and Hot Charging Rolling Mill

- Induction Furnaces with medium power input capacity 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 for analysis from raw material storage.
- Then the Raw Mix is gradually fed in crucible for melting and the generated slag is regularly removed during the progress of melting . Necessary alloying ingredients like Ferro Manganese, Ferro Silicon etc. are added by weight after the melting of charge and de-slagging of charge is completed, This way Melting of steel along with other alloying element is accomplished in the crucible of coreless M.F. Induction Furnace
- 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 is proposed.

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.

2.1.2 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 with Pulverized Coal firing or Hot Producer Gas. Steel Pieces are rolled through all stands in order to get required shape of finished goods.

2.1.3 Manufacturing Process of Pipe Mill

Steel Pipes/Tubes are manufactured from mild steel sheets/ stripes etc. The sheet/ strips etc. will be cut into the required size. Then passes through a series of drive forming and fin rolls and takes the required circular shape and is welded continuously by passage of an electric current of high frequency across the abutting edges.

The steel pipes tubes formed and welded pass through the sizing sections. The tubes are then end deburred and pressure tested. The final product will be cut in required size and dispatch to market.

2.1.4 Manufacturing Process of Galvanizing Unit

- 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

Acid fumes Recovery system: Acid fumes would be collected through fume extraction system proposed. Acid recovery unit will be setup in pickling unit of Galvanizing section.

2.1.5 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.

2.2 LAND REQUIREMENT

The total project area for expansion is 4.51 Hectare. Greenbelt area 33% (i.e., 1.5 Ha.) including 0.48 ha additional area. The land already diverted to industrial purpose. Sufficient flat land, free from major undulations and sparse vegetation is available within the plant premises. The detail of land use planning in the project area is provided as follows:

TABLE 2.1
AREA STATEMENT

Sr. No.	Particulars	Area (In Ha.)	% After Expansion
1.	Built-up Area	1.80	40
2.	Road and Paved	0.50	11
3.	Greenbelt	1.50	33
4.	Open Area	0.71	16
	Grand Total ::	4.51	100.00

2.3 RAW MATERIALS REQUIREMENT, SOURCE & MODE OF TRANSPORT

The raw material required for the project is Iron Ore; Coal; Lime stone/Dolomite/ Refractory Material; sponge iron, CI/ Pig Iron Heavy Scrap; Ferro Alloys, Aluminium, Fluorspar. Some of these raw materials are readily available within 100 km radius and these will be transported through covered trucks. But Bulk Material like Iron Ore; Coal etc. are proposed to be brought by Rail upto nearest railway siding and thereby transported to plant site through covered truck.

Solid and Hazardous Waste Generation

The total estimated solid waste generation (including existing and proposed expansion) will be 119687.00 TPA and 4 KLA Haz. Waste in the form of Waste oil/ Used oil. It will be given to authorized recycler having authorization from competent authority. The generated Coal Ash from Rolling Mill will be sold to nearby Brick making units or cement plants; Refractory waste, Refractory & Ramming Mass waste Slag Sold to authorized recyclers; Defective Billets, Defective and Miss Roll, MS scrap from Pipe mill will be Used as melting/Re Rolling scrap in own plant/Sold outside to Rerolling mills; Mill Scale will be Sold to Ferro Alloys / Pellet Plants and Slag from Induction Furnace will be given/ sold to nearby metal recovery units.

2.4 WATER REQUIREMENT & SOURCE

Total water requirement (existing + proposed expansion) will be 380 KLD (1,25,400 KLA) out of which 20 KLD required for domestic purpose. The source of water is Ground Water for which NOC application for approval from CGWA is being submitted. The area is classified as “SAFE Zone” from the CGWA categorization of the area. Further, the management had decided to implement a 10,000 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 26 days. Therefore, it is considered that about 101 days (38,380 KL) water requirement will be met through rain water and rain water collection. Therefore, the net requirement from ground source per annum will be about 87,020 KLA. Total 8 Nos. Of Rain Water harvesting (1 m dia, 3 meter depth) system will be implemented along with implementation of project.

2.5 POWER REQUIREMENT & SUPPLY

Total power requirement (existing and proposed expansion) will be 35 MW which will be sourced through State Grid (CSPDCL). In addition, total 4 nos. of 500 kVA DG sets are proposed for emergency backup.

2.6 MANPOWER REQUIREMENT

M/s. BSPPL will provide employment to 290 (95 existing + 195 additional) persons.

2.7 FIRE FIGHTING FACILITIES

In order to combat any occurrence of fire in plant premises, a central firefighting facility is proposed which will have access to various units of the plant. In addition to this, 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 existing cost of the project is Rs. 1997 Lakhs whereas cost for proposed expansion is Rs. 7500 Lakhs. Provision for CER is kept as Rs. 100 Lakh. Thus, total cost of project considered for expansion is Rs 7600 lakhs and post expansion cost of project is Rs. 9597 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 Pre-monsoon Season (15th March 2023 – 15th June 2023).

3.2 METEOROLOGY & AMBIENT AIR QUALITY

Summary of the Meteorological Data Generated at Site (15th March 2023 – 15th June 2023)

Predominant Wind Direction	Pre-monsoon Season
First Predominant Wind Direction	W (10.73%)
Second Predominant Wind Direction	WSW (9.51%)
Calm conditions (%)	2.36
Avg. Wind Speed (m/s)	2.40

The status of ambient air quality within the study area was monitored for Pre - Monsoon Season of the year 2023 at 8 locations covering project site. The levels of Respirable Particulate Matter (PM₁₀), Fine Particulates (PM_{2.5}), Sulphur Dioxide (SO₂), 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 3.1**.

TABLE 3.1
SUMMARY OF AMBIENT AIR QUALITY RESULTS

Sr. No.	Location		PM ₁₀	PM _{2.5}	SO ₂	NO ₂	CO	Ozone	NH ₃
			µg/m ³	µg/m ³	µg/m ³	µg/m ³	mg/m ³	µg/m ³	µg/m ³
1.	Project Site	Min	65.3	28.2	12.0	18.3	0.306	8.2	7.1
		Max	83.6	37.7	19.4	26.5	0.463	14.8	12.3
		Avg	75.2	32.5	15.3	21.8	0.381	11.6	9.5
		98 th	83.4	37.3	18.8	26.0	0.452	14.6	12.1
2.	Raikhera	Min	59.9	23.5	11.4	16.3	0.227	7.5	6.3
		Max	82.1	32.8	17.1	23.2	0.488	13.4	11.6
		Avg	71.8	28.6	14.1	20.5	0.326	10.2	8.7
		98 th	81.2	32.7	16.7	23.2	0.482	13.4	11.1
3.	Gaitara	Min	66.3	28.7	13.5	21.3	0.357	8.8	8.4
		Max	87.2	37.6	20.6	33.4	0.452	15.7	13.1
		Avg	79.9	33.7	16.4	26.9	0.412	12.3	10.2
		98 th	87.0	37.6	20.1	32.8	0.449	15.5	12.8
4.	Khapri	Min	60.6	21.6	11.9	16.4	0.238	7.5	6.8
		Max	77.8	32.7	17.3	22.7	0.511	11.1	9.7
		Avg	69.6	27.1	14.2	19.3	0.341	9.4	8.2
		98 th	77.3	32.3	17.1	22.5	0.505	11.0	9.6
5.	Sontara	Min	56.7	19.7	10.6	13.4	0.224	5.8	5.2
		Max	73.9	29.5	15.1	20.3	0.337	9.8	9.8
		Avg	65.8	23.8	12.6	17.0	0.274	8.1	7.5
		98 th	73.3	28.5	14.6	19.9	0.325	9.6	9.5
6.	Chicholi	Min	61.4	21.3	13.4	17.1	0.299	9.0	7.1
		Max	81.4	36.0	17.6	25.1	0.449	12.9	10.6
		Avg	73.2	30.4	15.7	20.8	0.365	10.7	9.1
		98 th	80.8	35.4	17.6	24.5	0.433	12.8	10.5
7.	Tarashiv	Min	60.5	19.6	12.0	13.1	0.259	6.8	5.9
		Max	73.6	33.7	15.6	18.7	0.350	10.1	8.8
		Avg	68.5	25.7	13.6	15.4	0.297	8.5	7.3
		98 th	73.6	32.3	15.5	18.3	0.347	9.9	8.7
8.	Bhatapara	Min	66.9	26.2	14.3	19.7	0.379	9.3	8.2
		Max	84.6	36.9	21.2	27.2	0.570	14.4	13.8
		Avg	76.4	31.9	17.3	22.8	0.463	12.1	10.5
		98 th	84.0	36.6	20.6	26.4	0.549	14.2	13.1

Sr. No.	Location		PM ₁₀	PM _{2.5}	SO ₂	NO ₂	CO	Ozone	NH ₃
			µg/m ³	µg/m ³	µg/m ³	µg/m ³	mg/m ³	µg/m ³	µg/m ³
9.	Nakti Khapri	Min	64.3	28.1	16.4	20.2	0.358	9.8	9.4
		Max	86.4	37.7	25.0	31.6	0.539	17.4	13.5
		Avg	79.6	33.1	19.9	25.5	0.438	13.6	11.4
		98 th	86.1	37.7	24.4	31.0	0.520	17.2	13.3
CPCB Standards			100 (24hr)	60 (24hr)	80 (24hr)	80 (24hr)	2 (8hrs)	100 (8hr)	400 (24hr)

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

3.3 AMBIENT NOISE LEVELS

Ambient noise level monitoring was carried out at the 08 monitoring locations; those were selected for ambient air quality monitoring. The monitoring results are summarized in **Table 3.2**.

TABLE 3.2
AVERAGE NOISE LEVELS IN THE STUDY AREA

Sr. No.	Monitoring Locations	Equivalent Noise Level	
		Leq _{Day}	Leq _{Night}
Residential Area			
1	Khapri	51.9	38.6
2	Sontara	53.2	40.1
CPCB Standards dB(A)		55.0	45.0
Commercial Area			
3	Chicholi	62.1	43.7
4	Bhatapara	63.8	45.2
CPCB Standards dB(A)		65.0	55.0
Silence Zone			
5	Gaitara – (Nr. Govt Primary School Gaitara)	47.5	38.3
6	Tarashiv – (Nr. Govt Primary School)	48.3	39.1
CPCB Standards dB(A)		50.0	40.0
Industrial Area			
7	Project Site	67.2	56.4
8	Raikhera	65.5	53.7
CPCB Standards dB(A)		75.0	70.0

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

3.4 SURFACE AND GROUND WATER RESOURCES & QUALITY

3.4.1 Geology and Hydrogeology

Regional Geology

Site specific Geology:

Major rock types present in the study area is stromatolitic dolomitic limestone. Appearances of laterites are also observed in the northern part of the study area. The stromatolitic dolomitic

limestone belongs to Mesoproterozoic to Neoproterozoic age, whereas, the Laterite belongs to Cenozoic age. Geologically the study area comes under Chandi Formation of Raipur Group of Chhattisgarh Supergroup.

Geomorphology:

In the study area pediplains are the most prominent geomorphic units. Lateritic Uplands are mainly concentrated in the northern and southeastern part. Anthropogenic terrain formed by abandoned quarry is also observed in the southern part of the study area.

Hydrogeology and Aquifer Systems:

The occurrence of groundwater and its distribution in space are highly influenced by the underlying geological formations and hydrogeological characteristics of the surroundings. The porous, weathered, jointed, and fractured zones present in the rocks or formation provide scope for groundwater occurrence, storage, and movement. The hydrogeology of the area broadly describes the disposition of water-bearing formations, occurrence of groundwater and its yield potential, groundwater regime conditions and depth to water levels in different seasons, etc.

Depth to water level scenario in the study area:

- 1.9 to 18.54 mbgl in pre-monsoon and
- 0.77 to 10 mbgl in post-monsoon period

The fluctuation varies from 1.12 to 14.1 m. The optimum desirable depth of bore wells in the district is between 50 mbgl and 90mbgl. The transmissivity of this formation ranges from 2.1 to 121.7 m²/day and the specific capacity ranges between 51.5 to 403lpm/m of draw down and storativity ranges from 0.0014 to 0.0032. The discharge varies from 0.2 to 13.14 lps. Categorization of Assessment Units as per Dynamic Ground Water Resources of India the area comes under Safe category.

3.4.2 Water Quality

Groundwater and surface water quality was assessed by identifying 8 groundwater (Bore well/ hand pump) locations in different villages and 5 surface water samples.

A] Groundwater Quality

The analysis results indicate that the pH ranged 7.36 – 7.79. The TDS was ranging from 386 – 567 mg/l. Total hardness was found to be in the range of 196.98 – 332.68 mg/l. The fluoride concentration was found to be in the range of 0.12 – 0.56 mg/l. The nitrate and sulphate were found in the range of 4.58 – 8.13 mg/l and 7.67 – 32.26 mg/l respectively.

The chloride concentration was found in the range of 90.24 – 135.31 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 0.08 – 0.17 mg/l.

B] Surface Water Quality

The analysis results indicate that the pH ranged between 7.12 – 7.85. The pH of water indicates whether the water is acid or alkaline. The TDS was observed to be 386 – 560 mg/l which is within the permissible limit of 2000 mg/l. The total hardness recorded was in the range of 173.88 – 284.63 mg/l as CaCO₃ 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 87.54 – 144.28 mg/l and 22.17 – 43.37 mg/l respectively.

Dissolved oxygen (DO) refers to the amount of oxygen (O₂) dissolved in water. Because fish and

other aquatic organisms cannot survive without oxygen, DO is one of the most important water quality parameters. The reported value of range of 5.6 – 6.2 mg/l. Phosphorus (as PO₄) is an important nutrient for plants and algae. Because phosphorus is in short supply in most fresh waters, even a modest increase in phosphorus can cause excessive growth of plants and algae that deplete dissolved oxygen (DO) as they decompose. PO₄ concentration was found to be BDL (DL - 0.1) mg/l. COD ranges from 17.61 – 41.75 mg/l and BOD ranges from 4.92 – 12.68 mg/l.

C] Bacteriological Characteristics

Coliform group of organisms are indicators of faecal contamination in water. All surface water samples were found to be bacteriologically contaminated. Presence of total coliforms in surface water indicates that the contamination pathway exists between any source of bacteria (septic system, animal waste, etc.) and the surface water stream. A defective well can often be the cause when coliform bacteria are found in well water. For surface water, treatment followed by chlorination or disinfection treatment is needed before use for domestic purpose. Groundwater samples were not found to be 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 25th May 2023 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°21'47.42"N to 21°32'44.98"N latitude and 81°44'16.84"E to 81°56'06.78"E longitude and elevation 287-326 meters are used as per the project site confined within that area. The Land Cover classes and their coverage are summarized in Table 3.3.

TABLE 3.3
LU/LC CLASSIFICATION OF 10 KM STUDY AREA

Sr. No.	Level-I	Level-II	Area (Sq. Km ²)	Percentage (%)
1	Built-up land	Settlement	26.79	8.25
		Industrial Settlement	4.21	1.30
		Road Infrastructure	3.22	0.99
		Railway Line	0.81	0.25
2	Agricultural Land/ Crop Land	Single Crop	168.73	51.96
		Double Crop	32.45	9.99
3	Forest Area	Protected Forest	9.95	3.06
		Open Mixed Jungle	0.81	0.25
4	Scrubs/Wastelands	Open Scrub	46.54	14.33
		Wasteland	4.84	1.49
		Fairly Dense Scrubs	3.22	0.99
5	Waterbodies	River/Nala/Stream	2.41	0.74
		Tank/Pond/Lake	20.28	6.25
6	Mines Area	Stone Quarry	0.44	0.14
		Total	324.70	100

3.6 SOIL QUALITY

For studying soil profile of the region, sampling locations were selected to assess the existing soil conditions in and around the project site representing various land use conditions. The physical, chemical and heavy metal concentrations were determined. The samples were collected by ramming a core-cutter into the soil from 15 cm up to a depth of 60 cm. Total 8 representative samples were collected from different locations within the study area and analyzed.

Physical Characteristics of Soil

Physical characteristics of soils were determined through specific parameters viz. particle size distribution, bulk density, porosity, water holding capacity, texture.

Regular cultivation practices increase the bulk density of soils thus inducing compaction. This results in reduction in water percolation rate and penetration of roots through soils. The soils with low bulk density have favourable physical conditions whereas those with high bulk density exhibit poor physical conditions for agriculture crops. The bulk density of the soil in the study area ranged between 1.542 – 1.738 g/cc which indicates favourable physical condition for plant growth. The water holding capacity is between 33.72 – 35.49 %. Infiltration rate, in the soil is in the range of 17.327 – 27.484 mm/hr.

Chemical Characteristics of Soil

Data collected for chemical characteristics of soils through selected parameters viz. pH, soluble cations and anions, exchangeable cations, organic content and fertility status in the form of NPK values and organic matter.

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 is found to be neutral (7.27 – 7.62) in reaction. Electrical conductivity, a measure of soluble salts in the soil is in the range of 453 – 909 μ S/cm.

The important soluble cations in the soil are calcium and magnesium whose concentration levels ranged from 546.27 - 981.75 mg/Kg and 98.78 - 209.1mg/Kg respectively. Chloride is in the range of 359.37 - 575.1 mg/Kg. Organic matter and organic carbon present in the soil influences its physical and chemical conditions and is responsible for stability of soil aggregates. Organic carbon was found in the range of 0.45 - 0.75 %. Nitrogen, Phosphorus and Potassium was found to be in the range of 216.88 – 310.67 Kg/hect, 23.28 – 45.52 Kg/hect and 172.45 – 397.32 Kg/hect respectively.

3.7 BIOLOGICAL ENVIRONMENT

Floral composition in Study Area

Total 110 plant species were enlisted within the study area out of which habit wise details are given below:

- | | | | |
|----|-----------------------------|---|---|
| a. | Trees | : | Total 62 species were found in the study area |
| b. | Shrubs (small trees) | : | Total 23 species were enumerated from the study area. |
| c. | Herbs | : | In the study area 13 species were observed. |
| d. | Grasses | : | 7 species were enlisted from the study area |
| e. | Climbers and Twiners | : | Total 4 species of climbers/ twiners were recorded in the study area. |
| f. | Parasite Plant | : | 1 species enlisted in the study area. |

3.8 RET (Rare, Endangered and Threatened species) STATUS

According to IUCN Status report 2013 out of total 110 plant species identified within study area among the observed species *Chloroxylon swietenia* which is Vulnerable (VU) species as per IUCN RED list. The other identified plant species in the study area belongs to least concern (LC), Data Deficient (DD) and Data not available (NA), as per IUCN status. Thus, none of reported species in study area belongs to Rare, Endangered or Threatened category.

Fauna Details:

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 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; Jackal (*Canis aureus*), Common Langur (*Semnopithecus entellus*), Common Mongoose (*Herpestes edwardsi*), Indian fox (*Vulpes bengalensis*), are protected in Schedule-II. whereas, Black-naped hare (*Lepus nigricollis*), Palm squirrel (*Funambulus pinnati*) 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.

3.9 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 3.4**. Details regarding education and infrastructure facilities 2011 are presented in **Table 6** and **Table 3.5** respectively.

TABLE 3.4
SUMMARY OF SOCIO-ECONOMIC ENVIRONMENT OF VILLAGES WITHIN STUDY AREA

Zones	Total household	Total Population	Total Male	Total Female	Total 0-6 child	Total SC	Total ST	Population Literate	Population Illiterate
0-2 km	1239	6114	3036	3078	890	945	341	3812	2302

Zones	Total household	Total Population	Total Male	Total Female	Total 0-6 child	Total SC	Total ST	Population Literate	Population Illiterate
2-5km	4535	22132	10962	11170	3290	4325	1494	13520	8612
5-10km	15613	75130	37980	37150	10848	14824	3707	48008	27122
10km	21387	103376	51978	51398	15028	20094	5542	65340	38036
In %	4.83		50.28	49.72	14.54	19.44	5.36	63.21	36.79

Source: Primary census abstract 2011, State Chhattisgarh

TABLE 3.5
INFRASTRUCTURE FACILITIES AVAILABLE IN THE STUDY AREA

Infrastructure Facilities	Availability (In percentage) As per year 2011, Census Dist Raipur Chhattisgrh
Educational Facilities	100
Drinking water	100
Road	100
Power	100
Communication	78.12
Transportation	89.06
Govt. PHC & SC	37.50
Bank & Society	89.06
Drainage	50
Recreation	95.31

Source: Primary census abstract 2011, State Chhattisgarh.

Salient Observation of the Socio-Economic Survey

➤ **Major crops of study area:**

Rice is one of the staple crops of Chhattisgarh and is extensively cultivated in the region, including Tehsil Kharora. Wheat is another important cereal crop grown in the area. Maize cultivation is also common, and it serves both as a food crop and as fodder for livestock.

➤ **Employment:**

Main occupation in the study area was Labour Work and Agricultural its allied activities eg. Cattle rearing, dairy farming etc. Other source of income in the study area is small business; private jobs etc. The labours were getting daily wags in the range of Rs. 400-500/- depending on type of work.

➤ **Livestock and Poultry:**

While surveying through the study area, goat, cattle and buffaloes and poultry were observed.

➤ **Milk Centers:**

The study area has a significant presence of dairy farming due to its predominantly rural and agrarian economy. The state government and various dairy cooperatives have been actively promoting dairy farming through schemes and initiatives to improve milk production, milk processing, and marketing. These cooperatives often establish milk collection centers where farmers can sell their milk. Some of them also have their own processing units for milk and milk products.

➤ **Migration from other states:**

Migration to Tehsil Kharora from other states may be motivated by the availability of economic opportunities like industries. During survey it was found that local population was given preference

for employment.

➤ **Self Help Group:**

Some villages are working small loan for basic needs, loan for toilet construction under company, Seed and Fertilizers for stop the money lender issue and federation doing the work for girl's education and social issues by SHGs.

➤ **Sanitation:**

Ensuring access to proper sanitation facilities is a fundamental necessity for households. Remarkably, over 90% of households in the surveyed area possess functional toilet facilities within their homes. The Swachh Bharat Mission Gramin (SBM-G) played a pivotal role in constructing 70% of these toilets in 2019, marking significant progress in sanitation infrastructure.

However, it is concerning that a small fraction of the population still practices open defecation, which poses severe public health risks. Additionally, some villages lack adequate drainage systems, indicating the need for improved sanitation infrastructure.

➤ **Water Facilities:**

Our survey revealed a diverse range of water sources serving the villages. The primary sources of drinking water in the study area include hand pumps, tap water, and dug wells. Agriculture in the majority of villages heavily relies on groundwater sources and surface water sources. In contrast, villages situated in proximity to the rivers utilize them for both drinking water and irrigation purposes, highlighting the versatile nature of water resource utilization in the region. The lakes and ponds around the village are useful to the population for various purposes like bathing, watering to catlles etc.

➤ **Road connectivity:**

Road infrastructure in the surveyed area predominantly comprises well-maintained pucca roads, ensuring efficient connectivity. However, a limited number of kaccha roads were identified as requiring immediate repair and maintenance to enhance accessibility and safety for residents and commuters.

➤ **Medical facilities:**

The survey revealed that, access to government Primary Health Centers (PHCs) and Sub-Centers (SCs) in the study area is limited, with potential gaps in healthcare infrastructure.

➤ **Electricity:**

The availability of power at 100% indicates that the tehsil is adequately electrified, and residents have access to electricity for various purposes. Solar Street lights were seen in some of the villages.

➤ **Banking Facility:**

The study area has almost all the schedule Private banks, commercial banks with ATM facility at urban areas and the district HQ.

➤ **Education:**

Government Pre Primary, Govt Primary, Private Primary, Govt Middle, Private Middle and Govt Secondary Schools are available in this Village. Nearest Govt Engineering College and Govt Medical College are in Raipur like NIT Raipur, AIIMS Raipur. Nearest Govt Disabled School, Govt Arts and Science Degree College, Govt MBA College, Govt Polytechnic College and Govt ITI College are in Raipur.

➤ **Communication:**

Post Office is available in this Village. Landline and mobile network availability is also available. Private Courier Facility available in this village.

➤ **Transportation:**

Public Bus service is very limitedly available in these villages. Private Bus service is available for transportation. The closest railway stations are Baikunth Railway Station and Siliari Railway Station; Autos are Available in the study area for local transport and village to tehsil transport. Pucca road, Kuccha Road, Macadam Road and Foot Path are other Roads and Transportation within the villages in study area.

3.9.1 Awareness and opinion of the respondents about the project

In the context of promoting human development in the changing social landscape, effective communication holds a key role. To capture the diverse perspectives of individuals and communities regarding a specific project, the practice of conducting awareness cum public discussions becomes imperative. This process not only encourages individuals to voice their thoughts but also addresses their concerns and misconceptions through informed counseling.

Observations in the villagers are:

- In the core zone villages, the majority of the local population is already well-informed about the project, as per primary survey results.
- Respondents in these areas possess an understanding of both the project's advantages and disadvantages and exhibit curiosity regarding its broader benefits.
- Local leaders show a keen interest in gaining insights into the project's potential for employment generation, overall development, and social advantages.

3.9.2 Interpretation

The proposed expansion of steel plant will have impacts on the local environment however with proper mitigation measures and with the effective implementation of the environment management measures as suggested in the EIA/EMP report and as recommended by MoEF&CC, CPCB and State Pollution Control Board, the impacts will be minimized to a great extent. However, development of this project has beneficial impact/effects in terms growth in regional economy, social upliftment of local people, increase in Government earnings, revenues and accelerate the pace of industrial development in the region. The proposed project will provide direct employment to a large number of personnel. This project will also generate indirect employment to a considerable number of families, who will render their services for the employees of the project. The project will also encourage ancillary industries in the region, which will not only increase the employment potential but also the economic base of the region will be further strengthened. Thus, in view of considerable benefits from the project, the proposed project is most advantageous to the region as well as to the nation.

4.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.1 AIR ENVIRONMENT

Dust will be the main pollutant affecting the ambient air quality of the area during the construction phase. Dust will be generated during vehicular movement of trucks, dumpers and construction machinery. Further, concentration of NO_x and CO may also slightly increase due to increased vehicular traffic. However, change in ambient concentrations of air quality will be insignificant and

temporary. As most of the construction equipment will be mobile, the emissions are likely to be fugitive. The impacts will be localized in nature and the areas outside the project boundary are not likely to have any significant adverse impact.

The maximum ground level concentrations (GLCs) for particulate matter and gaseous concentration SO₂, NO_x due to proposed condition were carried out. The details are as under:

POST PROJECT RESULTANT BASELINE DATA

Receptor	PM ₁₀ in µg/m ³ (Limit 100)			PM _{2.5} in µg/m ³ (Limit 60)			SO ₂ in µg/m ³ (Limit 80)			NO _x in µg/m ³ (Limit 80)		
	Max Baseline	Incremental	Resultant	Max Baseline	Incremental	Resultant	Max Baseline	Incremental	Resultant	Max Baseline	Incremental	Resultant
AAQ2	82.1	0.07	82.17	32.8	0.03	32.83	17.1	0.18	17.28	23.2	1.19	24.39
AAQ3	87.2	0.23	87.43	37.6	0.08	37.68	20.6	0.68	21.28	33.4	3.39	36.79
AAQ4	77.8	0.05	77.85	32.7	0.02	32.72	17.3	0.13	17.43	22.7	0.85	23.55
AAQ5	73.9	0.10	74.00	29.5	0.04	29.54	15.1	0.30	15.40	20.3	1.68	21.98
AAQ6	81.4	0.05	81.45	36.0	0.02	36.02	17.6	0.13	17.73	25.1	0.77	25.87
AAQ7	73.6	0.03	73.63	33.7	0.01	33.71	15.6	0.09	15.69	18.7	0.54	19.24
AAQ8	84.6	0.07	84.67	36.9	0.02	36.92	21.2	0.18	21.38	27.2	1.06	28.26
AAQ9	86.4	0.03	86.43	37.7	0.01	37.71	25.0	0.07	25.07	31.6	0.45	32.05

By adopting the effective implementation of all the mitigative measures no adverse impact on Air quality due to the proposed expansion is expected.

Details of Air Pollution Control System/ Mitigation measures

Facilities	Air Pollution Control equipment
Steel Melting Shop with hot charging rolling mill beneficiation unit	Movable suction hood along with Bag Filters with a chimney
Billet Reheating Furnace attached to Rerolling Mill	Waste heat recuperator with Wet Scrubber/Bag Filter with a Chimney
Ferro Alloys and/or Pig Iron	4 Sets of Bag Filter with Chimney

Additional Measures to reduce/control pollution control

- Roads will be frequently sprinkled with water.
- Most of the materials like Sponge Iron ore, pig iron will be stored under covered shed.
- In case of storage of Sponge Iron, pig iron in open, it will be covered by tarpaulins to prevent spread of dust from it during transportation.
- Regular sweeping of road by using vacuum cleaner will be carried out
- Regular maintenance of vehicles and machineries will be carried out in order to control emissions.
- Green belt development will be taken up all along the roads, plant premises etc.
- Protective appliances will be provided to all the workers exposed in dusty atmosphere.
- Avoiding overloading of the trucks.
- Workers will be equipped with all personal protective devices like Gum Boot; hand gloves; Safety helmet; Safety goggles, earplugs at work place.

- By controlling the speed of the truck.
- Proper gradient of roads to reduce cumulative noise.
- Transportation of materials will be limited to day hours only.
- Periodical maintenance of process machinery.

4.2 NOISE ENVIRONMENT

Noise will be generated during the normal operation of manufacturing process due to operational activities of Induction Furnace, Billet Reheating Furnace, Rolling Mill, Ferro Alloy, Galvanizing, Pipe Mill, Fabrication Unit, 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. Day and night sound pressure levels are often used to describe the community exposure. The nearest Govt. Primary School, Gaitara is 940 m away from project site and resultant noise level at this school are 48.2 dB(A) & 42.2 dB(A) at day & night time respectively. The ambient noise levels (daytime and night time) at some locations will be marginal increased and noise mitigation measure should be adopted at project site to attenuate noise levels to safe limits. The preventive measures are given below:

1. Dense plantation will help to reduce noise pollution in the following ways –
 - The sounds that are produced by the leaves helps muffle the noise.
 - Hedging makes a thick front of the wall and blocks the noise.
 - Thick tree trunks create a sound-absorbing buffer zone.
 - They help in filtering the noise.
 - The research also concluded that a 30 m dense plantation can give a noise reduction of 6 dB (A).
2. Equipment will be standard and equipped with silencer. The equipment will be in good working conditions, properly lubricated and maintained to keep noise within permissible limits.
3. Most of the equipment's will be placed in closed room.
4. Equipment's will be placed on acoustic floor to reduce vibration and noise.
5. High noise zone will be marked, and earplugs will be provided to the workmen near high noise producing equipment.
6. Use of PPES awareness program will be provided to all workers.
7. Proper shifting arrangement will be made to prevent over exposure to noise and vibration.
8. Silent DG sets will be used site.
9. Speed limits will be enforced on vehicle.
10. Regular noise & vibration monitoring will be carried for all equipment's to check compliance with prevailing rules.

Vehicular Movement

There will be NOX emission impact observed 1808 gm/km-hr on the surrounding environment due to 226 Trips/day. The impact due to the emission of other pollutants will be insignificant. This quantum spread over the whole day at Maximum production is considered low and shall not make significant impact on the transportation route on the road.

The additional load of (226 trips/day) will add insignificant contribution on the carrying capacity of the concerned road. Hence it is concluded that it is not likely to have any significant adverse effect.

4.3 WATER ENVIRONMENT

The proposed expansion may have some impact on the water environment. The impact may be on the source of water in the form of depletion of water resources of the area and in the form of deterioration of quality of natural water resources due to discharge of plant effluent. Total water requirement will be 380 KLD (1,25,400 KLA). Total water required for domestic purposes will be 20 KLD. There will be no industrial effluent discharged outside the plant premises due to existing as well as proposed units. Generated domestic wastewater will be treated in STP and treated water will be used for green belt and dust suppression purposes. M/s. BSPPL will maintain zero discharge condition from the plant all the time throughout the year.

The various control measures that will be adopted are:

- Closed circuit circulation system will be followed.
- Rain water charged to ground water.
- All stock piles will be on pucca flooring to prevent for any ground water contamination.
- Treated domestic waste water will be reused for Gardening.
- Treated Industrial wastewater will be recirculated in processes.
- Implementation of ETP (50 KLD) and STP (20 KLD)
- Rain water harvesting will be carried out.
- All stock piles will be on pucca flooring to prevent for any ground water contamination.

4.4 BIOLOGICAL ENVIRONMENT

Ecology & Biodiversity: Aspect - Impact identification and mitigation measures suggestion for proposed expansion project.

S. No.	Project Aspects / Activities	Residual Impacts	Mitigation Measures Suggested
1.	Transportation, unloading & storage of Material and Movement of vehicle inside plant, Dust and sound generation due to proposed expansion activities	Impact on nearby vegetation and avifauna in a scale of 3 out of 5 due to proposed expansion activity.	Thick greenbelt will be developed along periphery of the project site in order to provide buffer between plant fugitive emission and nearest vegetation.
2.	Gaseous emission from Stack, Movement of vehicle inside plant and Raw material & finished product transportation, Product manufacturing	Decline in photosynthetic activities, Stomatal index may be minimized, Crop yield may be reduced.	Air quality modelling outputs study revealed that, the resultant concentrations of particulate matter, sulphur di-oxide and oxides of nitrogen are well within the prescribed limits. Greenbelt area of 1.50 Ha. (33%) has been provided with local species, broad leaves, higher canopy and fast-growing tree species. Existing plantation status within plant premises as on Oct' 2023 is 4000 nos. of trees at 1.5 Ha. This will be maintained in expansion also. Indigenous species for plantation is recommended along the approach road and plantation under CER. Thus, the impact due to proposed expansion project would be minimal as project activity will be

S. No.	Project Aspects / Activities	Residual Impacts	Mitigation Measures Suggested
			carried out within the plant boundary limit with proper control measures.

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.

4.5 SOCIO-ECONOMIC IMPACT

Positive Impacts:

- Benefits to the nation and GDP due to steel production and Business development. Nation also gets benefitted with taxes.
- Creation of indirect employment through the local community establishing small shops like tea stalls, supply of intermediate raw materials, repair outlets, hardware stores garages etc.
- Economic growth due to development of area and increase in quality of life.
- Improvement in green cover due to the plantation of trees in the study area, also are leading to a decrease in environmental pollution.
- Improvement in social and infrastructural development by the industries as a part of CER and EMP.

Negative impacts:

- Health of the surrounding population may get affected due to emission of gases in the atmosphere. Production of Steel through Induction furnace can cause release of pollutants. Other components of Environment like animals, birds and trees may also get affected.
- The increase in vehicles due to the proposed expansion may lead to extra pressure on the existing traffic. Heavy vehicle movement lead to dispersion of dust particles which affects the health of the workers and Local Peoples. Trucks, tankers, and other vehicles may cause additional air pollution to the surrounding areas. The effects may be more prominent in nearby villages.
- Possibilities of Hazards and accident which may cause harm to the workers working or loss of life of the workers.
- Generation of Solid and Hazardous waste will be there, if the waste is not managed properly, it may cause contamination of the area, environment and health of the nearby population.
- If influx of workers from outside areas, then there may an increased pressure on residential accommodation the neighborhood.

Mitigation Measures

In order to mitigate the adverse impact likely to arise in social, cultural and economic aspects in the surrounding region due to the proposed expansion project and improvement in quality-of-life following mitigation measures should be adopted:

- Adequate pollution control Equipment as per the CPCB Guidelines should be adopted and proper maintenance of industrial and pollution control equipment should be done to ensure minimum pollution.

- The efficiency of the pollution control equipment should be checked periodically to comply with the emission standards provided by CPCB and minimize the pollution levels.
- Ensure that roads are properly signed, vehicles are well maintained and drivers are well trained and safety conscious.
- A Safety climate should be prepared and every worker should be trained with all safety equipment. All health and safety measures should be adopted by the company to ensure the safety of the workers and the surrounding society.
- Project proponent should take appropriate steps to keep environment clean and Greenbelt development/ Plantation along with the internal Road.
- Transportation of hazardous waste should be done as per CPCB Guidelines. The heavy trucks are covered to prevent spillage or dusting. The drivers should be imparted training.

5.0 ALTERNATIVE ANALYSIS

The proposal is for a Brownfield project for implementation of new manufacturing facilities for production of MS Billets, Hot-rolled Steel Rerolled products, Ferro Alloys (SiMn/FeMn/FeSi/Pig Iron); along with expansion of Reheating Furnace based Rerolling Mill, MS Black pipe mill; Galvanizing unit within the existing premises of M/s. BSPPL. Since the Project is a brownfield project no site alternative has been considered. The study of alternative technology in brief involved in each of the products and choice of the technology based on environmental applicability, technical and financial viability are provided in Ch. 5

6.0 ENVIRONMENTAL MONITORING PROGRAM

Environmental monitoring shall be done as per the guidelines provided by CPCB / SPCB. The methods conducted or applied shall be approved or accepted by the any recognized body or authority i.e. MoEFCC / CPCB / SPCB. The suggested monitoring shall be done to ensure that Environmental management practices/technologies are adequate to meet the requirement of the prescribed norms as prescribed by state pollution control board.

Environment Management Department with suitably qualified and experienced staff and environmental laboratory to cater the routine monitoring requirement will be implemented in the plant.

As part of the Board structure, Audit & Compliance reporting team shall also oversee the environmental status inclusive of the conditions prescribed under various environmental consents and clearances, as and when obtained from various State and Central Govt. authorities, as well as the corporate norms, standards and targets that exceed the legal compliance requirements.

7.0 RISK ASSESSMENT & DISASTER MANAGEMENT PLAN

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

A detailed Disaster Management Plan for facing disasters due to natural effects and human reasons is prepared and incorporated in the EIA/EMP report for ensuring safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities. For effective implementation of Disaster Management Plan, it will be widely circulated and personnel training through rehearsals. Site facilities, procedures, duties and responsibilities, communications, etc. are considered in details in the Disaster Management Plan.

8.0 PUBLIC CONSULTATION

The Draft EIA-EMP 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.

9.0 PROJECT BENEFITS

The proposed expansion 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, BSPPL 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. Corporate Environment Responsibility (CER) value of Rs. 100 Lakhs will be spent for the social infrastructure development.

- The project benefits also entail revenue earnings to national and state exchequer through Gross GST (Estimated Rs. 309 Crores GST), road tax, income by registration of trucks & trailers, income tax, corporate tax, etc.
- Fully compliance of Corporate Responsibility for Environmental Protection (CREP) for steel industry.
- Thus, result in –
 - ❖ Periodic Monitoring Low emissions,
 - ❖ Water conservation, recycle of treated wastewater,
 - ❖ Solid waste management
 - ❖ Thereby protection of environment and also result in low cost of production
 - ❖ Hot Charging based steel re-rolling will also result in fuel emission avoidance of almost 33600t CO₂ per annum.

10.0 ENVIRONMENTAL MANAGEMENT PLAN

The major objective and benefit of utilizing Environmental Impact Assessment in project planning stage itself, is to prevent avoidable losses of environmental resources and values as a result of Environmental Management. Environmental Management includes protection/mitigation/enhancement measures as well as suggesting post project monitoring program. Environmental management may suggest revision of project site or operation to avoid adverse impacts. The industrial development in the study area needs to be intertwined with judicious utilization of nonrenewable resources of the study area and within the limits of permissible assimilative capacity. The Environment Management Plan (EMP) is required to ensure sustainable development in the study area of the proposed expansion project site, hence it needs to be an all comprehensive plan for which the proposed industry, Government, Regulating agencies like Pollution Control Board working in the region and more importantly the affected population of the study area need to extend

their cooperation and contribution.

Judicious use of the environmental management will be implemented with addressing the components of environment, which will be likely affected during construction and operation of the expansion project. The total project cost of the project is **Rs 9497 Lakhs** (which includes Existing - Rs.1997 Lakhs + Rs. 7500 Lakhs). Capital cost of EMP in the project will be **Rs 550 Lakhs** and recurring cost will be **Rs. 20 Lakhs**. The company will also comply with its obligation for CSR as per Company's Act too, in addition to the above EMP budget.

11.0 CONCLUSION

The proposed expansion project of M/s. Blackrock Steel and Power Pvt. Ltd. will be beneficial for the overall development of the nearby villages. Environmental aspects like dust emission, noise, wastewater generation, traffic density, etc. will have to be controlled better than the permissible norms to avoid impacts on the surrounding environment in particular agriculture crop. Necessary pollution control equipment like bag house as regulatory requirement whereas Industrial sweeping machine, wheel washing system, Industrial grade vacuum cleaner, water sprinklers, enclosures, etc. form integral part of the plant infrastructure and it will be implemented under ideal environmental management practices. Additional pollution control measures and environmental conservation measures will be adopted to control/ minimize the 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 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 expansion project will not add adverse pollution levels to the environment. As per employment point of view, 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.

12.0 DISCLOSURE OF CONSULTANTS

The Environmental studies for proposed expansion project of M/s Blackrock Steel and Power Pvt. Ltd. (M/s. BSPPL) 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/2326/RA0304** dtd. Sept 18, 2023 valid till Sept 29, 2026.