

EXECUTIVE SUMMARY

For

PROPOSED CAPACITY EXPANSION OF SPONGE IRON (97,500 TPA TO 140,000 TPA); MS BILLET (90,000 TPA TO 192,500 TPA); REROLLED STEEL PRODUCTS (90,000 TPA TO 180,000 TPA - THROUGH HOT CHARGING 126000 TPA AND THROUGH REHEATING FURNACE 54,000 TPA); EXISTING CAPTIVE POWER 8 MW (THROUGH WHRB); AND PIPE MILL 175,000 TPA (NEW) WITHIN EXISTING PLANT PREMISES

Terms of Reference File No. IA-J-11011/401/2018-IA. II(I), dated 20 April 2022
Category A, Schedule 3(a) Metallurgical Industries, 1(d) Thermal Power Plant
Baseline Period: Pre-monsoon season (1st March 2022 – 31st May 2022)

Project Proponent

M/s. NIROS ISPAT PVT. LTD.

At

**PLOT NO: 14 - A, HEAVY INDUSTRIAL AREA, HATHKHOJ, BHILAI,
DIST.- DURG (C.G.) PIN CODE- 490 026.**

Environmental Consultant



M/s Anacon Laboratories Pvt. Ltd., Nagpur

QCI-NABET Accredited EIA Consultant
MoEF&CC (GOI) and NABL Recognized Laboratory
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Report No. ANqr/PD/20A/2022/214

SEPTEMBER - 2022

EXECUTIVE SUMMARY

1.0 INTRODUCTION:

M/s. Niros Ispat Private Limited (hereafter referred as NIPL) has proposed to expand permitted existing capacity of manufacturing facilities for production of Sponge Iron, MS Billet, Steel Rerolled products and captive power generation plant comprising of Waste Heat Recovery Boilers (WHRB – no change) along with new implementation of pipe mill. This is a brownfield project and will be carried out within existing plant premises of 8.903 Ha.

As per Environmental Impact Assessment Notification dated 14th September, 2006 and subsequent amendment thereof, Sponge Iron, Steel Melting Shop (Induction Furnaces, with CCM) falls under S. No. 3(a) of schedule EIA Notification 2006. The WHRB based power plant is falls under S. No. 1(d) 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), MoEF&CC, 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/IND/261957/2022 dated 15.03.2022). The Standard ToR was granted for proposed expansion by EAC (Industry – I), MoEF&CC, New Delhi vide file no. IA-J-11011/401/2018-IA.II(I) on dtd. 20th April 2022.

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.

The draft report is submitted for public hearing as per the EIA Notification (dated 14th September 2006) and subsequent amendment thereof. The final report will be upgraded after public hearing.

1.1 IDENTIFICATION OF PROJECT

M/s. NIPL has proposed expansion of existing capacity for production of Sponge Iron, MS Billet, Steel Rerolled products and captive power generation plant comprising of Waste Heat Recovery Boilers (WHRB – no change) along with new implementation of pipe mill. The project is located at Khasra No.14 -A, B, C, H and 15 (part), Heavy Industrial Area, Hathkhoj, Bhilai District – Durg (CG – 490024). The proposal is to seek Environment Clearance based on energy efficient as well as well proven technology process.

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

S. No.	Details	Existing Permitted Capacity (TPA)	Proposed Addition in Capacity (TPA)	Final Capacity after Expansion (TPA)
1	DRI Kilns for Sponge Iron	97,500 (300 TPD x 1no) and (25 TPD x 1 no)	42,500	140,000 (370TPD x 1 No) and (30TPD x 1 No)
2	MS Billets through Induction Furnace with CCM	90,000 (10 ton x 2 Nos. + 5 ton x 2 Nos.)	102,500	192,500 (10 ton x 5 Nos.)
3	Rerolled Steel Rolling Mill (Refer Note 1)	90,000	90,000	180,000
	(i) Hot Charging based	90,000	360,000	126,000
	(ii) Reheating Furnace based on Coal Gasifier		54,000	54,000
4	Captive Power plant	8 MW	-	8 MW
	(i) WHRB from Sponge Iron	8 MW	-	8 MW
5	Pipe Mill	-	175,000	175,000

Note 1 – Coal Gasifier of 8750 m³/hr. will be implemented along with the Rerolling mill (Reheating Furnace) to produce 54000 TPA rerolled steel products from the permitted capacity of 90000 TPA.

1.2 LOCATION OF THE PROJECT

The proposed expansion project activities will be carried out within existing plant premises of 8.903 Ha. The plant is located at Khasra No.14 - A, B, C, H and 15(part), Heavy Industrial Area, Hathkhoj, Bhilai, District Durg, State Chhattisgarh. The nearest city is Bhilai which is around 2 Km in west direction. Nearest airport is Bhilai Airstrip, Birebhat Rd which is around 7.16 Km in North West direction and Swami Vivekanand International Airport, Raipur, which is around 34.42 km in south east direction. The nearest habitation is Akrodih Village which is at 0.2 Km in ENE direction from project site. The nearest roadway is NH 6 – 3.20 km in south direction. The nearest railway station is Bhilai Railway Station which is 3.66 Km in the south 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 (1st March 2022 – 31st May 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 1.1**). 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.

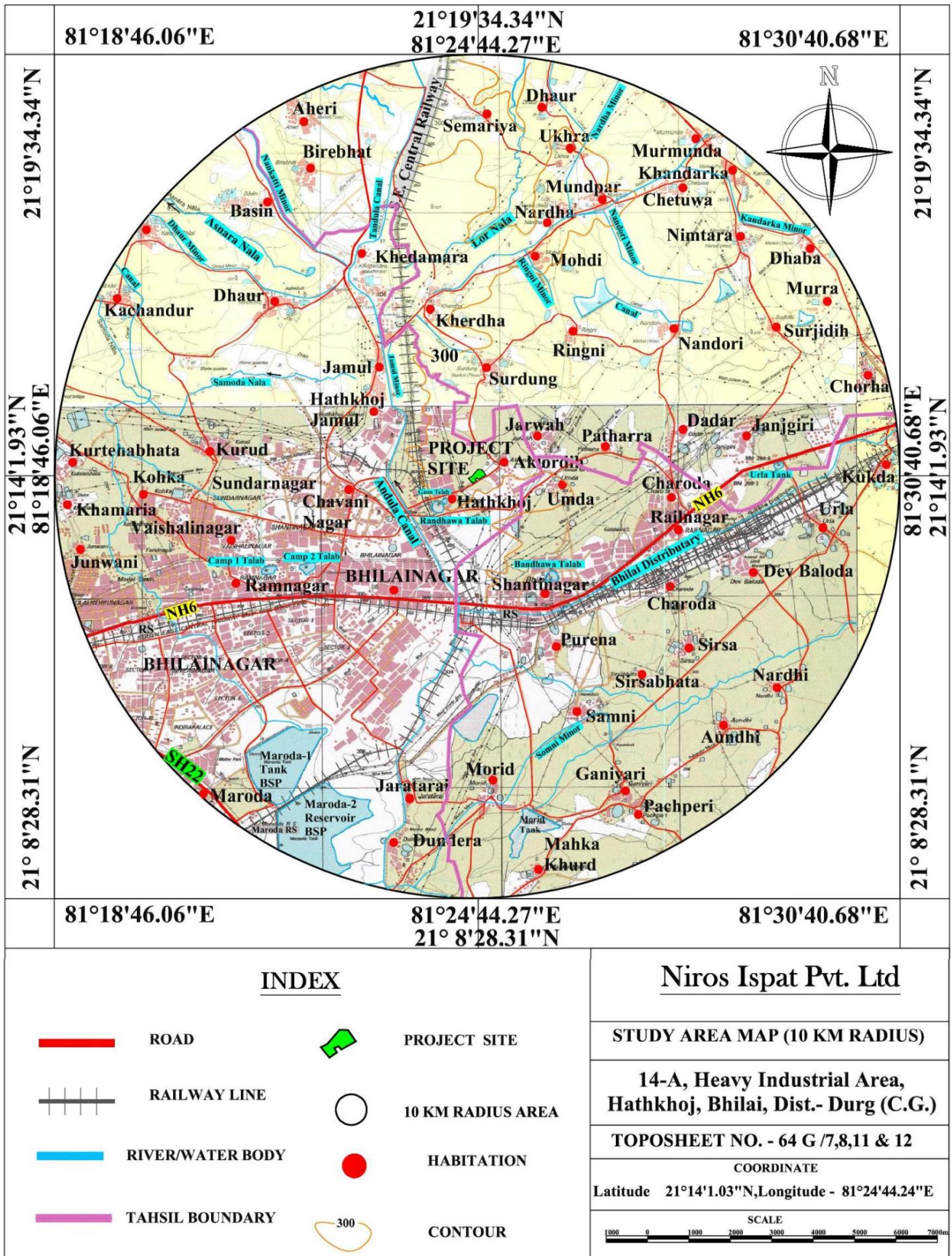


FIGURE 1.1: STUDY AREA (10 KM RADIAL DISTANCE)

**TABLE 1.2
DETAILS OF ENVIRONMENTAL SETTINGS**

Sl.	Particulars	Details			
1.	Project Location	14-A, B, C, H and 15 (part), Heavy Industrial Area, Village - Hathkhoj, Bhilai, Dist. – Durg – 490024, State – Chhattisgarh			
	Registered Office	14-A, Heavy Industrial Area, Hathkhoj, Bhilai, Dist.- Durg (C.G.)			
2.	Geographical Locations	Points	Latitude	Longitude	
		01	21°14'8.41"N	81°24'47.28"E	
		02	21°14'7.95"N	81°24'49.44"E	
		03	21°14'1.08"N	81°24'55.06"E	
		04	21°13'57.21"N	81°24'46.47"E	
		05	21°13'58.51"N	81°24'43.47"E	
		06	21°13'57.88"N	81°24'42.45"E	
		07	21°13'56.42"N	81°24'43.81"E	
		08	21°13'55.36"N	81°24'41.45"E	
		09	21°14'0.39"N	81°24'36.74"E	
		10	21°14'0.89"N	81°24'38.64"E	
		11	21°13'59.31"N	81°24'41.07"E	
		12	21°14'0.40" N	81°24'42.25"E	
		13	21°14'1.73"N	81°24'40.59"E	
		14	21°14'6.45"N	81°24'44.47"E	
3.	Toposheet No.	64G/7, 64G/8, 64G/11 & 64G/12			
4.	Climatic Conditions	Mean annual rainfall		1252.8 mm	
		Temperature	Pre monsoon	Max	41.7 ^o C
				Min	20.6 ^o C
		Temperature	Winter	Max	31.0 ^o C
				Min	13.3 ^o C
		Temperature	Post monsoon	Max	31.8 ^o C
Min	17.3 ^o C				
Source: IMD, Raipur					
5.	Nearest representative IMD station	IMD Raipur, Chhattisgarh – 32.30 Km, SE			
6.	Land Form, land Use and Ownership	The land is existing industrial land; total involved land is 8.90 Ha. No additional land proposed to be acquired. Greenbelt area 33.03% (i.e. 2.94 Ha.) will be kept unchanged. The land already diverted to industrial purpose.			
7.	Site topography	Project site located at min. 299 m, max. 305 m (above MSL)			
8.	Nearest roadway	NH - 6, 3.20 KM, S			
9.	Nearest Railway Station	Bhilai Railway Station - 3.66 Km, S			
10.	Nearest Air Port	Bhilai Airstrip, Birebhat Rd,	7.16 Km, NW		
		Swami Vivekananda International Airport	34.42 Km, SE		
11.	Nearest Port	NA			
12.	Nearest lake	NA			
13.	Nearest State/National Boundaries	Madhya Pradesh – 77.63 Km, W			
14.	Nearest major city with 2,00,000 population	Raipur	22.5 Km, ENE		
		Bhilai	2.00 KM W		
15.	Nearest village/major town	Jarway Bhilai	1.5 Km, NE		
		Akrodih	0.2 Km, ENE		
		Jamul	1.82 Km, NW		
		Kohka	7.68 Km, W/WSW		
16.	Hills/valleys	Nil			



Sl.	Particulars	Details		
17.	Nearest tourist place	Jublee Park, Bhilai	7.6 km, WSW	
		Jawahar Nehru Park	8.2 km, WSW	
		Maitri Bagh Zoo	9.5 KM, SW	
18.	Archaeologically important places	Nil		
19.	Nearest Reserved/ Protected forests	Nil		
20.	Nearest water bodies	1	Shivnath River	12.6 Km, W
		2	Maroda 1 Tank	7.0 Km, WSW
		3	Maroda-2 Reservoir (BSP)	7.4 Km, SW
		4	Randhawa Talab	0.9 Km, WSW
		5	Morid Tank	8.0 Km, S
		6	Bandhwa Talab	2.6 Km, SSE
		7	Camp 1 Talab	5.2 Km, WSW
		8	Camp 2 Talab	4.4 Km, WSW
		9	Kharun River	13.5 Km, E
		10	Gaon Talab	0.6 Km, WSW
21.	Nearest Industries	1	Bhilai Engineering Corporation	1.54 Km, WSW
		2	Bhilai Steel Plant (BSP)	6.7 KM (SSW)
		3	NSPCL Power plant	5.36 KM (SSW)
		4	Simplex Engineering & Foundry Works Pvt. Ltd.	2.95 KM(W)
		5	ACC, Cement Jamul	2.3 KM (W)
		6	MR Enterprises	1.3 KM (NW)
		7	Vossloh Cogifer Sign. India Pvt. Ltd.	1.10 Km, W
		8	Shri Balaji Wire Industries - Iron & Steel Industry	1.01 Km, NW
		9	Shri Jai Baba Steels Pvt. Ltd.- Iron & Steel Industry	0.68 Km, SE
		10	Durafon Technologies Pvt. Ltd. - Steel fabricator	0.41 Km, WN
		11	Supreme Industries	0.20 km, WNW
		12	Perfect Wire (Omkamal Steel Private Limited)	0.06 km, S
		13	Pilania Industries Pvt Ltd	0.82km, WNW
		14	Sarthak Metals limited	0.10km, E
		15	Bhilai Iron and Steel Processing company	0.76km, WNW
		16	Kripal Industries	0.47km, NNW
		17	Encore Projects Private limited	0.83km, WNW
		18	Shree Shyam chemicals	0.44km, NW
		19	Mahamaya minerals and Chemicals	0.57km, E
		20	Shree Sai Infra India Private limited	0.69 Km, WSW
		21	Jaya Industries	4.35km, NE
		22	Ayush Industries	0.30km, SE
		23	Kukreja Industries	2 Km, WSW
		25	B.K Steel Industries	3.60km, W
		26	Golden Engineering Industries	3.45km, W
		27	Shri Bhavani Wire Industries	0.94 Km, W
		28	Atmastco Limited	3.27Km, SW
		29	Mahadeva Industries	2.15Km, SW
		30	Pawana techno Chem.industreis	0.86Km, W
		31	Anamika Industries-GI Wire Manufacturer	2.11 Km, SW

Sl.	Particulars	Details		
		32	SISCOL manufacturing unit 1	1.20Km, W
22.	Areas occupied by sensitive man- made land uses (hospitals, schools, places of worship, Universities, Community Hall etc.)	1	The ICFAI University Raipur	8.84 Km, E
		2	Govt. Primary School Chhawani	2.20 Km, SW
		3	Indu IT School	6.64 Km, WS
		4	Forbells Public School	3.41 Km, SW
		5	G.S.I.T. School Charoda	3.52 Km, ES
		6	Neetu Public School	4.60 Km, E
		7	Community Hall	4.43 Km, W
		8	Community Hall DHOS	9.58 Km, WS
		9	Muslim Community Hall	7.52 Km, SW
23.	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 Sponge Iron (DRI)

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

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

- Induction Furnaces with medium power input capacity of 5 to 6.5 MVA each will be setup with automatic charging facility and Power Sharing software.
- The melting process involves taking sample of Sponge Iron & Pig Iron; Iron Powder and mild steel scrap, end cutting from rolling mills or scrap from user units is taken from raw material storage.
- Homogeneous molten mass is poured hydraulically into the ladle.

LRF (Ladle Refining Furnace):

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

CCM:

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

2.1.3 Manufacturing process of Rolling mill:

Rerolled Steel Products through Rolling Mill:

The company has existing 90000 TPA Rolled Steel production which is proposed be increased to 180000 TPA. The existing capacity through Direct hot charging of hot billet from Induction Furnace will be increased from 90000 TPA by additional 36000 TPA capacity to achieve 126000 TPA. Along with this a Hot Producer Gas based Gasifier with 8750 m³/hr will be implemented

along with Reheating Furnace to reheat cold billets to produce 54000 TPA rerolled steel products. Thus the total rerolled steel production will increase to 180000 TPA. The rolled steel will be mainly in the form of strips which will be used for making Pipes and Tubes.

Raw Material i.e. Billet produced internally or procured from outside is cut to size; either by Gas Cutting. The sized billets in case of cold billets are then pushed into Billet reheating furnace fired with Pulverized Coal firing or Hot Producer Gas for reheating after heating these are ejected from RHF to be sent to Rolling mill. The rolling mill also receives hot sized billets from CCM of Induction furnaces. Then hot Steel billets Pieces from both the sources are rolled through all rolling mill stands in order to get required shape of finished goods.

2.1.4 WHRB based Power Generation

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

2.1.5 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.

2.2 LAND REQUIREMENT

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		
	(a) Main Building and shed	2.769	
	(b) Admin and Utilities	0.254	
	(c) Raw Material Shed	0.675	
	Sub Total ::	3.698	41.54%
2.	Road and Paved		
	(a) Road and Pavement	0.254	
	(b) Truck Parking	0.547	
	Sub Total ::	0.801	9.00%
3.	Greenbelt		
	Greenbelt	2.938	33.00%
4.	Open Area		
	Reservoir	0.849	
	Open Area	0.617	
	Sub Total ::	1.466	16.47%
	Grand Total ::	8.903	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. 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 brought by Rail upto nearest railway siding and thereby transported to plant site through covered truck. Many times the Coal and Iron Ore are also being transported by road.

2.3.1 Solid and Hazardous waste generation

The total estimated solid waste generation (including existing and proposed expansion) will be 100370.00 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 Char Dolochar will be Sold to nearby Power plants, Bottom Flue Dust ash, Coal Ash from Rolling Mill will be sold to nearby Brick making units or cement plants; Kiln Accretion and 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

Water requirement (existing + proposed expansion) will be 546 KLD, out of which 37 KLD will be used for domestic purposes. Total Yearly water requirement will be 546 KLD * 330 days = 191100 KLA. The unit is having NOC from CGWA for 88500 KLA. Total water requirement after proposed expansion will be fulfilled from ground water source. For proposed expansion, the NOC from CGWA will be obtained. In addition, two In-house reservoirs of 33000 KLA for collection of rain water will be implemented. Company will implement the recharge systems which will recharge ground water 100% of the runoff potential.

2.5 POWER REQUIREMENT & SUPPLY

Total power requirement (existing and proposed expansion) will be 22 MW out of which 8 MW will be met through captive power plant and 14 MW will be sourced through State Grid (CSPDCL). In addition, existing plant already has 2 nos. of 1010 kVA and 1 no of 600 kVA DG sets which will be continued to be used as emergency backup.

2.6 MANPOWER REQUIREMENT

M/s. Niros Ispat Pvt. Ltd. will provide employment to 990 (810 existing + 180 additional) peoples as direct employment which includes 93 people as administrative staff and 897 people will be appointed for 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, 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. The details of available firefighting facilities are provided in **Chapter 7**.

2.8 PROJECT COST

The existing cost of the project is Rs. 157.09 Crores whereas cost for proposed expansion is Rs. 25.00 Crores. Thus, Total Cost of the project after expansion is Rs. 182.29 Crores. Provision for CER is kept as Rs. 20 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 (1st March 2022 – 31st May 2022).

3.2 METEOROLOGY & AMBIENT AIR QUALITY

Summary of the Meteorological Data Generated At Site (1st March 2022 – 31st May 2022)

Predominant Wind Direction	Pre-monsoon season
First Predominant Wind Direction	WSW (19.97%)
Second Predominant Wind Direction	W (13.81%)
Calm conditions (%)	1.22
Avg. Wind Speed (m/s)	3.01

The status of ambient air quality within the study area was monitored for Pre - Monsoon Season of the year 2022 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	1	Min	56.4	24.6	11.2	20.4	0.471	9.2	6.2
		2	Max	76.3	38.4	21.7	27.7	0.581	12.3	9.1
		3	Avg	68.2	32.6	17.1	23.5	0.539	10.8	8.0
		4	98 th	75.9	37.9	21.3	27.6	0.580	12.2	9.1
2	Akrodih	1	Min	64.0	27.7	10.1	18.7	0.642	9.5	6.1
		2	Max	85.2	39.2	18.2	27.7	0.736	13.1	10.2
		3	Avg	71.9	33.4	15.1	24.4	0.694	11.5	8.5
		4	98 th	83.4	38.8	18.2	27.7	0.730	13.0	9.9
3	Umda	1	Min	53.7	23.1	9.2	17.1	0.447	7.2	5.4
		2	Max	75.4	35.5	17.3	26.7	0.582	11.2	8.6
		3	Avg	65.3	28.6	12.4	21.4	0.513	9.5	7.2
		4	98 th	75.3	35	16.5	25.8	0.575	11.1	8.6
4	Jarwah	1	Min	56.4	24.2	10.6	17.7	0.373	7.3	6.2
		2	Max	72.6	31.4	16.5	21.9	0.479	11.3	9.2
		3	Avg	64.2	27.8	13.7	20.3	0.428	9.1	7.5
		4	98 th	70.9	31.2	16.2	21.9	0.471	11.1	9.0
5	Chavani Nagar	1	Min	55.6	22.7	11.8	19.5	0.458	7.7	7.1
		2	Max	75.3	36.4	16.7	25.8	0.538	12.4	9.4
		3	Avg	67.5	30.0	14.6	22.5	0.496	10.1	8.2
		4	98 th	74.5	35.8	16.5	25.2	0.536	12.3	9.3
6	Hathkhoj	1	Min	64.7	27.5	13.7	20.4	0.538	9.9	7.6
		2	Max	82.7	45.2	19.1	27.9	0.685	14.5	10.8

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
7	Surdung	3	Avg	73.4	36.8	16.2	24.1	0.634	12.3	9.4
		4	98 th	82.1	44.9	18.8	27.6	0.683	14.1	10.7
		1	Min	56.3	22.4	8.5	15.5	0.439	5.5	4.8
		2	Max	67.7	28.7	15.0	24.5	0.683	11.6	8.1
8	Shanti Nagar (Old Bhilai)	3	Avg	61.7	25.4	11.8	19.6	0.567	8.7	6.5
		4	98 th	67.6	28.3	14.6	23.5	0.674	11.5	7.8
		1	Min	62.3	24.7	14.6	19.6	0.581	8.5	6.9
		2	Max	76.7	36.8	19.5	25.6	0.732	13.9	10.2
		3	Avg	70.2	31.2	16.7	22.8	0.662	11.4	8.6
		4	98 th	76.7	36.7	19.2	25.5	0.727	13.8	10.2
CPCB Standards				100 (24hr)	60 (24hr)	80 (24hr)	80 (24hr)	2 (8hr)	100 (8hr)	400 (24hr)

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.	Akrodih	53.1	42.8
2.	Jarwah	51.6	41.4
CPCB Standards dB(A)		55.0	45.0
Commercial Area			
3.	Vishv Bank Colony	56.8	44.5
4.	New Khursipar	59.2	46.1
CPCB Standards dB(A)		65.0	55.0
Silence Zone			
5.	Surdung	48.3	37.7
6.	DAV Public School	46.9	38.1
CPCB Standards dB(A)		50.0	40.0
Industrial Area			
7.	Project site-	61.8	56.5
8.	Hathkhoj	64.2	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

10 km radius study area is mainly comprised of sedimentary rock formations, like stromatolitic limestone, ferruginous sandstone and lateritic patches. 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.

Site specific Geology:

Project area is mostly covered by soil cover which is having thickness of around 0.5-1.0m. Outcrops are very rare in project site.

Hydrogeology:

All of the study area is covered by sedimentary formations. Groundwater occurs in water table, semi-confined and confined conditions. Primary porosity of these formations is very poor as limestone is hard and compact. The weathered and cavernous part of the formations and fractured zones act as a good aquifer in the study area.

Depth to water level scenario in the study area:

- Pre-monsoon Water levels- 8 to 14 m bgl
- Post-monsoon water levels: 2 to 4 m bgl

Geomorphology:

Study area comprises of gently sloping plains (Pediaplains) on Proterozoic age. Some surface waterbodies are observed. Lateritic patches also observed in most of the study area.

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 4 surface water samples.

A. Groundwater Quality

The analysis results indicate that the pH ranged 6.72 – 8.16. The TDS was ranging from 324 – 410 mg/l. Total hardness was found to be in the range of 168.53 – 192.44 mg/l. The fluoride concentration was found to be in the range of 0.16 – 0.24 mg/l. The nitrate and sulphate were found in the range of 6.97 – 12.81 mg/l and 15.92 – 21.51mg/l respectively.

The chloride concentration was found in the range of 18.52 to 32.58 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 0.09 to 0.32 mg/l.

B. Surface Water Quality

The analysis results indicate that the pH ranged between 6.73 – 8.16. The pH of water indicates whether the water is acid or alkaline. The TDS was observed to be 402 – 632 mg/l which is within the permissible limit of 2000 mg/l. The total hardness recorded was in the range of 160.28 – 298.14 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 26.19 – 46.29 mg/l and 17.32 – 72.81 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 – 6.1 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 in the range of 0.47 – 0.63 mg/l. COD ranges from 12.59 – 22.64 mg/l and BOD ranges from 3.82 – 7.24 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 19th MAY 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° 8'52.39"N to 21°19'5.85"N latitude and 81°19'36.45"E to 81°30'6.15"E longitude and elevation 264 to 351 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	67.54	20.62
		Industrial Settlement	13.48	4.12
		Road Infrastructure	4.36	1.33
		Railway Line	1.98	0.60
2	Agricultural Land/ Crop Land	Single Crop	132.17	40.36
		Double Crop	85.90	26.23
3	Mines Area	Stone Quarry	0.68	0.21
4	Scrubs/Wastelands	Wasteland	6.48	1.98
5	Water bodies	River/Nala/Stream/Canal	2.35	0.72
		Pond/Lake	7.42	2.27
		Tanks	2.16	0.66
		Reservoir	2.99	0.91
Total			327.51	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 1.531 - 1.726 g/cc which indicates favourable physical condition for plant growth. The water holding capacity is between 31.52 - 33.68%. Infiltration rate, in the soil is in the range of 21.68 – 24.36 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 (6.73 – 7.19) in reaction. Electrical conductivity, a measure of soluble salts in the soil is in the range of 281.46 – 308.26 $\mu\text{S/cm}$.

The important soluble cations in the soil are calcium and magnesium whose concentration levels ranged from 246.29 – 312.57 mg/Kg and 47.29 – 61.42 mg/Kg respectively. Chloride is in the range of 146.27 – 153.39 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 matter and organic carbon were found in the range of 1.97% – 2.36% and 1.14% – 1.37%.

3.7 BIOLOGICAL ENVIRONMENT

Floral composition in Study Area

Total 105 plant species were enlisted within the study area out of which habit wise details are given below:

- | | | | |
|----|-----------------------------|---|--|
| a. | Trees | : | Total 54 species were found in the study area |
| b. | Shrubs (small trees) | : | Total 24 species were enumerated from the study area. |
| c. | Herbs | : | In the study area 11 species were observed. |
| d. | Bamboo & Grasses | : | 10 species were enlisted from the study area |
| e. | Climbers and Twiners | : | Total 05 species of climbers/ twiners were recorded in the study area. |
| f. | Parasite Plant | : | 1 species enlisted in the study area. |

RET (Rare, Endangered and Threatened species) STATUS

According to IUCN Status report 2013 out of total 105 plant species identified within study area among the 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. IUCN Red List is recognized as the most authoritative guide to the status of biological diversity.

Among the reported animals all wild fauna including avifauna are categorized under least concern category.

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.

Among mammals; Jackal (*Canis aureus*), Common Mongoose (*Herpestes edwardsii*), Rhesus Macaque (*Macaca mulatta*), Common Langur (*Presbytis entellus*) and Indian Fox (*Vulpes bengalensis*) are provided protection as per schedule II of Wild Life (Protection) Act, 1972. *Funambulus pinnati* (Palm squirrel) protected in Schedule IV whereas, Rats species protected under Schedule V of Wild Life (Protection) Act, 1972.

Among the reptiles and Amphibians, Indian Cobra (*Naja naja*), Russel's Viper (*Vipera russelli*) Common rat snakes (*Ptyas mucosus*) and Checkered Keelback (*Xenochrophis piscator*) are provided protection as per Schedule-II of Wild life protection act, (1972). Remaining species are included in schedule IV and some of the species are does not give the protection in any schedule of WPA 1972. Amount Avifauna total 21 bird species observed within the study area covered under schedule IV 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 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
0-2 km	766	3699	1855	1844	497	536	173
2-5km	6080	28295	14427	13868	3632	7326	1230
5-10km	15851	73390	37209	36181	9157	12699	4190
10km	22697	105384	53491	51893	13286	20561	5593
In%	4.64		50.76	49.24	12.61	19.51	5.31

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 Durg District
Educational Facilities	100%
Drinking water	100%
Road	100%

Infrastructure facilities	Availability (In percentage) As per year 2011, Census Durg District
Power	100%
Communication	86.11%
Transportation	88.89%
Govt. PHC & SC	52.78%
Bank & Society	25%
Drainage	44.44%
Recreation	91.67%

Source: Primary census abstract 2011, State Chhattisgarh.

Salient Observation of the Socio-Economic Survey

A number of aspects were studied in the villages surveyed for socio- economic studies. Following are the observations found during interviews, focused group discussions and as per the Questionnaire.

(1) Housing Pattern:

The study area surrounded by mainly agriculture area and industrial zone and so the people are economically strong enough and having job opportunities and small and big businesses. Many houses in the area are seen to well-constructed. It is observed that, the housing pattern in study area varied from hatched to pucca (pakka) houses. Near about 75% of the houses were in pucca (pakka) form whereas 20% in semi pakka form and 5% houses were observed in kaccha form.

(2) Employment:

The Main occupation in the study area was agriculture and Labor Work its allied activities eg. Cattle rearing, dairy farming, agro-horticulture. The study comprises of industrial area which provides significant job opportunities for villagers in the factories or in plant. Other income generation sources of the area, small business; private jobs etc. The labors were getting daily wages in the range of 400-450 Rs, depending on type of work they set.

(3) Major crops of study area, production & yield:

The farmers in the area cultivate wide variety of crops. About half 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 crops include Rice, Maize, Millets, Wheat and Soybean. Other than this, Vegetables and fruits are also grown in the region.

(4) Migration from other states:

The area is industrially developed and main industries found here are coal washery, power plant, steel industries etc. Migration from other states eg. UP, Bihar & Odisha for employment purpose found in the study area.

(5) Education Status:

The education status was explored in 15% of the sample villages which was discussed with Panchayat members or school teacher for adult working population only. Details shown in table 3.7.2 are more approximate to give the rough idea of possible employment opportunity among the industries located in the project areas. It is to be noted that the Skill gaps in the industries for persons having skilled jobs degree are largely fulfill by the urban areas while the persons with unskilled jobs are largely taken up from surrounding villages during construction and operation stage of the industries.

(6) Transportation Network:

The site is well connected to all weather roads. It is also connected to railway network. One should note that the transportation road network is vital and had played significant role in economic development, trade and social integration of the country. It facilitates smooth conveyance of both people and goods. Size of the road network, its quality and access have a bearing on various parameters of the economy like travel time, transport costs, cost of input, cost of finished products etc. Besides, road network promotes wide market of various products / services and thereby extend markets as a consequence enable exploitation of the economies of scale as witnessed in Durg district.

(7) Medical facilities:

The Primary & secondary data reveals that, there are only 02 nos. of Sub Health Centers & 09 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. To control the spread of diseases and reduce the rates of mortality due to lack of adequate health facilities, special attention needs to be given to the health care in rural areas. The key challenges in the healthcare sector are low quality of care, poor accountability, lack of awareness, and limited access to facilities. It is also observed that Malnutrition is the common in most of the villages.

(8) Drinking Water, Sanitation & Infrastructure:

It is observed that the source of water for Drinking & Agriculture in most of the Villages is groundwater. And the remaining villages which are proximate to the river, uses it as source of drinking water & for Agriculture. It was observed that most of the Houses in the villages are not having sanitation facilities including in several schools. It was observed that now a day's Internet is playing major role in society, but in the study area only one Internet shop is available.

(9) Banking facility:

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

(10) Sports & social ailment issues:

Social ailment issues like child marriage, alcoholism among tribes. It is observed during FGD that there are only a few people got the benefit of Self-employment scheme and needs substantial improvement. It is observed that there is no encouragement for sports as there are less Schools & Colleges in the Study area.

(11) Animal Husbandry:

Cows & buffaloes were found in the study area with people. Bullocks were also found to be used for agricultural activities.

(12) Criminal Cases:

The criminal cases were no found to be significant within the study area as per the discussion with villagers, but some women reported that they are being victim of domestic violence which is not being reported to police.

(13) Population Growth:

As per indiagrowing.com Durg District population in 2022 is 3,698,169 (estimates as per aadhar uidai.gov.in Dec 2020 data). As per 2011 census of India, Durg District has a population of 3,343,872 in 2011 out of which 1,682,101 are male and 1,661,771 are female. Hence, it can be said that there is increase in population by 10.59% after census 2011.

(14) Migration Status:

Our Primary finding suggest that from the total population of 105384 villages coming under the radial distance of 10 km from the project site, about 05% of the population are migrated. The owner of these houses return twice in a year (in May and during Oct-Nov Diwali Vacation). The population residing are doing large agriculture labour work and also depended upon casual labour work industries.

3.8.1 Awareness and opinion of the respondents about the project

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

- In core zone villages, majority of the respondents were aware about the project site but they were unaware about the project activity.
- The respondents were happy to know about the project and they opined positively because the activity would contribute development in the study area.
- Village leaders asked to give employment opportunities to local people.
- Main demands of villagers in study area were for medical facility and employment opportunity.

3.8.2 Interpretation

Hathkhaj is a heavy industrial area having a plenty of industries are present within 10 km radius area from the project site. People work in industries as labour and also do farming. The people in the area are earning enough money to cater to their basic needs of food, cloth, and shelter but to improve the lifestyle social and infrastructural development is necessary in terms of education, modernization of agriculture activities etc. Vocational training centers, trainings related to modern agricultural techniques and women empowerment programs should be arranged for the people in the area. Trainings related to new technologies and methods of doing farming should be given to people in study area.

Education is the base for development of area. This will rise to grow economy by creating opportunities to students to get jobs in different fields. Training to the youth for development of technical skills should be given so that the local they get good employment in industries. Health camps, women empowerment, entrepreneurship programs, training computer skills will be beneficial to the people to grow healthy and economically. Apart from this, the villages are lacking infrastructure facilities like community hall, bank facility, toilet facilities, open gyms, college facilities and sports clubs. The people in the study area were happy to know that the existing project of Niros Ispat Pvt. Ltd. is going to be installed in the area as it will create more employment opportunities to the local people.

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. In normal condition the predicted 24-hourly maximum contribution of particulate matter are 1.96 µg/m³ and 2.15 µg/m³ for existing and proposed scenarios respectively. After proposed expansion, the incremental concentration of SO₂ and NO_x will be 1.96 µg/m³ and 6.57µg/m³ at distance of 1000 m respectively in N direction in controlled condition.

Details of Air Pollution Control System/ Mitigation measures

S. No.	Facilities	Air Pollution Control equipment	Emission Level
1.	DRI Kiln with WHRB	a. Dust extraction system, ESPwith Chimney b. Bag Filters for Product house; Kiln discharge end and transfer points.	PM - 30 mg/Nm ³
2	Steel Melting Shop with Hot Charging rolling mill	Bag Filters with Chimney	PM - 30 mg/Nm ³
3	Billet Reheating Furnace based Rolling Mill based on coal gasifier	Bag Filter with Chimney	PM - 30 mg/Nm ³ SO ₂ - 300 mg/Nm ³ NO _x - 1000 mg/Nm ³

Additional Measures to reduce/control pollution control

- Roads will be frequently sprinkled with water.
- Most of the materials will be stored under covered shed.
- Sponge Iron/ Carbon Powder; Coal will be covered by tarpaulins to prevent fugitive emissions
- Water spraying will be used to control the fugitive emissions in the internal open storage yards.
- Regular maintenance of vehicles and machineries will be carried out in order to control emissions.
- Green belt development would be taken up –
 - Along the road side
 - Periphery of Plant Premises both inside and outside the boundary.
 - Both sides of approach road, etc.
- PPE (Viz. Gum Boot; hand gloves; Safety helmet; Safety goggles, earplugs as per requirement) as a part of SOP provided to workers at dust prone area and it will be continue after expansion.
- No overloading
- Vehicles deployed complying BS-VI will be used, preferably.
- Proper gradient of approach roads to reduce cumulative noise.
- Transportation of materials will be limited to day hours only.

- Movable Industry grade Vacuum cleaning system (2 Nos.)
- Dry Fog System and crushing and screening system (1 No.)
- Protective appliances are being/ will be provided to all the workers exposed in dusty atmosphere.
- Transportation of materials is being/ will be limited to day hours only.
- End to end pavement of road.
- Fleet management to avoid unnecessary vehicle movement restriction.
- Daily sweeping of road to remove silt content.

4.2 NOISE ENVIRONMENT

Noise will be generated during the normal operation of manufacturing process due to operational activities of Induction Furnaces, ID Fan, Blower/air Fan, Cutting/Shearing Machine, CPP (WHRB) 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 nearest human settlement Akrodih is 200 m away from project site and resultant noise level at this village are 57.2 dB(A) & 55.3 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 2304 gm/km-hr on the surrounding environment due to 144 trucks/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 only of (288 trips/day) will add insignificant contribution on the carrying capacity of the concern roads. 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 546 KLD (191100 KLA). Total water required for domestic purposes will be 37 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. Niros Ispat Pvt. Ltd. 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 water system implemented in DRI Division, SMS and WHRB power plant division.
- Treated domestic waste water will be reused for Gardening.
- Treated Industrial wastewater will be re-circulated in processes.
- It is proposed to install 30 KLD STP based on MBBR technology.
- Rain water harvesting will be carried out.
- All stock piles will be on pucca flooring to prevent for any ground water contamination.

4.4 BIOLOGICAL ENVIRONMENT

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

S. No.	Project Aspects / Activities	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 2.938 Ha. (33%) will be provided with local species, broad leaves, higher canopy and fast growing tree species. Existing plants are 6000 nos. whereas additional plantation will also 1345 be carried out. Thus, the total plantation after expansion will be 7345 nos (considering 2500/Ha. density). Indigenous species for plantation is recommended. Thus, the impact due to proposed expansion project would be minimal as project activity will be carried out within

S. No.	Project Activities	Aspects /	Impacts	Mitigation Measures Suggested
				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 Sponge Iron and operation of Induction furnace can cause release of pollutants in the Air Environment. 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 Green belts 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 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.

6.0 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.

7.0 PUBLIC CONSULTATION

The draft EIA-EMP report is submitted for public hearing as per the EIA Notification (dated 14th September 2006) and subsequent amendment thereof. The final report will be upgraded after public hearing.

8.0 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. Niros Ispat Pvt. Ltd. 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. 20 Lakhs will be spent for the social infrastructure development.

9.0 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 existing capital cost of EMP in the existing project is **Rs. 15.850 Crores** whereas **capital** cost for EMP in the proposed expansion will be **Rs. 4.140 Crores**. Thus total EMP cost of project is estimated to be Rs **20.94 Crores**. Total recurring (O&M) cost of the project will be **Rs. 0.2483 Crores**.

10.0 CONCLUSION

The proposed expansion project of M/s. Niros Ispat 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 ESP, 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.

11.0 DISCLOSURE OF CONSULTANTS

The environmental studies for proposed expansion project of M/s Niros Ispat Pvt. Ltd. carried out by M/s Anacon Laboratories Pvt. Ltd., Nagpur (M/s ALPL). M/s. 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/2023/SA0160 dtd. 13 April, 2022 Valid till March 29, 2023.