



EXECUTIVE SUMMARY

1.0 INTRODUCTION

The firm Ispat India is in operation of its unit with Environment Clearance from SEIAA CG (284/SEIAACG/SIA/CG/IND/Raipur/536 dated 12.06.2017) and Consent Under Air Act and Water Act from CECB (1945 and 1947/TS/CECB/2018, Dated 24.05.2018) for its 59000 TPA MS Billet production through Induction Furnaces and 55000 TPA Rerolled product such as strips, pipes etc. manufacturing through Hot Charging Rerolling Mill. Now, in order to expand production capacity, considering market scenario the management has decided to increase the production capacity by addition of 1 No. of 10 MT capacity induction furnace along with increase in crucible capacity to 9 MT each for existing all the three induction furnaces.

Thus, M/s. Ispat India will be able to produce MS Billet 146520 TPA (from 59000 TPA) and Hot Charging based Rolling Mill from 55000 TPA to 139194 TPA Rerolled Steel products.

As per Environmental Impact Assessment Notification dated 14th September, 2006 and subsequent amendment thereof. The proposed project falls under "Category B1", Schedule 3 (a) and requires Environmental Clearance (EC) to be obtained from SEAC/SEIAA, Chhattisgarh.

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 expansion project.

The online application for prior Environmental Clearance (Form-1) was submitted to SEIAA/SEAC, Chhattisgarh on Dated 28/06/2018 and subsequent Letter dtd. 01/11/2018 (Proposal No.: SIA/CG/IND/27903/2018) for proposed expansion project. The proposal was considered by the State Expert Appraisal Committee (SEAC) during its meeting held on 04th October 2018. The SEAC has suggested standard Terms of References (ToR) (Vide Letter no. 330/SEACCG/RO&IND/Raipur/721A dtd. 04.12.2018) for preparation of the draft EIA-EMP Report.

Environmental baseline studies were carried out during in Post-Monsoon Season 2018. This EIA report is prepared based on the ToR conditions recommended by SEAC, Chhattisgarh and project related technical details provided by M/s. Ispat India. A copy of the TOR letter is enclosed as Annexure and its compliance with cross referencing provided in the beginning of the chapter scheme.

1.1 IDENTIFICATION OF PROJECT

The existing and proposed plant details of M/s. Ispat India are given below:

Product	Existing		Proposed Capacity	Ultimate Capacity after Expansion	
	Facility	Capacity (TPA)	Capacity (TPA)	Facility	Capacity (TPA)
M.S. Billet	6 MT X1 + 7 MT X 2 Nos. IF's	59000	87520	*9 X 3 Nos + 10 MT X 1 Nos. IF's	146520
Rerolled Steel Products (Strips, Pipes, etc.)	Rerolling Mill with online hot charging of Semi-finished steel (166 TPD)	55000	84194	Rerolling Mill with online hot charging of semi-finished steel (421 TPD)	139194

Note: * In order to achieve better energy efficiency in the melting furnaces and rolling mill the management has decided to increase the production capacity by addition of additional 1 No. of 10 MT capacity induction furnaces along with increase in crucible capacity to 9 MT each for existing all the three induction furnaces.

1.2 LOCATION OF THE PROJECT

Plant is located at Phase – II, Siltara Industrial Growth Centre, Tehsil and District Raipur of Chhattisgarh. The nearest city is Raipur which is around 12.58 km towards South of South West direction. Nearest airport is also Raipur which is around 21.3 km at SE direction. The nearest roadway is National Highway - 200 which is 0.43 km in East direction whereas Ring Road 3 is about 10.0 km in South direction. The proposed expansion project will be coming up within the existing premises. The study area of 10 km radial distance from the project site is shown in **Figure 1**.

1.3 EIA/EMP REPORT

In line with the approved ToR obtained from SEAC, Chhattisgarh, baseline environmental monitoring was carried out during Post monsoon season (15th October 2018 to 15th January 2019) for determining the status of ambient air quality, ambient noise levels, surface and groundwater quality, soil quality, status of flora, fauna and eco-sensitive areas and socio-economic status of the villages within 10 km radius study area from the project site. **(Figure 1)** The observations of the studies are incorporated in the draft EIA/EMP report. Impacts of the proposed project activities during construction and operation stages were identified and duly addressed in the draft.

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

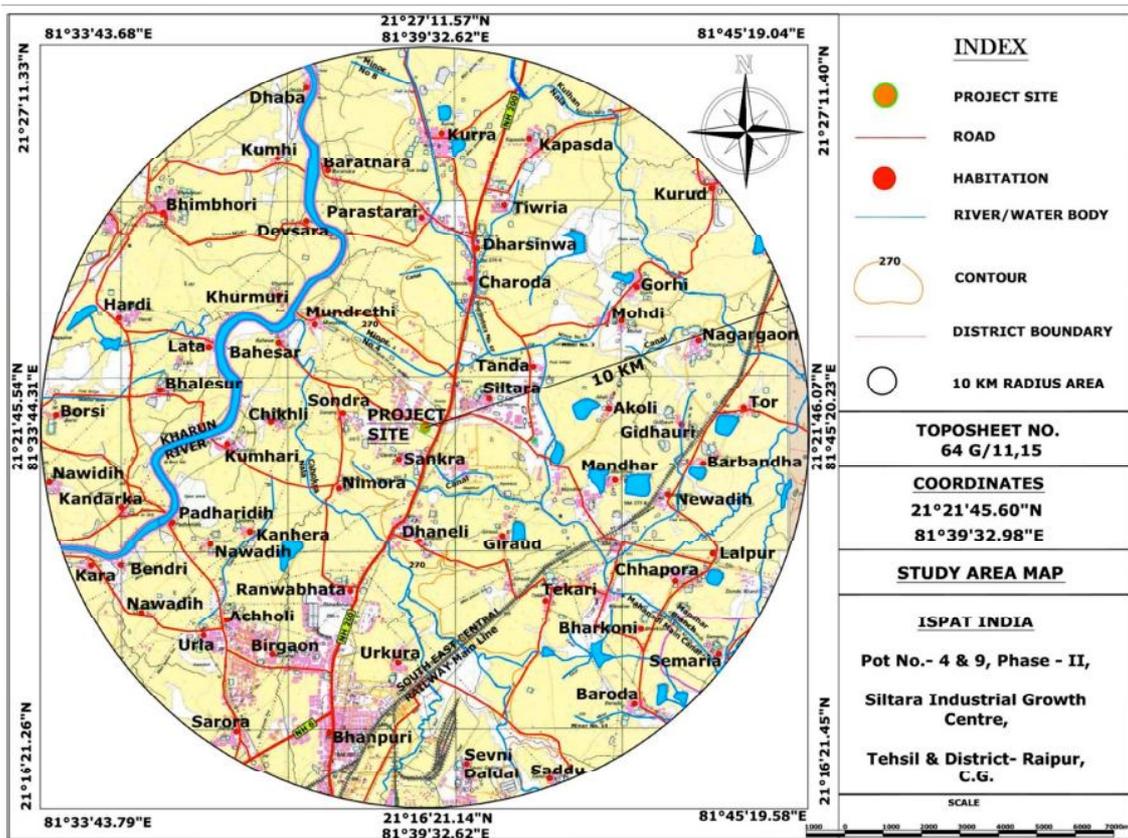


FIGURE 1: STUDY AREA (10 KM RADIAL DISTANCE)

	Proposed Expansion of Induction Furnace from capacity 59000 TPA to 146520 TPA (M.S Billet Facilities) and Rolled Steel Products capacity from 55000 TPA to 139194 TPA at Siltara Industrial Growth Centre, Tehsil and District Raipur (CG) of M/s. Ispat India	
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**TABLE 1
DETAILS OF ENVIRONMENTAL SETTINGS**

Sr. No.	Particulars	Details
1.	Project Location	Siltara Industrial Growth Centre, Phase-II, Tehsil-Raipur, Dist.-Raipur (Chhattisgarh)
2.	Co ordinate	Latitude : 21°21'45.60"N ; Longitude: 81°39'32.98"E
3.	Toposheet No.	F44P11 (Old No. 64 G/11)
4.	Climatic Conditions	Mean annual rainfall is 1252.8 mm Temperature : Pre monsoon 20.6° C (Min.) 41.7° C (Max.) : Winter 13.3° C (Min.) 31.0° C (Max) : Post monsoon 17.3° C (Min.) 31.8° C (Max.) Source: IMD, Raipur
5.	Nearest IMD station	IMD Raipur – 16.77 km in S
6.	Land Form, land Use and Ownership	Industrial
7.	Site topography	Project site located at 295 m (MSL) ; Flat Terrain
8.	Nearest roadway	National Highway No. 200 and SH No. 2 – 0.43 km (E) Ring Road 3 – 10 km (S)
9.	Nearest Railway Station	Mandhar Railway Station – 3.47 (SE)
10.	Nearest Air Port	Swami Vivekanand International Airport – 21.3 km (SE)
11.	Nearest Port	NA
12.	Nearest lake	Lake, Near- Village Sankra – 0.5 km (SSE)
13.	Nearest State/National Boundaries	Madhya Pradesh – 99.26 km (W) Maharashtra – 103.8 km (WSW) Odhisra – 106.4 km (ESE)
14.	Nearest major city with 2,00,000 population	Nearest city – Raipur – 12.58 km (SSW)
15.	Distance for sea coast	NA
16.	Hills/valleys	None
17.	Nearest Reserved/ Protected forests	None
18.	Nearest water bodies	Kharun river – 4.7 km (W)
19.	Seismic zone	The proposed expansion 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 along with Hot Charging Rolling Mill

- The manufacturing process identified for the proposed expansion unit is one which is well established and proven and presently being followed by majority of similar manufacturing units mostly in small or medium scale sector.
 - In order to achieve high energy efficiency four numbers of Induction Furnaces (1 No. of 10 MT capacity induction furnaces along with increase in crucible capacity to 9 MT each for existing all the three induction furnaces) with higher power input capacity will be setup with completely automatic charging facility as well as power sharing panel also. Electronic software will be installed to monitor the input power and maintaining power factor to almost unity level.
 - 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. This is then tested for its chemical composition and noted. Before preparation of charge necessary ingredients like Ferro Manganese, Ferro Silicon etc. are added by weight, Flux is taken up in crucible and then charge is put into it. Melting of steel along with other alloying element is accomplished in the crucible of coreless M.F. Induction Furnace.
 - The high A.C. Current is passed through the copper oil wrapped around the outer periphery of crucible. By transformer action the A.C. Current induces much higher secondary current at 1000 hertz in charge through the coil. Enormous heat is thus developed by resistance which causes the melting of charge. As soon as the molten pool is formed very pronounced stirring action in the molten metal takes place which helps in accelerating the melting. Deoxidizing agents and sometimes specific alloying elements are also added at suitable intervals during melting. Melting of homogenous mass occurs at 1600 °C. If necessary superheating up to 1650 °C as done for specific time. After completion of melting cycle of an hour the homogeneous molten mass is poured hydraulically into the ladle.
- **Continuous Casting Machine (CCM):**
- The ladle containing liquid steel will be placed on the CCM platform and continuous casting of hot billet will be carried out in the same for which CCM is setup, the casting will be done through a highly automated controlled cooling software governed mechanism by which the casted billet will be so cooled that the temperature of billets do not fall below 1050°C. The case formation in the CCM mould starts with drop in surface temperature below 1520°C, the liquid metal inside the case contains enough energy for maintaining the overall temperature of billet for hot online rolling. In the CCM section hot billet shearing machines will be installed with each casting strand, so as to facilitate the cutting of billets to proper length for feeding to the rolling mill.
- **Hot Charging Rerolling Mill:**
- Raw Material i.e. Billet coming from CCM in red hot condition is cut either by Gas Cutting or automatic hot billet Shearing Machine. In the proposed plant automatic hot billet shear machines are going to be installed with each strand. The gas cutting facility will be maintained as a backup to the hot billet shearing machine. After the Billet is cut into required length, then pushed out to rolling stands for re-rolling. Steel Pieces are rolled through all stands in order to get required shape of finished goods i.e. rerolled product.

	Proposed Expansion of Induction Furnace from capacity 59000 TPA to 146520 TPA (M.S Billet Facilities) and Rerolled Steel Products capacity from 55000 TPA to 139194 TPA at Siltara Industrial Growth Centre, Tehsil and District Raipur (CG) of M/s. Ispat India	
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➤ **Process Pipe Mill:**

The rerolled strips are folded in the form of pipe and then welded by the ERW machines with electrical resistance to produce Black MS Pipes.

2.2 LAND REQUIREMENT

Land is already acquired on lease total Land Area is 2.35 Hectare Located at plot 4, 9 & 10 Phase II within Siltara Industrial Growth Center; no change in land use is involved. The land detail are provided as follows.

**TABLE 2
LAND UTILIZATION PATTERN**

Sr.no.	Particulars	Area in (Sq.m)	Area (In Hectare)	Percentage (%)
1.	Builtup Area	11098	1.11	47%
2.	Road and Paved	7657	0.77	33%
3.	Green Belt	4750	0.48	20%
	Total Area	23505	2.35	100

NOTE: The unit has acquired 0.76 Ha. Additional land from CSIDC at plot no. 10 adjoining to the present plot 4 and 9 with 1.59 Ha. of the industry

2.3 RAW MATERIALS REQUIREMENT, SOURCE & MODE OF TRANSPORT

The raw material will be transported through truck. It is estimated that approx. 54 trucks/day required for transportation of raw materials and finished products of the plant

2.3.1 Solid and Hazardous waste generation

Total Solid wastes generation through process is estimated to be about 29770 TPA which includes Mill scale, Defective Billet, Miss Roll and End Cutting, Slag and Refractory Waste are 2931 TPA, 2931 TPA, 2784 TPA and 20974 TPA and 150 TPA respectively. Waste oil/used oil will be 4 KL/Yr which are classified as hazardous waste.

2.4 WATER REQUIREMENT & SOURCE

The total makeup water requirement for the project will be about 180 m³/day. (inclusive of 08 KL for domestic purpose). Industrial Water requirement will be fulfilled through CG Ispat Bhumi Limited's Industrial Water Supply Network & Domestic Water requirement will be fulfilled through existing borewell.

2.5 POWER REQUIREMENT & SUPPLY

Power requirement will be around 18 MW which will be drawn from CSPDCL. An emergency backup DG set of 600 KVA and 125 KVA is already in place.

2.6 MANPOWER REQUIREMENT

The existing manpower is 70 whereas additional manpower requirement for proposed expansion project of M/s. Ispat India will be 110 manpower during operation phase. Thus, the total manpower will be 180 people after proposed expansion activities. Preference will be given to local people, depending upon their qualification and skill. Marginal employment will also generate during construction phase.

2.7 FIRE FIGHTING FACILITIES

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

2.8 PROJECT COST

The project cost for expansion of the project is estimated as Rs. 3115 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, Land were monitored during Post monsoon season (15th October 2018 to 15th January 2019).

3.2 METEOROLOGY & AMBIENT AIR QUALITY

Summary of the Meteorological Data Generated At Site (15th Oct. 2018 to 15th Jan. 2019)

Predominant Wind Direction	Post monsoon season
First Predominant Wind Direction	ENE (20.17 %)
Second Predominant Wind Direction	NE (19.49 %)
Calm conditions (%)	0.83
Avg. Wind Speed (m/s)	3.54
Temperature (°C)	11-35

The status of ambient air quality within the study area was monitored for post-monsoon season for at 8 locations covering project site, Akoli, Sankra, Dhaneli, Nimora, Siltara, Charoda, Achholivillages. Total 8 sampling locations were selected based on the meteorological conditions considering upwind and downwind, cross wind directions and reference point. The levels of Respirable Particulate Matter (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**.

TABLE 3
SUMMARY OF AMBIENT AIR QUALITY MONITORING 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	67.5	21.3	15.7	16.2	0.356	10.2	12.1
		Max	99.8	30.5	20.1	26.4	0.452	18.6	15.8
		Avg	78.7	26.4	17.3	22.8	0.392	14.0	13.7
		98 th	98.1	30.2	19.5	26.3	0.452	18.5	15.8
2.	Akoli	Min	61.3	19.4	10.1	12.5	0.215	14.1	8.2
		Max	88.9	29.4	17.7	21.6	0.253	17.9	11.7
		Avg	73.9	23.5	14.2	16.3	0.234	16.1	9.7
		98 th	88.2	29.0	17.7	21.4	0.253	17.9	11.7
3.	Siltara	Min	90.1	32.3	11.3	19.0	0.451	12.1	10.2
		Max	122.3	44.9	20.8	32.2	0.495	20.5	17.9
		Avg	102.9	38.1	15.4	26.0	0.471	16.3	13.3
		98 th	121.4	44.7	20.5	31.8	0.494	20.2	17.7
4.	Sankra	Min	52.6	16.1	11.1	17.1	0.335	12.1	8.0
		Max	80.2	27.9	17.2	24.9	0.369	16.3	11.7
		Avg	63.2	20.6	14.1	20.4	0.353	14.1	9.3
		98 th	79.3	27.9	17.1	24.7	0.369	16.1	11.7
5.	Nimora	Min	50.9	17.2	9.3	10.4	0.209	11.2	8.2
		Max	75.4	26.9	18.8	17.7	0.269	16.8	11.6

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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
		Avg	62.1	21.3	12.8	13.6	0.231	14.2	9.6
		98 th	52.3	22.5	18.6	17.6	0.265	16.7	11.5
6.	Dhaneli	Min	63.7	20.2	10.2	12.3	0.365	15.2	6.5
		Max	88.3	30.3	17.9	22.6	0.386	19.3	11.7
		Avg	73.7	24.6	13.7	15.6	0.376	16.9	8.2
		98 th	87.7	30.0	17.7	22.1	0.386	19.3	11.0
7.	Charoda	Min	55.4	18.0	8.9	10.9	0.187	7.8	6.2
		Max	72.3	29.1	14.7	16.7	0.330	14.7	13.1
		Avg	62.3	22.8	11.3	13.6	0.259	10.8	10.5
		98 th	71.8	28.2	14.1	16.2	0.329	14.5	13.0
8.	Achholi	Min	66.0	20.3	14.6	18.3	0.312	11.5	11.4
		Max	81.1	28.4	20.5	26.4	0.492	16.5	16.9
		Avg	72.8	23.5	18.1	21.8	0.375	13.9	14.6
		98 th	80.9	27.7	20.4	25.9	0.492	16.3	16.6
CPCB Standards			100 (24hr)	60 (24hr)	80 (24hr)	80 (24hr)	2 (8hr)	100 (8hr)	400 (24hr)

From the above results, it is observed that the ambient air quality at all the monitoring locations except PM₁₀ value at Siltara (Max. 122.3 µg/m³) was within the permissible limits specified by CPCB.

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 4**.

TABLE 4
SUMMARY OF AMBIENT NOISE LEVEL MONITORING RESULTS

Sr. No.	Monitoring Locations	Equivalent Noise Level	
		Leq _{Day}	Leq _{Night}
Residential Area			
1.	Nimora	52.4	41.3
2.	Dhaneli	51.6	42.7
3.	Giraud	48.3	38.1
CPCB Standards dB(A)		55.0	45.0
Commercial Area			
4.	Sankra	54.1	43.8
5.	Mandhar	54.5	42.6
CPCB Standards dB(A)		65.0	55.0
Silence Zone			
6.	Sondra	48.1	36.5
CPCB Standards dB(A)		50.0	40.0
Industrial Area			
7.	Project Site	70.6	56.1
8.	Siltara	62.8	56.3
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 Local Geology

The lithology in 10 km study area mainly consists of Laterites of quaternary age and limestone and Sandstone of Proterozoic age. The study area around the project site does not have major faults or shear zone.

3.4.2 Local Hydrogeology and Aquifer Systems

Hard rock mainly consist of limestone, shale, dolomite and sandstone belong to Chhattisgarh Supergroup of Proterozoic age. Ground water occurs in phreatic condition in the weathered mantle of these rocks, which extends up to a depth of 25 mbgl. The caverns formed in limestone and dolomites holds good amount of ground water which are limited mostly to around 80 meters. Limestone and dolomite form the main aquifer system in the area. Charmuria limestone and Gunderdehi shale are not very good yielding. Cavernous limestone of Chandi formation forms the good aquifer in the district. The alluvium blanket along the major rivers also form good repository of ground water. In study area ground water level in Pre-monsoon season ranges from 10-11 mbgl and in Post-monsoon season ranges from 0.75-3.0 mbgl (As per CGWA data Yrs. 2007 to 2018). The project is located in "Semi critical "zone as per CGWA classification.

3.4.3 Geomorphology

Geomorphologically the district is having matured type of land forms and can be broadly divided into two prominent geomorphic units. These are as follow.

1. Dissected Pedit plain made by Proterozoic shale- limestone dolomite area.
2. Alluvial Plain formed by Seonath-Mahanadi Alluvium.

The Central Chhattisgarh Plain is represented by Structural Plain on Proterozoic rocks which cover the study area. They are having gently sloping erosion surfaces and thin to moderate cover of soil. Topography of the surrounding area is flat and no major geomorphic feature is present.

3.4.4 Water Quality

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

A. Groundwater Quality

The analysis results indicate that the pH ranged between 7.42 - 8.17. The TDS was ranging from 497 - 1146 mg/l. Total hardness was found to be in the range of 255.55 - 732.33 mg/l. The fluoride concentration was found in the range of 0.24 - 0.96 mg/l. The nitrate and sulphate were found in the range of 21.39 - 35.67 mg/l and 28.69 – 68.39 mg/l respectively. Heavy metals content (i.e. As, Al, Cd, Cr, Cu, Pb, Mn, Zn and Hg) were found to be bellow detection limit and within specified standards.

Sr. No.	Locations	WQI	Quality	Remark
1	Project Site	57.44	Good	Water quality assessed based upon above physico-chemical parameters and most samples are physico-chemically good except Giraud
2	Sondra	86.79	Good	
3	Nimora	67.72	Good	
4	Charoda	72.98	Good	
5	Giraud	121.64	Poor	
6	Bhalesur	94.60	Good	
7	Mundrethi	83.13	Good	
8	Mandhar	80.92	Good	

B. Surface Water Quality

The analysis results indicate that the pH ranged between 7.54 - 7.81 which is well within the specified standard of 6.5 to 8.5. pH is a measure of the hydrogen ion concentration of the water. The pH of water indicates whether the water is acid or alkaline. The TDS was observed to be 342 - 540 mg/l which is within the permissible limit of 2000 mg/l. The total hardness recorded was in the range of 153.92 - 305.76 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 22.61-129.56 mg/l and 19.28 - 37.43 mg/l respectively.

C. Bacteriological Characteristics

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

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 23.5 m spatial resolution and date of pass 28 May 2016 satellite image with reference to Google Earth data. These were later verified by using SOI toposheet, Google Earth imagery and Ground trothing by GPS survey. Polygon layers for each class were digitized and the respective areas were calculated. The Land Cover classes and their coverage are summarized in **Table 5**.

TABLE 5

S.No.	Level-I	Level-II	Area Sq. Km	Percentage
1	Built-up land	Settlement	48.97	15.60
		Industrial Settlement	19.85	6.32
		Road Infrastructure	7.19	2.29
		Railway	1.58	0.50
		Brick Kline	2.84	0.90
2	Barren Land	Barren Land	0.98	0.31
3	Agricultural Land	Agriculture land	188.33	59.98
4	Scrubs/Wastelands	Open Scrub	30.29	9.65
5	Waterbodies	River	5.92	1.89
		Waterbodies	3.92	1.25
		Drainage	2.89	0.92
6	Others	Mining/Stone Quarry	1.24	0.39
	Total		314	100

3.6 SOIL QUALITY

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

From the analysis results of the soil samples, it was observed the bulk density of the soil in the study area ranged between 1.4-1.66 g/cc which indicates favorable physical condition for plant growth. The water holding capacity is between 18.0-35.05 %. Infiltration rate, in the soil is in the range of 15.17-25.8 mm/hr. The important soluble cations in the soil are calcium and magnesium whose

concentration levels ranged from 205.05-266.08 mg/Kg and 55.12-125.08 mg/Kg respectively. Chloride is in the range of 66.11-264.08 mg/Kg. Organic matter and nitrogen were found in the range of 2.08-3.41 % and 152.29-182.69 kg/ha.

3.7 BIOLOGICAL ENVIRONMENT

Floral composition in Study Area

Floral characteristics within project site and surrounding areas including various villages were studied during post-monsoon season. Total 110 floral species were observed in the study area. The details about the floral composition are as follows.

- 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. **Bamboo & Grasses:** 07 species were enlisted from the study area
- e. **Climbers and Twiners:** Total 04 species of climbers/ twiners were recorded in the study area.
- f. **Parasite :** Each 1 species enlisted in the area

Fauna in the Study area:

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

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

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

3.8 SOCIO-ECONOMIC ENVIRONMENT

Information on socio-demographic status and the trends of the communities in the 10 km radius was collected through primary social survey and secondary data collection from census 2011 & District Census hand book 2011. Summary of the socio-economic status of the study area is given in **Table 6**. Details regarding Infrastructure facilities evaluation 2011 are presented in **Table 7** respectively.

TABLE 6
SUMMARY OF SOCIO-ECONOMIC ENVIRONMENT OF VILLAGES WITHIN 10 KM RADIUS AREA

No. of villages	43
No of Towns	02
Total households	22099
Total population	107004
Male Population	54870
Female population	52134
SC Population	17136
ST Population	4079
Total literates	68960
Total Illiterates	38044

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Total workers	44535
Total main workers	33934
Total marginal workers	10601
Total non-workers	62469

Source: Primary census abstract 2011, district Raipur, Chhattisgarh

TABLE 7
INFRASTRUCTURE FACILITIES IN THE STUDY AREA

Yr.	In percentage (%)									
	Education	Drinking water	Road	Power	Recreation	Transportation	Medical	Communication	Social Security	Drainage
2011	100	100	97.67	100	93.02	76.74	46.51	93.02	25.58	58.14

Source: District census handbook 2011, District Raipur, state Chhattisgarh

SALIENT OBSERVATION OF THE SOCIO-ECONOMIC SURVEY

3.7.1 Salient observation of the survey / study area

Project Site located in Siltara Industrial Area.

Some of the villages have good facilities like R.O water plant, Sewing machine center, etc. in surrounding villages from project site. These all happen only because of CSR initiatives taken by various private industrial units and companies.

House pattern: Types of housing varied from thatched to pucca (pakka) houses 60% houses were in pucca (pakka) form 20% in semi pakka and 20 % houses were observed in kaccha form.

Employment: Main occupation in the study area was agriculture and Labour Work its allied activities eg. Cattle rearing, dairy farming etc. Other income generation sources of the area, small business; private jobs etc. There is substantial employment generated in the industries located in Siltara growth Center and surrounding areas. There are several associated business and services opportunities created in the area due to these industries. The major service is transport. The labours were getting daily wags in the range of 300-350 Rs, depending on type of work.

Agriculture Labour and wage rates: The wages of agriculture labour are varied from Rs. 100 (2010) to Rs. 135 (2011). The prevailing labour charges of agriculture operations are varied with the operations of cultivations of crops i.e. ploughing, leveling, weeding, transplanting, harvesting and winnowing. The actual wage rates of agriculture labour varied from Rs. 152 to 200 per man day in different operations of the crops. The rates are higher in peak operation periods i.e. ploughing of seeds and harvesting of crops.

Fuel: The primary sources of cooking fuel were LPG, cow dung and coal etc.

Major crops of study –area, production & yield: The various crops are grown by the cultivators in Study area. The rice (70.8%) was found to be major crop of the state. The cultivators are also found to be grown tiwra (6.5%), gram (4.6%), paddy (2.6%), kodo-kutki (2.3%) and wheat (1.9%). The maize, urad, niger, soybean, arhar, mustard, kulthi, alsii, groundnut, til, masoor, pea, moong, jwar, urd, kulthi and safflower are also grown in small proportion by the cultivators in the Study Area.

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

Language: Official language is Hindi spoken and understood by most of the population. Chhattisgarhi is also widely spoken here by the locals.

Sanitation: Toilet facility is one of the most basic facilities required in a house. There was no proper drainage line in the villages, open and kachha drainage which was not working properly seen in most of the villages. Various villages in study area now actively involved in open defecation free (ODF) in the community level under which toilet facilities developed within several villages. The overall position of cleanliness was near to satisfactory.

Solid waste: Solid waste management is carried out by Raipur Municipal Corporation

Drinking water Facilities: During the survey it was observed diverse sources of drinking water supply in villages. Major source of drinking water in the study area were hand pumps, tap water and dug wells and canal. During survey people from some villages reported Water Quality are not good and shortage in summer season.

Education facilities: Most of the villages had education facilities in the form of anganwadi and primary schools. Higher education facilities were available in the range of 3-5 km. Colleges and other diploma courses were available at Birgaon City.

Transportation facility: For transportation purpose auto, jeep and private bus services were available in the study area; however villagers reported that transportation facilities were not frequently available. Private vehicles like bicycles & motor cycles were also used by villagers for transportation purpose. Mandhar Railway Station – 3.47 km (SE).

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

Communication facilities: For communication purpose mainly mobile phones, newspapers & post offices were present in the villages

Medical facilities: There were healthcare facilities available in the study area. In some of the villages primary health sub centres were available. Hospitals and other better health centres were available in the range of 5-10 km at town/city place

Electricity: All villages were availing electricity facility for domestic and agriculture purposes. Solar Street lights were seen in some of the villages.

Gram Panchyat facility: Most of the villages were having gram panchayat building and Community halls and building found well maintained. Some of the villages are having female Sarpanch; it indicates that they are in good number and also taking interest in politics. But they are unaware about their rights

Market facility: Study area was predominantly rural. In villages, small shops were available for daily need things. Weekly market facility was available in some villages. Wholesale market was available Birgaon and Siltara.

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

Recreation facilities: Television and radio were the main recreation facilities in the study area. Newspaper/magazine facilities were also used by villagers. Internet based Mobile usage has gained the highest popularity. Most of the youth are found to be using the Mobile based applications. At some places video parlors are also seen. Cinema houses are not found in the Rural area. It is only found in Raipur City which is also one of the main sources of recreation. Rural areas also frequently organize the sports and cultural events; like Jas Git; Ramyan Katha; Ramlila; Guru Ghasidass Jayanti. The area has enough resources for recreations.

4.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Air Environment

The proposed expansion will have impact on the air quality parameters like PM₁₀, PM_{2.5}, SO₂, NO_x and CO. The raw material handling plant, IF's, steel melting shops will emit dust and fumes. Apart from the above, there will be fugitive dust emissions due to transportation, storage and processing of raw materials.

Although, the quantity of production will be increased but ground level concentrations will not be increased as the process of sponge and pig iron melting in induction furnace does not cause any SO_x emission, even the NO_x formation is negligible. It only emits some particulate matter with carbon loss gases exiting from top of induction furnace crucible. The existing emission limit of Particulate matter of 50 mg/NM³ will be reduced to 30 mg/NM³. By use of better quality raw material carbon loss based flue gas generation will also get reduced. Hence it is inferred that considering cumulative concentration levels based on Air (ISCST3) Modeling Studies, the pollution load exerted due to proposed expansion project will be insignificant.

The mitigation measures adopted are:

- The primary & secondary emissions from the Induction furnaces, and continuous casting machine area are being and will be extracted and treated in a fume extraction system.
- Adequate capacity dust extraction measures with swivel hood, ID fan is and shall be provided at different loading, unloading and transfer points in the raw material handling section.
- Fumes is and will be evacuated directly from induction furnaces through hoods with swiveling mechanism and ducting.
- The duct carrying fumes from Induction furnaces will join in a mixing chamber from where the gases will be led to the bag house by means of ID fan.
- To control Air Pollution industry had already installed Bag Filter with 30 meter chimney which will be upgraded by improvement in number of bags and ID/FD fan capacity to cater the future requirement i.e. to restrict emissions within the 30 mg/Nm³ in place of prescribed limit of 50 mg/Nm³
- Adequate dust suppression system in the form of water sprinklers is and shall be provided at raw material yard, and open area; and at temporary solid waste dump site and along the vehicular roads.
- There will be dedicated roads for vehicles carrying raw materials and products.
- Adequate greenbelt (26%) is being already provided within plant premises. Whereas, Further, additional plantation will also be developed outside the plant at Atal Nagar (formally known as Naya Raipur)
- Stacks are being already provided with porthole and working platform so that stack monitoring can be done as per norms of statutory authority.

Noise Environment:

During the normal operation of manufacturing process noise will be generated due to Induction Furnaces, Rolling mill, ID Fan, Blower/air Fan, Cutting/Shearing Machine and DG Set, etc. the ambient noise levels are expected to increase significantly with the attributes of the respective equipment, but this noise will be restricted close to the concerned equipment. The preventive measures are given below:

- Equipment 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.

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

Water Environment:

The proposed expansion project 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.

The various control measures that will be adopted are:

- No pre-treatment of raw water is required. As the water will be used for cooling purpose only.
- No wastewater generation from the process
- Closed circuit cooling system will be implemented.
- No groundwater required for Industrial Cooling. Water will be provided through Chhattisgarh Ispat Bhoomi Water supply pipeline network.
- Water requirement for domestic purposes only fulfilled through ground water.
- RO back wash will be used in slag quenching in Induction Furnaces and in to maintain the water table in Scale Pits.
- Waste water generated through sanitary/toilet activities. This will be treated in STP and treated water will be used for plantation purposes and dust suppression.
- All stock piles will be on pucca flooring to prevent for any ground water contamination.

Vehicular Movement

All the major raw materials and finished products will be transported through trucks by road. All the trucks carrying sponge iron or such dry powdery material will be properly covered to avoid any leakage and fugitive emission.

Biological Environment

There is no ecological sensitive area like national park, sanctuary, biosphere reserve, wetland, forest, etc. within 10 km radial distance from the project site. No rare or endangered flora/fauna were recorded in the study area. Proposed expansion of M/s. Ispat India will be within the existing plant premises, no tree cutting involved in the project. There will not be any significant increase in pollution load due to proposed expansion project. Thus, the impact on local ecology in surrounding area would be minimum.

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Further, existing plant (industrial) area is 1.59 Hect. The industry acquired additional land 0.76 from CSIDC at plot no. 10 adjoining to the present plot of the industry. Green belt will be developed in 0.48 Ha. (20%) of land 2.35 Hect. Moreover, additional plantation will be developed in 0.41 Ha (i.e. 26%) which is outside the plant at Atal Nagar (formally known as Naya Raipur).

Socio-economic Impacts:

The land use is not going to be significantly change as the proposed expansion will be carried out within existing plant premises, thus there will be no issue of involvement of any agriculture land or settlement on the contrary there will be positive impact on the socio economic environment of the area. Increase in direct/indirect job opportunity shall take place. Services in the locality shall be used and accordingly growth in economic structure of the area will take place.

5.0 ENVIRONMENTAL MONITORING PROGRAM

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

6.0 RISK ASSESSMENT & DISASTER MANAGEMENT PLAN

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

A detailed Disaster Management Plan for facing disasters due to natural effects and human reasons is prepared and incorporated in the draft 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 PROJECT BENEFITS

Proposed Social Welfare Arrangement

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

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

As per O.M. dated 01/05/2018 issued by MoEF&CC, New Delhi proposals regarding Corporate Environment Responsibility (C.E.R.). The proposed expansion cost of the project is Rs. 3115 Lakhs. Thus, as per CER 1% i.e. 31.15 lakhs will be spent for the improvement of Environment. The amount of CER will be spent as per the MOEF&CC guidelines on the creation of capital assets for the surrounding community which help them to improve the local environment.

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8.0 ENVIRONMENTAL MANAGEMENT PLAN

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

- Overall conservation of environment.
- Minimization of natural resources and water.
- Ensure effective operation of all control measures.
- Monitoring of cumulative and longtime impacts.
- Ensure effective operation of all control measures.
- Control of waste generation and pollution.

Judicious use of the environmental management plan addressing the components of environment, which will be likely affected by the different operations in the project, will be implemented. The capital cost required to implement the EMP for proposed expansion is estimated to be Rs. 42 Lakhs. The annual recurring expenses will be Rs.17Lakhs has been allocated for implementation of the Environmental Management Plan for proposed expansion project.

9.0 CONCLUSION

The proposed expansion of M/s. Ispat India will be beneficial for the overall development of the nearby villages. Some environmental aspects like dust emission, noise, wastewater, traffic density, etc. will continue to be controlled within permissible norms to avoid impacts on the surrounding environment. Necessary pollution control equipment like bag house, water sprinklers, enclosures, etc. form integral part of the plant infrastructure. Additional pollution control measures and environmental conservation measures will be adopted to control/minimize impacts on the environment and socio-economic environment of the area. Measures like development of green belt and plantation in nearby village and along transport road, adoption of rainwater harvesting/recharging in the plant and in nearby villages will be carried out.

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 significant pollution level than existing, being a hot charging based rerolling process., 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 in particular and country in general.

10.0 DISCLOSURE OF CONSULTANTS

The Environmental studies for proposed project of M/s Ispat India 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 as per QCI-NABET SA – 241th AC Meeting, dtd. Jan 4, 2019.