

EXECUTIVE SUMMARY

1.0 INTRODUCTION

M/s. Sunil Manufacturing and Trading India Private Limited has proposed to install induction with CCM 20 MT x 4 Nos. in order to achieve better energy efficiency in the melting furnaces. Thus, will be able to achieve the production capacity of 316800 TPA of MS Billet.

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 green-field project.

The online application for prior Environmental Clearance (Form-1 and PFR) was submitted to SEIAA/SEAC Chhattisgarh, proposal no. SEAC/ CG/IND/30362/2018 on Dated 18/12/2018 Implementation of Greenfield Induction Furnaces with CCM to produce 316800 TPA MS Ingot/Billet. The proposal was considered by the State Expert Appraisal Committee (SEAC) during 268th meeting held on 31/1/2019. The SEAC has suggested standard Terms of References (ToR) (Vide Letter no. 107/SEAC, CG/IND/Raipur/758 dtd. 10/5/2019) for preparation of the EIA-EMP Report.

Environmental baseline studies were carried out during in Nov to Jan 2018-19 (1.11.2018 to 31.1.2019). This EIA report is prepared based on the ToR conditions recommended by SEAC, Chhattisgarh and project related technical details provided by M/s. Sunil Manufacturing and Trading India Private Limited. A copy of the TOR letter is enclosed as **Annexure–I** and its compliance with cross referencing provided in the beginning of the chapter scheme.

1.1 IDENTIFICATION OF PROJECT

M/s. Sunil Manufacturing and Trading India Private Limited, for Implementation of Greenfield Induction Furnaces with CCM to produce 316800 TPA MS Ingot/Billet at Village –Sarora, Tehsil and District Raipur- 493111 CG.

1.2 LOCATION OF THE PROJECT

Plant is located at Village Sarora, Khasra No. 248/7(P), 248/10(P), 248/5(P), 247/12(kh) (P), 249/34(P), 248/18(P), 248/4, 250/1(P), 249 (P), 247/34(P), 247/18(P), Tehsil and District Raipur of Chhattisgarh (**Annexure II**). The nearest city is Raipur which is around 5.0 km in south east direction. Nearest airport is also Raipur which is around 19 km at SE direction. The nearest roadway is National Highway - 200 which is 3.6 km in East direction whereas Ring Road 2 is about 2.0 km in SE direction. The details of environmental setting are given in **Table 1.2** and the index map showing plant location and study area of 10 km radius are given in **Figure 1.1** and **Figure 1.2** respectively. **Photograph 1.1** shows the proposed site photographs.

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 (Nov-Dec 2018 to Jan 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 along-with the proposed management plan to control/ mitigate the impacts. Environmental Management Plan is suggested to implement the pollution control in the project.

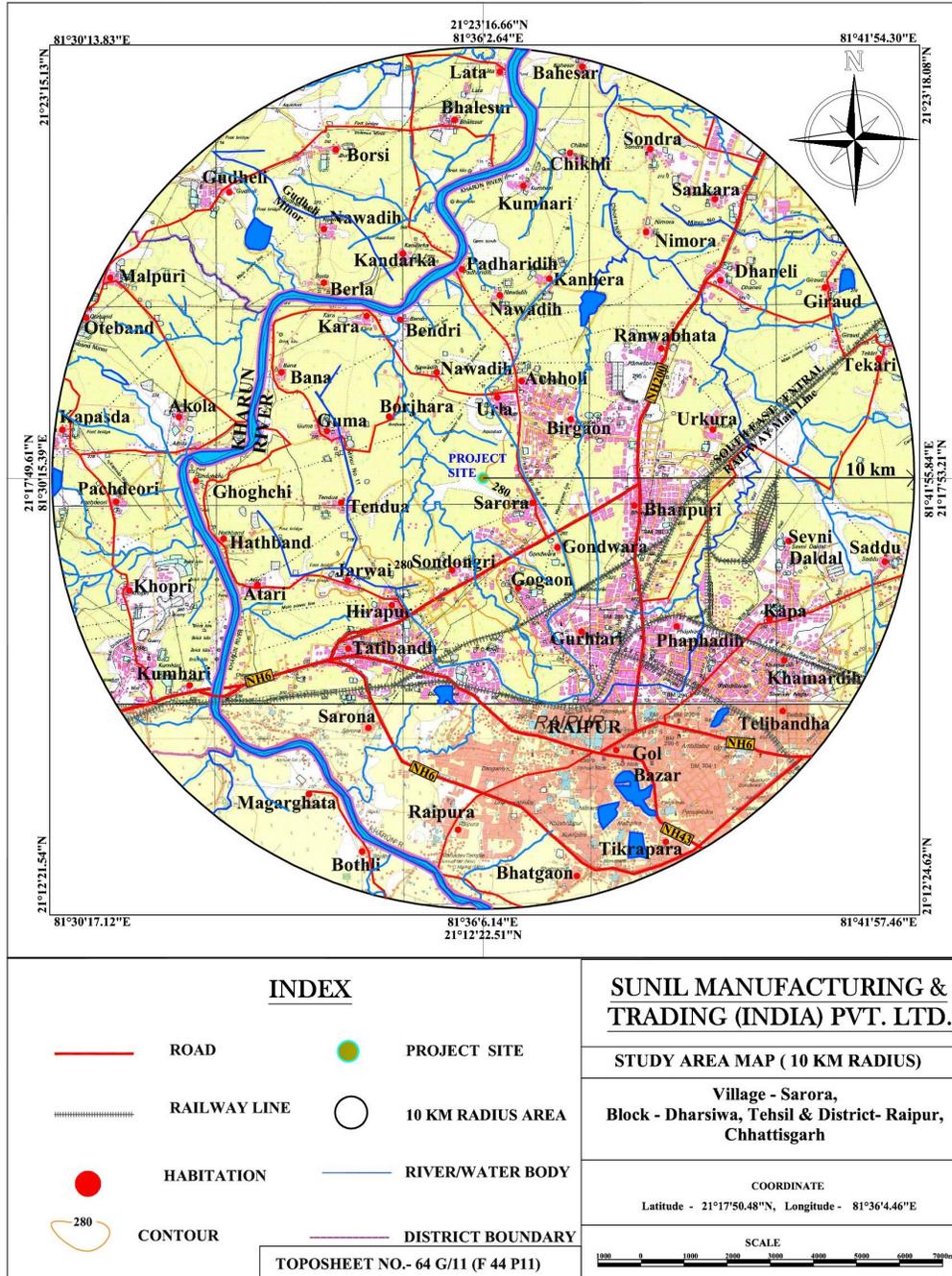


FIGURE 1: STUDY AREA (10 KM RADIAL DISTANCE)

**TABLE 1
DETAILS OF ENVIRONMENTAL SETTINGS**

Sr. No.	Particulars	Details
1.	Project Location	Village Sarora, Tehsil and District Raipur of Chhattisgarh 493111
2.	Khasra No.	248/7(P), 248/10(P), 248/5(P), 247/12(kh)(P), 249/34(P), 248/18(P), 248/4, 250/1(P), 249 (P), 247/34(P), 247/18(P)
3.	Co ordinate	Latitude:- 21°17'50.48"N Longitude:- 81°36'4.46"E
4.	Toposheet No.	64 G/11 (New No. F44 P11)
5.	Climatic Conditions	Mean annual rainfall is 1252.8 mm Temperature: Pre monsoon 20.60 C (Min.) 41.70C (Max.) : Winter 13.30C (Min.) 31.00C (Max) : Post monsoon 17.30 C (Min.) 31.80C (Max.) Source: IMD, Raipur
6.	Nearest IMD station	IMD Raipur – 19 km in SE
7.	Land Form, land Use and Ownership	land is diverted to industrial use
8.	Site topography	Project site located at 282 m (MSL) ; Flat Terrain
9.	Nearest roadway	National Highway No. 200 – 3.6 km (E) Ring Road 2 – 2.00 km (SE) NH6 - 2.4 Km, ESE NH43 - 4.7 Km , SSW
10.	Nearest Railway Station	WRS Colony 4.2 KM (ESE) Raipur JN Railway Station 5.0 KM (SE) Urkura – 4.7 Km , ESE
11.	Nearest Air Port	Swami Vivekanand International Airport – 19.0 km (SE)
12.	Nearest Port	NA
13.	Nearest lake	NA
14.	Nearest State/National Boundaries	Madhya Pradesh – 92 km (W) Maharashtra – 96 km (WSW) Odisha – 90 km (ESE)
15.	Nearest major city with 2,00,000 population	Nearest city – Raipur – 5.0 km (SE)
16.	Nearest village	Sarora – 1.0 Km, SE
17.	Villages within 1 km radius	Sarora – 1.0 Km, SE Birgaon - 1.0 Km ENE
18.	Distance for sea coast	NA
19.	Hills/valleys	NA
20.	Nearest Reserved/ Protected forests	None
21.	Archaeologically important places	-

22.	Protected areas as per Wildlife Protection Act, 1972 (Tiger reserve, Elephant reserve, Biospheres, National parks, Wildlife sanctuaries, community reserves and conservation reserves)	-
23.	Nearest water bodies	Kharun River – 5.2 Km. W Chhokra Nala – 5.9 Km, ENE Dumar Talao – 4.8 Km, SSW Burha Talao – 7.5 Km, SSE Rata Talao - 7.7 Km, SE
24.	Seismic zone	The proposed 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 Details of Manufacturing Process of Steel Melting Shop (Induction Furnace) with CCM

The manufacturing process proposed for the unit is well established and proven technology 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 (20 Ton x 4 Nos.) with medium power input capacity which will be setup with completely automatic charging facility. 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 the charge fed into crucible 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.

CCM:

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

2.2 LAND REQUIREMENT

The land located at Village- Sarora, Tehsil and District Raipur (CG) having khasara No. 248/7(P), 248/10(P), 248/5(P), 247/12 (kh)(P), 249/34(P), 248/18(P) = 1.214 Ha and (Kh. No.248/4, 250/1 (P),

249 (P), 247/34 (P), 247/12(P), 247/18(P)) area of 0.786 Ha. thus total area will be 1.214 Ha + 0.786 Ha. = 2.00 Ha. On inclusion of this land width becomes minimum 40 meter and highest width will become 93 meter.

The promoters have obtained NOC from the current land owners for seeking EC from MOEFCC and execution of land transfer sale deed will be executed immediately after grant of EC. The current owner has issued in principal consent for the same.

**TABLE 2
LAND UTILIZATION**

Sr. No.	Particulars	Area in Hectare	% Percentage
1	Built up area	0.50	25
2	Road and Paved Area	0.09	5
3	Open Area	0.74	36
4	Green Belt Area	0.67	34
	Total	2.00	100

2.3 RAW MATERIALS REQUIREMENT, SOURCE & MODE OF TRANSPORT

The raw material will be transported through truck. It is estimated that approx. 112 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 42725 TPA which includes Defective Billet/piping/end cutting, Slag and Refractory Waste are 6336TPA, 36072 TPA and 317TPA respectively. Waste oil/used oil will be 2 KL/Yr which are classified as hazardous waste.

2.4 WATER REQUIREMENT & SOURCE

The total makeup water requirement for the project will be about 148 KLD (inclusive of 04 KLD for domestic and 144 KLD for cooling purpose). Industrial Water requirement will be fulfilled through ground water bore-well.

2.5 POWER REQUIREMENT & SUPPLY

For proposed project 28 MW power will be required, which will be sourced through CSPDCL power supply network, DG set of suitable capacity will also be installed for emergency backup.

2.6 MANPOWER REQUIREMENT

The proposed manpower will be 122. 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 will be 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 proposed plant is estimated as Rs.1400.00 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 (**November 2018 to January 2019**).

3.2 METEOROLOGY & AMBIENT AIR QUALITY

Summary of the Meteorological Data Generated At Site (Nov. 2018 to Jan. 2019)

Predominant Wind Direction	Post monsoon season
First Predominant Wind Direction	ENE (21%)
Second Predominant Wind Direction	NE (20%)
Calm conditions (%)	0.46
Temperature (°C)	11-33

The status of ambient air quality within the study area was monitored for post-monsoon season for at 8 locations covering project site, Sarora, Birgaon, Urla, Bana, Tendua, Sondongri, Urkura villages. 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	83.1	27	16.3	21.2	0.283	10.2	9.8
		Max	97.3	33.9	21.1	26.9	0.331	13.6	12.3
		Avg	91.7	30.0	18.4	23.6	0.309	11.7	10.7
		98 th	97.1	33.9	20.9	26.9	0.330	13.5	12.0
2.	Sarora	Min	90.3	27.4	10.5	15.3	0.189	10.0	7.8
		Max	141.8	45.6	20.8	28.7	0.276	17.8	11.5
		Avg	129.2	39.2	17.3	23.9	0.250	14.5	9.6
		98 th	141.7	45.5	20.8	28.4	0.272	17.8	11.3
3.	Birgaon	Min	67.5	20.3	15.7	20.1	0.354	10.0	12.1
		Max	79.5	28.3	20.1	25.7	0.459	18.6	15.9
		Avg	74.3	23.9	17.3	22.7	0.397	14.0	14.1
		98 th	79.5	28.3	19.5	25.5	0.459	18.5	15.9
4.	Urla	Min	87.3	27.4	14.4	19.3	0.289	11.2	9.3
		Max	100.7	34.9	20.1	25.5	0.371	13.9	12.7
		Avg	94.8	31.6	17.0	22.2	0.329	12.7	10.8
		98 th	100.7	34.9	20.0	25.5	0.370	13.9	12.5
5.	Bana	Min	45.5	12.1	5.1	9.7	0.136	9.8	8.5
		Max	74.2	25.3	10.2	18.9	0.188	18.1	14.4
		Avg	59.3	18.2	7.6	13.2	0.166	12.9	11.1
		98 th	73.9	24.4	10.1	18.7	0.185	17.7	14.2
6.	Tendua	Min	62.5	21.1	8	9.3	0.115	7.1	5.5
		Max	99.6	33.8	13.5	20.5	0.189	11.9	12.2
		Avg	83.9	27.1	10.8	17.3	0.162	9.9	8.8
		98 th	98.9	32.2	13.5	20.2	0.189	11.7	12.2

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.	Sondongri	Min	67.8	21.2	15.2	20.1	0.252	9.9	7.2
		Max	96.6	35.1	24.7	33.4	0.345	15.5	10.7
		Avg	80.8	28.8	19.9	26.3	0.303	12.7	9.4
		98 th	94.3	34.8	24.6	32.9	0.343	15.3	10.6
8.	Urkura	Min	66	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 Sarora and Urla (Max. 141.8 µg/m³, 100.7 µg/m³ respectively) was within the permissible limits specified by CPCB.

One month ambient air monitoring has been carried out at two locations (Khopri & Sarona) as per suggestion of SEAC during ToR presentation and reports are presented in Annexure VI (a).

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.	Sondongri	54.1	43.6
2.	Gogaon	52.5	41.4
3.	Gondwara	52.3	40.2
CPCB Standards dB(A)		55.0	45.0
Commercial Area			
4.	Tendua	54.1	43.8
CPCB Standards dB(A)		65.0	55.0
Silence Zone			
5.	Birgaon	48.3	39.7
CPCB Standards dB(A)		50.0	40.0
Industrial Area			
6.	Project Site	71.3	55.2
7.	Sarora	62.1	51.3
8.	Urla	64.1	55.1
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 Super group 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).

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

1. Dissected Pediplain 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/ hand pump) locations in different villages and 4 surface water samples.

A. Groundwater Quality

The analysis results indicate that the pH ranged between 6.98 – 7.98.. The TDS was ranging from 230-510 mg/l. Total hardness was found to be in the range of 118-364 mg/l. The fluoride concentration was found in the range of 0.21 – 0.93 mg/l. The nitrate and sulphate were found in the range of 12.39 – 29.74 mg/l and 18.91 – 52.98 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	62.76	Good	Water quality assessed based upon above physico-chemical parameters and samples are physico-chemically excellent to good range.
2	Sarora	49.26	Excellent	
3	Tendua	41.90	Excellent	
4	Sarona	53.74	Good	
5	Akola	42.73	Excellent	
6	Borjhara	46.44	Excellent	
7	Nawadih	58.69	Good	
8	Nimora	43.64	Excellent	

B. Surface Water Quality

The analysis results indicate that the pH ranged between 7.69 - 7.98 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 218 - 558 mg/l which is within the permissible limit of 2000 mg/l. The total hardness recorded was in the range of 86

- 186 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 22.09 - 28.41 mg/l and 15.63 - 33.72 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.

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 27 Nov 2018 satellite image with reference to Google Earth data and the Cartosat-I data having 2.5 m spatial resolution and date of pass Jan 2017. 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
LU/LC CLASSES AND THEIR COVERAGE IN SQ. KM OF 10 KM RADIUS

Sr. No.	LU/LC Class	Area (Sq.Km)	Percentage (%)
1	Built up Land Rural/Urban)		
	Settlement	52.63	16.76
	Industrial Settlement	48.94	15.59
	Road Infrastructure	9.54	3.04
	Railway Infrastructure	6.85	2.18
2	Agriculture Land		
	Cropland	124.88	39.77
	Barren Land	10.86	3.46
	Play Ground	2.43	0.77
3	Water bodies		
	River/Nala/Stream	9.88	3.15
	Pond/Tank	2.92	0.93
4	Scrub/Waste Land		
	Land with scrub/Open Scrub	40.96	13.04
5	Mining/Stone Quarry	1.24	0.39
	Brick Kline area	2.87	0.91
	Total	314.00	100.00

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 1.505- 1.692 g/cc which indicates favorable physical condition for plant growth. The water holding capacity is between **19.16 – 34.35 %**. Infiltration rate, in the soil is in the range of

15.99 - 25.43 mm/hr. The important soluble cations in the soil are calcium and magnesium whose concentration levels ranged from **9.38 – 29.31** mg/Kg and **11.46 - 17.93** mg/Kg respectively. Chloride is in the range of **20.62 – 23.88** mg/Kg. Organic matter and nitrogen were found in the range of **1.07 – 1.38** % and **54.84 – 63.27** 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 111 floral species were observed in the study area. The details about the floral composition are as follows.

- Trees:** Total 62 species were found in the study area
- Shrubs (small trees):** Total 24 species were enumerated from the study area.
- Herbs:** In the study area 13 species were observed.
- Bamboo & Grasses:** 07 species were enlisted from the study area
- Climbers and Twiners:** Total 04 species of climbers/ twiners were recorded in the study area.
- 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	34
No of Towns	1
Total households	13348
Total population	66873
Male Population	33932
Female population	32941
SC Population	9392
ST Population	1832
Total literates	42169

Total Illiterates	24704
Total workers	28015
Total main workers	21310
Total marginal workers	6705
Total non-workers	38858

Source: Primary census abstract 2011, District Raipur and Durg, State Chhattisgarh

TABLE 7
INFRASTRUCTURE FACILITIES IN THE STUDY AREA

Yr. 2011	In percentage (%)									
	Educational	Drinking water	Road	Power	Recreation	Transportation	Medical	Communication	Social Security	Drainage
Availability	97	100	100	100	91	82	50	65	21	53
Not Availability	3	0	0	0	9	18	50	35	79	47

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

SALIENT OBSERVATION OF THE SOCIO-ECONOMIC SURVEY

3.7.1 Salient observation of the survey / study area

- **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 Labor Work its allied activities eg. Cattle rearing, dairy farming etc. Other income generation sources of the area, small business; private jobs etc. The labours were getting daily wags in the range of 300-350 Rs, depending on type of work they set
- **Agriculture Labour and wage rates:** The wages of agriculture labour are varied from Rs. 100 (2010) to Rs. 235 (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. 252 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 (4.9%) and wheat (1.9%). The maize, urd, Niger, soybean, arhar, mustard, kulthi, als, groundnut, til, masoor, pea, moong, jwar, urd, kulthi and sunflower 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 Hindi As well As Hindi is 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

- **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. Urkura Railway Station – 4-7 km (SSE).
- **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 centers were available. Hospitals and other better health centers 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 city.
- **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 project will impact on the air quality parameters like PM₁₀, PM_{2.5}, SO₂, NO_x and CO. The raw material handling plant, IF's will emit dust and fumes. Apart from the above, there will be fugitive dust emissions due to transportation, storage and processing of raw materials.

Proposed Particulate matter emission limit will be considered as 30 mg/NM³. Hence it is inferred that considering incremental concentration levels, the pollution load exerted due to proposed project will be insignificant.

The mitigation measures adopted are:

- Roads are frequently sprinkled with water.
- Raw Materials like will be stored under covered shed.
- Regular maintenance of vehicles and machineries are carried out in order to control emissions.
- Green belt development will be developed done in plant premises outside plant too.
- Green belt will also be developed on the sides of approach road.
- Protective appliances will be provided to all the workers exposed in dusty atmosphere.
- Avoid no overloading and over speeding of the trucks.
- Workers are equipped with all personal protective devices like Gum Boot; hand gloves; Safety helmet; Safety goggles, earplugs at work place.
- Transportation of materials will be limited to day hours only.
- Periodical maintenance of process machinery.

Noise Environment:

During the normal operation of manufacturing process noise will be generated due to Induction Furnaces, ID Fan, Blower/air Fan, Cutting/Shearing Machine and DG Sets, 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:

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

Water Environment:

In general, the proposed project may have some impact on the water environment. The impact may be on the source of water in the form of depletion water resources of the area.

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.
- Rain water charged to ground water.
- 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 M/s. Sunil Manufacturing and Trading India Private Limited will be green-field project, no tree cutting involved in the project. There will not be any increase in pollution load to the greater extent since it is clean technology. Moreover, incremental emission of air pollutants is not likely to induce any significant changes in the ecology as the ambient air quality standards will remain within the limits. Thus, the impact on local ecology in surrounding area would be minimum.

The total plant area is 2 Ha out of which **M/s. Sunil Manufacturing and Trading India Private Limited** will be planted of different local and fast growing species within 0.67 ha (34% of total plant area).

Socio-economic Impacts:

The land use converted in to industrial purpose, 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 ANALYSIS OF ALTERNATIVES (SITE AND TECHNOLOGY)

SITE SELECTION

Suitable site for a project is as important as selecting a technology and suppliers. Factors which are taken into consideration for selection of site are proximity to raw materials or market and availability of resources like manpower, water, infrastructure and ease of transportation. However a new dimension has also raised concerns in selection of site and environment.

The project site located village Sarora, Tahsil & District Raipur. The site is already selected and all the facilities related to production are easily available for proposed plant.

Selection of Technology

➤ Induction Furnace based Steel Melting Shop with Continuous Casting Machine (CCM).
The above technologies are most proven technology in secondary metallurgical activities.

The management has decided to adopt the best operating practices to suit world class requirements. As the products are going to be external audits to fulfill QA/QC requirements. The products will be manufactured based on green chemistry concept so that there is minimum emissions and zero wastewater generation during manufacturing process.

6.0 ENVIRONMENTAL MONITORING PROGRAM

An Environmental Management Cell (EMC) will be established for the proposed project under the control of Executive Director followed by General Manager. The EMC will be headed by an Environmental 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.

7.0 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.

8.0 PROJECT BENEFITS

The proposed implementation of induction furnace becomes a project of national interest as the proposed technology to produce MS Billet through Induction Furnace is well establish and clean technology. The technology does not involve any fossil fuel consumption.

All these technology required to be promoted for securing a better energy efficiency and safer environment.

- **CORPORATE ENVIRONMENT RESPONSIBILITY (CER)**

As per O.M. dated 01/05/2018 issued by MoEF&CC, New Delhi proposals regarding Corporate Environment Responsibility (C.E.R.). The CER budget along with capital expanses with different heads are given below.

The proposed cost of the project is Rs. 1400.00 Lakhs. Thus, as per CER 2% i.e. 28.00 lakhs will be spent for the Improvement of Environment.

9.0 ENVIRONMENTAL COST BENEFIT ANALYSIS

On overall assessment of the project with technical and financial aspects, it is concluded that the proposed induction furnace with CCM to produce finished ingots products is technically highly feasible and financially profitable.

The project is of utmost importance as it is going to reduce the GHG emission & promote sustainable development with a saving in energy consumption. In addition, the project being located away from the urban areas will avoid pollution-addition to the densely populated areas; at the same time promote the growth of the area, through CER and CSR activities.

Apart from the tangible benefits, there are other intangible benefits of the project. The project helps to increase the economic growth of the state/nation.

It can be concluded that the project is more beneficial economically and viable with environment sustainability by adopting proper environmental protection measures.

10.0 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 project is estimated to be Rs. 29 Lakhs. The annual recurring expenses will be Rs.15 Lakhs allocated for implementation of the Environmental Management Plan for proposed project.

11.0 CONCLUSION

The proposed project of **M/s. Sunil Manufacturing and Trading India Private Limited** 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. The proposed CSR activities to be initiated by the company will be helpful to improve the social, economic and infrastructure availability status of the nearby villages.

Thus, 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.

12.0 DISCLOSURE OF CONSULTANTS

The Environmental studies for proposed project of **M/s. Sunil Manufacturing and Trading India Private Limited** 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 as Cat A consultant for sector no. '8'.