

# EXECUTIVE SUMMARY

For

BROWNFIELD PROJECT FOR SUBSTANTIAL EXPANSION BY INSTALLATION OF PRODUCTION FACILITIES FOR PRODUCTION OF: SPONGE IRON 375,000 TPA; MILD STEEL BILLET 365,400 TPA; REROLLED STEEL PRODUCTS THROUGH HOT CHARGING AND THROUGH REHEATING FURNACE 350,000 TPA AND CAPTIVE POWER 40 MW (30 MW THROUGH WHRB AND 10 MW THROUGH AFBC)

At

VILLAGE - TARAIMAL, TAHSIL - GHARGHODA,  
DISTRICT - RAIGARH, CHHATTISGARH

Terms of Reference File No. IA-J-11011/195/2021-IA-II(I) dated 2<sup>nd</sup> June, 2021  
Category A, Schedule 3 (a) Metallurgical Industries & Thermal Power Plant (Sector 4) 1(d)

Baseline Monitoring Period: Pre Monsoon Season (1<sup>st</sup> March 2021 to 31<sup>st</sup> May 2021)

PROJECT PROPONENT

M/S. NRVS STEELS LIMITED

ENVIRONMENTAL CONSULTANT



M/s Anacon Laboratories Pvt. Ltd., Nagpur

QCI-NABET Accredited EIA Consultant for  
Metallurgical Industries (Sector 8) 3(a) & Thermal Power Plant (Sector 4) 1(d)

MoEF&CC (GOI) Recognized Laboratory  
ISO 9001:2015, ISO 14001:2015, OHSAS 18001:2007

Lab. & Consultancy: FP-34, 35, Food Park,

MIDC, Butibori, Nagpur – 441122

Mob.: +91-9372960077

Email: [info@anacon.in](mailto:info@anacon.in), [ngp@anacon.in](mailto:ngp@anacon.in)

Website: [www.anaconlaboratories.com](http://www.anaconlaboratories.com)

Report No. ANqr /PD/20A/2021/162

AUGUST 2021

---

---

<b>EXECUTIVE SUMMARY</b>
--------------------------

## 1.0 INTRODUCTION

M/s. NRVS Steels Limited has proposed to expand the existing capacity of manufacturing facilities for production of Sponge Iron, MS Billet, along with captive power generation plant comprising of Waste Heat Recovery Boilers (WHRB) and Atmospheric Fluidized Bed Combustion (AFBC) Boiler. The Company NRVS has taken over the two existing companies (i.e., Seleno Steels Ltd. and later Keshav Sponge and Energy Pvt. Ltd.) who were operating their respective sponge iron plants with Induction furnaces and power plant for which they had obtained consents from CECB for their existing plant.

The existing brownfield project will be expanded within in 25.33 Ha. of already existing total land area. It is proposed to expand the existing facilities by implementing manufacturing facilities for production of Sponge Iron (180,000 TPA to 375,000 TPA), Induction furnace with CCM (51,600 to 365,400 TPA), Rolling mill (15000 TPA (not implemented) to 350,000 TPA), Captive power plant (total 18 MW (15 MW implemented) to 40 MW) as a Brownfield project at Village Taraimal, Tehsil Gharghoda, District- Raigarh (C.G.)

As per Environmental Impact Assessment Notification dated 14<sup>th</sup> September, 2006 and subsequent amendment thereof, Sponge Iron plant and Steel Melting Shop (Induction Furnaces, with LRF) fall under S. No. 3(a) of schedule EIA Notification 2006. The AFBC based power plant is falls under falls under S. No. 1(d) of schedule EIA Notification 2006. It is also proposed to implement facilitates for Hot Charging Rolling Mill and Billet Reheating Furnace. The overall project falls under Category “A”; Project Activity ‘3(a)’ Metallurgical Industries and ‘1(d)’ Thermal Power Plant and requires Environmental Clearance (EC) to be obtained from EAC, MoEF & CC, New Delhi.

The online application for prior Environmental Clearance (Form-1) was submitted to EAC, Delhi vide proposal no. IA/CG/IND/210323/2021 Dated 07/05/2021 for proposed expansion project and the proposal was accepted by Member secretary dated 10/05/2021. The proposal was considered by the Expert Appraisal Committee (Industry -I) during its 36th meeting of Re-constituted EAC (industry-I) held on 19th May 2021. The Terms of References (ToR) has granted for the proposed project (Vide F. no. IA-J-11011/195/2021-IA-II(I) dtd. 2nd June 2021) for preparation of the EIA-EMP Report.

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) and Environment Management Plan report is prepared for obtaining Environmental Clearance (EC) from MoEF&CC, New Delhi and the Consent for Establishment from the Chhattisgarh Environment Conservation Board (CECB) for the proposed expansion project.

This EIA report is prepared based on the ToR conditions recommended by EAC (Industry – I), New Delhi and project related technical details provided by M/s. NRVS Steels Limited.

## 1.1 IDENTIFICATION OF PROJECT

M/s. NRVS Steels Limited has proposed to expand the existing facilities by implementing manufacturing facilities for production of Sponge Iron with WHRB (180,000 to 375,000 TPA), Induction furnace with CCM/PCM (51,600 to 365,400 TPA), Rolling mill (15,000 (*not implemented*) to 350,000 TPA), Captive power plant (Total 18 MW (*implemented 15 MW*) to 40 MW) as a Brownfield project at Village Taraimal, Tehsil Gharghoda, District – Raigarh, Chhattisgarh.

## 1.2 LOCATION OF THE PROJECT

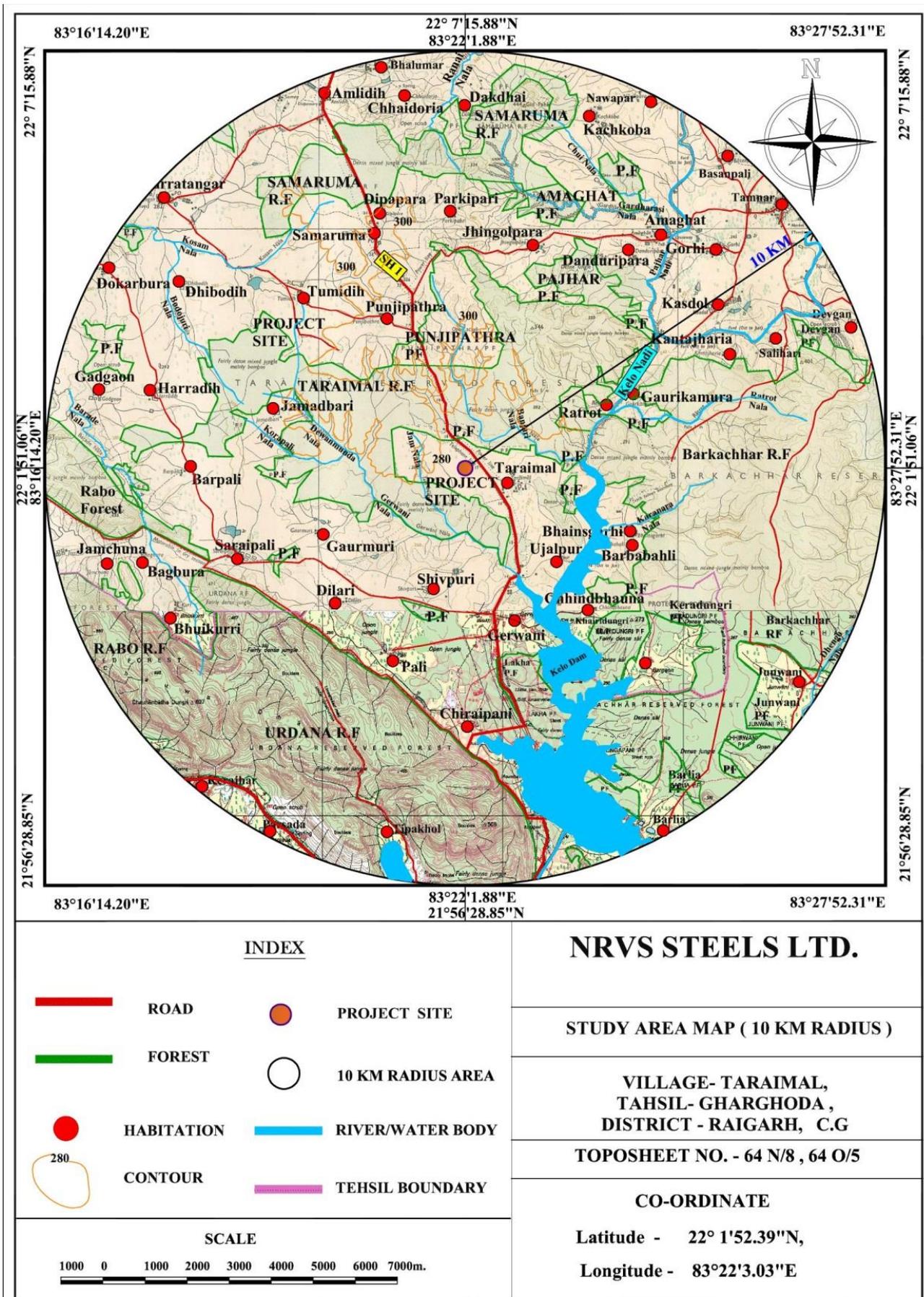
The proposed expansion project activities will be carried out within existing plant premises which is 25.33 Ha. Plant is located at Khasra No. 1/7क/2, 15/2, 16, 15/1, 24/1क, 24/1ख, 24/1ग, 26/3, 26/5ख, 26/6ख, 26/7क, 26/7ख, 26/8ख, 26/8क, 26/9, 29, 31, 1/8, 1/18 क, 1/7 ख, 1/7 ग, 1/18 ख, 1/18 ग and 1/7 क/1. Village Taraimal, Tehsil Gharghoda, District – Raigarh, Chhattisgarh. The nearest city is Raigarh which is around 14.1 km in south-south-east direction. Nearest airport is Raigarh (Airstrip) which is around 22 km in south direction and Veer Surendra Sai Airport, Jharsuguda which is around 71.2 km at East-south-East direction. Nearest railway station is Kirodimalnagar Railway Station, 12.0 km, S. The nearest Roadway is SH1 which is 0.1 km, Adjacent to project site in East Direction.

The study area of 10 km radial distance from the project site is shown in **Figure 1**.

## 1.3 EIA/EMP REPORT

In line with the approved ToR obtained from EAC (Industry –I), MoEFCC, New Delhi, baseline environmental monitoring was already conducted during Pre monsoon season (1<sup>st</sup> March, 2021 to 31<sup>st</sup> May, 2021) has been considered 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 EIA/EMP report. Impacts of the proposed 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: STUDY AREA (10 KM RADIAL DISTANCE)**

**TABLE 1**  
**DETAILS OF ENVIRONMENTAL SETTINGS**

SI	Particulars	Details		
1.	Project Location	M/s. NRVS Steels Limited Village - Taraimal, Tahsil - Gharghoda, District- Raigarh (C.G.)		
2.	Co ordinate	<b>S. No.</b>	<b>Latitude</b>	<b>Longitude</b>
		A	22° 1'55.22"N	83°22'7.45"E
		B	22° 1'44.64"N	83°22'16.91"E
		C	22° 1'39.69"N	83°22'16.53"E
		D	22° 1'47.90"N	83°21'46.24"E
		E	22° 1'55.72"N	83°21'55.92"E
3.	Toposheet No.	64 N/8, 64 O/5		
4.	Climatic Conditions	Mean annual rainfall is 1394.7 mm Temperature : Pre monsoon 20.5 <sup>o</sup> C (Min.) 44.8 <sup>o</sup> C(Max.) : Winter 13.1 <sup>o</sup> C (Min.) 30.8 <sup>o</sup> C (Max.) : Post monsoon 17.5 <sup>o</sup> C (Min.) 32.4 <sup>o</sup> C(Max.) Source: IMD, Raigarh		
5.	Nearest representative IMD station	Raigarh, 22 km/S		
6.	Land Form, land Use and Ownership	<ul style="list-style-type: none"> <li>The proposed expansion is on existing sponge iron project it is proposed on the existing 25.33 Hect. available land. This land is a free hold land owned by the company.</li> <li>No additional land is proposed to be acquired. Total 33.08% area are being developed as Greenbelt.</li> </ul>		
7.	Site topography	Project site located at 270 m (above MSL); Flat		
8.	Nearest roadway and highways	SH1 (Ambikapur Highway) 0.1 KM /E		
9.	Nearest Railway Station	Kirodimalnagar Railway Station 12.0 KM/S		
10.	Nearest Air Port	Raigarh Airport (Airstrip) at 22 km in south Direction Veer Surendra Sai Airport, Jharsuguda 71.2 Kms /ESE		
11.	Nearest Port	NA		
12.	Nearest lake	Kelo Dam, 6.6 km/ SSE		
13.	Nearest State/National Boundaries	Odisha, 19 kms/ East		
14.	Nearest major city with 2,00,000 population	Raigarh, 15.0 kms/SSE		
15.	Nearest Habitation	Taraimal, 1 km/ SE		
16.	Distance for sea coast	Bay of Bengal 345/ SE		
17.	Hills/valleys	None		
18.	Nearest Reserved/Protected forests	1. Urdana Reserve Forest	5.20	SW
		2. Barkachhar Reserve Forest	3.30	ESE
		3. Kharidungri Reserve Forest	4.70	SE
		4. Taraimal Reserve Forest	0.70	N
		5. Protected Forest (Near Vill. Jamadbhari)	4.30	W
		6. Rabo Reserve Forest	8.00	WSW
		7. Samaruma Reserve Forest	7.00	NW
		8. Punjipathra Protected Forest	2.40	N
		9. Pajhar Protected Forest	4.90	NE
		10. Protected Forest Near Saraipali	4.40	WNW
		11. Protected Forest Near Dokarbura	9.40	NW
		12. Protected Forest Near Shivpuri	3.40	SSW
		13. Lakha Protected Forest	4.50	SE
		14. Barlia Protected Forest	8.00	SE
		15. Dongpani Protected Forest	6.90	SSE
		16. Chhirwani Protected Forest	8.90	SSE
		17. Junwani Protected Forest	7.70	SE

SI	Particulars	Details		
				18. Keradongri Protected Forest
		19. Devgan Protected Forest	8.50	ENE
		20. Amaghat Protected Forest	6.20	N
		21. Protected Forest Near Amaghat	7.20	NE
		22. Protected Forest Near Taraimal	2.30	ESE
19.	Nearest water bodies	1. Kelo River, 2.7 KMs/E 2. Pajhar Nadi, 5.5 KMs/NE 3. Jam Nala, 1 KMs/W 4. Dewanmunda Nala, 2.9 KMs/W 5. Korapali Nala, 3 KMs/W 6. Barade Nala, 7.8 KMs/WSW 7. Bodojuri Nala, 5.5 KMs/WNW 8. Kosam Nala, 6.8 KMs/NW 9. Ranai Nala, 7 KMs/N 10. Chui Nala, 7.7 KMs/NE 11. Gardharasi Nala, 7.1 KMs/NE 12. Ratrot Nala, 3.8 KMs/ENE 13. Banjari Nala, 1.7 KMs/ENE 14. Gerwani Nala, 1.9 KMs/SW 15. Karanara Nala, 3.6 KMs/SE 16. Dhengu Nala, 9 KMs/SSW 17. Tipakhhol Tal, 9.7 KMs/SE		
20.	Seismic zone	Zone-II [As per IS :1893 (Part-I): 2002]		
21.	Areas already subjected to pollution or environmental damage	Area is not classified or notified as severally or critically polluted area.		

## 2.0 PROJECT DESCRIPTION

### 2.1 PROJECT DESCRIPTION

#### Manufacturing Process of Sponge Iron (DRI)

- Iron ore, coal, dolomite/limestone is fed in the weighed quantity and the kiln is rotated at a speed of about 0.5 RPM. 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. The product is separated from the coal ash and coal char and then taken for final use.
- The waste gas is taken to an after-burner chamber and the Combustibles are burnt is cooled to about 160°C and taken to ESP for final dust separation, before going to stack via ID Fans.
- The kiln has three functions; heat exchange, chemical reaction in vessel and conveying solids.

#### Manufacturing process of Steel Melting Shop with CCM

- The manufacturing process installed in the unit is one which 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, Existing 3 nos of 7 ton IF will be upgraded 12 Tons Thus IF, 12 TON X 3 Nos; 4 numbers of Induction Furnaces (each 20 MT capacity) with medium power input capacity of 5.5 to 8 MVA each will be setup with 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.
- Homogeneous molten mass is poured hydraulically into the ladle.
- **LRF (Ladle Refining Furnace):**
- Subsequent to the production of molten steel the production of quality requires refining of the same for which one Ladle Refining Furnace (LRF, 20 Ton x 1 No.) will be set up. The liquid steel containing in the ladle will be brought to LRF and after due processing of the liquid steel the ladle will be transferred to CCM.
- **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.

## Power Generation

### WHRB based Power Generation (30 MW)

The Waste heat Recovery boilers are attached with DRI Kiln and 15 MW is being generated and with proposed expansion 15 MW will be added. The flue gases released from DRI Kilns will be passed through Waste Heat Recovery Boiler, where waste heat will be recovered and steam will be generated in required temperature and pressure. The source of energy is the heat content in waste flue gases released from DRI Kilns

### AFBC based Power Generation (10 MW)

Power generation by using Atmosphere Fluidized Bed Combustors (AFBC) boiler by use of Char Dolo Char and reject Coals will be set up based on Air Cooled condenser. .

## 2.2 LAND REQUIREMENT

The total proposed expansion in project will be implemented in existing land area of 25.303 Hectare. The land is existing industrial land. No additional land proposed to be acquired. The land is a free hold land owned by the company. There will be no additional land required for proposed expansion. Total 33.00 % (8.360 ha.) of total area is being developed as Greenbelt. The details of Area statement are provided as follows:

**TABLE 2  
AREA STATEMENT**

Particulars	Area in (Ha.)	Percentage
Constructed Area	11.002	43.43%
Road and paved area	2.235	8.82%
Green Belt	8.360	33.00%
Open Area	3.733	14.74%
<b>Total</b>	<b>25.330</b>	

## 2.3 RAW MATERIALS REQUIREMENT, SOURCE & MODE OF TRANSPORT

The raw material 2029661.08 TPA will be transported through truck. It is estimated that approx. 237 trips per day i.e. 473 trucks per day required for transportation of raw materials and finished products of the plant.

### 2.3.1 Solid and Hazardous waste generation

The details Solid and Hazardous waste generation are given in **Table 3**.

**TABLE 3  
SOLID AND HAZARDOUS WASTE GENERATION**

Name of Waste generated	Qty (TPA)	Proposed Disposal Plan
Melting Scrap (I.e., Defective Billets, End Cutting, Miss Rolls etc.)	5408.00	Reused in process
Mill Scale from Induction Furnace	9957.00	Reused in process/ sold to other ferro Alloys or Sold to Palletization unit.
<b>(A) SUBTOTAL</b>	<b>15365.00</b>	
<b>Slag and other waste required to be disposed off outside</b>		
Slag from Induction Furnace	66229.00	Sold to metal recovery units.
Refractory and Ramming Mass waste	1157.00	Given to Recycler/ landfill/ Brick making
Fluidized Bed Material Waste	50.00	Given to Recycler/ landfill/ Brick making
Char/ DoloChar	93750.00	To be used in AFBC boiler of CPP in the plant
Bottom Flue Dust Ash	75000.00	Given to Recycler/ landfill/ Brick making and to Cement plants
Total Ash generation	84735.00	Given to Recycler/ landfill/ Brick making
<b>(B) SUBTOTAL</b>	<b>320921.00</b>	
<b>(C) Grand Total (A+B)</b>	<b>336286.00</b>	

**TABLE 3(A)  
HAZARDOUS WASTE GENERATION**

Type of Hazardous Waste	H. W. Category	Quantity	Disposal
Waste Oil/Used Oil	5.1	5 KL/annum	Partly used for lubrication and will be stored in covered HDPE Drums & will be given to CECB approved vendors/authorized recycler

## 2.4 WATER REQUIREMENT & SOURCE

Total water requirement will be 1950 KLD (682500 KLA). The management had decided to implement a 50000 KL Rain water collection Tank which will be enough to cater water requirement of 25 days, During, 75 days of monsoon water requirement will be met through rain water collection. Therefore, it is considered that about 100 days water requirement will be met through rain water and rain water collection, and balance 250 days water (487500KLA) will be sourced from Surface Water. As per CGWA, the area is classified as "SAFE" zone.

## 2.5 POWER REQUIREMENT & SUPPLY

Total power requirement – 51 MW. Source: 40 MW will be met through CPP and rest from CSPDCL industrial power supply network, in addition to this 2 Nos. of 1500 kVA DG sets are proposed for emergency backup.

## 2.6 MANPOWER REQUIREMENT

M/s. NRVS steels Limited will provide employment to about 990 (245 existing + 745 additional) peoples which includes total 60 administrative staff (15 existing + 45 proposed) and 930 Production staff (230 existing + 700 proposed). Preference will be given to local people, depending upon their qualification and skill.

## 2.7 FIRE FIGHTING FACILITIES

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

## 2.8 PROJECT COST

The proposed cost of expansion is estimated as Rs. 30,500.00 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 **pre monsoon season (1<sup>st</sup> March 2021 – 31<sup>st</sup> May 2021)** along with secondary data.

#### 3.2 METEOROLOGY & AMBIENT AIR QUALITY

##### Summary of the Meteorological Data Generated At Site (1st March, 2021 to 31st May, 2021)

Predominant Wind Direction	Pre Monsoon Season
First Predominant Wind Direction	WNW (13.09%)
Second Predominant Wind Direction	W (13.04%)
Calm conditions (%)	2.26
Avg. Wind Speed (m/s)	2.51

The status of ambient air quality within the study area was monitored for pre-monsoon season of the year 2020 at 8 locations covering project site. The levels of Respirable Particulate Matter (PM<sub>10</sub>), Fine Particulates (PM<sub>2.5</sub>), Sulphur Dioxide (SO<sub>2</sub>), Oxides of Nitrogen (NO<sub>x</sub>) 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 4**.

**TABLE 4  
SUMMARY OF AMBIENT AIR QUALITY MONITORING RESULTS**

Sr. No.	Location		PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>2</sub>	CO	Ozone	NH <sub>3</sub>
			µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	mg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>
1	Project site	Min	64.9	25.2	16.1	19.0	0.367	10.2	5.7
		Max	87.9	42.1	20.7	30.7	0.411	14.9	10.7
		Avg	78.7	32.4	19.1	25.6	0.389	12.6	8.5
		98 <sup>th</sup>	87.3	41.3	20.6	30.6	0.411	14.8	10.6
2	Jamadbari	Min	41.1	18.4	8.6	14.7	0.302	4.9	5.2
		Max	65.4	29.4	11.3	19.6	0.344	12.9	9.8
		Avg	57.6	22.6	9.7	17.5	0.320	8.9	7.5
		98 <sup>th</sup>	64.1	29.3	11.2	19.4	0.341	12.7	9.8
3	Gaurmuri	Min	51.3	21.3	9.6	15.8	0.291	7.2	4.3
		Max	70.5	28.5	15.0	21.8	0.334	11.6	8.5
		Avg	61.5	24.8	11.5	18.6	0.311	9.2	6.4
		98 <sup>th</sup>	70.5	28.4	14.9	21.6	0.334	11.5	8.3
4	Ujalpur	Min	49.5	22.1	9.2	15.4	0.283	6.3	4.6
		Max	72.6	33.5	13.9	21.6	0.371	14.3	12.3
		Avg	63.4	26.3	11.8	18.3	0.327	10.2	8.3
		98 <sup>th</sup>	72.1	33.3	13.8	21.4	0.370	14.3	12.1
5	Gerwani	Min	50.4	18.4	10.2	14.8	0.245	7.7	5.1
		Max	70.7	28.6	17.3	26.3	0.354	12.6	8.0
		Avg	60.2	23.4	13.7	20.3	0.296	9.8	6.7
		98 <sup>th</sup>	70.4	27.9	17.2	26.0	0.350	12.5	8.0
6	Ratrot	Min	59.5	22.7	10.8	16.9	0.302	6.9	4.8
		Max	79.1	29.5	14.6	21.5	0.369	12.4	10.6
		Avg	67.3	25.7	12.7	19.5	0.336	9.6	7.2
		98 <sup>th</sup>	78.9	29.4	14.4	21.4	0.368	12.3	10.4
7	Punjipathra	Min	57.9	23.7	12.4	18.3	0.318	8.5	5.4
		Max	76.9	31.6	16.6	23.1	0.386	14.6	11.8
		Avg	65.6	27.4	14.5	21.2	0.353	11.5	8.1
		98 <sup>th</sup>	76.1	31.5	16.5	23.1	0.385	14.4	11.6
8	Taraimal	Min	67.1	25.1	12.8	19.0	0.352	8.7	5.6
		Max	89.4	38.9	19.9	24.9	0.396	13.6	9.8
		Avg	74.1	29.4	16.5	22.1	0.365	10.8	8.0

Sr. No.	Location	98 <sup>th</sup>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>2</sub>	CO	Ozone	NH <sub>3</sub>
			µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	mg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>
			89.3	38.7	19.8	24.5	0.394	13.1	9.8
	<b>CPCB Standards</b>		<b>100</b> (24hr)	<b>60</b> (24hr)	<b>80</b> (24hr)	<b>80</b> (24hr)	<b>2</b> (8hr)	<b>100</b> (8hr)	<b>400</b> (24hr)

From the above results, it is observed that the ambient air quality at all the monitoring locations was within the permissible limits specified by CPCB.

### 3.3 AMBIENT NOISE LEVELS

Ambient noise level monitoring was carried out at the 08 monitoring locations; The monitoring results are summarized in **Table 5**.

**TABLE 5  
SUMMARY OF AMBIENT NOISE LEVEL MONITORING RESULTS**

Sr. No.	Monitoring Locations	Equivalent Noise Level	
		Leq <sub>Day</sub>	Leq <sub>Night</sub>
<b>Residential Area</b>			
1.	Ratrot	49.1	39.4
2.	Gerwani	51.3	42.4
3.	Gaurmuri	52.3	40.8
<b>CPCB Standards dB(A)</b>		<b>55.0</b>	<b>45.0</b>
<b>Commercial Area</b>			
4.	Taraimal	54.7	43.2
<b>CPCB Standards dB(A)</b>		<b>65.0</b>	<b>55.0</b>
<b>Silence Zone</b>			
5.	Kantajharia	47.6	37.4
6.	Jhingolpara	45.3	36.2
<b>CPCB Standards dB(A)</b>		<b>50.0</b>	<b>40.0</b>
<b>Industrial Area</b>			
7.	Project site	61.4	52.3
8.	Punjipathra	58.1	49.8
<b>CPCB Standards dB(A)</b>		<b>75.0</b>	<b>70.0</b>

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

### 3.4 SURFACE AND GROUND WATER RESOURCES & QUALITY

#### 3.4.1 Regional geology

10 km radius study area is mainly comprised of sedimentary rock formations, like sandstones, arenites, conglomerates, shale, tillites, boulder beds etc. All these formations are of Proterozoic age and of Gondwana age. There are no major geological structure present in study area as far as concern with construction of buildings and other structure. Study area falls in seismic zone-II i.e. low damage risk zone.

#### Site specific Geology:

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

#### 3.4.2 Hydrogeology

Most of the study area is covered by sedimentary formations. Sandstones are good aquifer as it holds and transmit very good amount of water. The ground water occurs in both phreatic and semi-confined to confined condition. One distinct perennial autoflow zone has been demarcated in Tamnar block in the Mand river sub-basin.

Depth to water level scenario in the study area:

Pre-monsoon Water levels- 4.5 to 7 m bgl

Post-monsoon water levels: 0.3 to 3.5 m bgl.

### 3.4.3 Geomorphology

Study area is comprises of gently sloping plains on Proterozoic age and on Gondwana rocks. Pediment/pediplain zone is observed in SE part of the study area. Flood plains are observed along River courses. There are no major geomorphological structures present in study area.

### 3.4.4 Water Quality

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

#### A. Groundwater Quality

The physico-chemical characteristics of groundwater are compared with the IS-10500 standards. The analysis results indicate that the pH ranged between 6.94- 8.13. The TDS was ranging from 238-558 mg/l. Total hardness was found to be in the range of 158.21-417.1 mg/l. The fluoride concentration was found in the range of 0.13-0.38 mg/l. The nitrate and sulphate were found in the range of 2.00-16.85 mg/l and 8.52-58.17 mg/l respectively. Heavy metals content (i.e., As, Al, Cd, Cr, Cu, Pb, Mn, Zn and Hg) were found to be below detection limit and within specified standards.

Sr. No.	Locations	WQI	Quality	Remark
1	Project site	33.44	Excellent	<b>Water quality assessed based upon above physico-chemical parameters and all samples are physico-chemically good to excellent.</b>
2	Jamadbari	45.11	Excellent	
3	Gaurmuri	38.55	Excellent	
4	Ujalpur	42.83	Excellent	
5	Gerwani	46.86	Excellent	
6	Ratrot	42.70	Excellent	
7	Punjipathra	61.13	Good	
8	Pali	49.29	Excellent	

#### B. Surface Water Quality

The analysis results indicate that the pH ranged between 6.73-8.16 which are well within the specified standard of 6.5 to 8.5. The pH of water indicates whether the water is acid or alkaline. The TDS was observed to be 140-286 mg/l which is within the permissible limit of 2000 mg/l. The total hardness recorded was in the range of 97-198.01 mg/l as CaCO<sub>3</sub> 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 8.61-56.24 mg/l and 9.04-34.6 mg/l respectively.

Dissolved oxygen (DO) refers to the amount of oxygen (O<sub>2</sub>) 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 6.0-6.3 mg/l. Phosphorus (as PO<sub>4</sub>) 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. The reported value for PO<sub>4</sub> ranged from 0.27-0.52 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 a 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 15th April 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°56'23.95"N to 22°06'48.54"N latitude and 83°16'23.43"E to 83°27'35.62"E longitude and elevation 230 – 588 meter are used as per the project site confined within that area.

The Land Cover classes and their coverage are summarized in **Table 6**.

**TABLE 6**  
**LAND COVER CLASSES AND THEIR COVERAGE ARE SUMMARIZED**

S.No.	Level-I	Level-II	Area (Sq.Km <sup>2</sup> )	Percentage (%)
1	Built-up land	Settlement	10.25	3.26
		Industrial Settlement	8.69	2.77
		Road Infrastructure	0.74	0.24
2	Agricultural Land	Cropland	98.57	31.4
		Barren Land	1.1	0.35
3	Forest Land	Reserve forest / Protected Forest	163.92	52.2
4	Scrubs	Open Scrub	6.87	2.19
5	Water bodies	Canal/River/Pond/ Tank	22.36	7.12
6	Others	Brick Kiln	0.56	0.18
		Mining Area	0.94	0.29
	<b>Total</b>		<b>314</b>	<b>100</b>

### 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 landuse conditions. The physical, chemical and heavy metal concentrations were determined. The samples were collected by ramming a core-cutter into the soil up to a depth of 30 cm. Total 8 representative samples were collected from different locations within the study area and analyzed.

#### Physical Characteristics of Soil

From the analysis results of the soil samples, it was observed, the bulk density of the soil in the study area ranged between 1.563-1.638 g/cc which indicates favorable physical condition for plant growth. The water holding capacity is between 25.89-48.88 %. Infiltration rate, in the soil is in the range of 19.89-23.89 mm/hr

#### Chemical Characteristics of Soil

pH is an important parameter indicative of alkaline or acidic nature of soil. It greatly affects the microbial population as well as solubility of metal ions and regulates nutrient availability. Variation in the pH is found to be slightly acidic to neutral (6.73-7.42) in reaction. Electrical conductivity, a measure of soluble salts in the soil is in the range of 136.7-316.52  $\mu$ S/cm.

The important soluble cations in the soil are calcium and magnesium whose concentration levels ranged from 176.94-371.96 mg/Kg and 64.73-408.69 mg/Kg respectively. Chloride is in the range of 121.25-186.2 mg/Kg.

Organic matter and nitrogen were found in the range of 1.18—3.17% and 146.39-242.61 kg/ha. The nutrient status in terms of NPK value was found to be in the range of 146.39-242.61 kg/ha, 7.8-13.64 kg/ha and 67.19-132.08 kg/ha respectively. This indicates that soil is poor in nature with low productivity.

### 3.7 BIOLOGICAL ENVIRONMENT

#### Floral composition in Study Area

Floral characteristics at select forests and surrounding areas including villages were studied during Pre Monsoon Season - 2021. Forest Plan of Raigarh District as secondary data was studied for primary survey. Total 143 floral species were observed in the study area. The details about the floral composition are as follows:

- a. **Trees:** Total 94 species were found in the study area
- b. **Shrubs (small trees):** Total 16 species were enumerated from the study area.
- c. **Herbs:** In the study area 05 species were observed.
- d. **Bamboo & Grasses:** 15 species were enlisted from the study area
- e. **Climbers:** Total 12 species of climbers were recorded in the study area.
- f. **Parasite/epiphytic plant:** Each 1 species enlisted in the area

#### RET (Rare, Endangered and Threatened species) STATUS

According to IUCN Status report 2013 out of total 143 plant species identified within study area among the observed species Chloroxylon swietenia which is Vulnerable (VU) species as per IUCN Ret list. The other identified plant species in the study area belongs to least concern (LC), Data Deficient (DD) and Data not available (NA), as per IUCN status. Thus, none of reported species in study area belongs to Rare, Endangered or Threatened category.

#### Fauna Details:

##### As per IUCN RED (2013) list

The IUCN Red List is the world's most comprehensive inventory of the global conservation status of plant and animal species. It uses a set of criteria to evaluate the extinction risk of thousands of species and subspecies. These criteria are relevant to all species and all regions of the world. With its strong scientific base, the IUCN Red List is recognized as the most authoritative guide to the status of biological diversity.

Among the reported animals, the categorization of species as per IUCN is as follows:

##### As per Indian Wild Life (Protection) Act, 1972

Wild Life (Protection) Act, 1972, as amended on 17th January 2003, is an Act to provide for the protection of wild animals, birds and plants and for matters connected therewith or ancillary or incidental thereto with a view to ensuring the ecological and environmental security of the country.

Some of the sighted fauna was given protection by the Indian Wild Life (Protection) Act, 1972 by including them in different schedules. Among the birds in the study area, Pea fowl (*Pavocristatus*), is included in schedule I of Wild life protection Act (1972), while many other birds are included in schedule IV.

Among the reptiles, Python molurus (Indian Python) and Varanus bengalensis (Bengal Monitor Lizard) categorized as Schedule –I Whereas, Indian Cobra (*Naja naja*), Common rat snakes (*Ptyas mucosus*), are provided protection as per Schedule-II of Wild life protection act, (1972).

Among mammals; *Elephas maximus* – Asiatic Elephant and *Melursus ursinus* – Sloth Bear Categorized under Schedule – I. Whereas, Mongoose (*Herpestes edwardsi*), *Macaca mulata* (Rhesus macaque), Jungle cat (*Felis chaus*), Indian Fox (*Vulpes bengalensis*) are schedule –II animals. Wild boar (*Sus sucrofa*) and *Hyaena hyaena* (Hyena) is protected as Schedule-III animal and Hares & Five striped squirrel are included in schedule IV of Wild Life Protection act 1972. Fruit bat & Rats protected in Schedule V of Wild Life Protection act 1972.

### 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 7**. Details regarding education and infrastructure facilities 2011 are presented in **Table 8**.

**TABLE 7**  
**SUMMARY OF SOCIO-ECONOMIC ENVIRONMENT OF VILLAGES WITHIN 10 KM RADIUS AREA**

No. of villages	37
Total households	8417
Total population	33943
Male Population	17419
Female population	16524
SC Population	2974
ST Population	12513
Total literates	22312
Total Illiterates	11631
Total workers	15017
Total main workers	10669
Total marginal workers	4348
Total non-workers	18926

Source: Primary census abstract 2011, state Chhattisgarh.

**TABLE 8**  
**INFRASTRUCTURE FACILITIES AVAILABLE IN THE STUDY AREA**

Yr. 2011	In percentage (%)									
	Education	Drinking water	Road	Power	Communication	Transportation	Govt. PHC & SC	Bank	Drainage	Recreation
Availability	100	100	92	100	76	54	22	8	59	65

Source: Primary census abstract 2011, State Chhattisgarh.

#### SALIENT OBSERVATION OF THE SOCIO-ECONOMIC SURVEY

- **Employment:** Main occupation in the study area was agriculture and Labor Work its allied activities eg. Cattle rearing, dairy farming, agro-horticulture, bamboo-agricultural crop patterns, floriculture, bee-keepings etc. Other income generation sources of the area, small business; private jobs etc. The labors were getting daily wags in the range of 300-350 Rs, depending on type of work they set. It is observed that the Raigarh District is having huge scope for employment as industrialization is more in this area. But due to lack of Vocational training centers in the area the Industries are outsourcing some of the key employees from other areas.
- **Agriculture and labor** - Main occupations are mostly labour and agriculture but other business includes preparation of leaf tray, leaf cups, collection of Mahua for the preparation of countryside liquor. People in the study area resort to rearing of livestock as a source of income. As per the local interview during field survey, it was observed that the most common animal reared by the people is cow, buffalo, poultry and goat.
- **Major crops of study area, production & yield:** About 45% 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 and the type of crops includes paddy, ragi, green gram and black gram. Til, groundnut, mustard, jute, sugar cane etc are the major commercial crops grown in the study area. Banana and mango are the major fruits grown in this area.

- **Migration from other states:** Main industries were coal washery, power plant, steel industry etc. in the study area Migration from other states eg. UP, Bihar & Odisha for employment purpose found in the study area.
- **Education facilities:** The Primary & secondary data reveals that literacy levels in all the villages is varying from 60 to 80 %. Most of the students in Villages in the study area are going to Raigarh town for their studies which is about 15 Kms. from the plant. The schools are also not having proper infrastructure facilities. College facility is available in Trimal and Raigarh in the study area.
- **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. Kirodimalnagar Railway Station, 12.km. Lack of access for transportation, irregular bus/auto facilities were seen in the villages. School/college going students facing problem to attend schools/colleges which were at long distance.
- **Medical facilities:** The Primary & secondary data reveals that there are only 06 nos. of Sub Health Centers & 01 nos. of PHC's in the Study area. During FGD villagers made various issues in health care facilities, such due to COVID-19 crisis ,public health in particular workers' health and safety, converge not properly working health facilities available at PHCs, Laboratory testing and Delivery facilities at Government Health Centers, availability of clean toilet and drinking water at PHCs, and distance of the nearest health center from the Village. To control the spread of diseases (COVID-19 ,Malaria & viral fever) and reduce the growing rates of mortality due to lack of adequate health facilities, special attention needs to be given to the health care in rural areas. The key challenges in the healthcare sector are low quality of care, poor accountability, lack of awareness, and limited access to facilities. It is also observed that Malnutrition is the common in most of the villages.
- **Drinking water, sanitation & infrastructure:** It was observed that only 31 villages have Pucca Road facilities. It means nearly 86 % of the villages have road facility. It was observed that there is good improvement in Power Supply. As the study area comprises of few Power Plants. This ultimately solved the Power cuts & Power Fluctuations in the villages of entire Raigarh District. 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 use that as source of drinking water & for Agriculture. Tap water and water tanker is also provided by panchayat in summer, but supplied water quantity is not sufficient. For treating water, the Panchayat needs adequate funds to take any actions. Overhead Water Tanks are also installed in few villages 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. Need to go to Raigarh.
- **Communication Facility:** Communication facility is good in the Study area. Maximum villagers are having Mobile Phone, news paper, television facility. It indicates that the study area is well progress in communication.
- **Banking facility:** The study area has almost all the schedule commercial banks with ATM facility at urban areas and the district HQ.
- **Women empowerment:** Most of the women population is having local woman saving group and engaged in household activities. Women literacy was satisfactory in the study area (According to Primary Data Collection, only 20% Female population were workers) Since Most of the villages is having local Mahila Mandal and Women self-help groups were exist in the study area only for money savings purposes. Women literacy was satisfactory in the study area

➤ **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. Raigarh is the only place where Sports training facilities are available in entire District.

### 3.7.1 Awareness and opinion of the respondents about the project

Public opinion is the aggregate of individual attitudes or beliefs. It is very important to take opinion of the villagers about the project. The awareness will not only promote community participation but also enable them to understand the importance of the project and encourage them to express 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 Nearest 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 definitely contribute development in the study area
- Village leaders asked to give employment opportunities to local people.
- According to the respondent air Pollution was increased due to industries area and directly affecting health of nearby villagers.
- Main demands of villagers in study area were The Study area condition is very worst during COVID 19 disease. People are not getting proper employment. Most of the People wanted Special needs to be given are Hospital bed, oxygen cylinder, medicines for villagers.

### 3.7.2 Interpretation

Socioeconomic survey was carried out to know the infrastructural activities amenities available within 10 km radius from Project Site. The information regarding facilities available and the opinion of the people was sought by floating questionnaires and interaction with the people. This is done for observing the impact due to the project wrt social aspects so that proper actions / measures could be taken up for the benefit of the people (economically and wrt quality of life) and the project.

During the primary survey it was observed that almost pakka road facility is available in all villages within 10 km radius. Literacy rate of the study region is from 65.73%. On the basis of survey for literacy rate data it is interpreted that there is need to promote educate more and more people. Almost all the villages have more than 55.76% people as non-workers. It indicates that the problem of unemployment can be solved by providing proper training and education. There is also need to establish more industries so that maximum number of employment can be generated. Basic amenities like Education facilities Health care facilities, water supply, mode of transportation etc. are not available in Most of the villages.

## 4.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

### 4.1 AIR ENVIRONMENT

The implementation of proposed project will have impact on the air quality parameters like PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>x</sub> and CO. The raw material handling plant along with proposed Induction Furnaces, steel melting shops process will emit dust and fumes. Apart from the above, there will be fugitive dust emissions due to transportation, storage and processing of raw materials.

---

The mathematical Model ISCST-3, was used for predicting the GLCs, which is entirely in line with the requirement of Central Pollution Control Board, New Delhi. The maximum ground level concentrations (GLCs) for particulate matter and gaseous emission of SO<sub>2</sub>, NO<sub>2</sub> due to proposed expansion plant with new installations were carried out. The predicted 24 hourly maximum contribution in AAQ concentrations from main process unit facilities for particulate matter, SO<sub>2</sub> and NO<sub>2</sub> are found to be 1.4 µg/m<sup>3</sup>, 2.5 µg/m<sup>3</sup> and 2.5 µg/m<sup>3</sup> (existing implemented), 1.5 µg/m<sup>3</sup>, 6.0 µg/m<sup>3</sup> and 10.0 µg/m<sup>3</sup> (after expansion) occurring at a distance of about 6.7km respectively in ESE and E direction and emissions from standby DG sets for particulate matter, SO<sub>2</sub> and NO<sub>2</sub> are found to be 0.25 µg/m<sup>3</sup>, 0.25 µg/m<sup>3</sup> and 4.4 µg/m<sup>3</sup> occurring at a distance of about 5.3 km each respectively in ESE and E direction. No significant incremental concentration was found due to proposed installation activities. The mitigation measures adopted are:

- The main pollutants discharged from the Induction Furnace, Sponge Iron Plant, captive power plant, Billet reheating Furnace will be particulate matter, SO<sub>2</sub>. In case of power failure DG set will be used and emissions generated from DG set operation will be PM, SO<sub>2</sub> and NO<sub>x</sub>. Other gaseous emissions due to pig iron plant which is considered maximum consumption of raw material i.e. worst condition considered but all the predicted values well within the standard.
- In Sponge Iron Plant and Power Plant ESP with Dust Collectors will be installed.
- In Induction Furnace; LRF; and Sponge Iron Material handling area, Dust Collector along with it; the Bag Filter will be installed.
- In Billet reheating Furnace waste heat recuperator followed with flue cooling device and then Wet Scrubber will be installed.
- Steel Melting Shop with hot charging rolling mill will be provided with Bag filters, 30 meter stack and ID/FD fan capacity to cater the future requirement to control emission less than 30 mg/Nm<sup>3</sup>.
- DRI Kiln with WHRB will be provided with Dust extraction system, ESP with Chimney; to keep particulate matter emission below 30mg/Nm<sup>3</sup>. Bag Filters for Product house; Kiln discharge end and transfer points;
- AFBC based power plant ESP with Chimney of 45 m height and 2 Bag Filters at Coal conveyors
- The existing facilities are all well equipped with proper Air Pollution control equipment such as ESP in sponge iron and Bag Filters at various locations.
- Water spraying will be carried out in order to control fugitive emissions in the internal open storage yards.
- Adequate dust suppression system in the form of water sprinklers shall be provided at raw material yard, temporary solid waste dump site and along the vehicular roads.
- There will be dedicated roads for vehicles carrying raw materials and products.
- Stacks will be provided with porthole and working platform so that stack monitoring can be done as per norms of statutory authority.

#### **4.2 NOISE ENVIRONMENT:**

During the normal operation of manufacturing process noise will be generated due to Induction Furnaces, Sponge Iron Plant, Billet Reheating Furnace, Rolling Mill, 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.
- 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 broad 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.

#### **4.3 WATER ENVIRONMENT:**

The implementation of proposed 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:

- 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 dry powdery material like Sponge Iron; Ore and Coal/Charcoal, etc will be transported in covered trucks.

#### **4.4 BIOLOGICAL ENVIRONMENT**

No National Park, Wildlife Sanctuary, Biosphere Reserve, Tiger Reserve, migratory corridors, etc. within the 10 km radial distance from the project site. Nearest Debrigarh Wildlife Sanctuary is 42.0 km in SSE direction and Gomarda Wildlife Sanctuary is 52.4 KM in SSW. No forest land is involved at project site. Whereas, Taraimal Reserve Forest – 0.7 Km in North direction). Moreover, it is expansion project in which land is already acquired by M/s. NRVS. No forest land/ no tree cutting involved in the project. A thick green belt around the periphery of plant site is recommended to provide safeguard for surrounding area in line with project activities. Further, it is recommended to implement Biological Conservation Plan within 10 KM study area to improve the existing habitat

Greenbelt area of 8.360 Ha. (33%) will be kept unchanged for the proposed expansion project with local species with broad leaves and higher canopy and fast growing tree species. Existing plants are 15126 nos. whereas additional plantation will also be carried out. Indigenous species for plantation is recommended.

---

#### **4.5 SOCIO-ECONOMIC IMPACTS:**

The land use is not going to be significantly changed 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 Board of Directors 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 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. NRVS steels limited 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.

Although the MOEFCC vide its OM dated 30 September 2020 has provided that the CER value for the project would be based on Public Hearing outcome and as per the commitments made by the project promoters during the Public hearing however the provisions for CER are made in the proposal as per TOR which required to consider O.M. dated 01/05/2018 and 30.09.2020 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 Additional cost for expansion of the project is Rs. 30,500.00 Lakhs. Thus, 0.75 % i.e. 229 lakhs will be made provision and spent towards the improvement of Environment.

#### **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 will be implemented with addressing of components of environment, which will be likely affected during construction and operation of the proposed expansion project. The capital cost required to implement the EMP for proposed expansion project is estimated to be Rs. 421 Lakhs. The annual recurring expenses will be Rs. 50 Lakhs has been allocated for implementation of the Environmental Management Plan for proposed project.

## **9.0 CONCLUSION**

The proposed expansion project of M/s. NRVS steels Ltd. will be beneficial for the overall development of the nearby villages. Some environmental aspects like dust emission, noise, wastewater, traffic density, etc. will have to be controlled better than the permissible norms to avoid impacts on the surrounding environment. Necessary pollution control equipment like ESP, bag house, water sprinklers, enclosures, etc. forms 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 area will be carried out. The proposed CSR/CER activities to be initiated by the industry will be helpful to improve the social, economic and infrastructure availability status of the nearby villages.

Thus, it can be concluded that with the judicious and proper implementation of the pollution control and mitigation measures, the proposed expansion project will not add adverse pollution levels to the environment, moreover, it will be beneficial to the society and will help to reduce the demand-supply gap of steel to some extent and will contribute to the economic development of the region and thereby the country.

## **10.0 DISCLOSURE OF CONSULTANTS**

The Environmental studies for proposed expansion project of M/s. NRVS steel 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 having Accreditation Certificate No.: NABET/EIA/1922/RA 0150 dtd. 03 Feb 2020 Valid till September 30, 2022.