REPORT SUBMITTED FOR PUBLIC HEARING

EXECUTIVE SUMMARY OF DRAFT EIA-EMP REPORT

FOR

GREENFIELD PROJECT FOR IMPLEMENTATION OF DRI BASED STEEL PLANT TO PRODUCE SPONGE IRON 245000 TPA (350 TPD X 2 NOS.); MILD STEEL BILLETS 274400 TPA, ROLLED STEEL PRODUCTS 266168 TPA (THROUGH HOT CHARGING 201684 AND THRU BRF (BASED ON COAL GASIFIER) 64484 TPA; SAF 9 MVA X 2 NO TO PRODUCE SiMn-34000 TPA AND/OR FeMn- 43000 TPA AND/OR FeSi-19000 TPA AND /OR PIG IRON 68000 TPA); CAPTIVE POWER OF 25 MW (16 MW THROUGH WHRB AND 9 MW THROUGH FBC); AND FLY ASH BRICKS 39,800 TPA

LOCATED AT

VILLAGE - CHAMPA AND KOTA, TEHSIL - TILDA, DISTRICT - RAIPUR (C.G.) 493 221

Terms of Reference File No. IA-J-11011/334/2024-IA-II(IND-I) dated 20th Oct 2024
Category A, Schedule 3 (a) Metallurgical Industries (Ferrous & Non-Ferrous) and Sector 1 (d) Thermal Power Plant
Baseline Monitoring Period: Pre-Monsoon Season (1st March, 2024 – 31st May 2024)

PROJECT PROPONENT

M/s. SHREE RADHE SHAKTI SPONGE AND POWER PVT. LTD.

ENVIRONMENTAL CONSULTANT

M/s. ANACON LABORATORIES PVT. LTD., NAGPUR
QCI - NABET Accredited EIA Consultant for
3 (a) Metallurgical Industries (Ferrous & Non-Ferrous) &
Sector 1 (d) Thermal Power Plant
MoEF&CC (GOI) Recognized Laboratory
ISO 9001:2015, ISO 14001:2015, ISO 45001:2018
QCI NABET Certificate No. - NABET/EIA/23-26/RA 0304_Rev.01
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NOVEMBER- 2024

EXECUTIVE SUMMARY

1.0 INTRODUCTION

The company "**Shree Radhe Shakti Sponge and Power Pvt. Ltd**" is a newly incorporated company created on 5th July 2023 under the Companies Act 1956 with an objective to set up a DRI based Steel plant along with Captive power plant.

As per Environmental Impact Assessment Notification dated 14th September, 2006 and subsequent amendment thereof, the Sponge Iron, Steel Melting Shop (Induction Furnace) and Ferro Alloys Plants falls under **Sector 3 (a)** and the AFBC based power plant falls under **Sector 1 (d)**. The overall project activity is categorized as **Category "A"**; therefore, it require Environmental Clearance (EC) to be obtained from EAC (Industry –I), MoEFCC, New Delhi.

The application for prior Environmental Clearance (Form-1) for proposed metallurgical project was submitted to EAC, MoEFCC, New Delhi (Online Proposal No. **IA/CG/IND1/472540/2024** on **25th July, 2024.**

The proposal was considered by the Expert Appraisal Committee (EAC) and ToR was granted on **20.10.2024** (vide. file no. : **IA-J-11011/334/2024-IA-II(IND-I)**).

Anacon Laboratories Pvt. Ltd., Nagpur, is QCI-NABET accredited (NABET Certificate No.- **NABET/EIA/23-26/RA 0304 - Rev. 01** ; Issue date 13-03-2024; Validity **29-09-2026**) in 'Category A' environment consultant organization has been assigned to undertake an Environmental Impact Assessment (EIA) study and preparation of Environment Management Plan (EMP) for various environmental components, which may be affected due to the impacts arising out of the proposed project.

The Environmental Impact Assessment (EIA) report is prepared for obtaining Environmental Clearance (EC) from Ministry of Environment, Forest and Climate Change (MoEFCC), New Delhi and the Consent for Establishment from the Chhattisgarh Environment Conservation Board (CECB) for the proposed Greenfield project.

1.1 IDENTIFICATION OF PROJECT

M/s. Shree Radhe Shakti Sponge and Power Pvt Ltd has proposed to production of DRI based Steel plant to produce Sponge Iron 2,45,000 TPA (350 TPD X 2 Nos.); Mild Steel Billets 2,74,400 TPA, Rolled Steel Products 2,66,168 TPA (through Hot Charging 2,01,684 and thru BRF (based on Coal Gasifier) 64,484 TPA; SAF 9 MVA X 2 Nos. to produce SiMn - 34,000 TPA and/or FeMn- 43,000 TPA and/or FeSi-19,000 TPA and/or Pig Iron 68,000 TPA); Captive Power of 25 MW (16 MW through WHRB and 9 MW through FBC); and Fly Ash Bricks 39,800 TPA, unit. The project is proposed to be located at Village - Champa and Kota, Tahsil - Tilda, District - Raipur (CG) Pin code -493221.

The proposal is to seek Environment Clearance based on energy efficient as well as well proven technology process.

TABLE 1: PROPOSED PLANT DETAILS WITH CAPACITY

S. No.	Product	Configuration	Capacity (in TPA)
1.	Sponge Iron	350 TPD X 2 Nos. DRI Kiln	245,000
2.	MS Ingot Billet (as intermediate/ semi-finished	20 MT X 4 Nos. Induction Furnace along with CCM	274,400

S. No.	Product	Configuration	Capacity (in TPA)
	product)		
3.	Rerolled Steel products	2 Electrically Operated Rolling Mill	266,168
	(a) Rolled steel product thru Hot charging	Direct Hot Charging facility with one No. Electrically Operated Rolling Mill	201,684
	(b) Rerolled steel product thru BRF	Coal Gasifier (4200 Nm^3) based Billet Reheating Furnace	64,484
4.	Ferro Alloys- SiMn	Submerged Arc Furnace 9 MVA X 2 Nos	34,000
	And/or		And/or
	Ferro Alloys- FeMn		43,000
	And/or		And/or
	Ferro Alloys- FeSi		19,000
	And/or		And/or
	Pig Iron		68,000
5.	WHRB based power	3 Nos. of WHRB boiler with each of DRI Kiln connected to TG	16 MW
6.	FBC based power	FBC based boiler connected to TG	9 MW
7.	Fly Ash Brick/Blocks etc.	Fly Ash Brick/Block and other product making machine	39,800

1.2 LOCATION OF THE PROJECT

The proposed project located at Village - Champa and Kota, Tahsil - Tilda District - Raipur (CG) Pin code - 493221. The nearest city is Raipur. Nearest airport is Swami Vivekananda Airport, Raipur - 42.62 km/SSW which is around 42.62 km at SSW direction. The project site can be reached from nearest City Tilda through a connecting road to Simga Kharora Road, which is connected to national highway No.130. The project is well connected to all weather roads. Nearest Railway station Tilda about 6.42 KM in WSW direction from the project site.

1.3 EIA-EMP REPORT

As per approved ToR obtained from EAC (Industry –I), MoEFCC, New Delhi, baseline environmental monitoring was conducted during **pre-monsoon season (1st March, 2024 – 31st May 2024)** 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.

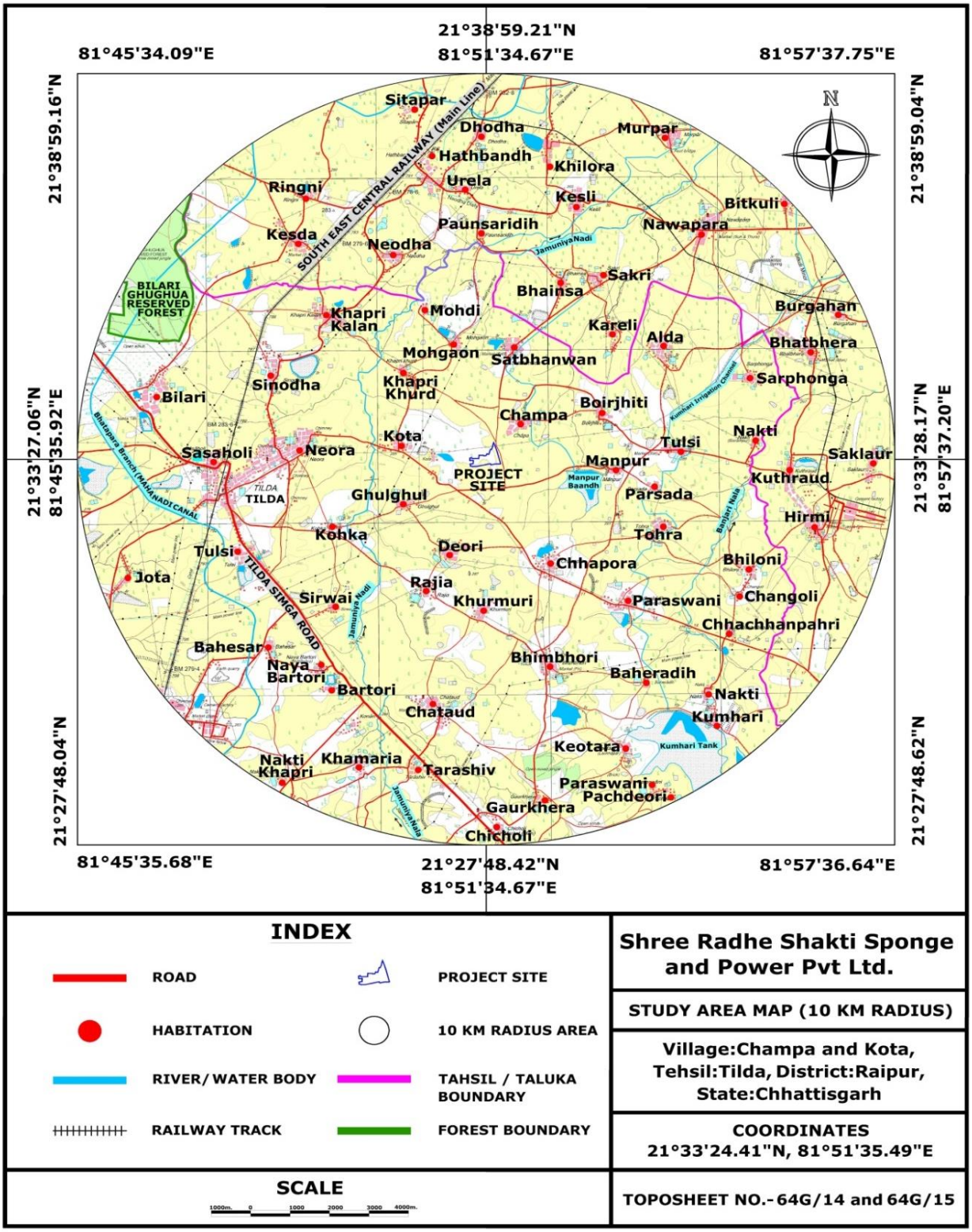

FIGURE 1 A: STUDY AREA (10 KM RADIAL DISTANCE)

TABLE 2: DETAILS OF ENVIRONMENTAL SETTINGS

Sl.	Particulars	Details
1.	Project Location	Village - Champa and Kota Tahsil - Tilda District-Raipur State-Chhattisgarh 493221
2.	Latitude/Longitude	See table below
3.	Location covered in Toposheet No	**Toposheet No.:** 64G/14 and 64G/15.
4.	Nearest representative IMD Station	IMD Raipur - 43.23km/SSW
5.	Site elevation above Mean Sea Level	299 m to 311m
6.	Nearest roadway	1.Road connecting village Ghulghul and village Manpur-0.5km/S 2.Road connecting village Kota and village Chhapora-0.78km/SW 3.Tilda Simga Road-5.90km/SW
7.	Nearest Railway Station	Tilda Neora Railway Station-6.42km/WSW
8.	Nearest Air Port	Swami Vivekananda Airport, Raipur - 42.62 km/SSW
9.	Nearest village	Champa -0.50 km/NE Kota- 0.80 km/W
10.	Nearest Port	Gopalpur Port - 408.5 km/SE
11.	Distance from Sea Coast	Bay of Bengal - 406.64 km/SE
12.	Nearest major city with 2,00,000 population	Raipur
13.	Nearest State/National Boundaries	Odisha - 89.62 km/SE
14.	Hills/Valleys	None within study area
15.	Ecologically sensitive zone	None within study area
16.	National Parks, Wildlife Sanctuaries, etc.	None within study area
17.	Nearest Reserved / Protected forests	Bilari Ghughua Reserved Forest - 8.24 km/WNW
18.	Historical/Tourist places	See table below
19.	Nearest	See table below

PTS.	LATITUDE	LONGITUDE	PTS.	LATITUDE	LONGITUDE
1.	21°33'31.71"N	81°51'21.82"E	11.	21°33'17.81"N	81°51'24.16"E
2.	21°33'30.30"N	81°51'30.09"E	12.	21°33'18.36"N	81°51'21.61"E
3.	21°33'30.77"N	81°51'32.77"E	13.	21°33'18.72"N	81°51'19.61"E
4.	21°33'31.81"N	81°51'33.24"E	14.	21°33'22.73"N	81°51'19.01"E
5.	21°33'31.30"N	81°51'34.46"E	15.	21°33'22.84"N	81°51'19.75"E
6.	21°33'30.11"N	81°51'34.23"E	16.	21°33'23.86"N	81°51'19.41"E
7.	21°33'28.80"N	81°51'39.35"E	17.	21°33'24.43"N	81°51'21.95"E
8.	21°33'39.63"N	81°51'42.43"E	18.	21°33'25.29"N	81°51'21.88"E
9.	21°33'20.79"N	81°51'48.09"E	19.	21°33'25.40"N	81°51'22.24"E
10.	21°33'19.70"N	81°51'39.63"E			

Sr. No.	Name	Distance (Km)	Direction
1	Children Garden/ Elephant Garden	9.78	SW

Sr. No.	Name	Distance (Km)	Direction

Sl.	Particulars	Details
	Industries	

1	Ultratech Cement Limited, Hirmi Cement Works	8.52	ESE
2	Krishnam Industry Pvt. Ltd.	0.71	SE
3	Vidyasri Rice Mills	0.97	WSW
4	Artech Infra Engineering (P) Ltd.	7.11	SE
5	Orchestrate Solar Plant	3.50	ESE
6	Gravity Iron and Power Pvt. Ltd.	0.23	E
7	Avinash Solar Plant	8.13	S
8	Chaitanya Solvex Pvt. Ltd.	6.08	SW
9	Century Cement Limestone Mine	8.43	SW
10	Century Cement	9.9	SW
11	Tirupati Balaji Foods Pvt. Ltd.	4.55	SW

20. Nearest Water Bodies

Sr. No.	Name	Distance (Km)	Direction
1	Jamuniya Nadi	2.46	W
2	Kumhari Tank	7.90	SE
3	Manpur Baandh	2.03	ESE
4	Banjari Nala	5.90	ESE
5	Bhatapara Branch Mahanadi Canal	6.65	WSW
6	Kumhari Irrigation Channel	4.32	E

21. Archaeological Sites — None within study area

22. Religious Places

Sr. No.	Name	Distance (Km)	Direction
1	Jogidwip Temple Kareli	4.58	NE
2	Baikuntheswar Temple	9.52	SW
3	Shri Laxmi Narayan Temple Tilda	5.86	WSW

23. Hospitals and Education Institutions (Sensitive Manmade Landuse)

HOSPITALS

Sr. No.	Name	Distance (Km)	Direction
1	Verma Hospital	7.64	ESE
2	Hospital Chhataud	6.71	SSW
3	Khushi Hospital	5.09	W
4	Government Ayurvedic Dispensary	6.71	SSW

EDUCATIONAL INSTITUTIONS

Sr. No.	Name	Distance (Km)	Direction
1	Primary School Champa	0.83	NE
2	Good Shepherd High School Nawapara	7.12	NE
3	High School Satbhawa	2.37	NNE
4	Navapara School	7.47	NE
5	Satyanarayan Agrawal Art & Comm. College Kohka Tilda	4.85	WSW
6	Carmel Public School	6.10	WSW

24. Community Places — None within study area

2.0 PROJECT DESCRIPTION

2.1 PROCESS DESCRIPTION

2.1.1 Manufacturing process of Sponge Iron (DRI)

- Iron ore, coal, dolomite/limestone is fed in the weighed quantity and the kiln is rotated at 0.5 RPM speed. A temperature between 1000^{0}C to 1050 ^{0}C is maintained in about 70% of the kiln length towards discharge end side for required reaction.
- After the reaction, the product is taken into an indirect cooling drum cooler. The product is

cooled to 100°C and taken for product separation and then taken for final use.

- The kiln has three functions; heat exchange, chemical reaction in vessel and conveying solids.

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

Induction Furnaces:

- The manufacturing process proposed 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.
- 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 than tested for its chemical composition and noted.
- Melting of steel along with other alloying element is accomplished in the crucible of coreless M.F. Induction Furnace.
- After completion of melting cycle of an hour the 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 with 20 MT ladle will be setup with three electrode arcing facility with complete provision to carry out desulphurization and de-phosphorization if required.
- 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.
- The slag generated during the melting as well as refining is normally removed manually through BELCHAS (Steel Spatulas) Accumulated slag is used for land fill. But in some systems slag is also poured out by tilting the furnace into slag pots.

CCM:

- The ladle containing liquid steel is placed on the CCM platform and continuous casting of hot billet is carried out in the same.
- In the CCM section hot billet shearing machines will be installed with each casting strand, so as to facilitate the cutting of billets to proper length for feeding in to the rolling mill.

2.1.3 Manufacturing process of Rolling Mill (Billet reheating furnace [BRF] with Coal Gassifier)

- Raw Material i.e., Cold Billet is cut to size; either by Gas Cutting.
- The sized billets are then Pushed into BRF fired with Coal Hot Producer Gas
- After the Billet is Red Hot then pushed out to rolling stands for re-rolling. Steel Pieces are rolled through all stands in order to get required shape of finished goods i.e., MS Channel, Structures and other rerolled product are produced.

2.1.4 Manufacturing process of Ferro Alloys Plant

High Carbon Ferro/ Silico Manganese as a finished product produced through a conventional submerged arc electric furnace.

Pig Iron is also proposed to produce alternately from the same submerged arc furnace by using lower grades Iron ore and Magnetite Iron ores.

2.1.5 WHRB based Power Generation

The Waste heat Recovery boilers are attached with DRI Kiln. 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.

2.1.6 AFBC Based Power Generation

- In an AFBC boiler, the fluidized bed media, which consists of ash, sand, limestone and other such materials is heated to the ignition temperature of the fuel.
- Fuel, such as char, is continuously supplied to the bed as it burns very quickly in the high bed temperatures of almost 1000˚C.
- The heat generated from this combustion is used to produce steam which, like in WHRB systems, will produce power through a steam generator.

2.1.7 Process of brick making from waste

Fly ash bricks Fly ash, Lime, Sand and Gypsum along with slag from the induction and arc furnaces are fed into a pan mixer, where water is added, all is mixed together, mixture is poured in moulds, dried in atmospheric temp. & pressure and after curing for 25 days, bricks are removed from moulds.

2.2 LAND REQUIREMENT

The project is proposed on the land of 29.181 Hectares, out of 10.388 Ha. land is diverted for industrial use and lease deed in favour of company has been executed, 9.373 Ha. is Government Land to obtained for which application has been filed to State Government and 9.420 Ha. is currently owned by private land owners (sale agreement has been done). Land will be permanently diverted to industrial purpose.

The proposed land is located at Kh. No. 425, 428/1, 428/2, 428/3, 428/4, 428/5, 429/1, 429/2, 431/1, 431/2, 431/3, 431/4, 431/6, 431/7, 431/5, 431/8, 431/9, 430 (total 11.713 Ha.) at Village: Champa, Tahsil- Tilda, District Raipur (CG); And Kh. No. 595, 593, 594, 596, 748,751, 752,753,597/1, 597/2, 598/1, 598/2, 737/1, 737/2, 738/3,738/4, 739/1, 739/2, 739/3, 739/4, 739/5, 739/7, 745/1, 745/2, 745/3, 745/4, 745/5, 745/6, 745/7, 746/1, 746/2,746/3, 746/4,747/1, 747/2,747/3, 747/5, 749/1, 749/2, 749/3,749/4, 749/5,749/6, 750/1, 750/2 (Total 17.486 Ha.) at Village Kota, Tahsil- Tilda, District Raipur (CG) Pin code - 493221.

The company had obtained ToR on 29.181 Ha. land at Village – Champa and Kota, Tahsil - Tilda, District - Raipur (CG) Pin code - 493221.

The detail of land use planning in the project area is provided as follows:

TABLE 3: AREA STATEMENT

Land Use		Area (In Ha.)	In %
Built Up Area		13.558	46.46%
Main Shed and Building	11.216		
Storage	2.342		
Road and Paved including Parking		2.043	7.00%
Road and Paved	1.201		
Parking	0.842		
Green Belt area		9.912	33.97%
Open Area including Reservoir		3.668	12.57%
Reservoir	0.853		
Open area	2.815		
Total		**29.181**	**100%**

2.3 RAW MATERIALS REQUIREMENT, SOURCE & MODE OF TRANSPORT

The raw materials are abundantly available within a radius of 50 to 500 km from the project site. Fuel requirements will primarily be met from local sources and transported to the site using covered trucks.

2.3.1 Solid and Hazardous waste generation

The total estimated solid waste generation will be 270,780 TPA and 3 KLA Hazardous Waste in the form of oil/ spent oil and 560 TPA ETP sludge. It will be disposed by scientific manner. The generated Char Dolochar will be used in own captive power plant, Bottom Flue Dust ash, Fly Ash from Char Dolo char, Ash from Coal, Fluidized Bed Material will be used for own brick making unit. Slag from manufacturing of SiMn, FeSi and Pig Iron thru SAF will be used for Road making and landfill. Slag from manufacturing of FeMn thru SAF will be used in Silico Manganese production in own unit or sold to other Silico Manganese production unit. The other slag and refractory waste will be used for road making and land fill.

2.4 WATER REQUIREMENT & SOURCE

Total Yearly water requirement will be 1,357 KLD * 350 days = 474,950 KLA. which will be sourced thru ground water.

Further, the management had decided to implement a 25,000 KL Rain water collection Tank which will be able to collect sufficeint rain water during rainy days which would continously be collecting rain water during the rainy days. Which extends to almost 75 days. Thus water requirement will be met through rain water collections from it for 75 days. The balnce water after the rain days will be sufficient to cater water requirement of 18 days. Therefore, it is considered that about 93 days (126,201 KL) water requirement will be met through rain water and rain water collection. Therefore, the net requirement of fresh ground water will be about 348,749 KLA.

However, we are seeking permission for the gross quantity i.e. 474,950 KLA

2.5 POWER REQUIREMENT & SUPPLY

Total power requirement will be 48 MW out of which 25 MW will be met through captive power plant and 23 MW will be sourced through State Grid (CSPDCL). In addition to this emergency

DG sets (total capacity 3300 KVA) are also provided.

2.6 MANPOWER REQUIREMENT

M/s. Shree Radhe Shakti Sponge and Power Pvt. Ltd. will provide employment to 400 peoples as direct employment which includes 30 people as administrative staff and 370 people will be production staff. Preference will be given to local people, depending upon their qualification and skill.

2.7 FIRE FIGHTING FACILITIES

In order to combat any occurrence of fire in plant premises, a central firefighting facility is proposed which will have access to various units of the plant. In addition to this, all plant units, office buildings, laboratories, etc. will be provided with adequate number of portable fire extinguishers to be used as first aid fire appliances.

2.8 PROJECT COST

The project cost of the project is estimated as Rs. 18,900.00 Lakhs. Estimated CER expenses Rs. 290.00 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 (1st March, 2024 – 31st May 2024).**

3.2 METEOROLOGY & AMBIENT AIR QUALITY

Summary of the Meteorological Data Generated at Site (1st March, 2024 – 31st May 2024)

Predominant Wind Direction	1st March, 2024 – 31st May, 2024
First Predominant Wind Direction	W (14.90%)
Second Predominant Wind Direction	WSW (12.27%)
Calm conditions (%)	1.31
Avg. Wind Speed (m/s)	2.65

The status of ambient air quality within the study area was monitored for Pre-Monsoon Season of the year 2024 at 9 locations covering project site. The levels of Respirable Particulate Matter (PM_{10}), Fine Particulates ($PM_{2.5}$), Sulphur Dioxide (SO_2,), 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 RESULTS
(PERIOD – 1st March, 2024 – 31st May 2024)

Sr. No.	Location		PM_{10} µg/m^3	$PM_{2.5}$ µg/m^3	SO_2 µg/m^3	NO_2 µg/m^3	CO mg/m^3	Ozone µg/m^3	NH_3 µg/m^3
1.	Project Site	Min	53.9	20.1	10.6	13.7	0.219	7.4	6.5
		Max	72.9	28.4	16.2	21.2	0.457	12.7	9.7
		Avg	64.3	23.3	13.2	17.5	0.312	9.8	8.4
		98th	72.0	27.8	15.8	21.0	0.451	12.7	9.7
2.	Champa	Min	52.4	17.7	9.6	14.4	0.235	5.9	6.3

Sr. No.	Location		PM_{10} µg/m^3	$PM_{2.5}$ µg/m^3	SO_2 µg/m^3	NO_2 µg/m^3	CO mg/m^3	Ozone µg/m^3	NH_3 µg/m^3
		Max	71.2	27.3	14.2	22.6	0.318	10.7	8.7
		Avg	62.2	22.8	11.6	18.2	0.284	8.1	7.4
		98^{th}	70.7	26.6	14.1	22.1	0.317	10.1	8.7
3.	Kota	Min	54.5	20.5	13.1	18.6	0.327	8.5	6.8
		Max	72.2	32.2	17.3	25.7	0.427	12.2	10.6
		Avg	65.1	27.2	15.2	21.4	0.376	10.2	8.6
		98^{th}	71.7	31.7	17.2	25.1	0.425	11.9	10.4
4.	Khapri Khurd	Min	50.9	18.3	8.5	13.6	0.211	6.3	6.2
		Max	68.2	25.4	12.8	19.7	0.276	10.8	9.6
		Avg	60.8	21.6	10.5	16.7	0.246	8.6	8.0
		98^{th}	67.9	24.9	12.6	19.5	0.272	10.5	9.4
5.	Ghulghul	Min	56.3	18.5	11.9	16.8	0.292	7.9	6.5
		Max	74.6	27.7	17.8	23.7	0.376	11.4	9.7
		Avg	67.2	24.1	14.4	19.6	0.332	9.5	8.3
		98^{th}	74.1	27.7	17.3	23.4	0.374	11.3	9.6
6.	Manpur	Min	64.9	22.2	13.7	18.2	0.343	9.7	7.4
		Max	85.6	33.6	20.2	26.7	0.519	13.6	11.7
		Avg	74.3	28.3	16.5	22.3	0.419	11.7	9.0
		98^{th}	84.5	33.1	19.9	26.1	0.511	13.4	11.4
7.	Tohra	Min	63.1	20.7	11.5	16.5	0.331	8.4	6.4
		Max	76.6	34.7	15.8	26.4	0.448	12.5	9.5
		Avg	71.6	26.4	13.9	21.7	0.383	10.4	7.9
		98^{th}	76.6	33.2	15.6	25.9	0.444	12.4	9.5
8.	Boirjhiti	Min	57.3	19.8	12.9	18.7	0.352	7.7	6.8
		Max	77.2	29.6	19.6	29.2	0.448	12.2	9.8
		Avg	68.2	25.6	15.7	23.5	0.407	9.3	8.6
		98^{th}	76.5	29.4	19.4	28.6	0.447	11.7	9.8
9.	Khurmuri	Min	51.7	16.3	8.4	14.7	0.221	5.7	5.5
		Max	70.3	25.5	12.4	23.1	0.282	10.1	7.6
		Avg	61.6	21.2	10.2	18.6	0.256	7.8	6.6
		98^{th}	69.8	24.9	12.3	22.4	0.282	9.8	7.6
CPCB Standards			**100 (24hr)**	**60 (24hr)**	**80 (24hr)**	**80 (24hr)**	**2 (8hrs)**	**100 (8hr)**	**400 (24hr)**

3.3 AMBIENT NOISE LEVELS

Ambient noise level monitoring was carried out at the 8 monitoring locations; those were selected for ambient air quality monitoring. The monitoring results are summarized in **Table 4.**

TABLE 4: AVERAGE NOISE LEVELS IN THE STUDY AREA

Sr. No.	Monitoring Locations	Equivalent Noise Level	
		Leq_{Day}	Leq_{Night}
Residential Area			
1	Ghulghul	51.3	42.6
2	Deori	50.8	43.2
3	Chhapora	52.7	41.5
CPCB Standards dB(A)		**55.0**	**45.0**
Commercial Area			

Sr. No.	Monitoring Locations	Equivalent Noise Level	
4	Kota	61.2	50.6
5	Manpur	64.5	52.3
CPCB Standards dB(A)		**65.0**	**55.0**
Silence Zone			
6	Primary School Champa	46.6	37.6
7	High School Satbhawa	47.2	38.1
CPCB Standards dB(A)		**50.0**	**40.0**
Industrial Area			
8	Project Site	52.6	44.1
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 Geology and Hydrogeology

Geological field survey methodology:

1. Secondary data collected with the help of satellite imageries, GSI reports and research paper, it is helpful for planning of field survey in 10 km radius.
2. During filed survey, verification of secondary data available with actual geology of that area observed during site visit. For field survey GPS, toposheet map and Google imagery plays very important role.
3. Geological sequence is observed along sites such as Nallah cutting, Exposures along Road/Highway construction sites and nearby opencast mining areas.
4. Geological maps are prepared with the help of District Resource Map of GSI and data collected through field survey.

Hydrogeological Survey methodology:

1. Secondary data collection for the study area with the help of CGWB brochures and data available with state ground water departments like long term water levels data, groundwater usage, etc.
2. During field survey well inventory is critically done to assess water level scenario in particular season to verify the secondary data.
3. In case of mining projects pumping test are carried out to assess the aquifer parameters. In case of thermal power plant, ash pond sites are critically surveyed qualitatively as well as quantitatively so as to foresee the probable impact on it and discuss the preventive measures.
4. Groundwater level maps are prepared as per water level data of Govt. agencies and data collected through field survey.
5. Groundwater recharge and harvesting techniques are suggested as per CGWA guidelines.

Regional Geology:

The geology of the study area is predominantly composed of rocks from the Meso to Neo-Proterozoic era, characteristic of the Raipur District. Stromatolitic dolomitic limestones are the primary rock type found in and around the area, with occasional occurrences of sandstones and laterites. The rock formations in the area belong to the Chandi Formation, which is part of the Raipur Group within the Chhattisgarh Super group.

3.4.2 Water Quality

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

A. Groundwater Quality

The analysis results indicate that the pH ranged from 7.19 to 8.26, falling within the permissible limit of 6.5 to 8.5. Total Dissolved Solids (TDS) were measured between 229 and 407 mg/L, well below the permissible limit of 2000 mg/L. Total hardness was found to range from 150.8 to 294.8 mg/L, which is also below the permissible limit of 600 mg/L. Chloride concentrations varied from 93.58 to 192.42 mg/L, remaining within the acceptable range of 1000 mg/L. Sulfate levels were recorded between 9.49 and 30.68 mg/L, significantly below the permissible limit of 400 mg/L. Nitrate concentrations ranged from 2.32 to 7.56 mg/L, well under the no relaxation threshold of 45 mg/L. Fluoride levels were found to be between 0.15 and 0.31 mg/L, which is acceptable as it is below the limit of 1.5 mg/L. Iron concentrations ranged from 0.09 to 0.19 mg/L, remaining under the no relaxation limit of 1.0 mg/L. Heavy metals such as cadmium and arsenic were below detection limits (BDL), with permissible limits of 0.003 mg/L and 0.01 mg/L respectively. Zinc concentrations were found between 0.11 and 0.17 mg/L, well within the permissible limit of 15 mg/L. Lead and chromium were also detected below their respective limits, with no relaxation thresholds of 0.01 mg/L and 0.05 mg/L. Overall, the water quality parameters indicate compliance with health and safety standards.

B. Surface Water Quality

The pH levels ranged from 7.24 to 7.96, well within the permissible range of 6.5 to 8.5. Electrical conductivity (EC) was measured between 299.52 and 584.64 µS/cm. Total Dissolved Solids (TDS) ranged from 192 to 336 mg/L, below the permissible limit of 2000 mg/L. Total hardness levels varied from 125.72 to 261.85 mg/L as CaCO3, also below the permissible limit of 600 mg/L. Dissolved oxygen (DO) concentrations ranged from 5.4 to 6.3 mg/L indicating healthy oxygen levels. Biological Oxygen Demand (BOD) levels were found to be between 2.56 and 4.12 mg/L and Chemical Oxygen Demand (COD) ranged from 12.34 to 25.74 mg/L, indicating moderate organic pollution. Heavy metals such as cadmium, arsenic, zinc, lead, and chromium were found below detection limits (BDL), indicating minimal contamination. Overall, the water quality during this monitoring period appears to comply with relevant standards for drinking water sources

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 March 2024 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°27'55.87"N to 21°38'47.79"N latitude and 81°45'44.45"E to 81°57'25.52"E longitude and elevation 252 to 323 meters are used as per the project site confined within that area.

The Land Cover classes and their coverage are summarized in **Table 5.**

TABLE 5: LU/LC CLASSIFICATION SYSTEM

LU/LC Classification System				
Sr. No.	**Level-I**	**Level-II**	**Area (Sq. Km²)**	**Percentage (%)**
1	Built-up land	Settlement	16.67	5.15
		Industrial Settlement	2.48	0.77
		Road Infrastructure	3.98	1.23
		Railway Line	1.64	0.51
2	Agricultural Land/ Crop Land	Single Crop	184.86	57.06
		Double Crop	48.68	15.03
3	Forest Area	Reserved Forest	3.68	1.14
		Open Jungle	1.28	0.40
4	Scrubs/Wastelands	Open Scrub	35.74	11.03
		Wasteland	6.93	2.14
5	Waterbodies	River/Nala/Stream/Canal	6.48	2.00
		Dam/Pond/Lake/Tank	11.15	3.44
6	Mines Area	Limestone Mines	0.42	0.13
		Total	**323.99**	**100**

3.6 SOIL QUALITY

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

Physical Characteristics of Soil

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

Regular cultivation practices increase the bulk density of soils thus inducing compaction. This results in reduction in water percolation rate and penetration of roots through soils. The soils with low bulk density have favorable physical conditions whereas those with high bulk density exhibit poor physical conditions for agriculture crops. The bulk density of the soil in the study area ranged between 1.53 - 1.74 g/cm^3 which indicates favorable physical condition for plant growth. The water holding capacity is between 30.89 - 49.11%. Infiltration rate, in the soil is in the range of 21.55 – 27.13 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 of the soil in the study area is found to be neutral (7.18 – 7.53) in reaction. Electrical conductivity, a measure of soluble salts in the soil is in the range of 142 – 231 µS/cm

The important soluble cations in the soil are calcium and magnesium whose concentration levels ranged from 197.84– 491.76 mg/Kg and 84.37– 234.71 mg/Kg respectively. Chloride is in the range of 214.85– 452.16 mg/Kg. Organic matter and organic carbon present in the soil influences its physical and chemical conditions and is responsible for stability of soil aggregates. Organic matter and organic carbon were found in the range of 1.05% – 1.39% and 0.61% – 0.81%.

3.7 BIOLOGICAL ENVIRONMENT

Floral composition in Study Area

Total 138 plant species were enlisted within the study area out of which habit wise details are given below:

a. **Trees:** Total 59 species were found in the study area
b. **Shrubs (Small trees):** Total 30 species were enumerated from the study area.
c. **Herbs:** In the study area 14 species were observed.
d. **Bamboo & Grasses:** 18 species were enlisted from the study area
e. **Climbers and Twiners:** Total 23 species of climbers/ twiners were recorded in the study area.
f. **Parasite/epiphytic plant:** 2 species enlisted in the study area.

RET (Rare, Endangered and Threatened species) STATUS

According to IUCN Status report 2024-1 out of total 138 plant species identified with study area. Among the observed species *Tectona grandis* (Teak) is listed in Endangered (EN). While *Aegle marmelos* (Bel) is listed in Near Threatened (NT) as per IUCN RED list 2024-1. While remaining 85 species belongs to the Least Concern (LC), 2 species belongs to Data Deficient (DD) and 57 species are Not Evaluated (NE), as per latest IUCN status report 2024-1.

Fauna Details:

As per IUCN RED (2024-1) list

Among the reported animals, all are categorized under Least Concern category as per IUCN list.

As per Indian Wild Life (Protection) Amendment Act, 2022

Some of the sighted fauna were given protection by the Indian Wild Life (Protection) Amendment Act, 2022 by including them in different Schedule.

Among the Avifauna; all birds observed in the study area are protected in Schedule II as per Wild Life Protection Amendment Act (2022) and subsequent amendments thereof.

Among mammals; Jackal (*Canis aureus*), Common Mongoose (*Herpestes edwardsi*), Indian fox (*Vulpes bengalensis*), are protected in Schedule –I. Whereas, Rhesus macaque (*Macaca mulatta*), Wild boar (*Sus scrofa*), Black-Naped Hares (*Lepus nigricollis*) and Common langur (*Semnopithecus entellus*) are protected as Schedule –II animals of Wild Life Protection

Amendment Act 2022. Palm Squirrels, Fruit bats & Rats dose not protected in Schedule of Wild Life Protection Amendment Act 2022.

Among the Herpetofauna; Indian Cobra (*Naja naja*), Indian python (*Python molurus*) and Common Rat Snake (*Ptyas mucosa*) were provided protection as per Schedule-I; While Common Indian Krait (*Bungarus caerulus*), Indian Toad (*Bufo parietalis*) were provided as per Schedule – II of Wildlife protection (Amendment) Act 2022 and as amended.

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 education and infrastructure facilities 2011 are presented in **Table 6** and **Table 7** respectively.

TABLE 6: SUMMARY OF SOCIO-ECONOMIC ENVIRONMENT OF VILLAGES WITHIN STUDY AREA

Zones	Total household	Total Population	Total Male	Total Female	Total 0-6 child	Total SC	Total ST	Population Literate	Population Illiterate	Total worker	Total Non-worker
0-2 km	1191	5472	2810	2662	766	1010	146	3694	1778	-	-
2-5km	4613	22392	11072	11320	3174	2683	1270	14549	7843	-	-
5-10km	13191	64620	32350	32270	9562	14324	5241	40569	24051	-	-
10km	**18995**	**92484**	**46232**	**46252**	**13502**	**18017**	**6657**	**58812**	**33672**	**50579**	**41905**
In %	**4.87**		**49.99**	**50.01**	**14.60**	**19.48**	**7.20**	**63.59**	**36.41**	**-**	**-**

Source: Primary census abstract 2011, State Chhattisgarh.

TABLE 7: INFRASTRUCTURE FACILITIES AVAILABLE IN THE STUDY AREA

Infrastructure facilities	Availability (In percentage) As per year 2011, Census Dist. Raipur Chhattisgarh
Educational Facilities	100
Drinking water	100
Road	100
Power	100
Communication	84.09
Transportation	100
Govt. PHC & SC	48.5
Bank & Society	25.45
Drainage	55.73
Recreation	92.64

***Source**: Primary census abstract 2011, State Chhattisgarh.*

SALIENT OBSERVATION OF THE SOCIO-ECONOMIC SURVEY

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

- **Major Crops of the Study Area:**

The predominant crops in the study area include paddy, maize, and pulses during the Kharif season, while wheat, gram, and mustard are grown during the Rabi season. Additionally, the region cultivates vegetables such as tomatoes, brinjal, and ladyfinger, and fruits like mangoes and bananas, contributing to the local agrarian economy.

- **Agriculture Labor and Wage Rates:**

Agricultural labor in the region primarily comprises local villagers. Wage rates for unskilled labor range from ₹150 to ₹200 per day, while skilled labor earns between ₹300 and ₹400 per day. These rates reflect the standard economic conditions and labor availability in the rural setting.

- **Skilled and Unskilled Labor:**

The workforce in the area includes skilled labor such as welders, electricians, machine operators, and technicians, essential for industrial and agricultural operations. Unskilled labor typically consists of helpers, loaders, and general agricultural workers, providing the necessary support for various manual tasks.

- **Agricultural Production & Marketing:**

Agricultural production in the area is moderate, with paddy and wheat being the major crops. Marketing of agricultural produce is facilitated through local markets and cooperatives, which play a crucial role in ensuring that farmers can sell their produce efficiently. Additionally, some of the produce is transported to nearby urban centers for broader market access.

- **Livestock:**

Livestock rearing is an integral part of the rural economy, with common livestock including cows, buffaloes, goats, and poultry. These animals provide essential products such as milk, meat, and eggs, contributing to the nutritional and economic well-being of the local population.

- **Culture:**

The local culture is rich and vibrant, with traditional festivals like Diwali, Holi, and local harvest festivals celebrated with great enthusiasm. The primary languages spoken are Hindi and Chhattisgarhi, reflecting the cultural heritage and linguistic diversity of the region.

- **Health Care:**

Health care facilities in the area are limited to primary health care centers and private clinics, with major hospitals located in Raipur. Common health issues include malaria, respiratory infections, and gastrointestinal problems, highlighting the need for improved healthcare services.

- **Social Well-being:**

The community benefits from local self-help groups (SHGs) and community-based organizations (CBOs) that support social development. Social security schemes such as MGNREGA, PDS,

and various state welfare programs are accessible to the population, aiding in improving their quality of life.

- **Education:**

The area has primary and secondary schools, but higher education facilities are sparse, necessitating travel to Raipur for advanced studies. The literacy rate is moderate, and there is an ongoing focus on improving educational infrastructure to enhance literacy and educational outcomes.

- **Infrastructure Building:**

There are several development projects underway, including road construction and the enhancement of communication networks. Government initiatives are aimed at rural development and infrastructure improvement, which are crucial for the overall growth of the area.

- **Afforestation:**

The current green cover in the area is limited due to extensive agricultural practices. Afforestation initiatives, driven by government and non-governmental organizations, are in place to increase tree plantation and improve the region's green cover, contributing to environmental sustainability.

- **Rural Water Supply:**

The primary sources of water in the area are borewells, handpumps, and local water bodies. Efforts are being made to improve the quality and consistency of water supply, addressing the community's needs for reliable and safe water sources.

- **Migration from Other States:**

There is a notable influx of labor migrating seasonally from other states for agricultural and industrial work. This migration brings cultural diversity and increases labor availability but also poses challenges related to the strain on local resources and infrastructure.

- **Sanitation:**

Sanitation facilities in the area vary, with ongoing improvements driven by government schemes such as Swachh Bharat Abhiyan. These initiatives are focused on enhancing the sanitation infrastructure to ensure better hygiene and health standards for the local population.

- **Road Connectivity:**

Road connectivity in the area is being developed, with projects aimed at improving access to nearby towns and cities. Better road infrastructure is crucial for economic development and the movement of goods and people.

- **Electricity:**

The region has access to electricity, although the supply can be inconsistent. Efforts are being made to ensure a more reliable power supply to support both residential and industrial needs, which is vital for the area's development.

- **Banking Facilities:**

Banking facilities are available, with several banks and cooperative societies providing financial services to the local population. Access to banking services is essential for economic activities, savings, and access to credit for both agricultural and non-agricultural purposes.

- **Transportation:**

Transportation infrastructure is developing, with improvements in road and public transport facilities. Efficient transportation is necessary for the movement of agricultural produce, industrial goods, and the daily commute of residents, contributing to the overall economic growth of the area.

4.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.1 AIR ENVIRONMENT

The mathematical Model AERMOD was used for predicting the GLCs, which is entirely in line with the requirement of Central Pollution Control Board, New Delhi. In 1991, the U.S. Environmental Protection Agency (EPA) in conjunction with the American Meteorological Society (AMS) formed the AERMOD. AERMOD is a steady-state plume model aimed at short-range (up to 50 km) dispersion from stationary industrial-type sources.

The impact of a source or group of sources on air quality is evaluated using mathematical models. The widely accepted interpretation models simulate the relationships between air pollutant emissions and its impact on air quality. For the present study, this model is used for the prediction of maximum ground level concentrations.

The maximum ground level concentrations (GLCs) for particulate matter (PM_{10} & $PM_{2.5}$) and gaseous concentration SO_2, NO_x due to proposed condition were carried out. The predicted resultant concentrations of above parameters are as follows:

TABLE 8: RESULTANT CONCENTRATIONS DUE TO PROPOSED PROJECT

Pollutant	Baseline Concentration at Project Site (µg/m^3)	Incremental Concentration (µg/m^3)	Resultant Concentration (µg/m^3)	NAAQ Standards (µg/m^3)
PM_{10}	72.9	4.91	77.81	100
$PM_{2.5}$	28.4	1.84	30.24	60
SO2	16.2	13.5	29.7	80
NOx	21.2	23.2	44.4	80

TABLE 9: DETAILS OF AIR POLLUTION CONTROL SYSTEM/ MITIGATION MEASURES

S. No.	Facilities	Air Pollution Control equipment	Emission Level
1	DRI Kiln with WHRB's	I. Dust extraction system, Electro Static Precipitators (ESP) - 3 Nos. (with 4 field) with two Chimney II. Bag Filters for Product house; Kiln discharge end and transfer points.	PM <30 mg/Nm^3
2	Steel Melting Shop with hot charging rolling mill	Movable suction hood along with Bag Filters with a chimney	PM <30 mg/Nm^3

S. No.	Facilities	Air Pollution Control equipment	Emission Level
3	Reheating Furnace	Wet Scrubber with a chimney	PM <30 mg/Nm^3 SO_2 - 300 mg/Nm^3 NO_x - 300 mg/Nm^3
4	Ferro Alloys and/or Pig Iron	3 Sets of Bag Filter with Chimney	PM <30 mg/Nm^3
5	AFBC Boiler	Electro Static Precipitators (ESP) with a Chimney and Bag Filters at Coal Conveyors	PM <30 mg/Nm^3 SOx <100 mg/Nm^3 NOx <100 mg/Nm^3
		Lime Dosing	
		Low NOx burners with 3-stage combustion, flue gas recirculation and auto combustion control system will be provided	

- Water spraying will be used to control the fugitive emissions in the internal open storage yards.
- Mist fogging facility will be provided at dust prone zones
- Movable sweeping machine will be provided for clearing of roads.

Additional measures proposed to be adopted to reduce fugitive dust emission and pollution control:-

- Dust Suppression System will be installed within plant premises along internal roads.
- Water sprinkling will be carried out at approach road.
- Most of the materials will be stored under covered shed.
- In case of storage of Sponge Iron/ Carbon Powder; Coal in open, it will be covered by tarpaulins to prevent spread of dust from it during transportation.
- Regular maintenance of vehicles and machineries will be carried out in order to control emissions.
- Green belt development would be taken up all along the roads, plant premises etc.
- 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.
- Avoiding overloading of the trucks.
- Workers will be equipped with all personal protective devices like Gum Boot; hand gloves; Safety helmet; Safety goggles, earplugs at work place.
- By controlling the speed of the truck.
- Proper gradient of approach roads to reduce cumulative noise.
- Transportation of materials will be in covered truck and limited to day hours.
- Periodical maintenance of process machinery.

4.2 NOISE ENVIRONMENT

During the normal operation of manufacturing process noise will be generated due to operational activities of ID Fan, Blower/air Fan, Cutting/Shearing Machine and DG Set, etc. the ambient noise levels are expected to increase significantly with the attributes of the respective equipment,

but this noise will be restricted close to the concerned equipment. The preventive measures are given below:

- More than 20 m thick greenbelt will be planted towards village Kota and Champa.
- 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 / plantationarea, 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.

Vehicular Movement

The LoS value from the proposed activity on – Tilda Simga Road will be **"B (0.2 to 0.4)" i.e. Very Good** and Raipur Bilaspur Road will be **"C (0.4 to 0.6)" i.e. Good/Average/Fair**. The inclusion of additional vehicle carrying raw material and finished products to the existing traffic will not having much change in the traffic.

So the additional load of (282 trips/day) will add insignificant contribution on the carrying capacity of the concerned road. Hence it is concluded that it is not likely to have any significant adverse effect.

4.3 WATER ENVIRONMENT

The proposed implementation of the 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. It is proposed that no effluent will be discharged outside the plant.

The various control measures that will be adopted are:

- Closed circuit cooling system will be adopted. Industrial waste water (85 KLD) will be treated in ETP (Cap. 100 KLD).
- Industry will get 78 KLD ETP Treated water out of this 70 KLD will be used in process as recycle water and rest 8 KLD will be used for dust suppression within plant premises.
- Domestic waste water (14 KLD) will be treated in STP (20 KLD). 13 KLD STP treated water will be used for plantation. Thus total 13 + 88 = 101 KLD water will be used for greenbelt development.

- Rain water harvesting will be carried out.
- All stock piles will be on pucca flooring to prevent for any ground water contamination.

4.4 BIOLOGICAL ENVIRONMENT

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

Sl.	Project Aspects / Activities	Impacts	Mitigation Measures Suggested
1.	Transportation, unloading & storage of Material and Movement of vehicle inside plant, Dust and sound generation due to proposed activities	Impact on human habitation (Champa Village – 0.50 Km in North-East direction) in a scale of 3 out of 5 due to proposed project activity.	20 M thick greenbelt will be developed towards east as well as west direction from the project site.
2.	Gaseous emission from Stack, Movement of vehicle inside plant and Raw material & finished product transportation, Product manufacturing	Decline in photosynthetic activities, Stomatal index may be minimized, Crop yield will be reduced in absence of site-specific mitigation measures	Air quality modelling outputs study revealed that, the resultant concentrations of particulate matter, sulphur di-oxide and oxides of nitrogen are well within the prescribed limits. The impact due to proposed project would be minimal as project activity will be carried out within the plant boundary limit with proper control measures. Greenbelt area of 9.912 Ha. (33.97%) will be proposed for project with local species with broad leaves and higher canopy and fast-growing tree species. Total plants are 24,780 nos. are proposed. Indigenous species for plantation is recommended **Control Measures to avoid impacts on agriculture crops** • Periodic maintenance of transport road in collaboration with PWD • Regular sprinkling of water through mobile tankers on raw material and finished product transportation road. • Covered Transport system • Plantation along the transportation route (both sides) • Monitoring of dust fall at agriculture land located in the vicinity of project site. • Green nets will be provided along the agriculture farm boundary facing in the vicinity of proposed plant and transport road • Apart from the above, monitoring will be carried out by Environmental Cell of the company to assess effectiveness of the dust control system and complaints of farmers regarding impact on crops productivity/damage, if any. The complaints will be verified through agriculture department and if found correct, crop damage compensation will

Sl.	Project Aspects / Activities	Impacts	Mitigation Measures Suggested
			be paid as per the suggestions and recommendations of District agriculture department.

There is no ecological sensitive area like national park, sanctuary, biosphere reserve, within 10 km radial distance from the project site. No forest land involved in the project activities. Thus, no significant impact envisaged on biological environment.

4.5 SOCIO-ECONOMIC IMPACT

There is likely to be growth in the revenue generation and economy at local /regional. There will certainly be improvement in standard of living due to required facilities provided by management under CER. During operation phase heavy vehicular movements will lead to dispersed dust particles which will affects the health of the workers and Local Peoples. If influx of workers from outside areas then there will be an increased pressure on residential accommodation the neighborhood during construction phase.

The existing land use pattern of proposed site is agriculture without significant natural vegetation. The 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

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. The company has propsed to Capital Cost of Rs. 20 Lakhs and Recurring Cost of Rs. 15 Lakhs towards Environmental Monitoring Program.

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

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

6.0 RISK ASSESSMENT & DISASTER MANAGEMENT PLAN

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

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

7.0 PUBLIC CONSULTATION

The draft EIA-EMP report for brownfield project is prepared as per the ToR issued by EAC (Industry -I), MoEF&CC, New Delhi and the report is submitted for public consultation process as per the provisions of EIA Notification 2006 and amendments thereof.

After completing the public consultation process, the points raised and commitment of project proponent during the public hearing will be incorporated in the final EIA-EMP report for final submission to Environmental Clearance.

8.0 PROJECT BENEFITS

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. Shree Radhe Shakti Sponge and Power Pvt. Ltd. will carry community welfare activities in the following areas:

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

The project proponent will comply with its obligation for CSR as per Company's Act too.

A budgetary provision towards compliance of PH response, **Rs. 290 Lakhs** will be spent.

9.0 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.

The company plans to invest approx. **Rs. 2293 Lakhs** in Capital Expenditure for the environment management plan, with an annual recurring cost (O& M) of around **Rs. 83 lakhs.**

10.0 CONCLUSION

The proposed Greenfield project by M/s. Shree Radhe Shakti Sponge and Power Pvt. Ltd. is expected to contribute to the overall development of nearby villages. However, environmental factors such as dust emissions, noise, wastewater, and increased traffic will have to be managed more effectively than the prescribed standards to prevent negative impacts, particularly on local crops. The plant infrastructure will include essential pollution control systems like ESP, bag houses, industrial sweeping machines, wheel washing systems, industrial-grade vacuum cleaners, water sprinklers, and enclosures.

In addition, supplementary pollution control and environmental conservation measures will be implemented to minimize the project's impact on the environment and the socio-economic well-

being of the area. These efforts include developing a green belt, planting trees in nearby villages and along transportation routes, and adopting rainwater harvesting and recharge initiatives both within the plant and in surrounding communities.

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

11.0 DISCLOSURE OF CONSULTANTS

The Environmental studies for proposed Greenfield project of M/s. Shree Radhe Shakti Sponge and Power Pvt. Ltd. has been 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 company 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/23-26/RA 0304_Rev.01** dtd. 13 March, 2024 valid till Sept 29, 2026