

**EXECUTIVE SUMMARY****1.0 INTRODUCTION**

**M/s. OM SPONGE** has proposed reconfiguration of existing DRI Kilns without any increase in production capacity of sponge iron from 2Nos x 50 TPD to 100 TPD x 1 No Kiln of Sponge Iron having same annual capacity 30000 TPA sponge iron making; to enable it to implement Waste Heat recovery power which was not possible with the existing old 50 TPD x 2 Nos of Kilns. Along with this expansion is proposed in induction furnace, CCM with hot charging based Steel Rolling Mill from capacity of 30,000 MTPA to 500,000 TPA MS Billets/Rerolled steel production, 165000 TPA, ERW pipe - 165000 TPA along with permitted capacity of its captive power generation plant comprising of Waste Heat Recovery Boilers (WHRB 04 MW– no change), Biomass based power generation ( 08MW - no change) and expansion of its existing capacity of Fly ash based bricks from 30,000 Nos per day to 45,000 Nos per day.

As per Environmental Impact Assessment Notification dated 14<sup>th</sup> September, 2006 and subsequent amendment thereof the overall project activities falls under Category “A”; Project Activity ‘3(a)’ Metallurgical Industries and ‘1(d)’ Thermal Power Plant [Only WHRB which is exempt under 1(d)] and requires Environmental Clearance (EC) to be obtained from EAC, MoEF&CC, New Delhi.

The application for prior Environmental Clearance (Form-1) for proposed brownfield metallurgical project was submitted to EAC, MoEF & CC (Online Proposal No. IA/CG/IND1/438232/2023 on 12 October 2023 whereas, ToR was granted by EAC (Industry –I) vide. no. **File No. IA-J-11011/308/2023-IA.II(IND-I)** on dtd. 23<sup>rd</sup> October 2023.

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.

EIA process requires the primary baseline data collection to know the information on the biophysical, social and economic backgrounds of Greenfield as well as Brownfield 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 Brownfield project.

**1.1 IDENTIFICATION OF PROJECT**

The firm “**OM SPONGE**” proposes Brownfield project for for reconfiguration of Sponge Iron and enhancement of MS Billets, Steel Rerolled products, newly installed ERW steel pipes along with captive power generation plant comprising of Waste Heat Recovery Boilers (WHRB), and biomass-based power plant and a fly ash bricks unit. The project is proposed to be located at Village – Munrethi, Tahsil- Tilda, District- Raipur (Chhattisgarh) Pin Code – 493116. The proposal is to seek Environmental Clearance based on energy efficient as well as approved technology process. The product profile has been finalized based on the market demand and the technology process compatibility.

The following capacities would require EC for expansion of the existing facilities:

**TABLE 1: EXISTING AND PROPOSED CAPACITY DETAILS (IN TPA)**

S. No.	Details	Existing Permitted Capacity	Proposed Capacity addition	Final Capacity after Expansion
1	DRI Kilns for Sponge Iron	30,000 (50 TPD x 2no)	NIL 30,000 (100TPD x 1 No)	30,000 (100 TPD x 1 No)
2	MS Billets through Induction Furnace with CCM	30,000 (10 ton x 2 Nos. + 5 ton x 2 Nos.)	500,000 (25 ton x 6 Nos)	500,000 (25 ton x 6 Nos.)
And/or				
2	Rerolled Steel Rolling Mill (Refer Note 1)	30,000	500,000	500,000
	(i) Hot Charging based	30,000	500,000	500,000
3	Captive Power plant	4 MW	-	4 MW
	(i) WHRB from Sponge Iron	4 MW	-	4 MW
4	Biomass based power plant	8MW	-	8MW
5	ERW Pipe Mill	-	165,000	165,000
6	Fly ash bricks plant	30,000 Nos/day	15,000 Nos/day	45,000 Nos/day

**1.2 LOCATION OF THE PROJECT**

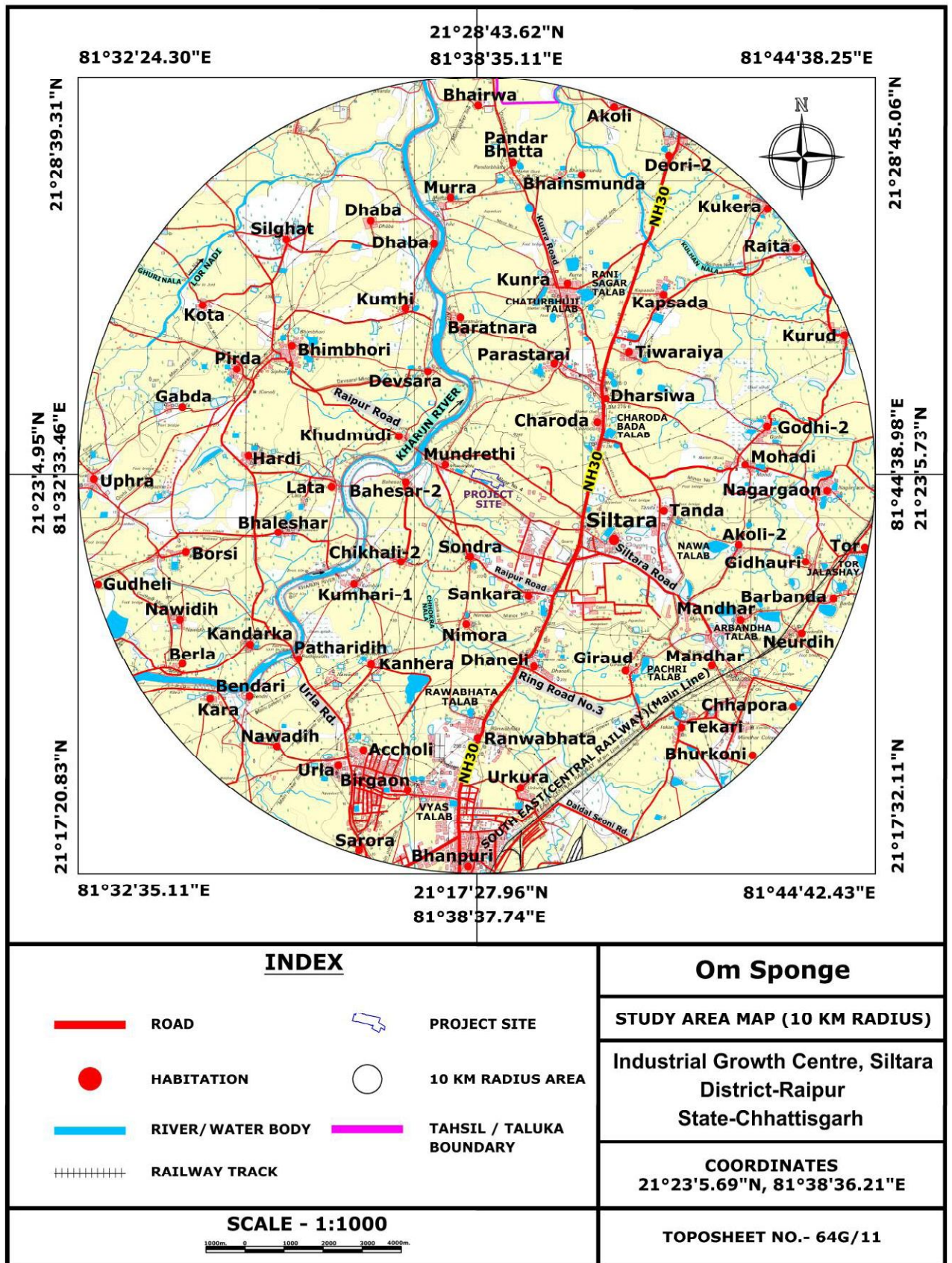
The proposed expansion project activities will be carried out within existing plant premises of 5.09 Ha. at Kh. No 140/1 (Part), 115/1, 115/2, 136/6, 139/12, and it is proposed to add contiguous land area of 10.401 hectares at Kh No 139/1,139/5, 139/6, 139/7 , 139/9, 139/10, 139/20, 139/21, 139/22, 139/2 139/3, 139/24, 139/25, 139/26, 139/31, 139/20, 139/21, 139/22, 139/23, 139/24, 139/25, 139/26, 139/1, 139/2, 139/3, 143, 139/30, 139/4, 117/6,7, 117/5, 118/6, 118/12, 118/2, 118/10, 118/11,119/1, 119/2, 118/3 , 117/1, 117/2, 117/3, 117/4, 21/8, 21/13 Village - Munrethi, Tehsil and District- Raipur (CG). Thus, proposed expansion total land area will be 16.0142 Ha No additional land required.

The nearest city is Raipur which is around 13.75 Km in South South West direction. Nearest airport is Swami Vivekanand International Airport, Raipur, which is around 23.79 km at south east direction. The nearest habitation is Munrethi Village which is at 0.45 Km in West direction from project site. The nearest roadway is NH 30 –2.20 km in east direction. The nearest railway station is Mandhar Railway Station which is 7.74 Km in the south east direction and Raipur railway station which is 13.75 km south south-west 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), MoEF&CC, New Delhi, baseline environmental monitoring was conducted during Pre-monsoon season (15<sup>th</sup> March 2023 – 15<sup>th</sup> June 2023) 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 report.



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

**TABLE 2 : DETAILS OF ENVIRONMENTAL SETTINGS**

Sl.	Particulars	Details																																																																																										
1.	Project Location	Village – Munrethi, Tahsil- Tilda, District- Raipur (Chhattisgarh) Pin Code – 493116 Geo coordinate: 21°23'5.81"N, 81°38'36.15"E Toposheet No. : 64G/11																																																																																										
	Registered Office	Village Munrethi, Block- Dharsiwa, District- Raipur																																																																																										
2.	Geographical Locations	<table border="1"> <thead> <tr> <th>Pts.</th> <th>Latitude</th> <th>Longitude</th> <th>Pts.</th> <th>Latitude</th> <th>Longitude</th> </tr> </thead> <tbody> <tr> <td>01</td> <td>21°23'5.30"N</td> <td>81°38'21.09"E</td> <td>15</td> <td>21°23'0.54"N</td> <td>81°38'49.44"E</td> </tr> <tr> <td>02</td> <td>21°23'10.31"N</td> <td>81°38'22.59"E</td> <td>16</td> <td>21°22'57.77"N</td> <td>81°38'49.14"E</td> </tr> <tr> <td>03</td> <td>21°23'9.39"N</td> <td>81°38'23.90"E</td> <td>17</td> <td>21°22'59.64"N</td> <td>81°38'46.01"E</td> </tr> <tr> <td>04</td> <td>21°23'11.85"N</td> <td>81°38'24.33"E</td> <td>18</td> <td>21°22'58.49"N</td> <td>81°38'45.24"E</td> </tr> <tr> <td>05</td> <td>21°23'11.01"N</td> <td>81°38'27.91"E</td> <td>19</td> <td>21°22'57.31"N</td> <td>81°38'44.97"E</td> </tr> <tr> <td>06</td> <td>21°23'11.39"N</td> <td>81°38'28.09"E</td> <td>20</td> <td>21°22'57.21"N</td> <td>81°38'45.04"E</td> </tr> <tr> <td>07</td> <td>21°23'9.99"N</td> <td>81°38'30.52"E</td> <td>21</td> <td>21°22'55.93"N</td> <td>81°38'44.22"E</td> </tr> <tr> <td>08</td> <td>21°23'10.50"N</td> <td>81°38'31.00"E</td> <td>22</td> <td>21°22'59.07"N</td> <td>81°38'38.48"E</td> </tr> <tr> <td>09</td> <td>21°23'9.88"N</td> <td>81°38'32.23"E</td> <td>23</td> <td>21°23'1.24"N</td> <td>81°38'39.40"E</td> </tr> <tr> <td>10</td> <td>21°23'9.60"N</td> <td>81°38'32.33"E</td> <td>24</td> <td>21°23'1.85"N</td> <td>81°38'38.53"E</td> </tr> <tr> <td>11</td> <td>21°23'9.18"N</td> <td>81°38'33.65"E</td> <td>25</td> <td>21°23'1.43"N</td> <td>81°38'38.14"E</td> </tr> <tr> <td>12</td> <td>21°23'9.46"N</td> <td>81°38'33.70"E</td> <td>26</td> <td>21°23'3.02"N</td> <td>81°38'32.69"E</td> </tr> <tr> <td>13</td> <td>21°23'7.17"N</td> <td>81°38'45.21"E</td> <td>27</td> <td>21°23'4.82"N</td> <td>81°38'24.32"E</td> </tr> <tr> <td>14</td> <td>21°23'3.49"N</td> <td>81°38'43.90"E</td> <td>28</td> <td>21°23'4.42"N</td> <td>81°38'24.27"E</td> </tr> </tbody> </table>	Pts.	Latitude	Longitude	Pts.	Latitude	Longitude	01	21°23'5.30"N	81°38'21.09"E	15	21°23'0.54"N	81°38'49.44"E	02	21°23'10.31"N	81°38'22.59"E	16	21°22'57.77"N	81°38'49.14"E	03	21°23'9.39"N	81°38'23.90"E	17	21°22'59.64"N	81°38'46.01"E	04	21°23'11.85"N	81°38'24.33"E	18	21°22'58.49"N	81°38'45.24"E	05	21°23'11.01"N	81°38'27.91"E	19	21°22'57.31"N	81°38'44.97"E	06	21°23'11.39"N	81°38'28.09"E	20	21°22'57.21"N	81°38'45.04"E	07	21°23'9.99"N	81°38'30.52"E	21	21°22'55.93"N	81°38'44.22"E	08	21°23'10.50"N	81°38'31.00"E	22	21°22'59.07"N	81°38'38.48"E	09	21°23'9.88"N	81°38'32.23"E	23	21°23'1.24"N	81°38'39.40"E	10	21°23'9.60"N	81°38'32.33"E	24	21°23'1.85"N	81°38'38.53"E	11	21°23'9.18"N	81°38'33.65"E	25	21°23'1.43"N	81°38'38.14"E	12	21°23'9.46"N	81°38'33.70"E	26	21°23'3.02"N	81°38'32.69"E	13	21°23'7.17"N	81°38'45.21"E	27	21°23'4.82"N	81°38'24.32"E	14	21°23'3.49"N	81°38'43.90"E	28	21°23'4.42"N	81°38'24.27"E
		Pts.	Latitude	Longitude	Pts.	Latitude	Longitude																																																																																					
		01	21°23'5.30"N	81°38'21.09"E	15	21°23'0.54"N	81°38'49.44"E																																																																																					
		02	21°23'10.31"N	81°38'22.59"E	16	21°22'57.77"N	81°38'49.14"E																																																																																					
		03	21°23'9.39"N	81°38'23.90"E	17	21°22'59.64"N	81°38'46.01"E																																																																																					
		04	21°23'11.85"N	81°38'24.33"E	18	21°22'58.49"N	81°38'45.24"E																																																																																					
		05	21°23'11.01"N	81°38'27.91"E	19	21°22'57.31"N	81°38'44.97"E																																																																																					
		06	21°23'11.39"N	81°38'28.09"E	20	21°22'57.21"N	81°38'45.04"E																																																																																					
		07	21°23'9.99"N	81°38'30.52"E	21	21°22'55.93"N	81°38'44.22"E																																																																																					
		08	21°23'10.50"N	81°38'31.00"E	22	21°22'59.07"N	81°38'38.48"E																																																																																					
		09	21°23'9.88"N	81°38'32.23"E	23	21°23'1.24"N	81°38'39.40"E																																																																																					
		10	21°23'9.60"N	81°38'32.33"E	24	21°23'1.85"N	81°38'38.53"E																																																																																					
		11	21°23'9.18"N	81°38'33.65"E	25	21°23'1.43"N	81°38'38.14"E																																																																																					
		12	21°23'9.46"N	81°38'33.70"E	26	21°23'3.02"N	81°38'32.69"E																																																																																					
		13	21°23'7.17"N	81°38'45.21"E	27	21°23'4.82"N	81°38'24.32"E																																																																																					
14	21°23'3.49"N	81°38'43.90"E	28	21°23'4.42"N	81°38'24.27"E																																																																																							
3.	Toposheet No.	64G/11																																																																																										
4.	Climatic Conditions	Mean annual rainfall is 1252.8 mm Temperature: Pre monsoon 20.6 <sup>o</sup> C (Min.) 41.7 <sup>o</sup> C (Max.) : Winter 13.3 <sup>o</sup> C (Min.) 31.0 <sup>o</sup> C (Max) : Post monsoon 17.3 <sup>o</sup> C (Min.) 31.8 <sup>o</sup> C (Max.) Source: IMD, Raipur																																																																																										
5.	Nearest representative IMD station	IMD Raipur, Chhattisgarh – 18.97 Km, SSE																																																																																										
6.	Land Form, land Use and Ownership	The land is existing industrial land; total involved land is 16.01 Ha, out of which 8.2282 hectares land is owned by the Firm and 5.05 Hectares of land is owned by sister concern M/s Topper Tubes Pvt. Ltd. NOC has been provided. Thus, remaining 2.736 Hectare land agreement is being signed with private land owners. And NOC will be obtained. No additional land proposed to be acquired. Greenbelt area 40% (i.e. 6.41 Ha.) will be kept unchanged. The land already diverted to industrial purpose.																																																																																										
7.	Site topography	Project site located at min. 292 m, max. 298m (above MSL)																																																																																										
8.	Nearest roadway	NH 30- 2.20,E (Road connecting Siltara Village to Munrethi Village -0.1km/S)																																																																																										
9.	Nearest Railway Station	Mandhar Railway Station-7.74km/SE Raipur Railway Station-13.75km/SSW																																																																																										
10.	Nearest Air Port	Swami Vivekananda International Airport – 23.79 Km, SE																																																																																										
11.	Nearest Port	1)Gopalpur Port - 416km/ESE 2) Paradeep Port - 537km/ESE																																																																																										
12.	Nearest lake	NA																																																																																										
13.	Nearest State/National Boundaries	Madhya Pradesh – 93.91 Km, WNW. Odisha – 91.27 km, ESE																																																																																										
14.	Nearest major city with 2,00,000 population	Raipur – 5.46 Km, SSW																																																																																										

Sl.	Particulars	Details																																																												
15.	Nearest village/major town	<ul style="list-style-type: none"> <li>Munrethi – 0.45 Km, W</li> <li>Siltara – 2.75 Km, ESE</li> <li>Raipur -5.46 km, SSW</li> </ul>																																																												
16.	Hills/valleys	Nil																																																												
17.	Nearest tourist place	Kharun Dam, Bahesar – 1.43 km, NW Rawabhata Talab – 6.07 km, SSW Maa Chaturbuji Mandir -5.32km, NNE Banjari Mata Mandir – 7.65 KM, S																																																												
18.	Archaeologically important places	Nil																																																												
19.	Nearest Reserved/ Protected forests	Nil																																																												
20.	Nearest water bodies	Karun River -1.39 KM (WNW) ; Pachri Talab, Giraud - 5.92 KM (SE) Arbandha Talab, Giroud Rd. - 7.45 KM (ESE), Rani Sagar Talab, Kunra - 5.37 KM (NNE) Dongia Talab Giraud - 6.17 KM (SE) ; Rawabhata Talab - 6.07 KM (SSW) Nawa Talab, Sankara - 2.94 KM (ESE) ; Tor Jalashay - 9.11 KM (ESE) Chaturbhujji Talab - 5.36 KM (NE) ; Charoda Bada Talab - 2.42 KM (ENE) Vyas Talab, Bhanpuri - 8.63 KM(SSW); Sodhe Talab, Tekari - 8.45 KM (SE) Ranisagar Talab Kunra - 5.34 KM (NE);Atmanand Sarovar - 8.83 KM (ESE) Chhokar Nala - 1.02 KM (WSW) ; Lor Nadi - 8.82 KM (NNW) Kulhan Nala - 7.42 KM (NE)																																																												
21.	Nearest Industries	<table border="1"> <tbody> <tr><td>1</td><td>SKS Ispat &amp; Power Ltd</td><td>0.45 Km (N)</td></tr> <tr><td>2</td><td>Jagdamba Power (hira Group)</td><td>0.2 KM (N)</td></tr> <tr><td>3</td><td>Narmada Industries</td><td>0.28 KM (N)</td></tr> <tr><td>4</td><td>API Ispat &amp; Powertech Pvt Ltd (Real Ispat).</td><td>0.92 KM(S)</td></tr> <tr><td>5</td><td>Agrawal Channel Mills Pvt Ltd</td><td>1.64 KM (ESE)</td></tr> <tr><td>6</td><td>Jayaswal Neco Industries Ltd</td><td>4.04 KM (SE)</td></tr> <tr><td>7</td><td>Vandana Global Ltd.</td><td>1.91Km (SSE)</td></tr> <tr><td>8</td><td>Ratan India Power Ltd.</td><td>7.08 Km (NE)</td></tr> <tr><td>9</td><td>Nandan Steel and Power Ltd</td><td>1.33 Km (SSW)</td></tr> <tr><td>10</td><td>Gopal Sponge &amp; power Pvt Ltd</td><td>0.73 Km (S)</td></tr> <tr><td>11</td><td>Gajapati TMT</td><td>0.07 km (S)</td></tr> <tr><td>12</td><td>Aarti Sponge &amp; Power Ltd</td><td>0.91 km (SSW)</td></tr> <tr><td>13</td><td>Mahendra Sponge and Power</td><td>2.01km (SSE)</td></tr> <tr><td>14</td><td>Sarda Energy &amp; Minerals ltd</td><td>3.60km (ESE)</td></tr> <tr><td>15</td><td>Sunil Sponge Pvt Ltd</td><td>0.65km (ESE)</td></tr> <tr><td>16</td><td>Ispat India</td><td>2.46km (SSE)</td></tr> <tr><td>17</td><td>Nakoda Ispat Ltd. Power plant Siltara Pahse 2</td><td>2.48km (SSE)</td></tr> <tr><td>18</td><td>Godawari Power &amp; Ispat Ltd</td><td>3.36km (ESE)</td></tr> <tr><td>19</td><td>NR Sponge</td><td>1.34km (SW)</td></tr> <tr><td>20</td><td>Rama Udyog vt Ltd</td><td>1.0369 Km (ESE)</td></tr> </tbody> </table>	1	SKS Ispat & Power Ltd	0.45 Km (N)	2	Jagdamba Power (hira Group)	0.2 KM (N)	3	Narmada Industries	0.28 KM (N)	4	API Ispat & Powertech Pvt Ltd (Real Ispat).	0.92 KM(S)	5	Agrawal Channel Mills Pvt Ltd	1.64 KM (ESE)	6	Jayaswal Neco Industries Ltd	4.04 KM (SE)	7	Vandana Global Ltd.	1.91Km (SSE)	8	Ratan India Power Ltd.	7.08 Km (NE)	9	Nandan Steel and Power Ltd	1.33 Km (SSW)	10	Gopal Sponge & power Pvt Ltd	0.73 Km (S)	11	Gajapati TMT	0.07 km (S)	12	Aarti Sponge & Power Ltd	0.91 km (SSW)	13	Mahendra Sponge and Power	2.01km (SSE)	14	Sarda Energy & Minerals ltd	3.60km (ESE)	15	Sunil Sponge Pvt Ltd	0.65km (ESE)	16	Ispat India	2.46km (SSE)	17	Nakoda Ispat Ltd. Power plant Siltara Pahse 2	2.48km (SSE)	18	Godawari Power & Ispat Ltd	3.36km (ESE)	19	NR Sponge	1.34km (SW)	20	Rama Udyog vt Ltd	1.0369 Km (ESE)
1	SKS Ispat & Power Ltd	0.45 Km (N)																																																												
2	Jagdamba Power (hira Group)	0.2 KM (N)																																																												
3	Narmada Industries	0.28 KM (N)																																																												
4	API Ispat & Powertech Pvt Ltd (Real Ispat).	0.92 KM(S)																																																												
5	Agrawal Channel Mills Pvt Ltd	1.64 KM (ESE)																																																												
6	Jayaswal Neco Industries Ltd	4.04 KM (SE)																																																												
7	Vandana Global Ltd.	1.91Km (SSE)																																																												
8	Ratan India Power Ltd.	7.08 Km (NE)																																																												
9	Nandan Steel and Power Ltd	1.33 Km (SSW)																																																												
10	Gopal Sponge & power Pvt Ltd	0.73 Km (S)																																																												
11	Gajapati TMT	0.07 km (S)																																																												
12	Aarti Sponge & Power Ltd	0.91 km (SSW)																																																												
13	Mahendra Sponge and Power	2.01km (SSE)																																																												
14	Sarda Energy & Minerals ltd	3.60km (ESE)																																																												
15	Sunil Sponge Pvt Ltd	0.65km (ESE)																																																												
16	Ispat India	2.46km (SSE)																																																												
17	Nakoda Ispat Ltd. Power plant Siltara Pahse 2	2.48km (SSE)																																																												
18	Godawari Power & Ispat Ltd	3.36km (ESE)																																																												
19	NR Sponge	1.34km (SW)																																																												
20	Rama Udyog vt Ltd	1.0369 Km (ESE)																																																												
22.	Areas occupied by sensitive man- made land uses (hospitals, schools, places of worship, Universities, Community Hall etc.)	<table> <tbody> <tr><td>Maa Durga Mandir</td><td>6.72 km</td><td>(SSW)</td></tr> <tr><td>Ma Banjari Mandir</td><td>7.65 km</td><td>(SSW)</td></tr> <tr><td>Boharhi Ma Ka Mandir</td><td>9.95 km</td><td>(E)</td></tr> <tr><td>Shitla Mata Mandir</td><td>8.13 km</td><td>(SSW)</td></tr> <tr><td>Satbahinya Temple</td><td>7.38 km</td><td>(NNW)</td></tr> <tr><td>Shri Radhe Krishna Mandir</td><td>7.12 km</td><td>(ENE)</td></tr> <tr><td>ESIC hospital, Raipur</td><td>6.38 km</td><td>(SSW)</td></tr> </tbody> </table>	Maa Durga Mandir	6.72 km	(SSW)	Ma Banjari Mandir	7.65 km	(SSW)	Boharhi Ma Ka Mandir	9.95 km	(E)	Shitla Mata Mandir	8.13 km	(SSW)	Satbahinya Temple	7.38 km	(NNW)	Shri Radhe Krishna Mandir	7.12 km	(ENE)	ESIC hospital, Raipur	6.38 km	(SSW)																																							
Maa Durga Mandir	6.72 km	(SSW)																																																												
Ma Banjari Mandir	7.65 km	(SSW)																																																												
Boharhi Ma Ka Mandir	9.95 km	(E)																																																												
Shitla Mata Mandir	8.13 km	(SSW)																																																												
Satbahinya Temple	7.38 km	(NNW)																																																												
Shri Radhe Krishna Mandir	7.12 km	(ENE)																																																												
ESIC hospital, Raipur	6.38 km	(SSW)																																																												

Sl.	Particulars	Details
		UMA Dental Care 5.04 km (SSE) B.K. Multi-speciality Clinic 8.09 km (SSW) Siddi Vinayak Hospital 8.11 km (S) Maa Sharda Hospital & Maternity Home 8.53 km (SSW) C.H.C. Dharsiwa (Hospital) 4.45 km (NE) VITS College Raipur, Baratnara 3.17 km (N) Jagmohan Lal Higher Sec. School, Sankara 3.09 km (SE) Dau Poshanlal Gov. School, Parastarai 3.32 km (NE) Govt. High School Kunra 4.74 km (NNE) Ambition English Medium School 3.44 km (NE) Gyan Deep Vidya Mandi 8.29 km (SSW) Vidya Sagar English School 9.94 km (S) Swami Atmanand School Barbanda 8.81 km (ESE) Ishwar Public School, Birgoan 8.44 km (SSW) Agashe ITI College 6.97 km (SW) Ambition English Medium School 3.45 km (NE) V. R. Education, Birgoan 7.78 km (SSW) Gyan Prakash Vidya Mandir 6.30 km (SSW) Columbia Global School, Vidhan Sabha Rd, 9.38 km (SE) Swami Atmanand School Barbanda 8.82 km (ESE) Government Primary School, Mandhar 7.51 km (SE) Shaskiya Navin Prathmik Shala 7.21 km (SSE)
23.	Seismic zone	The project site falls in Zone-II as per IS 1893 (Part-I): 2002. Hence, seismically it is a stable zone.

## 2.0 PROJECT DESCRIPTION

### 2.1 PROCESS DESCRIPTION

#### 2.1.1 Manufacturing process of Sponge Iron (DRI)

- Iron ore, coal, dolomite/limestone is fed in the weighed quantity and the kiln is rotated at 0.5 RPM speed. A temperature between 1000°C to 1050 °C is maintained in about 70% of the kiln length towards discharge end side for required reaction.
- After the reaction, the product is taken into an indirect cooling drum cooler. The product is cooled to 1000°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 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.
- The melting process involves taking sample of Sponge Iron & Pig Iron; Iron Powder and mild steel scrap, end cutting from rolling mills or scrap from user units is taken from raw material storage. This is then tested for its chemical composition and noted.
- 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.

➤ **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.
- 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 MS Pipe Fabrication Unit (Proposed)**

- Steel Pipes/Tubes are manufactured from mild steel sheets/ stripes etc. The sheet/ strips etc will be cut into the required size. Then passes through a series of drive forming and fin rolls and takes the required circular shape and is welded continuously by passage of an electric current of high frequency across the abutting edges.
- The steel pipes tubes thus formed and welded pass through the sizing sections where dimensional deviations if any are corrected before the tubes are cut into required length by automatic cutting machines. The tubes are then end deburred and pressure tested.
- The final product will be cut in required size and dispatch to market.

### **2.1.4 Process of Power Generation**

#### **WHRB based Power Generation**

- The Waste heat Recovery boilers (4 MW) will be attached with one 100 TPD 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 will be the heat content in waste flue gases released from DRI Kiln.

#### **Biomass Based Power Generation:**

- A biomass-based power plant generates electricity by burning organic materials such as wood, agricultural residues, or municipal solid waste. The process typically begins with the collection and transportation of biomass to the plant. Upon arrival, the biomass undergoes preprocessing, including shredding and drying, to enhance combustion efficiency.
- The dried biomass is then fed into a boiler, where it combusts to produce high-pressure steam. This steam drives a turbine connected to a generator, converting thermal energy into electricity.
- The resulting electricity is then transmitted through the power grid for distribution. Notably, biomass power generation is considered a renewable energy source, as the carbon dioxide released during combustion is part of the natural carbon cycle, making it a more sustainable alternative to fossil fuel-based power plants.

### **2.1.5 Process of brick making from waste**

- To make Fly ash bricks Fly ash, Lime, Sand and Gypsum along with granulated slag from the induction will be fed into a pan mixer, where water will be added in the appropriate proportion before mixing it all together.
- After mixing; the mixture will be shifted to hydraulic presses for where the mixture is given its brick like shape.

- The molded bricks are then carried into the open area where they are air dried and cured in an autoclave to give them its rigidity.

## 2.1 LAND REQUIREMENT

The total project area for expansion is 5.09 Hectare and it is proposed to add contiguous land area of 10.401 hectares at Village - Munrethi, Tehsil and District- Raipur (CG). Thus, proposed expansion total land area will be 16.01 Ha. The land is existing industrial land. No additional land proposed to be acquired. Greenbelt area 40% (i.e., 6.41 Ha.) will be kept unchanged. The land already diverted to industrial purpose. Sufficient flat land, free from major undulations and sparse vegetation is available within the plant premises. The detail of land use planning is provided in **Table 3**.

**TABLE 3 : AREA STATEMENT**

Sr. No.	Particulars	Area (In Ha.)	% after expansion
1.	<b>Built-up Area</b>		
	(a) Main Building and shed	5.379	
	(b) Admin and Utilities	0.374	
	(c) Raw Material Shed	0.271	
	<b>Sub Total ::</b>	<b>6.024</b>	41.54
2.	<b>Road and Paved</b>		
	(a) Road and Pave	1.152	
	(b) Truck Parking	0.154	
	<b>Sub Total ::</b>	<b>1.306</b>	9.00
3.	<b>Greenbelt</b>		
	Greenbelt	<b>6.410</b>	40.00
4.	<b>Open Area</b>		
	Reservoir	0.643	
	Open Area	1.6312	
	<b>Sub Total ::</b>	<b>1.7222</b>	16.47
	<b>Grand Total ::</b>	<b>16.0142</b>	<b>100.00</b>

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

Availability of raw material is abundant within 50 km km to 500 km area from project site. Fuel consumption will be mainly source from local sources. No linkage compulsion to acquire most of this raw material which are available in open market. Iron ore and coal are the basic bulk raw materials, which are also procured through market through negotiation and open bidding. Iron Ore can also be procured from NMDC through bidding. The raw material required for the project is Iron Ore; Coal; Lime stone/Dolomite/ Refractory Material; sponge iron, CI/ Pig Iron Heavy Scrap; Ferro Alloys. Some of these raw materials are readily available within 100 km radius and these will be transported through covered trucks. But Bulk Material like Iron Ore; Coal etc. are proposed to be brought by Rail upto nearest railway siding (Mandhar) and thereby transported to plant site through covered truck.

### 2.2.1 Solid and Hazardous waste generation

The details of solid and hazardous waste generations are given in **Table 4** and **5**, respectively.

**TABLE 4 : SOLID AND HAZARDOUS WASTE GENERATION AND ITS DISPOSAL**

Sl.	Name of Waste generated	Qty (TPA)	Proposed Disposal Plan
1.	Char / Dolochar (SID)	9,000	Is being sold to Power plant
2.	Bottom Flue Dust Ash (SID)	10,200	Used for Brick making, Road making and Land filing.
3.	Mill Scale (SMS)	15,750	Partially Captive use and to be sold to



Sl.	Name of Waste generated	Qty (TPA)	Proposed Disposal Plan
			Ferro Alloys/ pellet plant etc Plants
4.	MS Scrap	7,600	Reused in own Induction furnace
5.	Refractory & Ramming Mass waste (IF)	394	Reused then Sold to authorized recyclers
6.	Defective Billets (IF)	1,500	Reused in own Induction furnace
7.	Slag from Induction Furnace	57,280	Captive use in own Fly Ash Brick unit and remaining (after recovery of metal) used for Road making and Land filing
8.	Ash from Biomass based power generation	11,550	Used in own Fly Ash Brick making unit
	<b>Total</b>	<b>113,274</b>	

**TABLE 5 : HAZARDOUS WASTE GENERATION**

Type of Hazardous Waste	H. W. Category	Quantity	Disposal
Waste Oil/Used Oil	5.1(as per HWM Schedule I)	4 KL/Annum	Will be given to authorized recycler having Authorization from competent authority.
Used Lead Acid batteries	17 (as per HWM Schedule IV)	—	

**2.3 WATER REQUIREMENT & SOURCE**

Total water requirement (existing + proposed expansion) will be 640 KLD (224000 KLA) out of which 20 KLD required for domestic purpose. The source of water is surface water from Chhattisgarh Ispat Bhumi Limited (Industrial Water Supply network). The unit is not expecting to withdraw any water from ground water resources. However, the firm will recharge rain water within plant premises.

According to rainfall of the project area, total recharge potential of Rain Water is 27,552 Cum/Year of rainfall run-off can be recharged annually within the premises. Total 6 no. of Structures are proposed.

**2.4 POWER REQUIREMENT & SUPPLY**

The total power requirement is 51 MW. Out of 12 MW is through captive power plant (WHRB) and 39 MW will be sourced from State Grid (CSPDCL). In addition, existing plant already has 2 nos. of 550 kVA and 4 no of 550 kVA (proposed) of DG sets which will be continued to be used as emergency backup

**2.5 MANPOWER REQUIREMENT**

M/s. Om Sponge will provide employment to 416 peoples as direct employment which includes 36 people as administrative staff and 380 people will be production staff. Preference will be given to localpeople, depending upon their qualification and skill.

**2.6 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.

## 2.7 PROJECT COST

The total project cost of the project is estimated as Rs. 5159.46 Lakhs (Existing Project Cost - Rs. 2149.46 Lakhs and **Additional cost for expansion - Rs. 3010 Lakhs**)

## 3.0 EXISTING ENVIRONMENTAL SCENARIO

### 3.1 BASELINE ENVIRONMENTAL STUDIES

Baseline environmental studies were conducted at project site along with 10 km radial distance from the project site. The baseline environmental quality data for various components of environment, viz. Air, Noise, Water, and Land were monitored during **Pre-monsoon season (15<sup>th</sup> March 2023 – 15<sup>th</sup> June 2023)**

### 3.2 METEOROLOGY & AMBIENT AIR QUALITY

#### Summary of the Meteorological Data Generated at Site (15<sup>th</sup> March 2023 – 15<sup>th</sup> June 2023)

Predominant Wind Direction	Pre-monsoon season
First Predominant Wind Direction	WSW (12.86%)
Second Predominant Wind Direction	W (10.05%)
Calm conditions (%)	2.63
Avg. Wind Speed (m/s)	2.65

The status of ambient air quality within the study area was monitored for pre-monsoon season at 8 locations. All these 8 sampling locations were selected based on the meteorological conditions considering upwind and downwind, cross wind directions and reference point. The levels of Respirable Particulate Matter (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 6**.

**TABLE 6: 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	73.2	28.6	16.5	25.3	0.328	8.7	8.2
		Max	93.4	39.4	26.3	34.9	0.427	15.1	13.2
		Avg	83.5	34.8	21.1	29.4	0.372	12.5	10.5
		98 <sup>th</sup>	92.5	39.0	25.6	34.0	0.421	14.9	13.2
2	Sondra	Min	63.8	26.9	12.5	16.8	0.254	7.9	6.9
		Max	87.4	37.6	19.0	23.9	0.547	14.2	12.8
		Avg	76.5	32.8	15.6	21.2	0.365	10.8	9.6
		98 <sup>th</sup>	86.5	37.5	18.6	23.9	0.540	14.2	12.6
3	Siltara	Min	80.5	36.2	17.7	25.9	0.444	10.3	10.1
		Max	126.0	51.3	27.0	40.6	0.562	18.3	14.4
		Avg	104.7	43.1	21.5	32.7	0.512	14.3	12.2
		98 <sup>th</sup>	124.7	50.1	26.4	39.8	0.558	18.1	14.2
4	Tanda	Min	71.7	28.1	13.8	21.6	0.346	10.0	8.7
		Max	92.1	42.6	19.9	30.0	0.475	14.8	13.5
		Avg	82.5	35.2	16.3	25.4	0.414	12.5	10.6
		98 <sup>th</sup>	92.0	42.0	19.7	29.6	0.472	14.7	13.2
5	Charoda	Min	63.0	24.6	12.0	15.4	0.269	7.3	6.0
		Max	82.2	36.8	17.2	23.3	0.405	12.4	11.4
		Avg	72.6	29.7	14.4	19.6	0.329	10.2	8.7
		98 <sup>th</sup>	81.6	35.6	16.6	22.9	0.390	12.2	11.0
6	Nimora – 1	Min	58.3	19.5	10.5	13.8	0.258	8.1	5.9
		Max	77.2	32.9	13.8	20.3	0.334	11.7	8.7

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>
7	Sankara	Avg	69.5	27.8	12.3	16.8	0.294	9.7	7.5
		98 <sup>th</sup>	76.7	32.4	13.8	19.8	0.328	11.6	8.6
		Min	71.8	24.0	15.3	20.8	0.300	9.2	7.4
		Max	87.3	41.3	20.0	29.5	0.406	13.6	10.9
		Avg	81.3	31.5	17.4	24.3	0.344	11.4	9.0
8	Munrethi	98 <sup>th</sup>	87.3	39.6	19.8	28.9	0.402	13.3	10.8
		Min	57.1	20.3	7.8	12.7	0.245	6.2	5.6
		Max	72.2	28.6	11.6	17.5	0.319	9.7	9.4
		Avg	65.2	24.6	9.5	14.7	0.278	8.1	7.2
		98 <sup>th</sup>	71.7	28.3	11.3	16.9	0.314	9.5	8.9
<b>CPCB Standards</b>			<b>100</b> <b>(24hr)</b>	<b>60</b> <b>(24hr)</b>	<b>80</b> <b>(24hr)</b>	<b>80</b> <b>(24hr)</b>	<b>2</b> <b>(8hrs)</b>	<b>100</b> <b>(8hr)</b>	<b>400</b> <b>(24hr)</b>

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 9 monitoring locations. The monitoring results are summarized in **Table 7**.

**TABLE 7 : 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	Sondra	52.8	40.1
2	Tanda	51.4	39.7
3	Munrethi	53.2	41.3
<b>CPCB Standards dB(A)</b>		<b>55.0</b>	<b>45.0</b>
<b>Commercial Area</b>			
4	Sankara	64.2	46.3
5	Charoda	63.7	44.5
<b>CPCB Standards dB(A)</b>		<b>65.0</b>	<b>55.0</b>
<b>Silence Zone</b>			
6	Govt. Hr. Sec. School, Siltara	48.4	38.1
7	Jagmohan Lal HS School, Sankara	47.8	37.7
<b>CPCB Standards dB(A)</b>		<b>50.0</b>	<b>40.0</b>
<b>Industrial Area</b>			
8	Project Site	67.2	53.4
9	Siltara Industrial Area	66.7	51.8
<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

- **Site Specific Geology:** The study area is mainly covered by rocks of Meso to Neo Proterozoic age. Major rock types present in the study area are stromatolitic dolomitic limestones. Though few appearances of sandstones and laterites are noticed in the study area. The rocks of study area are represented by Chandi Formation belonging to Raipur Group of Chhattisgarh Super Group.
- **Chandi Formation:** Chandi Formation is mostly a calcareous facies with intra-formational arenite represented by stromatolitic limestone and dolomite with argillaceous intercalations at places. The limestone /Dolomite is pink, purple, reddish brown, grey, greenish grey, in colour, fine to medium grained, hard and compact bedded rock. The arenite is reddish brown, brown in colour, fine to coarse grained, cross bedded with micaceous shale partings. Fine grained facies is thinly laminated.
- **Geomorphology :** In the study area pediplains are the most prominent geomorphic units. Lateritic uplands are mainly concentrated in the western and north western part. As Kharun River is flowing from north to southwest it developed features like active flood plain, abandoned channel and cut-off meanders etc. along its path. Kulhan River is flowing from north to east and formed small patches of meander scars and paleochannel. Water Bodies like ponds are present in northeastern and eastern region.

The study area is drained by the Kharun & Kulhan Rivers and their distributaries. Drainage pattern of the area is dendritic to sub-dendritic in nature.

### **3.4.2 Hydrogeology and Aquifer Systems**

The occurrence of groundwater and its distribution in space are highly influenced by the underlying geological formations and hydrogeological characteristics of the surroundings. The porous, weathered, jointed, and fractured zones present in the rocks or formation provide scope for groundwater occurrence, storage, and movement. The hydrogeology of the area broadly describes the disposition of water-bearing formations, occurrence of groundwater and its yield potential, groundwater regime conditions and depth to water levels in different seasons, etc.

The main rock type consists of arenaceous-argillaceous-calcareous rocks and is dominated by limestone/ dolomite and calcareous shale. The ground water in these formations occurs under semi-confined and confined conditions. The weathered, cavernous and fractured part of the formation constitutes the aquifers in the area.

#### **Chandi Limestones**

Chandi limestone is controlled by the solution cavities, joints and fractures. Generally, 1 to 2 sets of fractures are encountered within 50 m depth, 1 to 3 sets of fractures within 50 to 200 m depth. The discharge varies from 0.1 to 2.0 lps. The drawdown varies widely from 2m to 29.7m. These formations are mostly developed by the way of dug wells, bore wells and tube wells.

Pre-monsoon depth to water level varies from 1.9 – 18.54 mts.

Post-monsoon depth to water level varies from 0.77 – 10.0 mts.

### **3.4.3 Water Quality**

**A. Surface Water Quality**

Parameters	Unit	Baseline Monitoring Period (15 <sup>th</sup> Mar, 2023 – 15 <sup>th</sup> June, 2023)	IS 2296:1992; Class C (Drinking water source after conventional treatment and disinfection)
		Range	
pH	-	7.28 – 7.82	No relaxation (6.0 to 9.0)
EC	µs/cm	695.95 - 941.62	--
TDS	mg/l	449 - 529	1500
Total hardness	mg/l	193.08 - 211.64	-
DO	mg/l	5.4 – 6.4	4.0
BOD	mg/l	6.54 – 21.36	3.0
COD	mg/l	22.95 – 65.18	-
Chloride	mg/l	70.53 – 156.46	600
Sulphate	mg/l	29.28 – 37.71	400
Nitrate	mg/l	12.67 – 28.27	50
Fluoride	mg/l	0.24 – 0.44	1.5
Iron	mg/l	0.11 – 0.32	0.5
Cadmium	mg/l	BDL (DL - 0.001)	0.01
Arsenic	mg/l	BDL (DL - 0.01)	0.2
Zinc	mg/l	0.11 – 0.22	15
Lead	mg/l	BDL (DL - 0.001)	0.1
Chromium	mg/l	BDL (DL - 0.05)	0.05
Total Coliform	MPN/100 ml	46 - 253	5,000

**B. Groundwater Quality**

Parameters	Unit	Baseline Monitoring Period (15 <sup>th</sup> Mar, 2023 – 15 <sup>th</sup> June, 2023)	Permissible Limit
		Range	
pH	-	7.36 – 7.89	No relaxation (6.5 to 8.5)
EC	µs/cm	780.69 – 1375.94	-
TDS	mg/l	484 - 773	2000
Total hardness	mg/l	248.24 – 553.19	600
Chloride	mg/l	92.78 – 181.30	1000
Sulphate	mg/l	19.14 – 42.66	400
Nitrate	mg/l	9.74 – 27.74	No relaxation (45)
Fluoride	mg/l	0.29 – 0.53	1.5
Iron	mg/l	0.05 – 0.44	No relaxation (1.0)
Cadmium	mg/l	BDL (DL - 0.001)	No relaxation (0.003)
Arsenic	mg/l	BDL (DL - 0.01)	No relaxation (0.01)
Zinc	mg/l	0.12 – 0.19	15
Lead	mg/l	BDL (DL - 0.001)	No relaxation (0.01)
Chromium	mg/l	BDL (DL - 0.03)	No relaxation (0.05)

**Location wise Water Quality Assessment**

S. N.	Locations	WQI	Quality	Remark
1.	Project Site	71.03	Good	<b>Water quality assessments based upon above physico-chemical parameters showed quality of ground water samples is good.</b>
2.	Sondra	82.64	Good	
3.	Sankara	66.53	Good	
4.	Giraud	62.65	Good	
5.	Siltara	97.14	Good	
6.	Tanda	71.93	Good	
7.	Charoda	64.45	Good	
8.	Munrethi	85.45	Good	

**C. Bacteriological Characteristics**

Coliform group of organisms are indicators of fecal 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 24th May 2021 satellite image with reference to Google Earth data. In order to strengthen the baseline information on existing land use pattern, the following data covering 10 km radius is approximate about 21°17'43.80"N to 21°28'26.93"N latitude and 81°32'45.44"E to 81°44'22.42"E longitude and elevation 242 to 341 meters are used as per the project site confined within that area.

The Land Cover classes and their coverage are summarized in **Table 8**.

**TABLE 8 : LU/LC CLASSIFICATION SYSTEM**

Sr. No.	Level-I	Level-II	Area (Sq. Km <sup>2</sup> )	Percentage (%)
1	Built-up land	Settlement	32.29	10.20
		Industrial Settlement	3.41	1.08
		Road Infrastructure	2.64	0.83
		Railway Line	0.91	0.29
2	Agricultural Land/ Crop Land	Single Crop	158.04	49.94
		Double Crop	68.45	21.63
3	Mines Area	Stone Quarry	0.62	0.20
4	Scrubs/Wastelands	Open Scrub	23.72	7.50
		Wasteland	4.85	1.53
5	Waterbodies	River/Nala/Stream	15.21	4.81
		Pond/Lake/Jalashay	6.31	1.99
<b>Total</b>			<b>316.45</b>	<b>100</b>

**3.6 SOIL QUALITY**

The project site and its terrain consist of flat to moderately steep slopes. The terrain is characterized by forest, agricultural land, land, various settlements, waterbody and open scrub/wasteland. It is

also observed that the open scrub area and barren land are dominant in South South East (SSE) and North West (NW) Portion of the study area. The following observations from the Soil Quality reports are as follows:

Parameters	Unit	Results	Fertility Status
pH	-	5.85 – 6.72	Slightly acidic to Neutral
Organic Carbon	%	1.13 – 1.92	more than sufficient
Nitrogen	Kg/hect	165.84 – 313.58	Better
Phosphorus	Kg/hect	20.22 – 35.26	Less to medium
Potassium	Kg/hect	129.34 – 254.25	Less to average
Sodium Absorption Ratio	-	0.82 – 1.64	Excellent (Little or No Hazard)

### 3.7 BIOLOGICAL ENVIRONMENT

#### Floral composition in Study Area:

Total 110 plant species were enlisted within the study site out of which habitat wise details are given as follows: Trees: 62, Shrubs: 23, Herbs: 13, Climbers: 7, Grasses & Bamboos: 4, and Parasite: 1 species observed in the study area.

#### Endemic Plants of the Study Area

Among recorded plant species none were assigned the status of endemic plant of this region.

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

According to IUCN Status report 2013 out of total 110 plant species identified within study area among the observed species *Chloroxylon swietenia* which is Vulnerable (VU) species as per IUCN RED 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**

Among the reported animals, all are categorized under least concern category as per IUCN list.

- **As per Indian Wild Life (Protection) Act, 1972**

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

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

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

A thick green belt around the periphery of plant site is recommended to provide safeguard for surrounding area in line with project activities.

### 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 9**. Details regarding education and infrastructure facilities 2011 are presented in **Table 10** respectively

**TABLE 9 : SUMMARY OF SOCIO-ECONOMIC ENVIRONMENT OF VILLAGES WITHIN 10 KM RADIUS AREA**

Total households	46890
Total population	221258
Male Population	114347
Female population	106911
SC Population	28853
ST Population	8510
Total literates	143732
Total Illiterates	77526
Total workers	84311
Total main workers	133650
Total marginal workers	15201
Total non-workers	72010

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

**TABLE 10 : IN PERCENTAGE DETAILS REGARDING INFRASTRUCTURE FACILITIES WITHIN 10 KM RADIUS STUDY AREA**

Infrastructure Facilities	Availability (In percentage) As per year 2011, Census District Raipur
Educational Facilities	100
Drinking water	100
Road	98.27
Electricity	100
Communication	94.82
Transportation	79.31
Medical	51.72
Bank & Society	24.13
Drainage	53.44
Recreation	94.82

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

## 4.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

### 4.1 Air Environment

#### Impact on Air Environment

The impact on air environment mainly depends on magnitude of operation and threshold limit of the project. The source of emission will be mainly in form of fugitive emission and point source.

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.

### Presentation of Results

For the short-term simulations for point emission sources, the concentrations were estimated around 441 receptors to obtain an optimum description of variations in concentrations over the site in 10 km radius covering 16 directions. The predicted incremental GLCs for PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>2</sub> and CO are presented below:

#### PREDICTED INCREMENTAL GROUND LEVEL CONCENTRATIONS

Pollutant	Incremental Concentration (µg/m <sup>3</sup> )	Distance (m)	Direction
PM <sub>10</sub>	1.72	200	SW
PM <sub>2.5</sub>	0.58		
SO <sub>2</sub>	1.58	1000	
NO <sub>x</sub>	11.5		
CO	24.0	200	

#### Details of Air Pollution Control System/Mitigation measures

Facilities	Air Pollution Control equipment
DRI Kiln with WHRB and combined with Bio mass Power plant flue gas duct	a. Dust extraction system, ESP with Chimney, b. Bag Filters for Product house; Kiln discharge end and transfer points.
Induction Furnance (25MT x 6)	6 No. Movable suction hood along with 1 common Bag Filters with a common chimney.
DG Set (75kVA to 800 kVA)	Acoustic Enclosure

#### Additional Measures to reduce/control pollution control

- Roads will be frequently sprinkled with water.
- Most of the materials like Sponge Iron ore, pig iron will be stored under covered shed.
- In case of storage of Sponge Iron, pig iron in open, it will be covered by tarpaulins to prevent spread of dust from it during transportation.
- Regular sweeping of road by using vacuum cleaner will be carried out
- Regular maintenance of vehicles and machineries will be carried out in order to control emissions.
- Green belt development will be taken up all along the roads, plant premises etc.
- 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 roads to reduce cumulative noise.
- Transportation of materials will be limited to day hours only.
- Periodical maintenance of process machinery.

#### **4.2 Noise Impacts**

The nearest human settlement Munrethi Village is 0.45 KM away from project site in West Direction and resultant noise level at this village are 53.2 dB(A) & 41.5 dB(A) at day & night time respectively. Thus, thick green belt 20 M will be developed towards West direction. Full body vibration and hand-arm vibration impacts will be felt by operators sitting in heavy machineries and operating vibrating devices, respectively. Necessary precautions in workplace environment shall be exercised to reduce workplace vibration impacts.

#### **Mitigation measures**

- Site specific mitigation measures will be adopted at project site to attenuate noise levels to safe limits. It can be further concluded that in actual conditions due to presence of various topographical features in the path of sound propagation the noise levels will be further attenuated.
- Dense plantation will help to reduce noise pollution in the following ways –
  - ✓ The sounds that are produced by the leaves helps muffle the noise.
  - ✓ Hedging makes a thick front of the wall and blocks the noise.
  - ✓ Thick tree trunks create a sound-absorbing buffer zone.
  - ✓ They help in filtering the noise
- 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.
- Most of the equipment's will be placed in closed room
- Equipment's will be placed on acoustic floor to reduce vibration and noise
- High noise zone will be marked, and earplugs will be provided to the workmen near high noise producing equipment.
- Use of PPES awareness program will be provided to all workers.
- Proper shifting arrangement will be made to prevent over exposure to noise and vibration.
- Silent DG sets will be used site.
- Speed limits will be enforced on vehicle.
- Regular noise & vibration monitoring will be carried for all equipment's to check compliance with prevailing rules.

#### **4.3 Impact on 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.

**Mitigation measures**

- The project will have a **40 KLD ETP** Unit to treat Industrial waste water and **20 KLD STP** for treatment of domestic waste water. The project site is located in an area classified as ‘**Critical Zone**’ as per the guidelines of CGWB, moreover the source of water will be surface water.
- Total 14 KLD treated water will be reused/recycled in process.
- 14 KLD treated domestic water through STP will be used green belt development.
- Raw material from the proposed project will be stored on concrete layer thus no seepage from the raw material piles anticipated.
- The material will be stored under adequate shed in order to prevent the leachate through runoff.
- Separate stockyards for storage of Raw materials, finish products and solid waste will be maintained.
- All stockyards will be designed with the impervious flooring to prevent leachate percolation.
- Garland drain will be provided to all stockyards area to prevent run-off containing suspended solids by routing the storm water drains through catch pits/sediment traps.
- Any spillage of hazardous waste (used oil/spent oil, ETP Slag, etc.) or contamination will be immediately removed.
- Periodic ground water monitoring at project site as well as nearby villages will be carried out.
- Rain water charged to ground water
- Closed circuit circulation system will be followed.

**4.4 Impact on Biological Environment**

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

<b>S. No.</b>	<b>Project Aspects / Activities</b>	<b>Residual Impacts</b>	<b>Mitigation Measures Suggested</b>
1.	Transportation, unloading & storage of Material and Movement of vehicle inside plant, Dust and sound generation due to proposed expansion activities	Impact on nearby vegetation and avifauna in a scale of 3 out of 5 due to proposed expansion activity.	Thick greenbelt will be developed along periphery of the project site in order to provide buffer between plant fugitive emission and nearest vegetation.
2.	Gaseous emission from Stack, Movement of vehicle inside plant and Raw material & finished product transportation, Product manufacturing	Decline in photosynthetic activities, Stomatal index may be minimized, Crop yield may be reduced.	Air quality modelling outputs study revealed that, the resultant concentrations of particulate matter, sulphur di-oxide and oxides of nitrogen are well within the prescribed limits. In expansion project is proposed at total 16.0142 hectare land out of which it is proposed to develop 40% (6.41 ha.) area as greenbelt. In the above 6.41 Hectare land it is proposed to develop a greenbelt by plantation of 16025 Trees. This will be developed within two year time from completion of the expansion. At present 2513 Nos no. of trees are alive within plant premises.

			<p>Indigenous species for plantation is recommended along the approach road and plantation under CER.</p> <p>Thus, the impact due to proposed expansion project would be minimal as project activity will be carried out within the plant boundary limit with proper control measures.</p>
--	--	--	--

#### 4.5 Impact on Socio-economic environment

##### ➤ Positive Impacts

- Benefits to the nation and GDP due to steel production and Business development. Nation also gets benefitted with taxes.
- Creation of indirect employment through the local community establishing small shops like tea stalls, supply of intermediate raw materials, repair outlets, hardware stores garages etc.
- Economic growth due to development of area and increase in quality of life.
- Improvement in green cover due to the plantation of trees in the study area, also are leading to a decrease in environmental pollution.
- Improvement in social and infrastructural development by the industries as a part of CER and EMP.

##### ➤ Negative Impacts.

- Health of the surrounding population may get affected due to emission of gases in the atmosphere. Production of Sponge Iron and operation of Induction furnace can cause release of pollutants in the Air Environment. Other components of Environment like animals, birds and trees may also get affected.
- The increase in vehicles due to the proposed expansion may lead to extra pressure on the existing traffic. Heavy vehicle movement lead to dispersion of dust particles which affects the health of the workers and Local Peoples. Trucks, tankers, and other vehicles may cause additional air pollution to the surrounding areas. The effects may be more prominent in nearby villages.
- Possibilities of Hazards and accident which may cause harm to the workers working or loss of life of the workers.
- Generation of Solid and Hazardous waste will be there, if the waste is not managed properly, it may cause contamination of the area, environment and health of the nearby population.
- If influx of workers from outside areas, then there may an increased pressure on residential accommodation the neighborhood.

##### ➤ Mitigation Measures

In order to mitigate the adverse impact likely to arise in social, cultural and economic aspects in the surrounding region due to the proposed project and improvement in quality-of-life following mitigation measures should be adopted:

- Adequate pollution control Equipment as per the CPCB Guidelines should be adopted and proper maintenance of industrial and pollution control equipment should be done to ensure minimum pollution.

- The efficiency of the pollution control equipment should be checked periodically to comply with the emission standards provided by CPCB and minimize the pollution levels.
- Ensure that roads are properly signed, vehicles are well maintained and drivers are well trained and safety conscious.
- A Safety climate should be prepared and every worker should be trained with all safety equipment. All health and safety measures should be adopted by the firm to ensure the safety of the workers and the surrounding society.
- Project proponent should take appropriate steps to keep environment clean and Green belts development/ Plantation along with the internal Road.

Transportation of hazardous waste should be done as per CPCB Guidelines. The heavy trucks are covered to prevent spillage or dusting. The drivers should be imparted training.

## **5.0 ANALYSIS OF ALTERNATIVES (SITE AND TECHNOLOGY)**

### **5.1 Site Selection**

This is an expansion project. The expansion will be carried out within existing land (5.095 Ha.) as well as contiguous additional land (10.399 Ha.). Thus, total land after expansion will be 16.01 Ha.

### **5.2 Selection of Alternative Technology**

The entire project related activities are discussed in Chapter 2. The following aspects of the project are dealing with the study of alternative technology in brief involved in each of the proposed products and choice of the technology based on environmental applicability, technical and financial viability. Selection of suitable production process and the capacity of the production units form the nucleus around which the basic concept of a plant is developed. While the selection of a process takes into account factors like type of product, availability of local raw material, process status, specific energy consumption, level of energy required, environment, and pollution etc., the capacity selection of major units would depend on the volume of production, available unit sizes, economies of scale, etc.

## **6.0 ENVIRONMENTAL MONITORING PROGRAM**

An Environmental Management Cell (EMC) will be established for the proposed project under the control of by General Manager (Plant Head) with a direct reporting to Management.

The firm has proposed to set up its own Environment Monitoring lab as it is evident with the investment of about Rs 36 lakhs on Capital cost towards monitoring equipment whereas Rs.09 Lakhs cost per year for monitoring of Environment. This facility will be created along with the gradual implementation of the project.

In addition to the above as the proposed project comes into operation, NABL/MoEFCC accredited lab (Third party) will engaged to monitor all the environmental components as per CPCB/CECB norms.

## **7.0 ADDITIONAL STUDIES**

### **7.1 PUBLIC CONSULTATION**

The 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.

## **7.2 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.

Hazard analysis involves the identification and quantification of the various hazards (unsafe conditions) that exist in the project site. On the other hand, risk analysis deals with the identification and quantification of risks occurring due to the plant equipment and personnel exposed, due to accident resulting from the hazards in the plant. The occupational and safety hazards and preventive measures, process hazards and their preventive measures, and storage hazards and preventing measures are provided in details in Chapter 7 of the EIA report.

The main objective of the risk assessment study is to determine damage due to major hazards having damage potential to life and property and provide a scientific basis to assess safety level of the facility. The secondary objective is to identify major risk in manufacturing process, operation, occupation and provide control through assessment and also to prepare on-site, off site plans to control hazards.

The assessment of risk in the proposed project has been estimated for material handling, movement of Trucks/Tippers, Dust hazards, Hazards, shock hazards, etc. and corresponding mitigation measures are suggested in the EIA/EMP report.

## **8.0 PROJECT BENEFITS**

### **Proposed Social Welfare Arrangement**

In addition to the activities along with budgetary provision provided under CER, M/s. Om Sponge will also support social welfare activities under CSR obligation.

The Social welfare/CSR activities will aim at strengthening the bond between the project authorities and the local population in the vicinity of project area. In line with CSR policy, M/s. Om Sponge will carry community welfare activities in the following areas:

- Community development
- Education
- Health & medical care
- Drainage and sanitation
- Roads
- Drinking water supply occasionally in the event of water scarcity through tankers, etc.
- As per MoEF&CC vide its OM dated 30<sup>th</sup> September 2020 has provided that the CER value for the project will be revised based on Public Hearing outcome and as per the commitments made by the project promoters during the Public hearing. Thus, CER are made in the proposal as per requirement considering O.M. dated 01/05/2018 and 30.09.2020 issued by MoEF&CC, New Delhi proposals regarding Corporate Environment Responsibility (C.E.R.). A CER budget of Rs. 62 Lakhs will be added on project cost. The final heads of expenditure and amount will be decided as per Public consultation and requirement of the region to improve and strengthen surrounding environment which may be slightly impacted due to implementation of the proposed project activity
- The project benefits also entail revenue earnings to national and state exchequer through GST

(Estimated Rs. 259 Crores Gross GST), road tax, income by registration of trucks & trailers, income tax, corporate tax, etc.

- It is estimated that **Total 386** people will get direct employment due to proposed Brownfield project; the priority of management is to fulfill the requirement through local peoples. In addition, there will be indirect employment to more than **250 persons** (as drivers, conductors and attendants of new trucks, passenger carrying vehicles, technicians in workshops and garage besides the plumbers, electricians and masons).
- The estimated cost of Plant and Machinery and Other Equipment is about Rs 17 Crores. Transporters and Erection people will also get opportunity for manufacture their respective plant and Machinery and equipment. This will add to GDP of the Nation.
- The firm is likely to add about Rs 1400 Crores Turnover to the GDP due to which about Rs 259 Crores Gross GST will be payable to the Govt. The salary wages payment will be above Rs. 6.5 Crores per year. Payment towards power to the state grid will be more than Rs 108 Crore. All these will help to grow the National GDP and local area economy too.
- Preference will be given to local people, depending upon their qualification and skill. The salary wages payment will be above Rs.6.5 Crores per year.

## 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 firm will invest about Rs 1482.5 lakhs Capital cost on environment management plan and spent about Rs.51 lakhs per year for operation and maintenance.

## 10.0 CONCLUSION

The proposed project of M/s. Om Sponge 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 bag house, water sprinklers, enclosures, etc. are integral part of the plant infrastructure. Additional pollution control measures and environmental conservation measures will be adopted to control/minimize impacts on the environment and socio-economic environment of the area. Measures like development of green belt and plantation in nearby village and along transport road, adoption of rainwater harvesting/recharging in the plant and in nearby villages will be carried out. The proposed CSR/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 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.

#### **11.0 DISCLOSURE OF CONSULTANTS**

The Environmental studies for proposed expansion project of M/s Om Sponge 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/2326/RA0304** dtd. 18 September, 2023 valid till Sept 29, 2026.