## **SUMMARY ON**

# ENVIRONMENTAL IMPACT ASSESSMENT REPORT

OF

# **SARDA ENERGY & MINERALS LIMITED**

[Proposed Steel & Power Plant (Greenfield Project) – Establishment of 4 x 600 TPD DRI Kilns (Sponge Iron - 7,92,000 TPA ), 12 x 20 T of Induction Furnaces with CCM, LRF, AOD,VD (MS Billets -9,24,000 TPA), Rolling Mill with Reheating Furnace & Coal Gasifier (Rolled Products – 7,00,000 TPA), 4 x 12 MVA of Submerged Electric Arc Furnaces (FeMn- 85,800 TPA/ SiMn – 72,600 TPA), 44 MW WHRB based Power Plant (4 x11 MW)and 136 MW AFBC based Power Plant (2 x 19 MW & 2 x 30 MW & 1x38 MW)-, Wire Drawing Mill (HB Wire - 2,00,000 TPA), Fly Ash Brick Manufacturing Unit (7,00,000 TPA)]

at

## Nevnara Village, Berla Tehsil, Bemetara District, Chhattisgarh

Submitted to

CHHATTISGARH ENVIRONMENT CONSERVATION BOARD Chhattisgarh

## 1.0 PROJECT DESCRIPTION

Sarda Energy & Minerals Limited has proposed to establish a Mini Steel Plant, a Greenfield Project, comprising of establishment of DRI Kilns (Sponge Iron - 7,92,000 TPA), Induction Furnaces with CCM, LRF, AOD,VD (MS Billets -9,24,000 TPA), Rolling Mill with Reheating Furnace and Coal Gasifier(Rolled products -7,00,000 TPA), Submerged Eletric Arc Furnaces (FeMn- 85,800 TPA/ SiMn – 72,600 TPA), WHRB based Power Plant – 44 MW, AFBC based Power Plant - 136 MW, Wire Drawing Mill (HB Wire - 2,00,000 TPA), FlyAsh Brick manufacturing unit (7,00,000 TPA).

Total land envisaged for the proposed project is 79.239 ha. (195.8 Acres). Agreements have been entered for total land with landowners for the total land requirement of 79.239 ha. (195.8 Acres. The project cost envisaged for the proposed project is Rs 2370 Crores.

As per the Ministry of Environment, Forest& Climate Change, New Delhi notification, dated 14<sup>th</sup>September, 2006 and its subsequent amendments, all Primary metallurgical processing industries are classified under Category 'A'. The Ministry of Environment, Forest& Climate Change (MOEF&CC), New Delhi has accorded Terms of Reference (TOR) for the proposed project vide letter No. J-11011 / 183 / 2021 – IA II (I), dated 14<sup>th</sup> June 2021.The EIA Report has been prepared by incorporating the TOR stipulated by MOEF&CC.

*Pioneer Enviro Laboratories & Consultants Private Limited, Hyderabad*, which is accredited by NABET, Quality Council of India, vide certificate No. NABET/ EIA/ 1922/ RA 0149, for preparing EIA report for Metallurgical Units, have prepared Environmental Impact Assessment (EIA) report for the proposed projectby incorporating the TOR approved by Ministry of Environment, Forest & Climate Change, New Delhi. The report contains detailed description of the following:

- Characterization of status of environment with in an area of 10 km radius from the plant for major environmental components including air, water, noise, soil, flora, fauna and socioeconomic environment.
- Assessment of air emissions, liquid waste and solid waste from the proposed project along with the noise level assessment.
- Environmental Management Plan comprising of emission control measures proposed to be adopted in the proposed project, solid waste management, Greenbelt development, etc.
- Post Project Environmental Monitoring & Budget for Environmental Protection Measures.

## 1.1 ENVIRONMENTAL SETTING WITHIN 10 Km. RADIUS OF THE PLANT SITE

The following is the environmental setting within the 10 Km. radius of the Project site:

| S.No.     | Salient Features / Environmental features        | Distance w.r.t. site / Remarks                        |
|-----------|--|---|
| 1.        | Type of Land                                     | Agricultural Land                                     |
| 2.        | Type of Land (Study Area)                        | As per LULC the land use within 10 Km. is as follows: |
|           |  | Settlements – 4.3 %, Industrial Area – 2.7 %,         |
|           |  | Tank / River / Reservoir – 9.3%, Single Crop –        |
|           |  | 63.3%, Double Crop – 6.9%, Plantation – 4.4%,         |
|           |  | Land with scrub – 4.3%, Land without scrub –          |
|           |  | 2.6%, Sheet rock area – 2.2%                          |
| 3.        | National Park/ Wildlife sanctuary /              | Nil   |
|           | Biosphere reserve / Liger Reserve /              |   |
|           | Birds  |   |
| 4.        | Historical places / Places of Tourist            | Nil   |
|           | importance / Archeological sites                 |   |
| 5.        | Critically polluted area as per MoEF&CC          | None  |
|           | Office Memorandum dated 13 <sup>th</sup> January | And also the Plant area does not fall in the          |
|           | 2010   | areas given in Hon'ble NGT order issued vide          |
|           |  | dated 10 <sup>st</sup> July 2019.                     |
| 6.<br>7   | Defence Installations                            | NII<br>Kata (0 CKma in East Direction)                |
| 7.<br>o   | Ne of Villages in the Study Area                 | Kold (U.OKITIS.III Edst Direction)                    |
| <u>ð.</u> | No. of Villages in the Study Area                | 40 Mos.   |
| 9.<br>10  | Polesis<br>Water body                            | Water Rody:   |
| 10.       |  | Iorrnadhi- Adiacent(Fast)                             |
|           |  | Ghurinala –Adjacent ( North)                          |
|           |  | Kharoon River - 6.1 Kms (Fast)                        |
|           |  |   |
| 11.       | Nearest Highway                                  | Nil within 10 Km. Radius.                             |
| 12.       | Nearest Railway Station                          | Nil within 10 Km. Radius.                             |
| 13.       | Nearest Port facility                            | Nil within 10 Km. Radius.                             |
| 14.       | Nearest Airport                                  | Nil within 10 Km. Radius.                             |
| 15.       | Nearest Interstate Boundary                      | Nil within 10 Km. Radius.                             |
| 16.       | Seismic zoneas per IS-1893                       | Seismic zone – III                                    |
| 17.       | R&R  | There is no rehabilitation and resettlement           |
|           |  | issue, as there are no habitations present in the     |
|           |  | site area.  |
| 18.       | Litigation / court case is pending against       | NII   |
|           | the proposed project / proposed site and         |   |
|           | or any direction passed by the court of law      |   |
|           | against the project                              |   |

## Table No. 1.1: Environment Setting within 10 Km. radius of the site

## **1.2 PLANT CONFIGURATION AND PRODUCTION CAPACITY**

Following is the proposed plant configuration and proposed production capacities:

## Table No.1.2: Proposed Plant Configuration & Production Capacities

| S.  | Unit and<br>product  | Unit<br>Configuration   | Production<br>capacity                     | Unit<br>Configuration   | Production<br>capacity                     | Total                                      |
|-----|--|---|--|---|--|--|
| No. | Details  | PHASE -1  |  | PHAS  |  |  |
| 1   | DRI Kiln<br>(Sponge Iron)  | 2 x 600 TPD   | 3,96,000 TPA                               | 2 x 600 TPD   | 3,96,000 TPA                               | 7,92,000 TPA                               |
| 2   | Induction<br>Furnace with<br>CCM, LRF,<br>AOD, VD<br>(Steel Billet)                  | 6 x 20 MT<br>(7.5 nos. of<br>crucibles)<br>+ 40 MT LRF +<br>Argon Oxygen<br>Decarburization<br>(AOD) 40T +<br>Vacuum<br>Degasser (VD) -<br>40 T | 4,62,000 TPA                               | 6 X 20 MT<br>(7.5 nos. of<br>crucibles)<br>+ 40 MT LRF +<br>Argon Oxygen<br>Decarburization<br>(AOD) 40T +<br>Vacuum<br>Degasser (VD) -<br>40 T | 4,62,000 TPA                               | 9,24,000 TPA                               |
| 3   | Rolling Mill<br>with<br>Reheating<br>Furnace and<br>Gasifier<br>(Rolled<br>products) | Mill – 3,50,000<br>TPA,<br>RHF - 40 TPH   | 3,50,000 TPA                               | Mill – 3,50,000<br>TPA,<br>RHF - 40 TPH   | 3,50,000 TPA                               | 7,00,000 TPA                               |
| 4   | Coal Gasifier<br>for Rolling Mill<br>(Producer gas)                                  | Hot Gasifier - 5<br>Modules of 3.2<br>meter Ø.<br>Total 14000<br>nm3/h  | 111<br>MNm <sup>3</sup> /Annum             | Hot Gasifier - 5<br>Modules of 3.2<br>meter Ø.<br>Total 14000<br>nm3/h  | 111<br>MNm <sup>3</sup> /Annum             | 222<br>MNm <sup>3</sup> /Annum             |
| 5   | Submerged<br>Electric<br>Furnaces -<br>Ferro Alloys<br>Plant                         | 2 x 12 MVA  | FeMn-42,900<br>TPA /<br>SiMn-36,300<br>TPA | 2 x 12 MVA  | FeMn-42,900<br>TPA /<br>SiMn-36,300<br>TPA | FeMn-85,800<br>TPA /<br>SiMn-72,600<br>TPA |
| 6   | Power<br>generation<br>through<br>WHRB   | 2 x11 MW<br>WHRB  | 22 MW                                      | 2 x 11 MW<br>WHRB   | 22 MW                                      | 44 MW                                      |
|     | Power<br>generation<br>through AFBC<br>Boiler  | 2 x 19 MW<br>+ 1 x 30 MW  | 68 MW                                      | 1 x 30 MW<br>+ 1 x 38 MW  | 68 MW                                      | 136 MW                                     |
| 7   | Wire Drawing<br>Mill   | 1 x 1,00,000<br>TPA   | 1,00,000 TPA                               | 1 x 1,00,000<br>TPA   | 1,00,000 TPA                               | 2,00,000 TPA                               |
| 8   | FlyAsh Bricks  | 1 x 3,50,000  | 3,50,000 TPA                               | 1 x 3,50,000  | 3,50,000 TPA                               | 7,00,000 TPA                               |

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| manufacturing | TPA | TPA |  |
|---------------|-----|-----|--|
| unit          |     |     |  |

## 1.3 RAW MATERIAL REQUIRMENT

The following will be the raw material requirement for the proposed project:

## Table No.1.3: Raw Material Requirement, Source & Mode of Transport

| S.No. | Raw Material       | Quantity<br>(TPA)  | Sources             | Distance from site (in Kms.) | Mode of Transport         |
|-------|--------------------|--------------------|---------------------|------------------------------|---------------------------|
| 1.    | For DRI Kilns (Spo | onge Iron) –       | 7,92,000TPA         |                              |                           |
| 2)    | Iron ore           | 13 16 30/          | NMDC Bacheli/       | 500                          | By rail & road            |
| a)    | nonore             | 13,10,304          | OMC                 |                              | (through covered trucks)  |
|       |                    |                    | SECL,               | 280                          | By rail & road            |
| b)    | Indian coal        | 9,63,864           | GarePlama IV,       |                              | (through covered trucks)  |
|       |                    |                    | Sahapur West        |                              |                           |
| c)    | Dolomite           | 39 600             | Chandranur          | 550                          | By road                   |
| د)    | Dolomice           | 33,000             | Chanarapai          | 550                          | (through covered trucks)  |
| 2.    | For Steel Melting  | Shop (Steel        | Billets) – 9,24,000 | ТРА                          |                           |
| a)    |                    |                    | Own generation      | 100                          |                           |
|       | Sponge Iron        | 8,48,232           | & external          |                              | Through covered conveyers |
|       |                    |                    | purchase            |                              |                           |
| b)    | MS Scrap           | 1.94.964           | Own generation      | 200                          | By road                   |
|       |                    | 1,5 1,5 0 1        | /Chhattisgarh       | 200                          | (through covered trucks)  |
| c)    | Recovered iron     | 18,480             | Own generation      |                              | By road                   |
|       | from IF slag       | 10,100             | e in generation     |                              | (through covered trucks)  |
| 3.    | For Rolling Mill – | <b>7,00,000</b> TP | Α                   |                              |                           |
| a)    | Steel Billets      | 7,14,000           | Own generation      |                              |                           |
| b)    | Coal ( Gasifier)   | 1,08,500           | SECL,               | 280                          | By rail & road            |
|       |                    |                    | GarePlama IV        |                              | (through covered trucks)  |
| 4.    | For AFBC Boiler [  | Power Gene         | ration : 44 MW]     |                              |                           |
| a)    | Indian Coal        | 7,86,240           | SECL,               | 280                          | By rail & road            |
|       |                    |                    | GarePlama IV        |                              | (through covered trucks)  |
| b)    | Dolochar           | 134,640            | In plant            |                              | through covered conveyors |
|       |                    |                    | generation          |                              |                           |
| 5.    | For Ferro Alloys ( | 4 x 12 MVA)        |                     |                              |                           |
| (i)   | For Ferro Magnes   | se – 85,800 T      | PA                  |                              |                           |
| a)    | Magnese ore        | 2.05.920           | Vizag Port          | 600                          | By Rail & Road            |
|       |                    | _,                 |                     |                              | (through covered trucks)  |
| b)    | Coke/coal          | 55.770             | SECL, Sahapur       | 320                          | By road                   |
|       |                    |                    | West                |                              | (through covered trucks)  |
| c)    | Flux               | 17.160             | Raipur              | 100                          | By road                   |
|       |                    |                    |                     |                              | (through covered trucks)  |
|       |                    |                    | (or)                |                              |                           |
| (ii)  | For Silico Mangar  | nese – 72,600      | ) TPA               |                              |                           |
| a)    | Manganese Ore      | 1 63 335           | Vizag Port          | 600                          | By Rail & Road            |
|       |                    |                    |                     |                              |                           |

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|    |                                  |               |                       |          | (through covered trucks)            |  |
|----|----------------------------------|---------------|-----------------------|----------|-------------------------------------|--|
| b) | Coke                             | 9440          | Vizag Port            | 600      | By Rail & Road                      |  |
|    |                                  |               |                       |          | (through covered trucks)            |  |
| c) | Coal                             | 44,600        | SECL, Sahapur<br>West | 280      |                                     |  |
| d) | FeMn. Slag                       | 21,780        | Own generation        |          |                                     |  |
| e) | Quartz                           | 7,260         | Mandla                | 250      | By road                             |  |
|    |                                  |               |                       |          | (through covered trucks)            |  |
| f) | Dolomite                         | 3,630         | Chandranur            | 550      | By road                             |  |
|    |                                  |               | Chandrapur            | 550      | (through covered trucks)            |  |
| 6. | Wire Drawing Mill – 2,00,000 TPA |               |                       |          |                                     |  |
| a) | Coil                             | 2,03,000      | Own generation        |          |                                     |  |
| 7. | Bricks Plant-7,00                | ,000 – Brick/ | Year                  |          |                                     |  |
| a) | Fly Ash(PP)                      | 356031        | Own generation        |          |                                     |  |
| b) | Fly Ash (DRI)                    | 138600        | Own generation        |          |                                     |  |
| c) | Slag (IF)                        | 110880        | Own generation        |          |                                     |  |
| d) | Ash + cinder                     | 42400         | Own generation        |          |                                     |  |
|    | (Gasifier)                       | 43400         |                       |          |                                     |  |
| e) | Accretion (DRI)                  | 9504          | Own generation        |          |                                     |  |
| f) | Wet Scrapper<br>(DRI)            | 19800         | Own generation        |          |                                     |  |
| g) | Cement                           | 21785         | From cement<br>plants | 200 Kms. | By road<br>(through covered trucks) |  |

## 1.4 MANUFACTURING PROCESS

## 1.4.1 Sponge Iron (DRI)

The proposal consists of 4x600 TPD of DRI kilns to produce 7,92,000 TPA of Sponge Iron with 4 x 11 MW WHRB facility. Refractory lined rotary kilns will be used for reduction of iron ore in solid state. Refractory lined rotary kilns will be used for reduction of iron ore in solid state. A central Burner

located at the discharge end will be used for initial heating of the kiln. Iron ore will be continuously fed into the kiln along with coal which has dual role of fuel as well as

reductant. Dolomite will be added to scavenge the sulphur from the coal. A number of air tubes will be provided along the length of the kiln. The desired temperature profile will be maintained by controlling the volume of the combustion air through these tubes. The Carbon monoxide generated due to the combustion of coal, reduces the iron ore and converts it into sponge iron. The rotary kiln is primarily divided into two zones viz. the pre heating zone and the reduction zone. The preheating zone extends over 30 to 50 % of the length of the kiln and in this the moisture in the charge will be driven off and the volatile matter in the coal will be burnt with the combustion air supplied through the air tubes. Heat from the combustion raises the temperature of the lining and

the bed surface. As the kiln rotates, the lining transfers the heat to the charge. Charge material, pre-heated to about 1000<sup>0</sup>C enters the reduction zone. Temperature of the order of 1050<sup>0</sup>C will be maintained in the reduction zone, which is the appropriate temperature for solid state reduction of iron oxide to metallic iron.

This hot material will be transferred to Heat exchanger. In Heat exchanger the material will be cooled to 160°C. The cooler discharge material consists of sponge iron lumps, sponge iron fines and char. Magnetic and non-magnetic material will be separated through magnetic separators and stored in separate bins. The hot flue gases will be taken to a Waste Heat Recovery Boilers and after heat recovery they will be treated in high efficiency ESP and discharged into the atmosphere through stack whose height will be in accordance with CPCB norms.

### 1.4.2 Steel Melting Shop

In Steel Melting Shop (SMS), Sponge Iron will be melted along with melting scrap and fluxes to make pure liquid steel and then to mould it in required size billets. The SMS will consist of Induction furnace, Ladles, Cranes & Continuous Casting Machine (CCM). There will be12 x 20 T Induction furnaces to manufacture Billets of 9,24,000TPA. Billets will be sent to Re-heating Furnace to reheat the Billets and then sent to Rolling Mill to manufacture Rolled Products.

#### 1.4.3 Rolling Mill

Billetswill be cooled and stored will be sent to reheating furnaces for the heating and will be sent to Rolling Mill. Furnace will be heated with producer gas. A Rolling mill will be installed in the plant to produce 7,00,000TPA of Rolled products.

### 1.4.5 Submerged Electric Arc Furnaces

4no.s of Submerged Electric Arc Furnaces each of 12 MVA will be setup in the proposed plant. Ferro manganese/Silicon-manganese will be produced using manganese ore as main raw materialin a sub-merged arc furnace using reducer (Coke) under high voltage.

#### 1.4.6 Power Generation

#### **Through WHRB Boiler**

The hot flue gases from proposed 4x600 TPDDRI kilns will pass through waste heat recovery Boiler to recover the heat and to generate 44 MW (4 x 11 MW)electricity. The gases after heat recovery

will pass through ESP and then discharged through chimneys into the atmosphere for effective dispersion of emissions into the atmospherethrough stacks of adequate height.

#### **Through CFBC Boiler**

Indian Coal along withdolochar will be used as fuel in AFBC Boilers to generate 136 MW (2 x 19 MW & 2 x 30 MW& 1x38 MW) of electricity. The flue-gases will be treated in high efficiency ESP and then discharged through a stack of adequate height into the atmosphere.

#### 1.5 Water Requirement

- Water required for the proposed project will be 7646 KLD.
- Water required for proposed project will be sourced from Kharoon River (which is at a distance of 6.1 Kms. from the project site).
- Water drawl permission from Water Resource Department, Chhattisgarh will be obtained. As MOU has been signed by the company with Govt. of Chhattisgarh, State Investment Promotion Board (SIPB) will facilitate the required approvals for the plant.
- Air cooled condensers will be provided to AFBC Power plant.
- The following is the breakup of water requirement

| S. No | Plant Name        | Water Requirement in KLD |
|-------|-------------------|--------------------------|
| 1     | Sponge Iron Plant | 2170                     |
| 2     | Induction Furnace | 2170                     |
| 4     | Rolling Mill      | 920                      |
| 5     | Power Plant       | 1800                     |
| 5     | Ferro Alloy       | 400                      |
| 6     | Brick Plant       | 50                       |
| 7     | Domestic          | 136                      |
|       | Total             | 7646                     |

## Table No.1.4: Water Requirement Breakup

#### **1.6** Wastewater Generation

- Total wastewater generation will be 1121 KLD.
- The wastewater generated from DRI, SMS, Rolling mill, Ferro Alloys, Power plant will be treated ETP and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development.
- Air Cooled condensers will be provided in the power plant, which will reduce the water consumption significantly. Hence wastewater generation will also be minimized.

- During monsoon period, the treated wastewater will be utilized as makeup water for Rolling Mill
- Sanitary wastewater will be treated in STP.
- Garland drains will be provided around all the raw material stacking areas.
- The following is the breakup of the wastewater generation from proposed project.

| SI. No | Plant Name        | Waste water Generation in KLD |
|--------|-------------------|-------------------------------|
| 1      | Sponge Iron Plant | 217                           |
| 2      | Induction Furnace | 217                           |
| 4      | Rolling Mill      | 120                           |
| 5      | Power Plant       | 360                           |
| 5      | Ferro Alloy       | 80                            |
| 6      | Brick Plant       | 5                             |
| 7      | Domestic          | 122                           |
| Total  |                   | 1121                          |

### Table No.1.5: BreakupOfWastewater Generation

## 2.0 DESCRIPTION OF ENVIRONMENT

Base line data has been collected on ambient air quality, water quality, noise levels, flora and fauna and socio-economic details of people within 10 km radius of the project site.

## 2.1 Ambient air quality

Ambient air quality was monitored for  $PM_{2.5}$ ,  $PM_{10}$ ,  $SO_2$ , NOx& CO at 8 stations including project site during **1<sup>st</sup> March 2021 to 31<sup>st</sup> May 2021**. The following are the concentrations of various parameters at the monitoring stations:

| S.No. | Parameter         |   | Concentration                    |
|-------|-------------------|---|----------------------------------|
| 1.    | PM <sub>2.5</sub> | : | 3<br>16.2 to 34.7μg/m            |
| 2.    | PM <sub>10</sub>  | : | <sup>3</sup><br>26.9 to 57.9μg/m |
| 3.    | SO <sub>2</sub>   | : | 6.1 to 9.4µg/m <sup>3</sup>      |
| 4.    | NO <sub>X</sub>   | : | 6.5 to 12.6μg/m <sup>3</sup>     |
| 5.    | СО                | : | 311 to 847µg/m                   |

| TableNo.2.1 : Ambient | Air Quality | Summary |
|-----------------------|-------------|---------|
|-----------------------|-------------|---------|

## 2.2 Water Quality

2.2.1 Surface Water Quality

Lorr nadhi- Adjacent (East), Ghurinala –Adjacent (North)&Kharoon River - 6.1 Kms (East)are present within 10 Km. radius of the project site. 2 no. of samples i.e. 60m Upstream & 60 m Downstream from Kharoon River and 6 other samples have been collected and analyzed for various parameters. The analysis of samples shows that all the parameters are in accordance with BIS-2296 specifications.

### 2.2.2 Ground Water Quality

8 No. of ground water samples from open wells / bore wells were collected from the nearby villages to assess ground water quality impacts and analyzed for various Physico-Chemical parameters. The analysis of samples shows that all the parameters are in accordance with BIS: 10500 specifications.

#### 2.3 Noise Levels

Noise levels were measured at 8 locations during daytime &Nighttime. The noise levels at the monitoring stations are ranging from 46.19dBA to 52.18dBA.

### 3.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

## 3.1 Prediction of impacts on air quality

The likely emissions from the proposed project are  $PM_{10}$ ,  $SO_2$ , NOx& CO. The predictions of Ground level concentrations have been carried out using Industrial Source Complex (ISC-3) model. Meteorological data such as wind direction, wind speed, max. and min. temperatures collected at the site have been used as input data to run the model.

The predicted max. Incremental  $PM_{10}$  concentrations (24 hourly) due to the proposed project will be 0.87µg/M<sup>3</sup> at a distance of 1400m from the stack in the down wind direction over the baseline concentrations.

The predicted incremental rise in Particulate Matter concentration due to the Vehicular emission will be  $1.19 \mu g/m^3$ .

Hence the total predicted incremental rise inParticulate Matter concentrationdue to the emission from proposed project and due the vehicular emissions will be  $0.87 \mu g/m^3 + 1.19 \mu g/m^3 = 2.06 \mu g/m^3$ .

The predicted max incremental SO<sub>2</sub> concentrations (24 hourly) due to the emissions from operation of proposed project will be  $7.49 \mu g/m^3$  at a distance of 1400 m from the stack in the down wind direction over the baseline concentrations.

The predicted max incremental NO<sub>2</sub> concentrations (24 hourly) due to the proposed project will be  $5.27 \mu g/m^3$  at a distance of 1400 m from the stack in the down wind direction over the baseline concentrations.

The predicted incremental rise in NO<sub>2</sub>concentration due to the Vehicular emission will be  $5.65 \mu g/m^3$ .

Hence the total predicted incremental rise in NO<sub>2</sub> concentration due to the emission from project and due the vehicular emission will be  $5.27 \mu g/m^3 + 5.65 \mu g/m^3 = 10.92 \mu g/m^3$ 

The predicted incremental rise in CO concentration due to the Vehicular emissions will be  $2.86\mu g/m^3$ .

# Table No.3.1: NET RESULTANT MAXIMUM CONCENTRATIONS DURING THE OPERATION OF THE PROPOSEDPROJECT

| ltem   | PM <sub>10</sub> | SO <sub>2</sub> | NO <sub>2</sub> | СО      |
|--|------------------|-----------------|-----------------|---------|
|  | (µg/m³)          | (µg/m³)         | (µg/m³)         | (µg/m³) |
| Maximum baseline conc. in the study area         | 57.9             | 9.4             | 12.6            | 847     |
| Maximum predicted incremental rise in            | 0.64             | 7.49            | 5.27            | Nil     |
| concentration due to proposed project (Point     |                  |                 |                 |         |
| Sources)   |                  |                 |                 |         |
| Maximum predicted incremental rise in            | 1.19             | Nil             | 5.65            | 2.86    |
| concentration due to proposed project (Vehicular |                  |                 |                 |         |
| emissions)                                       |                  |                 |                 |         |
| Net resultant concentrations during operation of | 59.73            | 16.89           | 23.52           | 849.86  |
| the proposed project                             |                  |                 |                 |         |
| National Ambient Air Quality Standards           | 100              | 80              | 80              | 2000    |

The net resultant Ground level concentrations during operation of the proposed project are within the NAAQS. Hence, there will not be any adverse impact on air environment due to the proposed project.

## 3.2 Prediction of impacts on Noise quality

The major sources of noise generation in the proposed project will be STG, boilers, compressors, DG set, etc. Acoustic enclosures will be provided to the STG. The ambient noise levels will be within the standards prescribed by MoEF vide notification dated 14-02-2000 under the Noise Pollution (Regulation & Control), Rules 2000 i.e. the noise levels will be less than 75 dBA during day time and less than 70 dBA during night time. 26.64 Ha (65.82 Acres)of extensive greenbelt will be developed to further attenuate the noise levels. Hence there will not be any adverse impact due to noise on population in surrounding areas due to the proposed project.

#### 3.3 Prediction of impacts on Water Environment

The wastewater generated from DRI, SMS, Rolling Mill, Ferro alloys and power plant will be treated in Effluent Treatment plant and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development. Sanitary wastewater will be treated in STP. Treated sewage will be used for Greenbelt development. There will not be any effluent discharge outside the premises. ZLD will be followed. Hence there will not be any adverse impact on environment due to the proposed project.

## 3.4 Prediction of Impacts on Land Environment

The effluent will be treated to achieve SPCB standards. Zero effluent discharge will be adopted. All the required air pollution control systems will be provided to comply with CPCB / SPCB norms. All solid wastes will be disposed/utilized as per CPCB/SPCB norms. 26.64 Ha (65.82 Acres)of extensive greenbelt will be developed as per guidelines. Hence, there will not be any adverse impact on land environment due to the proposed project.

### 3.5 Socio - Economic Environment

There will be certain upliftment in Socio Economic status of the people in the area & development of the area due to the proposed project. Due to this the economic conditions, the educational and medical standards of the people living in the study area will certainly move upwards which will result in overall economic development, improvement in general aesthetic environment and increase in business opportunities.

#### 4.0 ENVIRONMENTAL MONITORING PROGRAMME

Post project monitoring will be conducted as per the guidelines of SPCB and MoEF&CC are tabulated below:

| S.No.  | Particulars                                     | Frequency of   | Duration of                       | Parameters required    |  |  |  |
|--------|---|--|-----------------------------------|------------------------|--|--|--|
|        |   | Monitoring   | sampling                          | to be monitored        |  |  |  |
| 1. Wat | 1. Water & Wastewater quality                   |  |                                   |                        |  |  |  |
| A.     | Water quality in the area                       | Once in a month except<br>for heavy metals which<br>will be monitored on<br>quarterly basis. | Composite sampling<br>(24 hourly) | As per IS: 10500       |  |  |  |
| В.     | Effluent at the Inlet<br>& Outlet of the<br>ETP | Once in a month  | Grab sampling<br>(24 hourly)      | As per EPA Rules, 1996 |  |  |  |

#### **TABLE NO.4.1: MONITORING SCHEDULE FOR ENVIRONMENTAL PARAMETERS**

PIONEER ENVIRO Laboratories & Consultants Pvt. Ltd **Executive Summary** 

| S.No.    | Particulars   | Frequency of<br>Monitoring      | Duration of<br>sampling                            | Parameters required to be monitored  |
|----------|---|---------------------------------|--|--|
| C.       | STP Inlet & Outlet                                      | Once in a month                 | Grab sampling<br>(24 hourly)                       | As per EPA Rules1996   |
| 2. Air ( | Quality   |                                 |  |  |
| А.       | Stack Monitoring  | Online monitors<br>(all stacks) |  | PM   |
|          |   | QuarterlyOnce                   |  | PM,SO <sub>2</sub> & NO <sub>2</sub>   |
| B.       | Ambient Air quality<br>(CAAQMS)                         | Continuous                      | Continuous   | PM <sub>10</sub> , SO <sub>2</sub> & NO <sub>2</sub>                             |
|          |   | QuarterlyOnce                   | 24 hours   | PM <sub>2.5</sub> , PM <sub>10</sub> , SO <sub>2</sub> ,<br>NO <sub>2</sub> & CO |
| С.       | Fugitive emissions                                      | QuarterlyOnce                   | 8 hours  | PM   |
| 3. Met   | eorological Data  |                                 |  |  |
|          | Meteorological data<br>to be monitored at<br>the plant. | Daily                           | Continuous<br>monitoring                           | Temperature, Relative<br>Humidity, rainfall,<br>wind direction & wind<br>speed.  |
| 4. Nois  | e level monitoring                                      |                                 |  |  |
|          | Ambient Noise levels                                    | Once in a month                 | Continuous for 24<br>hours with 1 hour<br>interval | Noise levels   |

## 5.0 ADDITIONAL STUDIES

No Rehabilitation and Resettlement is involved in the proposed project as there are no habitations in the project site. Hence no R & R study has been carried out.

## 6.0 **PROJECT BENEFITS**

With the establishment of the proposed project employment potential will increase. Land prices in the area will increase. The economic status of the people in the area will improve due to the proposed project. Periodic medical checkups will be carried out. Top priority will be given to locals in employment.

## 7.0 ENVIRONMENT MANAGEMENT PLAN

## 7.1 Air Environment

The following are air emission control systems proposed in the proposed project:

## Table No.7.1: Air Emission Control Systems Proposed

| S.No. | Source                      | Control Equipment                   | Particulate emission    |
|-------|-----------------------------|-------------------------------------|-------------------------|
|       |                             |                                     | at the outlet           |
| 1.    | DRI kilns with WHRB's       | Electro Static Precipitators (ESPs) | < 30 mg/Nm <sup>3</sup> |
| 2.    | Induction Furnaces with CCM | Fume Extraction system with bag     | < 30 mg/Nm <sup>3</sup> |

|    |  |  | at the outlet                  |
|----|--|--|--------------------------------|
|    |  | filters  |                                |
| 3. | Submerged Electric Arc Furnace               | 4 <sup>th</sup> Hole Fume Extraction system with bag filters   | < 30 mg/Nm <sup>3</sup>        |
| 4. | Re-heating furnaces attached to Rolling Mill | Heat Recuperator   | < 30 mg/Nm <sup>3</sup>        |
| 5. | FBC Boilers                                  | Electro Static Precipitators   | < 30 mg/Nm <sup>3</sup>        |
|    |  | Lime dosing  | <sup>3</sup><br>SOx< 100 mg/Nm |
|    |  | Low NOx burners with 3-stage<br>combustion, flue gas recirculation<br>and auto combustion control<br>system will be provided | NOx< 100 mg/Nm                 |

**Note** : Apart from the above Fume extraction system with bagfilters, dust suppression system, covered conveyers etc. will also be installed

Apart from the above the following air emission control systems/ measures are proposed in the Plant:

- > All conveyors will be completely covered with G.I. sheets to control fugitive dust.
- All bins will be totally packed and covered so that there will not be any chance for dust leakage.
- All the dust prone points material handling systems will be connected with de-dusting system with bag filters.
- All discharge points and feed points, wherever the possibility of dust generation is there a de-dusting suction point will be provided to collect the dust.

## 7.2 WasteWater

Total wastewater generation will be 1121 KLD.The wastewater generated from DRI, SMS, Rolling mill, Ferro Alloys, Power plant will be treated ETP and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development. Air Cooled condensers will be provided in the power plant, which will reduce the water consumption significantly. Hence wastewater generation will also be minimized.Sanitary wastewater will be treated in STP.

## TREATED EFFLUENT DISPOSAL

| Effluent quantity to be used for ash and slag quenching | : | 180 m³/day |
|---|---|------------|
| Effluent to be used for dust suppression in CHP         | : | 119 m³/day |

Effluent to be used for Greenbelt development : 700 m<sup>3</sup>/day

26.64 Ha. (65.8 Acres) of greenbelt will be developed within the plant premises by using the treated effluent. A dedicated pipe distribution network will be provided for using the treated effluent for greenbelt development.

## 7.3 Noise Environment

The major sources of noise generation in the proposed project will be STG, boilers, compressors, DG set, etc. Acoustic enclosure will be provided. All the machinery will be manufactured in accordance with MoEF&CC norms on Noise levels. The employees working near the noise generating sources will be provided with earplugs. The extensive greenbelt development proposed within the plant premises will help in attenuating the noise levels further. Noise barriers in the form of trees are recommended to be grown around administrative block and other utility units.

#### 7.4 Land Environment

The wastewater generated from the proposed project will be treated in the Effluent Treatment Plant to comply with the SPCB standards and will be used for dust suppression, ash conditioning and for greenbelt development. All the required Air emission control systems will be installed and operated to comply with SPCB norms. Solid wastes will be disposed off as per norms. Extensive greenbelt will be developed in the plant premises. Desirable beautification and landscaping practices will be followed. Hence there will not be any impact due to the proposed project.

| Waste / By product  | Quantity<br>(TPA)   | Proposed method of disposal   |
|---------------------|---|---|
| Ash from DRI        | 1,58,400  | Will be utilised in the proposed Brick Manufacturing  |
|                     |   | Unit  |
| Dolochar            | 1,34,640  | Will be used in proposed AFBC power plant as fuel.  |
| Char                | 71,280  | will be given to brick kiln units.  |
| Kiln Accretion Slag | 9,504   | Will be utilised in the proposed Brick Manufacturing  |
|                     |   | Unit  |
| Wet scrapper sludge | 19,800  | Will be utilised in the proposed Brick Manufacturing  |
|                     |   | Unit  |
| Bag Filter Dust     | 13,464  | Will be utilised in the proposed Brick Manufacturing  |
|                     |   | Unit  |
| SMS Slag            | 1,29,360  | Slag from SMS will be crushed and iron will be  |
|                     |   | recovered & then remaining non -magnetic material   |
|                     |   | being inert by nature will be utilised in the proposed  |
|                     |   | Brick Manufacturing Unit.   |
|                     | Waste / By product<br>Ash from DRI<br>Dolochar<br>Char<br>Kiln Accretion Slag<br>Wet scrapper sludge<br>Bag Filter Dust<br>SMS Slag | Waste / By productQuantity<br>(TPA)Ash from DRI1,58,400Dolochar1,34,640Char71,280Kiln Accretion Slag9,504Wet scrapper sludge19,800Bag Filter Dust13,464SMS Slag1,29,360 |

| sal |
|-----|
| )   |

| S.No. | Waste / By product                 | Quantity<br>(TPA) | Proposed method of disposal   |
|-------|------------------------------------|-------------------|---|
| 8.    | End Cuttings from<br>Rolling Mill  | 7,000             | Will be reused in the SMS   |
| 9.    | Mill scales from Rolling<br>Mill   | 7,000             | Will be reused in Ferro Alloy units   |
| 10.   | Ash+ cinder from coal gasifier     | 43,400            | Will be utilised in the proposed Brick Manufacturing Unit                       |
| 11.   | Mill scales from Wire drawing mill | 2,000             | Will be reused in the SMS   |
| 12.   | Ash from Power Plant               | 3,49,423          | Will be utilized in the proposed brick manufacturing unit                       |
| 13.   | Slag from FeMn                     | 77,220            | Will be reused in manufacture of SiMn as it contains high $SiO_2$ and Silicon.  |
| 14.   | Slag from SiMn                     | 87,120            | will be used for Road construction / will be given to slag cement manufacturing |

## 7.5 Greenbelt Development

Greenbelt of 26.64 Ha (65.82 Acres) of extensive greenbelt will be developed in the plant premises. 20 to 167 mwide greenbelt will be developed all around the plant.

| Capital Cost for Environment Protection for proposed plant | : Rs.135.23Crores |
|--|-------------------|
| Recurring Cost per annum for Environmental protection      | : Rs.20.15Crores  |

## **11.7.7 Implementation of CREP Recommendations**

All the CREP recommendations will be strictly followed.