

SUMMARY ON ENVIRONMENTAL IMPACT ASSESSMENT REPORT

OF

L N Steel and Alloys Pvt. Ltd.

[Establishment of Pellet Plant of 4,95,000 TPA, Gasifier for Pellet plant 21000 Nm³/Hr, DRI Kilns to produce Sponge Iron of (4 x 250 TPD) 3,30,000 TPA, Induction Furnaces along with LRF & CCM to produce Hot Billets /MS Billets /Ingots of 2,97,000 TPA, Rolling Mill along with reheating furnace to produce TMT bars / Structural Steel of 3,30,000 TPA (through 85 % Hot charging with Hot Billets and remaining 15% through RHF with LDO), Gasifier for Reheating Furnace 2970 Nm³/Hr, Oxygen Plant -4 TPD, Ferro Alloys Unit (2x 9 MVA - (FeSi - 14,000 TPA / FeMn - 40,000 TPA / SiMn -28,000 TPA / FeCr - 30,000 TPA / Pig Iron - 48,000 TPA) , Brick Manufacturing Unit – 60,000 Bricks/Day, Briquetting Plant 200 Kg./Hr., Power generation through WHRB of (4x7.5MW), 30 MW and through FBC based Power Plant of (1 x 10 MW)- 10 MW]

at

Badiadih & Lamti Villages, Patharia Tehsil, Mungeli District, Chhattisgarh

Submitted to

CHHATTISGARH ENVIRONMENT CONSERVATION BOARD

1.0 PROJECT DESCRIPTION

L N Steel and Alloys Pvt. Ltd. is proposing to establish a Steel Plant, a Greenfield Project, comprising of Establishment of Pellet Plant of 4,95,000 TPA, Gasifier for Pellet plant 21000 Nm³/Hr, DRI Kilns to produce Sponge Iron of (4 x 250 TPD) 3,30,000 TPA, Induction Furnaces along with LRF & CCM to produce Hot Billets /MS Billets /Ingots of 2,97,000 TPA, Rolling Mill along with reheating furnace to produce TMT bars / Structural Steel of 3,30,000 TPA (through 85 % Hot charging with Hot Billets and remaining 15% through RHF with LDO), Gasifier for Reheating Furnace 2970 Nm³/Hr, Oxygen Plant -4 TPD, Ferro Alloys Unit (2x 9 MVA - (FeSi - 14,000 TPA / FeMn - 40,000 TPA / SiMn -28,000 TPA / FeCr - 30,000 TPA / Pig Iron - 48,000 TPA) , Brick Manufacturing Unit – 60,000 Bricks/Day, Briquetting Plant 200 Kg./Hr., Power generation through WHRB of (4 x 7.5MW), 30 MW and through FBC based Power Plant of (1 x 10 MW)- 10 MW.

Total land identified for the proposed project is **25.757 Ha.** Out of which, **22.862 Ha.** is registered in the name of company and agreement has been entered with land owners for remaining **2.895 Ha.** of land

As per the Ministry of Environment, Forests & Climate Change, New Delhi, EIA notification 14th September 2006 & its subsequent amendments, all Primary metallurgical processing industries are listed under S.No. 3(a), under Category 'A'. The Ministry of Environment, Forests & Climate Change, New Delhi has accorded Terms of Reference (TOR) for the proposed project vide letter no. **F.No. IA-J-11011/377/2023-IA-II (IND-I)**, dated **21st February 2024**. The EIA Report has been prepared by incorporating the TOR stipulated by the Hon'ble EAC.

Pioneer Enviro Laboratories & Consultants Private Limited, Hyderabad, which is accredited by NABET, Quality Council of India, vide certificate No. NABET/EIA/2225/RA 0282, for preparing EIA report for Metallurgical Unit, have prepared Environmental Impact Assessment (EIA) report for the proposed project by incorporating the TOR approved by Ministry of Environment, Forests & Climate Change, New Delhi. The report contains detailed description of the following:

- Characterization of status of environment within an area of 10 km radius from the plant for major environmental components including air, water, noise, soil, flora, fauna and socio-economic 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.
- Post Project Environmental Monitoring & Budget for Environmental Protection Measures.

1.1 ENVIRONMENTAL SETTING WITHIN 10 Km. RADIUS OF THE PROJECT SITE

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

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

| S.No. | Salient Features / Environmental features | Distance w.r.t. site / Remarks |
|-------|--|--|
| 1. | Type of Land | Agricultural Land and same will be converted for Industrial use |
| 2. | Type of Land (Study Area) | As per LULC the land use within 10 Km. is as follows: Settlements – 3.9 %; Industrial area - 1.7 %; Tanks / River – 10.4 %; Single crop – 65.8 %; Double crop – 7.6 %; Plantation - 1.4 %; Land with scrub – 5.2 %; Land without scrub - 2.6 %; Mining area – 1.4. |
| 3. | National Park/ Wildlife sanctuary / Biosphere reserve / Tiger Reserve / Elephant Corridor / migratory routes for Birds | There are no notified National Park/ Wild life sanctuary / Biosphere reserve / Tiger Reserve/ migratory routes for Birds within 10 Km. radius of the plant. |
| 4. | Historical places / Places of Tourist importance / Archeological sites | Nil |
| 5. | Critically polluted area as per MoEF&CC Office Memorandum dated 13 th January 2010 | Nil And also the Plant area does not fall in the areas given in Hon'ble NGT order issued vide dated 10 th July 2019. |
| 6. | Defence Installations | Nil |
| 7. | Nearest village | Badiadih – 0.3 Kms. / SE Direction |
| 8. | No. of Villages in the Study Area | 82 nos. |
| 9. | Nearest Hospital | <ul style="list-style-type: none">• Health care centre Madawani, Kartala – 2.5 km /NW• The Leprosy Mission Hospital, Baitalpur- 2.2 km/W |

| S.No. | Salient Features / Environmental features | Distance w.r.t. site / Remarks |
|-------|---|---|
| | | <ul style="list-style-type: none"> • Evangelical Mission Hospital, Baitalpur – 2.4 km /W • Government Hospital Sargaon – 5.2 km/NE |
| 10. | Nearest School | <ul style="list-style-type: none"> • Govt. Secondary School at Badiadih – 0.36 Kms. - South Direction • Govt. Higher Secondary School, Madku – 0.87 Kms. - South Direction • Government Higher Secondary School, Chandrakh – 3.4 km/WSW |
| 11. | Forests | Nil |
| 12. | Water body | <ul style="list-style-type: none"> • Water Pond exists in the site in the Southern side & same will be utilized as Water Reservoir • Linjua Nala – Adjacent /W • Shivrath River – 0.7 km/SE • Tesuwa River - 6.2 km /N • Maniyari River – 9.3 km/ENE |
| 13. | Nearest Highway | NH # 130 – 2.0 Kms. West Direction (By Road) |
| 14. | Nearest Railway Station | Dagori Rly. Stn. – 20.0 Kms. / ESE (By Road) |
| 15. | Nearest Port facility | Nil |
| 16. | Nearest Airport | Raipur Airport- 76.5 kms/SW (by Aerial) |
| 17. | Nearest Interstate Boundary | Nil within 15 Km. radius |
| 18. | Seismic zone as per IS-1893 | Seismic zone – II |
| 19. | R & R | Not applicable as there are no habitations in the proposed project land. |
| 20. | Litigation / court case is pending against the proposed project / proposed site and or any direction passed by the court of law against the project | Nil |

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.No. | Units (Products) | Plant Configuration (Production Capacity) |
|-------|--|---|
| 1. | Pellet plant (Pellet) | 1 x 1500 TPD (4,95,000 TPA) |
| 2. | Gasifier for Pellet plant | 21,000 NM ³ /Hr. |
| 3. | DRI Kilns (Sponge Iron) | 4 x 250 TPD (3,30,000 TPA) |
| 4. | Induction Furnaces (Hot Billets / MS Billets / Ingots) | 6 x 15 T (2,97,000 TPA) |

| S.No. | Units (Products) | Plant Configuration (Production Capacity) | |
|-------|---|--|-------|
| 5. | Rolling Mills (TMT bars / Structural Steel) (85 % Hot charging with Hot Billets and remaining 15% through RHF with LDO as fuel) | 2 x 500 TPD (3,30,000 TPA) | |
| 6. | Gasifier for Reheating Furnace | 2,970 Nm ³ /Hr. | |
| 7. | Oxygen Plant | 4 TPD | |
| 8. | Ferro Alloys Unit (FeSi/ FeMn/ SiMn/ FeCr/Pig Iron) | 2 x 9 MVA (FeSi - 14,000 TPA / FeMn - 40,000 TPA / SiMn - 28,000 TPA / FeCr - 30,000 TPA / Pig Iron - 48,000 TPA) | |
| 9. | Brick Manufacturing Unit | 60,000 Brick/Day | |
| 10. | Briquette Plant | 200 Kg./Hr. | |
| 11. | Power Plant (40 MW) | WHRB Power Plant (4 x 7.5 MW) | 30 MW |
| | | FBC Power Plant (1 x 10 MW) | 10 MW |

1.3 RAW MATERIAL REQUIREMENT

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 (TPA) | Sources | Distance from site (in Kms.) | Mode of Transport |
|-------|--|-----------------------|--------------------------------------|------------------------------|--|
| 1. | Pellet Plant (Pellets) - 4,95,000 TPA | | | | |
| a) | Iron Ore Concentrate / Iron ore fines | 5,29,650 | Chhattisgarh / Orissa | ~ 200 Kms. | By rail & road (through covered trucks) |
| b) | Bentonite | 4,455 | Gujarat | ~ 600 Kms. | By rail & road (through covered trucks) |
| c) | Limestone | 24,750 | Chhattisgarh | ~ 100 Kms. | By road (through covered trucks) |
| d) | Anthracite Coal | 4,950 | SECL Chhattisgarh / MCL Odisha | ~ 500 Kms. | By rail & road (through covered trucks) |
| e) | Coal for Gasifier | Indian Coal 63,000 | SECL Chhattisgarh / MCL Odisha | ~ 500 Kms. | By rail & road (through covered trucks) |

| S.No. | Raw Material | | Quantity (TPA) | Sources | Distance from site (in Kms.) | Mode of Transport |
|-------|---|---------------|----------------|---|------------------------------|--|
| | (21,000 Nm ³ /hr.) | Imported Coal | 40,320 | Indonesia / South Africa / Australia | ~ 600 Kms. (from Vizag Port) | Through sea route, rail route & by road (through covered trucks) |
| 2. | DRI Kilns (Sponge Iron) – 3,30,000 TPA (4 x 250 TPD) | | | | | |
| a) | Pellets (100 %) | | 4,95,000 | Own generation | --- | Through covered conveyers & By road (through covered trucks) |
| | or | | | | | |
| b) | Iron ore (100%) | | 5,28,000 | Barbil, Orissa NMDC, Chhattisgarh | ~ 500 Kms. | By rail & road (through covered trucks) |
| c) | Coal | Indian | 4,29,000 | SECL Chhattisgarh / MCL Odisha | ~ 500 Kms. | By rail & road (through covered trucks) |
| | | Imported | 2,74,560 | Indonesia / South Africa / Australia | ~ 600 Kms. (from Vizag Port) | Through sea route, rail route & by road (through covered trucks) |
| d) | Dolomite | | 16,500 | Chhattisgarh | ~ 100 Kms. | By road (through covered trucks) |
| 3. | Steel Melting Shop (Hot Billets /MS Ingots/ Ingots) – 2,97,000 TPA (6 x 15T) | | | | | |
| a) | Sponge Iron | | 3,00,000 | Own generation | --- | Through covered conveyers |
| b) | MS Scrap / Pig Iron | | 45,000 | Chhattisgarh | ~ 100 Kms. | By road (through covered trucks) |
| c) | Ferro alloys | | 15,000 | Own generation | --- | By road (through covered trucks) |
| 4. | Rolling Mill through Hot charging & Reheating Furnace (Rolled Products) – 3,30,000 TPA | | | | | |
| a) | Hot Billets | | 2,91,720 | Own generation | --- | --- |
| b) | Billets / Ingots | | 54,450 | Own generation & Purchased from outside | ~ 100 Kms. | By road (through covered trucks) |

| S.No. | Raw Material | | Quantity (TPA) | Sources | Distance from site (in Kms.) | Mode of Transport |
|-----------|--|---------------|----------------|--------------------------------------|------------------------------|--|
| c) | Coal for Gasifier (2970 Nm ³ /hr) | Indian Coal | 8910 | SECL Chhattisgarh / MCL Odisha | ~ 500 Kms. | By rail & road (through covered trucks) |
| | | Imported Coal | 5702 | Indonesia / South Africa / Australia | ~ 600 Kms. (from Vizag Port) | Through sea route, rail route & by road (through covered trucks) |
| d) | LDO | | 1603 Kl/annum | Nearby IOCL Depot | ~ 100 Kms. | By road (through Tankers) |
| 5. | FBC Boiler [Power Generation - 1 x 10 MW] | | | | | |
| a) | Indian Coal (100 %) | | 59,400 | SECL Chhattisgarh / MCL Odisha | ~ 500 Kms. | By rail & road (through covered trucks) |
| OR | | | | | | |
| b) | Imported Coal (100 %) | | 38,016 | Indonesia / South Africa / Australia | ~ 600 Kms. (from Vizag Port) | Through sea route, rail route & by road (through covered trucks) |
| OR | | | | | | |
| c) | Dolochar + Indian Coal | Dolochar | 99,000 | In plant generation | --- | through covered conveyors |
| | | Indian Coal | 9,900 | SECL Chhattisgarh / MCL Odisha | ~ 500 Kms. | By rail & road (through covered trucks) |
| OR | | | | | | |
| d) | Dolochar + Imported Coal | Dolochar | 99,000 | In plant generation | --- | through covered conveyors |
| | | Imported Coal | 6,336 | Indonesia / South Africa / Australia | ~ 600 Kms. (from Vizag Port) | Through sea route, rail route & by road (through covered trucks) |
| 6. | For Ferro Alloys (2 x 9 MVA) | | | | | |
| 6 (i) | <i>Ferro Silicon – 14,000 TPA</i> | | | | | |
| a) | Quartz | | 30,800 | Chhattisgarh / Andhra Pradesh | ~ 500 Kms. | By road (through covered trucks) |
| b) | Mill Scale & M.S. Scrap | | 6,300 | In house Generation | --- | By road (through covered trucks) |
| c) | Char Coal / Coke | | 21,700 | In house Generation | --- | By road (through covered trucks) |
| d) | Electrode paste | | 1,400 | Andhra Pradesh | ~ 500 Kms. | By road |

| S.No. | Raw Material | Quantity (TPA) | Sources | Distance from site (in Kms.) | Mode of Transport |
|---------|--------------------------------------|----------------|-------------------------------|------------------------------|--|
| | | | | | (through covered trucks) |
| e) | Briquetted Bag filter dust | 980 | Maharashtra / West Bengal | ~ 300 Kms. | By road (through covered trucks) |
| 6 (ii) | <i>Ferro Manganese – 40,000 TPA</i> | | | | |
| a) | Manganese Ore | 96,000 | MOIL / OMC | ~ 500 Kms. | By Rail & Road (through covered trucks) |
| b) | Coke | 12,000 | Andhra Pradesh | ~ 500 Kms. | By road (through covered trucks) |
| c) | MS scrap / Mill scales | 8,000 | Chhattisgarh / Andhra Pradesh | ~ 500 Kms. | By road (through covered trucks) |
| d) | Electrode paste | 880 | Inhouse Generation | --- | By road (through covered trucks) |
| 6 (iii) | <i>Silico Manganese – 28,000 TPA</i> | | | | |
| a) | Manganese Ore | 56,000 | MOIL / OMC | ~ 500 Kms. | By Rail & Road (through covered trucks) |
| b) | FeMn Slag | 12,600 | Andhra Pradesh | ~ 500 Kms. | By road (through covered trucks) |
| c) | Coke | 8,400 | In house generation | --- | ---- |
| d) | Dolomite | 8,400 | Chhattisgarh / Andhra Pradesh | ~ 500 Kms. | By road (through covered trucks) |
| e) | Electrode paste | 560 | Maharashtra / West Bengal | ~ 300 Kms. | By road (through covered trucks) |
| f) | Quartz | 9,800 | Chhattisgarh / Andhra Pradesh | ~ 500 Kms. | By road (through covered trucks) |
| g) | Briquetted Bagfilter dust | 420 | Own generation | --- | --- |
| 6 (iv) | <i>For Ferro Chrome – 30,000 TPA</i> | | | | |
| a) | Chrome Ore | 72,000 | Sukinda, Odisha | ~ 500 Kms. ~ 600 Kms. | By road (through covered trucks) From Port By Road |

| S.No. | Raw Material | Quantity (TPA) | Sources | Distance from site (in Kms.) | Mode of Transport |
|-------|---------------------------|----------------|-----------------------------------|------------------------------|---|
| | | | Import, South Africa | (from Vizag Port) | (through covered Trucks) |
| b) | LAM Coke | 15,000 | Andhra Pradesh | ~ 500 Kms. | By road (through covered trucks) |
| c) | Quartz | 1,830 | Chhattisgarh / Andhra Pradesh | ~ 500 Kms. | By road (through covered trucks) |
| d) | MS Scrap / Mill Scale | 4,500 | Inhouse Generation | --- | By road (through covered trucks) |
| e) | Magnetite / Bauxite | 4,500 | Chhattisgarh / Maharashtra | ~ 500 Kms. | By road (through covered trucks) |
| f) | Electrode Paste | 600 | Maharashtra / West Bengal | ~ 300 Kms. | By road (through covered trucks) |
| g) | Briquetted Bagfilter dust | 600 | Own generation | --- | --- |
| 6 (v) | For Pig Iron-48,000 TPA | | | | |
| a) | Iron Ore | 52,560 | Barbil, Orissa NMDC, Chhattisgarh | ~ 500 Kms. | By rail & road (through covered trucks) |
| b) | Mill Scale | 31,200 | Andhra Pradesh | ~ 500 Kms. | By road (through covered trucks) |
| c) | Coke | 30,144 | Chhattisgarh / Andhra Pradesh | ~ 500 Kms. | By road (through covered trucks) |
| d) | Limestone | 7,200 | Chhattisgarh / Andhra Pradesh | ~ 500 Kms. | By road (through covered trucks) |
| e) | Fluorspar | 1,200 | Maharashtra / West Bengal | ~ 300 Kms. | By road (through covered trucks) |
| f) | Dolomite | 7,200 | Own generation | --- | --- |

1.4 MANUFACTURING PROCESS

1.4.1 Pelletization

Iron ore fines will be grinded in Ball mills. The concentrate will be fed to thickener and subsequently to filtering unit. The filter cake will be sent to pellet plant comprising of

Travelling grate kiln. Green pellets will be produced from this process. The flue gases from grate kiln will be treated in ESP and discharged through a stack

1.4 .2 Sponge Iron (DRI)

The proposal consists of 4 x 250 TPD to manufacture 3,30,000 TPA of Sponge Iron with 30.0 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°C enters the reduction zone. Temperature of the order of 1050°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.

1.4.3 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 be 6 x 15 T Induction furnaces to manufacture Hot Billets / MS Billets / Ingots of 2,97,000 TPA. Either the Hot Billets produced from LRF will be directly sent to Strip Mill without using Re-heating Furnace through Hot charging method (or) Billets / Ingots will be sent to Re-heating Furnace to reheat the Billets and then sent to Rolling Mill to manufacture Rolled Products. The flue gases will be treated in fume extraction system with bagfilters.

1.4.4 Rolling Mill

The Hot Billets produced from Induction Furnaces will be directly sent to Strip Mill to produce Rolled Products (OR) Hot Billets will be cooled and stored will be sent to reheating furnaces for the heating and will be sent to Strip Mill. Furnace will be heated with either LDO / Producer Gas. Rolling Mills (2 x 500 TPD) will be installed in the present proposal to produce 3,30,000 TPA of Rolled Products.

1.4.4 Submerged Electric Arc Furnace

Submerged Electric Arc Furnace (2 x 9 MVA) will be setup in the proposed project. Ferro Manganese, Silicon Manganese will be produced using manganese ore as main raw material, Ferro Silicon will be produced using Quartz as main raw material & Ferro Chrome will be produced using Chrome Ore as main raw material in a sub-merged arc furnace using reducer (Coke) under high voltage. Flue gases will be extracted through 4th hole and then treated in bag filters.

1.4.5 Power Generation

Through WHRB Boiler

The hot flue gases from proposed 4 x 250 TPD DRI kilns will pass through waste heat recovery Boiler to recover the heat and to generate (4 x 7.5 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 atmosphere through stacks of adequate height.

Through FBC Boiler

Coal (Imported / Indian) along with dolochar will be used as fuel in FBC Boilers to generate 10 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.

1.4.7 Fly Ash Brick Manufacturing Unit

It is proposed to establish Fly Ash brick making unit of 60,000 bricks/day capacity. Fly ash (70%), Gypsum (5%), cement (10%) and Stone dust (15%) are manually feed into a pan mixer where water is added to the required proportion for homogeneous mixing. The proportion of raw material may vary depending upon quality of raw materials.

1.5 Water Requirement

- Water required for the proposed project will be 2060 KLD. This includes make up water for Pellet Plant, DRI Kilns, Induction Furnaces, Rolling Mill, Ferro Alloys Unit, Coal Gasifier, Brick manufacturing unit & for Domestic requirement.
- Water required for proposed project (for process and domestic) will be met from Shivrath river (which is at a distance of 0.7 Kms. SE from the project site). A dedicated pipeline will be laid from the river to the project site.
- Water drawl permission from Water Resource Department, Chhattisgarh is in the process.
- Air cooled condensers will be provided to FBC Power plant instead of water-cooled condensers to reduce the water consumption significantly

Table No.1.4: Water Requirement Breakup

| S.No. | Unit | Quantity in KLD |
|-------|--------------------------|-----------------|
| 1. | Pellet Plant | 125 |
| 2. | Gasifier | 20 |
| 3. | DRI Kilns | 330 |
| 4. | Induction Furnaces | 210 |
| 5. | Rolling Mills | 300 |
| 6. | Ferro Alloys | 60 |
| 7. | Power Plant (WHRB & FBC) | 960 |
| | • Cooling tower makeup | 462 |
| | • Boilers make up | 346 |
| | • DM plant Regeneration | 152 |
| 8. | Brick Manufacturing unit | 10 |
| 9. | Briquetting Plant | 10 |

| S.No. | Unit | Quantity in KLD |
|-------|--------------|-----------------|
| 10. | Domestic | 25 |
| | Total | 2060 |

1.6 Wastewater Generation

- Total effluent generated from the proposed project will be **446 KLD**.
- There will be no effluent discharge from the Sponge Iron unit as closed-circuit cooling system will be adopted.
- Effluent from Pelletisation plant, Induction Furnace, Ferro Alloys & Power Plant will be treated in ETP and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development.
- Effluent from Coal gasifier (phenolic effluent) will be used in ABC chamber for quenching in DRI Units.
- Effluent from Rolling Mill will be sent to settling tank & will be recycled through closed circuit cooling system.
- 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 generated from proposed project will be treated in proposed STP and after treatment the treated sewage will be used for greenbelt development.
- Garland drains will be provided around all the raw material stacking areas.
- During monsoon the treated effluent will be utilized as makeup water in Rolling Mill. Accordingly, the makeup water for Rolling mill also reduces during the rainy period.
- Zero Liquid Discharge (ZLD) will be maintained in the proposed project.

Table No.1.5: Breakup of Wastewater Generation

| S.No. | Source | Generation (KLD) |
|-------|----------------------------------|------------------|
| 1. | Pellet Plant | 7 |
| 2. | DRI Unit | --- |
| 3. | Induction Furnace | 20 |
| 4. | Rolling Mill | 15 |
| 5. | Ferro Alloys | 4 |
| 6. | Coal Gasifier | 16 |
| 7. | Power Plant | 364 |
| | a) Cooling Tower blowdown | 115 |
| | b) Boilers blowdown | 97 |
| | c) D.M. plant regeneration water | 152 |
| 8. | Sanitary Wastewater | 20 |

| S.No. | Source | Generation (KLD) |
|-------|--------------|------------------|
| | Total | 446 |

1.7 Wastewater Characteristics

The following are the Characteristics of wastewater.

Table No. 1.6: Characteristics of Effluent

| PARAMETER | CONCENTRATION | | | |
|---------------------|------------------------|-----------------------|-----------------|----------------------|
| | Cooling Tower blowdown | DM Plant Regeneration | Boiler Blowdown | Sanitary waste water |
| pH | 7.0 – 8.0 | 5.0 – 10.0 | 9.5 – 10.5 | 7.0 – 8.5 |
| BOD (mg/l) | -- | -- | -- | 200 – 250 |
| COD (mg/l) | -- | -- | -- | 300 – 400 |
| TDS (mg/l) | 1000 | 5000 – 6000 | 1000 mg/l | 800 – 900 |
| Oil & Grease (mg/l) | -- | 10 | -- | 5 - 10 |
| TSS (mg/l) | -- | -- | -- | 150-200 |

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 plant.

2.1 Ambient air quality

Ambient air quality was monitored for PM_{2.5}, PM₁₀, SO₂, NO_x & CO at 8 stations including project site during **1st March 2023 to 31st May 2023**. The following are the concentrations of various parameters at the monitoring stations:

Table No.2.1: AAQ Data Summary

| S.No. | Parameter | Concentration range (µg/m ³) | Standard as per NAAQS (µg/m ³) |
|-------|-------------------|--|--|
| 1. | PM _{2.5} | 15.3 to 26.2 | 60 |
| 2. | PM ₁₀ | 25.1 to 43.5 | 100 |
| 3. | SO ₂ | 9.3 to 15.4 | 80 |
| 4. | NO _x | 10.8 to 16.5 | 80 |
| 5. | CO | 425 to 1025 | 2000 |

2.2 Water Quality

2.2.1 Surface Water Quality

2 no. of samples i.e. from Shivanth River is flowing at a distance of 0.7 Kms. from the project site, has 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 equivalent day-night noise levels in the study zone are ranging from **47.58 dBA to 54.00 dBA**.

3.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

3.1 Prediction of impacts on air quality

The likely emissions from the proposed project are PM₁₀, SO₂, NO_x & 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.

Table No. 2.2: NET RESULTANT MAXIMUM CONCENTRATIONS DURING THE OPERATION OF THE PROPOSED PROJECT (APCS WORKING SCENARIO)

| Item | PM _{2.5} (µg/m ³) | PM ₁₀ (µg/m ³) | SO ₂ (µg/m ³) | NO _x (µg/m ³) | CO (µg/m ³) |
|--|---|--|---|---|----------------------------|
| Maximum baseline conc. in the study area | 26.20 | 43.50 | 15.40 | 16.50 | 1025.00 |
| Maximum predicted incremental rise in concentration due to proposed project (Point Sources) | 1.33 | 2.24 | 9.81 | 14.03 | 0.75 |
| Maximum predicted incremental rise in concentration due to proposed project (Vehicular emissions) | 0.43 | 0.59 | --- | 4.31 | 2.78 |
| Net resultant concentrations during operation of the proposed project | 27.96 | 46.33 | 25.21 | 34.84 | 1028.53 |
| National Ambient Air Quality Standards | 60 | 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. | | | | | |

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. **8.989 Ha.** 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

- Total wastewater generation will be **446 KLD**.
- There will be no effluent discharge from the Sponge Iron unit as closed-circuit cooling system will be adopted.
- Effluent from Pelletisation plant, Induction Furnace, Ferro Alloys & Power Plant will be treated in ETP and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development.
- Effluent from Coal gasifier (phenolic effluent) will be used in ABC chamber for quenching in DRI Units.
- Effluent from Rolling Mill will be sent to settling tank & will be recycled through closed circuit cooling system.
- 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 generated from proposed project will be treated in proposed STP and after treatment the treated sewage will be used for greenbelt development.
- Garland drains will be provided around all the raw material stacking areas.
- During monsoon the treated effluent will be utilized as makeup water in Rolling Mill. Accordingly, the makeup water for Rolling mill also reduces during the rainy period.
- Zero Liquid Discharge (ZLD) will be maintained in 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. **8.989 Ha.** 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:

TABLE NO.4.1: MONITORING SCHEDULE FOR ENVIRONMENTAL PARAMETERS

| S.No. | Particulars | Frequency of Monitoring | Duration of sampling | Parameters required to be monitored |
|---|---|--------------------------------------|-----------------------------------|---|
| 1. Water & Waste water quality | | | | |
| A. | Water quality in the area | Quarterly Once | Grab sampling | As per IS: 10500 |
| B. | Effluent at the inlet & outlet of the ETP | Twice in a month | Composite Sampling (24 hourly) | As per EPA Rules, 1996 |
| C. | Sanitary Wastewater (inlet & outlet of STP) | Twice in a month | Composite Sampling (24 hourly) | As per EPA Rules, 1996 |
| 2. Air Quality | | | | |
| A. | Stack Monitoring | CEMS (all Stacks) Once in a month | -- -- | PM, SO ₂ & NO _x PM, SO ₂ & NO _x |
| B. | Ambient Air quality | CAAQMS Quarterly Once | continuously 24 Hourly | PM _{2.5} , PM ₁₀ , SO ₂ , NO _x PM _{2.5} , PM ₁₀ , SO ₂ , NO _x & CO |
| C. | Fugitive emissions | Once in a Month | 8 hours | PM |
| 3. Meteorological Data | | | | |
| A. | Meteorological data to be monitored at the plant. | Daily | Continuous monitoring | Temperature, Relative Humidity, rainfall, wind direction & wind speed. |

| S.No. | Particulars | Frequency of Monitoring | Duration of sampling | Parameters required to be monitored |
|----------------------------|----------------------|--------------------------|--|-------------------------------------|
| 4. Noise level monitoring | | | | |
| A. | Ambient Noise levels | Once in a month (Hourly) | Continuous for 24 hours with 1-hour interval | Noise levels |
| 5. Soil Quality monitoring | | | | |
| A. | Soil Quality | Half yearly once | Core drilling sample | pH, SAR, texture, N,P,K, etc. |

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 | Emission at the outlet |
|-------|--|--|------------------------------|
| 1. | Pellet Plant | Electro Static Precipitators (ESP) | PM <30 mg/Nm ³ |
| 2. | DRI kilns with WHRB's | Electro Static Precipitators (ESP) | PM < 30 mg/Nm ³ |
| 3. | Induction Furnaces with CCM | Fume Extraction system with PTFE bag filters | PM < 30 mg/Nm ³ |
| 4. | Submerged Electric Arc Furnace | 4 th Hole Fume Extraction system with bag filters | PM < 30 mg/Nm ³ |
| 5. | Re-heating furnaces attached to Rolling Mill | Stack | PM < 30 mg/Nm ³ |
| 6. | FBC Boiler | Electro Static Precipitators | PM < 30 mg/Nm ³ |
| | | Limestone will be used as bed material and act as sulphur absorbent. Lime dosing will also be done | SOx < 100 mg/Nm ³ |

| S.No. | Source | Control Equipment | Emission at the outlet |
|-------|--------|---|------------------------------|
| | | Combustion temperature will be around 800-850°C, which is not conducive for thermal NOx formation. Low NOx burners with 3-stage combustion, flue gas recirculation and auto combustion control system will be provided. | NOx < 100 mg/Nm ³ |

Note: Apart from the above Dry fog system with dust suppression at transfer points, crushing plant, dust extraction system with bagfilters at other dust emanating areas, covered conveyers, mechanical dust sweepers, etc. will also be provided.

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 Water Environment

- Total wastewater generation will be **446 KLD**.
- There will be no effluent discharge from the Sponge Iron unit as closed-circuit cooling system will be adopted.
- Effluent from Pelletisation plant, Induction Furnace, Ferro Alloys & Power Plant will be treated in ETP and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development.
- Effluent from Coal gasifier (phenolic effluent) will be used in ABC chamber for quenching in DRI Units.
- Effluent from Rolling Mill will be sent to settling tank & will be recycled through closed circuit cooling system.
- Air Cooled condensers will be provided in the power plant, which will be reduce the water consumption significantly. Hence wastewater generation will also be minimized.

- Sanitary wastewater generated from proposed project will be treated in proposed STP and after treatment the treated sewage will be used for greenbelt development.
- Garland drains will be provided around all the raw material stacking areas.
- During monsoon the treated effluent will be utilized as makeup water in Rolling Mill. Accordingly, the makeup water for Rolling mill also reduces during the rainy period.
- Zero Liquid Discharge (ZLD) will be maintained in the proposed project

EFFLUENT TREATMENT PLANT

pH of the boiler blowdown will be between 9.5 to 10.5. Hence a neutralization tank will be constructed for neutralizing the boiler blow down. DM plant regeneration water will be neutralized in a neutralization tank. After neutralization, these two effluent streams will be mixed with Cooling Tower blowdown in a Central Monitoring Basin (CMB). Service water will be treated in an oil separator and after treatment it will be taken to CMB. The treated effluent will be utilized for dust suppression, ash conditioning and for Greenbelt development. No effluent will be let out of the plant premises. Hence Zero discharge concept will be implemented.

TREATED EFFLUENT DISPOSAL

| | |
|---|----------------|
| Total treated effluent generation | 446 KLD |
| Effluent quantity to be used for ash conditioning | 68 KLD |
| Effluent to be used for dust suppression in CHP | 60 KLD |
| Effluent to be used for Greenbelt development | 222 KLD |
| Effluent from Gasifier to be used in ABC Chamber | 16 KLD |
| RO Rejects to be used for Floor washing, Toiler cleaning & Flushing | 88 KLD |

8.989 Ha. 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.

Table No.7.2: Solid Waste Generation and Disposal

| S.No. | Waste / By product | Quantity (TPA) | Proposed method of disposal |
|-------|--|----------------|--|
| 1. | Ash from Pellet Plant | 14,850 | Will be utilized in the proposed Brick Manufacturing Unit |
| 2. | Ash from DRI | 59,400 | Will be utilized in the proposed Brick Manufacturing Unit |
| 3. | Dolochar | 99,000 | Will be used in proposed FBC power plant as fuel. |
| 4. | Kiln Accretion Slag | 2970 | Will be used in road construction & utilized in the proposed brick manufacturing unit. |
| 5. | Wet scrapper sludge | 15,180 | Will be used in road construction & utilized in the proposed brick manufacturing unit within the premises. |
| 6. | SMS Slag | 29,700 | Slag from SMS will be crushed and iron will be recovered & then remaining non -magnetic material being inert by nature will be used as sub base material in road construction. |
| 7. | End Cuttings from Rolling Mill | 9,900 | Will be reused in the SMS |
| 8. | Mill scales from Rolling Mill | 9,90 | Mill scales will be utilized in the proposed Ferro alloys manufacturing units. |
| 9. | Ash from Power Plant (with Indian Coal + dolochar) | 63,855 | Will be utilized in the proposed brick manufacturing unit within the premises. |
| 10. | Slag from FeMn | 40,000 | Will be reused in manufacture of SiMn as it contains high SiO ₂ and Silicon. |
| 11. | Slag from FeSi | 1,960 | Will be given to Cast iron foundries |
| 12. | Slag from SiMn | 28,000 | will be used for Road construction / will be given to slag cement manufacturing |
| 13. | Slag from FeCr | 27,000 | Will be processed in jigging plant for Chrome recovery. After Chrome recovery, the left-over slag will be analysed for Chrome content through TCLP test, if the Chrome |

| S.No. | Waste / By product | Quantity (TPA) | Proposed method of disposal |
|-------|--------------------|----------------|---|
| | | | content in the slag is within the permissible limits, then it will be utilized for Road laying /brick manufacturing. If Chrome content exceeds the permissible limits, it will be sent to nearest TSDF. |
| 14. | Slag from Pig Iron | 28,800 | Will be given to slag cement manufacturing |
| 15. | Bag filter Dust | 13,440 | will be utilized in the proposed Ferro alloys manufacturing units |

7.5 Greenbelt Development

Greenbelt of **8.989 Ha.** of extensive greenbelt will be developed in the plant premises. Width of proposed greenbelt ranges from 15 m to 60 m.

7.6 Cost for Environment Protection

Capital Cost for Environment Protection for proposed plant : Rs. 39.11 Crores

Recurring Cost per annum for Environmental protection : Rs. 7.0005 Crores

7.7 Implementation of CREP Recommendations

All the CREP recommendations will be strictly followed.

- Continuous stack monitoring system is proposed for stack attached to all the Stacks.
- Online Ambient Air Quality Monitoring Stations will be established in consultation with SPCB during operation of the plant.
- Fugitive emission monitoring will be carried out as per CPCB norms.
- Energy meters will be installed for all the pollution control systems.
- Rain water harvesting pits are being constructed in consultation with CGWB.