

# ***EXECUTIVE SUMMARY***

*Of*

***Proposed Expansion by installation of 3x2MVA SAF  
and 3x 4MVA SAF at Village Sankra, Tehsil Dhamdha,  
Dist. Durg, Chhattisgarh.***

**Proponent**

**Goenka Cast Engineering (India) Private Limited**

**Village Sankra, Tehsil Dhamdha, Dist. Durg, Chhattisgarh**

*By*

***Pollution & Ecology Control Services***

***NAGPUR***

***Accreditation no.: NABET/EIA/SA0165 Valid till 08.09.2023***

## EXECUTIVE SUMMARY

### 1.0 INTRODUCTION

The proposed project attract the provisions of EIA Notification, 2006 and falling under Category A of Schedule, 3 (a) Metallurgical Industries (Ferrous and Non-ferrous). The proponent made online application on 26<sup>th</sup> March 2022 along with Form-1, Pre-feasibility report and other documents for proposing Terms of Reference (TORs) for undertaking detailed EIA study. The committee recommended the Standard ToRs for undertaking EIA study for proposed project of Expansion by the installation of 3x2MVA SAF in the existing shed of Unit I and 3x 4MVA SAF in Unit II for the production of FeMn 49000 TPA or SiMn 34000 TPA or Pig Iron 49000 TPA or Calcium Carbide 34000 TPA at Village Sankra, Tehsil Dhamdha, Dist. Durg, Chhattisgarh. Accordingly, the Ministry prescribed ToRs vide letter No.IA-J-11011/94/2022-IA-II(IND-I) dated 30<sup>th</sup> March, 2022for the proposed project.

### OVERALL JUSTIFICATION FOR IMPLEMENTATION OF THE PROJECT

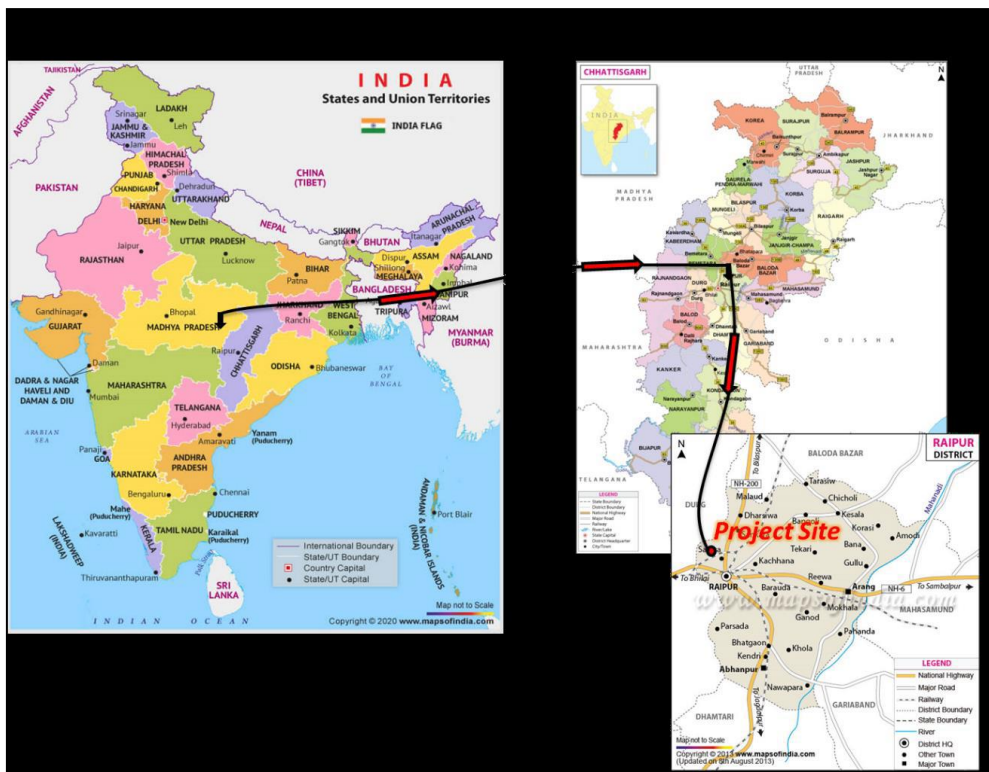
The expansion is proposed in existing premises. 100% land is in possession of M/s Goenka Cast Engineering (India) Private Limited.

### PROJECT DETAILS

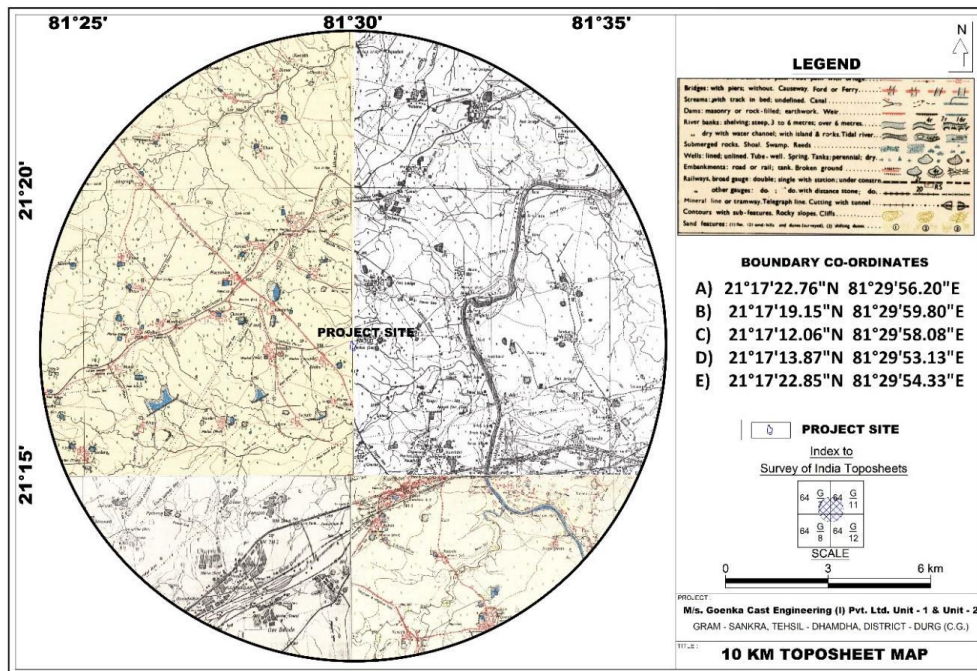
#### Project at a Glance

Project Name	Proposed Expansion by installation of 3x2MVA SAF and 3x 4MVA SAF for production of FeMn or SiMn or Pig Iron or Calcium Carbide
Project location	Khasra No. 147/1, 147/2, 147/3, 147/4, 147/6, 152, 153, 155/1, 155/2, 166/4 and 166/5 Village Sankra, Tehsil Dhamdha, Dist. Durg, Chhattisgarh
Total Area	3.54 Ha.
Coordinates	A. 21°17'22.76"N 81°29'56.20"E B. 21°17'19.15"N 81°29'59.80"E C. 21°17'12.06"N 81°29'58.08"E D. 21°17'13.87"N 81°29'53.13"E E. 21°17'22.85"N 81°29'54.33"E

Water Demand	Existing Water Requirement: 11 Proposed Water Requirement: 420 KLD Total Water Requirement: 433
Power Requirement	20 MW
Man Power	Existing: 77 Proposed: 200 Total: 277
Nearest railway station	Kumhari Railway Station: 5.0 Km (SSE)
Nearest airport	Raipur Airport: 27.00 Km (SE)
Project cost	Existing: 8.5 Cr Proposed: 45 Cr Total: 53.5 Cr



Location Map



Location on Toposheet

## 2.0 PROCESS DESCRIPTION

### Ferro Alloy Plant

The submerged electric arc furnaces will be installed in the Ferro Alloys plant. The submerged arc process is a reduction smelting operation. The reactants consist of metallic ores (ferrous oxides, silicon oxides, manganese oxides, chrome oxides, etc.) and a carbon-source reducing agent, usually in the form of coke, low-volatility coal. Limestone/Dolomite may also be added as a flux material. Raw materials are crushed, sized, and in some cases, dried, and then conveyed to a mix house for weighing and blending. Conveyors, buckets, skip hoists, or cars transport the processed material to hoppers above the furnace. The mix is then gravity-fed through a feed chute either continuously or intermittently, as needed. At high temperatures in the reaction zone, the carbon source reacts with metal oxides to form carbon monoxide and to reduce the ores to base metal.

Smelting in an electric arc furnace is accomplished by conversion of electrical energy to heat. An alternating current applied to the electrodes cause current to flow through the charge between the electrode tips. The furnace shell is water cooled to protect it from the

heat of the process. A water-cooled cover and fume collection hood are mounted over the furnace shell. Normally, three carbon electrodes arranged in triangular formation extend through the cover and into the furnace shell opening. Pre bake or self-baking electrodes are typically used. Raw materials are sometimes charged to the furnace through feed chutes from above the furnace.

The surface of the furnace charge containing both molten material and unconverted charge during operation is typically maintained near the top of the furnace shell. The lower ends of the electrodes are maintained at about 1 to 2 meters below the charge surface. Three-phase electric current arcs from electrode to electrode, passing through the charge material. The charge material melts and reacts to form the desired product as the electric energy is converted into heat. The carbonaceous material in the furnace charge reacts with oxygen in the metal oxides of the charge and reduces them to base metals. The reactions produce large quantities of carbon monoxide which passes upward through the furnace charge. The molten metal and slag are removed (tapped) through one or more tap holes extending through the furnace shell at the hearth level. Feed materials may be charged continuously or intermittently. Power is applied continuously. Tapping is intermittent based on production rate of the furnace.

The molten alloy and slag that accumulate on the furnace hearth are removed at one to five hour intervals through the tap hole. Tapping typically lasts 10 to 15 minutes. In some cases, tapping is done continuously. Tap holes are opened with pellet shot from a gun, by drilling or by oxygen lancing. The molten metal and slag flow from the tap hole into a carbon-lined trough, then into a carbon-lined runner which directs the metal and slag into a reaction ladle, ingot molds, sand bath or chills (chills are low, flat, iron or steel pans that provide rapid cooling of the molten metal). After tapping is completed the furnace is resealed by inserting a carbon paste plug into the tap hole.

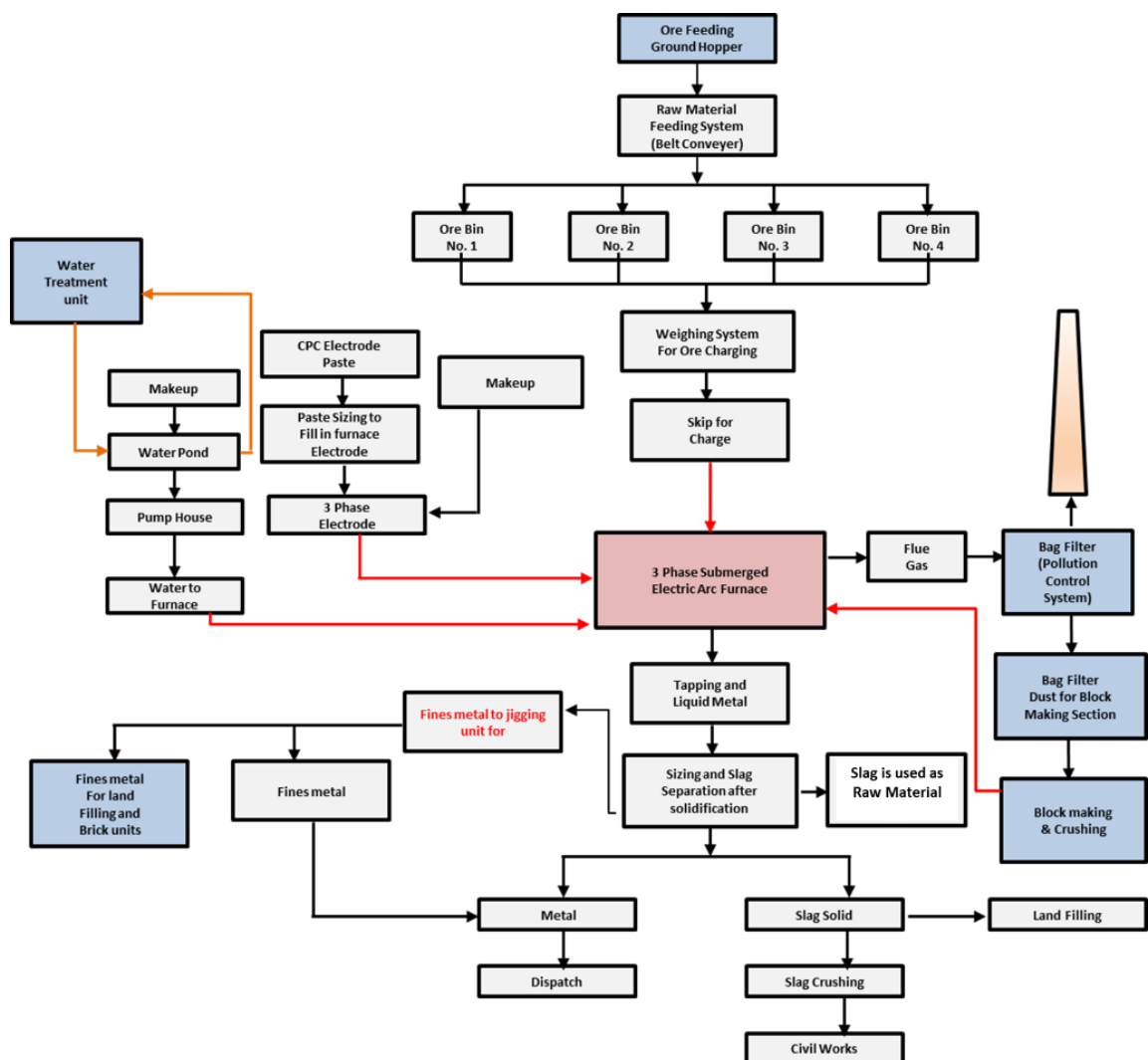
After cooling and solidifying, the large ferro alloy castings may be broken with drop weights or hammers. The broken ferroalloy pieces are then crushed, screened (sized) and stored for further shipment.

**Reduction Process:**

The reduction of Mn from pyrolusite occurs as:  $MnO_2 > Mn_3O_4 > MnO > Mn_3C$  with a reducing atmosphere in the furnace, the dissociation of manganese oxides can take place at low temperatures. Carbon monoxide and hydrogen can also reduce  $Mn_3O_4$  to  $MnO$  at low temperature. High Carbon FeMn can be smelted with addition of fluxes or by flux-less process. In the latter case, a valuable by-product of the process is high

manganese low phosphorus slag which is used in smelting Silico Manganese and manganese metal. The reducing conditions in the furnace ensure that phosphorus be reduced almost fully. The acid slag cannot absorb phosphorus which is removed with furnace gases and 75 – 80 % passes to the alloy.

Mixed charge is delivered to the furnace from furnace bays along four movable chutes. Three chutes serve to deliver the charge to spaces between the electrodes and the fourth, into the space between the central electrode and furnace wall. Charging is done periodically to allow the previous charge settled at the top, to move down. With normal run of the furnace, yellow flames shoot up evenly all over the surface of the furnace top



Process Flow Chart of Ferro Alloys

### 3.0 DESCRIPTION OF ENVIRONMENT

#### Air Environment

The ambient air quality monitored at 8 locations selected based on predominant wind direction, indicated the following ranges;

PM<sub>10</sub> : 38.4 to 69.9 µg/m<sup>3</sup>.

PM<sub>2.5</sub> : 20.2 to 42.3 µg/m<sup>3</sup>

SO<sub>2</sub> : 7.5 to 18.4 µg/m<sup>3</sup>

NO<sub>x</sub> : 18.2 to 33.3 µg/m<sup>3</sup>

CO : 0.4 to 1.8 mg/m<sup>3</sup>

Industrial Area, Residential, Rural Area (CPCB Norms)	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO
	100 µg/m <sup>3</sup>	60 µg/m <sup>3</sup>	80 µg/m <sup>3</sup>	80 µg/m <sup>3</sup>	2 mg/m <sup>3</sup>

The concentrations of PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>x</sub> and CO were found within the National Ambient Air Quality Standards (NAAQ).

#### Water Environment

The company follows “the zero wastewater discharge concept” and the entire wastewater is recycled to the plant for various uses. The domestic wastewater will be treated in closed STP. As no wastewater will be discharged outside the plant premises, there will be no impact on the water quality of any surface water bodies of the area.

#### Noise Environment

Noise levels measured at eight stations are within limit of 55.0 dB (A) for Residential Area or 75.0 dB (A) for Industrial Area as given in MoEF Gazette notification for National Ambient Noise Level Standard.

Area Code	Category of Area	Limits in dB(A) Leq	
		Day time	Night time
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone**	50	40

\*\* Silence zone is defined as area up to 100 meters around premises of hospitals, educational institutions and courts. Use of vehicle horns, loud speakers and bursting of crackers are banned in these zones

### **Land Environment**

Eight Soil samples were collected analyzed for physico-chemical characteristics at selected locations in the study area to assess the existing soil conditions around the proposed project site. The relevant parameters show the following characteristics.

The characteristics of the soil sample were compared with different depths for respective parameters.

#### **The observations of soil characteristics are discussed parameter wise below:**

- a. Texture of all soil samples are Silty-Clay in Texture.
- b. Colour of all the soil samples are Brownish in color.
- c. The bulk density of all the soil samples are in the range of 1.08 to 1.46 gm/cc.
- d. All the Soil samples have pH values in the range of 5.63 to 6.98. The pH values are indicating nature of soil samples as Acidic to Neutral.
- e. All the Soil samples have conductivities between 60.16 to 74.62  $\mu\text{S}/\text{cm}$ .
- f. All the Soil samples have Organic Matter between 0.62 to 3.12 %. These values represent average fertility of soils.
- g. All the Soil samples have concentration of Available Nitrogen values ranged between 425 to 462 kg/ha.
- h. All the Soil sample have concentration of Available Phosphorous values ranged between 22.4 to 28.6 kg/ha.
- i. All the Soil sample have concentration of Available Potassium values range between 148 to 158 kg/ha.

## **4.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

### **Impact on Air Quality**

The major pollutants of air in a proposed plant are the particulate matters from the various stacks and fugitive emissions due to material handling. Company is presently taking all measures to effectively control the air emissions and periodic monitoring of the stack emissions & ambient air quality is being done to monitor the pollutant concentrations. Same will be continued after the proposed expansion. During operation



phase, air emissions both gaseous and fugitive will be on account of process emissions from stacks of ferro alloy unit as well as transportation of men and material. The impacts on air quality due to source of the air pollutant in the proposed facilities have been identified

### **Sources of Emissions**

Emissions released from the stack during operation phase will get dispersed in the atmosphere and finally reach the ground at a specified distance from the sources. From the proposed expansion activities the possible environmental impact on air quality has been envisaged due to the following sources.

### **Raw Material Handling / Transport System**

The possible pollutants are fugitive dust emissions from raw materials handling areas viz. loading / unloading, etc. Raw materials will be fed to hopper with the help of pay-loader / tipper.

### **Mitigation Measures**

- Existing Bag filter Capacity 35,000 m<sup>3</sup>/Hr has been installed in Arc furnaces. Goenka Cast Engineering (I) Private Limited has proposed the installation of 3x2MVA SAF in and 3x 4MVA SAF. Two more stacks will be installed along with bag filter.
- All internal concrete road has been constructed as per specification.
- Stack will be well equipped with continuous emission monitoring system along with remote calibration facility for gaseous parameters.
- Fugitive as well ambient air quality monitoring is being/will be carried out on regular basis to ensure the compliance with National Ambient Air Quality Standards (NAAQS). The ambient air quality within the factory premises shall not exceed the standards (PM<sub>10</sub> 100 µg/m<sup>3</sup>, PM<sub>2.5</sub> 60 µg/m<sup>3</sup> SO<sub>2</sub> 80µg/m<sup>3</sup> and NO<sub>x</sub> 80 µg/m<sup>3</sup> prescribed by CPCB.
- Water sprinklers are installed on all internal roads, raw material storage yard to control fugitive dust emission
- Fugitive as well ambient air quality monitoring shall be carried out on regular basis to ensure the compliance with National Ambient Air Quality Standards (NAAQS). The ambient air quality within the factory premises shall not exceed the standards (PM<sub>10</sub> 100 µg/m<sup>3</sup>, PM<sub>2.5</sub> 60 µg/m<sup>3</sup> SO<sub>2</sub> 80µg/m<sup>3</sup>, NO<sub>x</sub> 80 µg/m<sup>3</sup> and CO 04 µg/m<sup>3</sup>) prescribed by CPCB.
- Sufficient no. of water sprinklers are installed in the existing plant.

### **Noise Levels**

During operation, the major noise generating sources are auto loading section, electric motors etc. These sources will be located far off from each other. Under any circumstances the noise level from each of these sources will not exceed 85 dB (A).

Noise levels generated in the project site will be confined to the noise generating plant units hence the impact of noise levels on surroundings will be insignificant

### **Mitigation Measures**

The noise levels stipulated by Central Pollution Control Board at any point of time will not exceed the standards.

- By providing padding at various locations to avoid sharp noise due to vibration.
- Other than the regular maintenance of the various equipment, ear plugs/muffs are recommended for the personnel working close to the noise generating units;
- All the openings like covers, partitions will be designed properly
- Inlet and outlet mufflers will be provided which are easy to design and construct.
- All rotating items will be well lubricated and provided with enclosures as far as possible to reduce noise transmission.
- The insulation provided for prevention of loss of heat and personnel safety will also act as noise reducers.

### **Impact on Water**

Total water requirement for the proposed project will be about 420 KLD. Water requirement for the project will be sourced from Ground Water.

Goenka Casting Engineering (India) Pvt, Limited, is committed to ZERO Discharge of waste water. 132 KLD Industrial waste water will be treated in Neutralization Pit and settling tank. 9 KLD of Domestic waste water will be taken to adequately designed 15 KL STP. The treated water will be recycled for utilization in Green Belt Development.

### **Impact on Terrestrial ecology**

There is no National park, Wildlife sanctuary, Biosphere reserves and protected forest within 10 km of the plant area. No schedule- I species were recorded in the core and buffer zone of plant area during the biodiversity assessment. There may be an impact on the biological environment of the area due to operation of plant, if proper care will not be taken:

- Particulate matter emissions and fugitive emissions due to transportation activity & material handling may degrade the soil quality of surrounding environment that may affect the biodiversity of surrounding environment.
- Fugitive emissions (dust) may impact the terrestrial flora. The settlement of dust on the laminar surface of plants can impede the efficiency of photosynthesis and thereby, affect the productivity of plants. In some of the plant, it may also smother the leaf surface blocking stomata, resulting in reduced transpiration.

The present running plant has no significant impact on surrounding ecology and biodiversity as following mitigation measures have been / will be adopted:

- Greenbelt development and plantation in and around the plant site.
- Using paved roads for transportation to minimize fugitive emissions.
- Transporting material in truck covered with tarpaulin and storing it under covered facilities.
- Transport vehicles and machinery will be properly maintained and periodically checked for pollution level to reduce noise and gaseous emission in the surrounding environment.

### **Solid Waste Generation**

The solid waste generation in the existing and proposed expansion activities are given in following table

#### **Solid Waste Management**

<b>Sr. No.</b>	<b>Waste</b>	<b>Quantity</b>	<b>Proposed method of disposal</b>
1.	Slag from FeMn	41650 TPA	Will be reused in manufacture of SiMn as it contains high SiO <sub>2</sub> and Silicon.
2.	Slag from SiMn	34000 TPA	Will be used for Road construction / will be given to cement manufacturing
3.	Slag from Pig Iron	39200 TPA	Will be sold in local market
4.	Slag from CaC <sub>2</sub>	NIL	No waste generated

### **Impact on Socio-Economic Environment**

M/s Goenka Cast Engineering (India) Private Limited is providing direct employment 77 workers, which will be increased to 277 after proposed expansion. The local persons have

been/will be given preference in employment as per the qualification and technical competencies. In order to mitigate the adverse impacts likely to arise in the proposed project activities and also to minimize the apprehensions to the local people, it is necessary to formulate an affective EMP for smooth initiation and functioning of the project. The suggestions are given below:

- ❖ Communication with the local people will be established regular basis by project authority to provide an opportunity for local youth.
- ❖ Project authorities will undertake regular environmental awareness program on environmental management
- ❖ Job opportunities are the most demanding factor, the local people as per their education will be employed.
- ❖ For social welfare activities to be undertaken by the project authorities, collaboration should be sought with the local administration, gram panchayat, block development office etc for better coordination.

The overall impact on the socio economic environment will be significant.

## **5.0 ENVIRONMENTAL MONITORING PROGRAMME**

M/s Goenka Cast Engineering (India) Private Limited is carrying out the Environmental Monitoring on regular basis. The methodologies adopted for environmental monitoring are in accordance with the CPCB guidelines.

The environmental monitoring points is done considering the environmental impacts likely to occur due to the operation of existing and proposed project as the main scope of monitoring program is to track, timely and regularly, the change in environmental conditions and to take timely action and adopt mitigation measures for protection of environment.

### **Ambient Air Quality Monitoring**

Ambient air quality monitoring at 8 locations in and around the plant is also being carried out by NABL accredited lab (Ultimate Envirollytical Solutions (UES)), on regular basis and reports are being submitted to CECB regularly.

### **Ground Water Monitoring**

Ground water quality & Waste water quality samples are being collected and analyzed by NABL accredited lab(Ultimate Envirollytical Solutions (UES)), ground water from different locations on quarterly basis and analyzed by NABL accredited lab. Reports are being submitted to CECB, CPCB and MoEF.

### **Noise Environment**

Noise levels are being monitored at various locations of the plant for day and night time as per the CPCB guidelines.

### **Fugitive emission**

Monitoring of Ground level dust concentration/Fugitive emission along with gaseous pollutants viz SO<sub>2</sub>, NO<sub>x</sub> is being carried out periodically. Dust concentration and gaseous emission levels from all the fugitive sources are well within prescribed limit and it is being regularly monitored.

Necessary control measures are being adopted to keep the secondary fugitive emission within limits.

## **6.0 ADDITIONAL STUDIES**

The additional studies as per the ToR issued by MoEF&CC are Public Consultation, Social Impact Assessment, Risk Assessment, & Disaster Management Plan.

## **7.0 PROJECT BENEFITS**

45 lakhs will be kept for CER which will be spent on social, economical and peripheral development activities as per the requirement of local people. Detailed plan will be prepared after studying the socio-economic conditions of study area and points raised at the time of public hearing. The CSR will be done on regular basis after the establishment of the plant.

## **8.0 ENVIRONMENTAL MANAGEMENT PLAN**

### **Environmental Management Cell**

A separate environmental management cell will be established to implement the management plan. The group is headed by a Vice President-Comml/HR. The group will ensure the suitability, adequacy and effectiveness of the Environment Management Program. The functions of Environmental Management Cell are:

- Obtaining consent order from State Pollution Control Board.
- Environmental monitoring.
- Analysis of environmental data, preparations and submission of report to statutory authorities, & Corporate Office.
- To co-ordinate with statutory bodies, functional groups of the plant units & head office.

- Interactions with plant official for modification programme if any to improve pollution control devices / systems.
- Environmental Appraisal (Internal) and Environmental Audit.

### **Air pollution**

There will be two major source of air pollution in the plant, fugitive emissions from various material handling and transfer points and flue gases generated from various combustion units. **Emissions from the Submerged Electric Arc Furnace (SEAF)** will be sucked through hoods and will pass through a 4<sup>th</sup> Hole extraction system with bag filters (PTFE dipped) with 50% extra rated flow and then the treated gases will be discharged into the atmosphere through a stack height for effective dispersion of emissions from SAF. Height of the all the flue gas discharge facilities is designed as per CPCB norms.

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

Proper Dust Suppression is existing in the premises, sprinkling on internal roads, regular check-up & maintenance of vehicles, it will be ensured that all trucks/dumper will be covered by Tarpaulin.

### **Transportation**

- Raw material & Finished Products is transported by road.
- It will be ensure that all trucks carrying raw material are tarpaulin covered.
- Internal roads are Tarred / Concreted with installation of water sprinklers to suppress dust due to transportation.

### **Water pollution**

The company follows “the zero wastewater discharge concept” and the entire wastewater is recycled to the plant for various uses. The domestic wastewater will be treated in closed STP. As no wastewater will be discharged outside the plant premises, there will be no impact on the water quality of any surface water bodies of the area.

### **Noise Pollution**

Noise from fans, centrifugal pumps, electrical motors etc. will be kept in control so that the ambient noise level shall not exceed 75dBA during daytime and 70dBA during night time. Noise pollution control measures will be provided in respective departments by way of providing silencers soundproofs cubicles / covers and proper selection of less noise prone machinery and by development of green belt.

### **Solid Waste Management**

<b>Sr. No.</b>	<b>Waste</b>	<b>Quantity</b>	<b>Proposed method of disposal</b>
1.	Slag from FeMn	41650 TPA	Will be reused in manufacture of SiMn as it contains high SiO <sub>2</sub> and Silicon.
2.	Slag from SiMn	34000 TPA	Will be used for Road construction / will be given to cement manufacturing
3.	Slag from Pig Iron	39200 TPA	Will be sold in local market
4.	Slag from CaC <sub>2</sub>	NIL	No waste generated

There is no generation of hazardous waste except used oil from machineries and transformers. This waste oil will be used for secondary purpose and will be disposed through authorized vendors / recyclers.

### **GREEN BELT DEVELOPMENT**

The plantation and green belt development will also be taken care in the plant and the total 2.8 Acres of area will be developed as green belt. Green belt has already being developed in 0.8 Acres of the land in the existing plant and the plantation in 2.0 Acres of land will be done in the land possessed by company situated at the distance of 5 Km from the proposed site.

Adequate plantation will substantially abate the dust pollution, filter the polluted air, reduce the noise and ameliorate the plant environment.

### **CONCLUSION**

It can be concluded that there would be negligible impact in the buffer zone due to the proposed expansion. The project shall contribute to the socio-economic development, strengthening of infrastructural facilities like medical, educational etc. The plant shall be operated keeping "Sustainable Development" of the region in mind.

Further, management is committed to contribute towards improving socio-economic status of the surrounding local community.

Environmental monitoring is a successful tool for the management for implementation of adequate & effective environmental measures. It also helps the management to take mid-course correction, if required based on the environmental monitoring results. Considering the above overwhelming positive impact on the community, there shall be overall development of the area.

**Existing Plantation Photographs**

