

Executive Summary

OF

Expansion of Manufacturing capacity of Ferro Alloys from 8,000 TPA to 19,000 TPA by replacing old 1 x 6 MVA SAF by 1 x 9 MVA SAF and one New Unit of 1 x 9 MVA SAF for manufacturing 19,000 TPA Ferro Alloys. Total expansion will be 8000TPA to 38000 TPA.

Proponent

The Metallic Alloys

**Plot No. 28 & 29, Industrial Growth Centre Siltara Phase II, District: Raipur,
State: Chhattisgarh**

By

***Pollution & Ecology Control Services
Nagpur***

Accreditation no.: QCI/NABET/EIA/1720/RA0101

Extension Letter: QCI/NABET/ENV/ACO/21/2133 dated 17th November, 2021

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1.0 INTRODUCTION

The proposed brownfield project attracts the provisions of EIA Notification, 2006 and falling under Category 'A' of Schedule 3 (a) Metallurgical Industries (Ferrous and Non-ferrous). The proponent made an online application on 14th March 2020 along with Form-1, Pre-feasibility report and other documents for Terms of Reference (TORs) for undertaking detailed EIA study. Standard ToR was granted vide letter J-11011/67/2020-IA.II(I) dated 31st March 2020 for undertaking EIA study for the proposed expansion project.

The Metallic Alloys has proposed Expansion of Manufacturing of Ferro Alloys from 8,000 TPA to 19,000 TPA by replacing 1 x 6 MVA SAF by 1 x 9 MVA SAF and New Unit of 1 x 9 MVA SAF for manufacturing 19,000 TPA Ferro Alloys, Total expansion will be 8000TPA to 38000 TPA Ferro Alloys. (Ferro Manganese OR Silico Manganese OR Pig Iron OR Ferro Silicon).

A complaint was filed in Honorable NGT Principal Bench, New Delhi regarding violation of environmental norms by Mr. Sudhir against M/s Metallic Alloy, Plot No. 28 & 29 Industrial Growth Centre, Phase III, Raipur Chhattisgarh.

The matter was considered on 14.05.2020 with original application number 694/2019, in the light of the report furnished by the State Pollution Control Board. The matter was deferred for a fresh report by a joint Committee comprising of CPCB, MoEF&CC and the State PCB.

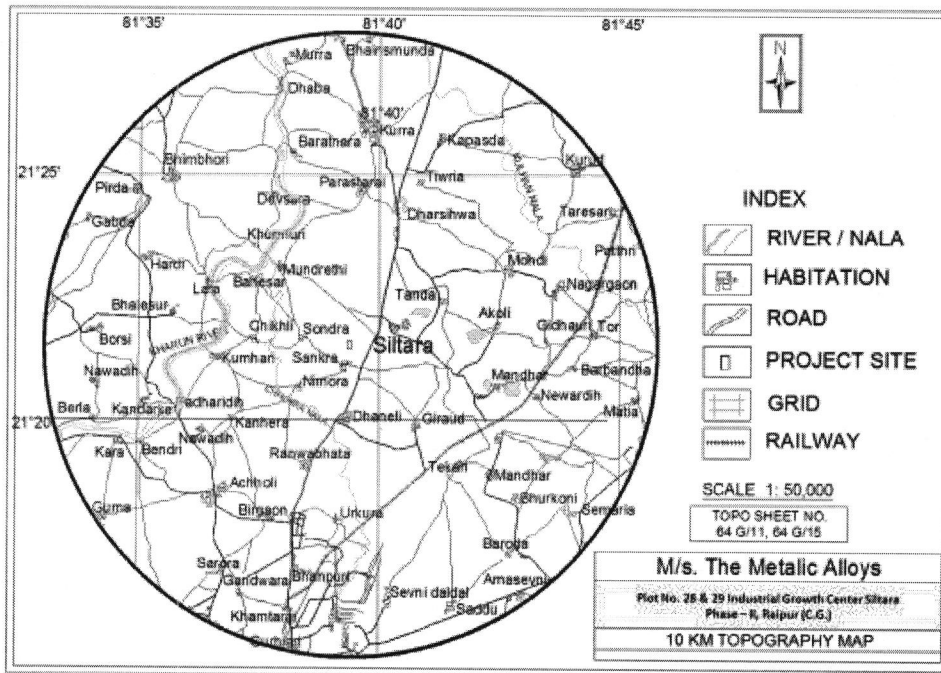
The matter was again considered by NGT on 11th August 2021 with application no. 644/2019, in the light of the joint report of CPCB, MoEF&CC and the State PCB and objections of applicants too.

The order of Honorable NGT, Principal Bench, New Delhi dated 11.08.2021 as under:

"We have heard learned Counsel for the parties. Since admittedly, the matter is sub judice before the Honorable Supreme Court, the parties may have to raise their respective contentions in the said pending matter and move this Tribunal, after decision of the Honorable Supreme Court, if any issue survives, warranting consideration by this Tribunal. M.A. is disposed of accordingly."

2.0 PROJECT DESCRIPTION

The Plant Site is a part of the Survey of India Toposheet No. 64/G/11, 64/12, 64G/14. The site falls between 21°22'0.70" N to 21°22'5.29" N Latitude and 81°39'24.92"E to 81°39'23.18"E Longitude with an average altitude of 276m above MSL.



**Source: SOI Toposheet
Topographical Map (10 km Radius)
Salient Features of the Proposed Project**

Particulars	Description
Cost of the Project	Expansion cost : Rs. 16 Crores Existing Cost : Rs. 6.72 Crores Total Cost : Rs. 22.72 Crores
Total Area	1.49 Ha
Water Requirement	Total: 20 KLD Existing : 8 KLD Proposed : 12 KLD Total yearly water requirement will be 20*330 = 6600 KLA. Source: CSIDC Zero discharge will be maintained

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Air Pollution Control Equipment	The emissions from the furnace is being/will be sucked through bag filters and then let out through a stack to maintain the emission below 30 mg/Nm ³ .
Power Requirement	Total power requirement: 18 MW Source: State electricity board.
Total Manpower Utilization	90 people.
No. of Working Days	330

The Project is an expansion of existing ferro alloys plant by replacing existing Submerged Arc Furnace and installing one new Submerged Arc Furnace.

Production Scenario

Sr. No.	Product	Existing Production (TPA) (1 x 6 MVA SAF)	After Expansion (TPA) (2 x 9 MVA SAF)
1.	Ferro Manganese OR	8000	38000
2.	Silico Manganese OR	-	30000
3.	Pig Iron OR	-	38000
4.	Ferro Silicon	-	14500

PROCESS DESCRIPTION

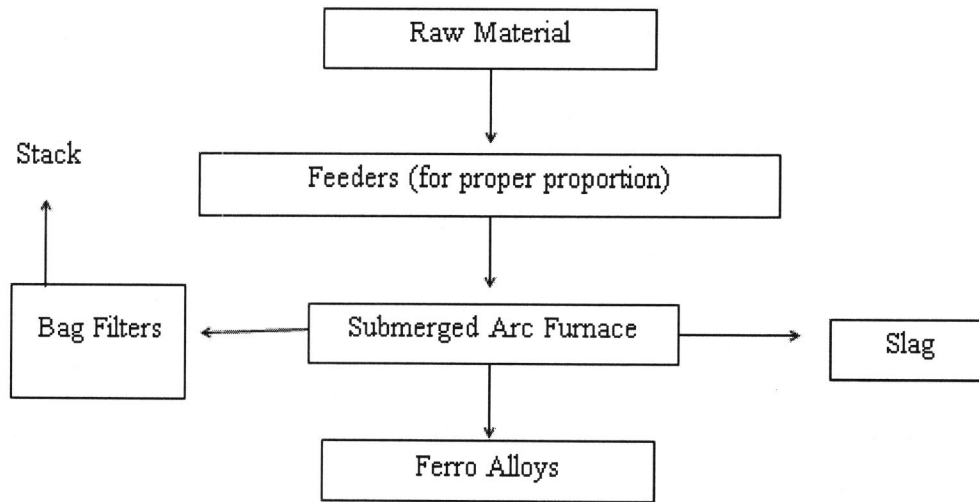
Standard Ferro Manganese is melted at about 1700 - 1800°C. This is achieved by a conventional Submerged Arc Electric Furnace. The three carbon electrodes, partially submerged in the charge, are supported on hydraulic cylinders for upward and downward movements to maintain the desired electrical conditions in the furnace.

The body of the furnace is cylindrical in shape, and is lined with firebricks, silicon carbide bricks and carbon tamping paste. Two tap-holes are provided at 120 Deg. apart for draining out both the molten alloy and the slag. During the repair works of one of the tap holes the other will function as standby. The raw materials are thoroughly mixed in the proper proportion before being charged into the furnace. Manual poking rods or stoker car are used for stoking the charge on the furnace top.

As the charge enters the smelting zone, the alloy formed by chemical reactions of the oxides and the reductant, being heavy gradually settles at the bottom. The slag produced by the

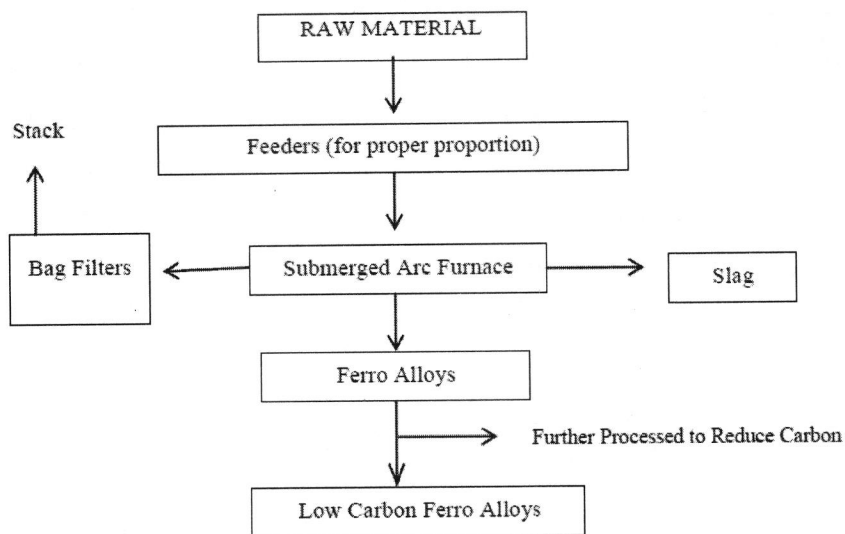
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unreduced metal oxides and the flux, being relatively lighter, floats on the alloys surface. At regular intervals the furnace is tapped. The tap hole is opened by Oxygen lancing pipe and after tapping is completed, it is closed by clay plug. The liquid Silico-manganese and the slag flow into the C.I. Pan. The slag being lighter overflow from the C.I. Pan or sand mold and is taken into the sand mould. The alloy cake from C.I. Pan is removed and broken manually with hammer to required lump size. The slag produced in the process, after cooling is removed by lorry to the slag dump.



Process Flow Diagram

“If market supports for production of low carbon ferro alloys then after tapping of ferro alloys from submerged arc, tapped ferro alloys is further treated as per required process to reduce the carbon content.” The flow chart is given below:-



Process Flow Diagram

3.0 DESCRIPTION OF THE ENVIRONMENT

Air Environment

The ambient air quality monitored at 08 locations selected based on predominant wind direction, indicated the following ranges;

- PM₁₀: 52 to 98 µg/m³.
- PM_{2.5} : 18 to 48 µg/m³
- SO₂ : 6 to 24 µg/m³
- NO_x : 20 to 38 µg/m³

Industrial Area	PM ₁₀	PM _{2.5}	SO ₂	NO _x
Residential, Rural Area (CPCB Norms)	100 µg/m ³	60 µg/m ³	80 µg/m ³	80 µg/m ³

The concentrations of PM₁₀, PM_{2.5}, SO₂ and NO_x were found within the National Ambient Air Quality Standards (NAAQ).

Water Environment

A total 16 samples including eight surface & eight ground water samples were collected and analyzed. The water samples were analyzed as per Standard Methods for Analysis of Water and Wastewater, American Public Health Association (APHA) Publication.

The data indicates that the ground water as well as the surface water quality are below the stipulated standard for drinking water (BIS 10500 – 2012) except high concentration of total coli form in surface water, which may be due to the human activities.

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

Four 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 soil samples are Silt Clay Loam
- b) Colour of soil samples are Yellowish in colour.
- c) The Organic Matter of soil samples are in the range of 1.46 to 1.82 g/cc
- d) pH values of soil samples varied between 6.52 to 7.11.
- e) Soil samples have conductivities between 162 to 285 mmhos/cm

4.0 Anticipated Impacts & Mitigation Measures

Impact on Air Quality

Construction phase

During construction phase, dust will be the main pollutant, which will be generated from the site development activities and vehicular movement on the road. Further, concentration of NO_x and CO may also slightly increase due to increase in vehicular traffic movement.

Mitigation Measures

- ❖ It is necessary to control the dust emissions particularly during dry weather. This will be achieved by regular water sprinkling all over the exposed area, at least twice a day using truck-mounted sprinklers. The nose-mask will be provided to workers in dust prone area.
- ❖ Ambient NO_x and CO levels will increase due to operation of construction machinery such as excavators, trucks etc. However, increase in levels of these pollutants is expected to be insignificant since these machines will be operated intermittently.
- ❖ Equipment are not stationary and would be moving from one place to other, hence there will not be increase in concentration of emissions at a single location. Nevertheless, it will be ensured that both gasoline and diesel powered construction vehicles are properly maintained to minimize exhaust emissions.
- ❖ The construction will not be carried out in night time.

Operation phase

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. The impacts on air quality due to source of the air pollutant in the proposed facilities have been identified.

I. Stack Emission

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 activities the possible environmental impact on air quality has been envisaged due to the following sources.

In this case the source emission is envisaged from various sources, 1 Stack of height 32m is available for proper dispersion of gaseous pollutants (**Table 4.1**).

Mitigation Measures

- Bag filters of Capacity 50000 m³/Hr will be installed in ARC furnaces.
- All internal roads are tarred.
- Both the stacks are equipped with continuous emission monitoring system along with remote calibration facility for gaseous parameters.
- 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.
- Water sprinklers are installed in the existing plant to control dust emission.

II. Fugitive Emission

Fugitive emissions are the air pollutants released in the air. Fugitive dust may be defined as "any solid particulate matter that becomes airborne by natural or man-made activities, excluding particulate matter emitted from an exhaust stack.

Sources of Fugitive Emissions & Mitigation Measures

In plant, the fugitive dust is emitted primarily from the following:

Transportation: Movement of heavy trucks/vehicles on the roads generates substantial Quantity of dust. This is due to the presence of dust over the road, which is carried away by wind.

Raw Material Handling: Raw materials like Manganese ore, Dolomite etc. when transferred within the premises will lead to the fugitive dust emissions.

Storage of Raw Materials & Finished Product: Dust may be generated due to carryover by wind. However, to avoid this, the raw materials is/will be stored in covered shed.

Action plan to control Fugitive emissions

- All Internal roads are paved to prevent the fugitive dust emission due to vehicular movement.
- Speed limit in plant premises is in control.
- All transportation vehicles carry/ will carry a valid PUC (Pollution under Control) Certificate.
- Flow of vehicles is being/will be maintained.
- Proper traffic management is being/will be undertaken.
- Proper servicing& maintenance of vehicles is being/will be carried out.
- Proper dust masks are being/will be provided to workers coming in direct contact of fugitive emissions
- Adequate greenbelt will be developed in the plant area. Greenbelt acts as a surface for settling of dust particles and thus reduces the concentration of particulate matter in air.
- Water Sprinkling is being /will be done to reduce fugitive emission in the plant and maintain the ambient air quality within CPCB standard.
- Ambient air quality is being/will be regularly monitored, so as to keep a check on the emissions of different pollutants.
- Fugitive emission sources are being /will identified and monitored at regular basis.

Noise Levels

During operation, the major noise generating sources are crushing mill, 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

Impact on Water

Total water requirement for the project will be about 20 KLD. Water requirement for the project will be sourced from CSIDC.

The Metallis Alloys is committed to ZERO Discharge of waste water.

1.4 KLD Industrial waste water will be treated in settling tank.

2.4 KLD of Domestic waste water will be taken to adequately designed 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.

Solid Waste Generation

The solid waste generation and utilization from the Metallic Alloys is given below as Table.

Table : Solid Waste Quantity and Disposal for Existing and Proposed plant

Solid Waste generation	Quantity (TPA)	Method of Disposal
Ferro Manganese Slag	32300	Ferro Manganese slag will be used in manufacturing of Silico Manganese.
Silico Manganese Slag	30000	The Silico Manganese slag will be disposed through land filling in construction work.
Pig Iron Slag	30400	Will be used / sold for road making, hardening of working area etc.

Impact on Socio-Economic Environment

The Metallic Alloys is providing direct employment 50 workers. And 40 more workers will be employed in proposed expansion. The local persons have been 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.

5.0 Environmental Monitoring Programme

The environmental monitoring will be important to assess performance of pollution control equipment in the proposed project of M/s. The Metallic Alloys. The proposed expansion project is for expansion of manufacturing of Ferro Alloys. The sampling and analysis of environmental attributes including monitoring locations will be as per the conditions of the Consent issued by Chhattisgarh Environment Conservation Board (CECB).

Environmental monitoring will be conducted on regular basis by M/s. The Metallic Alloys through MoEF&CC Recognized Laboratory to assess the pollution level in the proposed plant. Therefore, regular monitoring program of the environmental parameters is essential to take into account the environmental pollutant of the study area.

The objective of monitoring is:

- To follow the trend of parameters which have been identified as pollutants;
- To check or assess the efficiency of the controlling measures;
- To ensure that new parameters, other than those identified in the impact assessment study, do not become critical due to the commissioning of proposed facilities;
- To check assumptions made with regard to the development and to detect deviations in order to initiate necessary measures;

The attributes, which needs regular monitoring, are specified below:

- Air quality
- Water and wastewater quality;
- Noise levels;
- Soil quality;

6.0 Capital Cost

Total cost of the project will be Rs. 16 Crores.

Budget for Implementation of Environmental Management Plan

The budgetary provision for EMP will be as Rs. 160 Lacs & recurring cost is Rs. 16 Lacs/annum.

7.0 CER Plan

M/s. The Metallic Alloys to carry out various CER activities in following villages:

- Siltara
- Sondra
- Dhaneli
- Tanda

As per the Office Memorandum No. 22-65/2017-IA.III dated 20th October 2020 based on the issued raised at the time of public hearing the CER will be detailed in the Final EIA Report.

8.0 Occupational Health Measures

Occupational health needs attention both during erection, operation and maintenance phases. However, the problem varies both in magnitude and variety in the above phases. To control any occupational health and safety impact a detailed planning for mitigation measures has been done in the design stage of the project. Apart from the occupational exposure mitigation plans for various activities and work areas of hazards, following existing administrative control measures will be undertaken to ensure occupational health and safety of the employees:

- All employees will be trained for EHS policies and practices.
- Periodic health check-up for employees.
- All employees will be trained in first aid and emergency handling during fire breakout.
- Preparation and training of the employees in safety and emergency preparedness.
- Compliance to PPE use.
- Safety display sign board in the plant.

9.0 Environmental Management

The management of the M/s The Metallic Alloys has taken all the necessary steps to control and mitigate the environmental pollution in the existing project and will continue to do the same in the proposed expansion project. The environmental management plan briefs all the elements of environment pollution controlling systems proposed by the project proponent in operation phase. The environmental management plan describes briefly the action plans to be implemented during the post project monitoring stage as per the Ministry of Environment and Forest (MoEF) New Delhi, Central and State Pollution Control Board guidelines.

10.0 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.