ENVIRONMENTAL STATEMENT (AUDIT)

FOR

M/s. SRI RAMAKRISHNA FERRO ALLOYS (INDIA) PVT. LTD.,

For the Year 2017- 2018

M/s. SRI RAMAKRISHNA FERRO ALLOYS (INDIA) PVT. LTD.,
Plot No. 5 & 6, IDA, Gollapuram (V),
Hindupur (M), Anantapur (Dist) – 515 211

Report Prepared By

M/s. GLOBAL ENVIRO LABS
Tilaknagar "X" Roads, Baghamberpet,
Hyderabad – 13

ACKNOWLEDGMENT

M/s. GLOBAL ENVIRO LABS express sincere gratitude to ***M/s. SRI RAMAKRISHNA FERRO ALLOYS (INDIA) PVT. LTD.,*** for the opportunity provided by assigning the preparation of Environmental Statement (Audit) for their Unit at Plot No. 5 & 6, IDA, Gollapuram (V), Hindupur (M), Anantapur (Dist) of Andhra Pradesh. The Environmental Statement (Audit) is prepared for the financial year from April 2017 to March 2018. ***GLOBAL ENVIRO LABS*** are obliged to the Executives of ***M/s. SRI RAMAKRISHNA FERRO ALLOYS (INDIA) PVT. LTD.,*** for their co-operation and assistance during the preparation of this statement. We also wish to acknowledge our gratitude to all of them who helped during the data collection and report preparation.

1. INTRODUCTION:

The Concern for Environment, both in the national and international arena, has increased manifold in the recent years. Sustainability of present, manufacturing practices, rates of resource consumption, and the effects of economic progress on Environment are debated. People are worried about the health hazards that are posed by any degraded environment. In order to limit degradation, the government in line with its regulatory approach to environmental protection, has enacted environmental audit.

Environment audit can be defined as a management tool compressing a systematic, documentable, periodic and objective evaluation of how well environmental organisation, management and equipment are performing with the aim of helping to regulate the environment by facilitating management control of environmental practices and assessing complains with company policies, which would include meeting regulatory requirements. In essence, environmental audit is a process of detecting waste of resources and environmental damage that can be avoided in any productive activity.

When the procedure for environmental audit was first notified under the Environment (Protection) Act, 1986 by the Ministry of Environment and Forests (vide notification no GSR 329(E) Dated 13th March 1992) the industrial units were required to furnish environmental audit reports. By an amendment (vide notification no GSR 386 (E) Dated 22nd April 1993) the term for the document has been revised from "environmental audit report" to "environmental statement".

M/s. SRI RAMAKRISHNA FERRO ALLOYS (INDIA) PVT. LTD., **has** set up their unit at Plot No. 5 & 6, IDA, Gollapuram (V), Hindupur (M), Anantapur (Dist) of Andhra Pradesh in the year 2012 for manufacturing of Ferro Manganese / Silicon Manganese or Ferro Silicon.

2. OBJECTIVE OF THE STUDY:

The objective of the present study is to review the performance of pollution control systems installed by the industry so as to identify efficient pollution prevention and control systems, which could be beneficial to both environment and its components.

M/s. SRI RAMAKRISHNA FERRO ALLOYS (INDIA) PVT. LTD., has entrusted the task of preparation of Environmental Statement (Audit) to ***M/s. GLOBAL ENVIRO LABS,*** *{ Recognized by NABET, QCI, GoI, New Delhi }* Hyderabad and an in-depth study was conducted to review the process efficiency, waste water generated and the present treatment systems, emissions generated and air pollution control equipment provided, mode of solid waste collection and disposal and the other associated problems leading to the pollution and impact on environment.

3. SITE LOCATION:

M/s. SRI RAMAKRISHNA FERRO ALLOYS (INDIA) PVT. LTD., is located Plot No. 5 & 6, IDA, Gollapuram (V), Hindupur (M), Anantapur (Dist) of Andhra Pradesh. The management is committed in its Quality Policy to maintain Clean and Safe Environment. The project is located about 12 km away from National Highway connecting Hyderabad – Bangalore, predominant soil is red soil. The climatic conditions at the site are mainly dry throughout the year. The average annual rainfall in the area is 550 mm, the maximum ambient temperature is 43^{o}C and minimum is 17^{o}C. There is no forest area within the radius of 10 kms around the present project site.

FORM - V
(See Rule 14)

ENVIRONMENTAL STATEMENT FOR THE FINANCIAL YEAR 31st MARCH 2018.

PART – A

i) Name and address of the owner/ Occupier of the industry operation or process : **Mr. S. NIRMAL KUMAR**

M/s. SRI RAMAKRISHNA FERRO ALLOYS (INDIA) PVT. LTD.,

Plot No. 5 & 6, IDA,
Gollapuram (V), Hindupur (M),
Ananthapur (Dist).

iii) Production Capacity (Units) : Silicon Manganese - 12,600 TPA

Produced Quantity (2017-2018) : Silicon Manganese - 9,150.87 TPA

PART – B

WATER AND RAW MATERIAL CONSUMPTION

1) Water consumption : 25.0 m^3/day

Process : 0.0 m^3/day
Cooling (Make Up) : 19.5 m^3/day
Gardening & Domestic : 5.50 m^3/day

Name of Products	Water consumption per unit of products (m^3/MT)	
	During the previous financial year (1) 2016-2017	During the current financial year (2) 2017-2018
Silico Manganese	0.790	0.703

ii) Raw Material Consumption

Name of the raw materials	Name of product	Consumption of raw material per MT of output (MT)	
		During the previous financial year 2016-2017	During the current financial year 2017-2018
Dolomite	Silicon Manganese	0.198	0.169
Manganese Ore		2.557	2.675
Dolochar		0.546	0.701

PART – C

POLLUTION GENERATED
(Parameter as specified in the consent issued)

i)	Pollutants	Quantity of pollutant discharged (mass/day) (Avg.)	Concentration of pollutant discharges (mass/volume) (Avg.)	Percentage of variation from prescribed standards with reasons
a) **Water**		NIL		
1.0 m^3 / day of wastewater generated from Domestic use. The Domestic Effluents are sent to septic tank followed by soak pit.				
b) **Air (Stack Quality)**		Quantity of pollutant Emissions (Kgs/day) 2017-2018	Concentration of pollutant in Emissions (mg/N m3) 2017 – 2018	Percentage of variation from prescribed standards with reasons
1.	Stack attached to the 6 MVA Submerged Arc Furnace			
	Particulate Matter [PM]	78.32	41 mg/Nm^3	18.00% less
	Sulphur Dioxides [SO2]	91.70	48 mg/Nm^3	94.00% less
	Oxides of Nitrogen NOx]	68.77	36 mg/Nm^3	94.00% less

b) Air (Ambient Air Quality) [µg /m^3] Avg		**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**NO_x**	All the values are well within the limits stipulated by APPCB
1.	Near Main Gate	53.0	27.0	08.0	11.0	
2.	Near Furnace	67.0	39.0	16.0	13.0	
3.	Near D.G.Set	59.0	31.0	13.0	19.0	

PART – D

HAZARDOUS WASTE

(As specified under Hazardous wastes/Management and handling) rules, 1989

Hazardous Wastes	Total Quantity (KL / Year)	
	During the previous financial year 2016-2017	During the current financial year 2017-2018
Waste Oils	0.04	0.04 Kl / yr

PART – E

SOLID WASTES

	Total Quantity (Tons/ Year)	
	During the previous financial year 2016-2017	During the current financial year 2017-2018
(a) From Process	NIL	NIL
(b) From Pollution Control Facility		
Bag Filter Dust	65.7	62.0
(c) Quantity recycled or re-utilized	NIL	NIL

PART - F

Please specify the characteristics (in terms of concentration and Quantum) of Hazardous as well as solid wastes and Indicates disposal practice adopted for both these categories of wastes.

There are 40 lt/year of used oils are generated from this unit as hazardous waste and these are disposed to authorized reprocessing agencies.

There are 62.0 MT/Year of Bag filter dust and cleaning process rejects are generated from the pollution control facilities in the form of Solid waste. The same shall be sold to out side parties/ Recycled into production process.

PART - G

Impact of the pollution control measures on conservation of natural resources and consequently on the cost of production.

Adequate measures taken to maintain clear environment in and around the factory premises. There is a bare minimum impact on the surrounding environment. Cost of production is slightly increased due to the pollution control measures.

PART – H

Additional investment proposal for environmental protection including abatement of pollution.

M/s. SRI RAMAKRISHNA FERRO ALLOYS (INDIA) PVT. LTD., has already spent 1.50 Crores to control the water and air pollution from their plant. They are spending around 11.0 Lakhs - per month as maintenance expenditure to run the pollution control system.

Any other particulars in respect of environment protection and abatement of pollution.

Pollution control facilities are functioning satisfactorily. The plant has developed green belt in area of 5.8 acres area in the plant. Prompt attempts have been taken by the plant authorities to grow trees since from beginning of the plant. The management also proposed to develop the Greenbelt in all vacant areas of the plant. The steps taken by the management to abate pollution and at the same time improves the surrounding environment. About 700 plants were planted under the greenbelt development program during the year 2017 – 2018 by the plant management.

SILICO MANGANESE / FERRO SILICON PROCESS DESCRIPTION OF THE PLANT

Silico Manganese Process:

Silico Manganese (Si Mn), as the name suggests, is a ferro alloy with high contents of manganese and silicon. It is made by heating a mixture of oxides like manganese oxide (MnO_2), Silicon dioxide (SiO_2), and iron oxide Fe_2O_3, with carbon in furnace. They undergo a thermal decomposition reaction. It is used as a de-oxidizer and an alloying element in steel.

Manufacturing Process:

Silico Manganese is an alloy of manganese and iron with additions of Silicon, Carbon, and several other various elements. The Silico Manganese & Ferro Manganese are alloys of manganese and iron with additions of Silicon, Carbon and several other various elements. The Ferro alloys can be divided into various grades depending upon the content in the alloy.

Manganese Ore is the basic material having the major constituents of the alloy viz. Iron and manganese. Different type of manganese ores is blended to achieve an appropriate manganese iron ratio used for the furnace charge. Coke is used as a reductant and quartz as an additional agent. The raw materials are charged into a furnace where they are smelted by electric power supplied through three carbon electrodes. The alloy and the slag produced in the furnace are tapped at regular intervals. The specifications of Silicon Manganese produced will conform to Indian Standard.

Electrode Paste, Casing/Ms Items, Oxygen Lance and Refractories:-

The Soderberg electrodes are formed in suite by charging electrode paste of suitable compressive strength, electrical conductivity, porosity and apparent density, into mild steel cylindrical shell provided with inner ribs for reinforcement. There is a continuous consumption of both electrode paste-casing sheets/MS Items.

The other consumables of the process include Oxygen Lancing pipes and Oxygen used for opening the furnace tap-holes, and the refractories for the lining of pans / runners used for alloy collection.

The Process:–

Standard Silico Manganese is smelted at about 1700-1800^{O}C. A conventional Submerged Electric Furnace achieves this. 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^{O}. 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 reluctant, being heavy gradually settles at the bottom. The slag produced by the 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 Silicon manganese and the slag flow the C.I. Pan. The slag being lighter overflows from the C.I. pan 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, generally freed from ferro alloys after cooling are sent to the slag dump.

Source:

The main raw material required for manufacture of Silico Manganese is available from the mines of Manganese ore India Ltd, Nagpur and also from private mine owners in Visag, Andhra Pradesh, Nagpur, Hyderabad, Bellary etc. Coal and coke required for manufacture are available in and around Andhra Pradesh and Karnataka, in sufficient quantity.

Ferro Silicon Process:

Ferro Silicon is an alloy called silicon (Si 02) with small percentage of Aluminum (Al2 03) and many other elements. The Ferro silicon is used for manufacturing different variety steels for different uses.

Manufacturing process:

The Ferro Silicon is manufactured in electric operated submerged arc furnace the manufacturing process of Ferro Silicon can be broadly classified into four steps.

a) Blending of raw materials
b) Charging and smelting in the arc furnace
c) Tapping and cooling of molten materials
d) Breaking, Cleaning and packing.

a) Blending of Raw Materials:

Quartz, Charcoal and M.S. scrap are mixed in the required quantity and lifted to the charging platform with the help of the lifting arrangements. The raw materials are generally mixed in the following proportion in terms of weight.

Quartz	-	53%
Charcoal	-	35%
M.S Scrap	-	12%

b) Charging of raw materials

The blended raw materials are charged to the furnace with the help of hoist and charging chutes at a regular interval. In the furnace three carbon electrodes are partially submerged in the charge, which are supported by hydraulic cylinders for upward and down ward movements. The electrodes help in maintaining desired electric conditions in the furnace. The chemical reaction starts at a temperature of 1600 C to 1700 C. In the reaction zone of the furnace the silica reacts with the reductants and after reaction, a mixture of iron and silicon trickles down and gets collected at the bottom of the furnace crucible. The impurities present in the form of molten slag are collected in vessel.

c) Tapping and cooling

Three tap holes are provided at the bottom of the furnace for tapping both molten alloys and slag. During repair work of the Tap hole functions and the other works as standby. As the charge enters the smelting zone, the alloy formed by chemical reactions of the oxides and the reductants, being heavy, gradually settles at the bottom. At regular intervals of 2 to 2.5 hours the furnace is tapped. The tap hole is opened by Oxygen lancing pipe and after tapping is completed, it is closed by clay plugs. The liquid Ferro silicon is collected in the tapping pot and cast on the dressed sand beds for solidification and cooling.

d) Breaking cleaning and packing

After solidification the cakes are broken manually with help of hammer's to reduce into the required lump sizes after being removal of undesired particles if any, like slag contents etc. After cleaning and breaking, laboratory test is conducted for checking quality and composition. Finished goods are then packed in either jute bags/ P.P. bags ready for dispatch

Material Requirement

The specific consumption and quantities of raw materials / consumables for an annual production of 50 TPD of Ferro Silicon and 90 TPD of Silico Manganese are shown in the table