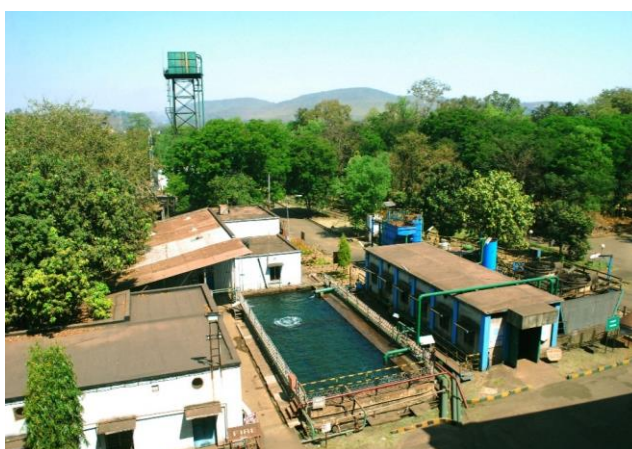




ENVIRONMENT STATEMENT

FOR THE FINANCIAL YEAR 2015-16

Submitted to SPCB under Rule 14 of The Environment (Protection) Rules 1986



TATA STEEL LIMITED
FERRO MANGANESE PLANT
JODA, KEONJHAR



TATA STEEL LTD.
FERRO MANGANESE PLANT, JODA

Ref. No. FAPJ/4562 /

/2016

Dated : 23/09/2016

The Member Secretary
Odisha Pollution Control Board
A/118, Nilakantha Nagar
Bhubaneswar

Sub: Submission of Environmental Statement.

Sir,

We are submitting one set of Annual Environmental Statement in respect of M/s
Ferro Manganese Plant, Joda for the year ending 31st March, 2016.

This is for your kind perusal.

Thanking you,

Yours faithfully,
For : TATA STEEL LTD.


HEAD
FERRO MANGANESE PLANT,
JODA

Encl : as above.

Copy to -Regional Officer, OPCB, At-Baniapatt, College Road, Keonjhar - with
enclosure.

TATA STEEL LTD.
Ferro Alloys & Minerals Division
Ferro Manganese Plant, Joda
Joda - 758034, Odisha, India

Tel : 09238100945, e-mail - head.office@tatasteel.com
Regd. Office : Bombay House, 24 Homi Mody Street, Mumbai - 400 001



**ENVIRONMENTAL STATEMENT
OF
FERRO MANGANESE PLANT
(TATA STEEL LIMITED)
JODA, KEONJHAR**

FOR THE YEAR 2015-2016

**PREPARED BY
THE DEPARTMENT OF SAFETY & ENVIRONMENT**

**FERRO MANGANESE PLANT
TATA STEEL LIMITED
JODA, DIST. KEONJHAR**

INTRODUCTION

Ferro Manganese plant, Joda was installed in 1958 as a captive source of supply of Manganese Alloys to steel Works, Jamshedpur with a capital investment of 1.58 Crores. The plant was set up in technical collaboration with M/s. ELKEM, Norway, one of the world pioneers in smelting technology. JODA Valley was selected as the plant site because of its close proximity to the Mn Mines of TSL from where major raw materials were to be procured. The plant was set up with an installed capacity of 30,000 MT of Fe-Mn per year from two Furnaces of 9 MVA.

Considering the changed market scenario, one of the two furnaces was modified in the year 1989 to increase the capacity from 9 MVA to 15 MVA. In the year 1995, further modification was carried out in the furnace configuration as well as pit side facilities.

M/S Tata steel limited (hereinafter termed as TSL) is presently operating with two submerged arc furnace to produce a total of 0.0504 MTPA Fe-Mn.

ABOUT THE PLANT

Plant Location and Accessibility

The site of the Ferro Manganese Plant is located at Joda, Tehsil- Barbil, District- Keonjhar, State-Odisha and it is a part of Survey of India Topo Sheet No. 73-F/8 bounded by the latitudes 22° 01' 01.181" N to 22° 01' 25.922" N and longitudes 85° 25' 48.671"E and to 85° 25' 48.671" E and the plant site is at a distance of 1.95 km from NH-215. The nearest South Eastern Railway line is at a distance of 1.0 km from plant, in East direction. The nearest airport is at Bhubaneswar at a distance of about 196 km in South-east direction. Nearest port is Paradeep at a distance of 232 km. The nearest township is Barbil which is 10.2 Km in North-West direction.

FORM - V

FORM - V

Environmental Statement for the financial year ending on 31.3.2016

PART - A

1. Name and address of the Owner/occupier of the Industry, operation or process. : Mr. T.V. Narendran
MD, Tata Steel India & SEA
AT/PO- 5c Road, Jamshedpur
2. Name and address of the Factory Manager : Mr. G. P Sahu
Head, Ferro manganese Plant
AT/PO- Joda
3. Industry Category : Large
4. Production Capacity of Ferro Alloys. : 50,400 MT/Year
5. Year of establishment : 1958
6. Date of submission of previous Environmental Statement : 22nd September, 2015

PART - B

Water and Raw Material Consumption

Water consumption (In m³)	2014-2015	2015-2016
1. Industrial Cooling	171689	181406
2. Process	48073	37431
3. Domestic	13735	5561
Total:	233497	224398

*Includes fresh water make up, service water etc.

**Includes water for drinking, toilets, washing & Canteen supply in plant.

Process water consumption per unit of product output:-

NAME OF THE PRODUCT(S)	RATE OF WATER CONSUMPTION IN M ³ /T	
	DURING THE PREVIOUS FINANCIAL YEAR	DURING THE CURRENT FINANCIAL YEAR
High Carbon FeMn	4.88	4.67

B. Raw material Consumption :-

The raw material consumption for the production of FeMn is as follows:-

FeMn :

Name of raw materials	Name of Products	Consumption of raw material per unit of Output (KG/ MT or (MWH)	
		During the Financial Year (2014-2015)	During the current Financial Year (2015-2016)
Manganese ore	Fe-Mn	2261 kg	2301 kg
Coke	Fe-Mn	563 kg/358 kg (F.C)	573 kg/354 kg (F.C)
Dolomite	Fe-Mn	225 kg	246.2 kg

PART-C

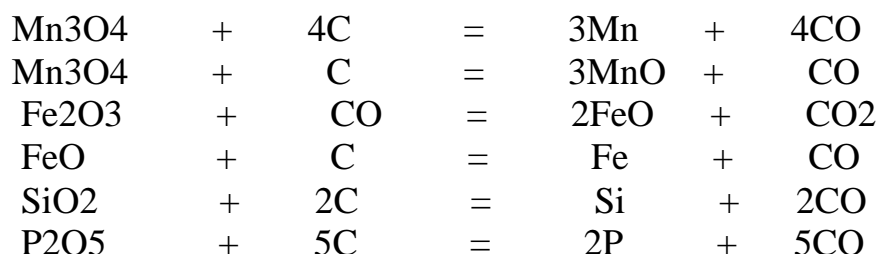
POLLUTION DISCHARGED TO ENVIRONMENT/ UNIT OF OUTPUT

(PARAMETERS AS SPECIFIED IN CONSENT ISSUED)

Basically the plant produces air pollution and the causes can be attributed to the process which has been briefed as follows:-

Brief description of the process producing FeMn :

During the smelting process, oxides of Iron, Manganese, Silicon, Sulphur and Phosphorous are reduced and the reactions involved in the above process are as follows:-



The Sulphur goes into the Slag and also escapes to the atmosphere through the stack as SO₂.

A. Water Pollutants:

The water used for cooling several parts of the Furnaces as well as scrubbing the flue gas in the Gas Cleaning Plants is re-circulated to the system and is not discharged outside the Plant. However during rainy season discharge of storm water is a natural process.

B. Air Pollutants:

B.1 Pollutants from Stack:

SI No.	Stack details	Pollutants	Quantity of Pollutants discharged (mass/day) (Ton/day) 2015-2016	Concentration of Pollutants discharged (mass/volume) (mg /Nm ³) 2015-2016	Percentage of variation from prescribed standard with reasons
1	Furnace 1	PM (mg/Nm ³)	0.003	36.9	Due to the effective operation of Gas Cleaning Plant.
2	Furnace 2		0.004	40.5	

PART - D

HAZARDOUS WASTES

(AS SPECIFIED UNDER THE HAZARDOUS WASTES)

HAZARDOUS WASTES	TOTAL QUANTITY (In Lt)	
	DURING THE PREVIOUS FINANICAL YEAR(2014-2015)	DURING THE CURRENT FINANICAL YEAR(2015-2016)
I) FROM PROCESS		
a. USED TRANSFORMER OIL	4800 Lt	2561 Lt
b. WASTE OIL	Nil (Garage activities have been totally stopped)	Nil (Garage activities have been totally stopped)
c. WASTE BATTERIES	15 Nos. of 12 Volt & 54 Nos. of 2 Volt	8 Nos. of 12Volt
II) FROM POLLUTION CONTROL FACILITY		
a) Flue gas cleaning residue(Ferro Manganese plant)	3600 MT(Approx.)	3600 MT(Approx.)

PART - E
SOLID WASTES

SOURCES	TOTAL QUANTITY	
	DURING THE PREVIOUS YEAR(2014- 2015)	DURING THE CURRENT YEAR(2015- 2016)
a. From Process		
i) Slag	33635 MT	50,337.02MT
ii) Cotton wastes	Nil(The use has been stopped completely)	23 Kg
iii) Waste Batteries	Nil	Nil
b. From Pollution Control Facility.	3600 MT(Approx.)	3600 MT(Approx.)
c. i. Quantity recycled or Reused within the unit	NIL	NIL
ii.Quantity sold	23483.6 MT of Slag *	38038.9 MT of Slag*
iii. Quantity disposed	NA	NA

* including backlog

PART - F

Characteristics of FeMn Slag	Characteristics of GCP Sludge
MnO = 26% to 35%	MnO = 46% to 48%
SiO ₂ = 20% to 30%	C = 3% to 4%
R ₂ O ₃ * = 18% to 21%	R ₂ O ₃ = 10% to 12%
CaO = 6 % to 10%	CaO = 3% to 5%
MgO = 4 % to 8%	MgO = 6% to 7.5%

* R₂O₃ = (Al₂O₃ + Fe₂O₃)

The compositions of other hazardous wastes like Waste Oil & Waste Batteries are Hydrocarbons, lead and used acids.

DISPOSAL PRACTICE :

SLAG :-

Furnace # 1 & Furnace # 2 produce high MnO slag as a by - product, which is partly used in Fe-Mn Process and partly sold in market.

SLUDGE :-

The sludge after being conveyed to the sludge drying beds from the thickener is allowed to dry sufficiently and the dry sludge is then transported to the earmarked sludge dumping site (a Co's low lying leasehold area) for final disposal. The dumping site is properly fenced and caution board displayed. In order to prevent the sludge getting into the water body flowing in proximity, a retaining wall of size 250Mtrs x 2.5 Mtrs x 0.5 Mtr as well as a garland drain encircling the total sludge dumping site and a 2-stage settling pit have been constructed around the dumping site adjoining the water body as pollution prevention measures .Two Test Wells (as per the specifications of the OPCB) have also been constructed both in the Upstream and in the Downstream in order to monitor the ground water quality near the sludge dumping site. Plantation around the sludge dumping site has also been undertaken having a survival rate of more than 90%.

WASTE OIL :

The waste oil generated at various sources are collected in leak proof barrels and then are kept on an impervious floor with oil catch pit. It is also ensured that the caps of the barrels remain intact and horizontal .The storage area is properly fenced and caution board displayed. During transfer of waste oil to barrels, a trough is placed underneath in order to prevent land contamination due to oil spillage then at a fixed interval, these barrels are returned to stores for final disposal through auction to the authorized party.

WASTE BATTERIES :

Waste Batteries are generated in Electrical section and Garage to the tune of 12 Nos./year(max). These batteries with diluted acid and caps intact are kept under a shed having impervious floor. Then at a fixed interval, these batteries are returned to Stores for final disposal. All storage areas are having sheds have been suitably barricaded and caution board displayed.

USED COTTON WASTES:

The used cotton wastes generated at various locations are kept in designated barrels and at a fixed interval; these wastes are handed over to the Shift In-charge of the Furnace Section for incinerating in the Electric Arc Furnace at a temperature of more than 1100 degree C.

USED OIL:

The used oil generate is sold to authorized recycler.

PART - G

IMPACT OF THE POLLUTION ABATEMENT MEASURES TAKEN ON CONSERVATION OF NATURAL RESOURCES AND ON THE COST OF PRODUCTON :

M/s Ferro Manganese Plant, Joda has spearheaded the pursuit for Environmental Protection by implementing an effective environmental management system. To this effect, the Plant has undertaken the following measures:-

- i. Annual maintenance of all four the GCPs including power consumption and sludge transportation is Rs. 104 Lakhs (Approx.)
- ii. Sewage Treatment plant was installed and made operational which costs Rs. 46.7 Lakhs.
- iii. High velocity mobile type rotary water sprinkler procured and made operational for dust suppression which incurred cost of Rs. 48.62 Lakhs.
- iv. Annual Maintenance of Fume Extraction System including power consumption is Rs. 2 Lakhs (Approx.)
- v. Extensive Plantation in and around the Plant for which the annual expenditure of Rs.6 lakhs was incurred.

- vi. Misc. contractual jobs for maintaining environmental management system was Rs.15 lakhs(approx.)

So the total annual expenditure incurred towards environmental protection = (104+48.62+46.7 + 2 +6+ 15) lakhs = Rs 222.32 / lakhs (approx.)

Annual production of the plant during the year = 48001 MT

So the impact of the pollution abatement measures on the cost of production shall be = Rs 222.32 lakhs / 48001 MT = Rs 462 / MT (Including new stand by GCP)

Thus the plant is incurring an additional expenditure of Rs 462 / MT of finished product towards pollution control measures.

PART - H

Environmental Management System in concurrence with the requirements of ISO-14001:2004 standards have been implemented very effectively thro' the following efforts:-

- a. Effective solid wastes management
- b. 100% recycling of waste water
- c. Scheduled water sprinkling of haul roads by using air borne dust suppression system
- d. Discharging the canteen waste water to Soak Pits thro' Sewage treatment plant.
- e. Imparting EMS training to all the employees
- f. Gas Cleaning Plant
- g. Fume Extraction System at Furnace Tap hole.
- h. Proper handling and management of Hazardous Wastes
- i. Optimization of consumption of natural resources like water & minerals

PART - I

1. Community awareness development programmers on environmental protection are also undertaken through celebration of World Environment Day and plantation inside and outside the premises.

2. The Plant has been certified to the coveted ISO-14001:2004 (EMS) Certification by IRQS, Mumbai.