

**ENVIRONMENTAL STATEMENT**

**OF**

**FERRO ALLOYS PLANT  
(TATA STEEL LIMITED)**

**BAMNIPAL, KEONJHAR**

**FOR THE YEAR 2017-2018**

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

**FERRO ALLOYS PLANT**

**TATA STEEL LIMITED**

**BAMNIPAL, DIST. KEONJHAR**



etc

Ref. No. FAP(B)/HEAD/332/2018

Date: 26.09.2018

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

Sub: Submission of Environmental Statement for the period of 2017-18 for Ferro Alloys Plant, Bamnipal of Tata Steel Limited.

Sir,

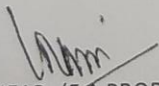
We are submitting one set of Annual Environmental Statement in form-V dully filled in for the year 2017-2018 in respect of M/s Ferro Alloys Plant, Bamnipal by Tata steel for your kind consideration.

We wish to maintain that necessary control measures have been installed and adopted to minimize the impact on environment.

We look forward to further your guidance which shall certainly help us in endeavoring further improvements in our Environmental Management Practices.

Thanking you,

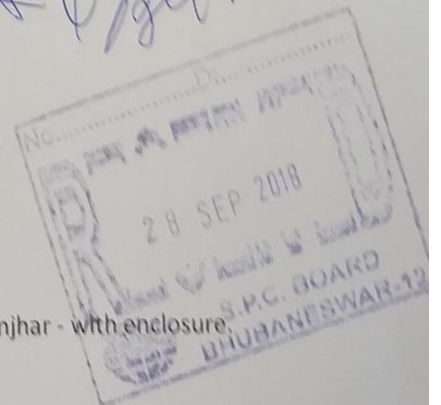
Yours faithfully,  
For : TATA STEEL LTD.

  
HEAD, (F.A. PRODUCTION)  
FERRO ALLOYS PLANT, BAMNIPAL

Encl : as above.

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

Received  
28/9/18



**TATA STEEL**

Ferro Alloy Plant, Bamnipal-758082, Keonjhar, Odisha, India  
Tel. : 9238118601, 9238118603, Fax : 916726243324  
Regd. Office : Bombay House, 24 Homi Mody Street, Mumbai-400 001  
Tel. : 91 22 6665 8282 Fax 91 22 66657724  
Corporate Identity Number L27100MH1907PLC000260 Website www.tatasteel.com

## **INTRODUCTION**

The Ferro Alloy Plant, Bamnival unit was originally set up by M/s ORISSA MINING CORPORATION LTD. (OMC) (A GOVT. OF ORISSA UNDERTAKING) in 1986, under technical collaboration with Consortium Voest Alpine AG (Linz, Austria) and Outokumpu OY, ESPOO Finland. The Plant adopts the OUTOKUMPU process of manufacturing sintered chrome ore pellet and production of Ferro Chrome by Electro Thermic Reduction in Sub-merged Arc-Furnace.

The Plant was taken-over by "TATA STEEL" under an agreement with GOVT. OF ORISSA on 27th SEPT'91. The earlier marketing agreement with M/s KLOCKNER AG, WEST GERMANY ceased to exist w.e.f. the date of takeover by TATA STEEL.

It is obvious that the economic development of a nation rests on the extent of industrialization it has. With the advent of the industrial revolution, the global economic growth has assumed staggering proportion. But simultaneously this phenomenon has substantially impeded the preservation of flora and fauna which is imperative for human existence. Indiscreet exploitation of natural resources has resulted in gross environmental degradation. So, to help preserve the natural habitat, the Government has enacted various laws in order to bridle the environmental pollution caused by the industries.

M/s Tata Steel Ltd. has always supported the cause of environmental protection and has adopted environmental measures both in letter and spirit. The Environmental Audit Report, a topic notified on the 13<sup>th</sup> March, 1992 as an outcome of the amendment of the Environment (Protection) Rules, 1986, is basically an annual status report of an industry as regards the environmental measures adopted by the industry to protect and improve the work environment and the periphery.

**FORM - V**

**Environmental Statement for the financial year ending on 31.03.2017**

**PART - A**

1. Name and address of the owner/ occupier of the Industry, operation or process : Ferro Alloy Plant, Bamnival  
Tata Steel Ltd,  
At/PO- Bamnival, Keonjhar-758082
- Factory Manager : Mr. U P RATH  
Head, Ferro Alloys Production,
- Nominated Occupier : Mr. T.V Narendran,  
Managing Director,  
Tata Steel Ltd., Jamshedpur.
2. Industry Category : Large
3. Production Capacity of Ferro Alloys. : 65,000 MT/Year
4. Year of establishment : 1986
5. Date of submission of previous Environmental Statement : 23<sup>rd</sup> September, 2016

**PART - B**

**Water and Raw Material Consumption**

- Water Consumption - Water is used inside the Plant for the following purposes
- a) Industrial Cooling
  - b) Process and
  - c) Domestic Purpose

Water consumption under all the three heads for the assessment year are as follows:-

1. Industrial Cooling : 741568.7 M<sup>3</sup>
2. Process : 164397 M<sup>3</sup>
3. Domestic : 187674.4M<sup>3</sup>

**Process water consumption per unit of product output:-**

Name of the Product(s)	Rate of water consumption in M <sup>3</sup> /Ton	
	During FY 16-17	During FY 17-18
High Carbon FeCr	16.09	17.89

**B. Raw material Consumption :-**

The raw material consumptions for the production of FeCr are as follows:-

**FeCr:**

Raw Materials Used	Avg quantity used to produce 1 MT of FeCr for the Previous Year(2016-17)	Avg Quantity used to produce 1 MT of FeCr for the current year (2017-18)
Chrome Ore (Kg)	2083*	2105*
Coke (Kg)	525*	526*
Electrode Paste (Kg)	9*	8*
Power (KWH)	3651*	3618*

\*Annual average

**PART - C**

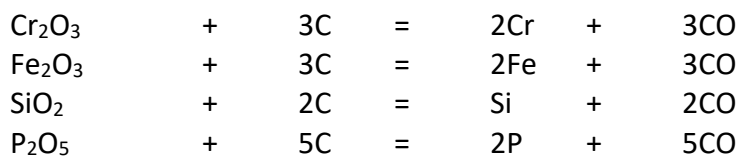
**Pollution discharged to environment / unit of output**

**(Parameter as specified in the Consents 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 FeCr:**

During the smelting process, oxides of Chromium, Iron, 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 SO<sub>2</sub>.

**Sources of Pollution:**

The sources of pollution can be in the form of:

1. Air Pollution
2. Water Pollution

**Air Pollution:**

30 MVA Arc Furnace produces the following air pollutants which is released to atmosphere through GCP.

SPM, SO<sub>2</sub>, NO<sub>2</sub> & CO

**Water Pollution:-**

The water used for cooling several parts of the Furnaces, making slurry in GFPS, slag granulation, scrubbing in GCP is re-circulated to the system and is not discharged outside the Plant.

**DETAILS OF THE ENVIRONMENTAL MONITORING****Stack Emission Quality:**

	Type of Air pollutant	Concentration of pollutants in mg/Nm <sup>3</sup>	Prescribed standard in mg/Nm <sup>3</sup>	% variation from the norms with reason.
Stack attached to Arc Furnace	PM	35.8(max)	100	64% (due to the effective operation of Gas Cleaning Plant)

**AMBIENT AIR QUALITY:**

TYPE OF AIR POLLUTANTS	CONCN.OF POLLUTANTS IN µg/m <sup>3</sup>	PRESCRIBED STANDARDS IN µg/m <sup>3</sup>	% OF VARIATION FROM THE NORMS WITH REASONS
PM <sub>10</sub>	57.84	100*	Due to effective water Sprinkling on haul roads. DE system in GFPS (Grinding Filtering Pelletizing Sintering Plant). Plantation around boundary and natural greenery around the plant premises.
PM <sub>2.5</sub>	28.8	60*	Due to effective water Sprinkling on haul roads. DE system in GFPS (Grinding Filtering Pelletizing Sintering Plant).
SO <sub>2</sub>	4.22	80	
NO <sub>x</sub>	18.85	80	
CO	0.31	2 mg/m <sup>3</sup>	The CO gets diluted in the air immediately

\*Annual average

\*\* in mg/NM3

NT - Not Traceable

**PART – D**

**HAZARDOUS WASTES**

(AS SPECIFIED UNDER THE HAZARDOUS WASTES)

HAZARDOUS WASTES	TOTAL QUANTITY	
	DURING THE PREVIOUS YEAR (2016-17)	DURING THE CURRENT YEAR(2017-18)
I) FROM PROCESS a. Used Oil b. Waste Containing Oil c. Waste batteries	a) 7440 Ltrs* b) Nil Ltrs c) 43 Nos* ( Including Telephone exchange batteries)	e) 2800 Ltrs f) Nil Ltrs g) Nil Nos
II) From Pollution Control Facility (GCP)	d) 159.06 (as sludge)	h) 155.9 Mt (as sludge)

\* Including Back log

**PART - E**

**SOLID WASTES**

SOURCES	TOTAL QUANTITY	
	DURING THE PREVIOUS YEAR(2015- 2016)	DURING THE CURRENT YEAR(2016- 2017)
a. From Process i) Slag ii) Cotton wastes iii) Waste Batteries	57232.56 MT Nil (The use has been stopped completely) 43 Nos* (Including telephone exchange batteries)	57232.56 MT Nil (The use has been stopped completely) Nil Nos* (Including telephone exchange batteries)
b. From Pollution Control Facility.	159.06 MT (As sludge)	155.9 MT (As sludge)
c. i. Quantity recycled or Reused within the unit	Nil	Nil
ii. Quantity sold	Nil	Nil
iii. Quantity disposed	Slag dumped in our company leased area and sludge stored in impervious lined pit.	Slag dumped in our company leased area and sludge stored in impervious lined pit.

\* including backlog

## **PART - F**

<b>Characteristics of FeCr Slag</b>	<b>Characteristics of GCP Sludge</b>
Cr <sub>2</sub> O <sub>3</sub> = 7% to 10%	Cr <sub>2</sub> O <sub>3</sub> = 25% to 28%
SiO <sub>2</sub> = 28% to 32%	SiO <sub>2</sub> = 17% to 18%
MgO = 25% to 28%	C = 7% to 8%
Al <sub>2</sub> O <sub>3</sub> = 25% to 28%	Al <sub>2</sub> O <sub>3</sub> = 10% to 12%
Fe <sub>2</sub> O <sub>3</sub> = 3% to 4%	CaO = 2% to 4%
CaO = 1% to 4%	MgO = 16% to 18%
	FeO = 11 to 12%

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

### **DISPOSAL PRACTICE:**

#### **SLAG:-**

Slags generated from furnace are dumped in our leased area.

#### **SLUDGE:-**

The sludge after being conveyed to the imperviously lined sludge drying beds from the thickener is allowed to dry sufficiently and the dry sludge is then transported to the earmarked sludge dumping site inside the plant premises.

#### **WASTE OIL:**

The waste oil generated at various sources is 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 recycler after due intimation to State Pollution Control Board. After dispatch of same, intimation of auction along with copy of manifest is also being sent to State Pollution Control Board.

#### **WASTE BATTERIES:**

Waste Batteries are generated in Electrical section and Garage. 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. Then at a fixed interval, these batteries are disposed through auction to the authorized recycler after due intimation to



State Pollution Control Board. After dispatch of same, intimation of auction along with copy of manifest is also being sent to State Pollution Control Board.

### **PART - G**

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

M/s Ferro Chrome Plant 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. Installation of DFDS system with Air compressor at cost 26.37 lakhs.
- ii. Annual maintenance of both the GCPs including power consumption and sludge transportation is 2.8 crores (approx.).
- iii. Plantation in and around the Plant for which the annual expenditure of Rs. 2.73 lakhs was incurred.
- iv. Rs. 4.10 lakhs every year for water sprinkling on haul roads.
- v. Environmental Monitoring & Measurement every month by third party at annual cost of Rs. 12.39 lakhs.
- vi. Feasibility study for ETP setup at a cost of 2.6 lakhs.
- vii. Miscellaneous contracts of Rs. 68.66 lakhs for garden maintenance, housekeeping, segregation and collection of house hold wastes from colony housing, scrap collection & disposal, mosquito control, development of helipad area etc.
- viii. Development of nursery of Rs. 3.97 lakhs.
- ix. Against work of STP for colony housing of Rs. 14.91 lakhs.
- x. For industrial water treatment Rs. 22.03 Lakhs.
- xi. Water cess of Rs. 74.79 lakhs.
- xii. Slag dump toe wall strengthening & protection of eroded river bed of Rs. 16.07 Lakhs

So the total annual expenditure incurred towards environmental protection  
=26.37+ 2.8 crores + 2.73 lakhs + 4.10 lakhs + 12.39 lakhs + 2.6 lakhs + 68.66lakhs +3.97 lakhs +14.91 lakhs +22.03 Lakhs + 74.79 lakhs + 16.07 Lakhs = 2.51 Crores (Approx.)

Annual production of the plant during the year = 50670 MT

So the impact of the pollution abatement measures on the cost of production shall be = Rs 2.51 Crores/50670 MT = Rs. 495.04/ MT ≈ Rs.495/MT

Thus the plant is incurring an additional expenditure of Rs 495 / MT of finished product towards pollution control measures.

## **PART – H**

Environmental Management System in concurrence with the requirements of ISO-14001 standards has 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
- d. Waste dump plantation
- e. Discharging the canteen waste water to Soak Pits thro' settling tank
- f. Imparting EMS training to all the employees.
- g. Proper handling and management of Hazardous Wastes
- h. Optimisation of consumption of natural resources like water & minerals

## **PART – I**

1. Community awareness development programs on environmental protection are also undertaken through celebration of World Environment Day and showing films on Environmental Protections in captive channel. Involvement of school children, spouse, family members and Road show (Drama) to develop awareness on world Environment day.
2. Also took integrated mosquito control programme to eradicate malaria cases in the colony.
3. TSRDS has done several mobile treatment programs in different villages regarding diseases and their remedial measures with full checkup.
4. The Plant has been certified to the coveted ISO-14001:2004 (EMS) Certification by IRQS, Kolkata.

**Head, FA Production**

**Ferro Alloy Plant, Bamnival**

**Tata Steel Limited**

