



**The Member Secretary
State Pollution Control Board
Paribesh Bhawan
A/118, Nilakantha Nagar
Unit: VIII
BHUBANESWAR-751012**

MD/ENV/395/120/16
Date: 29.09.2016

Sub: Environment Statement of Joda East Iron Mine, Tata Steel Ltd. for FY 2015-16

Dear Sir,

As required under "Environmental (Protection) Amendment Rules, 1992", we are submitting here with the Environmental Statement for our Joda East Iron Mine for your kind perusal.

Thanking you,
Yours faithfully,

F: Tata Steel Limited

Head (Planning), OMQ

Encl: As above.

Copy to: Regional Officer, State Pollution Control Board, At: Baniapat, College Road, Dist:
Keonjhar - 758001, Orissa.

TATA STEEL LIMITED

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**ENVIRONMENT STATEMENT
2015-16**

JODA EAST IRON MINE

TATA STEEL LIMITED

FORM - V
(See Rule -14)

ENVIRONMENT STATEMENT FOR THE FINANCIAL YEAR ENDING THE 31st MARCH, 2015

JODA EAST IRON MINE, TATA STEEL LIMITED

PART-A

- 1 Name and address of the owner/ occupier of the industry, operation or process : Joda East Iron Mine, Tata Steel Limited, Joda, Dist.-Keonjhar , Odisha-758034
- Agent : Mr Mukesh Ranjan
Nominated Owner : Mr T V Narendran, Managing Director, Tata Steel India & SEA, Jamshedpur-831001
- 2 Industry Category : Major
- 3 Production Capacity : 12 MTPA Iron Ore
- 4 Year of Establishment : 1956
- 5 Date of last Environmental Statement submitted. : 29th September, 2015

PART-B

Water and Raw Material Consumption

(i) Water Consumption:

<u>Consumption Head:</u>	2014-15 (in cum/day) (Annual average)	2015-16 (in cum/day) (Annual average)
Process	5061	4931
Spraying in mine pit , services	200	219
Domestic	Nil (The colony is situated outside of the mining lease area. Hence, the consumption under domestic head is shown under Joda West Manganese Mine).	
Name of the product	Process water consumption per product output (m³/MT)	
	During the Previous financial Year (2014-15)	During the current financial Year (2015-16)
Washed Iron Ore	0.34	0.17

(Based on industrial water consumption in wet process)

(ii) Raw Material Consumption

The following items have been consumed/ utilized:

Name of Raw materials	Consumption of Raw Material	
	During previous financial year (2014-15)	During current financial year (2015-16)
High Speed Diesel	4098657 Litres	4224558 Litres
Lubricants	197676 Litres	268554 Litres
Grease	15818 kg	20748 kg
Explosives of all types (Explosive, codex, detonator)	2355623 kg	2493394 kg
Electric Power:		
Consumed	21697076 KWH	27294472 KWH
Generated	29983 KWH	18062 KWH
Gas	3514 Cum	5965 Cum
Tyres	48 Nos.	31 Nos.
Drill rods	359 Nos.	22 Nos.

PART-C

POLLUTION DISCHARGED TO ENVIROMENT/ UNIT OF OUTPUT **(Parameters as specified in the consent issued)**

Water Pollution: Not applicable as there is no outside discharge of any industrial effluent.

Air Pollution:

Average Air Quality of FY' 16:

Pollutants	Concentration of pollutants ($\mu\text{g}/\text{m}^3$)	Standards ($\mu\text{g}/\text{m}^3$)
Near Electronic display board		
1. PM ₁₀	56.83	60
2. PM _{2.5}	33.33	40
3. SO ₂	6.27	50
4. NO _x	11.30	40
Near Manmora Manganese Mines		
1. PM ₁₀	50.64	60
2. PM _{2.5}	29.74	40
3. SO ₂	5.87	50
4. NO _x	10.70	40
Near Slime Dam		
1. PM ₁₀	45.41	60
2. PM _{2.5}	26.11	40
3. SO ₂	5.68	50
4. NO _x	10.20	40
Near Magazine Area		
1. PM ₁₀	50.37	60
2. PM _{2.5}	28.50	40
3. SO ₂	5.74	50
4. NO _x	10.70	40

This is an opencast mine and does not have single point source of air pollutants. There is a DG set in the mine, but it runs only in case of power failure and hence very less operation. So, the quantity of air pollutants discharged in Kg/day cannot be ascertained. The above data shows the average ambient air quality during 2015-16.

PART-D
HAZARDOUS WASTES

As specified under the Hazardous Waste (Management, Handling and Transboundary) Rules, 2008 and amendment thereof

Hazardous Wastes	Total Quantity	
	During the Previous Financial Year (2014-15)	During the Current Financial Year (2015-16)
I) From Process: <ul style="list-style-type: none"> ▪ Used Oil ▪ Waste containing Oil ▪ Waste Battery 	18000 Litre 1.00 MT 160 Nos.	15250 Litre 0.50 MT 63 Nos.
II) From Pollution Control Facility: <ul style="list-style-type: none"> ▪ Waste oil from oil & grease separation pit ▪ Sludge from oil and grease separation pit 	} Included in the Item I	} Included in the Item I

PART-E
SOLID WASTES

Solid waste from this mine is generally of two categories i.e. Overburden/rejects removed during mining operations and slime generated in the process of iron ore washing.

Sources	TOTAL QUALITY	
	During the Previous Year (2014-15)	During the Current Year (2015-16)
a) From Process: <ul style="list-style-type: none"> ▪ From Mining as Overburden ▪ From OB plant as Tailing 	1195000 MT 42555.21 MT	1166300 MT 462595.496 MT
b) From Pollution Control Facility	Not Applicable	Not Applicable
c) i. Quantity recycled or reused within the unit	Study under Progress	Study under Progress
ii. Quantity sold <ul style="list-style-type: none"> ▪ General Office Waste 	Nil	Nil
iii. Quantity disposed <ul style="list-style-type: none"> ▪ Mining overburden ▪ Canteen and colony waste 	1195000 MT Organic wastes are disposed off in dumps	1166300 MT Organic wastes are disposed off in dumps

The slime generated from the beneficiation plant has a potential mineral value. So it is pumped into the tailing/slime pond where it is stored for future use.

PART-F
THE CHARACTERISTICS (in terms of composition and quantum) OF HAZARDOUS ASWELL AS SOLID WASTES AND INDICATE DISPOSAL PRACTICE ADOPTED FOR BOTH THESE CATEGORIES OF WASTES.

The composition of hazardous wastes like used oil & waste containing oil are Gear oil: SP460, 320, 220 & 90, Hydraulic oil: 68, 10, 46, and 100, Mobil oil: 20W40, 30, 40 Transformer oil, Grease: Senogem EP2, KG 10. Solid waste generated as overburden, sub-grade mineral and slime are inert. The average chemical composition are

	Overburden/Sub-grade (in %)	Slime (in %)
Fe	53.98	48.63
SiO ₂	12.97	10.75
Al ₂ O ₃	4.11	9.61
Phos	0.066	0.129

DISPOSAL PRACTICE:-

a) SOLID WASTES:

The overburden is systematically and scientifically dumped on a geologically barren area and properly supported with hard material and the same is being reclaimed by plantation after being declared inactive.

The organic wastes from the canteen and other places are stored in individual different waste buckets which are later on disposed at defined place to enrich the nutrient content. This has been found to hasten the plant growth and the seeds contained in the vegetable waste have contributed to the green cover in the dumps.

The municipal solid wastes (other than above) are segregated as per their characteristics e.g. paper, jute bags, tins, bottles, plastics, metal scraps etc. The inert material like building debris etc. is used as landfills development of landscapes etc.

Slime from ore washing plant is separately stored in a slime dam.

b) HAZARDOUS WASTE:

Used Oil:

The waste oil generated at various sources is collected in leak proof barrels and then are kept under a covered roof and on concrete platforms (Capacity-200 Kl) in the barrels very carefully and sealed properly to avoid any spillage or leakage. 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 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.

Waste containing Oil:

Oil soaked jutes, filter and filter materials are produced during the schedule maintenance and repair of the vehicles from the workshop. Oil soaked sand/soil are stored in a vat made before the oil and grease separation system. Water is added to make the waste free from oil. The oil containing water is led to oil and grease separation system and the sand/soil is disposed of like filters and filter material mentioned above.

Oily waste in solid form are being collected and kept in an impervious pit. It is then regularly handed over to M/s West Bengal Waste Management Ltd. for incineration as advised by OSPCB.

c) WASTE BATTERIES :

The used lead acid batteries with diluted acid and caps intact are kept under a shed having impervious floor. 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 POLLUTION ABATEMENT MEASURES TAKEN ON CONSERVATION OF NATURAL RESOURCES AND ON THE COST OF PRODUCTION

- Efforts were made to reduce the consumption of lubricant oil used in Heavy Mining Equipment's, by timely maintenance, arresting leakages and eliminating spillages. Similarly, attempts were also made to reduce the consumption of electricity in operations. In colony also, some electrical light points have been replaced with solar lights to save consumption of electricity.
- Water spraying on mine haul ways by water tankers has reduced the dust levels in the ambient air. The cost of maintenance of water sprinklers during 2015-16 was about ₹ 12.00 lakhs.
- Construction of Toe wall and garland drain constructed to arrest silt within the mining lease area. The cost of construction of toe wall and garland drain was about ₹ 45.00 lakhs.
- Desilting of all check dams done. The cost of this work was about ₹ 14.00 lakhs
- Installation of LED lights across the mining area and plant site. The cost of it was ₹ 80 lakhs
- An amount of Rs. 8.07 lakhs was spent towards Manpower Engagement in the Environment Department during the year 2015-16.
- Construction of shed for storage of waste material like lubricants etc in equipment division. The cost of it was ₹ 2.00 lakhs
- Construction of new oil catchment pit at equipment division. The cost of it was ₹ 10 Lakhs
- Wet Plant Joda: Modification was done in hydro cyclone to improve reliability hence working hours of system It further avoid spillages. Increase in operation of hydro cyclone helps in improving recovery from slime before getting discharged to slime pond.
- To maintain tailing disposal system, the company has incurred an expenditure of ₹ 40.00 lakhs.
- An amount of ₹ 0.75 lakhs was spent as a part of Manpower Engagement in the Environment Department in the year 2015-16.
- An amount of ₹ 1.80 lakhs was spent towards monitoring of various environmental parameter.
- An amount of ₹ 1.29 lakhs was spent towards the maintenance of electronic boards at Joda during 2015-16
- For landscaping and horticultural development in the lease area at Joda, an amount of 1.90 lakhs (2.54) lakhs was spent during 2015-16.
- During 2015-16, a total of 17,560 saplings were planted within the mine lease area at a cost of about ₹ 22.00 lakhs.
- To generate awareness among the employees and their families about environment, World Environment Day was celebrated at Joda. During 2015-16 an amount of ₹ 2.10 lakh was spent on this account.
- Annual Flower and Vegetable Show was conducted in the month of January 2016 to make the public appreciate the importance of greening efforts. An amount of ₹ 2.25 lakh was spent for the show.
- Wet drilling arrangement provided in each drill machine helps in minimizing the dust generation during the drilling activity. During 2015-16, the mine has spent an amount of 1.70 lakhs for the above measure.

- For maintenance/ evacuation of slime dam, the company has incurred an expenditure of ₹ 180.00 lakhs.
- Environment Management Department is in function to manage regular environmental monitoring jobs and to ensure operation of environmental safeguards. The administrative expenditure of the department for year 2015-16 was ₹5.00 lakhs.
- An amount of ₹ 2.40 lakhs was spent towards study of ground vibration.
- An amount of ₹ 0.50 lakhs was spent towards monitoring through outside party of various environmental parameter.

The above abatement measures have resulted in improvement of air and water quality, reduction in noise exposure, greenery and aesthetics in the mine as well as in residential areas.

In addition to the above Tata Steel Rural Development Society (TSRDS) is engaged in peripheral developmental activities in villages around the mine. The projects of the Society include irrigation and agricultural extension projects, plantation programmes, installation of solar street lights and illuminate villages on through low cost, construction of ponds in support to provision of irrigation water and for other domestic use and in recharging groundwater by arresting the flow of rainwater in downstream, creation of SAVE FOREST groups, civic amenities development, medi-care and health education, rural sports, skill development and promotion of rural cultural activities.

PART-H

ADDITIONAL MEASURES/ INVESTMENT PROPOSAL FOR ENVIRONMENTAL PROTECTION INCLUDING ABATEMENT OF POLLUTION, PREVENTION OF POLLUTION

- ₹1.40 lakhs will be spent on monitoring of various environmental parameters during next financial year.
- During monsoon 2016, we are having the proposal to plant 10,000 saplings in available sites within the lease area, with a budgetary provision of ₹ 10.50 lakhs.
- ₹ 100.00 lakhs have been planned to be spent towards buying scientific equipments and strengthening the environmental laboratory.
- Implementation of wet drilling interlocking system in the new drill machine. The company incurred the expenditure of ₹ 15.00 lakhs
- Implementation of electronic detonator system in blasting to reduce ground vibration and fly rock. The company incurred the expenditure of ₹ 13.00 Lakhs
- Purchase & installation of two nos. of Lechar gun at dry fine stacking to reduce dust emission from fine stack which cost about ₹ 30.00 Lakhs
- Installation of automatic bit grinder to reduce scrap generation. The company has procured this of costing ₹ 40.00 Lakhs.
- Implementation of electronic detonator system in blasting to reduce ground vibration and fly rock which cost was ₹ 13.00 Lakhs
- Flow meters at different input and output points at wet processing plant were installed. The expenses incurred in the installation of these flow meters was ₹ 30.00 Lakhs.

PART-I

ANY OTHER PARTICULARS FOR IMPROVING THE QUALITY OF THE ENVIRONMENT

- The Company is having a full-fledged Environmental Management Department with personnel from relevant fields to take care of all environmental aspects relating to the mines of TATA STEEL. This department has in-house capabilities for monitoring various environmental parameters and suggesting to the management for necessary abatement measures.

- Implementation of online slime dam disposing monitoring system for which the company had incurred the expenditure of ₹ 5.00 Lakhs
- Thickeners are provided in the washing plant, from where water is recovered to the extent of 85%, thus minimising fresh water consumption.
- Hydro-cyclone has been installed in the wet circuit to maximise the ore recovery and to reduce loss of iron value in tailings.
- Specific water consumption for wet processing of ore has been reduced from 0.34 m³/tonne to 0.17 m³/tonne.
- Study on advance vibration management using Monte Carlo simulation method was done which cost was ₹ 108 Lakhs.
- Project was done on to reduce the dust level at tertiary crusher floor from 8.9mg/m³ to 3mg/m³ . the expenses incurred in this project was ₹ 30.00 Lakhs
- Project was done to improve the availability of NBC2 conveyor by control of spillages in tail end side. The expenses incurred in this project was ₹ 15 Lakhs
- Study on iron recovery from slime is going on . The cost of the study is ₹ 100 Lakhs
- The mine is certified to ISO 9001:2008, ISO 14001:2004 & OHSAS 18001:2007. All the three systems have been integrated and implemented since 1st August, 2008.

Head (Planning), OMQ