The Member Secretary
State Pollution Control Board, Odisha
Paribesh Bhawan
A/118, Nilakantha Nagar, Unit - VIII
Bhubaneswar - 751012

MD/ ENV/ 827 / 120 / 2023
Date: 28th September 2023

Sub: Environmental Statement of Khondbond Iron & Manganese Mine, M/s Tata Steel Limited for 2022-23.

Dear Sir

Kindly find attach herewith the Environmental Statement in the prescribed format (Form V) as per "Environmental (Protection) Amendment Rules 1992" of our Khondbond Iron & Manganese Mine for your kind perusal.

Thanking you,

Yours faithfully
f: Tata Steel Limited

Chief (Mine Planning & Projects), OMQ

Encl: As above

Copy to: The Regional Officer, State Pollution Control Board, At: Baniapata, College Road, Keonjhar - 758001, Odisha

TATA STEEL LIMITED
Mines Division Noamundi 833 217 India
Tel 91 9234301340 Fax 91 6596 290737
Registered Office Bombay House 24 Homi Mody Street Fort Mumbai 400 001 India
Tel 91 22 66658282 Fax 91 22 66657724
Corporate Identity Number L27100MH1907PLC000260 Website www.tatasteel.com

ENVIRONMENT STATEMENT
2022-23

Khondbond Iron & Manganese Mine

KHONDBOND IRON & MANGANESE MINE

TATA STEEL LIMITED

September 2023

FORM - V
(See Rule -14)

ENVIRONMENT STATEMENT FOR THE FINANCIAL YEAR ENDING THE 31st MARCH, 2022

KHONDBOND IRON & MANGANESE MINE, TATA STEEL LIMITED

PART–A

1	Name and address of the owner/ occupier of the industry, operation or process	:	Mr Gedela V Satyanarayana, Chief (Khondbond) Khondbond Iron & Manganese Mine Tata Steel Limited, Joda Dist.- Keonjhar, Odisha – 758034 Mr S.S Mishra, Mine Manager (Khondbond) Khondbond Iron & Manganese Mine Tata Steel Limited, Joda Dist.- Keonjhar, Odisha – 758034
	Nominated Owner	:	Mr. Atul Bhatnagar, General Manager, OMQ division, Administrative Building, Noamundi Iron Mine, Tata Steel Limited PO.: Noamundi, Dist.-West Singhbhum Jharkhand – 833217 Mr T V Narendran, Managing Director & CEO, Tata Steel Limited, Bombay House, 24 Homi Mody Street, Mumbai-400 001
2	Industry Category	:	Opencast Iron & Manganese Mining & Processing & Dispatch Industry (Major)
3	Production Capacity*	:	Mine: 08 MTPA Iron Ore & Manganese :0.1MTPA Beneficiation & Dispatch: 08 MTPA Iron Ore
4	Year of Establishment	:	1960
5	Date of last Environmental Statement submitted.	:	27th September 2022, vide letter no. MD/ENV/307/120/2022 for the year 2021-22.

*As per Environmental Clearance

PART–B
Water and Raw Material Consumption

(i) Water Consumption:

Consumption Head:	**2021-22 (in cu.m/day) (Annual Average)**	**2022-23 (in cu.m/day) (Annual Average)**
Process	1914.70	3547.53
Spraying in mine pit, services	143.74	303.53
Domestic	203.98	435.33
Name of the product	**Process water consumption per product output (m3/MT)**	
Iron Ore	0.14	0.20
Manganese Ore	NA	NA

***Note:** *The consumption of water has increased due to increase in production & commissioning of wet plant.*

This is a mechanised mine producing iron ore. The iron ore processing is wet beneficiation along with crushing and screening. Dust suppression at wet beneficiation plant & C&S plant is carried out through a scientific way using dry fog system, thus reducing the requirement of water to very minimum level.

ii) Raw Material Consumption

The following items have been consumed/ utilized:

Name of Raw Materials	Consumption of Raw Material	
	During previous financial year (2021-22)	During current financial year (2022-23)
High Speed Diesel	6774185 Litre	5657016 Litre
Lubricants	86730 Litre	111300 Litre
Grease	10304 Kg	13601 Kg
Explosive of all types (Explosive, codex, detonator)	1715461 kg	1980125 Kg
Gas	Nil	2332276 Cu.m
Tyres	21 nos.	81 nos.
Drill rods	162 nos.	309 nos.
Electricity Consumed	7615315 kwh	18505000 kwh

***Note:** *The consumption of the raw materials has increased due to increase in production & commissioning of wet plant.*

PART–C

POLLUTION DISCHARGED TO ENVIROMENT/ UNIT OF OUTPUT

(Parameters as specified in the consent issued)

Pollutants	Quantity of Pollutants discharged (mass / day)	Concentration of Pollutants discharges (mass / day)	Percentage of variation from prescribed standards with reasons
a) Water	The Khondbond Iron & Manganese Mine with the wet processing plant, the iron and manganese mine pits have separately been operated. The processing plant is a zero effluent discharge unit & all the effluent generated from the processing of iron ore is collected from slime pond and recycled & reused by 100% in various activities including dust suppression and iron ore processing. One sewage treatment plant (STP) of 10 KLD is installed & in operated and entire treated water is recycled & reused for plantation and gardening purpose. One Effluent Treatment Plant (ETP) of 7 KLD is used for HEMM cleaning & washing and water is recycled. **All the water quality results of STP & ETP are attached herewith in annexure-1.**		
b) Air	The Khondbond Iron & Manganese Mine is an opencast iron mine with processing plant & dispatch unit. The air quality in the form of fugitive, dust fall, ambient, respirable is being measured and monitored regularly and is well within limits. All the dust generating points such as loading -unloading devices are equipped with dust arresting system such as dry fog, fixed & mobile water sprinklers, mist spray, dust extractors -bag filters, water scrubbers etc.		

Pollutants	Quantity of Pollutants discharged (mass / day)	Concentration of Pollutants discharges (mass / day)	Percentage of variation from prescribed standards with reasons
	Three continuous ambient air quality monitoring stations with PM_{10}, $PM_{2.5}$, SOx, NOx, (NO2 & NO) & CO parameters are continuously being monitored with online data connectivity at state Pollution Control Board server. A thick & dense vegetation is also placed in all surrounding the area which significantly reduced the pollution load. **The result of air quality monitoring is attached as annexure-2.**		

PART–D
HAZARDOUS WASTES

As specified under the Hazardous & Other Waste (Management & Trans boundary Movement) Rules, 2016 and amendment thereof

Hazardous Wastes	Total Quantity	
	During previous financial year (2021-22)	During current financial year (2022-23)
(a)From Process • Used Oil (Transformer Oil, Gearbox oil etc.) • Waste containing Oil • Waste Used Batteries	48400 litres 0.5MT 1.37 MT	70860 litres Nil Nil
ii) From Pollution Control Facility • Waste oil from oil & grease separation pit • Sludge from oil and grease separation pit	Nil All the Hazardous waste generated is disposed as per law.	

PART–E
SOLID WASTES

Solid wastes from Khondbond Iron & Manganese Mine has been categories in two parts i.e. Overburden/rejects removed during mining operations and slime/tailings generated from beneficiation / processing of Iron Ore. All the materials overburden and tailings are stocked in designated place inside the mine. However, other solid waste is also being generated from mining and processing / beneficiation activity.

Sources	Total Quantity	
	During previous financial year (2021-22)	During current financial year (2022-23)
a) From Process • From mining as Overburden	2163439 Tonne	2763607.76 Tonne
• Sub Grade	849154 Tonne	675360 Tonne
• From Plant as Tailing	Not Applicable	776265.22 Tonne

b) From Pollution Control Facility	Not Applicable	Not Applicable
c) i. Quantity recycled or reutilized within the unit		
• Sub Grade	1315782 Tonne	225581.74 Tonne
ii. Quantity sold	Nil	Nil
iii. Quantity disposed		
• Mining overburden	765959 Tonne	2763607.76 Tonne
• Sub Grade	Nil	460199.79 T
• Canteen & colony waste	Organic wastes are disposed-off as per standards	Organic wastes are disposed-off as per standards

***Note:** *The rate of solid waste has increased due to increase in production & commissioning of wet plant.*

PART-F

PLEASE SPECIFY THE CHARACTERISTICS (IN TERMS OF COMPOSITION AND QUANTUM) OF HAZARDOUS AS WELL AS SOLID WASTES AND INDICATE DISPOSAL PRACTICE ADOPTED FOR BOTH THESE CATEGORIES OF WASTES

The Khondbond Iron & Manganese Mine and processing / beneficiation generate hazardous waste mainly in the form of used oil. The used oil is being generated from HEMM maintenance, which are used in manning operations. The used oil is disposed to authorized agency for recycling and reuse. During handling and maintenance of HEMM, the oil-soaked materials (jute etc.) is being kept and disposed in impervious pit. The hazardous waste such as used batteries is sold to authorized agency.

The other solid waste in the form of overburden and sub-grade mineral are stocked in designated place.

PART-G

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

- Khondbond Iron & Manganese Mine is a star rated iron mine as per Sustainable Development Framework (SDF) has declared by Indian Bureau of Mines, Ministry of Mines, Govt. of India and has adopted various mineral conservation techniques such as blending of waste / subgrade materials, use of low-grade ore etc as per customer quality requirements.
- For conservation of natural resources, high efficiency HEMM are used with adequate maintenance so as to reduce the fuel consumption. Zero effluent discharge is being maintained.
- For ground water augmentation, various rainwater harvesting structures are made, the capacity of pond ~ 47,793 m^3/yr which will harvest the water through various RWH structures. Piezometers are also installed in mines.
- Fleet Management System (FMS) for better and efficient working of the HEMM was introduced in the mines which significantly reduced diesel consumption.

PART-H

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

- Coir matting was done on fine stocks to prevent any erosion that can lead to pollution. Various toe wall, garland drains are made as per progressive mine plan & mine closure plan. Bio Toilets were also installed in area.
- Bio-gas plant for adequate disposal of canteen waste & reduction of LPG are installed.
- The check dams are strengthened with two additional RWH structure.
- For biodiversity conservation, Plantation of local species, development of local nursery at site in area various scientific studies such as Carbon Sequestration study, ground vibration study etc. done.
- Awareness programme such as World environment day, Biodiversity Day, Swachhata pakhwada, Earth-day was organised for creating awareness of people regarding conservation of Natural resources in year 2022-2023. It incurred the cost of ₹ 1 lakh.
- The above abatement measures have resulted in improvement of air and water quality, reduction in noise levels, and improvement greenery within the lease. In addition, Tata Steel Foundation (TSF) is engaged in peripheral developmental activities in villages around the mine. The projects of the Society include irrigation and agricultural extension projects, plantation programmes, creation of SAVE FOREST groups, civic amenities development, medical care and health education, rural sports and skill development, rural cultural promotion, etc.

PART-I

ANY OTHER PARTICULARS FOR IMPROVING THE QUALITY OF THE ENVIRONMENT

- Khondbond Iron & Manganese Mine of Tata Steel Ltd. is a captive mine and is certified for the Integrated Management System (ISO-9001:2015, ISO-14001:2015 & OHSAS-18001:2007 and SA:8000) from last two decades. The unit has obtained various prestigious accolades.
- The Company is having a full-fledged Environmental Management Department with personnel from different backgrounds to take care of all environmental aspects relating to mines of Tata Steel. This department has in house capabilities for monitoring various environmental parameters and suggesting to the management necessary abatement measures.
- Various awareness programs throughout the year conducted in the area which included celebration of World Environment Day, World Water Day, Mine Environment & Mineral Conservation Week, Word Bio-diversity Week, Annual Flower & Vegetable Show etc. In which environment conservation models, current & future proposals are made, environment messages through Nukkad natak, poems, slogans, swachhata drive is being done every year.
- Plantation & green belt development projects have been undertaken by Khondbond Iron & Manganese mine. A total of 8040 saplings were planted in FY 22-23 for safeguarding the environment & strengthening the biodiversity of the area.
- Energy audit was conducted by M/s Powertech for FY 22-23.
- Drip irrigation system was installed at plantation site to reduce the consumption of water.
- All above efforts make the mine clean – green and sustainable. In the year 2022-23, Rs 527.57 lacs are spent on various environmental activities from Khondbond Iron & Manganese Mine. The details of the expenditure is mentioned in details.

Khondbond Iron and Manganese Mine: Environment Expenses for FY 22-23

S. No.	Expense Head	Total Cost in Lacs
1	Expense related to ETP, WTP, STP, Oil Separation Pit	128.9
2	Expense in Operation & Maintenance of Dry Fog system	56.8
3	Operation and Maintenance of Water Sprinklers	53.78
4	Environment Related Studies	0.45
5	Construction & Maintenance of toe walls and other civil works	22.22
6	House Keeping	32.36
7	Plantation related expense	49.27
8	Environment Monitoring, studies and Awareness	14.79
9	Statutory Fees (CTO fees up to 2026)	165
10	Maintenance of dispatch roads	293.2
11	Consultation Fees	4
	Total cost	**527.57**

Sudhanshu Ranjan
Manager (Environment)
Khondbond Iron Mine

Manager (Environment), Khondbond

Khondbond Iron and Manganese Mine: Plantation for FY 22-23

Drip Irrigation

WATER QUALITY DATA 2022-23
Khondbond Iron & Manganese Mine
(Annual Average)

	SEWAGE TREATMENT PLANT 10 KLD	EFFLUENT TREATMENT PLANT 7 KLD	
Parameters	**Outlet**		**Standard**
pH	7.29	7.49	**5.5–9.0**
DO (mg/l)	6.64	6.50	-
TSS (mg/l)	21.87	18.01	**100**
Oil & Grease (mg/l)	1.47	1.23	**10**
BOD 5 days (mg/l)	18.74	15.66	30
COD (mg/l)	37.50	35.45	**250**

Note: BDL – Below detection limit.

SURFACE WATER			
Parameters	**Sona river Upstream**	**Sona river Downstream**	**Standard**
pH	7.83	7.89	**6.0–9.0**
DO (mg/l)	6.39	6.44	**>4.0**
TSS (mg/l)	BDL	BDL	-
BOD 5 days (mg/l)	2.43	2.40	**30**
COD (mg/l)	7.795	7.52	-
Iron (mg/l)	0.27	0.28	**0.5**
Faecal Coliform	BDL	BDL	**5000**

AIR QUALITY DATA 2022-23
Annual Average Air quality of Khondbond Iron & Manganese Mine of FY'23

Pollutants	Concentration of pollutants ($\mu g/m^3$)	Standards ($\mu g/m^3$)
Near Pit-3		
1. PM_{10}	57.38	100
2. $PM_{2.5}$	21.27	60
3. SO_2	9.69	80
4. NO_x	19.18	80
5. CO	0.212	4*
Near Manganese Mine		
1. PM_{10}	54.67	100
2. $PM_{2.5}$	19.64	60
3. SO_2	9.21	80
4. NO_x	18.84	80
5. CO	0.195	4*
Near 16-D		
1. PM_{10}	53.38	100
2. $PM_{2.5}$	20.03	60
3. SO_2	9.82	80
4. NO_x	18.70	80
5. CO	0.196	4*
Near Security Barrack		
1. PM_{10}	55.96	100
2. $PM_{2.5}$	20.42	60
3. SO_2	9.66	80
4. NO_x	19.16	80
5. CO	0.222	4*

*Unit of CO is mg/m^3