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

MD/ ENV/ 307 / 120 / 2022
Date: 27th September 2022

Sub: Environmental Statement of Khondbond Iron & Manganese Mine, M/s Tata Steel Limited for 2021-22.

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

Sr Manager (Environment), OMQ

Encl: As above

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

ENVIRONMENT STATEMENT
2021-22

Khondbond Iron & Manganese Mine

KHONDBOND IRON & MANGANESE MINE

TATA STEEL LIMITED

September 2022

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 G.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, PO: Jamshedpur, Dist.: East Singhbhum, Jharkhand-831001
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.	:	22nd September 2021, vide letter no. MD/ENV/223/120/2021 for the year 2020-21.

*As per Environmental Clearance

PART–B
Water and Raw Material Consumption

(i) Water Consumption:

Consumption Head:	**2020-21 (in cu.m/day) (Annual Average)**	**2021-22 (in cu.m/day) (Annual Average)**
Process	NA	1914.70
Spraying in mine pit, services	95.04	143.74
Domestic	74.08	203.98
Name of the product	**Process water consumption per product output (m3/MT)**	
Iron Ore	NA	0.14
Manganese Ore	NA	NA

This is a mechanised mine producing iron ore. The iron ore processing is done at Wet Beneficiation plant & dry crushing and screening only. Dust suppression at 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) <u>Raw Material Consumption</u>

The following items have been consumed/ utilized:

Name of Raw Materials	Consumption of Raw Material	
	During previous financial year (2020-21)	During current financial year (2021-22)
High Speed Diesel	4088791 Litre	6774185 Litre
Lubricants	23436 Litre	86730 Litre
Grease	3496 Kg	10304 Kg
Explosive of all types (Explosive, codex, detonator)	1318542 kg	1715461 kg
Gas	Nil	Nil
Tyres	41 nos.	21 nos.
Drill rods	31 nos.	162 nos.
Electricity Consumed	1638656 kwh	7615315 kwh

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 processing plant, the iron and manganese mine pits are separately been operated. The processing plant is under construction and shall be of 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. The HEMM cleaning & washing unit passed through oil separation pit and water is recycled back. All the water quality results of STP 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 been 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, water scrubbers etc. Wet drilling is practiced in the mine with drills equipped with water injection system. Blasting is done using the controlled blasting technique.		

Pollutants	Quantity of Pollutants discharged (mass / day)	Concentration of Pollutants discharges (mass / day)	Percentage of variation from prescribed standards with reasons
	Dry fog system, fixed water sprinklers, mobile tankers and mist cannons are provided to prevent any fugitive emissions. 2nos of mobile tanker is in operation and fixed water sprinkler line has been installed. Three Continuous Ambient Air Quality Monitoring station (CAAQMS) are installed in core and buffer zone of Khondbond area. Various air quality parameters such as PM10, PM2.5, SOx, NOX, CO etc. are monitored and the data of same is transmitted to State Pollution Control Board server online. The data of same is also being displayed publicly. A thick & dense vegetation is also placed in all surrounding the area which significantly reduced the pollution load. **The results 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 (2020-21)	During current financial year (2021-22)
(a)From Process • Used Oil • Waste containing Oil • Waste Used Batteries • Used hose pipes and oil filters	 47480 litre 0.5MT 1.55 MT or 53 no. Nil	 48400 litre 0.5MT 1.37 MT 8.72 MT
ii) From Pollution Control Facility • Waste oil from oil & grease separation pit • Sludge from oil and grease separation pit	Nil (Included in process) All the Hazardous waste generated is disposed as per rules to authorized recyclers.	

PART–E
SOLID WASTES

Solid wastes from Khondbond Iron & Manganese Mine is categorized in two parts i.e. Overburden/rejects removed during mining operations and slime/tailings generated from beneficiation / processing of Iron Ore. All the overburden and tailings generated are stocked in designated place as per approved mining plan inside the mine.

Sources	Total Quantity	
	During previous financial year (2020-21)	During current financial year (2021-22)

a) From Process • From mining as Overburden	2518551 Tonne	2163439 Tonne
• Rejects	626334 Tonne	8860 Tonne
• From Wet Beneficiation Plant as Tailing	Not Applicable	179301 Tonne
b) From Pollution Control Facility	Not Applicable	Not Applicable
c) i. Quantity recycled or reutilized within the unit	Nil	Nil
ii. Quantity sold • General Office waste	Nil	Nil
iii. Quantity disposed • Mining overburden	765959 tonne	2163439 tonne Stored at designated place as per mining plan
• Rejects	Nil	8860 Tonne Stored at designated place as per mining plan

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 been 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 as per approved mining plan.

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 been maintained.

- Use of Paste Thickener technology for slime disposal which optimizes area utilization, increase in water conservation and safety. This has resulted in reduction of specific water consumption to ~0.090m3/Tp. The underflow of paste thickener is in the form of a paste and is pumped to the disposal location. The pulp ratio in case of a Paste thickener is 30:70 as compared to 70:30 in the case of conventional thickener. Thus, increasing water recovery and increasing the life of Tailing dam for storage of slime.
- 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.
- New 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.
- Dust-cum-noise barrier is proposed to be installed around the crushing and screening plants to act as windbreaker as well as attenuate the noise level and keep it below the prescribed noise levels at the boundary of plant.
- Online noise monitoring systems shall be installed at major noise generating sources and abatement measures shall be taken to reduce the amount of noise generation.
- For biodiversity conservation, a niche -nesting project implemented at Khondbond. 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 programmes on events such as World environment day, Biodiversity Day, Swachhata pakhwada, Earth day are being organised for creating awareness of people regarding conservation of Natural resources.
- 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

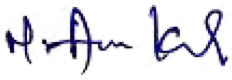
ANY OTHER PARTICULARS FOR IMPROVING THE QUALITY OF THE ENVIRONMENT

- 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)
- 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 been done every year.

- All above efforts make the mine clean – green and sustainable. In the year 2021-22, Rs 5.68 Cr are spent on various environmental activities at Khondbond Iron & Manganese Mine.



Manager (Environment), Khondbond

WATER QUALITY DATA 2021-22
Khondbond Iron & Manganese Mine
(Annual Average)

SURFACE WATER				**SEWAGE TREATMENT PLANT 10 KLD**		
Parameters	**Sona river Upstream**	**Sona river Downstream**	**Standard**	**Parameters**	**Outlet**	**Standard**
pH	7.66	7.73	**6.0–9.0**	pH	7.30	**5.5–9.0**
DO (mg/l)	6.21	6.22	**>4.0**	DO (mg/l)	6.54	-
TSS (mg/l)	BDL(DL-10)	BDL(DL-10)	-	TSS (mg/l)	38.46	**100**
BOD 5 days (mg/l)	2.32	2.24	**30**	Oil & Grease (mg/l)	1.73	**10**
COD (mg/l)	BDL(DL-4)	BDL(DL-4)	-	BOD 5 days (mg/l)	17.29	30
Iron (mg/l)	0.24	0.21	**0.5**	COD (mg/l)	32.77	**250**
Faecal Coliform	BDL(DL-2)	BDL(DL-2)	**5000**	-	-	-

Note: BDL – Below detection limit.

AIR QUALITY DATA 2021-22
Annual Average Air quality of Khondbond Iron & Manganese Mine of FY'22

Pollutants	Concentration of pollutants (µg/m³)	Standards (µg/m³)
Near Helipad		
1. PM_{10}	53.34	100
2. $PM_{2.5}$	19.48	60
3. SO_2	8.56	80
4. NO_x	17.66	80
5. CO	0.21	4*
Near Manganese Mine		
1. PM_{10}	53.36	100
2. $PM_{2.5}$	19.88	60
3. SO_2	8.72	80
4. NO_x	18.08	80
5. CO	0.22	4*
Near 16-D		
1. PM_{10}	53.02	100
2. $PM_{2.5}$	19.82	60
3. SO_2	8.43	80
4. NO_x	17.21	80
5. CO	0.23	4*
Near Labour Colony		
1. PM_{10}	53.04	100
2. $PM_{2.5}$	19.29	60
3. SO_2	8.64	80
4. NO_x	17.19	80
5. CO	0.22	4*

*Unit of CO is mg/m³