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

MD/ ENV/ 826 /120 / 2023
Date: 28th September 2023

Sub: Environmental Statement of Joda East Iron 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 Joda East Iron 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
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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

JODA EAST IRON MINE

TATA STEEL LIMITED

September 2023

FORM - V
(See Rule -14)

ENVIRONMENT STATEMENT FOR THE FINANCIAL YEAR ENDING THE 31ST MARCH 2023

JODA EAST IRON MINE, TATA STEEL LIMITED

PART–A

1	Name and address of the owner/ occupier of the industry, operation or process	:	Mr Rajesh Kumar Chief (Joda), Joda East Iron Mine Tata Steel Limited, Joda Dist.- Keonjhar, Odisha – 758034 Mr Braj Binod Kumar, Mines Manager (Joda East) Joda East Iron 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 mine with beneficiation plant & Dispatch facility (Major)
3	Production Capacity*	:	Mine: 12 MTPA Iron Ore Beneficiation & Dispatch: 12 MTPA Iron Ore
4	Year of Establishment	:	1956
5	Date of last Environmental Statement submitted.	:	27th September 2022, vide letter no. MD/ENV/306/120/2022 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	2302.88	4145.29
Spraying in mine pit, services	427.26	550.27
Domestic	442.16	458.94
Name of the product	**Process water consumption per product output (m3/MT)**	
Iron Ore	0.087	0.14

*The colony of Joda east Iron Mine is situated outside the mining lease area. The domestic water consumption is shown by other adjacent Manganese Mine of separate unit.

ii) Raw Material Consumption

The following items have been consumed/ utilized:

Name of Raw Materials		Name of Product	Consumption of Raw Material	
			During previous financial year (2021-22)	During current financial year (2022-23)
High Speed Diesel		Iron ore of steel grade	6103898 Litre	6704349 Litre
Lubricants			252252 Litre	258720 Litre
Grease			18564 Kg	15085 Kg
Explosive	Slurry explosives		Small dia (up to 32 mm) – Nil Large dia (above 32 mm) – 2455809 Kg	Small dia (up to 32 mm) – Nil Large dia (above 32 mm) – 3347571 Kg
	Detonators		Ordinary – 0 Electrical – 15768 nos.	Ordinary – 0 Electrical – 750nos.
	Detonating Fuse		7850 Mts	1650 Mts
Gas			12545 Cu.m	14601 Cu.m
Tyres			58 nos.	78 nos.
Drill rods			221 nos.	613 nos.
Electric Power in KWH				
Electricity Consumed		Iron ore of steel grade	33781556	39339938
Electricity Generated			106418	120462

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 Joda east Iron Mine with the processing plant is a zero effluent discharge unit, all the effluents 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 processing. Six sewage treatment plant (STP) of (One – 630 KLD, one – 270 KLD, Two – 150 KLD, Two – 50 KLD, Two – 10KLD) are installed and operated smoothly. The treated water is recycled & reused for plantation and gardening purpose. Two Effluent treatment plant (ETP) of 10 KLD are installed & operational in Hospital & Canteen area and treated water is used in horticulture activities. The water quality results of ETP & STP are attached herewith in **Annexure-1**. Apart from above some additional ETP & STP are also under construction.		
b) Air	The Joda east Iron 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.		

Pollutants	Quantity of Pollutants discharged (mass / day)	Concentration of Pollutants discharges (mass / day)	Percentage of variation from prescribed standards with reasons
	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. There are two stationary point such as stack of dust extractor from crushing unit & DG set used for emergency powers. Both are designed as per standards and regular monitoring has been done. Three continuous ambient air quality monitoring stations are installed in core & buffer area and operated with PM_{10}, $PM_{2.5}$, SOx, NOx, (NO2 & NO) & CO parameters have continuously been monitored with online data connectivity at Odisha State Pollution Control Board server. A thick & dense vegetation is also placed in all surrounding the mines area which significantly reduced the pollution load. **The results of air quality monitoring are 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	128.18 MT	137.76 MT
• Waste containing Oil (Jute etc)	Nil	Nil
• Lead Bering residues (Batteries etc)	5.46 MT	11.80 MT
• Rejected & used hosepipes	28.06 MT	13.02 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 are disposed as per law.	

PART–E
SOLID WASTES

Solid wastes from Joda east Iron Mine have 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 (such as scrap material, used conveyor belts, tyres, scrap machines etc) 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	905315 Tonne	1103340 Tonne
• From processing plant as Tailing	280314 Tonne	608009.894 Tonne
b) From Pollution Control Facility		
c) i. Quantity recycled or reutilized within the unit		
ii. Quantity sold	280314 Tonne	1103340 Tonne
iii. Quantity disposed • Mining overburden	All the overburden generated is stacked at designated place inside the mine lease.	

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 Joda East Iron Mine and processing / beneficiation generate hazardous waste mainly in the form of used oil due to HEMM operation & maintenance. The collected used oil used oil disposed to authorized agency via sale for recycling and reuse. During maintenance of HEMM, the oil-soaked materials (jute etc.) is 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

- Joda East Iron Mine is continuously a star rated iron mine as per Sustainable Development Framework (SDF) by Indian Bureau of Mines, Ministry of Mines, Govt. of India and has won various prestigious prizes in Environment, Health & safety field and become a best sustainable mine of area.
- Various mineral conservation techniques are operated by mine including use of low-grade ore, blending of waste / subgrade materials, etc as per steel plant quality requirements.
- For conservation of natural resources, high efficiency HEMM are used with adequate maintenance to reduce the fuel consumption. Zero effluent discharge is being maintained & all process water is recycled – reuse 100% back which reduces the fresh water consumption and withdrawal.

- For ground water augmentation, various rainwater harvesting structures are made, which harvest ~ 3 million m^3 per year. Various ground water augmentation structures are also being developed in surrounding villages also.
- Various Solar power-based illumination such as mass tower light etc & other measures are made at mine such as solar light pipes, solar street lights, solar geezer etc.

PART-H

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

- Joda East Iron Mine has installed & operated various ETP & STPs in colony & Plant area. The treated water is recycled & reused.
- Various projects related to water and environment conservation are in place. Drip irrigation project along with coir matting project and vetiver have been developed.
- Fixed and mobile water sprinkler facilities are extended for dust suppression in mines.
- For biodiversity conservation, various projects are implemented at Joda. An inhouse nursery of ~1 Lakh sapling developed in area and only local trees are planted.

PART-I

ANY OTHER PARTICULARS FOR IMPROVING THE QUALITY OF THE ENVIRONMENT

- Joda East Iron Mine of Tata Steel Ltd. is a captive mine and is certified for the Integrated Management System (ISO-9001:2015, ISO-14001:2015, ISO-45001:2018 & SA:8000) from last two decades. The unit has obtained various prestigious accolades from various agencies.
- The unit is having a full-fledged Environmental Management department with well qualified personnel from environmental background to take care of all aspects relating to mines and processing plant of unit.
- 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, Joda Festival etc. In which environment conservation models, current & future proposals are made, environment messages through Nukkad natak, poems, slogans, swachhata drive has been done every year.
- The mine has established a plantation in mine out area, for conservation of biodiversity various initiatives are placed in area, Butterfly Park, Medicinal Park, Botanical Park etc. developed in area. The mines have performed various examples of mineral conservation, upgradation of low-grade mineral by various unique techniques, strengthening the social progress by various skill development and job orientation of programmes for stakeholders.
- All above efforts make the mine clean – green and sustainable. In the year 2022-23, Rs 10.53 Cr are spent on various environmental activities from Joda East Iron Mine.

Shubham

Manager (Environment)

Manager (Environment), Joda East

Annexure - I

WATER QUALITY DATA 2022-23
Joda East Iron Mine
(Annual Average)

Parameters	SEWAGE TREATMENT PLANT								EFFLUENT TREATMENT PLANT		Standard
	STP 630 KLD		STP 150 KLD		STP 50 KLD		STP 10 KLD		Joda Hospital ETP 10 KLD		
	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	
pH	6.58	7.12	6.44	7.53	6.69	7.25	6.56	7.07	6.81	7.20	5.5--9.0
TSS (mg/l)	68.25	18.08	86.67	26.92	74.75	24.67	95.42	49.08	80.0	26.83	100
BOD 5 days (mg/l)	20.42	7.48	25.17	8.61	26.75	12.54	28.28	8.53	26.67	8.84	30
COD (mg/l)	65.50	22.79	71.17	23.50	81.92	34.24	92.19	25.05	88.17	24.48	250
Oil & Grease (mg/l)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	10
Iron (mg/l)	1.05	0.44	1.10	0.41	1.30	0.68	1.16	0.66	1.13	0.66	3.0
Fecal Coliform	122.42	54.0	120.67	50.75	120.83	43.17	114.25	45.25	138.67	59.08	-

Note: BDL – Below detection limit.

WATER QUALITY DATA 2022-23
Joda East Iron Mine
(Annual Average)

Parameters	SURFACE WATER		Standard
	Kundra nalla upstream - Nr. Joda Pump House	Kundra nalla downstream - Nr. Banaikela Village	
pH*	7.79	7.73	5.5--9.0
TSS (mg/l)	24.17	19.33	100
BOD 5 days (mg/l)	2.47	2.43	30
COD (mg/l)	6.56	4.49	250
Iron (mg/l)	0.30	0.28	0.5
Total Coliform	BDL	BDL	5000

Note: BDL – Below detection limit.

Annexure - 2

AIR QUALITY DATA 2022-23
Annual Average Air quality of Joda East Iron Mine of FY'23

Pollutants	Concentration of pollutants ($\mu g/m^3$)	Standards ($\mu g/m^3$)
Manmora Slime Dam		
1. PM_{10}	57.68	100
2. $PM_{2.5}$	21.26	60
3. SO_2	10.23	80
4. NO_x	19.95	80
5. CO	0.221	4*
Near Rainwater Harvesting		
1. PM_{10}	53.42	100
2. $PM_{2.5}$	18.64	60
3. SO_2	8.50	80
4. NO_x	17.68	80
5. CO	0.244	4*
Near Magazine		
1. PM_{10}	56.11	100
2. $PM_{2.5}$	20.06	60
3. SO_2	9.12	80
4. NO_x	18.78	80
5. CO	0.205	4*
Near Equipment Maintenance		
1. PM_{10}	56.16	100
2. $PM_{2.5}$	19.84	60
3. SO_2	9.77	80
4. NO_x	18.88	80
5. CO	0.202	4*

*Unit of CO is mg/m^3