**Raju Agrawal**
Head, Environment Clearance & Compliance (TSL)
Environment Management

EMD/C-23/249/21
September 22, 2021

**The Member Secretary**
Jharkhand State Pollution Control Board
T.A. Division Building, HEC Campus, Dhurwa
**RANCHI – 834004**

**Subject: Environmental Statement 2020-2021 for Tata Steel Limited - Main Works, Jamshedpur**

Dear Sir,

This has reference to the captioned subject. Please find enclosed the **"Environmental Statement"** for Tata Steel Limited - Main Works, Jamshedpur for the year 2020-2021 duly filled in the prescribed format is enclosed for your kind consideration.

Thanking you

Yours faithfully,
**For Tata Steel Limited**

**Raju Agrawal**
**Head, Environment Clearance & Compliance (TSL)**

Encl: As Above

Copy to: Regional Officer, Jharkhand State Pollution Control Board, Adityapur, Jamshedpur – 831013

TATA STEEL LIMITED
Environment Management Jamshedpur 831 001 India
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Tel 91 22 66658282 Fax 91 22 66657724
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# ENVIRONMENTAL STATEMENT
# FOR THE YEAR 2020-2021

## Main Steel Works
## TATA STEEL LIMITED

**Submitted by:**
**ENVIRONMENTAL MANAGEMENT DEPARTMENT**
**TATA STEEL LIMITED**
**JAMSHEDPUR-831001**
**JHARKHAND**

# [Form V]

**Environmental Statement for the Financial Year ending 31st March 2021**

## PART-A

| | | |
|---|---|---|
| **(i)** | **Name & address of the owner/occupier of the industry operation or process:** | Mr. T.V. Narendran<br>CEO & MD<br>Tata Steel Limited<br>Jamshedpur-831001<br>East Singhbhum, Jharkhand |
| **(ii)** | **Industry Code** | 3312 |
| | **Primary STC Code:** | Metallurgical industry |
| | **Secondary SIC Code** | Integrated Iron & Steel Industry |
| **(iii)** | **Production Capacity** | Production Capacity:<br>11 MTPA Crude Steel<br><br>Production during 2020-21:<br>9.34 Million Tons Crude Steel<br><br>(Major units are: RMM, Blast Furnaces, Coke ovens, Sinter Plants, Pellet Plant, LD Shops, HSM, CRM, WRM, MM, NBM, CAPL*, Captive Power Plant and Utilities, JAMIPOL**)<br>**CAPL is being owned and operated by M/s Jamshedpur Continuous Annealing and Processing Company (JCAPCPL), a joint venture formed by Tata Steel and Nippon Steel and Sumitomo Metal Corporation (NSSMC) to manufacture and market high-quality, automotive- grade continuous annealed products inside premises of Jamshedpur steel works.*<br>***Lime Grinding Plant and Bentonite Grinding Plant, JAMIPOL a joint venture of Tata Steel* |
| **(iv)** | **Year of Establishment** | 1907 |

| | | |
|---|---|---|
| **(v)** | **Date of last Environment Statement submitted** | September 18, 2020 vide letter no. EMD/C-23/408/20 |

# PART-B

## WATER & RAW MATERIAL CONSUMPTION

### i) Water Consumption ($m^3$/day)

| **Water Consumption** | During the previous Financial Year (2019-20) | During the current Financial year (2020-21) |
|---|---|---|
| **Industrial Consumption** (inside Works as Makeup water) | 78,212 | 54,497 |
| **Domestic Consumption** (Inside Works as drinking water) | 10,691 | 10,586 |

| **Name of the product** | **Process water consumption/unit of product output ($m^3$/tcs)** | |
|---|---|---|
| **Crude Steel** | During the previous Financial Year (2019-20) | During the current Financial year (2020-21) |
| **Specific Water Consumption** | 2.80 | 2.25 |

### ii) Raw Material Consumption (Works):

| **Name of raw material** | **Name of products** | **Consumption of raw material per unit of output (kg/ton of crude steel)** | |
|---|---|---|---|
| | | During the previous Financial Year (2019-20) | During the current Financial year (2020-21) |
| Iron Ore | Crude Steel | 1646.0 | 1683.0 |
| Coking Coal | | 575.0 | 599.8 |
| Limestone | | 303.3 | 316.2 |
| Non-Coking Coal | | 222.7 | 208.7 |
| Dolomite & Pyroxenite | | 95.4 | 82.2 |
| Purchase Pellet | | 23.8 | 1.0 |
| Quartzite and Other materials | | 8.2 | 6.3 |
| Zinc & Zinc Alloys | | 0.9 | 0.7 |

| | | | |
|---|---|---|---|
| Ferro Manganese - High Carbon Lumps | | 0.7 | 0.8 |
| Ferro Manganese - Medium Carbon | | 1.6 | 1.6 |

## PART-C

**Pollution Discharged to Environment/Unit of Output**
**(Parameter As Specified in the Consent Issued)**

**(i) Works:**

| **Pollutants** | **Quantity of pollutants discharged (mass/day)** | | **Concentrations of pollutants discharged (mass / volume)** | | **% of variation from prescribed standards** |
|---|---|---|---|---|---|
| | **(Tons/day)** | | **(mg/L)** | | **In %age (referring CTO)** |
| **(a) Water** | **2019-20** | **2020-21** | **2019-20** | **2020-21** | **2020-21** |
| TSS | 0.942 | 0.858 | 39.47 | 43.7 | -56.3 |
| COD | 1.580 | 1.779 | 64.57 | 91.4 | -63.4 |
| Ammonia as N | 0.093 | 0.103 | 4.22 | 6.0 | -88 |
| BOD | 0.193 | 0.189 | 8.26 | 9.8 | -67.3 |
| Oil & grease | 0.104 | 0.067 | 4.33 | 3.3 | -67 |
| Phenols | 0.005 | 0.004 | 0.20 | 0.2 | -80 |
| Cyanide as $CN^-$ | 0.003 | 0.003 | 0.14 | 0.1 | -50 |
| **(b) Air** | **2019-20** | **2020-21** | **2019-20** | **2020-21** | **2020-21** |
| | **(Tons/day)** | | **($mg/Nm^3$)** | | |
| PM | 9.12 | 7.39 | 15.64 | 12.91 | -91.4 |
| $SO_2$ | 20.78 | 15.76 | 105.90 | 67.63 | - |
| NOx | 20.16 | 14.99 | 102.43 | 80.40 | - |

**Effluent Quality (2020-21)**

| Parameter | UoM | Norms | Susungaria Drain | | |
|---|---|---|---|---|---|
| | | | Max | Min | Avg |
| pH | - | 6.0-8.5 | 8.5 | 7.0 | 7.9 |
| Total Suspended solids | mg/L | 100 | 98.0 | 9.0 | 43.7 |
| Oil & Grease | mg/L | 10 | 6.0 | 1.2 | 3.3 |
| Ammonical Nitrogen (as N) | mg/L | 50 | 28.8 | 0.8 | 6.0 |
| Free Cyanide (as $CN^-$) | mg/L | 0.2 | 0.2 | 0.0 | 0.1 |
| Biological Oxygen Demand, BOD | mg/L | 30 | 16.4 | 4.5 | 9.8 |
| Chemical Oxygen Demand, COD | mg/L | 250 | 202.0 | 20.0 | 91.4 |
| Phenol | mg/L | 1 | 0.9 | 0.0 | 0.2 |

**Ambient Air Quality (2020-21)**

| Parameter | UoM | Norm | WEST PLANT FIRST AID STATION (WPFA) | | | COLD ROLL MILL (CRM) | | | POWER HOUSE # 3 GATE | | | POWER HOUSE # 6 GATE | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Max. | Min. | Avg | Max. | Min. | Avg | Max. | Min. | Avg | Max. | Min. | Avg |
| **Particulate Matter, $PM_{10}$** | µg/m³ | 100 | 237.0 | 59.8 | 132.3 | 286.0 | 69.6 | 152.5 | 290.9 | 65.3 | 147.1 | 217.5 | 77.1 | 120.9 |
| **Particulate Matter, $PM_{2.5}$** | µg/m³ | 60 | 155.0 | 26.5 | 68.0 | 143.6 | 31.2 | 74.1 | 167.2 | 37.6 | 79.5 | 132.6 | 9.7 | 48.0 |
| **Sulphur Dioxide ($SO_2$)** | µg/m³ | 80 | 31.0 | 5.0 | 14.1 | 47.7 | 13.5 | 22.7 | 96.0 | 10.4 | 23.3 | 36.8 | 6.8 | 15.0 |
| **Nitrogen Dioxide, ($NO_x$)** | µg/m³ | 80 | 87.0 | 9.1 | 38.2 | 116.7 | 9.3 | 52.3 | 92.9 | 28.3 | 56.9 | 69.4 | 40.4 | 55.3 |
| **Carbon Monoxide (CO)** | µg/m³ | 2000 | 0.8 | 0.5 | 0.7 | 0.4 | 0 | 0.2 | 0.6 | 0 | 0.4 | 0.5 | 0.3 | 0.5 |
| **Ammonia ($NH_3$)** | µg/m³ | 400 | 86.0 | 20.8 | 43.6 | 63.9 | 15.6 | 32.4 | 69.7 | 19.8 | 50.6 | 167.0 | 26.7 | 55.3 |
| **Ozone ($O_3$)** | µg/m³ | 100 | 21.2 | 8.0 | 11.4 | 20.0 | 7.5 | 11.8 | 23.0 | 7.6 | 10.9 | 17.5 | 10.1 | 12.7 |
| **Nickel (Ni)** | µg/m³ | 1.0 | 8.3 | 4.3 | 5.9 | 11.5 | 4.3 | 7.6 | 12.7 | 4.1 | 8.5 | 13.2 | 6.3 | 10.2 |
| **Arsenic (As)** | ng/m³ | 6.0 | NT | NT | NT | NT | NT | NT | NT | NT | NT | NT | NT | NT |
| **Lead (Pb)** | ng/m3 | 20.0 | 0.2 | 0.1 | 0.1 | 0.2 | 0.1 | 0.2 | 0.3 | 0.2 | 0.3 | 0.3 | 0.1 | 0.2 |
| **Benzene (C6H6)** | µg/m3 | 5.0 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| **Benzo alpha Pyrene (BaP)** | ng/m3 | 1.0 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |

# PART-D

**Hazardous Waste**
**[As Specified under Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016]**

| Hazardous Waste | Total Quantity (Tonnes) | |
|---|---|---|
| | During the previous Financial Year (2019-20) | During the current Financial year (2020-21) |
| **(a) From Process** | | |
| Kiln Dust | 18,364 | 17,196 |
| GCP Sludge* | 5,35,499 | 5,10,322 |
| Mill Scale | 1,01,599 | 91,208 |
| Mill Sludge | 2,482 | 2,147 |
| Waste Oil | 3232 | 2099 |
| Waste Grease | 158.7 | 160.7 |
| Fe bearing Muck | 12,126 | 14,397 |
| Muck Waste | 4,474 | 9406 |
| Tar Sludge | 6295 | 2858 |
| Zinc dust Ash | 208 | 197 |
| Iron Oxide | 12117 | 8482 |
| Iron Hydroxide Sludge | 419.5 | 309.3 |
| Chrome Sludge | 2.0 | 0.125 |
| **(b) From Pollution Control Facilities** | | |
| APCE Dust | 1,76,079 | 1,46,292 |
| BOD Sludge | 288 | 567 |
| *GCP Sludge includes Sludges from LD Shops and Blast Furnaces | | |

# PART-E

**Solid Waste**

**Total Quantity Generated**

| **Name of the Waste** | **Total Quantity Generated (tonnes)** | |
|---|---|---|
| **(a) From Process** | During the previous Financial Year (2019-20) | During the current Financial year (2020-21) |
| BF Slag | 41,55,373 | 38,93,580 |
| LD Slag | 17,04,502 | 15,04,717 |
| Lime Fines | 2,13,417 | 1,99,282 |
| **(b) From Pollution Control Facilities- Nil** | | |

**(c)(1). Total Quantity Recycled/ Reutilized within the unit**

| Name of the Waste | Total Quantity Recycled/ Re utilized within the unit (tonnes) | |
|---|---|---|
| | During the previous Financial Year (2019-20) | During the current Financial year (2020-21) |
| BF Slag | 8,019 | 288 |
| LD Slag | 7,56,932 | 5,64,728 |
| Lime Fines | 1,95,522 | 1,79,804 |

**(c)(2). Total Quantity Sold**

| Name of the Waste | Total Quantity Sold (tonnes) | |
|---|---|---|
| | During the previous Financial Year (2019-20) | During the current Financial year (2020-21) |
| BF Slag | 40,16,057 | 40,56,484 |
| LD Slag | 11,64,258 | 10,42,293 |
| Lime Fines | 18,250 | 15,993 |

**(c)(3). Total Quantity Disposed**

| Name of the Waste | Total Quantity Disposed (tonnes) | |
|---|---|---|
| | During the previous Financial Year (2019-20) | During the current Financial year (2020-21) |
| BF Slag | 96,800 | 0 |
| LD Slag | 93,687 | 0 |

## PART-F

Chemical Composition of majority of waste as produced in process of Tata Steel's Jamshedpur operation is given below:

| Name of Wastes | Chemical Composition (%) | Disposal Method |
|---|---|---|
| Coal Tar Sludge | C – 90-95; Moisture – 1.3<br>S – 0.3-0.7; CV – 8800 KCal/kg<br>Sp. Gr. – 1.2; Ash – 0.04-0.05 | Mixed with coal & used in Coke Plant |
| BOD Sludge | VM – 50; Ash – 26<br>Moist. – 20; CV – 5800 KCal/kg | Mixed with coal & used in Coke Plant |
| B F Slag | CaO – 32; MgO – 9<br>$SiO_2$ – 34.5; MnO – 0.25 | • Sold to cement plant<br>• Used in construction |

| | | |
|---|---|---|
| | $P_2O_3$ – Nil; $Al_2O_3$ – 1.2<br>S – 1.4; $TiO_2$ – 1.2; FeO – 0.33 | |
| GCP Sludge from Blast Furnace | Fe(T) – 33.65; MnO – 0.14<br>CaO – 3.45; $Al_2O_3$ – 3.64<br>$SiO_2$ – 6.40; S – 0.230; $P_2O_5$ – 0.307<br>$TiO_2$ – 0.30; MgO – 1.40<br>Alkali – 0.5 to 0.7; C – 21-24 | • Used in Sinter Plant<br>• Used in Pellet Plant |
| L D Slag | Fe(T) – 18-25; MgO – 1-2<br>CaO – 45-55; MnO – 0.5-1.0<br>$SiO_2$ – 10-12; $Al_2O_3$ – 0.8-1.0<br>$P_2O_5$ – 3.5-4.0; S – 0.2<br>$TiO_2$ – 0.8-1; Alkali – 0.18 | • Used in construction<br>• Used in Sinter Plant |
| GCP Sludge from LD Shops | Fe(T) – 55 to 60; MgO - <1.0<br>CaO – 10-15; MnO - <0.5<br>$SiO_2$ – 1.5-2.0; $Al_2O_3$ - <0.5<br>$P_2O_5$ – 0.29; $TiO_2$ - <0.1 | • Used in Sinter Plant |
| Mill Scale | Fe(T) – 72-75; MnO - <0.5<br>$SiO_2$ - <0.5; $Al_2O_3$ - <0.5<br>MgO – 0.1; Oil – 10-12 | • Used in Sinter Plant |
| Mill Sludge | Fe(T) – 42.76; MgO – 0.35<br>CaO – 0.65; MnO – 0.27<br>$SiO_2$ – 1.12; $Al_2O_3$ – 0.50<br>$P_2O_5$ – 0.089; $TiO_2$ – 0.03<br>$Cr_2O_3$ – 0.03; Oil – 10-12 | • Used in Sinter Plant |
| Lime Fines | CaO – 66.5; $Al_2O_3$ – 0.26<br>$SiO_2$ – 1.53; MgO – 5.68 | • Sold<br>• Used in Sinter Plant |

## PART-G

| **Sl. No.** | **Pollution abatement Measures taken in 2020-21** | **Impact on conservation of natural resources & others** |
|---|---|---|
| 1 | Effluent recycling facility | Reduction of specific water consumption to be continued |
| 2 | Installation of APCE | Reduction in specific PM emission and to be continued |
| 3 | Green Belt Development | We have planted approx. 1,17,109 nos. saplings during April 2020 to March 2021 inside the works, Township and JMD area. Every year plantation done in available space. The following plant species are being planted:<br>*Ficus, karanj, Cicilipinia, Palm, Ashoka, Mahogany, Caesalpinia Arjun, Sita Ashok, Bakul, Spathodia, Kanchan, Jural, Tabulia,* |

| | | |
|---|---|---|
| | | *Sissam, Termanelia Sp., Arica palm, foxtail palm, Tecoma, Kannel, Tababia, Ghandhraj, calendra, Tagar, Hemelia, Kamani, Karbi, Calendra* etc. |

**Details of Plantation (nos.) done during April 2020 – March 2021**

| Month | Plantation in Town and JMD | Plantation in Works | Species |
|---|---|---|---|
| Apr-20 | 0 | 0 | - |
| May-20 | 0 | 0 | - |
| Jun-20 | 2120 | 1017 | *Kadam,Arjun, Bixa, Bakul, Cesselpiniya , Tecoma, Neem, Karanj, Simarouba glauca, Lakshmi taru, Amaltas* |
| Jul-20 | 15000 | 1008 | *Neem, Cesselpiniya Bakul, Champa, Arjun, Karanj, Ashoka, Karam* |
| Aug-20 | 10000 | 255 | *Neem, Cesselpiniya, Bakul, Champa, Arjun, Karanj, Ashoka, Karam Peltaform, Tababia* |
| Sep-20 | 25000 | 676 | *Tababia, palida, Neem, Cesselpiniya, Bakul, Champa, Arjun, Karanj, Ashoka, Karam, Peltaform, Kanchan* |
| Oct-20 | 8350 | 100 | *Bakul, Karnaj, Tababiya* |
| Nov-20 | 9237 | 1005 | *Bakul, Arjun, Karanj, Baken, Sirish, Gulmohar, Arjun, Jacaranda, Peltaform, Tababia* |
| Dec-20 | 3000 | 1015 | *Bottel brush, Cesselpiniya, Bakul, Champa, Arjun, Karanj, Ashoka, Peltaform, Tababia, Tababiya* |
| Jan-21 | 3835 | 2523 | *Sita Ashok, Bakul, ficus, Bottelbrush, Ashok, Simarobuagloca, foxtail palm,Syzyiem, Phonex palm, juniperious* |
| Feb-21 | 13107 | 4487 | *Hara, Behra, Ashoka, foxtail palm, Syzygium, Phonex palm, juniperious, Arjun, Tejpata* |
| Mar-21 | 15259 | 115 | *Arica Palm, Foxtail Palm, Harsingra , Jatropha, Arjun, Hara, Bahara, Sita Ashok, Ashoka, Acacia biflora, Tacoma* |

| | | | |
|---|---|---|---|
| **Total** | **1,04,908** | **12,201** | **Total= 1,17,109** |

## PART-H

**Additional Measures Investment Proposal of Environmental Protection Including Abatement of Pollution**

- Upgradation of the existing pollution control equipment to bring down dust level
- New pollution control equipment is with more stringent design emission value
- Improvement in water recycling facility for reducing the wastewater discharge
- Upgradation of Central Effluent Treatment Plant for effluent treatment from 4 MGD to 9 MGD is under progress.

## PART-I

**Any other particulars for improving the quality of environment**

- All the boilers of Captive power plants have been converted from coal fired to gas fired, thus there is no generation of fly ash in the power plant.
- LD Slag after metal recovery is being used internally in the manufacturing process as well as externally in brick and road making works.
- BF Slag is being granulated through online slag granulation facilities available at BFs and made available to the Cement plants for cement making.
- Zero effluent discharge (ZED) has been achieved in 4 out of 5 designated outlets. Action plan to achieve ZED in remaining one is under progress.
- Energy efficiency improvement in operations of TSJ Works by installing Variable Frequency Drive and Back Pressure Turbo Generator.