Shubhanand Mukesh
Head Environment Management

EMD/C-41/148 /19
May 25, 2019

Additional Principal Chief Conservator of Forests
(Eastern-Central) Regional Office (ECZ)
Ministry of Environment, Forests & Climate Change
Bungalow No. A-2, Shyamali Colony
RANCHI – 834 002

Subject: Submission of Six Monthly (October 2018 to March 2019) EC Compliance and monitoring reports of expansion of Steel plant (4 MTPA to 5 MTPA Crude Steel Production), (5 MTPA to 6.8 MTPA Crude Steel Production), (6.8 MTPA to 9.7 MTPA Crude Steel Production) and (9.7 MTPA to 11 MTPA Crude Steel Production)

Reference:

1. MoEF EC letter no. J-11011/221/2003-IA.II (I) dated May 24, 2005
2. MoEF EC letter no. J-11011/317/2006-IA.II (I) dated April 16, 2007
3. MoEF EC letter no. J-11011/691/2007-IA.II (I) dated May 11, 2010
4. MoEFCC EC letter no. J-11011/691/2007-IA.II (I) dated March 1, 2016

Dear Sir,

This has reference to the captioned subject and cited references. It is to inform that we are herewith submitting six monthly Compliance reports for the conditions stipulated in the Environment Clearance of expansion of Steel plant (4 MTPA to 5 MTPA Crude Steel Production), (5 MTPA to 6.8 MTPA Crude Steel Production), (6.8 MTPA to 9.7 MTPA Crude Steel Production) and (9.7 MTPA to 11 MTPA Crude Steel Production) for the period from **October 2018 to March 2019** along with monitoring data report for your kind consideration.

TATA STEEL LIMITED
Environment Management Jamshedpur 831 001 India
Tel 91 657 2424125 6644859 e-mail shubhanand.mukesh@tatasteel.com
Registered Office Bombay House 24 Homi Mody Street Fort Mumbai 400 001
Tel 91 22 66658282 Fax 91 22 66657724
Corporate Identity Number L27100MH1907PLC000260 Website www.tatasteel.com

Shubhanand Mukesh
Head Environment Management

The copy of above compliance report is also being sent in soft format through email (ro.ranchi-mef@gov.in) for your kind perusal. Also copy of 11 MTPA EC Compliance has been uploaded on MoEFCC website on portal http://environmentclearance.nic.in/.

Hope the above are in line with the statutory requirements.

Thanking you

Yours Faithfully

For Tata Steel Limited

Shubhanand Mukesh

Head, Environment Management

Encl:

1. Six Monthly Compliance Status report of Environmental Clearance from expansion of 4 to 5 MTPA Crude Steel Production
2. Six Monthly Compliance Status report of Environmental Clearance from expansion of 5 to 6.8 MTPA Crude Steel Production
3. Six Monthly Compliance Status report of Environmental Clearance from expansion of 6.8 to 9.7 MTPA Crude Steel Production
4. Six Monthly Compliance Status report of Environmental Clearance from expansion of 9.7 to 11 MTPA Crude Steel Production
5. Monitoring and analysis reports for Oct 2018 to March 2019

Copy to:

1. Zonal Officer, Central Pollution Control Board, Southern Conclave, Block 502, 5th and 6th Floors, 1582 Rajdanga Main Road, Kolkata - 700 107
2. Member Secretary, Jharkhand State Pollution Control Board, T.A. Division Building, HEC Campus, Dhurwa, Ranchi – 834004
3. Regional Officer, Jharkhand State Pollution Control Board, Jamshedpur

TATA STEEL LIMITED
Environment Management Jamshedpur 831 001 India
Tel 91 657 2424125 6644859 e-mail shubhanand.mukesh@tatasteel.com
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ENVIRONMENTAL CLEARANCE COMPLIANCE STATUS REPORT

October 2018 to March 2019

Tata Steel Limited, Jamshedpur

(MAIN WORKS & TOWN)

Six Monthly Compliance Status report of Environmental Clearance from expansion of 4 to 5 MTPA Crude Steel Production

ENVIRONMENTAL MANAGEMENT DEPARTMENT
TATA STEEL LIMITED
JAMSHEDPUR

Compliance to Conditions stipulated in Environment Clearance for Expansion of steel manufacturing capacity at Jamshedpur Steel works from 4.0 MTPA to 5.0 MTPA, No. J-11011/221/2003 - IA II (I) dated 24.05.2005

No.	Condition	Compliance Status
Specific Conditions		
i.	The gaseous emissions from various process units should conform to the load/mass based standards notified by this Ministry on 19th May 1993 and standards prescribed from time to time. The State Board may specify more stringent standards for the relevant parameters keeping in view the nature of the industry and its size and location. At no time the emission level should go beyond the prescribed standards. In the event of failure of any pollution control system adopted by the unit, the respective unit should not be restarted until the control measures are rectified to achieve the desired efficiency.	All the existing and new units are provided with adequate pollution control equipment (PCEs) to ensure the emission levels within specific legal requirement. Please refer **Annexure – I** for monitoring reports for **October 2018 to March 2019.**
ii.	As reflected in the EIA/EMP report, the waste water generation shall not exceed from the existing level from various units namely, Sponge iron plant, steel melting shop, rolling mill, rotary hearth furnace. The company shall undertake closed circuit system for the wastewater treatment and the sludge recycled to the sinter plant. The recovery and recycling of Susangharia nalla water shall be carried to recycle 800m^3/hr water. The Jugsalai and Ram Mandir nalla shall be made zero discharge. However, 31300 m^3/d of treated effluent after confirming to the prescribed standards shall be discharge into Subaranarekha river. The treated waste water to be discharged into the Kharkai river should remain at the existing level of 1364m^3/d. The domestic waste water after treatment in STP should be used for green belt development	• Waste water treatment plants have been provided in all the operating units. The treated water is recycled and reused for various processes within the plant. • The discharge quantity from the works drain is kept within the prescribed standard. • Waste water recovery system has been provided at all the process drains. • Discharges to Subarnarekha River & Kharkai River are confirming to prescribe standards. Please refer **Annexure – I** for monitoring reports for **October 2018 to March 2019.**
iii.	In plant control measures for checking fugitive emission from spillage/ raw materials handling should be provided. Further specific measures like provision of dust extraction system at sinter plant, stock house fume extraction system at cast house of blast furnace shall be installed.	To check the fugitive emission in raw material handling, dry-fog dust suppression systems are effectively operating. Spillage on the road, along the conveyors, if any, is collected and recycled. ESP and Bag Houses are installed in Sinter Plants. Cast Houses of Blast furnaces are having

	Particulate emissions shall not exceed 100mg/Nm3. Further de-dusting facilities at new lime kiln, sinter plant and wet suppression system at raw material bedding and blending plant shall be provided.	Fume Extraction System. Lime Kilns have been provided with Bag House. The emissions from the stacks are within specified limits. Please refer **Annexure – I** for monitoring reports for **October 2018 to March 2019.**
iv.	The company shall phase out steam coal burning by using by-products fuel gas and replace existing wet quenching facility of coke oven battery No.5,6 and 7 by dry quenching to recover energy and reduce CO2 greenhouse gas emission.	• The conversion of all the coal-fired boilers to gas firing in PH # 3, PH#4 & PH # 5 has been completed. • Coke dry quenching facility has been commissioned at battery no. 5, 6 & 7.
v.	As per the solid waste management plan submitted to the Ministry, about 7268 TPD of solid waste shall be generated. There shall be no generation of boiler ash as BF gas would be used instead of coal. The company shall recycle the BF and LD slag for cement manufacturing, road embankment, construction and filing up of low-lying areas. As per the plan submitted to the Ministry the company shall reuse 100% of BF and LD slag by December 2007.	• Tata Steel has been successful in achieving almost complete utilization of most of the solid wastes except LD Slag. Tata Steel has taken a number of initiatives to find increasing usage of LD Slag in construction, road making, soil conditioning and cement making. The initiatives include among others: o Approvals from BIS for use of LD slag in cement making. o Commercial trials for use of LD slag as soil conditioner. Three of four power houses within the Steel Works do not have even provision for firing coal. Only one boiler located at Power House 4 has provision for coal firing in addition to by-product gas firing. Normally this boiler also runs on by-product gas. Only in case of emergency conditions and shortage by-product gas due to disturbance in plant operations, coal firing is done as per the need. The quantity of fly ash generated has reduced drastically which is handled appropriately.
vi.	a. The chrome sludge (251kg/d) generated from the colour coating shall be disposed off in the lined pit within the plant premises and oily sludge (25TPD) shall be incinerated. b. The company shall undertake ground water quality monitoring around the chrome sludge disposal	• Chrome sludge is being disposed off in land filling facility in steel works. • The analysis of ground water is done for chromium content; the values are within prescribed limits. Please refer **Annexure – I** for monitoring reports for **October 2018**

	site and data submitted to the Ministry.	**to March 2019.**
vii.	A green belt adequate width and density should be developed in an area of 7.0 ha of plant area in addition to the 75 ha of area already afforested within and around the plant premises as per the CPCB guidelines.	We have planted 12697 nos. saplings during April 2018 to March 2019 inside the works, Jugsalai Muck Dump area and in Township in the same period. Every year plantation done in available space. The following plant species are being planted: • *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.* .
viii.	The company shall undertake rainwater-harvesting measures to harvest the rainwater for utilisation in the lean season as well as to recharge the ground water table.	• Rainwater collected from various facilities within the Steel Plant is channelled through surface drains into Cooling Pond. The rainwater thus collected is recycled in the plant. • Rainwater harvesting has been planned and being implemented at suitable locations within the plant.
ix.	Occupational Health Surveillance of the workers shall be done on a regular basis and records maintained as per Factories Act.	The health surveillance is being done as per Factory Act. Records are maintained at the Occupational Health Services. Health check-up for contractor's persons are conducted regularly.
x.	Recommendations made in the CREP shall be implemented.	Tata Steel has implemented the recommendations of CREP.
xi	The company shall carry out life cycle assessment for monitoring to assess the overall environmental improvement of the plant with respect to consumption norms of natural resources and energy and specific norms for waste generation.	Tata Steel had participated in the life cycle assessment conducted with the government agencies.
B. General Conditions		
i.	The project authorities must adhere to the stipulations made by the Jharkhand Environment Conservation	All the relevant stipulations made by JSPCB and State Government are being complied.

	Board and the State Government.	
ii.	No further expansion or modifications in the plant should be carried out without prior approval of the Ministry of Environment and Forests.	Environmental Clearance for the expansion from 6.8 MTPA to 9.7 MTPA Steel Plant was granted vide MoEF letter no. J-11011/691/2007-IA. (II) dated May 11, 2010. Environmental Clearance for the expansion from 9.7 MTPA to 11 MTPA Steel Plant was granted vide MoEF letter no. J-11011/691/2007-IA. (II) dated March 1, 2016. Necessary Environment Clearance will be taken before any further expansion or modification.
iii.	At least four ambient air quality-monitoring stations should be established in the downward direction as well as where maximum ground level concentration of SPM, SO2 and NOx are anticipated in consultation with the state pollution Control Board. Data on ambient air quality and stack emission should be regularly submitted to this Ministry including its Regional office at Bhubaneswar and State Pollution Control Board/Central Pollution Control Board once in six months.	Four Ambient Air Quality Monitoring Stations have been installed. Monitoring data on ambient air quality and stack emission is being submitted regularly to JSPCB. Please refer **Annexure – I** for monitoring reports for **October 2018 to March 2019.**
iv.	Industrial wastewater should be properly collected, treated so as to conform to the standards prescribed under GSR 422(E) dated 19th May, 1993 and 31st December 1993 or as amended form time to time. The treated wastewater should be utilized be for plantation purpose.	• All wastewater discharges from Steel Works are let out after treating them suitably. The discharge water quality is monitored at all the discharge points Please refer **Annexure – I** for monitoring reports for **October 2018 to March 2019.**
v.	The overall noise level in and around the plant area should be kept well within the standards (85 dBA) by providing noise control measures including acoustic hoods, Silencers, enclosures etc. on all sources of noise generation. The ambient noise levels should conform to the standards prescribed under EPA Rules, 1989 viz. 75 dBA (daytime) and 70 dBA (night time).	• The noise control measures such as; silencers, enclosures, hoods, rubber pads, have been provided at the required places in the existing plant. The work areas where noise levels are high, earplugs and earmuffs have been provided to the people to minimize noise exposure. • The high noise area within the plant have been identified and demarcated. Adequate caution boards are displayed and anyone

		who enters the area is required to wear ear-plugs/ear-muffs. The noise monitoring is done regularly.
vi.	The project proponent shall also comply with all the environmental protection measures and safeguards recommended in the EIA / EMP report. Further, the company must undertake socio-economic development programmes, educational programmes, drinking water supply and health care etc.	Socio economic development activities are regularly undertaken in and around Jamshedpur through the two agencies namely, Tata Steel Rural Development Society and Tata Steel Community Development & Welfare Services Centres. The development activities undertaken in the surrounding community are need based and are in the field of health care, education, mid-day meals in schools, sports and culture, self-employment, drinking water, rural electrification, etc. Tata Steel also facilitate the Institutes like R D Tata Technical Institute, Tata Football Academy, Tata Archery Foundation, etc. which encourages the local talent to develop themselves and participate at National and International levels.
vii.	The project authorities shall provide an amount of Rs 286 crores (question no. xix part b) funds both recurring and non-recurring to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so provided should not be diverted for any other purposes.	The funds for capital investment on pollution control equipment were not diverted. The 5 MTPA project has been completed. All the pollution control equipment have been commissioned and are being operated and maintained regularly.
vii.	The Regional Office of this Ministry at Bhubaneswar/ Central Pollution Control Board/State Pollution Control Board will monitor the stipulated conditions. A six monthly compliance report and the monitored data along with statistical interpretation should be submitted to them regularly.	Six monthly compliance reports and the monitored data are being submitted regularly. Please refer **Annexure – I** for monitoring reports for **October 2018 to March 2019.**
ix.	The Project Proponent should inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the State Pollution Control Board/ Committee and may also be seen at Website of the Ministry of Environment	The Notice has been advertised in two local newspapers viz. Chamkta Aaina (Hindi) and The Avenue Mail (English) on June 04, 2005 and communication to this effect was also sent to the MoEF.

	and Forests at http./envfor.nic.in. This should be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same should be forwarded to the regional office.	
x.	The Project Authorities should inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of commencing the land development work.	It has been complied as the project has already been completed and Consent to Operate has been issued by Jharkhand State Pollution Control Board.

ENVIRONMENTAL CLEARANCE COMPLIANCE STATUS REPORT

October 2018 to March 2019

Tata Steel Limited, Jamshedpur

(MAIN WORKS & TOWN)

Six Monthly Compliance Status report of Environmental Clearance from expansion of 5 to 6.8 MTPA Crude Steel Production

ENVIRONMENTAL MANAGEMENT DEPARTMENT
TATA STEEL LIMITED
JAMSHEDPUR

Compliance Status of Environmental Clearance of Expansion of Crude Steel Plant (5.0 MTPA to 6.8 MTPA) at Tata Steel Works, Jamshedpur, District East Shinghbhum, Jharkhand vide MoEF Letter no J-11011/317/2006.IA.II (I) dated April 16, 2007

Sl.No.	Condition	Compliance Status
	Specific Conditions	
i.	The gaseous emissions from various process units shall conform to the load/mass based standards notified by this Ministry on 11th May, 1993 and standards prescribed from time to time. The state Board may specify more stringent standards for the relevant parameters keeping in view the nature of the industry and its size and location. At no time, the emission level shall go beyond the prescribed standards. Interlocking facilities shall be provided so that process can be automatically stopped in case emission level exceeds the limit.	All the existing and new units are provided with adequate pollution control equipment (PCEs) to ensure the emission levels within specific legal requirement. Please refer **Annexure – I** for monitoring reports for October 2018 to March 2019. Alarms and interlocking wherever possible have been provided in the units to indicate emission level.
ii.	Efforts shall be made to reduce RSPM levels in the ambient air and a time bound action plan shall be submitted. On-line stack monitoring facilities for all the stacks including new sinter plant and power house and sufficient air pollution control devices shall be provided to keep the emission levels below 50 mg/Nm^3 and reports submitted to the Jharkhand SPCB and CPCB.	• We have submitted Action Plan and status update on reduction of RSPM Level in Ambient Air vide our letter no. EMD/C-33/124/13 dated June 22, 2013. • Online stacks monitoring systems in the major stacks have been installed. • All the new Air Pollution Control devices have been commissioned with design emission levels of below 50 mg/Nm^3 of particulate matter from stacks within Works. • Monitoring reports are being submitted regularly.
iii.	In-plant control measures for checking fugitive emissions from all the vulnerable sources shall be provided. Dust extraction system and dry fogging system will be provided to control air emissions at material transfer and sizing plants. ESP and bag filters shall be provided wherever required to keep the emission levels below 50 mg/Nm^3 particularly in 'H'-BF stock house, BF cast houses and Sinter stock house. Low NO burners will be installed to control NO emissions. Gas cleaning plant shall be provided to BF. Further, specific measures like water sprinkling	The status of control measures in the units are as follows. • Installed ESPs and Bag Houses in the "H" Blast Furnace, Sinter Plant#4. • Dust control systems, dry fog system and water spraying have been provided at the material handling systems. • Low NOx burners have been installed. The following control measures are in place to check the fugitive emissions. • Bag Houses, water-spraying arrangements are provided at all potential dust generating points.

Tata Steel Limited, Bistupur, Jamshedpur – 831 001
Ph - 0657 2426992 Email id : web@tatasteel.com
Contact Person: Shubhanand Mukesh, Head Environment Management

	shall be carried out and fugitive emissions shall be controlled, regularly monitored and records maintained.	• The boilers at Power House#3 have been converted to gas firing from coal. This has contributed significantly in the reduction of the fugitive emissions. • Regular cleaning of shop floor area with the help of mechanical dust collector, road sweepers, is being done. • Monitoring of fugitive emission is being done at the regular intervals and records kept. Please refer **Annexure – I** for monitoring reports for October 2018 to March 2019.
iv.	Gaseous emission levels including secondary fugitive emissions shall be controlled within the latest permissible limits issued by the Ministry and regularly monitored. Guidelines / Code of Practice issued by the CPCB in this regard shall be followed.	All the Steel Melting Shops (LD#1, LD#2 and LD#3) have been provided with Electrostatic Precipitators (ESP) as secondary emission control system.
v.	Total water requirement from River Subarnarekha shall not exceed 3,91,800 m^3/day as per the permission accorded by the State Govt. No ground water shall be used. GCP wastewater treatment plants for 'H'-BF and Billet Caster no. 3 shall be provided. The treated process effluent shall be recycled and re-used in cooling tower as well as for green belt development. Cooling tower blow down shall be used for granulation, coke quenching, dust suppression and other non-product uses. Treated effluent discharge into the streams/river shall not exceed 37,000 m^3/day. Domestic effluent shall be treated in Sewage Treatment Plant (STP).	• Water taken from Subarnarekha River for steelmaking as make-up water is within the recommended capacity by State Government. • Installations of closed loop system for the new units have been commissioned. The treated water is recycled for various processes within the plant. • The discharge quantity from the works drain is kept within the prescribed standard. • Sewage from the Jamshedpur Town is treated in Sewage Treatment Plants (2 nos.). BOD and Suspended Solids are within the prescribed limits.
vi.	Continuous monitoring of Total Organic Compounds (TOC) shall be done at the outlet of ETP (BOD plant).	Online TOC analyzer has been installed for continuous monitoring at BOD Plant Outlet.
vii.	Ground water monitoring around the solid waste disposal site / secured landfill (SLF) shall be carried out regularly and report submitted to the Ministry's Regional	We are regularly conducting the ground water monitoring around the waste disposal site at five locations. Analysis report submitted to JSPCB indicates that concentration of heavy

Tata Steel Limited, Bistupur, Jamshedpur – 831 001
Ph - 0657 2426992 Email id : web@tatasteel.com
Contact Person: Shubhanand Mukesh, Head Environment Management

	Office at Bhubaneswar, CPCB and OPCB.	meals is well within the prescribed limits. Please refer **Annexure – I** for monitoring reports for October 2018 to March 2019.
viii.	Solid wastes shall be reused in the cement plant, road construction and railway ballast. BF slag shall be granulated in cast house and used for cement making. LD slag shall be processed in Waste Recycling Plant and subsequently recycled in the BF LD sludge and sinter plants. Remaining slag shall be used for road construction and filling the low-lying areas. The Chrome sludge in the form of Cr^{+3} shall be dumped only in the secured landfill located within the plant premises and proper disposal of Chrome sludge shall be ensured. Oily waste shall be burnt in the incinerator.	• BF slag from H Blast Furnace is granulated in cast house and is used for cement making. • LD slag is processed at the modernized Waste Recycling Plant to recover the metallic portion and reuse at Sinter Plants. • The chrome sludge from CRM Plant is stored in secured land fill within the Works. • Oily sludge is burnt in the Incinerator.
ix.	Fly ash shall be used in cement plants. Bottom ash shall be disposed off in a suitably designed landfill as per CPCB guidelines to prevent leaching to the sub-soil and underground aquifer.	All boilers at Tata Steel are capable to fire gas. This has resulted in considerable reduction in generation of fly ash.
x.	Practice of disposal of solid wastes along the river shall be immediately stopped and efforts shall be made to remove the solid waste from the banks of the river.	No disposal of solid waste along the river bank from Tata Steel.
xi.	A time bound action plan should be submitted to reduce solid waste, its proper utilization and disposal. Action plan for the reclamation of Jugsalai Muck disposal site submitted to the Ministry shall be implemented in a time bound manner.	An action plan for Solid waste management has been submitted to JSPCB vides our letter no. EMD/C-02/460/11 dated December 16, 2011. We have also submitted road map regarding future generation and the disposal of solid waste vide our letter no. EMD/C-33/124/13 dated June 22, 2013. Tata Steel has taken a number of steps to improve the solid waste utilization. For the period during April to March 2019, the solid waste utilization was 99% excluding storage of LD slag at Galudih for processing. Various actions have been already planned to improve the solid waste utilization further.

Tata Steel Limited, Bistupur, Jamshedpur – 831 001
Ph - 0657 2426992 Email id : web@tatasteel.com
Contact Person: Shubhanand Mukesh, Head Environment Management

		The reclamation of JMD has been completed. A rainwater harvesting facility has been constructed at the top of the JMD which is being utilized for development of greenery. Besides this, there is a provision to pump surface drainage carry out from the plant to JMD area for development of greenery.
xii.	The company shall develop surface as well as ground water harvesting structures to harvest the rainwater for utilization in the lean season besides recharging the ground water table.	• Rainwater is collected from the new facilities through surface drain into Cooling Pond. The rainwater thus collected is recycled in the plant for reuse. • The rainwater harvesting structures at four buildings within and outside the plant have been completed.
xiii.	Green belt shall be developed in 1157.7 ha (33 %) out of total 4391.85 ha. within and around the plant premises as per the CPCB guidelines in consultation with DFO.	We have planted 12697 nos. saplings during April 2018 to March 2019 inside the works, Jugsalai Muck Dump area and in Township in the same period. Every year plantation done in available space. The following plant species are being planted: • *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.*
xiv.	Occupational Health Surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.	The health surveillance is being done as per Factory Act. Records are maintained at the Occupational Health Services.
xv.	Recommendations made in the Corporate Responsibility for Environment Conservation (CREP) issued for the steel plants shall be implemented.	CREP recommendations have been implemented.
	General Conditions	
i.	The project authorities must strictly adhere to the stipulations made by the Jharkhand Pollution Control Board (Jharkhand SPCB) and the	All the relevant stipulations made by JSPCB and State Government are being complied.

Tata Steel Limited, Bistupur, Jamshedpur – 831 001
Ph - 0657 2426992 Email id : web@tatasteel.com
Contact Person: Shubhanand Mukesh, Head Environment Management

	State Government	
ii.	No further expansion or modifications in the plant should be carried out without prior approval of the Ministry of Environment and Forests.	Environmental Clearance for the expansion from 6.8 MTPA to 9.7 MTPA Steel Plant was granted vide MoEF letter no. J-11011/691/2007-IA. (II) dated May 11, 2010. Environmental Clearance for the expansion from 9.7 MTPA to 11 MTPA Steel Plant was granted vide MoEF letter no. J-11011/691/2007-IA. (II) dated March 1, 2016. Necessary Environment Clearance will be taken before any further expansion or modification.
iii.	At least four ambient air quality monitoring stations shall be established in the downward direction as well as where maximum ground level concentration of SPM, SO_2 and NO_X are anticipated in consultation with the Jharkhand SPCB. Data on ambient air quality and stack emission should be regularly submitted to this Ministry including its Regional Office at Bhopal and the Jharkhand SPCB/CPCB once in six months.	Four Ambient Air Quality Monitoring Stations have been installed. We submit monitoring data on ambient air quality and stack emission regularly to JSPCB/MoEF/CPCB. Please refer **Annexure – I** for monitoring reports for October 2018 to March 2019.
iv.	Industrial wastewater shall be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 11th May, 1993 and 31st December, 1993 or as amended form time to time. The treated wastewater shall be utilized for plantation purpose.	Wastewater is being treated in the Effluent treatment plants of respective units for meeting the standards. Treated wastewater is used for plantations and road dust suppression. Most of treated wastewater is recycled back to the system.
v.	The overall noise levels in and around the plant area shall be kept well within the standards (85 dBA) by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels should conform to the standards prescribed under EPA Rules, 1989 viz. 75 dBA (daytime) and 70 dBA (nighttime).	The control measures such as silencers, enclosures, hoods, rubber pads, have been provided at the appropriate places on all sources of noise generation in the plant. The ambient noise level is being monitored. Please refer **Annexure – I** for monitoring reports for October 2018 to March 2019.
vi.	The project proponent shall also comply with all the environmental protection measures and	• Implementation of protection measures as indicated in the EIA for 6.8 MTPA plant units have

Tata Steel Limited, Bistupur, Jamshedpur – 831 001
Ph - 0657 2426992 Email id : web@tatasteel.com
Contact Person: Shubhanand Mukesh, Head Environment Management

	safeguards recommended in the EIA and EMP report. Further, the company must undertake socio-economic development activities in the surrounding villages like community development programs, educational programs, drinking water supply and health care etc.	been complied which includes ESPs, bag filters, on-line slag granulation system for blast furnaces and waste water treatment plants etc. • Socio economic development activities are regularly undertaken in and around Jamshedpur through the two agencies namely, Tata Steel Rural Development Society and Tata Steel Community Development and Welfare Services Centers. The development activities undertaken in the surrounding community are need based and are in the field of health care, education, mid-day meal at schools, sports and culture, self-employment, drinking water, rural electrification, etc. Tata Steel also facilitate the Institutes like R D Tata Technical Institute, Tata Football Academy, Tata Archery Foundation, etc. which encourages the local talent to develop themselves and participate at National and International levels.
vii.	As mentioned in the EIA and EMP, ₹ 259.00 Crores and ₹18.5 Crores earmarked towards the capital cost and recurring cost/annum for environmental pollution control measures shall be judiciously utilized to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government. The funds so provided shall not be diverted for any other purpose.	The funds for capital investment on pollution control equipment were not diverted. The 6.8 MTPA project has been completed. All the pollution control equipment have been commissioned and are being operated and maintained regularly.
viii.	The Regional Office of this Ministry at Bhubaneswar/ CPCB/Jharkhand SPCB will monitor the stipulated conditions. A six monthly compliance report and the monitored data along with statistical interpretation shall be submitted to them regularly.	Six monthly compliance reports and the monitored data are being submitted regularly. Please refer **Annexure – I** for monitoring reports for October 2018 to March 2019.
ix.	The Project Proponent shall inform the public that the project has been accorded environmental clearance	The Notice has been advertised in two local newspapers *viz.* Uditvani (Hindi) and Avenue Mail (English) on

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	by the Ministry and copies of the clearance letter are available with the OSPCB/Committee and may also be seen at Website of the Ministry of Environment and Forests at http://envfor.nic.in. This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the Regional office.	April 21, 2007 and communication to this effect was also sent to the MoEF vide our letter no. EMD/C-32/2118/07 dated August 18, 2007.
x.	Project authorities should inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of commencing the land development work.	It has been complied as the project has already been completed and Consent to Operate has been issued by Jharkhand State Pollution Control Board.

Tata Steel Limited, Bistupur, Jamshedpur – 831 001
Ph - 0657 2426992 Email id : web@tatasteel.com
Contact Person: Shubhanand Mukesh, Head Environment Management

ENVIRONMENTAL CLEARANCE COMPLIANCE STATUS REPORT

October 2018 to March 2019

Tata Steel Limited, Jamshedpur

(MAIN WORKS & TOWN)

Six Monthly Compliance Status report of Environmental Clearance from expansion of 6.8 to 9.7 MTPA Crude Steel Production

ENVIRONMENTAL MANAGEMENT DEPARTMENT
TATA STEEL LIMITED
JAMSHEDPUR

Compliance Status of Environmental Clearance of Expansion of Steel Plant (6.8 MTPA to 9.7 MTPA, Crude Steel Production) at Tata Steel Works, Jamshedpur, District East Singhbhum, Jharkhand vide MoEF Letter no J-11011/691/2007-IA. II (I) dated May 11, 2010

<table>
<tr><th>No.</th><th>Conditions</th><th>Compliance Status</th></tr>
<tr><td colspan="3">Specific Conditions:</td></tr>
<tr><td>i.</td><td>Compliance to all the specific and general conditions stipulated for the existing plant by the Central/State Govt. shall be ensured and regular reports submitted to the Ministry and its Regional Office at Bhubaneswar.</td><td>The six-monthly compliance reports are being submitted to the regional office regularly. The report for last 5 years submitted to Regional office at Ranchi/Bhubaneswar is as follows:
<table>
<tr><th>Six Monthly report</th><th>Submitted on</th></tr>
<tr><td>December 2018</td><td>November 28, 2018 vide letter no. EMD/C-41/429/18.</td></tr>
<tr><td>June 2018</td><td>May 28, 2018 vide letter no. EMD/C-41/280/18.</td></tr>
<tr><td>December 2017</td><td>November 28, 2017 vide letter no. EMD/C41/178/17</td></tr>
<tr><td>June 2017</td><td>May 25, 2017 vide letter no. EMD/C41/77/17</td></tr>
<tr><td>December 2016</td><td>November 25, 2016 vide letter no. EMD/C41/183/16</td></tr>
<tr><td>June 2016</td><td>June 01, 2016 vide letter no. EMD/C-41/78/16</td></tr>
<tr><td>December 2015</td><td>December 05, 2015 vide letter no. EMD/C-33/215/15</td></tr>
<tr><td>June 2015</td><td>May 19, 2015 vide letter no. EMD/C-33/58/15</td></tr>
<tr><td>December 2014</td><td>November 18, 2014 vide letter no. EMD/C-33/175/14</td></tr>
<tr><td>June 2014</td><td>June 24, 2014 vide letter no. EMD/C-33/116/14</td></tr>
<tr><td>December, 2013</td><td>December 16, 2013 vide letter no. EMD/C-33/237/13</td></tr>
</table>
The six monthly compliance reports along the monitored data is also uploaded in the website(http://www.tatasteelindia.com/ corporate-citizen/environment-compliance-reports.asp)</td></tr>
<tr><td>ii.</td><td>Efforts shall be made to reduce RSPM levels in the ambient air and a time bound action plan shall be submitted. On-line ambient air quality monitoring and continuous stack monitoring facilities for all the stacks shall be provided and sufficient air pollution control devices viz. Electrostatic precipitator (ESP), bag house, gas cleaning plant, bag filters etc. shall be provided to keep the emission levels below 50 mg/Nm^3 by installing energy efficient technology. Low NOx burners shall be installed to control NOx emissions. At no time, the emission level shall go beyond the prescribed standards. Interlocking facilities shall be provided so that process can be automatically stopped in case emission level exceeds the limit.</td><td>• 4 online AAQMS have been commissioned to monitor PM_{10}, $PM_{2.5}$, SO_2, NO_2, CO, NH_3 continuously.
• Low NOx burners have been provided in all the new units.
• Similarly in almost all the units alert facility have been provided in case of units exceed any prescribed emission level as the interlocking is technically not feasible in all the production units.</td></tr>
<tr><td>iii.</td><td>Existing electrostatic</td><td>• There is a proposal to upgrade all the ESP of</td></tr>
</table>

	precipitator (ESP) shall be upgraded and provided to new units to control gaseous emissions within 50 mg/Nm^3. ESPs shall be provided to pellet plant, cast house and stock house of blast furnaces and LD#3 shop. Waste gas from the drying and grinding unit of pellet plant shall be cleaned by bag filters. Adequate provisions shall be made to control NOx emissions. Bag house shall be provided to Lime kilns. Data on ambient air quality stack emissions and fugitive emissions shall regularly submit to the Ministry's Regional Office at Bhubaneswar, Jharkhand Pollution Control Board (JPCB) and Central Pollution Control Board (CPCB) once in six months.	Sinter Plant (SP), F & G Blast Furnace & LD1 & LD2 steel melting shops. Among these 6 ESP at Sinter Plant have already been upgraded by the agency. The agreed emission for their upgraded emission has been guaranteed to be 50 mg/Nm^3 with an efficiency of 99.9%. • Bag Filters are provided in the Cast House and Stock House of all the Blast Furnaces. • 3 nos. of bag filters have been provided in the Pellet Plant to control waste gas from the drying and grinding unit. • 12 nos. of Bag House have been provided in Lime Plant in process and dedusting units. • A total of 6 nos. of schemes to upgrade Existing Electrostatic Precipitator (ESP) have been commissioned at SP 1, 2 & 3. Additional 10 nos. of schemes to upgrade APCE including ESP and Bag Filters are being commissioned at various locations inside Works which shall be completed by FY 19.
iv.	Land based fume extraction system shall be provided to coke oven battery # 10 and 11 to arrest fugitive emissions during charging and pushing operations. The coke oven gas shall be desulphurized by reduction of H_2S content of coke oven gas in the by-product recovery section to below 500 mg/Nm^3. On-line charging with high pressure liquor aspiration (HPLA) for extraction of oven gas, leak proof oven doors, hydraulic door and door frame cleaner, water sealed AP caps and charging & pusher side emission extractor device shall be provided for the coke oven batteries to maintain VOC emissions within permissible limit. Land based fume extraction system for pushing emission control from coke ovens shall be provided.	• Land based fume extraction, desulphurization facilities, online charging with HPLA, Hydraulic door and door frame clearance, water seal AP caps and charging and pusher side emission extractor device etc were in place in both coke ovens battery 10 & 11 to minimize leaks from doors CAPs, etc and also to meet the CREP recommendations. • Coke oven gas is being desulphurised in Battery 10&11. The monitoring reports shows that H_2S content is below 500 mg/Nm^3.
v.	All the standards prescribed for the coke oven plants shall be followed as per the latest guidelines. Proper and full utilization of coke oven gases in power plant using heat recovery steam generators shall be ensured and no flue	• As per the CREP guidelines, % of PLD, PLL & PLO of all batteries are being monitored thrice in a month. The max % of PLD is found to be 9.3 in Battery#5, max % of PLL found to be 0.8 in battery#8&9 and % of maximum PLO is found to be 1.2 in Battery#10& 11 and maximum charging emission is found to be 72 sec in Battery#6. • Byproduct gas is recovered and used for power

	gases shall be discharged into the air. Sulphur shall be recovered from the coke oven gases from new product plant.	generation captive Power House # 3, 4 & 5 and heating purpose in all the mills. Power is also being generated in TRT at G, H & I Blast Furnace. Sulphur is recovered from coke oven gas and sold to authorized buyers.
vi.	Only dry quenching method in the coke oven in new battery # 10 & 11 shall be adopted.	Coke Dry quenching (CDQ) facility is under commissioning in the new Coke Oven Battery # 11is completed and commissioned. The Batery#10 project likely to be completed by FY-20
vii.	The National Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R. No. 826(E) dated 16th November, 2009 shall be followed.	• 4 online AAQMS have been commissioned to monitor PM_{10}, $PM_{2.5}$, SO_2, NOx, CO, NH_3 continuously. • There is one mobile monitoring facility & about 20 manual AAQMS located both inside the plant and also outside the plant area. • All other AAQ parameters being analysed by approved environment laboratory are also found within prescribed limit. • Monthly monitoring reports are being submitted to JSPCB and six monthly monitoring reports are being submitted along with EC compliance reports to Ministry's Regional office, CPCB and JSPCB. • Please refer **Annexure – I** for monitoring reports for October 2018 to March 2019.
viii.	In-plant control measures for checking fugitive emissions from all the vulnerable sources including bag filters and fume extraction system shall be provided. Dry fog dust suppression system / water sprinkling system shall be provided in raw material handling areas to control fugitive dust emissions. Fugitive emissions from different sources shall also be controlled by covered conveyors, water sprinkling in open yards and with dry fogging in the closed zones. Further, specific measures like asphalting of the roads within premises shall be carried out to control fugitive emissions. Fugitive emissions shall be controlled, regularly monitored and records maintained.	• Necessary air pollution control measures are provided to control fugitive dust emission. Please find enclosed a list of air pollution control devices for each of production unit as **Annexure 1**. • All the areas of dedusting operation as junction house, transfer tower, conveyors are connected with bag filters and/or dry fog dust suppression system. • All these locations are being monitored once in month. • 8 nos. of unit for dust extraction system (DE) have been commissioned at G Blast Furnaces, RMBB and RMM. Additional units for dust extraction system (DE) are being commissioned at various locations inside Works. • A total of 350 nos. of points for dust suppression system (DS) have been commissioned at Lime Plant, RMBB 1& 2, and C & F Blast Furnaces. • A total of 51 nos. Industrial vacuum cleaners (IVC) have been commissioned at MPSPP, RMBB 1&2, SP 1, 2 & 3 and HBF. Additional Industrial vacuum cleaners (IVC) are being commissioned at various locations inside Works.
ix.	Gaseous emission levels including secondary fugitive emissions from all the sources shall be controlled within the latest permissible limits issued by the Ministry and regularly monitored. Guidelines / Code of Practice issued by the CPCB shall be followed. New	• Secondary dust emission inside the plant in different critical areas is being monitored in about 150 locations monthly. • The average work area dust monitoring during April 2018 to March 2019 is 5.5mg/m^3.

	standards issued by the Ministry vide G.S.R. 414(E) dated 30th May, 2008 shall be followed.	
x.	As proposed, traffic decongestion plan shall be implemented in a time bound manner to reduce emissions in the Jamshedpur city and separate budget shall be allocated for implementing the same. Maximum inbound and out bound material movement shall be done by railway wagons only to reduce dust emissions. Measures like covered conveyors for handling of bulk materials, centralized screening of iron ore, rationalization of weighing system, use of higher capacity vehicles etc. shall be adopted to reduce dust emissions. Mechanized vacuum cleaning of arterial roads shall be carried out on regular basis to further reduce dust emissions.	Under the traffic decongestion plan in Jamshedpur city : • Strengthening of marine drive (Western corridor) has been implemented • Proposal of Eastern Corridor is in discussion with Govt. of Jharkhand and key issues settled **Inside the plant:** • Automatic traffic control system is in place to control the traffic density as well as the safely including secondary emission inside the plant. • All the loaded trucks are ensured to be covered with tarpaulin sheets to avoid dust getting air borne and thus generation of secondary emission. • Sign board have been placed on all the critical areas to keep the speed of the vehicle within 35 kmph to control secondary emission along the internal road (VIP Road) and similarly the vehicle speed is limited to 16 kmph in the units. • All the loaded trucks/dumpers coming inside the plant with their valid PUC. • 4 nos. of mechanized sweepers are deployed within Works for regular cleaning and dust evacuation of roads. • Approx. 400 tonnes/month of dust from road being collected by these mechanized sweepers which are being reused in sinter making through RMBB. • 2 nos. of mechanized sweepers are deployed in Jamshedpur town for regular cleaning and dust evacuation of roads.
xi.	Vehicular pollution due to transportation of raw materials and finished products shall be controlled. Proper arrangements shall also be made to control dust emissions during loading and unloading of the raw material and finished product.	• Approx. all the raw material is being transported through railways to reduce the road transport load and vehicular pollution. • Dry fog dust suppression and water sprinklers are provided to control dust emission during loading and unloading activity. • Tyre washing facility has also been provided in 8 strategic locations to keep tyres clean to reduce dust emission on roads and being installed in 5 additional locations.
xii.	As proposed, total water requirement from River Subarnarekha shall not exceed 33.3 MGD although permission for 227 MGD water is obtained vide letter dated 7th January, 1992. Closed circuit cooling system shall be provided to reduce further water consumption. All the wastewater from various units shall be treated in the common effluent treatment plant (CETP) for primary, secondary and	• Due to water recycling facilities, the total water requirement from River Subarnarekha shall not cross 33.3 MGD for Steel Works. • A central effluent treatment plant (CETP) of 4 MGD has been constructed to treat and recycle most of the effluent by tertiary treatment with Reverse Osmosis (RO). • New BOD plant has been commissioned and existing BOD has been upgraded to treat the additional effluent generated from Coke Oven Batteries including Battery 10 & 11. • Closed circuit cooling systems have been installed. Catch pits at all the five designated drains have been constructed to recycle the

	tertiary treatment shall be either recycled or used for dust suppression, slag quenching and green belt development etc. within the lease hold area. The phenolic effluent from the by-product recovery section of coke oven battery # 10 and 11 shall be treated in BOD plant. Wastewater containing suspended solids shall be passed through clarifloculation plant to recover and reuse the clarified water for cooling or cleaning. Mill effluent containing oil and suspended solids shall be passed through oil skimmers and filter press. No treated wastewater shall be released out the premises and 'Zero' discharge shall be adopted by recycling all the treated water in the plant itself including from the existing plant.	treated effluent within plant. • All the mills are equipped with respective effluent treatment plants with settling tanks and oil skimming facility.
xiii.	Efforts shall be made to make use of rain water harvested. If needed, capacity of the reservoir shall be enhanced to meet the maximum water requirement. Only balance water requirement shall be met from other sources.	• There are two ponds inside Steel works viz. Upper Cooling Pond (UCP) and Lower Cooling Pond (LCP), which stores and harvest most of the surface run off with cooling water of the units. • 38 nos. of rainwater harvesting structures in different office buildings have been provided inside the plant area of which some area has the facility of Ground Water Recharge system. • RWH structure has been constructed based on the maximum rainfall of last 20 yrs.
xiv.	Continuous monitoring of Total Organic Compounds (TOC) in the wastewater treated in BOD plant from the coke oven plant shall be done at the outlet of ETP (BOD plant). All the treated wastewater shall be monitored for pH, BOD, COD, oil & grease, cyanide, phenolic compounds, Chromium+6 etc. besides other relevant parameters.	• The BOD plant has facility of continuous monitoring of TOC. • Similarly monitoring of other parameters on the outlet of the BOD plant is being done regularly. • The monthly monitoring data is being submitted to JSPCB and six-monthly reports are being submitted to regional office of MoEFCC at Ranchi and CPCB. • Please refer **Annexure – I** for monitoring reports for October 2018 to March 2019.
xv.	Regular monitoring of influent and effluent surface, sub-surface and ground water shall be ensured and treated wastewater shall meet the norms prescribed by the State Pollution Control Board or described under the E(P) Act whichever are more stringent. Leachate study for the effluent generated and analysis shall also be regularly carried out	• All the effluent viz. catch pits, service water etc are being monitored regularly. • The treated effluents such as all ETP outlets and drains are being analyzed regularly. • Online effluent monitoring system has been commissioned in all the drains to monitor effluent quality on a real-time basis. • Online effluent monitoring data is connected with CPCB/JSPCB. • River Water quality of Subarnarekha and kharkai is also being monitored as a part of regular

<table>
<tr><td></td><td>and report submitted to the Ministry's Regional Office at Bhubaneswar, Jharkhand SPCB and CPCB.</td><td>monitoring of surface water quality.
• There are two cooling water pond whose water quality is also regularly monitored as part of sub surface water quality.
• Ground water quality is also being monitored at 7 locations both inside and outside plant premises.
• Monthly monitoring data is being submitted to JSPCB and six-monthly reports are being submitted to regional office of MoEFCC at Ranchi and CPCB.</td></tr>
<tr><td>xvi.</td><td>'Zero' effluent discharge shall be strictly followed and no additional wastewater shall be discharged outside the premises. Domestic wastewater shall be treated in septic tanks followed by soak pit and used for green belt development.</td><td>As per the water balance and plan of zero effluent discharge, all the plant effluent is being recycled in to different process units for various uses. The rain water which is being discharged into the nearby nallah is being collected and in low lying area and settled water is let out thereafter. Maximum effort is being taken to minimize the discharge of rain water.</td></tr>
<tr><td>xvii.</td><td>As proposed, the water consumption shall not exceed 5.7 m^3/Ton of steel at 9.7 MTPHY stage.</td><td>The specific water consumption has been reduced to 3.27 m^3/tcs during year 2018-19 as compared to 5.58 m^3/tcs for the year 2013-14.
<table>
<tr><th>Year</th><th>Specific Water Consumption (m^3/tcs)</th></tr>
<tr><td>FY 14</td><td>5.58</td></tr>
<tr><td>FY 15</td><td>5.54</td></tr>
<tr><td>FY 16</td><td>4.39</td></tr>
<tr><td>FY 17</td><td>3.83</td></tr>
<tr><td>FY 18</td><td>3.68</td></tr>
<tr><td>FY 19</td><td>3.27</td></tr>
</table></td></tr>
<tr><td>xviii.</td><td>All the blast furnace (BF) slag shall be granulated and provided to cement manufacturers for further utilization in cement making as per the MoUs signed with various companies including M/s Lafarge, M/s Eco-cement & M/s ACC. LD slag after metal recovery shall be used in sinter plant, blast furnaces and LD convertor, aggregates making, road ballast making, soil conditioning etc. All the flue dust generated shall be recycled within the plant to the maximum extent. Mill scales, LD sludge, lime fines and flue dust shall be recycled back to the sinter plant. The BF gas cleaning plant sludge shall be used for manufacturing briquettes.</td><td>• Online slag granulation facilities have been implemented in the all Blast Furnaces.
• All the BF Slag is being granulated and made available to the Cement plants for cement making.
• Blast Furnace gas cleaning plant (GCP) sludge is re-utilised in the process as well as being used for manufacturing briquettes.
• Additional initiatives undertaken for improving the utilization of LD Slag:
o Co-processing of LD Slag at Cement Kilns.
o Open & Closed Steam Ageing inside Works
o Use of LD Slag in Road Making & railway Ballast
• Collaboration with expert external agency for processing and subsequent use of LD Slag as aggregates and ballast.</td></tr>
<tr><td>xix.</td><td>As proposed, coal tar sludge and BOD sludge shall be recycled for coke making by mixing with the coal charge and used in the coke ovens. Chromium sludge shall be</td><td>• BOD Sludge and Coal Tar sludge generated from By Product Plant is being recycled in coke plant by mixing with raw materials.
• All other kind of process wastes are being reutilised in sinter plant.
• In house secured landfill with HDPE liner has</td></tr>
</table>

	disposed in a HDPE lined secured landfill as per the CPCB guidelines within the complex. All the other solid waste including broken refractory mass shall be properly disposed off in environment-friendly manner. Oily waste and spent oil shall be provided to authorized recyclers/reprocessors.	been constructed to dispose chrome sludge generated from Cold Rolling Mill.
xx.	All the slag shall be used for land filling inside the plant or used as building material only after passing through Toxic Chemical Leachability Potential (TCLP) test. Toxic Chromium sludge and other hazardous substances recovered from the slag and output waste shall be disposed off in secured landfill as per CPCB guidelines.	• LD Slag is being used for road making. • The TCLP test conducted by external approved agency. • Leachate potential of all Heavy metals is negligible. • Chrome Sludge is being disposed in the secured landfill inside Works.
xxi.	As proposed, Jugsalai muck dump (JMD) shall be reclaimed in a time bound manner by covering the dump site with geo-netting and vegetation alongwith localized water harvesting.	The reclamation of JMD has been completed. A rainwater harvesting facility has been constructed at the top of the JMD which is being utilized for development of greenery. Besides this, there is a provision to pump surface drainage carry out from the plant to JMD area for development of greenery.
xxii.	A time bound action plan shall be submitted to reduce solid waste, its proper utilization and disposal to the Ministry's Regional Office at Bhubaneswar, Jharkhand SPCB and CPCB.	An action plan for Solid waste management has been submitted to JSPCB vides our letter no. EMD/C-02/460/11 dated December 16, 2011. We had also submitted road map regarding future generation and the disposal of solid waste vide our letter no. EMD/C-33/124/13 dated June 22, 2013. We have taken many steps to improve the solid waste utilization. For the period during April 2018 to March 2019, the solid waste utilization was 99% excluding storage of LD slag at Galudih for processing. Various actions have been already planned to improve the solid waste utilization further.
xxiii.	Proper handling, storage, utilization and disposal of all the solid waste shall be ensured and regular report regarding toxic metal content in the waste material and its composition, end use of solid/hazardous waste shall be submitted to the Ministry's Regional Office at Bhubaneswar, Jharkhand SPCB and CPCB.	• Most of the solid waste is being reutilized. • Information regarding solid waste and hazardous waste is being submitted in Environment Statement to the Board every year.
xxiv.	Proper utilization of fly ash shall be ensured as per Fly Ash Notification, 1999 and subsequent amendment in	Ash generation from the captive power plants has been stopped due to no coal firing at Power Plants. Generation for last three years are as follows:

<table>
<tr><td></td><td>2003. All the fly ash shall be provided to cement and brick manufacturers for further utilization and 'Memorandum of Understanding' shall be submitted to the Ministry's Regional Office at Bhubaneswar.</td><td><table><tr><th>Year</th><th>Quantity generated in tonnes</th><th>Quantity utilized</th></tr><tr><td>2016-17</td><td>5012</td><td rowspan="3">Disposed in ash pond through HCSD system</td></tr><tr><td>2017-18</td><td>2291</td></tr><tr><td>2018-19</td><td>1289</td></tr></table>
All the boilers have been converted from coal fired to gas fired. Thus, there is no additional generation of fly ash in the power plant.</td></tr>
<tr><td>xxv.</td><td>A Risk and Disaster Management Plan along with the mitigation measures shall be prepared and a copy submitted to the Ministry's Regional Office at Bhubaneswar, Jharkhand SPCB and CPCB within 3 months of issue of environment clearance letter.</td><td>Disaster Management Institute, Bhopal has verified and certified the Risk assessment report and Disaster Management Plan vide their letter no. DMI/IDMU/Con-227/24 dated April 16, 2012. The same has been submitted to JSPCB.</td></tr>
<tr><td>xxvi.</td><td>As proposed, green belt shall be developed in more than 33 % area within and around the plant premises as per the CPCB guidelines in consultation with DFO.</td><td>We have planted 12,697 nos. saplings during April 2018 to March 2019 inside the works, Jugsalai Muck Dump area and in Township in the same period. Every year plantation done in available space.

The following plant species are being planted:

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.</td></tr>
<tr><td>xxvii.</td><td>Prior permission from the State Forest Department shall be taken regarding likely impact of the expansion of the proposed steel plant on the reserve forests. Measures shall be taken to prevent impact of particulate emissions / fugitive emissions, if any from the proposed plant on the surrounding reserve forests viz. Jora Pahar PF, Sand Pcha Rahar PF, Deluse RF located within 10 km radius of the project. Further, Conservation Plan for the conservation of wild fauna in consultation with the State Forest Department shall be prepared and implemented.</td><td>• Prior Permission from State Forest Department has been obtained vide their memo. No. 2605 dated October 29, 2010.
• Wildlife Conservation Plan has been submitted to PCCF, Jharkhand vide our letter no. EMD/C-33/368/11 dated October 07, 2011.
• A revised Wildlife Conservation Plan for Tata Steel has been prepared with the help of approved external agency recommended by State Forest Department and submitted for approval vide our letter no. EMD/C-41/128/16 dated August 22, 2016.
• Wildlife Conservation Plan has been approved by Principal Chief Conservator of Forests – Wildlife (PCCF-WL) GoJ on Nov 13, 2017. PCCF-WL has informed MoEFCC for the above approval.</td></tr>
<tr><td>xviii.</td><td>All the recommendations made in the Charter on Corporate</td><td>CREP recommendations have been implemented. Please find enclosed the same as Annexure – II.</td></tr>
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<table>
<tr><td></td><td>Responsibility for Environment Protection (CREP) for the Steel Plants shall be implemented</td><td></td></tr>
<tr><td>xxix.</td><td>All the commitments made to the public during the Public Hearing / Public Consultation meeting held on 18th June, 2009 shall be satisfactorily implemented and a separate budget for implementing the same shall be allocated and information submitted to the Ministry's Regional Office at Bhubaneswar.</td><td>All the commitments made to the public during the Public Hearing are being implemented.</td></tr>
<tr><td>xxx.</td><td>At least 5 % of the total cost of the project i.e. ₹ 750.00 Crores shall be earmarked towards the corporate social responsibility and item-wise details along with time bound action plan shall be prepared and submitted to the Ministry's Regional Office at Bhubaneswar. Implementation of such program shall be ensured accordingly in a time bound manner.</td><td>It is being complied as per the requirement under the Companies Act. The amount spent by the Company on Corporate Social Responsibility (CSR) activities is given below.
<table>
<tr><th>FY</th><th>Total Spent on CSR</th><th>CSR spent in and around Jamshedpur</th></tr>
<tr><td>2011</td><td>126</td><td>97.15</td></tr>
<tr><td>2012</td><td>146</td><td>106.43</td></tr>
<tr><td>2013</td><td>171</td><td>120.34</td></tr>
<tr><td>2014</td><td>212</td><td>136.95</td></tr>
<tr><td>2015</td><td>171</td><td>79.32</td></tr>
<tr><td>2016</td><td>204</td><td>83.62</td></tr>
<tr><td>2017</td><td>194</td><td>73.36</td></tr>
<tr><td>2018</td><td>232</td><td>82.19</td></tr>
<tr><td>2019</td><td>315</td><td></td></tr>
</table>
It is reported in the Company's Integrated Report. These reports are available on the website of Tata Steel and may be seen/downloaded.</td></tr>
<tr><td>xxxi.</td><td>The company shall provide housing for construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.</td><td>As the project is already commissioned. Compliance to this condition is not applicable.</td></tr>
<tr><td colspan="2">General Conditions:</td><td></td></tr>
<tr><td>i.</td><td>The project authorities must strictly adhere to the stipulations made by the Jharkhand Pollution Control Board (JSPCB) and the State Government.</td><td>We are regularly obtaining the CTO and authorization under Hazardous Waste from JSPCB.</td></tr>
<tr><td>ii.</td><td>No further expansion or modifications in the plant should be carried out without prior approval of the Ministry of Environment and Forests.</td><td>The Project informed that there shall be prior permission obtained for the concerned authorities in case of any medications, augmentation, and product mix change. The detail of production of various products for last three years is as follows:</td></tr>
</table>

		Product	**Unit**	**Capacity granted in EC**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**
		Hot Metal	MTPA	12.5	10.163	10.655	10.82	10.9	10.8
		Crude Steel		11	9.331	9.959	10.00	10.0	10.2
iii.	The gaseous emissions from various process units shall conform to the load/mass based standards notified by this Ministry on 19th May, 1993 and standards prescribed from time to time. The state Board may specify more stringent standards for the relevant parameters keeping in view the nature of the industry and its size and location.	There is a proposal to upgrade all the ESP of Sinter Plant (SP), F& G Blast Furnace & LD1 & LD2 steel melting shops. Among these 6 ESP of Sinter Plant have already been upgraded by the agency. The agreed emission for their upgraded emission has been guaranteed to be 50 mg/Nm^3 with an efficiency of 99.9%. ESPs have been provided in pellet plant (Hood Stack, Wind Box Stack and Central dedusting stack) and bag filters in other areas where dedusting as the main criteria. Bag Filters are provided in the Cast House and Stock House of H and I Blast Furnace each. As explained as above, 3 bag filters have been provided in the pellet plant to control waste gas from the drying and grinding unit of pellet plant.						
iv.	At least four ambient air quality monitoring stations shall be established in the downward direction as well as where maximum ground level concentration of SPM, SO_2 and NOx are anticipated in consultation with the Jharkhand PCB. Data on ambient air quality and stack emission should be regularly submitted to this Ministry including its Regional Office at Bhubaneswar and the Jharkhand PCB/CPCB once in six months.	4 online AAQMS have been commissioned to monitor PM_{10}, $PM_{2.5}$, SO_2, NOx, CO, NH_3 continuously inside the Works. There is one mobile monitoring facility & 20 manual AAQMS located both inside the plant and also outside the plant area. Monitoring report is being submitted to JSPCB, CPCB and Regional Office. The monitoring data for the period April to September 2018, indicates that all the parameters (except PM_{10} and $PM_{2.5}$ in few occasions) are within the prescribed limit of NAAQS. PAHs, Lead and Ammonia are being done by CPCB recognized environment laboratory. The ambient air quality represents the status of environment, which includes impact of several external factors such as other industrial activities, traffic movement, commercial and domestic activities etc.						
v.	Industrial wastewater shall be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19th May, 1993 and 31st December, 1993 or as amended form time to time. The treated wastewater shall be utilized for plantation purpose.	Surface and ground water monitoring at various locations are being done and analysis reports also being sent to RO, MoEFCC and JSPCB.							
vi.	The overall noise levels in and around the plant area shall be kept well within the standards (85 dBA) by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources	Personal Protective Equipment (PPE) have been provided to all the workers/officers to avoid any accompanied noise hazards. Facilities like silencers, enclosers, hood etc have been provided to reduce noise at source. The monitored data in the work zone reveals that the noise level does not exceeds >85 dBA for 8 hr exposures. Similarly, in the							

	of noise generation. The ambient noise levels should conform to the standards prescribed under EPA Rules, 1989 viz. 75 dBA (daytime) and 70 dBA (nighttime).	ambient also, the noise levels meet the prescribed standards. The ambient noise level monitoring is being done at different part of the Jamshedpur town in frequent interval outside Steel Works to assess the ambient noise level status. Noise level in the town is found beyond the standard in few occasions. The possible reason of equivalent noise levels in respect of all categories of areas exceeded the standards for day and night times is due to heavy traffic movement in the town, market and commercial activities, festivals and other domestic celebrations and frequent religious rituals.
vii.	Occupational Health Surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.	Regular health surveillance is being conducted i.e. 2 times in a year to all the workers who have already attended more than 40 years of age. The workers having age less than 40 years are under gone occupational health surveillance program once in a year.
viii.	The company shall develop surface as well as ground water harvesting structures to harvest the rainwater for utilization in the lean season besides recharging the ground water table.	Rain Water Harvesting structure of 38 Nos. has been provided inside the plant area of which some area has the facility of Ground Water Recharge system. RWH structures have been constructed based on the maximum rainfall of last 20 yrs.
ix.	The project proponent shall also comply with all the environmental protection measures and safeguards recommended in the EIA/EMP report. Further, the company must undertake socio-economic development activities in the surrounding villages like community development programmes, educational programmes, drinking water supply and health care etc.	Socio economic development activities are regularly undertaken in and around Jamshedpur through the two agencies namely, Tata Steel Rural Development Society and Tata Steel Community Development & Welfare Services Centers. The development activities undertaken in the surrounding community are need based and are in the field of health care, education, mid-day meals in schools, sports and culture, self-employment, drinking water, rural electrification, etc. Tata Steel also facilitate the Institutes like R D Tata Technical Institute, Tata Football Academy, Tata Archery Foundation, etc. which encourages the local talent to develop themselves and participate at National and International levels.
x.	As proposed, 2,107.00 Crores and ₹ 60.00 Crores shall be earmarked towards total capital cost and recurring cost/annum for environmental pollution control measures and judiciously utilized to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government. The funds so provided shall not be diverted for any other purpose.	Capital expenditure on environment is being spent on Air Pollution Control, Solid Waste Management, Zero Waste Water Discharge and Others including Greenery, Online Monitoring, etc. The total budget for the same as allocated by TSL Board is ₹ 2340 Crores. In FY 19 total capital expenditure for environment is ₹ 286 Crore The funds for capital investment on pollution control equipment are not diverted.
xi.	The Regional Office of this Ministry at Bhubaneswar/CPCB/Jharkhand SPCB will monitor the	Six monthly compliance reports and the monitored data are being submitted regularly.

	stipulated conditions. A six monthly compliance report and the monitored data along with statistical interpretation shall be submitted to them regularly.	
xii.	The Project Proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the JSPCB and may also be seen at Website of the Ministry of Environment and Forests at http:/envfor.nic.in. This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the Regional office.	The Notice has been advertised in two local newspapers viz. Hindustan (Hindi) and Hindustan Times (English) on May 18, 2010 and communication to this effect was also sent to the MoEF vide our letter no. EMD/C-33/128/10 dated June 15, 2010.
xiii.	A copy of Clearance letter shall be sent by proponent to concerned Panchayat, Zila Parishad/Municipal Corporation/Urban Local Body and the Local NGO, if any, from whom suggestions/ representations, if any, were received while processing the proposal. The clearance letter shall also be put on the website of the company by the proponent.	The copy of Clearance letter has been sent to Zila Parishad, DIC, Local Body and all concerned vide EMD/C-33/129-137/10 dated June 15, 2010.
xiv.	The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the MoEF, the respective Zonal Office of CPCB and the JPCB. The criteria pollutant levels namely; SPM, RSPM, SO_2, NOx (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the projects shall be monitored and displayed at a convenient	Six monthly compliance reports and the monitored data are being submitted regularly. The ambient air quality parameters are being monitored and displayed at the main gate of the company in the public domain.

	location near the main gate of the company in the public domain.	
xv.	The project proponent shall also submit six monthly reports on the status of the compliance of the stipulated environmental conditions including results of monitored data (both in hard copies as well as by e-mail) to the Regional Office of MOEF at Bhubaneswar, the respective Zonal Office of CPCB and the JSPCB. The Regional Office of this Ministry at Bangalore / CPCB / JPCB shall monitor the stipulated conditions.	Six monthly compliance reports are being submitted regularly both in hard copy and by e-mail.
xvi.	The environmental statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental conditions and shall also be sent to the respective Regional Offices of the MOEF by e-mail.	The environmental statement for each financial year in Form-V is regularly being submitted to the Jharkhand State Pollution Control Board.
xvii.	Project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of commencing the land development work.	It has been complied as the project has already been completed and Consent to Operate has been issued by Jharkhand State Pollution Control Board.

ENVIRONMENTAL CLEARANCE COMPLIANCE STATUS REPORT

October 2018 to March 2019

Tata Steel Limited, Jamshedpur
(MAIN WORKS & TOWN)

Six Monthly Compliance Status report of Environmental Clearance from expansion of 9.7 to 11 MTPA Crude Steel Production

ENVIRONMENTAL MANAGEMENT DEPARTMENT
TATA STEEL LIMITED
JAMSHEDPUR

A. Specific Conditions:

i. **The project proponent should install 24x7 air monitoring devices to monitor air emissions, as provided by the CPCB and submit report to Ministry and its Regional Office.**

Compliance Status:

- 4 online AAQMS have been commissioned to monitor PM_{10}, $PM_{2.5}$, SO_2, NO_2, CO, NH_3 continuously. All other AAQ parameters being analyzed by CPCB recognized environment laboratory are also found within prescribed limit except PM_{10}, $PM_{2.5}$.
- Real-time data of the monitoring stations are connected with the server at CPCB and JSPCB.
- The six-monthly compliance reports are being submitted to Ministry's Regional office, CPCB and JSPCB. Please refer **Annexure – I** for monitoring reports for October 2018 to March 2019.

ii. **The Project Proponent should ensure the compliance of environmental safeguard stipulated in the earlier environment clearance letter dated 11th May, 2010 and submit the compliance report to the Ministry and its Regional Office, Ranchi.**

Compliance Status:

- The six-monthly compliance reports of all existing environment clearances granted by Ministry are being submitted to the regional office regularly. The report for last 5 years submitted to Ministry's Regional office, CPCB and JSPCB is as follows:

Six Monthly report	Submitted on
December 2018	November 28, 2018 vide letter no. EMD/C-41/429/18.
June 2018	May 28, 2018 vide letter no. EMD/C-41/280/18.
December 2017	November 28 , 2017 vide letter no. EMD/C-41/178/17
June 2017	May 25, 2017 vide letter no. EMD/C-41/77/17
December 2016	November 25, 2016 vide letter no. EMD/C-41/183/16
June 2016	June 01, 2016 vide letter no. EMD/C-41/78/16
December 2015	December 05, 2015 vide letter no. EMD/C-33/215/15
June 2015	May 19, 2015 vide letter no. EMD/C-33/58/15
December 2014	November 18, 2014 vide letter no. EMD/C-33/175/14
June, 2014	June 24, 2014 vide letter no. EMD/C-33/116/14
December, 2013	December 16, 2013 vide letter no. EMD/C-33/237/13
June, 2013	June 22, 2013 vide letter no. EMD/C-33/124/13
December, 2012	December 29, 2012 vide letter no. EMD/C-33/330/12

- The six-monthly compliance reports along the monitored data is also uploaded on the following website
  a. **MoEFCC:** http://environmentclearance.nic.in/
  b. **Company:**(http://www.tatasteelindia.com/corporate-citizen/environment-compliance-reports.asp)

iii. **On-line ambient air quality monitoring shall be provided and sufficient air pollution control devices viz. Electrostatic precipitator (ESP), bag house, gas cleaning plant, bag filters etc. shall be provided to keep the emission levels below 50 mg/Nm³ by installing energy efficient technology. Low NOx burners shall be installed to control NOx emissions. At no time, the emission level shall go beyond the prescribed standards. Interlocking facilities shall be provided so that process can be automatically stopped in case emission level exceeds the limit. Efforts shall be made to further reduce PM_{10} and $PM_{2.5}$ levels in the ambient air and a time bound action plan shall be submitted.**

Compliance Status:

- 4 online AAQMS have been commissioned to monitor PM10, PM2.5, SO2, NO2, CO, NH3 continuously.

- Please find enclosed a list of air pollution control devices for each of production unit as **Annexure I**.
- Low NOx burners have been provided in all the new units.
- Similarly, in almost all the units alert facility have been provided in case of units exceed any prescribed emission level as the interlocking is technically not feasible in all the production units.
- Please find enclosed the updated status of implementation of action plan to reduce dust emission level in each of production unit and raw material storage area as **Annexure II.**

iv. **Existing Electrostatic Precipitator (ESP) shall be upgraded and provided to new units to control gaseous emissions within 50 mg/Nm^3. Waste gas from the drying and grinding unit of pellet plant shall be cleaned by bag filters. Adequate provisions shall be made to control NOx emissions. Bag house shall be provided to Lime kilns.**

Compliance Status:

- There is a proposal to upgrade all the ESP of Sinter Plant (SP), F & G Blast Furnace & LD1 & LD2 steel melting shops. Among these 6 ESPs of Sinter P1ant have already been upgraded. The agreed emission for their upgraded emission has been guaranteed to be 50 mg/Nm^3 with an efficiency of 99.9%.
- Bag Filters are provided in the Cast House and Stock House of all the Blast Furnaces.
- 3 nos. of bag filters have been provided in the Pellet Plant to control waste gas from the drying and grinding unit.
- 12 nos. of Bag House have been provided in Lime Plant in process and dedusting units.
- A total of 6 nos. of schemes to upgrade Existing Electrostatic Precipitator (ESP) have been commissioned at SP 1, 2 & 3. Additional 10 nos. of schemes to upgrade APCE including ESP and Bag Filters are being commissioned at various locations inside Works which shall be completed by FY 20.

v. **Land based fume extraction system shall be provided to coke oven battery to arrest fugitive emissions during charging and pushing operations. The coke oven gas shall be desulphurized by reduction of H_2S content of coke oven gas in the by-product recovery section to below 500 mg/Nm^3. On-line charging with high pressure liquor aspiration (HPLA) for extraction of oven gas, leak proof oven doors, hydraulic door and door frame cleaner, water sealed AP caps and charging & pusher side emission extractor device shall be provided for the coke oven batteries to maintain VOC emissions within permissible limit. Land based fume extraction system for pushing emission control from coke ovens shall be provided.**

Compliance Status:

- Land based fume extraction, desulphurization facilities, online charging with HPLA, Hydraulic door and door frame clearance, water seal AP caps and charging and pusher side emission extractor device etc. were in place in both coke ovens battery 10 & 11 to minimize leaks from doors CAPs, etc. and to meet the CREP recommendations.
- Coke oven gas is being desulphurised in Battery 10&11. The monitoring report shows that H_2S content is below 500 mg/Nm^3.

vi. **All the standards prescribed for the coke oven plants shall be followed as per the latest guidelines. Proper and full utilization of coke oven gases in power plant using heat recovery steam generators shall be ensured and no flue gases shall be**

discharged into the air. Sulphur shall be recovered from the coke oven gases from new product plant.

Compliance Status:

- As per the CREP guidelines, % of PLD, PLL & PLO of all batteries are being monitored thrice in a month. The max % of PLD is found to be 9.3 in Battery#5, max % of PLL found to be 0.8 in battery#8&9 and % of maximum PLO is found to be 1.2 in Battery#10& 11 and maximum charging emission is found to be 72 sec in Battery#6.
- Byproduct gas is recovered and used for power generation captive Power House # 3, 4 & 5 and heating purpose in all the mills. Power is also being generated in TRT at G, H & I Blast Furnace. Sulphur is recovered from coke oven gas and sold to authorized buyers.

vii. Only dry quenching method in the coke oven in new battery shall be adopted.

Compliance Status:

- Coke Dry quenching (CDQ) facility is under commissioning in the new Coke Oven Battery # 10 and 11. CDQ for Battery 11 is already completed. The project of CDQ battery 10 is likely to be completed by year 2019.

viii. The National Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R. No. 826(E) dated 16th November' 2009 shall be followed.

Compliance Status:

- 4 online AAQMS have been commissioned to monitor PM_{10}, $PM_{2.5}$, SO_2, NOx, CO, NH_3 continuously.
- There are about 20 manual AAQMS located both inside the plant and also outside the plant area.
- All other AAQ parameters being analysed by approved environment laboratory are also found within prescribed limit.
- Monthly monitoring reports are being submitted to JSPCB and six-monthly monitoring reports are being submitted along with EC compliance reports to Ministry's Regional office, CPCB and JSPCB. Please refer **Annexure – I** for monitoring reports for October 2018 to March 2019.

ix. In-plant control measures for checking fugitive emissions from all the vulnerable sources including bag filters and fume extraction system shall be provided. Dry fog dust suppression system / water sprinkling system shall be provided in raw material handling areas to control fugitive dust emissions. Fugitive emissions from different sources shall also be controlled by covered conveyors, water sprinkling in open yards and with dry fogging in the closed zones. Further, specific measures like asphalting of the roads within premises shall be carried out to control fugitive emissions. Fugitive emissions shall be controlled, regularly monitored and records maintained.

Compliance Status:

- Necessary air pollution control measures are provided to control fugitive dust emission. Please find enclosed a list of air pollution control devices for each of production unit as **Annexure -I**.

- All the areas of dedusting operation as junction house, transfer tower, conveyors are connected with bag filters and/or dry fog dust suppression system.
- All these locations are being monitored once in month.
- 4 nos. of unit for dust extraction system (DE) have been commissioned at G Blast Furnaces, RMBB and RMM. Additional 20 nos. of units for dust extraction system (DE) are being commissioned at various locations inside Works.
- A total of 350 nos. of points for dust suppression system (DS) have been commissioned at Lime Plant, RMBB 1& 2, and C & F Blast Furnaces.
- A total of 51 nos. Industrial vacuum cleaners (IVC) have been commissioned at MPSPP, RMBB 1&2, SP 1, 2 & 3 and HBF. Additional Industrial vacuum cleaners (IVC) are being commissioned at various locations inside Works.

x. Gaseous emission levels including secondary fugitive emissions from all the sources shall be controlled within the latest permissible limits issued by the Ministry and regularly monitored. Guidelines / Code of Practice issued by the CPCB shall be followed. New standards issued by the Ministry vide G.S.R. 414(E) dated 30th May, 2008 shall be followed.

Compliance Status:

- Secondary dust emission inside the plant in different critical areas is being monitored in about 350 locations monthly.
- The average work area dust monitoring during October 2018 to March 2019 is 5.5 mg/m^3.

xi. Traffic decongestion plan shall be implemented in a time bound manner to reduce emissions in the Jamshedpur city and separate budget shall be allocated for implementing the same. Maximum in bound and out bound material movement shall be done by railway wagons only to reduce dust emissions. Measures like covered conveyors for handling of bulk materials, centralized screening of iron ore, rationalization of weighing system, use of higher capacity vehicles etc. shall be adopted to reduce dust emissions. Mechanized vacuum cleaning of arterial roads shall be carried out on regular basis to further reduce dust emissions.

Compliance Status:

Under the traffic decongestion plan in Jamshedpur city:

- Strengthening of marine drive (Western corridor) has been implemented
- Proposal of Eastern Corridor is in discussion with Govt. of Jharkhand and key issues settled

Inside the plant:

- Automatic traffic control system is in place to control the traffic density as well as the safely including secondary emission inside the plant.
- All the loaded trucks are ensured to be covered with tarpaulin sheets to avoid dust getting air borne and thus generation of secondary emission.
- Sign board have been placed on all the critical areas to keep the speed of the vehicle within 35 kmph to control secondary emission along the internal road (VIP Road) and similarly the vehicle speed is limited to 16 kmph in the units.
- All the loaded trucks/dumpers coming inside the plant with their valid PUC.
- 4 nos. of mechanized sweepers are deployed within Works for regular cleaning and dust evacuation of roads.

- Approx. 400 tonnes/month of dust from road being collected by these mechanized sweepers which are being reused in sinter making through RMBB.
- 2 nos. of mechanized sweepers are deployed in Jamshedpur town for regular cleaning and dust evacuation of roads.

xii. Vehicular pollution due to transportation of raw materials and finished products shall be controlled. Proper arrangements shall also be made to control dust emissions during loading and unloading of the raw material and finished product.

Compliance Status:

- Approx. all the raw material is being transported through railways to reduce the road transport load and vehicular pollution.
- Dry fog dust suppression and water sprinklers are provided to control dust emission during loading and unloading activity.
- Tyre washing facility has also been provided in 8 strategic locations to keep tyres clean to reduce dust emission on roads and being installed in 5 additional locations.

xiii. All the wastewater from various units shall be treated in the common effluent treatment plant (CETP) for primary, secondary and tertiary treatment and shall be either recycled or used for dust suppression, slag quenching and green belt development etc. within the lease hold area. The phenolic effluent from the by-product recovery section of coke oven battery shall be treated in BOD plant. Wastewater containing suspended solids shall be passed through clarifloculation plant to recover and reuse the clarified water for cooling or cleaning. Mill effluent containing oil and suspended solids shall be passed through oil skimmers and filter press. No treated wastewater shall be released outside recycling all the treated waste water in the plant itself including from the existing plant.

Compliance Status:

- Due to water recycling facilities, the total water requirement from River Subarnarekha shall not cross 33.3 MGD for Steel Works.
- A central effluent treatment plant (CETP) of 4 MGD has been constructed to treat and recycle most of the effluent by tertiary treatment with Reverse Osmosis (RO).
- New BOD plant has been commissioned and existing BOD has been upgraded to treat the additional effluent generated from Coke Oven Batteries including Battery 10 & 11.
- Closed circuit cooling systems have been installed. Catch pits at all the five designated drains have been constructed to recycle the treated effluent within plant.
- All the mills are equipped with respective effluent treatment plants with settling tanks and oil skimming facility.

xiv. Efforts shall be made to make use of rain water harvested. If needed, capacity of the reservoir shall be enhanced to meet the maximum water requirement. Only balance water requirement shall be met from other sources.

Compliance Status:

- There are two ponds inside Steel works viz. Upper Cooling Pond (UCP) and Lower Cooling Pond (LCP), which stores and harvest most of the surface run off with cooling water of the units.

- 38 nos. of rainwater harvesting structures in different office buildings have been provided inside the plant area of which some area has the facility of Ground Water Recharge system.
- RWH structure has been constructed based on the maximum rainfall of last 20 yrs.

xv. Continuous monitoring of Total Organic Compounds (TOC) in the wastewater treated in BOD plant from the coke oven plant shall be done at the outlet of ETP (BOD plant). All the treated wastewater shall be monitored for pH, BOD, COD, oil & grease, cyanide, phenolic compounds, Chromium+6 etc. besides other relevant parameters.

Compliance Status:

- The BOD plant has facility of continuous monitoring of TOC.
- Similarly monitoring of other parameters on the outlet of the BOD plant is being done regularly.
- The monthly monitoring data is being submitted to JSPCB and six-monthly reports are being submitted to regional office of MoEFCC at Ranchi and CPCB.

xvi. Regular monitoring of influent and effluent and surface, sub-surface and ground water shall be ensured and treated wastewater shall meet the norms prescribed by the State Pollution Control Board or prescribed under the E(P) Act whichever are more stringent. Leachate study for the effluent generated and analysis shall also be regularly carried out and report submitted to the Ministry's Regional Office at Ranchi, Jharkhand, SPCB and CPCB.

Compliance Status:

- All the effluent viz. catches pits, service water etc are being monitored regularly.
- The treated effluents such as all ETP outlets and drains are being analyzed regularly.
- Online effluent monitoring system has been commissioned in all the drains to monitor effluent quality on a real-time basis.
- Online effluent monitoring data is connected with CPCB/JSPCB.
- River Water quality of Subarnarekha and kharkai is also being monitored as a part of regular monitoring of surface water quality.
- There are two cooling water pond whose water quality is also regularly monitored as part of sub surface water quality.
- Ground water quality is also being monitored at 7 locations both inside and outside plant premises.
- The monthly monitoring data is being submitted to JSPCB and six-monthly reports are being submitted to regional office of MoEFCC at Ranchi and CPCB.

xvii. All the blast furnace (BF) slag shall be granulated and provided to cement manufacturers for further utilization in cement making as per the MOUs signed with various companies including M/s Lafarge, M/s Eco-cement & M/s ACC. LD slag after metal recovery shall be used in sinter plant, blast furnaces and LD convertor, aggregates making, road ballast making, soil conditioning etc. All the flue dust generated shall be recycled within the plant to the maximum extent. Mill scales, LD sludge, lime fines and flue dust shall be recycled back to the sinter plant. The BF gas cleaning plant sludge shall be used for manufacturing briquettes.

Compliance Status:

- Online slag granulation facilities have been implemented in the all Blast Furnaces.
- All the BF Slag is being granulated and made available to the Cement plants for cement making.
- Blast Furnace gas cleaning plant (GCP) sludge is re-utilised in the process as well as being used for manufacturing briquettes.
- Additional initiatives undertaken for improving the utilization of LD Slag:
  - Co-processing of LD Slag at Cement Kilns.
  - Open & closed Steam Ageing inside Works
  - Use of LD Slag in Road Making & railway Ballast
- Collaboration with expert external agency for processing and subsequent use of LD Slag as aggregates and ballast.
- Status of hazardous and other waste generation and utilization from April 2018 to March 2019 is enclosed as **Annexure – III.**

xviii. **As proposed, coal tar sludge and BOD sludge shall be recycled for coke making by mixing with the coal charge and used in the coke ovens. Chromium sludge shall be disposed in a HDPE lined secured landfills as per the CPCB guidelines within the complex. All the other solid waste including broken refractory mass shall be properly disposed off in environment-friendly manner. Oily waste and spent oil shall be provided to authorized recyclers/reprocessors.**

Compliance Status:

- BOD Sludge and Coal Tar sludge generated from By Product Plant is being recycled in coke plant by mixing with raw materials.
- All other kind of process wastes are being reutilized in sinter plant.
- In house secured landfill with HDPE liner has been constructed to dispose chrome sludge generated from Cold Rolling Mill.

xix. **All the slag shall be used for land filling inside the plant or used as building material only after passing through Toxic Chemical Leachability Potential (TCLP) test. Toxic Chromium sludge and other hazardous substances recovered from the slag and output waste shall be disposed off in secured landfill as per CPCB guidelines.**

Compliance Status:

- LD Slag is being used for road making.
- The TCLP test conducted by external approved agency.
- Leachate potential of all Heavy metals is negligible.
- Chrome Sludge is being disposed in the secured landfill inside Works.
- Status of hazardous and other waste generation and utilization from April 2018 to March 2019 is enclosed as **Annexure – III.**

xx. **Proper handling, storage, utilization and disposal of all the solid waste shall be ensured and regular report regarding toxic metal content in the waste material and its composition, end use of solid/hazardous waste shall be submitted to the Ministry's regional office at Ranchi, Jharkhand SPCB and CPCB.**

Compliance Status:

- Most of the solid waste is being reutilized.
- Information regarding solid waste and hazardous waste is being submitted in Environment Statement to the Board every year.

- Status of hazardous and other waste generation and utilization from April 2018 to March 2019 is enclosed as **Annexure – III.**

xxi. Proper utilization of fly ash shall be ensured as per Fly Ash Notification, 1999 and subsequent amendment in 2003. All the fly ash shall be provided to cement and brick manufacturers for further utilization and "Memorandum of Understanding" shall be submitted to Ministry's Regional Office at Ranchi.

Compliance Status:

- Ash generation from the captive power plants has been stopped due to no coal firing at Power Plants.
- Generation for last three years is as follows:

Year	Quantity in tonnes	Quantity utilized
2016-17	5,012	Disposed in ash pond through HCSD system
2017-18	2291	
2018-19	1289	

- All the boilers have been converted from coal fired to gas fired. Thus there is no additional generation of fly ash in the power plant.

xxii. A Risk and Disaster Management Plan alongwith the mitigation measures shall be prepared and a copy submitted to the Ministry's Regional Office at Ranchi, Jharkhand SPCB and CPCB within 3 months of issue of environment clearance letter.

Compliance Status:

- Disaster Management Institute, Bhopal has verified and certified the Risk assessment report and Disaster Management Plan vide their letter no. DMI/IDMU/Con-227/24 dated April 16, 2012. The same has been submitted to JSPCB.

xxiii. As proposed, green belt shall be developed in more than 33 % area within and around the plant premises as per the CPCB guidelines in consultation with DFO.

Compliance Status:

- We have planted 12,697 nos. saplings during April 2018 to March 2019 inside the works, Jugsalai Muck Dump area and in Township in the same period. Every year plantation done in available space.

The following plant species are being planted:

- *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.*

xxiv. Prior permission from the State Forest Department shall be taken regarding likely impact of the expansion of the proposed steel plant on the reserve forests. Measures shall be taken to prevent impact of particulate emissions / fugitive emissions, if any from the proposed plant on the surrounding reserve forests viz. Jora Pahar PF, Sand Pcha Rahar PF, Deluse RF located within 10 km radius of the project. Further, Conservation Plan for the conservation of wild fauna in consultation with the State Forest Department shall be prepared and implemented.

Compliance Status:

- Prior Permission from State Forest Department has been obtained vide their memo. No. 2605 dated October 29, 2010.
- Wildlife Conservation Plan for Tata Steel has been prepared with the help of approved external agency recommended by State Forest Department and submitted for approval vide our letter no. EMD/C-41/128/16 dated August 22, 2016.
- Wildlife Conservation Plan has been approved by Principal Chief Conservator of Forests – Wildlife (PCCF-WL) GoJ on Nov 13, 2017. PCCF-WL has informed MoEFCC for the above approval.

xxv. All the recommendations made in the Charter on Corporate Responsibility for Environment Protection (CREP) for the Steel Plants shall be implemented.

Compliance Status:

- CREP recommendations have been implemented. Please find enclosed the same as **Annexure – II.**

xxvi. At least 5 % of the total cost of the project shall be earmarked towards the corporate social responsibility and item-wise details alongwith time bound action plan shall be prepared and submitted to the Ministry's Regional Office at Ranchi. Implementation of such program shall be ensured accordingly in a time bound manner.

Compliance Status:

- It is being complied as per the requirement under the Companies Act. The amount spent by the Company on Corporate Social Responsibility (CSR) activities is given below.

FY	Total Spent on CSR	CSR spent in and around Jamshedpur
2011	126	97.15
2012	146	106.43
2013	171	120.34
2014	212	136.95
2015	171	79.32
2016	204	83.62
2017	194	73.36
2018	232	82.19
2019	315	

- It is reported in the Company's Integrated Report. These reports are available on the website of Tata Steel and may be seen/downloaded.

xxvii. The company shall provide housing for construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.

Compliance Status:

- Necessary amenities for contractors like canteen, toilets, rest rooms, drinking water have been provided for all workers/contractors.

B. General Conditions:

i. **The project authorities must strictly adhere to the stipulations made by the Jharkhand Pollution Control Board and the State Government.**

Compliance Status:

- We are regularly obtaining the Consent to Operate and authorization under Hazardous Waste from Jharkhand State Pollution Control Board.

ii. **No further expansion or modifications in the plant should be carried out without prior approval of the Ministry of Environment, Forests and Climate Change (MoEFCC).**

Compliance Status:

- The Project informed that there shall be prior permission obtained for the concerned authorities in case of any medications, augmentation, and product mix change. The detail of production of various products for last three years is as follows:

Product	Unit	Capacity granted in EC	2014-15	2015-16	2016-17	2017-18	2018-19
Hot Metal	MTPA	12.5	10.16	10.65	10.83	10.9	10.8
Crude Steel		11	9.33	9.96	10.0	10.0	10.2

iii. **At least four ambient air quality monitoring stations shall be established in the downward direction as well as where maximum ground level concentration of PM10, PM2.5, SO2 and NOx are anticipated in consultation with the SPCB. Data on ambient air quality and stack emission should be regularly submitted to this Ministry including its Regional Office at Ranchi and the SPCB/CPCB once in six months.**

Compliance Status:

- 4 online AAQMS have been commissioned to monitor PM_{10}, $PM_{2.5}$, SO_2, NOx, CO, NH_3 continuously inside the Works. There is one mobile monitoring facility & 20 manual AAQMS located both inside the plant and also outside the plant area. Monitoring report is being submitted to JSPCB, CPCB and Regional Office.
- The monitoring data for the period Oct 2018 to March 2019 indicates that all the parameters (except PM_{10} and $PM_{2.5}$ in few occasions) are within the prescribed limit of NAAQS. PAHs, Lead and Ammonia are being done by CPCB recognized environment laboratory.
- The ambient air quality represents the status of environment, which includes impact of several external factors such as other industrial activities, traffic movement, commercial and domestic activities etc.

iv. **Industrial wastewater shall be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19th May, 1993 and 31st December, 1993 or as amended form time to time. The treated wastewater shall be utilized for plantation purpose.**

Compliance Status:

- Surface and ground water monitoring at various locations are being done and analysis reports also being sent to RO, MoEFCC and JSPCB.

v. The overall noise levels in and around the plant area shall be kept well within the standards (85 dB (A) by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels should conform to the standards prescribed under EPA Rules, 1989 viz. 75 dB (A) (daytime) and 70 dB (A) (night-time).

Compliance Status:

- Personal Protective Equipment (PPE) have been provided to all the workers/officers to avoid any accompanied noise hazards. Facilities like silencers, enclosures, hood etc have been provided to reduce noise at source. The monitored data in the work zone reveals that the noise level does not exceeds >85 dB (A) for 8 hr exposures. Similarly, in the ambient also, the noise levels meet the prescribed standards.
- The ambient noise level monitoring is being done at different part of the Jamshedpur town in frequent interval outside Steel Works to assess the ambient noise level status. Noise level in the town is found beyond the standard in few occasions. The possible reason of equivalent noise levels in respect of all categories of areas exceeded the standards for day and night times is due to heavy traffic movement in the town, market and commercial activities, festivals and other domestic celebrations and frequent religious rituals.

vi. Occupational Health Surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.

Compliance Status:

- Regular health surveillance is being conducted i.e. 2 times in a year to all the workers who have already attended more than 40 years of age. The workers having age less than 40 years are under gone occupational health surveillance program once in a year.

vii. The company shall develop surface as well as ground water harvesting structures to harvest the rainwater for utilization in the lean season besides recharging the ground water table.

Compliance Status:

- Rain Water Harvesting structure of 38 Nos. has been provided inside the plant area of which some area has the facility of Ground Water Recharge system. RWH structures have been constructed based on the maximum rainfall of last 20 yrs.

viii. The project proponent shall also comply with all the environmental protection measures and safeguards recommended in the EIA/EMP report. Further, the company must undertake socio-economic development activities in the surrounding villages like community development programmes, educational programmes, drinking water supply and health care etc.

Compliance Status:

- Socio economic development activities are regularly undertaken in and around Jamshedpur through the two agencies namely, Tata Steel Rural Development Society and Tata Steel Community Development & Welfare Services Centers. The development activities undertaken in the surrounding community are need based and are in the field of health care, education, mid-day meals in schools, sports and culture, self-employment, drinking water, rural electrification, etc.

Tata Steel also facilitate the Institutes like R D Tata Technical Institute, Tata Football Academy, Tata Archery Foundation, etc. which encourages the local talent to develop themselves and participate at National and International levels.

ix. Requisite funds shall be earmarked towards total capital cost and recurring cost/annum for environmental pollution control measures to implement the conditions stipulated by the Ministry of Environment, Forests and Climate Change (MoEFCC) as well as the State Government. An implementation schedule for implementing all the conditions stipulated herein shall be submitted to the Regional Office of the Ministry at Ranchi. The funds so provided shall not be diverted for any other purpose.

Compliance Status:

- Capital expenditure on environment is being spent on Air Pollution Control, Solid Waste Management, Zero Waste Water Discharge and Others including Greenery, Online Monitoring, etc. The total budget for the same as allocated by TSL Board is ₹ 2340 Crores.
- In FY 19 total capital expenditure for environment is ₹ 286 Crore.
- The funds for capital investment on pollution control equipment are not diverted.

x. A copy of Clearance letter shall be sent by proponent to concerned Panchayat, Zila Parishad/Municipal Corporation/Urban Local Body and the Local NGO, if any, from whom suggestions/ representations, if any, were received while processing the proposal. The clearance letter shall also be put on the website of the company by the proponent.

Compliance Status:

- The copy of Clearance letter has been sent to District Commissioner, Block Development Officer and Jamshedpur Notified Area Committee vide our letter no. EMD/C-41/32-34/16 dated March 04, 2016.

xi. The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the MoEFCC at Ranchi, the respective Zonal Office of CPCB and the JPCB. The criteria pollutant levels namely; PM10, SO2, NOx (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the projects shall be monitored and displayed at a convenient location near the main gate of the company in the public domain.

Compliance Status:

- Six monthly compliance reports and the monitored data are being submitted regularly. The ambient air quality parameters are being monitored and displayed at the main gate of the company in the public domain.

xii. The project proponent shall also submit six monthly reports on the status of the compliance of the stipulated environmental conditions including results of monitored data (both in hard copies as well as by e-mail) to the Regional Office of MOEFCC, the respective Zonal Office of CPCB and the JSPCB. The Regional Office of this Ministry at Ranchi / CPCB / JPCB shall monitor the stipulated conditions.

Compliance Status:

- Six monthly compliance reports are being submitted regularly both in hard copy and by e-mail.

xiii. The environmental statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental conditions and shall also be sent to the respective Regional Offices of the MoEFCC at Ranchi by e-mail.

Compliance Status:

- The environmental statement for each financial year in Form-V is regularly being submitted to the Jharkhand State Pollution Control Board.

xiv. The Project Proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB and may also be seen at Website of the Ministry of Environment, Forests and Climate Change (MoEFCC) at http:/envfor.nic.in. This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the Regional office.

Compliance Status:

- The Notice has been advertised in two local newspapers viz. Prabhat Khabar (Hindi) and The Telegraph (English) on March 08, 2016. The same has also been informed to the regional office of MoEFCC at Ranchi on March 09, 2016.

xv. Project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of commencing the land development work.

Compliance Status:

- The final approval Consent to Operate for Steel Plant issued from JSPCB having Ref No. JSPCB/HO/RNC/CTO-975929/2016/1078 dated 2016-12-27 of the project by the concerned authorities.

Details of Air/Water Pollution Control Equipment and Stacks with sampling arrangement

1. Unit wise Air/Water Pollution Control Equipment

Sl. No.	Area/Location	Air/Water Pollution Control Measures
1	**Raw Material Handling Section**	Covered storage under shed Covered conveyor Dry Fogging Water sprinkling Fabric filter based DE system Bag Filters Catchpit for storage of storm water
2	**Coke Ovens**	
	Battery # 5,6 & 7	Charging Gas Cleaning Cars (CGC) Dry Fogging Dust suppression Dust Extraction system for screen house Coke Dry Quenching
	Battery # 8 & 9	Coke Transfer Car (CTC) Charging Gas Transfer (CGT)
	Battery # 10 & 11	Main Charging by High Pressure LA Land based coke side dust extraction Hydro jet door cleaning Pushing and dedusting Bag filter Coke Dry Quenching (under construction)
	Coke Oven By Product Plant	De-Sulphurisation BOD Plant (Advent Integral System)
3	**Pellet Plant**	Bag Filters Dust Suppression Wet Scrubber Electrostatic Precipitators
4	**Sinter Plants**	
	Sinter Plant# 1	Bag Filters Dust Suppression Foam Spray System Electrostatic Precipitators
	Sinter Plant# 2	Bag Filters Dust Suppression Foam Spray System Electrostatic Precipitators
	Sinter Plant# 3	Bag Filters Dust Suppression Foam Spray System Electrostatic Precipitators
	Sinter Plant# 4	Bag Filters Dust Suppression Foam Spray System Electrostatic Precipitators
4	**Lime Plant**	
	Process and dedusting	Bag Filters
	Stock Pile	DS System
	Track Hopper	DS System

	Wagon Tippler	DS System
5	**Blast Furnaces**	
	C-F Blast Furnaces	Bag Filters Scrubbers DS System Gas Cleaning Plant with Press filter Effluent Treatment Plant
	G Blast Furnace	Bag Filters Scrubbers DS System Gas Cleaning Plant with Press filter Effluent Treatment Plant
	H Blast Furnace	Bag Filters Scrubbers DS System Gas Cleaning Plant with Press filter Effluent Treatment Plant
	I Blast Furnace	Bag Filters Scrubbers DS System Gas Cleaning Plant with Press filter Effluent Treatment Plant
6	**Steel Melting Shops**	
	LD 1	Bag Filters Electrostatic Precipitators Gas Cleaning Plant Effluent Treatment Plant
	LD 2	Bag Filters Electrostatic Precipitators Gas Cleaning Plant Effluent Treatment Plant
	LD 3	Bag Filters Electrostatic Precipitators Gas Cleaning Plant Effluent Treatment Plant
7	**Power Plants**	
	PH# 3	Effluent Treatment Plant
	PH# 4	Electrostatic Precipitators Effluent Treatment Plant
	PH# 5	Effluent Treatment Plant
8	**Finishing Mills**	
	Cold Rolling Mill	Scrubbers Effluent Treatment Plant
	Hot Strip Mill	Effluent Treatment Plant
	Merchant Mill	Effluent Treatment Plant
	CAPL	Scrubbers Mist Separators Effluent Treatment Plant
	Wire Rod Mill	Effluent Treatment Plant
	New Bar Mill	Effluent Treatment Plant
9	**Steel Works – Common**	Industrial Vacuum Cleaning System Mechanized Road sweeping system Water sprinklers Tyre Washing facilities Catch-pits at all drains for recycling Central Effluent Treatment Plant

Up to Date Status of Environmental Upgradation Project

1. Stack Emission Reduction Progress Status

SL	Facility description in Mar'17 CEC	Status	Completion date
1	F Blast furnace APC Systems	Completed	Jul'18
2	LD#1 DE System	Completed	Apr'18
3	LD#2 Dust Extraction System	Completed	Sep'16
4	SP# 1 Waste Gas ESP	Completed	May'14
5	SP# 2 De-dusting System (1 ESP and 1 Bag-filter)	Completed	Aug'17
6	SP# 3 De-dusting System	Completed	Dec'14
7	SP# 3 Waste Gas ESP	Completed	Oct'13
8	SP#2 Waste gas ESP ph.-I	Completed	Feb'13
9	CEMS	Completed	Oct'18
10	G Blast Furnace APC System	Under progress	Feb'20
11	LD#1 Secondary Emissions	Under progress	June'21
12	LD#2 Secondary Emissions	Under progress	Dec '19
13	Lime Plant De-dusting System	Under progress	Nov'19
14	Lime Plant Process Bag-Filter (waste gas system)	Completed	Jun'18
15	SP# 1 De-dusting System (1 ESP and 2 bag-filters)	Completed	May'19
16	SP# 4 Waste Gas ESP	Under progress	Dec'19

2. Fugitive dust control – Progress Status

SL	Facility description in Mar'17 CEC	Status	Completion date
1	a) Tyre Washing at Various Locations – 05 m/c (LD#1, 2, RMBB#1 and sludge dewatering) b) Tyre Washing at Various Locations – 05 m/c (LD#1, 2, HSM, Slag gate etc.)	Completed	Oct'16
2	DE System at RMM (Ventilation system)	Completed	Mar'16
3	Dust Extraction (DE) System at H Blast Furnace Stock House	Completed	Nov'17
4	Dust Suppression (DS) System at Coke Plant	Completed	Mar'17
5	Dust Suppression (DS) System at Lime Plant	Completed	Jun'15
6	Dust Suppression (DS) system at Ore circuit and Yard sprinkler	Completed	Mar'17
7	Dust Suppression (DS) System at RMBB#1	Completed	Jan'16
8	Dust Suppression (DS) System at RMBB#2	Completed	May'16
9	Dust Suppression (DS) System at Stock House C&F BF	Completed	Jun'15
10	Dust Suppression (DS) system at various locations (Fogging m/c)	completed	Jun'15
11	Fabrication and Erection of ducting at H-BF Cast House	Completed	Apr'16
12	Fume Extraction System-HMP	Completed	Feb'15
13	Industrial Vacuum Cleaning (IVC) for Conveyor no. 149	Completed	Jun'13
14	Industrial Vacuum Cleaning (IVC) System at RMBB#1 , 2 & SP#1, 2 & 3 (17 machines)	Completed	Sep'14
15	Industrial Vacuum Cleaning (IVC) System for H#BF	Completed	Mar'15
16	IVC at Locations I#BF, Coke Plant, SP#1 & SP#4, RMM & Pellet Plant	Completed	Jun'17
17	New Silo for Pneumatic Conveying System at G-BF	Completed	Apr'15
18	Tyre Washing Facility Inside Works (Phase -1)	Completed	Dec'12
19	Yard Sprinkler System at RMBB#1 & 2	Completed	May'16
20	Dust Extraction (DE) System at Coke Plant	Under progress	June'19
21	Dust Extraction (DE) System at Misc. area (RMBB#1 & G BF surroundings and Diamond crossing area)	Under progress	June'19
22	Dust Extraction (DE) System at RMBB#1	Under progress	June'19
23	Dust Extraction (DE) System at RMBB#2	Under progress	June'19

3. Solid waste utilization Progress Status

SL	Facility description in Mar'17 CEC	Status	Completion date
1	Composting Plant & Trash Incinerator	Completed	Aug'12
2	De-oiling Plant for Mill Scale and Sludge	Completed	May'14
3	Infrastructure Development at Galudih Phase - I	Completed	Jun'14
4	Infrastructure for LD slag processing - Galudih Ph - II	Completed	Mar'17
5	Magnetic Drums - MRSPP	Completed	Jan'14
6	Blast furnace Sludge Drying	Under progress	June'19
7	Revert Homogenization	Under progress	-
8	Revert Mix Feeding System to RMBB #1 & 2	Under progress	-
9	Infrastructure development for LD Slag Dumping at Bhatkunda	Under progress	Sep'19

4. Zero water discharge Progress Status

SL	Facility description in Mar'17 CEC	Status	Completion date
1	a) Tuiladungri (HSM)Catch Pit b) Tuiladungri (Increase in Pumping Capacity)	Completed	May'13
2	Blast Furnace Cyanide Treatment	completed	
3	Damp Pump House	Completed	Jan'16
4	Garam Nallah and Jugsalai-I Catch Pit	Completed	Dec'14
5	Greenery Development	Completed	Mar'15
6	Rain Water Harvesting	Completed	Feb'14
7	Storage, pumping & distribution of recycled water for low end use	Completed	Jan'15
8	Susungariah Catch Pit (Pump No-1)	Completed	Jan'14
9	Waste Water Re-cycling from Ram Mandir Nallah	Completed	Jun'15
10	CETP Capacity Augmentation (Phase-II)	Concept under finalization.	July'21
11	Waste Water Recycling from BOD	Under Progress	July'21

Annexure -III

Status of solid and Other Waste Generation and Utilization

(April 2018 to March 2019)

(All data in tonnes)

Sl.	Particulars	Generation	Internal	External Cons. & Sales	Total Utilisation	Utilization
A	**Process Solid Waste**	**1,022,435**	**945,899**	**63,071**	**1,008,970**	**99%**
1	Flue Dust	114,569	112,196		112,196	98%
2	GCP Sludge	157,415	93,741	44,607	138,349	88%
3	Lime Fines	212,283	197,631	12,075	209,706	99%
4	LD Sludge	351,551	361,955		361,955	103%
5	Kiln Dust	18,315	18,431		18,431	101%
6	Mill Scale	99,764	99,249	607	99,855	100%
7	Mill Sludge	2,889	2,968		2,968	103%
8	Iron Oxide	6,792	2,969	5,782	8,751	129%
9	Fe bearing muck	10,605	10,157		10,157	96%
10	ESP/DE Dust	44,929	43,167		43,167	96%
11	Coal Tar Sludge	3,324	3,435		3,435	103%
B	**LD Slag**	**1,742,810**	**681,804**	**1,067,808**	**1,749,612**	**100%**
1	LD Slag Metallic	1,742,810	428,867		428,867	100%
2	LD Slag Non Metallic		252,937	1,067,808	1,320,745	
C	**Blast Furnace Slag**	**4,124,476**	**22,502**	**4,050,383**	**4,072,885**	**99%**
1	Granulated BF Slag	3,850,983		3,965,946	3,965,946	103%
2	Air Cooled BF Slag	273,493	22,502	84,437	106,939	39%
D	**Total**	**6,889,721**	**1,650,205**	**5,181,262**	**6,831,466**	**99%**

MONITORING & ANALYSIS REPORT

October 2018 to March 2019

Tata Steel Limited, Jamshedpur
(MAIN WORKS & TOWN)

ENVIRONMENTAL MANAGEMENT DEPARTMENT
TATA STEEL LIMITED
JAMSHEDPUR

TATA STEEL LIMITED

WORKS, JAMSHEDPUR

LABORATORY - ENVIRONMENT MANAGEMENT DEPARTMENT

WORKS AMBIENT AIR QUALITY REPORT SUMMARY FROM Oct-18 to Mar-19

Sample Location	Parameter	UoM	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
WPFA	Particulate Matter, PM_{10}	$\mu g/m^3$	116.0	121.0	107.3	130.9	138.1	203.1
	Particulate Matter, $PM_{2.5}$	$\mu g/m^3$	63.1	60.0	53.9	69.0	60.7	69.3
	Sulphur Dioxide (SO_2)	$\mu g/m^3$	16.2	16.0	18.2	12.4	12.7	12.3
	Nitrogen Dioxide, (NO_2)	$\mu g/m^3$	21.3	21.0	22.2	16.0	18.3	15.5
	Carbon Monoxide(CO)	mg/m^3	0.5	0.5	0.5	0.5	0.5	0.6
	Ammonia (NH_3)	$\mu g/m^3$	54.3	54.3	41.3	56.3	49.3	60.7
	Ozone (O_3)	$\mu g/m^3$	25.0	25.0	30.0	29.5	21.0	28.0
	Lead (Pb)	$\mu g/m^3$	0.3	0.3	0.4	0.3	0.3	0.3
	Arsenic (As)	ng/m^3	0.02	0.02	0.01	0.01	0.02	0.01
	Nickel (Ni)	ng/m^3	0.3	0.3	0.3	0.3	0.4	0.3
	Benzene (C_6H_6)	$\mu g/m^3$	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Benzo alpha Pyrene (BaP)	ng/m^3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
CRM	Particulate Matter, PM_{10}	$\mu g/m^3$	102.6	124.0	117.1	126.7	182.9	214.2
	Particulate Matter, $PM_{2.5}$	$\mu g/m^3$	60.1	61.0	60.9	64.9	65.2	69.5
	Sulphur Dioxide (SO_2)	$\mu g/m^3$	14.7	14.0	19.9	11.7	16.2	12.9
	Nitrogen Dioxide, (NO_2)	$\mu g/m^3$	19.3	19.0	23.6	15.1	20.7	17.0
	Carbon Monoxide(CO)	mg/m^3	0.6	61.0	0.6	0.5	0.6	0.6
	Ammonia (NH_3)	$\mu g/m^3$	63.3	56.0	39.1	50.2	65.0	63.3
	Ozone (O_3)	$\mu g/m^3$	26.0	28.0	32.0	30.5	31.0	29.5
	Lead (Pb)	$\mu g/m^3$	0.6	0.5	0.4	0.5	0.5	0.4
	Arsenic (As)	ng/m^3	0.03	0.03	0.03	0.04	0.03	0.02
	Nickel (Ni)	ng/m^3	0.4	0.4	0.5	0.5	0.6	0.4
	Benzene (C_6H_6)	$\mu g/m^3$	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Benzo alpha Pyrene (BaP)	ng/m^3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
PH#3 Gate	Particulate Matter, PM_{10}	$\mu g/m^3$	117.9	119.0	103.0	168.2	188.7	191.3
	Particulate Matter, $PM_{2.5}$	$\mu g/m^3$	62.0	60.0	56.4	63.3	71.7	68.5
	Sulphur Dioxide (SO_2)	$\mu g/m^3$	12.5	15.0	16.8	11.3	14.2	13.6
	Nitrogen Dioxide, (NO_2)	$\mu g/m^3$	18.6	19.0	19.9	15.0	19.7	19.8
	Carbon Monoxide(CO)	mg/m^3	0.5	0.6	0.6	0.6	0.5	0.5
	Ammonia (NH_3)	$\mu g/m^3$	54.3	51.3	51.7	62.3	47.0	54.7
	Ozone (O_3)	$\mu g/m^3$	23.5	26.5	26.5	27.5	27.0	19.0
	Lead (Pb)	$\mu g/m^3$	0.4	0.4	0.2	0.3	0.3	0.2
	Arsenic (As)	ng/m^3	0.02	0.02	0.02	0.02	0.01	0.01
	Nickel (Ni)	ng/m^3	0.3	0.3	0.3	0.4	0.3	0.3
	Benzene (C_6H_6)	$\mu g/m^3$	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Benzo alpha Pyrene (BaP)	ng/m^3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Note

Standards applicable as per National Ambient Air Quality Standards vide Notification No.: B-29016/20/90/PCI-L dated 18th November 2009.

ND - Not Done

Manager
Environment Management

Sr. Manager
Environment Management

TATA STEEL LIMITED

WORKS, JAMSHEDPUR

LABORATORY - ENVIRONMENT MANAGEMENT DEPARTMENT

WORKS AMBIENT AIR QUALITY REPORT SUMMARY FROM Oct-18 to Mar-19

Sample Location	Parameter	UoM	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
PH#6 Gate	Particulate Matter, PM_{10}	$\mu g/m^3$	126	125	121.5	126.1	159.1	176.2
	Particulate Matter, $PM_{2.5}$	$\mu g/m^3$	61	63	61.5	68.1	65.2	66.8
	Sulphur Dioxide (SO_2)	$\mu g/m^3$	18	17	14.3	11.5	12.1	12.1
	Nitrogen Dioxide, (NO_2)	$\mu g/m^3$	24	22	18.0	15.3	17.5	18.2
	Carbon Monoxide(CO)	$\mu g/m^3$	1	0.4	0.5	0.4	0.6	0.6
	Ammonia (NH_3)	$\mu g/m^3$	66	58	33.7	57.3	39.3	58.2
	Ozone (O_3)	$\mu g/m^3$	21	22	28.5	20.0	30.5	22.8
	Lead (Pb)	$\mu g/m^3$	0.33	0.34	0.2	0.2	0.4	0.2
	Arsenic (As)	ng/m^3	0.02	0.02	0.02	0.02	0.02	0.02
	Nickel (Ni)	ng/m^3	0.27	0.31	0.3	0.3	0.3	0.3
	Benzene (C_6H_6)	$\mu g/m^3$	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Benzo alpha Pyrene (BaP)	ng/m^3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Note

Standards applicable as per National Ambient Air Quality Standards vide Notification No.: B-29016/20/90/PCI-L dated 18th November 2009.

ND - Not Done

Manager
Environment Management

Sr. Manager
Environment Management

TATA STEEL LIMITED, JAMSHEDPUR

LABORATORY - ENVIRONMENT MANAGEMENT DEPARTMENT

TOWNSHIP AMBIENT AIR QUALITY REPORT SUMMARY FROM Oct-18 to Mar-19

Sample Location	Parameter	UoM	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
River Pump House	Particulate Matter, PM_{10}	$\mu g/m^3$	74.7	101.0	77.7	93.8	91.2	114.8
	Particulate Matter, $PM_{2.5}$	$\mu g/m^3$	41.1	58.0	52.9	57.1	54.8	60.3
	Sulphur Dioxide (SO_2)	$\mu g/m^3$	10.4	12.0	11.1	6.7	7.9	8.7
	Nitrogen Dioxide, (NO_2)	$\mu g/m^3$	15.2	16.0	14.5	11.8	12.9	13.5
	Carbon Monoxide(CO)	mg/m^3	0.4	0.4	0.3	0.4	0.4	0.4
	Ammonia (NH_3)	$\mu g/m^3$	35.0	46.0	30.0	43.6	54.0	29.3
	Ozone (O_3)	$\mu g/m^3$	28.0	16.0	26.5	20.4	18.0	18.0
	Lead (Pb)	$\mu g/m^3$	0.2	0.3	0.2	0.2	0.2	0.2
	Arsenic (As)	ng/m^3	0.0	0.0	0.0	0.0	0.0	0.0
	Nickel (Ni)	ng/m^3	0.2	0.3	0.3	0.2	0.3	0.2
	Benzene (C_6H_6)	$\mu g/m^3$	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Benzo alpha Pyrene (BaP)	ng/m^3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Southern Sewage Treatment Plant	Particulate Matter, PM_{10}	$\mu g/m^3$	92.3	91.0	74.0	86.4	107.3	92.5
	Particulate Matter, $PM_{2.5}$	$\mu g/m^3$	52.3	45.0	47.4	53.5	55.4	52.4
	Sulphur Dioxide (SO_2)	$\mu g/m^3$	12.8	10.0	12.2	7.7	11.8	8.5
	Nitrogen Dioxide, (NO_2)	$\mu g/m^3$	16.7	14.0	17.4	12.3	17.1	13.1
	Carbon Monoxide(CO)	mg/m^3	0.5	0.4	0.3	0.4	0.4	0.4
	Ammonia (NH_3)	$\mu g/m^3$	43.0	38.0	42.0	44.7	43.0	27.0
	Ozone (O_3)	$\mu g/m^3$	28.0	22.0	26.5	26.0	25.0	14.5
	Lead (Pb)	$\mu g/m^3$	0.3	0.2	0.2	0.2	0.3	0.2
	Arsenic (As)	ng/m^3	0.0	0.0	0.0	0.0	0.0	0.0
	Nickel (Ni)	ng/m^3	0.3	0.3	0.4	0.3	0.2	0.3
	Benzene (C_6H_6)	$\mu g/m^3$	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Benzo alpha Pyrene (BaP)	ng/m^3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Golmuri	Particulate Matter, PM_{10}	$\mu g/m^3$	97.1	95.0	95.8	81.2	131.2	108.2
	Particulate Matter, $PM_{2.5}$	$\mu g/m^3$	53.3	41.0	49.3	41.8	62.2	59.9
	Sulphur Dioxide (SO_2)	$\mu g/m^3$	10.9	10.0	12.7	10.3	12.2	10.6
	Nitrogen Dioxide, (NO_2)	$\mu g/m^3$	16.7	15.0	16.7	13.1	18.4	14.7
	Carbon Monoxide(CO)	mg/m^3	0.4	0.5	0.5	0.4	0.4	0.5
	Ammonia (NH_3)	$\mu g/m^3$	36.0	43.0	54.7	33.7	39.3	40.3
	Ozone (O_3)	$\mu g/m^3$	24.0	24.0	23.0	32.0	27.0	19.0
	Lead (Pb)	$\mu g/m^3$	0.3	0.4	0.2	0.2	0.4	0.2
	Arsenic (As)	ng/m^3	0.0	0.0	0.0	0.0	0.0	0.0
	Nickel (Ni)	ng/m^3	0.4	0.3	0.3	0.3	0.3	0.3
	Benzene (C_6H_6)	$\mu g/m^3$	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Benzo alpha Pyrene (BaP)	ng/m^3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Burmamines	Particulate Matter, PM_{10}	$\mu g/m^3$	94.5	98.0	107.8	91.6	158.1	124.3
	Particulate Matter, $PM_{2.5}$	$\mu g/m^3$	54.8	51.0	55.0	55.5	64.4	61.0
	Sulphur Dioxide (SO_2)	$\mu g/m^3$	11.6	11.0	12.2	9.4	9.9	8.7
	Nitrogen Dioxide, (NO_2)	$\mu g/m^3$	16.8	14.0	16.7	13.1	13.5	12.9
	Carbon Monoxide(CO)	mg/m^3	0.3	0.5	0.4	0.4	0.4	0.4
	Ammonia (NH_3)	$\mu g/m^3$	45.0	43.0	50.7	41.9	37.3	41.0
	Ozone (O_3)	$\mu g/m^3$	25.0	30.0	21.5	26.5	26.0	13.5
	Lead (Pb)	$\mu g/m^3$	0.3	0.3	0.3	0.2	0.2	0.2
	Arsenic (As)	ng/m^3	0.0	0.0	0.0	0.0	0.0	0.0
	Nickel (Ni)	ng/m^3	0.3	0.3	0.3	0.2	0.2	0.2
	Benzene (C_6H_6)	$\mu g/m^3$	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Benzo alpha Pyrene (BaP)	ng/m^3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Note

Standards applicable as per National Ambient Air Quality Standards vide Notification No.: B-29016/20/90/PCI-L dated 18th November 2009.

ND - Not Done

Manager
Environment Management

Sr. Manager
Environment Management

TATA STEEL LIMITED

WORKS, JAMSHEDPUR

ENVIRONMENT MANAGEMENT DEPARTMENT

HOURLY AVERAGE OF ONLINE STACK PARTICULATE MATTER EMISSION MONITORING REPORT (mg/Nm^3)

ONLINE STACK MONITORING REPORT SUMMARY FROM Oct-18 to Mar-19

Stack Location	Oct-18			Nov-18			Dec-18			Jan-19			Feb-19			Mar-19		
	SO2	Nox	PM	SO2	Nox	PM	SO2	Nox	PM	SO2	Nox	PM	SO2	Nox	PM	SO2	Nox	PM
Battery#5	-	-	21	-	-	14	-	-	17	95.9	131.2	14.4	89.1	131	21.3	89.1	130.5	25.5
Battery#6	-	-	-	-	-	-	-	-	-	103.3	134.6	14.8	103	128	29.7	102.6	127.8	30.9
Battery#7	-	-	-	-	-	-	-	-	-	-	-	22.0	-	-	22.1	-	-	15.6
Battery#8	37	38	14	37	38	8	35.6	38.4	16.6	35.5	38.4	17.1	36.5	38.4	13.3	-	-	4.6
Battery#9	117	168	20	107	49	17	104	45.0	14.8	101.3	46.6	14.0	130.2	48.0	13.0	164.2	73.8	13.8
Battery#10 WG	376	-	10.7	299	-	17	307.3	-	8.8	311	974.3	9.4	334.6	975.8	17.7	345.8	978.7	22.1
Battery#11 WG	35	-	-	374	-	30	373.3	-	28.3	372.2	0.4	6.8	371.7	0.4	26.3	371.6	0.4	22.3
Battery#10 DD	-	-	-	-	-	5	-	-	4.7	-	-	28.0	-	-	6.8	-	-	6.8
Battery#11 DD	-	-	-	-	-	9	-	-	8.7	-	-	10.3	-	-	12.0	-	-	10.5
SP#1 waste gas	-	-	-	-	-	48	-	-	46	-	-	47.6	-	-	48.0	-	-	47.1
SP1 DD & Hot Region	-	-	-	-	-	27	-	-	27	-	-	41.0	-	-	30.3	-	-	22.1
SP1 Highline	-	-	-	-	-	9	-	-	11.4	-	-	12.8	-	-	12.0	-	-	10.5
SP#2 waste gas	28	119	28	28	120.0	39	28.4	119.7	45.5	28.4	113.9	46.1	38.1	260.4	19.8	100.4	239.1	22.8
SP#2 Dedusting	-	-	23	-	-	21	-	-	18	-	-	9.8	-	-	10.7	-	-	11.6
SP#2 High Line	-	-	1.6	-	-	2	-	-	1.9	-	-	2.1	-	-	2.6	-	-	2.0
SP#3 Combined	-	-		-	-	-	106	108.5	70.4	-	-	-	108.8	108.6	80.2	115.9	149.2	68.5
SP#3 Dedusting	-	-	9.8	-	-	7	-	-	6.7	-	-	2.3	-	-	2.3	-	-	2.4
SP#4 Combined	-	-	-	54	48	62	54.6	47.9	63.1	-	-	-	60.8	60.5	80.2	68.1	99.2	71.8
CBF Stove	-	-	-	-	-	-	-	-	8.4	-	-	10.2				-	-	7.8
EBF Stove	-	-	-	-	-	2	-	-	2	-	-	2.2	-	-	2.7	-	-	2.6
EBF SH & CH	-	-	5	-	-	29	-	-	19.7	-	-	22.8	-	-	5.2	-	-	7.4
FBF Stove	-	-	-	-	-	-	-	-	-	-	-	2.2	-	-	1.9	-	-	-
F Bl.Furnace Stock House DE	-	-	-	-	-	1	-	-	1.1	-	-	1.4	-	-	1.5	-	-	1.4
F Bl.Furnace Cast House	-	-	4.1	-	-	3	-	-	3	-	-	2.4	-	-	3.0	-	-	3.6
F Bl.Furnace PCI	-	-	7.3	-	-	7	-	-	7	-	-	13.8	-	-	12.7	-	-	18.7
GBF Stove	-	-		-	-	-	-	-		-	-	2.2	-	-	2.2	-	-	2.2
G Bl. Furnace stock House	-	-	30	-	-	31	-	-	36	-	-	39.3	-	-	38.9	-	-	48.8
G Bl.Furnace cast House	-	-	35	-	-	24	-	-	23.4	-	-	25.0	-	-	19.2	-	-	16.5
GBF PCI 1	-	-	27.2	-	-	26	-	-	23.4	-	-	21.6	-	-	21.0	-	-	25.3
GBF PCI 2	-	-	7.6	-	-	6	-	-	5.6	-	-	5.7	-	-	4.9	-	-	4.6
GBF PCI 3	-	-	12.5	-	-	17	-	-	9.7	-	-	10.3	-	-	14.6	-	-	12.1
HBF Stove	-	-		-	-	-	59.2	0.1	-	58.9	-	-	69.8	0.2	-	-	-	-
H Bl.Furnace Stock House	-	-	13	-	-	12	-	-	11.4	-	-	11.4	-	-	8.8	-	-	7.2
H Bl.Furnace Stock House DE	-	-		-	-	0.3	-	-	0.3	-	-	0.4	-	-	0.3	-	-	0.3
H Bl.Furnace Cast House	-	-	5	-	-	7	-	-	9	-	-	9.4	-	-	10.9	-	-	12.5
H Bl.Furnace PCI 1(OLD)	-	-	11.6	-	-	-	-	-	8				-	-	6.7	-	-	9.1
H Bl.Furnace PCI 2(NEW)	-	-	10	-	-	3	-	-	12.2	-	-	0.5	-	-	6.2	-	-	6.1
IBF Stove	-	-		-	-	-	-	-	-	2.8	6.4	-	1.9	5.3	-	-	-	-
I Bl.Furnace Stock House	-	-	7.8	-	-	15	-	-	13.9	-	-	16.2	-	-	11.4	-	-	7.9
I Bl.Furnace Cast House	-	-	4.1	-	-	6	-	-	7.3	-	-	7.9	-	-	5.5	-	-	7.4
I Bl.Furnace PCI	-	-	33	-	-	34	-	-	42	-	-	5.9	-	-	5.5	-	-	7.4
LD#01-LF#01	-	-	30.9	-	-	16	-	-	7.7	-	-	0.7	-	-	0.6	-	-	0.5
LD#01-LF#02	-	-		-	-	36	-	-	33.7	-	-	23.1	-	-	28.7	-	-	9.2
LD#01-LF#03	-	-	29.5	-	-	34	-	-	17	-	-	11.5	-	-	6.0	-	-	2.2
LD#01-SE	-	-	9.1	-	-	6	-	-	7.8	-	-	13.4	-	-	8.5	-	-	10.6
LD # 2 Sec. Emission 1	-	-	16	-	-	9	-	-	7.2	-	-	5.0	-	-	4.6	-	-	6.3
LD # 2 Sec. Emission 2	-	-	4	-	-	4	-	-	3.9	-	-	3.2	-	-	3.4	-	-	3.5
LD#02-LF#01	-	-	6.6	-	-	4	-	-	8.9	-	-	8.4	-	-	12.1	-	-	15.7
LD#02-LF#02	-	-	2.3	-	-	2	-	-	5	-	-	6.0	-	-	7.2	-	-	9.3
LD#2 DE1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LD#2 DE2	-	-	6	-	-	-	-	-	6	-	-	6.0	-	-	6.0	-	-	6.0
LD#2 DE3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LD#2 DE4	-	-	6	-	-	-	-	-	6.7	-	-	6.7	-	-	6.7	-	-	6.7
LD#2 DE5	-	-	5.9	-	-	-	-	-	6.2	-	-	6.3	-	-	6.3	-	-	6.3

Note - Standards applicable as per Environment (Protection) (Third Amendment) Rules, 2012 issued in Gazette of India Notification no. GSR 277 (E) –Dated March 31, 2012

Manager
Environment Management

Sr. Manager
Environment Management

TATA STEEL LIMITED

WORKS, JAMSHEDPUR

ENVIRONMENT MANAGEMENT DEPARTMENT

HOURLY AVERAGE OF ONLINE STACK PARTICULATE MATTER EMISSION MONITORING REPORT (mg/Nm^3)

ONLINE STACK MONITORING REPORT SUMMARY FROM Oct-18 to Mar-19

Stack Location	Oct-18			Nov-18			Dec-18			Jan-19			Feb-19			Mar-19		
	SO2	Nox	PM	SO2	Nox	PM	SO2	Nox	PM	SO2	Nox	PM	SO2	Nox	PM	SO2	Nox	PM
LD#2 DE6	-	-	4.9	-	-	-	-	-	2.8	-	-	2.0	-	-	1.4	-	-	0.7
LD#2 DE7	-	-	5.8	-	-	-	-	-	5.7	-	-	5.8	-	-	5.6	-	-	4.9
LD#2 DE8	-	-	1.3	-	-	-	-	-	-	-	-	3.4	-	-	5.1	-	-	4.9
LD#2 DE9	-	-	8.7	-	-	-	-	-	8.7	-	-	8.7	-	-	8.7	-	-	8.7
LD#3 LF#1	-	-	13	-	-	21	-	-	17.4	-	-	9.3	-	-	9.4	-	-	10.4
LD#3 LF#2	-	-	11	-	-	7	-	-	7.1	-	-	6.7	-	-	10.9	-	-	15.7
LD#3 Sec. Emission	-	-	8	-	-	8	-	-	7.6	-	-	8.0	-	-	7.7	-	-	8.1
Pellet Plant Wind Box	-	-	30	-	-	40	-	-	16.9	-	-	15.4	-	-	12.9	-	-	5.1
Pellet Plant Hood	-	-	15	-	-	4	-	-	4	-	-	1.3	-	-	2.9	-	-	4.8
Pellet Plant central dedusting	-	-	5	-	-	5	-	-	4	-	-	5.9	-	-	7.7	-	-	6.8
Pellet Plant combined dryer	-	-	13	-	-	12	-	-	12	-	-	11.2	-	-	11.3	-	-	12.3
Pellet Plant Grinding Mill 1	-	-	21	-	-	23	-	-	16.7	-	-	16.4	-	-	17.2	-	-	14.8
Pellet Plant Grinding Mill 2	-	-	24	-	-	28	-	-	30	-	-	17.9	-	-	12.8	-	-	11.8
Lime PlantMK#1	-	-	6.7	-	-	8	-	-	5	-	-	1.4	-	-	1.4	-	-	1.6
Lime MK#2	-	-	4.2	-	-	4	-	-	3.8	-	-	3.6	-	-	6.2	-	-	6.7
Lime MK#3&4	-	-	5.6	-	-	5	-	-	6.4	-	-	5.5	-	-	6.0	-	-	8.7
Lime MK#5	-	-	11.4	-	-	2	-	-	-	-	-	0.7	-	-	0.5	-	-	1.0
Lime MK#6	-	-	-	-	-	-	-	-	-	-	-	4.1	-	-	3.1	-	-	3.0
Lime MK#6 DE12	-	-	-	-	-	3	-	-	2.4	-	-	1.8	-	-	1.9	-	-	1.9
Lime MK#7	-	-	12.2	-	-	10	-	-	7.2	-	-	7.1	-	-	12.9	-	-	9.3
Lime MK#7 DE15	-	-	5.7	-	-	4	-	-	5.9	-	-	4.5	-	-	5.5	-	-	4.1
Lime MK#8	-	-	6.2	-	-	-	-	-		-	-	6.3	-	-	4.3	-	-	4.3
Lime MK#8 DE1B	-	-	6.5	-	-	6	-	-	7	-	-	4.3	-	-	3.4	-	-	5.4
Lime MK#9	-	-	5.7	-	-	5	-	-	4	-	-	3.5	-	-	4.1	-	-	4.7
Lime MK#9 DE9	-	-	2.9	-	-	3	-	-	3.4	-	-	3.2	-	-	2.5	-	-	2.1
PH#3(Blr.no.5)	-	-	-	-	-	-	-	-	2.2	-	-	2.3	19.7	9.2	22.2	13.8	8.7	28.5
PH#3(Blr.no.6)	-	-	-	-	-	-	-	-	1.8	-	-	2.2	-	-	6.3	39.8	17.1	22.7
Power House#3 Boiler7&8	-	-	32	-	-	-	-	-	-	-	-	-	-	-	-	33.2	25.9	36.1
Power House#4 Boiler1&2	-	-	-	-	-	-	-	-	-	-	-	-	27.8	3.5	10.2	22.0	3.3	17.1
Power House#4 Boiler 4	-	-	31	9	153	49	57	27.0	35.7	15.1	18.9	23.7	14.7	18.9	26.2	14.5	19.0	40.2
Power House#4 Boiler 5	-	-	-	-	-	9	-	-	-	-	-	-	-	-	-	-	-	-
Power House#5 Boiler A	-	-	21	-	-	-	-	-	-	-	-	-	-	-	-	45.1	8.4	45.9
Power House#5 Boiler B&C	-	-	9	-	-	-	-	-	-	-	-	-	-	-	-	-	9.6	10.9
HMPP	-	-	5	-	-	3	-	-	3.5	-	-	3.4	-	-	2.6	-	-	3.4

Note - Standards applicable as per Environment (Protection) (Third Amendment) Rules, 2012 issued in Gazette of India Notification no. GSR 277 (E) –Dated March 31, 2012

Manager
Environment Management

Sr. Manager
Environment Management

TATA STEEL LIMITED

WORKS, JAMSHEDPUR

ENVIRONMENT MANAGEMENT DEPARTMENT

MANUAL STACK PARTICULATE MATTER EMISSION MONITORING REPORT (mg/Nm3)

MANUAL STACK MONITORING REPORT SUMMARY FROM Oct-18 to Mar -19

Stack Location	Oct-18			Nov-18			Dec-18			Jan-19			Feb-19			Mar-19		
	SO2	Nox	PM	SO2	Nox	PM	SO2	Nox	PM	SO2	Nox	PM	SO2	Nox	PM	SO2	Nox	PM
Battery#5	-	-	47.9	-	-	-	-	-	-	-	-	-	66	218	45.5	-	-	28.8
Battery#6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Battery#7	-	-	28.0	-	-	-	-	-	47.6	-	-	46.9	182.8	107.3	39.6	-	-	-
Battery#8	-	-	22.7	-	-	-	-	-	-	-	-	-	-	-	-	56.1	119	24.7
Battery#9	-	-	24.8	-	-	48.0	-	-	-	-	-	28.6	-	-	-	-	-	-
Battery#10 Process	-	-	24.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Battery#11 Process	-	-	27.0	-	-	-	-	-	-	-	-	31.0	-	-	-	-	-	-
Battery#10 Dedusting	-	-	-	-	-	9.6	-	-	-	-	-	-	-	-	-	-	-	-
Battery#11 Dedusting	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.2	-	-	-
Coke Plant CDQ#11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	68	-	3.6
SP#1 waste gas	86	23	30.3	-	-	22.0	-	-	37.6	-	-	41.7	60.4	112.1	91.6	17.4	79.8	33.0
SP#1 DD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15.7
SP#2 waste gas	-	-	-	-	-	-	-	-	-	-	-	-	84.8	107.0	50.9	-	-	-
SP#2 DD	-	-	-	-	-	37.1	-	-	25.5	-	-	-	-	-	8.2	-	-	3.3
SP#2 High Line DD	-	-	-	-	-	-	-	-	3.8	-	-	-	-	-	-	-	-	3.4
SP#3 WG& DD	-	-	-	-	-	-				-	-	-	-	-	56.0	-	-	70.7
SP#3 DD	-	-	15.4	-	-	4.7	-	-	9.2	-	-	-	-	-	-	-	-	-
SP#4 WG& DD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
G BI. Furnace Cast House	-	-	-	-	-	20.0	-	-	-	-	-	46.0	-	-	-	-	-	-
G BI.Furnace Stock House	-	-	34.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	76.0
G BI.Furnace Stove	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
H BI.Furnace Cast House	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
H BI.Furnace Stock House	-	-	22.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.1
H BI.Furnace Stock House DE	-	-	-	-	-	0.8	-	-	-	-	-	-	-	-	0.4	-	-	-
I BI.Furnace Cast House	-	-	-	-	-	10.6	-	-	-	-	-	-	-	-	-	-	-	-
I BI.Furnace Stock House	-	-	34.6	-	-	16.0	-	-	-	-	-	10.9	-	-	-	-	-	-
F BI.Furnace Stock House	31	-	7.1	-	-	-	-	-	4.2	-	-	3.4	-	-	-	-	-	-
F BI.Furnace Cast House	-	-	-	-	-	-	-	-	8.8	-	-	3.6	NT	NT	9.0	-	-	-
F BI.Furnace PCI	-	-	-	-	-	-	-	-	16.5	-	-	8.3	401	NT	15.8	157	-	19.2
LD #1 Sec. Emission	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13.9
LD # 1 LF # 1	-	-	-	-	-	6.0	-	-	-	-	-	-	-	-	6.2			
LD # 1 LF # 2	-	-	-	-	-	25.0	-	-	-	-	-	-	-	-	-	-	-	6.8
LD # 1 LF # 3	-	-	-	-	-	26.0	-	-	-	-	-	-	-	-	-	-	-	-
LD # 2 Sec. Emission 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.4	-	-	-
LD # 2 Sec. Emission 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.4	-	-	-
LD#2 LF# 1	-	-	6.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LD#2 LF# 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.4
LD#2 ESP # 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LD#2 ESP # 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LD#3 LF#1	-	-	-	-	-	16.9	-	-	10.0	-	-	9.0	-	-	-	-	-	-
LD#3 LF#2	-	-	12.0	-	-	12.0	-	-	18.6	-	-	9.0	-	-	12.7	-	-	-
LD # 3 Sec. Emission	-	-	-	-	-	-	-	-	-	-	-	5.0	-	-	-	-	-	-
LD#3 TSCR 1B	-	-	-	-	-	1.5	-	-	-	-	-	-	-	-	8.0	-	-	-
LD#3 TSCR 3B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pellet Plant cent-I dedusting	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pellet Plant combined dryer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pellet Plant WB Exahust ESP (Duct no 41)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40.0	-	-	-
Pellet Plant WB Exahust ESP (Duct no 51)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pellet Plant WB Exahust ESP (Duct no 61)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.0	-	-	-
Pellet Plant BALL MILL#1	-	-	45.0	-	-	-	-	-	-	-	-	-	-	-	32.0	-	-	-
Pellet Plant BALL MILL#2	-	-	-	-	-	-	-	-	-	-	-	9.6	-	-	-	-	-	-
Pellet Plant Drying Section	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note - Standards applicable as per Environment (Protection) (Third Amendment) Rules, 2012 issued in Gazette of I-ia Notification no. GSR 277 (E) –Dated March 31, 2012

Manager
Environment Management

Sr. Manager
Environment Management

TATA STEEL LIMITED

WORKS, JAMSHEDPUR

ENVIRONMENT MANAGEMENT DEPARTMENT

MANUAL STACK PARTICULATE MATTER EMISSION MONITORING REPORT (mg/Nm3)

MANUAL STACK MONITORING REPORT SUMMARY FROM Oct-18 to Mar -19

Stack Location	Oct-18			Nov-18			Dec-18			Jan-19			Feb-19			Mar-19		
	SO2	Nox	PM	SO2	Nox	PM	SO2	Nox	PM	SO2	Nox	PM	SO2	Nox	PM	SO2	Nox	PM
Lime Plant MK# 1	8	124	2.7	-	-	2.0	-	-	3.2	-	-	2.8	NT	19	3.3	-	-	2.3
Lime Plant MK# 2	-	120	2.5	-	-	2.2	-	-	3.2	-	-	13.6	NT	24	3.4	47.1	76.3	4.8
Lime Plant MK# 3&4	-	-	4.3	-	-	-	-	-	2.0	-	-	1.1	-	-	3.0	-	-	-
Lime Plant MK# 5	-	-	2.2	-	-	1.2	-	-	-	-	-	-	-	-	-	-	-	-
Lime Plant MK# 6	-	-	-	-	-	-	-	-	-	-	-	4.1	152.5	126.3	0.3	-	-	1.3
Lime Plant MK# 7	31	71	6.9	-	-	4.2	-	-	1.5	-	-	-	NT	NT	1.7	-	-	3.1
Lime Plant MK# 7 DE 15	-	-	3.3	-	-	5.2	-	-	4.4	-	-	-	-	-	4.5	-	-	-
Lime plant DE-15	-	-	-	-	-	-	-	-	-	-	-	2.3	-	-	-	-	-	2.7
Lime plant DE-1B	-	-	-	-	-	3.2	-	-	3.0	-	-	3.2	-	-	1.5	-	-	3.6
Lime Plant DE#12	-	-	10.2	-	-	3.4	-	-	-	-	-	4.9	-	-	6.1	-	-	5.1
Lime Plant MK# 5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lime Plant MK# 8	-	-	-	-	-	-	-	-	-	-	-	3.4	-	-	2.0	-	13	15.4
Lime Plant MK# 9	31	39	3.9	-	-	4.4	-	-	-	-	-	4.3	-	-	3.0	-	27	11.1
Lime Plant DE# 9	-	-	-	-	-	7.4	-	-	5.1	-	-	1.8	-	-	11.0			
Lime Plant MK C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Power House#3 Boiler 5	-	-	-	-	-	-	-	-	24.5	-	-	-	52.9	78.7	17.6	-	-	-
Power House#3 Boiler 6	-	-	-	-	-	-	-	-	-	-	-	-	33.6	70.9	16.6	-	-	-
Power House#3 Boiler 7&8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Power House#3 Boiler 7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.2	39.7	64.6	22.0
Power House#3 Boiler 8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25.0	42.4	69.7	21.1
Power House#5 Boiler A	-	-	-	58	11	25	-	-	26.6	-	-	-	-	-	-	-	-	-
Power House#5 Boiler B&C	-	-	-	-	-	16	-	-	22.5	-	-	20.8	-	-	-	34	19	22.0
Power House#4 Boiler 1&2	13	23	44.7	-	-	-	-	-	-	-	-	22.1	<5.0	<10.0	17.4	-	-	-
Power House#4 Boiler 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Power House#4 Boiler 4	97	79	22.4	-	-	-	-	-	-	-	-	-	73.0	93.2	36.4			
SGDP Drier # 1	-	-	-	-	-	-	-	-	31.6	-	-	-	-	-	-	-	-	109.1
SGDP Drier # 2	-	-	15.1	-	-	-	-	-	25.0	-	-	-	-	-	-	-	-	32.1
CRM CGL-1	-	-	-	-	-	-	-	-	-	-	-	-	NT	NT	10.0			
CRM BAF	42	102	10.1	-	-	-	-	-	3.0	-	-	-	NT	NT	25.1			
CRM ARP(old)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	76.3	-	-	103.9
CRM ARP(New)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	80.1	-	-	86.9
CRM BA- Mills	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CRM Incine-tor	-	-	-	-	-	-	-	-	-	-	-	-	NT	NT	69.4	-	-	43.1
WRM RHF	-	60	40.2	-	-	-	-	-	-	-	-	-	NT	88	44.4	-	-	44.8
NBM RHF	-	-	-	-	-	25	-	-	-	-	-	-	-	-	-	-	-	-
Marchent Mill	-	-	17.7	-	-	-	-	-	16.1	-	-	-	-	-	-	5	62	18.5
HSM Reheating Furnace#1	18	-	13.9	16	7	22	-	-	-	-	-	-	13	197	26.4	-	-	-
HSM Reheating Furnace#2	26	4	11.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Metal Logistics	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30 MW DG Station # 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30 MW DG Station # 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30 MW DG Station # 5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BPH PH#2 DG Set	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26.2
BPH Seco-ry DG Set	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	41.6
BPH Hearth Sp-y DG Set	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	121.6
F BF PCI	-	-	8.7	21	43	17	-	-	-	-	-	-	-	-	-	-	-	-
C BF STOVE	-	-	-	-	-	24	-	-	-	-	-	28.6	-	-	-	-	-	-
D BF STOVE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F BF STOVE	-	-	-	354	179	13	-	-	-	-	-	14.9	-	-	-	-	-	-
G BF PCI#1	-	-	37.5	-	-	36	-	-	20.6	NT	NT	31.4	NT	NT	25.5	-	-	21.7
G BF PCI#2	-	-	15.5	-	-	12	-	-	24.6	NT	NT	27.6	-	-	-	-	-	17.6
G BF PCI#3	-	-	11.4	-	-	25	-	-	20.3	-	-	-	NT	NT	13.4	-	-	14.6
H BF PCI#1(OLD)	-	-	-	-	-	-	-	-	-	-	-	-	NT	NT	31.5	-	-	38.2
H BF PCI#2(NEW)	-	-	-	-	-	-	-	-	10.3	-	-	1.8	NT	NT	18.5	-	-	-
G BF STOVE	-	-	25.3	-	-	29	-	-	-	-	-	-	-	-	-	-	19	120.2
TMH Incine-tor	-	-	-	-	-	-	-	-	-	-	-	-	55	43	-	-	-	-
E BF SH & CH	-	-	3.9	-	-	4.1	-	-	-	-	-	-	-	-	-	-	-	-

Note - Sta-ards applicable as per Environment (Protection) (Third Ame-ment) Rules, 2012 issued in Gazette of I-ia Notification no. GSR 277 (E) –Dated March 31, 2012

Manager
Environment Management

Sr. Manager
Environment Management

AMBIENT NOISE MONITORING REPORT - JAMSHEDPUR TOWN

TATA STEEL LIMITED ENVIRONMENT MANAGAMENT DEPARTMENT - LABORATORY

NOISE LEVEL MONITORING REPORT SUMMARY FROM Oct-18 to Mar-19

Sl. No.	Area	Oct-18		Nov-18		Dec-18		Jan-19		Feb-19		Mar-19	
		Day Time	Night Time	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time
A)	**SILENCE ZONE**												
1	TMH (Near Status)	65	51	66	52	62	50	69	44	61	52	68	60
2	JUSCO School Kadma	67	49	70	61	68	56	66	51	65	50	70	58
3	Kerala Public School Bistupur	70	58	61	48	61	57	63	51	67	53	63	52
4	South Park School Bistupur	60	48	55	50	59	43	60	43	59	43	58	49
5	Old Court Area (Jubilee Park)	62	59	69	59	66	57	67	55	64	55	69	50
B)	**RESIDENTIAL ZONE**												
1	Circuit House Area (North)	73	52	67	58	72	51	71	53	74	52	66	53
2	B.H. Area	66	54	62	55	66	56	66	52	63	50	61	53
3	Farm Area	63	58	60	53	60	57	64	58	63	54	61	54
4	Baridih Basti	72	61	66	58	72	62	71	54	65	57	63	56
5	Carriage Colony Burma Mines	69	57	62	50	69	50	70	50	62	49	65	56
6	Agrico Colony	63	55	70	54	63	56	64	46	69	54	66	59
7	South Park	61	51	59	53	60	47	60	47	68	56	64	56
C.	**COMMERCIAL ZONE**												
1	Sakchi Market	73	58	72	68	73	55	74	56	74	61	71	62
2	Golmuri Market	70	53	70	58	63	51	68	50	66	50	65	61
3	Burma Mines Market	69	50	71	64	71	52	71	49	73	63	68	63
4	Apna Bazar Bistupur	73	63	68	60	75	62	75	61	73	58	70	62
5	'R' Road Bistupur (behind Nalanda Hotel)	66	51	66	58	66	55	69	56	67	51	66	57
D)	**INDUSTRIAL ZONE**												
1	EAST SIDE/ near HSM Drain	67	53	66	55	66	57	67	55	63	47	62	59
2	WEST SIDE /Near Ramm Mandir	65	56	70	51	65	56	66	44	65	55	62	58
3	NORTH/ Garam Nalla drain	70	57	56	52	70	57	70	52	70	57	69	64
4	NORTH EAST slag road gate	65	57	71	63	62	58	62	52	69	57	68	61
5	NORTH WEST/General Office	70	59	70	54	71	59	70	48	63	58	69	62
6	SOUTH EAST/Burmamines Gate	71	57	62	58	64	57	62	43	66	53	68	62
7	SOUTH WEST/Jugsali Drain	68	51	68	53	67	52	67	46	60	53	68	64

Note: Standards applicable as per Noise Pollution (Regulation and Control) (Amendment) Rules, 2000 notified vide S. O. 1046 (E), dated 22-11-2000

Manager
Environment Management

Sr. Manager
Environment Management

TATA STEEL LIMITED

ENVIRONMENT MANAGEMENT DEPARTMENT - LABORATORY

WORKS DRAINS EFFLUENT QUALITY TEST REPORT SUMMARY FROM OCT-18 to MAR- 19

Sample Location	Parameter	UoM	Oct-18			Nov-18			Dec-18			Jan-19			Feb-19			Mar-19		
			Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
Susun Gharia Drain	Ammonical Nitrogen (as N)	mg/L	28.6	6.7	12.2	18.5	4.8	10.1	45.3	6.0	11.0	27.6	6.3	12.5	17.7	2.6	6.9	15.7	0.9	4.5
	Free Cyanide (as CN-)	mg/L	0.19	0.09	0.16	0.20	0.09	0.16	0.19	0.12	0.17	0.19	0.08	0.18	0.19	0.11	0.17	0.19	0.12	0.18
	Oil & Grease	mg/L	8.8	3.2	5.4	8.0	2.8	5.0	5.6	2.4	3.6	5.6	1.6	3.6	6.0	2.8	4.6	6.0	3.6	4.9
	Total Suspended solids	mg/L	92	25	56	98	24	58	94	29	59	84	33	60	96	31	53	93	31	57
	Chemical Oxygen Demand, COD	mg/L	152	34	80	241	39	98	162	61	97	168	49	97	168	42	85	225	42	97
	Biological Oxygen Demand, BOD	mg/L	16	3	7	30	6	22	15.9	3.1	7.5	12.8	3.2	6.7	12.9	3.1	5.3	17	3	8
	pH	-	8.44	7.65	8.08	8.40	7.39	7.97	8.5	6.8	7.9	8.5	6.5	7.9	8.3	7.4	7.8	8.42	6.89	7.90
	Phenol	mg/L	0.38	0.01	0.11	0.82	0.10	0.22	0.70	0.02	0.16	0.36	0.02	0.14	0.55	0.01	0.13	0.74	0.02	0.23
Jugsalai Drain	**Parameter**	**UoM**	**Max**	**Min**	**Avg**	**Max**	**Min**	**Avg**	**Max**	**Min**	**Avg**	**Max**	**Min**	**Avg**	**Max**	**Min**	**Avg**	**Max**	**Min**	**Avg**
	Ammonical Nitrogen (as N)	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	Free Cyanide (as CN-)	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	Oil & Grease	mg/L	6.0	0.8	3.6	6.0	1.6	3.3	3.2	0.8	2.0	2.8	1.2	2.1	4.4	3.6	4.0	3.6	3.2	3.5
	Total Suspended solids	mg/L	69	9	33	56	9	26	16	5	11	25	18	21	30	23	27	14	11	13
	Chemical Oxygen Demand, COD	mg/L	89	14	48	204	22	77	215	10	79	88	36	56	216	42	129	44	13	31
	Biological Oxygen Demand, BOD	mg/L	13	3	6	29	3	12	19.1	3.1	9.1	14.1	3.2	9.2	24.0	9.0	16.5	3	3	3
	pH	-	8.43	7.01	7.78	8.45	7.25	8.02	8.5	6.4	7.8	7.9	7.3	7.6	8.5	7.4	7.9	8.00	7.30	7.70
	Phenol	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
	Parameter	**UoM**	**Max**	**Min**	**Avg**	**Max**	**Min**	**Avg**	**Max**	**Min**	**Avg**	**Max**	**Min**	**Avg**	**Max**	**Min**	**Avg**	**Max**	**Min**	**Avg**
Garam Nala Drain	Ammonical Nitrogen (as N)	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND	ND	ND
	Free Cyanide (as CN-)	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND	ND	ND
	Oil & Grease	mg/L	9.2	0.8	4.0	7.2	1.6	3.0	4.4	0.8	2.1	4.4	0.8	2.1	5.4	1.6	2.7	ND	ND	ND
	Total Suspended solids	mg/L	65	4	30	3	2	2	25	5	15	7	4	6	23	4	8	ND	ND	ND
	Chemical Oxygen Demand, COD	mg/L	51	13	31	110	22	47	72	6	38	88	14	41	55	4	29	ND	ND	ND
	Biological Oxygen Demand, BOD	mg/L	10	3	6	19	3	9	9.5	3.1	4.5	8.1	3.1	4.1	3.3	3.1	3.2	ND	ND	ND
	pH	-	8.45	7.18	8.21	8.45	6.56	8.21	8.5	7.3	8.2	8.5	7.2	8.1	8.4	7.5	8.0	ND	ND	ND
	Phenol	mg/L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND	ND	ND

Note

Standards applicable as per Environment (Protection) (Third Amendment) Rules, 2012 issued in Gazette of India Notification vide No.: G. S. R. 277 (E) dated March 31, 2012.

NT- Not Traced, ND - No Discharge

Manager Environment Management

Sr. Manager
Environment Management Department

TATA STEEL LIMITED

ENVIRONMENT MANAGEMENT DEPARTMENT - LABORATORY

WORKS DRAINS EFFLUENT QUALITY TEST REPORT SUMMARY FROM OCT-18 to MAR- 19

Sample Location	Parameter	UoM	Oct-18			Nov-18			Dec-18			Jan-19			Feb-19			Mar-19		
			Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
HSM Drain	Ammonical Nitrogen (as N)	mg/L	24.9	1.7	8.8	17.0	0.0	6.8	16.3	0.8	5.7	14.3	0.1	5.3	8.8	2.1	4.4	12.4	0.9	5.3
	Free Cyanide (as CN-)	mg/L	0.19	0.01	0.12	0.18	0.04	0.11	0.18	0.05	0.10	0.19	0.01	0.13	0.18	0.01	0.12	0.19	0.06	0.13
	Oil & Grease	mg/L	7.6	4.0	5.7	9.6	2.8	5.0	8.8	1.6	4.2	5.6	2.0	3.9	5.6	4.0	5.0	6.4	4.4	5.2
	Total Suspended solids	mg/L	62	16	38	83	13	39	72	12	38	51	16	37	97	18	54	90	12	40
	Chemical Oxygen Demand, COD	mg/L	172	44	80	178	32	97	140	25	81	150	41	80	218	48	101	168	0	67
	Biological Oxygen Demand, BOD	mg/L	16	6	10	13	6	9	13.3	3.3	8.6	12.6	3.2	7.0	15.9	6.2	8.9	16	3	8
	pH	-	8.46	7.58	8.16	8.49	6.97	8.10	8.5	7.2	8.1	8.4	6.7	7.9	8.5	7.0	7.9	8.47	6.89	7.95
	Phenol	mg/L	0.43	0.02	0.20	0.47	0.09	0.18	0.42	0.04	0.19	0.40	0.05	0.15	0.38	0.03	0.14	0.38	0.01	0.17
BOT TREATED	**Parameter**	**UoM**	**Max**	**Min**	**Avg**	**Max**	**Min**	**Avg**	**Max**	**Min**	**Avg**	**Max**	**Min**	**Avg**	**Max**	**Min**	**Avg**	**Max**	**Min**	**Avg**
	Ammonical Nitrogen (as N)	mg/L	49.26	13.49	37.31	48.69	9.54	33.74	49.4	15.0	37.6	49.4	5.4	43.0	47.6	0.2	13.4	6.6	0.8	2.3
	Free Cyanide (as CN-)	mg/L	0.20	0.16	0.19	0.20	0.15	0.19	0.20	0.12	0.19	0.20	0.10	0.19	0.19	0.10	0.18	0.18	0.11	0.18
	Oil & Grease	mg/L	8.80	3.20	6.41	9.60	3.20	5.52	6.0	3.2	4.6	7.2	3.0	4.8	6.0	4.0	5.2	5.6	3.2	4.7
	Total Suspended solids	mg/L	95	22	55	92	35	56	98	42	62	94	31	58	94	22	59	90	16	52
	Chemical Oxygen Demand, COD	mg/L	245	132	174	246	140	207	247	205	233	249	181	223	246	102	199	246	105	193
	Biological Oxygen Demand, BOD	mg/L	21.07	10.47	17.91	29.40	6.28	21.77	21.9	11.0	19.3	21.9	10.7	19.3	22.1	10.9	20.1	22	13	21
	pH	-	8.00	6.52	7.45	8.08	6.78	7.30	8.5	6.7	7.5	8.2	6.4	7.6	8.4	6.5	7.4	8.25	6.86	7.44
	Phenol	mg/L	0.28	0.02	0.14	0.36	0.09	0.18	0.57	0.04	0.16	0.28	0.01	0.12	0.36	0.01	0.10	0.41	0.03	0.17

Note

Standards applicable as per Environment (Protection) (Third Amendment) Rules, 2012 issued in Gazette of India Notification vide No.: G. S. R. 277 (E) dated March 31, 2012.

NT- Not Traced, ND - No Discharge

Manager Environment Management

Sr. Manager

Environment Management Department

TATA STEEL LIMITED

GROUNDWATER MONITORING - Done by NABL/ MoEF Certified Lab (OCT-18 to MAR-19)

Month	Sampling Locations	pH	Temperature	Conductivity	Total Dissolved Solids	Total Suspended Solids	Color	Odor	Alkalinity as $CaCO_3$	Total Hardness as $CaCO_3$	Calcium as Ca	Sodium as Na	Potassium as K	Chlorides as Cl^-	Sulphates as SO_4^{-2}	Total Phosphorus as P
		--	oC	µMho/Cm	mg/L	mg/L	CU	--	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Oct-18	Baganhattu Bore water	7.36	29.3	1913	1285	<10	< 1.0	Agreeable	455	370	188.4	52.9	15.2	175.7	85.2	0.41
	SonariBore water	6.93	28.6	497	330	<10	< 1.0	Agreeable	95.4	168	47.62	12.03	2.65	61.7	38.5	0.61
	Parvati GhatBore water	7.18	29.1	243	140	<10	< 1.0	Agreeable	532	225	232.1	96.23	15.6	180.5	102	0.78
	Jugsalai Bore Water	7.22	28.9	1069	692	<10	< 1.0	Agreeable	351	264	99.2	26.46	3	85.5	48.4	0.25
	Jemco Bore Water	7.28	28.1	1137	721	<10	< 1.0	Agreeable	326	153	113.6	34.8	3.3	78.3	56.2	0.39
Nov-18	Baganhattu Bore water	7.3	30.3	1536	990	<10	< 1.0	Agreeable	365	577	144.8	85	4	142.5	45	0.15
	SonariBore water	6.41	25	486	320	<10	< 1.0	Agreeable	95	160	47.02	57.5	5.2	62.48	42	0.37
	Parvati GhatBore water	7.29	28.5	2400	1560	<10	< 1.0	Agreeable	600	955	224.19	109	2.8	173.39	158	0.42
	Jugsalai Bore Water	7.2	25.1	1089	707.8	<10	< 1.0	Agreeable	320	356	98.9	78.6	3.1	94.97	60	0.21
	Jemco Bore Water	7.49	26.4	1103	716.8	<10	< 1.0	Agreeable	321.6	410	107.13	48	1.66	80.79	52	0.29
Dec-18	Baganhattu Bore water	7.4	23.1	1479	960	<10	< 1.0	Agreeable	316	555	138.7	288	5.1	316	120	0.3
	SonariBore water	7.25	22.8	464	310	<10	< 1.0	Agreeable	85	175	46.09	68.5	6	85.43	28	0.26
	Parvati GhatBore water	7.1	22.4	1032	662	<10	< 1.0	Agreeable	125	305	70.14	110	5.4	125	72	0.2
	Jugsalai Bore Water	7.58	22.9	1086	692	<10	< 1.0	Agreeable	311	360	96.19	299	8.2	311.5	184	0.49
	Jemco Bore Water	7.62	23.5	1109	742	<10	< 1.0	Agreeable	340	430	108.2	76	4.2	82.4	28.5	0.06
Jan-19	Baganhattu Bore water	7.18	23	1358	816	<10	< 1.0	Agreeable	311	549	154	120	5	144	88	0.04
	SonariBore water	6.32	23	454	272	<10	< 1.0	Agreeable	100.5	188	57.5	48	5.8	66	32	0.86
	Parvati GhatBore water	6.56	23.1	3370	2030	<10	< 1.0	Agreeable	165	328	76	120	6.2	137	52	0.188
	Jugsalai Bore Water	7.08	23.1	1014	609	<10	< 1.0	Agreeable	321	252	97.2	82	3.5	97.38	46	0.305
	Jemco Bore Water	6.98	23.3	1059	635	<10	< 1.0	Agreeable	316	217	105.15	48	1.66	85.7	52	0.68
Feb-19	Baganhattu Bore water	7.51	23	1358	816	<10	< 1.0	Agreeable	311	549	154	120	5	144	88	0.31
	SonariBore water	6.3	28.9	424	275	<10	< 1.0	Agreeable	90	160	38	59	5.8	64	33	0.708
	Parvati GhatBore water	7.08	28.9	1626	652	<10	< 1.0	Agreeable	340	695	166.3	194	6.2	242	91.01	0.86
	Jugsalai Bore Water	7.6	23.1	1014	609	<10	< 1.0	Agreeable	321	252	97.2	82	3.5	97.38	46	0.22
	Jemco Bore Water	7.11	24.8	988	620	<10	< 1.0	Agreeable	300	392	98	72.8	3.2	86.2	48	0.88
Mar-19	Baganhattu Bore water	7.53	31	1283	825	<10	< 1.0	Agreeable	325	495	138.27	88.97	3.56	154.95	85	0.52
	SonariBore water	7.23	28.7	1317	855	14.5	< 1.0	Agreeable	100.5	535	138.3	71.19	2.13	127.46	120	0.57
	Parvati GhatBore water	7.31	30.2	2180	1417	12.8	< 1.0	Agreeable	850	900	220.4	209	2.9	189.94	104	0.53
	Jugsalai Bore Water	7.4	27.6	1065	692	<10	< 1.0	Agreeable	220	345	28.06	88.28	5.23	102.46	64.37	0.29
	Jemco Bore Water	7.51	27.2	1069	690	18	< 1.0	Agreeable	316.5	390	62.1	75.92	2.14	94.97	116	0.44

Manager Environment Management

Sr. Manager
Environment Management

TATA STEEL LIMITED

GROUNDWATER MONITORING - Done by NABL/ MoEF Certified Lab (OCT-18 to MAR-19)

Month	Sampling Locations	Nitrate Nitrogen as N	Nitrite Nitrogen as N	Fluorides as F^-	Silica as SiO_2	Iron as Fe	Manganese as Mn	Hexavalent Chromium as Cr+6	Copper as Cu	Total Chromium as Cr	Cadmium Cd	Nickel as Ni	Zinc as Zn	Lead as Pb	Nitrogen (Ammonia) as N	Total Nitrogen	Oil & Grease
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Oct-18	Baganhattu Bore water	2.5	7.58	6.8	3.5	5.8	< 0.05	< 0.05	<0.01	< 0.05	< 0.001	<0.5	< 0.5	< 0.001	Nil	Nil	< 1.0
	SonariBore water	0.09	0.03	0.19	0.019	0.01	< 0.05	< 0.05	<0.01	< 0.05	< 0.001	<0.5	< 0.5	< 0.001	Nil	Nil	< 1.0
	Parvati GhatBore water	1.8	0.12	1.02	1.87	0.6	< 0.05	< 0.05	<0.01	< 0.05	< 0.001	<0.5	< 0.5	< 0.001	Nil	Nil	< 1.0
	Jugsalai Bore Water	10.9	9.35	11.7	8.89	3.84	< 0.05	< 0.05	<0.01	< 0.05	< 0.001	0.024	< 0.5	< 0.001	Nil	Nil	< 1.0
	Jemco Bore Water	0.15	0.13	0.26	0.16	0.18	< 0.05	< 0.05	<0.01	< 0.05	< 0.001	<0.5	< 0.5	< 0.001	Nil	Nil	< 1.0
Nov-18	Baganhattu Bore water	10	0.036	2.29	0.012	0.32	< 0.05	< 0.05	<0.01	< 0.05	< 0.001	0.055	< 0.5	< 0.001	Nil	Nil	< 1.0
	SonariBore water	7.25	0.036	0.1	9.2	0.103	< 0.05	< 0.05	<0.01	< 0.05	< 0.001	0.08	< 0.5	< 0.001	Nil	Nil	< 1.0
	Parvati GhatBore water	12	0.164	1.69	0.01	0.09	< 0.05	< 0.05	<0.01	< 0.05	< 0.001	0.11	< 0.5	< 0.001	Nil	Nil	< 1.0
	Jugsalai Bore Water	3.2	0.011	3.2	7.8	0.14	< 0.05	< 0.05	0.016	< 0.05	< 0.001	0.052	< 0.5	< 0.001	Nil	Nil	< 1.0
	Jemco Bore Water	4	0.005	2.28	8.84	0.22	< 0.05	< 0.05	0.018	< 0.05	< 0.001	0.09	< 0.5	< 0.001	Nil	Nil	< 1.0
Dec-18	Baganhattu Bore water	5.8	0.03	0.47	5.15	0.02	< 0.05	< 0.05	<0.01	< 0.05	< 0.001	<0.5	< 0.5	< 0.001	Nil	Nil	< 1.0
	SonariBore water	8.6	0.01	0.22	4.4	0.026	< 0.05	< 0.05	<0.01	< 0.05	< 0.001	<0.5	< 0.5	< 0.001	Nil	Nil	< 1.0
	Parvati GhatBore water	7	0.28	0.05	4.43	0.014	< 0.05	< 0.05	<0.01	< 0.05	< 0.001	<0.5	< 0.5	< 0.001	Nil	Nil	< 1.0
	Jugsalai Bore Water	4.8	0.05	1.4	6.04	0.002	< 0.05	< 0.05	0.016	< 0.05	< 0.001	0.024	< 0.5	< 0.001	Nil	Nil	< 1.0
	Jemco Bore Water	5.2	0.018	2.1	14.2	0.21	< 0.05	< 0.05	0.015	< 0.05	< 0.001	<0.5	< 0.5	< 0.001	Nil	Nil	< 1.0
Jan-19	Baganhattu Bore water	5	0.025	1.66	2.72	0.076	< 0.05	< 0.05	<0.01	< 0.05	<0.05	<0.5	< 0.5	<0.05	Nil	Nil	< 1.0
	SonariBore water	7.8	0.008	0.39	16.4	0.915	< 0.05	< 0.05	<0.01	< 0.05	<0.05	<0.5	< 0.5	<0.05	Nil	Nil	< 1.0
	Parvati GhatBore water	10.5	0.038	1.18	6.5	0.028	< 0.05	< 0.05	<0.01	< 0.05	<0.05	<0.5	< 0.5	<0.05	Nil	Nil	< 1.0
	Jugsalai Bore Water	3.2	0.005	0.88	7.6	0.054	< 0.05	< 0.05	0.016	< 0.05	<0.05	0.024	< 0.5	<0.05	Nil	Nil	< 1.0
	Jemco Bore Water	4	0.002	1.59	5.2	0.049	< 0.05	< 0.05	0.015	< 0.05	<0.05	<0.5	< 0.5	<0.05	Nil	Nil	< 1.0
Feb-19	Baganhattu Bore water	5	0.108	1.07	6.9	6.4	< 0.05	< 0.05	<0.01	< 0.05	<0.05	<0.5	< 0.5	<0.05	1.4	2.24	< 1.0
	SonariBore water	4.2	0.02	0.28	13.1	0.28	< 0.05	< 0.05	<0.01	< 0.05	<0.05	<0.5	< 0.5	<0.05	Nil	Nil	< 1.0
	Parvati GhatBore water	4.8	0.19	0.49	16.03	1.43	< 0.05	< 0.05	<0.01	< 0.05	<0.05	<0.5	< 0.5	<0.05	2.52	3.4	< 1.0
	Jugsalai Bore Water	3.2	0.021	0.54	1.18	0.25	< 0.05	< 0.05	0.016	< 0.05	<0.05	0.024	< 0.5	<0.05	1.96	2.8	< 1.0
	Jemco Bore Water	4.1	0.023	0.65	1.1	0.15	< 0.05	< 0.05	0.018	< 0.05	<0.05	<0.5	< 0.5	<0.05	Nil	Nil	< 1.0
Mar-19	Baganhattu Bore water	32	0.046	0.2	17.63	0.21	< 0.05	< 0.05	<0.01	< 0.05	<0.05	<0.5	< 0.5	<0.05	2.24	5.6	< 1.0
	SonariBore water	37	0.067	0.217	16.6	0.32	< 0.05	< 0.05	0.014	< 0.05	<0.05	<0.5	< 0.5	0	1.96	2.24	< 1.0
	Parvati GhatBore water	37.25	0.171	1.15	18.4	0.28	< 0.05	< 0.05	0.021	< 0.05	<0.05	<0.5	< 0.5	<0.05	1.4	2.8	< 1.0
	Jugsalai Bore Water	8.25	0.072	0.74	10.97	0.64	< 0.05	< 0.05	0.019	< 0.05	<0.05	0.024	< 0.5	<0.05	1.68	3.62	< 1.0
	Jemco Bore Water	3.2	0.014	2.16	4.98	0.34	< 0.05	< 0.05	0.017	< 0.05	<0.05	<0.5	< 0.5	<0.05	1.96	3.64	< 1.0

Manager Environment Management

Sr. Manager
Environment Management

TATA STEEL LIMITED

GROUNDWATER MONITORING - Done by NABL/ MoEF Certified Lab (OCT-18 to MAR-19)

Month	Sampling Locations	Chemical Oxygen Demand	Biological Oxygen Demand (5 Days at 20oC)	Residual Chlorine as Cl	Sulphide as S^{-2}	Phenolic Compounds as Phenols	Total Cyanide	Free Cyanide	Thio Cyanide	Arsenic as As	Mercury	Aluminum	Vanadium	PAH
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Oct-18	Baganhattu Bore water	<4.0	<2.0	< 1.0	Nil	< 0.001	< 0.01	< 0.01	< 0.01	< 0.005	< 0.001	< 0.03	< 0.01	Absent
	SonariBore water	4.0	<2.0	< 1.0	Nil	< 0.001	< 0.01	< 0.01	< 0.01	< 0.005	< 0.001	< 0.03	< 0.01	Absent
	Parvati GhatBore water	<4.0	<2.0	< 1.0	Nil	< 0.001	< 0.01	< 0.01	< 0.01	< 0.005	< 0.001	< 0.03	< 0.01	Absent
	Jugsalai Bore Water	<4.0	<2.0	< 1.0	Nil	< 0.001	< 0.01	< 0.01	< 0.01	< 0.005	< 0.001	< 0.03	< 0.01	Absent
	Jemco Bore Water	4.0	<2.0	< 1.0	Nil	< 0.001	< 0.01	< 0.01	< 0.01	< 0.005	< 0.001	< 0.03	< 0.01	Absent
Nov-18	Baganhattu Bore water	<2.0	<2.0	< 1.0	Nil	< 0.001	< 0.01	< 0.01	< 0.01	< 0.005	< 0.001	< 0.03	< 0.01	Absent
	SonariBore water	6	3.6	< 1.0	Nil	< 0.001	< 0.01	< 0.01	< 0.01	< 0.005	< 0.001	< 0.03	< 0.01	Absent
	Parvati GhatBore water	<2.0	<2.0	< 1.0	Nil	< 0.001	< 0.01	< 0.01	< 0.01	< 0.005	< 0.001	< 0.03	< 0.01	Absent
	Jugsalai Bore Water	4.0	<2.0	< 1.0	Nil	< 0.001	< 0.01	< 0.01	< 0.01	< 0.005	< 0.001	< 0.03	< 0.01	Absent
	Jemco Bore Water	<2.0	<2.0	< 1.0	Nil	< 0.001	< 0.01	< 0.01	< 0.01	< 0.005	< 0.001	< 0.03	< 0.01	Absent
Dec-18	Baganhattu Bore water	<2.0	<2.0	< 1.0	Nil	< 0.001	< 0.01	< 0.01	< 0.01	< 0.005	< 0.001	< 0.03	< 0.01	Absent
	SonariBore water	5.2	3	< 1.0	Nil	< 0.001	< 0.01	< 0.01	< 0.01	< 0.005	< 0.001	< 0.03	< 0.01	Absent
	Parvati GhatBore water	<4.0	<2.0	< 1.0	Nil	< 0.001	< 0.01	< 0.01	< 0.01	< 0.005	< 0.001	< 0.03	< 0.01	Absent
	Jugsalai Bore Water	<4.0	<2.0	< 1.0	Nil	< 0.001	< 0.01	< 0.01	< 0.01	< 0.005	< 0.001	< 0.03	< 0.01	Absent
	Jemco Bore Water	4.0	<2.0	< 1.0	Nil	< 0.001	< 0.01	< 0.01	< 0.01	< 0.005	< 0.001	< 0.03	< 0.01	Absent
Jan-19	Baganhattu Bore water	<4.0	<2.0	< 1.0	Nil	< 0.001	< 0.01	< 0.01	< 0.01	< 0.005	< 0.001	< 0.03	< 0.01	Absent
	SonariBore water	<4.0	<2.0	< 1.0	Nil	< 0.001	< 0.01	< 0.01	< 0.01	< 0.005	< 0.001	< 0.03	< 0.01	Absent
	Parvati GhatBore water	<4.0	<2.0	< 1.0	Nil	< 0.001	< 0.01	< 0.01	< 0.01	< 0.005	< 0.001	< 0.03	< 0.01	Absent
	Jugsalai Bore Water	<4.0	<2.0	< 1.0	Nil	< 0.001	< 0.01	< 0.01	< 0.01	< 0.005	< 0.001	< 0.03	< 0.01	Absent
	Jemco Bore Water	<4.0	<2.0	< 1.0	Nil	< 0.001	< 0.01	< 0.01	< 0.01	< 0.005	< 0.001	< 0.03	< 0.01	Absent
Feb-19	Baganhattu Bore water	12.0	6.0	< 1.0	Nil	< 0.001	< 0.01	< 0.01	< 0.01	< 0.005	< 0.001	< 0.03	< 0.01	Absent
	SonariBore water	<4.0	<2.0	< 1.0	Nil	< 0.001	< 0.01	< 0.01	< 0.01	< 0.005	< 0.001	< 0.03	< 0.01	Absent
	Parvati GhatBore water	<4.0	<2.0	< 1.0	Nil	< 0.001	< 0.01	< 0.01	< 0.01	< 0.005	< 0.001	< 0.03	< 0.01	Absent
	Jugsalai Bore Water	20.0	8.0	< 1.0	Nil	< 0.001	< 0.01	< 0.01	< 0.01	< 0.005	< 0.001	< 0.03	< 0.01	Absent
	Jemco Bore Water	<4.0	<2.0	< 1.0	Nil	< 0.001	< 0.01	< 0.01	< 0.01	< 0.005	< 0.001	< 0.03	< 0.01	Absent
Mar-19	Baganhattu Bore water	<4.0	<2.0	< 1.0	Nil	< 0.001	< 0.01	< 0.01	< 0.01	< 0.005	< 0.001	< 0.03	< 0.01	Absent
	SonariBore water	<4.0	<2.0	< 1.0	Nil	< 0.001	< 0.01	< 0.01	< 0.01	< 0.005	< 0.001	< 0.03	< 0.01	Absent
	Parvati GhatBore water	<4.0	<2.0	< 1.0	Nil	< 0.001	< 0.01	< 0.01	< 0.01	< 0.005	< 0.001	< 0.03	< 0.01	Absent
	Jugsalai Bore Water	24.0	9.2	< 1.0	Nil	< 0.001	< 0.01	< 0.01	< 0.01	< 0.005	< 0.001	< 0.03	< 0.01	Absent
	Jemco Bore Water	8	3	< 1.0	Nil	< 0.001	< 0.01	< 0.01	< 0.01	< 0.005	< 0.001	< 0.03	< 0.01	Absent

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RIVER WATER MONITORING DONE BY NABL/MoEF LAB (OCT-18 to MAR- 19)

Month	Locations	Alkalinity	Total Hardness	Calcium	Magnesium	Sodium	Potassium	Chloride
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Oct-18	KHARKHAI RIVER (NEAR DUMUHANI)	130	104	25.8	9.6	54.5	1.99	59.4
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	100	104	16.2	8.2	20.5	2.90	23.8
	SWARNREKHA RIVER(NEAR BAGUN HATU)	110	102	29.8	7.3	30.6	1.10	38.5
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	100	94	27.8	6.0	16.2	1.25	19.0
Nov-18	KHARKHAI RIVER (NEAR DUMUHANI)	121	119	34.5	8.2	19.5	2.35	28.5
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	106	110	31.7	9.6	21.0	2.05	24.9
	SWARNREKHA RIVER(NEAR BAGUN HATU)	101	99	27.8	7.2	20.2	4.42	39.2
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	95	69	24.0	3.2	28.0	5.80	29.6
Dec-18	KHARKHAI RIVER (NEAR DUMUHANI)	95	109	29.8	6.0	20.5	2.56	21.4
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	126	150	35.7	15.0	24.1	3.60	28.5
	SWARNREKHA RIVER(NEAR BAGUN HATU)	105	129	27.9	14.4	26.5	5.20	35.6
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	90	114	26.8	10.8	32.5	6.00	26.1
Jan-19	KHARKHAI RIVER (NEAR DUMUHANI)	126	103	30.2	6.8	26.4	2.65	34.6
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	130	154	35.7	15.6	29.0	2.00	32.0
	SWARNREKHA RIVER(NEAR BAGUN HATU)	110	133	35.7	10.8	55.0	3.80	71.5
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	85	109	27.8	9.6	20.0	2.50	29.0
Feb-19	KHARKHAI RIVER (NEAR DUMUHANI)	175	175	40.0	18.2	48.9	3.80	59.9
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	170	154	40.1	17.0	31.3	2.00	32.0
	SWARNREKHA RIVER(NEAR BAGUN HATU)	95	120	32.1	9.7	64.2	4.80	69.9
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	105	90	24.0	7.3	25.8	3.80	29.9
Mar-19	KHARKHAI RIVER (NEAR DUMUHANI)	130	125	28.1	13.4	36.5	5.72	55.0
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	120	115	26.1	12.2	39.5	4.32	50.0
	SWARNREKHA RIVER(NEAR BAGUN HATU)	110	105	26.1	9.9	51.2	6.14	57.5
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	95	85	22.0	8.3	33.65	4.03	50.0

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RIVER WATER MONITORING DONE BY NABL/MoEF LAB (OCT-18 to MAR- 19)

Month	Locations	pH	Temperature	Conductivity	Turbidity	Total Dissolved Solids	TSS	Color	Odor
		--	oC	µMho/Cm	NTU	mg/L	mg/L	CU	--
Oct-18	KHARKHAI RIVER (NEAR DUMUHANI)	8.58	32.5	257	< 0.05	155	<10	< 1.0	Agreeable
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	8.69	30.8	238	< 0.05	104	<10	< 1.0	Agreeable
	SWARNREKHA RIVER(NEAR BAGUN HATU)	8.24	31.4	293	< 0.05	182	<10	< 1.0	Agreeable
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	8.52	32.2	255	< 0.05	158	<10	< 1.0	Agreeable
Nov-18	KHARKHAI RIVER (NEAR DUMUHANI)	7.80	32.1	350	< 0.05	220	<10	< 1.0	Agreeable
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	7.85	31.2	319	< 0.05	201	<10	< 1.0	Agreeable
	SWARNREKHA RIVER(NEAR BAGUN HATU)	8.09	30.1	346	< 0.05	220	<10	< 1.0	Agreeable
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	8.30	28.5	272	< 0.05	172	<10	< 1.0	Agreeable
Dec-18	KHARKHAI RIVER (NEAR DUMUHANI)	7.92	23	262	< 0.05	178	<10	< 1.0	Agreeable
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	8.17	22.5	406	< 0.05	255	<10	< 1.0	Agreeable
	SWARNREKHA RIVER(NEAR BAGUN HATU)	7.78	23.1	402	< 0.05	255	<10	< 1.0	Agreeable
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	8.07	23.5	289	< 0.05	180	<10	< 1.0	Agreeable
Jan-19	KHARKHAI RIVER (NEAR DUMUHANI)	7.51	23.6	403	< 0.05	241	<10	< 1.0	Agreeable
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	8.21	23.7	341	< 0.05	205	<10	< 1.0	Agreeable
	SWARNREKHA RIVER(NEAR BAGUN HATU)	7.32	23.3	437	< 0.05	263	<10	< 1.0	Agreeable
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	7.32	28	250	< 0.05	154	<10	< 1.0	Agreeable
Feb-19	KHARKHAI RIVER (NEAR DUMUHANI)	7.08	29	565	< 0.05	367	<10	< 1.0	Agreeable
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	7.46	25.4	865	< 0.05	558	<10	< 1.0	Agreeable
	SWARNREKHA RIVER(NEAR BAGUN HATU)	7.34	25.6	420	< 0.05	288	<10	< 1.0	Agreeable
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	7.32	28	264	< 0.05	170	<10	< 1.0	Agreeable
Mar-19	KHARKHAI RIVER (NEAR DUMUHANI)	8.25	29	418	< 0.05	277	<10	< 1.0	Agreeable
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	8.4	32.3	344	< 0.05	220	<10	< 1.0	Agreeable
	SWARNREKHA RIVER(NEAR BAGUN HATU)	8.1	30.8	370	< 0.05	240	<10	< 1.0	Agreeable
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	8.73	29.8	263	< 0.05	165	<10	< 1.0	Agreeable

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Month	Locations	$SO4^{-2}$	P	Nitrate Nitrogen as N	Nitrite Nitrogen as N	F^-	SiO2	Fe	Mn
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Oct-18	KHARKHAI RIVER (NEAR DUMUHANI)	0.37	0.41	1.50	0.52	0.57	2.62	0.15	< 0.05
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	2.85	0.46	2.50	0.04	0.85	4.60	0.18	< 0.05
	SWARNREKHA RIVER(NEAR BAGUN HATU)	1.31	0.52	3.65	1.88	0.46	1.34	0.32	< 0.05
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	2.17	2.89	4.25	0.19	0.02	3.28	0.30	< 0.05
Nov-18	KHARKHAI RIVER (NEAR DUMUHANI)	4.40	0.38	2.00	<0.05	0.67	1.49	0.24	< 0.05
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	3.20	0.43	4.00	1.32	2.74	5.03	0.23	< 0.05
	SWARNREKHA RIVER(NEAR BAGUN HATU)	12.40	0.60	3.00	0.42	1.19	1.05	0.28	< 0.05
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	3.30	0.42	3.21	1.32	0.20	2.39	0.37	< 0.05
Dec-18	KHARKHAI RIVER (NEAR DUMUHANI)	14.20	0.48	2.22	0.70	0.75	0.46	0.01	< 0.05
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	8.80	0.60	3.90	0.03	3.18	2.18	0.02	< 0.05
	SWARNREKHA RIVER(NEAR BAGUN HATU)	10.58	0.70	3.55	0.01	0.54	1.06	0.01	< 0.05
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	18.00	0.68	0.58	0.02	0.56	2.37	0.05	< 0.05
Jan-19	KHARKHAI RIVER (NEAR DUMUHANI)	5.80	1.61	3.99	0.38	0.95	1.22	0.15	< 0.05
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	8.20	0.47	4.10	0.06	0.85	2.57	0.38	< 0.05
	SWARNREKHA RIVER(NEAR BAGUN HATU)	5.80	0.71	4.61	0.64	1.67	3.89	0.04	< 0.05
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	6.20	0.52	2.80	0.12	0.55	3.73	0.02	< 0.05
Feb-19	KHARKHAI RIVER (NEAR DUMUHANI)	8.20	2.58	3.65	0.01	0.24	6.50	0.24	< 0.05
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	8.20	1.03	4.10	1.81	0.08	2.14	0.39	< 0.05
	SWARNREKHA RIVER(NEAR BAGUN HATU)	24.00	0.47	5.00	2.10	0.61	0.70	0.11	< 0.05
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	11.00	0.18	3.90	0.06	0.02	0.84	0.62	< 0.05
Mar-19	KHARKHAI RIVER (NEAR DUMUHANI)	5.80	2.006	3.55	0.68	0.69	0.51	0.20	< 0.05
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	22.50	2.041	2.50	0.22	0.021	0.71	0.14	< 0.05
	SWARNREKHA RIVER(NEAR BAGUN HATU)	5.80	2.12	4.89	0.63	0.95	0.42	0.25	< 0.05
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	6.20	1.95	3.88	0.30	0.018	1.08	0.20	< 0.05

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Month	Locations	Cr (VI)	Cu	Cr	Cd	Ni	Zn	Pb	Nitrogen (Ammonia) as N	Total Nitrogen	O & G	COD
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Oct-18	KHARKHAI RIVER (NEAR DUMUHANI)	< 0.05	< 0.01	< 0.05	< 0.01	< 0.5	< 0.5	< 0.05	1.68	3.36	< 1.0	8
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	< 0.05	< 0.01	< 0.05	< 0.01	< 0.5	< 0.5	< 0.05	1.12	2.24	< 1.0	12
	SWARNREKHA RIVER(NEAR BAGUN HATU)	< 0.05	< 0.01	< 0.05	< 0.01	< 0.5	< 0.5	< 0.05	1.40	2.80	< 1.0	32
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	< 0.05	< 0.01	< 0.05	< 0.01	< 0.5	< 0.5	< 0.05	0.42	0.84	< 1.0	16
Nov-18	KHARKHAI RIVER (NEAR DUMUHANI)	< 0.05	0.006	< 0.05	< 0.01	0.14	< 0.5	< 0.05	0.56	4.68	< 1.0	4
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	< 0.05	0.002	< 0.05	< 0.01	0.03	< 0.5	< 0.05	0.56	3.40	< 1.0	36
	SWARNREKHA RIVER(NEAR BAGUN HATU)	< 0.05	0.005	< 0.05	< 0.01	0.09	< 0.5	< 0.05	0.28	3.40	< 1.0	20
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	< 0.05	0.002	< 0.05	< 0.01	0.08	< 0.5	< 0.05	0.32	3.56	< 1.0	12
Dec-18	KHARKHAI RIVER (NEAR DUMUHANI)	< 0.05	0.004	< 0.05	< 0.01	0.13	< 0.5	< 0.05	0.58	5.20	< 1.0	4
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	< 0.05	0.002	< 0.05	< 0.01	0.03	< 0.5	< 0.05	0.82	4.80	< 1.0	42
	SWARNREKHA RIVER(NEAR BAGUN HATU)	< 0.05	0.006	< 0.05	< 0.01	0.08	< 0.5	< 0.05	0.46	3.96	< 1.0	24
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	< 0.05	0.003	< 0.05	< 0.01	0.08	< 0.5	< 0.05	0.48	4.86	< 1.0	16
Jan-19	KHARKHAI RIVER (NEAR DUMUHANI)	< 0.05	< 0.01	< 0.05	< 0.01	0.13	< 0.5	< 0.05	0.84	2.86	< 1.0	<4.0
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	< 0.05	< 0.01	< 0.05	< 0.01	0.03	< 0.5	< 0.05	Nil	0.50	< 1.0	<4.0
	SWARNREKHA RIVER(NEAR BAGUN HATU)	< 0.05	< 0.01	< 0.05	< 0.01	0.08	< 0.5	< 0.05	0.24	2.20	< 1.0	<4.0
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	< 0.05	< 0.01	< 0.05	< 0.01	0.08	< 0.5	< 0.05	0.48	2.60	< 1.0	<4.0
Feb-19	KHARKHAI RIVER (NEAR DUMUHANI)	< 0.05	< 0.01	< 0.05	< 0.01	< 0.5	< 0.5	< 0.05	5.60	8.20	< 1.0	16
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	< 0.05	< 0.01	< 0.05	< 0.01	< 0.5	< 0.5	< 0.05	3.08	4.64	< 1.0	8
	SWARNREKHA RIVER(NEAR BAGUN HATU)	< 0.05	< 0.01	< 0.05	< 0.01	< 0.5	< 0.5	< 0.05	2.24	4.80	< 1.0	16
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	< 0.05	< 0.01	< 0.05	< 0.01	< 0.5	< 0.5	< 0.05	1.68	2.80	< 1.0	4
Mar-19	KHARKHAI RIVER (NEAR DUMUHANI)	< 0.05	0.023	< 0.05	< 0.01	0.023	< 0.5	< 0.05	5.20	6.80	< 1.0	76
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	< 0.05	0.022	< 0.05	< 0.01	0.05	< 0.5	< 0.05	3.24	5.98	< 1.0	32
	SWARNREKHA RIVER(NEAR BAGUN HATU)	< 0.05	<0.01	< 0.05	< 0.01	0.16	< 0.5	< 0.05	4.20	6.40	< 1.0	56
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	< 0.05	0.01	< 0.05	< 0.01	0.01	< 0.5	< 0.05	2.50	4.32	< 1.0	12

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Month	Locations	BOD (3days at 270C)	Barium as Ba	Boron as B	Residual Chlorine as Cl	Sulphide as S^{-2}	Phenolic Compounds as Phenols	Cyanide as CN	Arsenic as As	Selenium as Se	Mercury	Molybdenum as Mo	Aluminum	PAH
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Oct-18	KHARKHAI RIVER (NEAR DUMUHANI)	3.2	< 1.0	< 1.0	< 1.0	Nil	< 0.1	< 0.01	< 0.01	< 0.01	< 0.01	<0.01	< 0.03	Absent
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	4.2	< 1.0	< 1.0	< 1.0	Nil	< 0.1	< 0.01	< 0.01	< 0.01	< 0.01	<0.01	< 0.03	Absent
	SWARNREKHA RIVER(NEAR BAGUN HATU)	10.8	< 1.0	< 1.0	< 1.0	Nil	< 0.1	< 0.01	< 0.01	< 0.01	< 0.01	<0.01	< 0.03	Absent
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	6.0	< 1.0	< 1.0	< 1.0	Nil	< 0.1	< 0.01	< 0.01	< 0.01	< 0.01	<0.01	< 0.03	Absent
Nov-18	KHARKHAI RIVER (NEAR DUMUHANI)	<2.0	< 1.0	< 1.0	< 1.0	Nil	< 0.1	< 0.01	< 0.01	< 0.01	< 0.01	<0.01	< 0.03	Absent
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	14.0	< 1.0	< 1.0	< 1.0	Nil	< 0.1	< 0.01	< 0.01	< 0.01	< 0.01	<0.01	< 0.03	Absent
	SWARNREKHA RIVER(NEAR BAGUN HATU)	8.1	< 1.0	< 1.0	< 1.0	Nil	< 0.1	< 0.01	< 0.01	< 0.01	< 0.01	<0.01	< 0.03	Absent
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	4.6	< 1.0	< 1.0	< 1.0	Nil	< 0.1	< 0.01	< 0.01	< 0.01	< 0.01	<0.01	< 0.03	Absent
Dec-18	KHARKHAI RIVER (NEAR DUMUHANI)	<2.0	< 1.0	< 1.0	< 1.0	Nil	< 0.1	< 0.01	< 0.01	< 0.01	< 0.01	<0.01	< 0.03	Absent
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	16	< 1.0	< 1.0	< 1.0	Nil	< 0.1	< 0.01	< 0.01	< 0.01	< 0.01	<0.01	< 0.03	Absent
	SWARNREKHA RIVER(NEAR BAGUN HATU)	9.6	< 1.0	< 1.0	< 1.0	Nil	< 0.1	< 0.01	< 0.01	< 0.01	< 0.01	<0.01	< 0.03	Absent
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	6.4	< 1.0	< 1.0	< 1.0	Nil	< 0.1	< 0.01	< 0.01	< 0.01	< 0.01	<0.01	< 0.03	Absent
Jan-19	KHARKHAI RIVER (NEAR DUMUHANI)	<2.0	< 1.0	< 1.0	< 1.0	Nil	< 0.1	< 0.01	< 0.01	< 0.01	< 0.01	<0.01	< 0.03	Absent
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	<2.0	< 1.0	< 1.0	< 1.0	Nil	< 0.1	< 0.01	< 0.01	< 0.01	< 0.01	<0.01	< 0.03	Absent
	SWARNREKHA RIVER(NEAR BAGUN HATU)	<2.0	< 1.0	< 1.0	< 1.0	Nil	< 0.1	< 0.01	< 0.01	< 0.01	< 0.01	<0.01	< 0.03	Absent
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	<2.0	< 1.0	< 1.0	< 1.0	Nil	< 0.1	< 0.01	< 0.01	< 0.01	< 0.01	<0.01	< 0.03	Absent
Feb-19	KHARKHAI RIVER (NEAR DUMUHANI)	6.2	< 1.0	< 1.0	< 1.0	Nil	< 0.1	< 0.01	< 0.01	< 0.01	< 0.01	<0.01	< 0.03	Absent
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	3.0	< 1.0	< 1.0	< 1.0	Nil	< 0.1	< 0.01	< 0.01	< 0.01	< 0.01	<0.01	< 0.03	Absent
	SWARNREKHA RIVER(NEAR BAGUN HATU)	5.8	< 1.0	< 1.0	< 1.0	Nil	< 0.1	< 0.01	< 0.01	< 0.01	< 0.01	<0.01	< 0.03	Absent
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	<2.0	< 1.0	< 1.0	< 1.0	Nil	< 0.1	< 0.01	< 0.01	< 0.01	< 0.01	<0.01	< 0.03	Absent
Mar-19	KHARKHAI RIVER (NEAR DUMUHANI)	30.0	< 1.0	< 1.0	< 1.0	Nil	< 0.1	< 0.01	< 0.01	< 0.01	< 0.01	<0.01	< 0.03	Absent
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	12.0	< 1.0	< 1.0	< 1.0	Nil	< 0.1	< 0.01	< 0.01	< 0.01	< 0.01	<0.01	< 0.03	Absent
	SWARNREKHA RIVER(NEAR BAGUN HATU)	22.0	< 1.0	< 1.0	< 1.0	Nil	< 0.1	< 0.01	< 0.01	< 0.01	< 0.01	<0.01	< 0.03	Absent
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	4.2	< 1.0	< 1.0	< 1.0	Nil	< 0.1	< 0.01	< 0.01	< 0.01	< 0.01	<0.01	< 0.03	Absent

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TATA STEEL LIMITED

ENVIRONMENT MANAGEMENT DEPARTMENT- LABORATORY

RIVER WATER MONITORING DONE BY NABL/MoEF LAB (OCT-18 to MAR- 19)

Month	Locations	Alachlor	Atrazine	Aldrin/Dieldrin	Alpha HCH	Beta HCH	Butachchlor	Chlorpyriphos	Delta HCH	2,4-Dichlorophenoxyacetic acid	DDT	Endosulfan	Ethion
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Oct-18	KHARKHAI RIVER (NEAR DUMUHANI)	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
	SWARNREKHA RIVER(NEAR BAGUN HATU)	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
Nov-18	KHARKHAI RIVER (NEAR DUMUHANI)	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
	SWARNREKHA RIVER(NEAR BAGUN HATU)	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
Dec-18	KHARKHAI RIVER (NEAR DUMUHANI)	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
	SWARNREKHA RIVER(NEAR BAGUN HATU)	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
Jan-19	KHARKHAI RIVER (NEAR DUMUHANI)	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
	SWARNREKHA RIVER(NEAR BAGUN HATU)	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
Feb-19	KHARKHAI RIVER (NEAR DUMUHANI)	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
	SWARNREKHA RIVER(NEAR BAGUN HATU)	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
Mar-19	KHARKHAI RIVER (NEAR DUMUHANI)	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
	SWARNREKHA RIVER(NEAR BAGUN HATU)	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent

Manager
Environment

Sr. Manager
Environment Management

TATA STEEL LIMITED

ENVIRONMENT MANAGEMENT DEPARTMENT- LABORATORY

RIVER WATER MONITORING DONE BY NABL/MoEF LAB (OCT-18 to MAR- 19)

Month	Locations	Gamma-HCH	Isoproturon	Malathion	Methyl Parathion	Monocrotophos	Phorate	Total Coliforms	E-Coli
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	MPN/100ml	MPN/100ml
Oct-18	KHARKHAI RIVER (NEAR DUMUHANI)	Absent	Absent	Absent	Absent	Absent	Absent	51	4
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	Absent	Absent	Absent	Absent	Absent	Absent	48	6
	SWARNREKHA RIVER(NEAR BAGUN HATU)	Absent	Absent	Absent	Absent	Absent	Absent	54	8
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	Absent	Absent	Absent	Absent	Absent	Absent	52	5
Nov-18	KHARKHAI RIVER (NEAR DUMUHANI)	Absent	Absent	Absent	Absent	Absent	Absent	48	2
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	Absent	Absent	Absent	Absent	Absent	Absent	40	2
	SWARNREKHA RIVER(NEAR BAGUN HATU)	Absent	Absent	Absent	Absent	Absent	Absent	50	6
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	Absent	Absent	Absent	Absent	Absent	Absent	48	4
Dec-18	KHARKHAI RIVER (NEAR DUMUHANI)	Absent	Absent	Absent	Absent	Absent	Absent	50	6
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	Absent	Absent	Absent	Absent	Absent	Absent	36	4
	SWARNREKHA RIVER(NEAR BAGUN HATU)	Absent	Absent	Absent	Absent	Absent	Absent	46	5
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	Absent	Absent	Absent	Absent	Absent	Absent	48	3
Jan-19	KHARKHAI RIVER (NEAR DUMUHANI)	Absent	Absent	Absent	Absent	Absent	Absent	46	4
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	Absent	Absent	Absent	Absent	Absent	Absent	38	2
	SWARNREKHA RIVER(NEAR BAGUN HATU)	Absent	Absent	Absent	Absent	Absent	Absent	42	4
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	Absent	Absent	Absent	Absent	Absent	Absent	42	5
Feb-19	KHARKHAI RIVER (NEAR DUMUHANI)	Absent	Absent	Absent	Absent	Absent	Absent	40	6
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	Absent	Absent	Absent	Absent	Absent	Absent	42	4
	SWARNREKHA RIVER(NEAR BAGUN HATU)	Absent	Absent	Absent	Absent	Absent	Absent	40	6
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	Absent	Absent	Absent	Absent	Absent	Absent	32	4
Mar-19	KHARKHAI RIVER (NEAR DUMUHANI)	Absent	Absent	Absent	Absent	Absent	Absent	38	4
	KHARKHAI RIVER (NEAR ADITYAPUR BRIDGE)	Absent	Absent	Absent	Absent	Absent	Absent	40	5
	SWARNREKHA RIVER(NEAR BAGUN HATU)	Absent	Absent	Absent	Absent	Absent	Absent	38	6
	SWARNREKHA RIVER(NEAR MANGO BRIDGE)	Absent	Absent	Absent	Absent	Absent	Absent	38	8

Manager Environment Management

Sr. Manager
Environment Management

Central Effluent Treatment Plant

	
Clarifier	Reverse Osmosis Building
	
Reverse Osmosis Plant	Side stream filter of CETP

Upgradation of ESPs

	
Sinter Plant 1 Waste Gas ESP	Sinter Plant 2 Waste Gas ESP
	
Sinter Plant 2 Refurbished ESP	Sinter Plant 3 Refurbished ESP
	
Sinter Plant 3 New Waste Gas ESP	Sinter Plant 2 New Waste Gas ESP

	
Tyre Washing Facility (TWF)	CDQ 40 MW Power Plant
	
Blast Furnace Sludge Drying Plant	OCEMS Central Server Room
	
NABL Accredited EMD Laboratory	ICP at EMD Laboratory

	
Open Steam Aging plant for LD Slag	Greenery inside Works

CHARTER FOR CORPORATE RESPONSIBILITY FOR ENVIRONMENT PROTECTION (CREP)
INTEGRATED IRON AND STEEL PLANT, TATA STEEL LIMITED, JAMSHEDPUR

STATUS OF COMPLIANCE FOR VARIOUS ACTION POINTS (Apr18- March 2019)

Action point 1: Coke Oven Plants

- To meet the parameters PLD (% leaking doors), PLL (% leaking lids), PLO (% leaking off take), of the notified standards under EPA within three years (by December 2005)

Compliance Status: Complied

Apr'18 to Mar'19:

No. of batteries	No. of Observations	Parameters											
		PLD (%)			PLO (%)			PLL (%)			Charging Emissions (Sec.)		
		Max.	Min.	Avg.	Max.	Min.	Avg.	Max.	Min.	Avg.	Max.	Min.	Avg.
Battery#5	12	9.30	1.70	5.10	0.00	0.00	0.00	0.00	0.00	0.00	70.00	23.00	40.90
Battery#6	12	9.70	2.60	5.60	0.00	0.00	0.00	0.90	0.00	0.00	72.00	25.00	42.00
Battery#7	12	6.60	1.90	3.10	0.00	0.00	0.00	0.00	0.00	0.00	65.00	28.00	42.10
Battery#8	12	5.20	1.30	3.60	0.00	0.00	0.00	0.80	0.00	0.10	36.00	20.00	26.10
Battery#9	12	5.30	1.50	3.20	0.00	0.00	0.00	0.80	0.00	0.00	45.00	17.00	24.60
Battery#10	12	6.00	2.90	4.40	1.20	0.00	0.10	0.40	0.00	0.00	38.00	14.00	22.00
Battery#11	12	4.90	1.80	3.30	1.20	0.00	0.00	0.40	0.00	0.00	30.00	12.00	17.30

- To rebuild at least 40% of the coke oven batteries in next 10 years (December 2012).

Compliance Status: Complied

Battery No.	Date of Commissioning	
	Initial	After Rebuilding
Battery # 5 (SC)	1988	Converted to Stamp charged-1995*
Battery # 6 (SC)	1988	Converted to Stamp charged-1993*
Battery # 7 (SC)	1988	Converted to Stamp charged-1989*
Battery # 8 (SC)	1998	
Battery # 9 (SC)	2000	
Battery # 10 (SC)	2012	
Battery # 11 (SC)	2014	

SC=Stamp Charged
Several rounds of hot repairs have taken place for rebuilding the damaged oven walls.

Action point 2: Steel Melting Shop

- Fugitive emissions to reduce 30% by March 2004 and 100% compliance with norms by March 2008 (including installation of secondary de-dusting facilities)
- Secondary de- dusting facilities at SMS: **Yes**

Compliance Status: Complied

- All the Steel Melting Shops (LD#1, LD#2 and LD#3) have been provided with secondary emission control system.
- Fugitive emission in SMS (Apr'18- Mar'19):

Name of the Unit	No. of Observations	PM (mg/m3)		
		Max	Min	Avg
LD#1	311	18.6	0.7	5.3
LD#2	210	150	3.4	52.2
LD#3	44	21	2.8	11.9

Action point 3: Blast Furnace

- Direct inject of reducing agents- by June 2013

Compliance Status: Complied

- Coal/Coal Tar and oil injection facilities are provided in all the Blast Furnaces. (Apr'18 to Mar'19)

Blast Furnace	Fuel Injected	Apr'18 to Mar'19 (kg/thm)
C BF	Coal Tar	54
D BF	Phase out	Down for relining
E BF	Coal Tar	34
F BF	Coal Dust	181
G BF	Coal Dust	199
H BF	Coal Dust	204
I BF	Coal Dust	205

Action point 4: Solid Waste / Hazardous Waste Management

- Utilization of Steel Melting Shop (SMS)/ Blast Furnace (BF) Slag as per the following schedule:

By 2004- 70%
By 2006- 80%
By 2008- 100%

Compliance Status: Present level

- All the Blast Furnaces which are in regular operation are fitted with On-line Slag Granulation Facility.

	BF Slag	**LD Slag**
Percentage utilized (%)	99%	100%
Type of utilization	Cement Making	Reuse in Sinter Plant, In-house construction etc.
Actions to be taken for ensuring 100% utilization	-	Various initiatives are undertaken for improving the utilization of LD Slag: • Successfully implemented Co-processing of LD Slag at Cement Kilns. • Trial of Steam aging (Closed/ Open) • Collaboration with expert external agency for processing and subsequent use of LD Slag as aggregates and ballast. • LD slag is being utilized for making for pavement block • Flue dust and other wastes as indicated are being recycled in sinter plant. • BF sludge is used in sinter plant. • Accreditation from Indian Road Congress for 2 years trail for LD Slag in Jun'14 Directive issued by Rural Works Department, Govt. of Jharkhand allowing TSL LD Slag to be used in construction of rural road in " Pradhan Mantri Gram Sadak Yojna" (PMGSY) within the periphery of 100 Kms of Jamshedpur Steel Works.

- Charge of tar sludge/ ETP sludge to Coke Oven by June 2003.

Compliance Status: Complied

- 100% of tar sludge and ETP sludge from Coke Ovens is being recycled/ reused.
- Inventorization of the Hazardous Waste as per Hazardous Waste (M&H) Rules, 1989 as amended from time to time and implementation of the Rules by December 2003.

Compliance Status: Complied

Hazardous Waste	Quantity generated in Apr'18 to Mar'19 (Tonnes)	Quantity charged to Coke Oven in Apr'18 to Mar'19 (Tonnes)	Method of transport
Coal Tar Sludge	351,551	361,955	Transported by trucks and sold users.
BOT Plant Sludge	821	821	Transported by trucks and charged by conveyors; Mixing with Coal and used in coke making in battery
Used Oil	196	-	Oil is reused after filtration and excess if any is sold to registered recyclers
Waste Oil sludge	2808	-	Sold to authorized party and incinerated
Zinc Dust Ash	610	-	Sold to authorized recyclers

Action point 5: Water conservation / Water Pollution

- Reducing specific water consumption to 5 m^3/t for long products and 8 m^3/t for flat products by 2005

Compliance Status: Complied

Specific water consumption details for Apr'18 to Mar'19:

Specific water consumption (m3/tcs)	
Long Products (m^3/tcs $_{FP}$)	**Flat Products (m^3/tcs $_{LP}$)**
2.74	3.83

- To operate CO-BP effluent treatment plant efficiently to achieve the notified effluent discharge standards- By July 2004

Compliance Status: Complied

Effluent Treatment Plant is meeting the statutory norms.

			Apr-18			May-18			Jun-18			Jul-18			Aug-18			Sep-18		
BOT TREATED	Parameter	UoM	Max	Min	Avg.	Max	Min	Avg.	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
	Ammonical Nitrogen (as N)	mg/L	4.6	1.0	2.3	44.6	25.9	38.0	42.1	32.1	37.7	45.1	24.3	34.4	45.6	29.3	39.6	47.0	27.8	41.5
	Free Cyanide (as CN-)	mg/L	0.15	0.05	0.12	0.15	0.12	0.13	0.17	0.14	0.15	0.16	0.12	0.15	0.18	0.16	0.17	0.19	0.17	0.18
	Oil & Grease	mg/L	1.6	0.2	0.7	1.8	0.2	0.8	2.0	0.8	1.3	2.0	1.2	1.6	1.8	1.2	1.5	8.8	4.1	5.7
	Total Suspended solids	mg/L	86	34	72	89	25	61	88	48	69	90	44	69	88	32	59	78	15	41
	Chemical Oxygen Demand, COD	mg/L	75	64	70	215	203	208	228	166	210	238	223	229	235	180	213	238	192	216
	Biological Oxygen Demand, BOD	mg/L	21	11	18	22	10	19	21	11	18	21	10	14	21	6	15	21	10	14
	pH	-	8.23	7.17	7.56	8.30	7.22	7.86	8.13	7.43	7.80	8.06	7.28	7.70	8.15	7.23	7.63	8.30	7.00	7.72
	Phenol	mg/L	0.46	0.14	0.24	0.51	0.08	0.22	0.41	0.08	0.23	0.61	0.10	0.29	0.61	0.10	0.29	0.48	0.10	0.26

			Oct-18			Nov-18			Dec-18			Jan-19			Feb-19			Mar-19		
BOT TREATED	Parameter	UoM	Max	Min	Avg.	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg
	Ammonical Nitrogen (as N)	mg/L	49.3	13.5	37.3	48.7	9.5	33.7	49.4	15.0	37.6	49.4	5.4	43.0	47.6	0.2	13.4	6.6	0.8	2.3
	Free Cyanide (as CN-)	mg/L	0.20	0.16	0.19	0.20	0.15	0.19	0.20	0.12	0.19	0.2	0.1	0.2	0.19	0.10	0.18	0.18	0.11	0.18
	Oil & Grease	mg/L	8.8	3.2	6.4	9.6	3.2	5.5	6.0	3.2	4.6	7.2	3.0	4.8	6.0	4.0	5.2	5.6	3.2	4.7
	Total Suspended solids	mg/L	95	22	55	92.0	35.0	55.8	98.0	42.0	61.9	94.0	31.0	57.8	94.0	22.0	58.8	90.0	16.0	52.3
	Chemical Oxygen Demand, COD	mg/L	245	132	174	246.0	140.0	206.6	247.0	205.0	233.0	249.0	181.0	223.1	246.0	102.0	199.3	246.0	105.0	193.4
	Biological Oxygen Demand, BOD	mg/L	21	10	18	29.4	6.3	21.8	21.9	11.0	19.3	21.9	10.7	19.3	22.1	10.9	20.1	22.0	12.5	20.8
	pH	-	8.00	6.52	7.45	8.08	6.78	7.30	8.47	6.68	7.48	8.2	6.4	7.6	8.4	6.5	7.4	8.25	6.86	7.44
	Phenol	mg/L	0.28	0.02	0.14	0.36	0.09	0.18	0.57	0.04	0.16	0.3	0.0	0.1	0.4	0.0	0.1	0.4	0.0	0.2

Action point 6: Continuous stack monitoring system & its calibration, and installation of on-line ambient air quality monitoring station by June 2005.

Compliance Status: Complied

- Online stack monitoring system have been installed at major stacks.
- 4 AAQMS stations have been commissioned.

Locations/ Area	No. of Stacks connected to CPCB, New Delhi for OCEMS	No. of Stacks to be connected to CPCB, New Delhi for OCEMS	Remarks
Blast Furnace	23	1	DBF Stove (Closed for relining)
Coke Oven	9		
LD Shop	20		
Lime Plant	12		
Pellet Plant	6		
Power Plant	9		
Sinter Plant	9		
Total	88	1	

Action Point 7: Operation of pollution Control Equipment

To operate the existing pollution control equipment efficiently and to have proper record of run hours, failure time and efficiency with immediate effect. Compliance report in this regard to be submitted to CPCB/SPCB every three months.

Compliance Status: Complied

Status of Air Pollution Control Equipment (Apr'18- Mar'19)

Departments	Bag Filter Availability %
A-F BF	98.0%
Coke Plant 5,6,7	65.0%
Coke Plant 10,11	91.0%
G BF	97.0%
H BF	86.0%
I BF	88.0%
Pellet Plant	92.0%

RMBB # 1	98.0%
RMBB # 2	95.0 %
SP # 1	95.0%
SP # 2	89.0%
SP # 3	96.0%
SP # 4	98.0%
RMM	87.0%
Lime Plant	85.0%
LD # 1	96.0%
LD # 2 & SC	82.0%
LD # 3 TSCR	96.0%

Status of Wastewater Pollution Control Equipment (Apr'18- Mar'19)

Area/Location	Water Pollution Control System	Availability (%)
Coke Plant	BOT Plant	100%
A-F Blast Furnace	Waste water treatment plant	100%
G Blast Furnace	Waste water treatment plant	100%
H Blast Furnace	Waste water treatment plant	100%
I Blast Furnace	Waste water treatment plant	100%
LD1 and BC	Waste water treatment plant	100%
LD2 and SC	Waste water treatment plant	100%
LD3 and TSCR	Waste water treatment plant	100%
Wire Rod Mill	Waste water treatment plant	100%
Hot Strip Mill	Waste water treatment plant	100%
Cold Rolling Mill	Waste water treatment plant	100%
New Bar Mill	Waste water treatment plant	100%
Merchant Mill	Waste water treatment plant	100%
CETP	Waste water treatment plant	100%

Action point 8: Implementation of LCA study
To implement the recommendations of Life Cycle Assessment (LCA) study sponsored by MoEF&CC by December 2003.

Compliance Status: Complied

- Reduction of Green House Gases by:
  - ❖ Reduction in power consumption
  - ❖ Use of by-products gases for power generation- **Yes**/ ~~No~~
  - ❖ Promotion of Energy Optimisation technology, including energy audit- **Yes**/ ~~No~~

To set targets for Resource Conservation such as Raw material, energy and water consumption to match International Standards

	Actual FY-19	**Target for FY 20**
Specific Water Consumption (m^3/TCS)	3.27	2.97
Energy consumption (GCal/ TCS)	5.677	5.549
GHG (CO_2) emission (Ton/ TCS)	2.28	2.25
Steps taken for Resource Conservation	Yes	Yes
Environmental monitoring laboratory provided (Y/N)	Yes	Yes

- Up-gradation in the monitoring analysis facilities for air and water pollutants. Also, to impart elaborate training to the manpower in the environmental monitoring laboratories, so as realistic data can be obtained
- Monitoring facilities upgraded : **Yes**/~~No~~
- Training provided to laboratory personnel : **Yes**/~~No~~
- To improve housekeeping : **Being Done**

Action point 9: Clean Technologies

The industry will initiate steps to adopt the following clean technologies / measures to improve the performance of the industry towards production, energy and environment.

- Energy recovery of top Blast Furnace (BF) gas.
- Use of Tar-free runner linings.
- De-dusting of Cast House at tap holes, runners, skimmers, ladle and charging points
- Suppression of fugitive emissions using nitrogen gas or any other inert gas.
- To study the possibility of slag and fly ash Transportation back to the abandoned mines to fill up the cavities through empty railway wagons when they return back to the mines and its implementation.
- Processing of the waste containing flux & ferrous wastes through waste recycling plant.
- To implement rain water harvesting.

Clean technologies to be implemented	**Status, Provided Yes/ No**
Energy recovery of top Blast Furnace (BF) gas	TRT has been commissioned in G, H & I Blast Furnace.
Use of Tar-free runner linings.	Tar lining in the runner is not used.
De-dusting of Cast House at tap holes, runners, skimmers, ladle and charging points.	De-dusting facility in the cast house has been provided in F, G, H & I Blast Furnaces.
Suppression of fugitive emissions using nitrogen gas or any other inert gas	We have studied this system in detail and found the same very unsafe and have decided to not to go for it. Instead, dust extraction facilities have been installed wherever required.

To study the possibility of slag and fly ash transportation back to the abandoned mines, to fill up the cavities through empty railway wagons while they return back to the mines and its implementation.	None of our mines are abandoned so far. However, all the coal-fired boilers in Steel Works have been converted to gas firing. Coal will be fired only in emergency in one Boiler from where limited quantity of ash is being disposed in slurry form in captive ash pond.
Processing of the waste containing flux & ferrous wastes through waste recycling plant.	We have a metal recovery and slag processing plant for the same and such material is used in iron and steel making processes.
Implement rain water harvesting	Rainwater harvesting is in practice inside the Steel Works. Surface run-off is collected in cooling ponds/ catchments and pick up of fresh water from river is reduced during rainy seasons. Rainwater Harvesting has been installed in 37 locations (Steelenium Hall, SHE, MPDS, LD 3, rebar mill ECR, R&D and ITS Building) within Works.