

Half Yearly Compliance Report
for the period October'18 – March'19
of

Environment Clearance accorded by MoEF&CC
vide no. J-11015/108/2006-IA.II(M)
for

West Bokaro Open Cast Coal Mine
Tata Steel Limited

PO: Ghatotand, Block: Mandu
Dist.: Ramgarh, Jharkhand - 825314



Specific Conditions:

- (i) **No mining operations shall be undertaken in the forestland until clearance has been obtained under the provisions of FC Act, 1980.**

Compliance:

Being complied with.

- (ii) **The embankment along the River Bokaro shall be designed taking into account the highest flood level, based on past data, along the quarry area at the mine boundary along the River Bokaro so as to guard against mine inundation. The slope of the embankment shall at least 2:1 towards the ML and shall be stabilized by plantation. The height of the embankment shall be at least 5 m higher than the HFL.**

Compliance:

There is natural solid surface along the quarry area at the mine boundary along the River Bokaro to guard against mine inundation. The existing height of the natural solid surface along the Bokaro river is more than 5 m higher than the HFL. The HFL observed was 336 meters while the lower most level of quarry boundary or natural solid surface is 346 meters. At the same time 30 meters wide solid surface has also been left from river to avoid any ingress of water in the mine pit. Plantation by seed spray was done on the slope surface for stabilization. Further, Seed balls spreading will be done for further stabilization of slope surface. Photograph of the stabilized slope by grass plantation is shown below.



- (iii) **Topsoil should be stacked properly with proper slope at earmarked site(s) and should not be kept active and shall be used for reclamation and development of green belt.**

Compliance:

Currently, mining operation is being carried out laterally only so there is no top soil generation and previously accumulated top soil was used to spread over dumps for the plantation purpose. Catch drain on the one side of the top soil dump was cleaned after the monsoon. Photographs of Top Soil stack are with maintained drain and use of top soil for spreading on dump for plantation are shown below.

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Top Soil spreading on dump for plantation



Maintained catch drain of Top Soil Dump

- (iv) **No new external OB dumps shall be created for storing OB. Monitoring and management of existing reclaimed dump sites should continue until the vegetation becomes self sustaining. Compliance status should be submitted to the Ministry of Environment & Forests and its Regional office located at Bhubaneswar on and yearly basis.**

Compliance:

No new external OB dumps shall be created for storing of OB. Mined-out area and existing OB dumps are available in the operating mining area, which are being used for OB dumping. The existing reclaimed dump site is being monitored & maintained to sustain vegetation on regular basis and gap filling plantation is being done against the mortality of the plantation. Further, old dump area has been identified and taken up for reclamation. Soil spreading followed by grass seed spreading and native species plantation is on going.



Soil & grass Spreading on dump slope



Plantation on dump slope



Plantation on dump slope





Back filling of quarry by Over Burden

- (v) **Catch drains and siltation ponds of appropriate size should be constructed to arrest silt and sediment flows from soil, OB and mineral dumps. The water so collected should be utilized for watering the mine area, roads, green belt development, etc. The drains should be regularly desilted and maintained properly. Garland drains (size, gradient and length) and sump capacity should be designed keeping 50% safety margin over and above the peak sudden rainfall and maximum discharge in the area adjoining the mine site. Sump capacity should also be provided adequate retention period to allow proper settling of silt material.**

Compliance:

OB dumps have been created with inward slope so no water flows outside the dump to prevent soil erosion and siltation. Further, catch drains on the toe of the OB dump were made with slope towards quarry to divert all the runoff water into the quarry pit. Collected rain water is being used for dust suppression purpose. Catch drains were desilted before the monsoon and maintained thereafter. Construction of garland drain and toe wall is a regular practice to take care of run-off water.

The mine quarry act as a big sump with approximate sump capacity 50 - 120 million gallons, considering maximum rainfall & depending upon the catchment area. Further, accumulated mine pit water is also being used in industrial and domestic purpose after necessary treatment. One of the abandoned quarry is being used as Rain Water Harvesting Structure.



Catch Drains at the toe of dumps

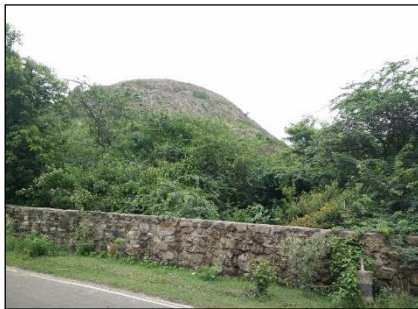


Abandoned mine pit as RWH pond

- (vi) **Dimension of the retaining wall at the toe of the dumps and OB benches within the mine to check run-off and siltation should be based on the rainfall data.**

Compliance:

Dumps have been created with inward slope so that maximum runoff water in monsoon comes into the mine pits and no runoff water goes outside the mining lease. Further, toe wall and garland drains have been made to channelize the water inside the mine pit. Damaged toe walls are being repaired on regular basis. Photographs of the toe wall and garland drains area shown below.



Toe walls on dumps



Garland drain in the area

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(vii) **Crushers at the CHP should be operated with high efficiency bag filters, water sprinkling system should be provided to check fugitive emissions from crushing operations, conveyor system, haulage roads, transfer points, etc.**

Compliance:

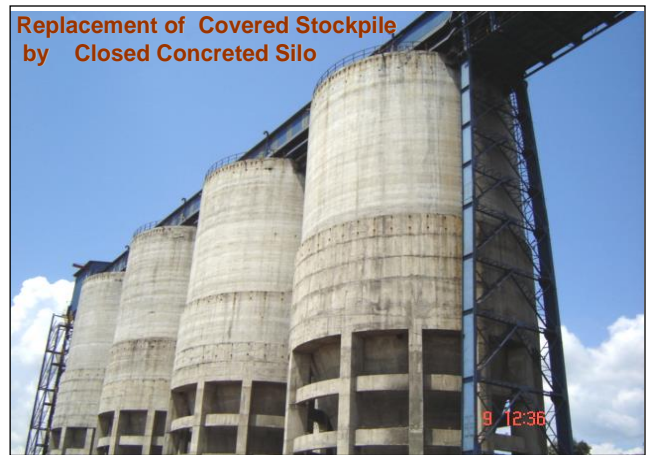
Crusher houses and CHP areas are equipped with dry fog dust suppression system. Fixed type dust suppression system is installed at all conveyor networks & various mineral transfer points. Conventional coal stock yards are replaced with concrete silos for dust controls. Mobile water sprinklers (pressurized water tankers) are used in mine haul roads and approach roads. Coal from mining to washery is being sent through pipe conveyor to reduce the fugitive emission. Water Mist Canon is being used in coal stacking area.



Use of fixed & mobile water sprinklers



Dry fog system



Replacement of Covered Stockpile by Closed Concreted Silo

concrete silos for material storage



Water Mist Canon in coal stacking area



Pipe Conveyor for material transport

- (viii) **Drills should be wet operated.**

Compliance:

All the drills are wet operated and interlocked with drill operations.



Wet Drilling

- (ix) **Controlled blasting should be practiced only during day time with use of delay detonators. The mitigative measures for control of ground vibrations and to arrest the fly rocks and boulders should be implemented.**

Compliance:

Blasting in mines area is regularly being practiced in day time only. Controlled blasting is practiced in the close proximity of structure, continuous monitoring along with data collection is being practiced. Delay detonators are used to minimize vibration, dust & formation of fly rocks. However, at regular intervals scientific study is also been conducted from reputed & recognized organizations.

- (x) **Area brought under afforestation shall not be less than 1260 ha which includes reclaimed external OB dump (85 ha), backfilled area (974 ha), along ML boundary, along roads, green belt (201 ha), in undisturbed areas and in colony within the mine lease area by planting native species in consultation with the local DFO/ Agriculture Department. The density of the trees should be around 2500 plants per ha.**

Compliance:

Progressive afforestation is practiced as per plan in the area. Last year about 55000 native trees, shrubs and grass saplings have been planted and the thrust has been given for green belt development along the safety zone in the area and mined out area. local and native species was planted, including OB dumps, lease boundary, residential colonies, and coal dispatch area. Voluntary afforestation in & around villages is also being done with company employees and local communities. Progressive afforestation is practiced as per plan in the area. In 2018, approximate 55000 saplings have been planted. Photographs of the same are shown below.

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Plantation activities

TATA Steel is committed to conserve, enhance & restore the biodiversity in it's areas of operations and made a biodiversity policy to achieve no net loss of biodiversity over a period of time. Various initiatives are taken to conserve and restore the bio-diversity in the area in consultation with IUCN & forest officials. To enhance the bio diversity of the area, a butterfly park is made. To enhance the medicinal and hibiscus habitat, hibiscus and medicinal park were also made. Further, we are developing a native plant species nursery in the mined out area.



Biodiversity Initiatives



Butterfly park development on mined out area



Hibiscus and Medicinal park development on mined out area



Inhouse development of Native Plant Species Nursery

- (xi) **A Progressive Closure Plan shall be implemented by reclamation of quarry area of 974 ha which shall be backfilled and afforested by planting native plant species in consultation with the local DFO/ Agriculture Department. The density of the trees should be around 2500 plants per ha. The balance 20 ha of de coaled area being converted into a water reservoir shall gently slope along the upper benches and stabilized and reclaimed with plantation.**

Compliance:

Mine plan & mine closure plan was approved by Ministry of Coal, which includes all plantation details. Afforestation & reclamation of de-coaled area shall be done by planting native species in consultation with DFO / Agriculture departments as per prevailing guidelines. As per approved mine plan, all dumps will be re-handled as the mine progress, however to stabilize the dumps, plantation was done by lemon grass, native trees, native shrubs and we have also done the soil spreading on dump slopes followed by grass seed spreading and native tree plantation.



Lemon grass in the dump



Soil & grass Spreading on dump slope



Plantation on dump slope

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- (xii) A Conservation Plan for endangered species found in and around the project area shall be formulated and for the medicinal plants (in-situ and ex-situ) shall be prepared and implemented in consultation with the State Forest and Wildlife Departments. Separate funds shall be earmarked for implementation of the various activities there under and the status thereof shall be regularly reported to this Ministry and the MoEF Regional Office, Bhubaneswar.

Compliance:

The project area doesn't have any endangered species found in and around area. However, some of the plants of having medicinal values are conserved by developing an area.

Some of the species of medicinal importance are as:



Datura



Sarpagandha



Tulsi



Periwinkle



Ghrith Kumari



Coleus aromaticus



Ginger



Adosa



Kadi patta

To conserve, restore and enhance the medicinal plants in the area, a separate medicinal garden also being prepared at one of the OB dump. Besides above several medicinal plants such as Bael (*Aegle marmelos*), Neem (*Azadirachta indica*), Avla (*Phyllanthus emblica*), Karanj (*Millettia pinnata*), Ber (*Ziziphus mauritiana*), Sarifa (*Annona squamosa*) were also planted in the area. Further, to enhance the medicinal and hibiscus habitat, hibiscus and medicinal park were also made.

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Hibiscus and Medicinal park development on mined out area

- (xiii) **No groundwater shall be used for the mining / project activities. Additional water required, if any, shall be met by recycling / reuse of the water from the existing activities and from rainwater harvesting measures.**

Compliance:

It is being complied and regularly practiced; no ground water is used for mining & other project activities. An abandoned mine pit is converted into rain water harvesting (RWH) pond of capacity of 1200 Million Gallon, which is being used for industrial and domestic purpose after proper treatment as per the requirement. All the plants are operated at Zero Effluent Discharge (ZED) and entire processed water is recycled and reused. We are recycling the washery outlet water after dewatering process of tailings in our dewatering plant and further, recycling of water from the tailings ponds in a closed circuit. Photographs of the same are shown below.



Abandoned mine pit converted into RWH pond



Water Recycling from tailings ponds



Tailing Dewatering Plant and Filter Press

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Further, we are planning to store active mine pit water into abandoned mine pit to use in lean season. Pipe laying Job is in progress. And photographs of the same are shown below.



Pipeline installation from active quarry pit to abandoned mine pit

- (xiv) **Regular monitoring of groundwater level and quality should be carried out by establishing a network of existing wells and construction of new piezometers. The monitoring for quantity should be done four times a year in pre-monsoon (May), monsoon (August), post-monsoon (November) and winter (January) seasons and for quality in May. Data thus collected should be submitted to the Ministry of Environment & Forests and to the Central Pollution Control Board quarterly within one month of monitoring.**

Compliance:

Regular monitoring is being carried out on quarterly and half yearly basis for ground water quantity and quality respectively by existing well and details are being sent to MoEF&CC regional office and CPCB office on quarterly basis. Further, we have constructed 5 nos. of bore holes inside the mining lease for regular ground water level monitoring and piezometer installation is also in progress.



BH-1

BH-2

BH-3

BH-4

BH-5

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- (xv) The Company shall put up artificial groundwater recharge measures for augmentation of groundwater resource. The project authorities should meet water requirement of nearby village(s) in case the village wells go dry due to dewatering of mine.

Compliance:

The ground water recharge measures are continuously being taken up and thrust has already been put up to streamline drinking water projects, which includes construction of ponds, bore well, check dams etc. in and around our leasehold areas. We have converted abandoned mined out pit near pundi area as a large water reservoir which helps to recharge the ground level.



CHECK DAM WITH SHUTTERING ARRANGEMENT TO MAXIMISE THE RECHARGE OF AQUIFER

Abandoned Mine pit converted into RWH pond Check Dam to increase ground water recharge



Artificial ground water recharge pit (Bore well) in Birhor village



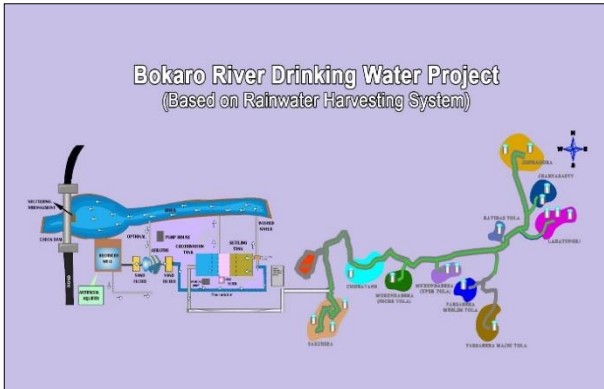
Rainwater Harvesting structures in Rahwan and Durukasmar Village

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We are supplying the drinking water to the nearby villages by pipe line network from our mine pit water followed by water softening facility and we have also constructed a Rain Water Harvesting cum water treatment facility to supply water to nearby 7 villages.



Artificial pond for recharging and Drinking Water System at Atna village



RWH cum drinking water project at Duni village

- (xvi) **ETP should also be provided for workshop, coal washery and CHP. There shall be zero discharge of wastewater from CHP and the coal washeries. Effluents from the tailings pond shall be treated to conform to prescribed standards in case of discharge into any water course outside the lease.**

Compliance:

Zero Effluent Discharge (ZED) is being maintained at Coal Washery, CHP, workshops & power plant; the effluent generated is completely recycled & reused. In addition to above, mechanical tailing dewatering system is installed for Washery & CHP area by which the tailing slurry is handled through high frequency screen and belt press to produce dry tailings and recover water for recycling.



Mechanical tailings de-watering system

Output of HFC at tailing dewatering plant

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Oil traps are also installed for workshops.



Oil & Grease trap at mines

The water from tailing pond after proper de-silting of tailings is recycled back to washeries to maintain zero discharge.



Water Recycling from tailings ponds

- (xvii) **A STP shall be provided for the township / colony to treat the domestic effluents to prescribed standards and for their reuse in project activities.**

Compliance:

A Sewage Treatment Plant (STP) of 240 KLD is already installed in the residential block and treated water is being reused in dust suppression of road. Further, a detailed feasibility study has been done by ISM Dhanbad for the STP requirement for the remaining areas and higher management budget approval for is in process.



Sewage Treatment Plant (0.24 MLD) at West Bokaro

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- (xviii) **R&R shall be based on norms laid down by the State Government and shall not be inferior than that in the National R&R Policy and shall be completed within a specified time - frame.**

Compliance:

Tata Steel's West Boakro Colliery was granted a mining lease of 1740 Ha. and all the operations are confined within the leasehold area and further, there is no additional land acquisition envisaged for the project so there is no applicability of R & R for the project. Although, we are shifting the illegal inhabitants (encroachers) outside the working area.

- (xix) **For monitoring land use pattern and for post mining land use, a time series of land use maps, based on satellite imagery (on a scale of 1: 5000) of the core zone and buffer zone, from the start of the project until end of mine life shall be prepared once in 3 years (for any one particular season which is consistent in the time series), and the report submitted to MoEF and its Regional office at Bhubaneswar.**

Compliance:

A Land use maps was prepared for core and buffer zone with a detailed study report and the same was submitted to Regional office of Ministry of Environment, Forest & Climate change.

- (xx) **A Final Mine Closure Plan along with details of Corpus Fund should be submitted to the Ministry of Environment & Forests for approval 5 years in advance of final mine closure for approval.**

Compliance:

It will be complied five years in advance of final mine closure plan for approval. An adequate fund has been provided separately for final mine closure activity.

- (xxi) **Consent to operate shall be obtained before expanding mining operations.**

Compliance:

Consent to operate is being obtained regularly.

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General Conditions:

- (i) **No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment and Forests.**

Compliance:

No change in mining technology shall be made without prior approval of the Ministry of Environment, Forests & Climate Change.

- (ii) **No change in the calendar plan including excavation, quantum of mineral coal and waste should be made.**

Compliance:

Complied with

- (iii) **Four ambient air quality monitoring stations should be established in the core zone as well as in the buffer zone for SPM, RPM, SO₂ and NO_x monitoring. Location of the stations should be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the SPCB.**

Compliance:

Consulted with Regional Officer of State Pollution Control Board, by considering the predominate wind direction, base line study and Air modeling 4 station in buffer zone and 4 stations in core zone has been established for ambient air quality monitoring.

- (iv) **Fugitive dust emissions (SPM and RPM) from all the sources should be controlled regularly monitored and data recorded properly. Water spraying arrangement on haul roads, wagon loading, dump trucks (loading and unloading) points should be provided and properly maintained.**

Compliance:

All the strategic locations of operating plants with the possibilities of fugitive dust emissions has been provided with adequate enclosures, side skirt, chute, seal plate, sealing of transfer points along with adequate dust suppression system. The haul road, loading and unloading points are provided with pressurized water tanker for water spraying along with chemical dosing, wagon loading does not require any water spraying since the coal is in moist condition. Fixed water sprinklers have been provided on the roads. Further, closed pipe conveyors and belt conveyors are being used for material transfer from mine pit head crushing plant to washeries. water mist canon is being used at material stock yards and water chemical crust is being used on outgoing material carrying trucks to eliminate the fugitive emission. All the sites are monitored regularly and data is kept for record.

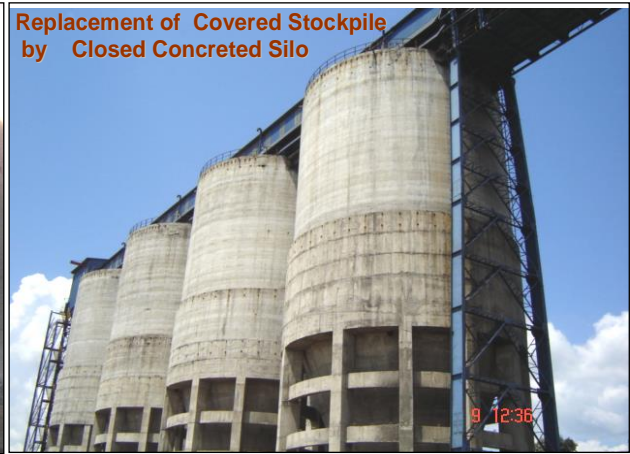


Use of fixed & mobile water sprinklers

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Dry fog system



Replacement of Covered Stockpile
by Closed Concreted Silo

concrete silos for material storage



Water Mist Canon in coal stacking area



Pipe Conveyor for material transport

- (v) **Data on ambient air quality (SPM, RPM, SO₂ and NO_x) should be regularly submitted to the Ministry including its Regional Office at Bhubneshwar and to the State Pollution Control Board and to the Central Pollution Control Board once in six months.**

Compliance:

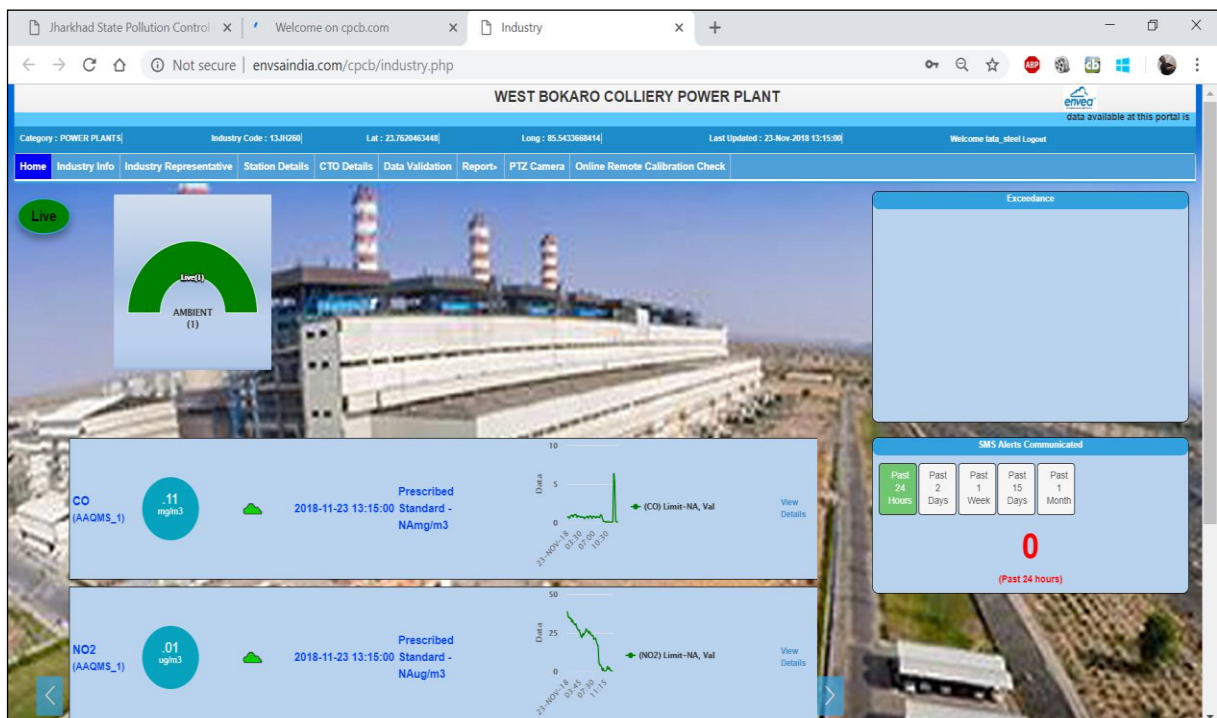
Being complied with, All environmental monitoring data for the period from Oct'18 to Mar'19 is attached as an **Annexure-I**.

Continuous Ambient Air Quality Monitoring System (CAAQMS) is installed at division and being operational. All the parameters such as PM₁₀, PM_{2.5}, NO, NO₂, NO_x, CO, SO₂, Wind Speed (in m/s), and Wind Direction (in degree) are recorded on every 15 minutes interval, all parameters were measured by analyzers equipped in mobile van. A displayed unit is also, installed at main entrance of division. All the instruments including mobile van is supplied by CPCB authorized agency & approved from USEPA. The data connectivity with CPCB & JSPCB server and transmission facility is being installed.

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Continuous Ambient Air Quality machine (CAAQMS) for data monitoring system



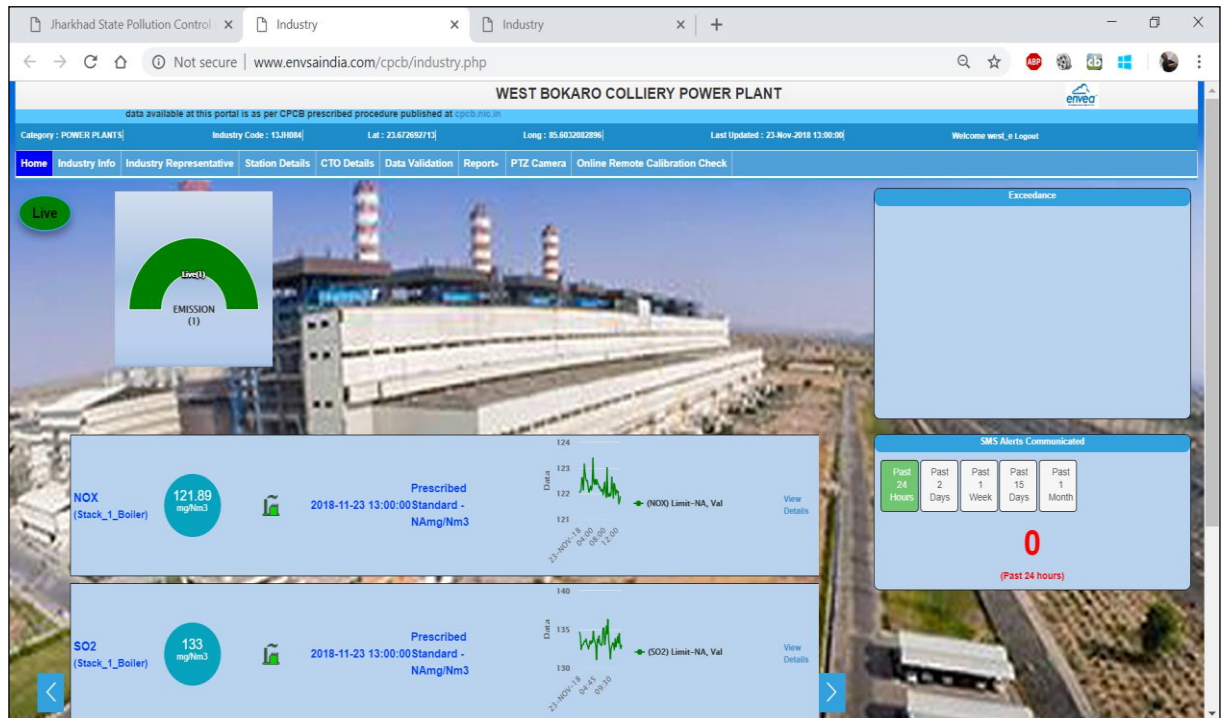
Online CAAQMS data transmission to CPCB and JSPCB server

Online emission monitoring for FBC based 2x10MW captive power plant is installed at for PM, SO₂ & NO_x monitoring in stack and continuously being transmitted to JSPCB server. Electro Static Precipitator (ESP) is attached with the power plant and is regularly being maintained. The quality & quantity of emission is maintained well within limit as per standard. All the data of PM, SO_x & NO_x are working smoothly. The data connectivity with CPCB & JSPCB server and transmission facility is being installed.



Continuous Emission Monitoring for Power House for PM, SO₂ & NO_x data

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Online CEMS data transmission to CPCB and JSPCB server

- (vi) Adequate measures should be taken for control of noise levels below 85 db(A) in the work environment. Workers engaged in blasting and drilling operations, operation of HEMM, etc should be provided with ear plugs/ muffs.

Compliance:

Control measures are being taken up to keep noise level well within limit in working environment by providing adequate enclosure/ separation to the various high noise sources, proper maintenance, provision of control room, operator's a/c cabin etc. In addition, all the persons are provided with PPEs such as ear plug/ muff during work. Warning signs in local language are also displayed at various areas in mines & plant. An adequate green belt is also maintained in the area.



Noise control measures in the area

- (vii) Industrial wastewater (workshop and wastewater from the mine) 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 from time to time before discharge. Oil and grease trap should be installed before discharge of workshop effluents.

Compliance:

The Industrial wastewaters generated from various operations are handled through effluent management system provided in all operational dept. with the objective to treat the effluent and recycle the clear water into the system again. The HEMM maintenance shops have been provided

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with oil trap arrangement to recover the oil during washing of equipments. The recovered used oil during washing is sold to authorized recycler as per guideline and the effluent generated is checked for quality and recycled -reused in the system.



Oil trap in mines

Zero Effluent Discharge (ZED) being maintained at all units including captive power plant (2x10MW FBC). A web camera along with flow meter is installed at discharge end and all data being regularly submitted to state pollution control board.



Live web camera footage installed at discharge point



Online Effluent Monitoring System installed at site (Power Plant)

- (viii) **Vehicular emissions should be kept under control and regularly monitored vehicles used for transporting the mineral should be covered with tarpaulins and optimally loaded.**

Compliance:

Vehicular emission is kept under control by regularly monitoring & maintenance of vehicles. overloading of vehicles is avoided during mineral transport. All the vehicles during transport of material covered with tarpaulin sheet. We also also transferring material by pipe conveyors.

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Pipe Conveyor



Covered Trucks



Conveyor belts

Introduced upgraded mode of transportation- Pipe conveyor to eliminate spillage/dust/unsafe condition

- (ix) **Environmental laboratory should be established with adequate number and type of pollution monitoring and analysis equipment in consultation with the State Pollution Control Board.**

Compliance:

A full-fledged Environmental laboratory is functioning with adequate number of pollution monitoring and analysis instruments. Accreditation of laboratory from NABL is under process.

- (x) **Personnel working in dusty areas should wear protective respiratory devices and they should also be provided with adequate training and information on safety and health aspects. Occupational health surveillance programme of the workers should be undertaken periodically to observe any contractions due to exposure to dust and to take corrective measures, if needed.**

Compliance:

All dusty areas such as crushers etc. are provided with dry fog system and fixed dust sprinklers so as to eliminate dust from source. All haul roads, are equipped with fixed and mobile dust sprinklers. All drill operations are wet only. The operators of various HEMM being operated inside the mines are provided with air-condition cabins. In addition, dust mask has been provided to the personnel working in dusty area. The persons have been imparted necessary training on safe work practices and appraised the adverse consequences on health in case of any violation of the practices. Occupation health surveillance program is being conducted on regular basis in our Hospital for health checkup as per the coal mines rule. The health awareness program is also being conducted regularly in all the departments.

- (xi) **A separate environmental management cell with suitable qualified personnel should be set up under the control of a Senior Executive, who will report directly to the Head of the company.**

Compliance:

A separate Environment Management Cell is in place with qualified person reporting to Top management. Details of the personals of Environmental Management Cell is as follows:

Sl. No.	Name	Designation	Work Experience
1	Dr. M K Gupta	Head (Environment & Forest)	25 years
2	Mr. Utsav Kashyap	Sr. Manager (Environment)	9 years
3	Mr. Amritanshu	Manager (Environment)	2 years
4	Mr. Kushwaha	Manager (Horticulture)	7 years
5	Mr. Nageshwar Mahato	Lab. Asst.	18 years
6	Mr. Budhan Besra	Lab. Asst.	17 years
7	Mr. Ajay Singh	Chemist	30 years
8	Mr. G A Khan	Chemist	26 years
9	Mr. Sunil Kumar	Ministerial staff	7 years
10	Mr. Ajay	-do-	10 years

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- (xii) **The funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purpose. Year-wise expenditure should be reported to this Ministry and its Regional Office at Bhubaneswar.**

Compliance:

The Environmental Management Cell of West Bokaro Division having separate fund for environmental protection measures / compliance to legal requirements. Besides above, all other departments are also maintaining expenditure details for environmental protection measures in their working area. The expenditure occurred during the financial year 2018-19 is more than Rs.4658.53 Lakh. Details are attached as Annexure-II.

- (xiii) **The Regional Office of this Ministry located at Bhubaneswar shall monitor compliance of the stipulated conditions. The Project authorities shall extend full cooperation to the office(s) of the Regional Office by furnishing the requisite data/ information/monitoring reports.**

Compliance:

Being complied with.

- (xiv) **A copy of the clearance letter will be marked to concerned Panchayat / local NGO, if any, from whom any suggestion / representation has been received while processing the proposal.**

Compliance:

A copy of the Environmental Clearance letter was submitted to The Panchayat Sewak vide letter no. WBD/EMC-10/59/07 dated: 12.06.2007.

- (xv) **State Pollution Control Board should display a copy of the clearance letter at the Regional Office, District Industry Centre and Collector's Office/ Tehsildar's Office for 30 days.**

Compliance:

Complied with.

- (xvi) **The Project authorities should advertise at least in two local newspapers widely circulated around the project, one of which shall be in the vernacular language of the locality concerned within seven days of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and may also be seen at the website of the ministry of Environment & Forests at <http://envfor.nic.in>.**

Compliance:

Complied with.

AMBIENT AIR QUALITY REPORT

(As National Ambient air quality monitoring standard dated 18th November, 2009)

Oct'18 to Dec'18

Industry Name: West Bokaro Division, Tata Steel Limited

Date of Sampling	Near Pundi			Near Banji			Near Chainpur Mandap			Near Duni			Near Mukundbeda							
	PM ₁₀	PM _{2.5}	NO _x	PM ₁₀	PM _{2.5}	NO _x	Date of Sampling	PM ₁₀	PM _{2.5}	SO ₂	NO _x	Date of Sampling	PM ₁₀	PM _{2.5}	SO ₂	Date of Sampling	PM ₁₀	PM _{2.5}	SO ₂	NO _x
01-Oct-18	48.00	29.00	28.00	47.00	26.00	21.00	03-Oct-18	69.00	37.00	27.00	34.00	01-Oct-18	43.00	29.00	11.00	03-Oct-18	79.00	44.00	21.00	29.00
04-Oct-18	52.00	27.00	24.00	44.00	28.00	27.00	09-Oct-18	73.00	41.00	24.00	28.00	04-Oct-18	47.00	26.00	14.00	09-Oct-18	81.00	47.00	19.00	24.00
08-Oct-18	47.00	28.00	27.00	49.00	26.00	24.00	17-Oct-18	74.00	36.00	26.00	29.00	08-Oct-18	44.00	32.00	17.00	17-Oct-18	78.00	43.00	17.00	27.00
11-Oct-18	51.00	24.00	23.00	45.00	23.00	19.00	22-Oct-18	71.00	39.00	19.00	31.00	15-Oct-18	47.00	27.00	15.00	01-Oct-18	77.00	45.00	27.00	21.00
15-Oct-18	53.00	27.00	21.00	48.00	27.00	22.00	25-Oct-18	72.00	37.00	21.00	33.00	15-Oct-18	49.00	29.00	17.00	25-Oct-18	74.00	49.00	23.00	23.00
01-Nov-18	46.00	24.00	23.00	47.00	23.00	27.00	05-Nov-18	69.00	41.00	17.00	37.00	01-Nov-18	47.00	24.00	19.00	05-Nov-18	72.00	46.00	21.00	27.00
08-Nov-18	47.00	27.00	18.00	48.00	25.00	23.00	12-Nov-18	75.00	43.00	21.00	34.00	05-Nov-18	51.00	23.00	18.00	06-Nov-18	75.00	47.00	23.00	27.00
15-Nov-18	53.00	28.00	25.00	47.00	25.00	21.00	19-Nov-18	73.00	41.00	21.00	33.00	15-Nov-18	49.00	29.00	17.00	19-Nov-18	79.00	47.00	29.00	23.00
21-Nov-18	49.00	26.00	29.00	44.00	26.00	24.00	26-Nov-18	72.00	37.00	19.00	34.00	21-Nov-18	44.00	26.00	14.00	26-Nov-18	74.00	44.00	24.00	26.00
27-Nov-18	46.00	29.00	27.00	46.00	27.00	26.00	29-Nov-18	74.00	39.00	16.00	29.00	27-Nov-18	46.00	29.00	17.00	29-Nov-18	79.00	47.00	26.00	24.00
03-Dec-18	49.00	29.00	20.00	50.00	27.00	25.00	05-Dec-18	73.00	45.00	23.00	38.00	03-Dec-18	53.00	25.00	20.00	05-Dec-18	77.00	49.00	25.00	29.00
06-Dec-19	55.00	25.00	16.00	43.00	23.00	20.00	10-Dec-18	77.00	45.00	16.00	31.00	06-Dec-19	55.00	25.00	17.00	10-Dec-18	77.00	51.00	25.00	25.00
11-Dec-18	57.00	27.00	19.00	48.00	24.00	28.00	13-Dec-18	71.00	43.00	21.00	34.00	11-Dec-18	47.00	27.00	16.00	13-Dec-18	73.00	43.00	19.00	32.00
17-Dec-18	53.00	24.00	22.00	46.00	27.00	22.00	20-Dec-18	74.00	41.00	19.00	28.00	17-Dec-18	49.00	29.00	19.00	20-Dec-18	77.00	49.00	23.00	28.00
25-Dec-18	57.00	27.00	18.00	45.00	25.00	18.00	26-Dec-18	79.00	47.00	18.00	33.00	25-Dec-18	57.00	27.00	19.00	26-Dec-18	79.00	53.00	27.00	27.00
Minimum	46.00	24.00	16.00	43.00	23.00	18.00	Minimum	69.00	37.00	16.00	28.00	Minimum	44.00	23.00	14.00	Minimum	72.00	43.00	19.00	21.00
Maximum	57.00	29.00	29.00	50.00	27.00	28.00	Maximum	79.00	47.00	23.00	38.00	Maximum	57.00	29.00	20.00	Maximum	79.00	53.00	29.00	32.00
Average	51.33	26.42	14.58	46.42	25.17	15.08	Average	73.33	41.50	19.25	32.92	Average	49.50	26.67	17.33	Average	76.08	47.50	24.33	26.00
Limit (µg/m3)	100.00	60.00	80.00	100.00	60.00	80.00	Limit (µg/m3)	100.00	60.00	80.00	80.00	Limit (µg/m3)	100.00	60.00	80.00	Limit (µg/m3)	100.00	60.00	80.00	80.00

Sr. Mgr. (Env. & Forest)
West Bokaro Division
Tata Steel Limited

AIR QUALITY REPORT AT WORK PLACE

(As per GSR 742 (E), dated 25th Sept 2009)

Oct'18 to Dec'18

Industry Name: West Bokaro Colliery									
FRS-QAB					CMC-QSE				
Date of Sampling	SPM	RPM	SO ₂	NO _x	Date of Sampling	SPM	RPM	SO ₂	NO _x
04-Oct-18	329.00	161.00	13.00	39.00	01-Oct-18	345.00	173.00	19.00	53.00
18-Oct-18	327.00	159.00	11.00	37.00	16-Oct-18	343.00	171.00	17.00	51.00
02-Nov-18	335.56	164.20	19.00	43.00	06-Nov-18	358.90	176.44	23.00	49.00
15-Nov-18	333.56	162.20	17.00	41.00	19-Nov-18	356.90	174.44	21.00	47.00
04-Dec-18	345.00	170.00	18.00	39.00	06-Dec-18	368.00	183.00	20.00	45.00
17-Dec-18	343.00	168.00	16.00	37.00	19-Dec-18	366.00	181.00	18.00	43.00
Minimum	327.00	159.00	11.00	37.00	Minimum	343.00	171.00	17.00	43.00
Maximum	345.00	170.00	19.00	43.00	Maximum	368.00	183.00	23.00	53.00
Average	335.52	164.07	15.67	39.33	Average	356.30	176.48	19.67	48.00
Limit (µg/m3)	700.00	300.00	120.00	120.00	Limit (µg/m3)	700.00	300.00	120.00	120.00

MINE WATER QUALITY REPORT

Oct'18 to Dec'18

Industry Name: West Bokaro Colliery									
Q-AB					Q-SE				
Date of Sampling	pH	TSS	COD	Oil & Grease	Date of Sampling	pH	TSS	COD	Oil & Grease
04-Oct-18	8.05	26.00	32.00	<1.0	01-Oct-18	7.66	28.00	64.00	<1.0
18-Oct-18	7.89	22.00	32.00	<1.0	16-Oct-18	7.82	22.00	64.00	<1.0
02-Nov-18	8.16	22.00	32.00	<1.0	06-Nov-18	7.83	24.00	32.00	<1.0
15-Nov-18	8.02	28.00	32.00	<1.0	19-Nov-18	8.01	26.00	32.00	<1.0
04-Dec-18	7.78	22.00	64.00	<1.0	06-Dec-18	7.82	24.00	32.00	<1.0
17-Dec-18	8.02	26.00	64.00	<1.0	19-Dec-18	7.88	24.00	64.00	<1.0
Minimum	7.78	22.00	32.00	<1.0	Minimum	7.66	22.00	32.00	<1.0
Maximum	8.16	28.00	64.00	<1.0	Maximum	8.01	28.00	64.00	<1.0
Average	7.99	24.33	42.67	<1.0	Average	7.84	24.67	48.00	<1.0
Limit	5.5-9.0	100 mg/L	250 mg/L	05 mg/L	Limit	5.5-9.0	100 mg/L	250 mg/L	05 mg/L

AMBIENT NOISE MONITORING REPORT

Oct'18 to Dec'18

Industry Name: West Bokaro Colliery									
Q-AB					Q-SE				
Date of Sampling	Day Time		Night Time		Date of Sampling	Day Time		Night Time	
	Limit	Level	Limit	Level		Limit	Level	Limit	Level
04-Oct-18	75.00	69.00	70.00	56.00	01-Oct-18	75.00	66.00	70.00	55.00
18-Oct-18	75.00	67.00	70.00	54.00	16-Oct-18	75.00	68.00	70.00	54.00
02-Nov-18	75.00	64.00	70.00	58.00	06-Nov-18	75.00	64.00	70.00	58.00
15-Nov-18	75.00	66.00	70.00	52.00	19-Nov-18	75.00	62.00	70.00	56.00
04-Dec-18	75.00	66.00	70.00	55.00	06-Dec-18	75.00	68.00	70.00	56.00
17-Dec-18	75.00	68.00	70.00	58.00	19-Dec-18	75.00	66.00	70.00	54.00
Minimum	75.00	64.00	70.00	58.00	Minimum	75.00	62.00	70.00	54.00
Maximum	75.00	69.00	70.00	58.00	Maximum	75.00	68.00	70.00	58.00
Average	75.00	66.67	70.00	55.00	Average	75.00	65.67	70.00	55.50


Sr. Mgr. (Env. & Forest)
West Bokaro Division
Tata Steel Limited

AIR QUALITY REPORT AT WORK PLACE

(As per GSR 742 (E), dated 25th Sept 2009)

Period: Oct'18 to Dec'18

Industry Name: Washey Complex (W-II)

Date of Sampling	SPM	RPM	SO ₂	NO _x
08-Oct-18	400.00	167.00	23.00	43.00
24-Oct-18	390.00	161.00	21.00	41.00
12-Nov-18	407.90	170.28	20.00	49.00
22-Nov-18	397.90	164.28	18.00	47.00
12-Dec-18	419.00	176.00	17.00	43.00
24-Dec-18	409.00	170.00	15.00	41.00
Minimum	390.00	161.00	15.00	41.00
Maximum	419.00	176.00	23.00	49.00
Average	403.97	168.09	19.00	44.00
Limit (µg/m3)	700.00	300.00	120.00	120.00

EFFLUENT QUALITY REPORT

Period: Oct'18 to Dec'18

Industry Name: Washey Complex -TP-08

Date of Sampling	pH	TSS	COD	BOD	Oil & Grease	Phenolics
08-Oct-18	6.73	28.00	166.00	8.20	<1.0	<1.0
24-Oct-18	7.83	24.00	166.00	8.10	<1.0	<1.0
12-Nov-18	7.12	24.00	128.00	8.00	<1.0	<1.0
22-Nov-18	7.68	24.00	128.00	8.00	<1.0	<1.0
12-Dec-18	7.02	26.00	128.00	8.00	<1.0	<1.0
24-Dec-18	7.44	28.00	128.00	8.20	<1.0	<1.0
Minimum	6.73	24.00	128.00	8.00	<1.0	<1.0
Maximum	7.83	28.00	166.00	8.20	<1.0	<1.0
Average	7.30	25.67	140.67	8.08	<1.0	<1.0
Limit	5.5-9.0	100 mg/L	250 mg/L	30 mg/L	5 mg/L	1 mg/L

Note:

1. Zero Effluent Discharge (ZED) is being maintained at Washery. Effluent generated is 100% recycled and reused.
2. All values are well within limits.

AMBIENT NOISE MONITORING REPORT

Period: Oct'18 to Dec'18

Industry Name: Washey Complex (W-II)

Date of Sampling	Day Time		Night Time	
	Limit	Level	Limit	Level
08-Oct-18	75.00	68.00	70.00	52.00
24-Oct-18	75.00	71.00	70.00	56.00
12-Nov-18	75.00	62.00	70.00	54.00
22-Nov-18	75.00	66.00	70.00	58.00
12-Dec-18	75.00	64.00	70.00	58.00
24-Dec-18	75.00	66.00	70.00	54.00
Minimum	75.00	62.00	70.00	52.00
Maximum	75.00	66.00	70.00	58.00
Average	75.00	166.17	70.00	55.33

Sr. Mgr.(Env. & Forest)
West Bokaro Division
Tata Steel Limited

AIR QUALITY REPORT AT WORK PLACE

(As per GSR 742 (E), dated 25th Sept 2009)

Period: Oct'18 to Dec'18

Industry Name: Washey Complex (W-III)

Date of Sampling	SPM	RPM	SO ₂	NO _x
08-Oct-18	400.00	167.00	23.00	43.00
24-Oct-18	390.00	161.00	21.00	41.00
12-Nov-18	407.90	170.28	20.00	49.00
22-Nov-18	397.90	164.28	18.00	47.00
12-Dec-18	419.00	176.00	17.00	43.00
24-Dec-18	409.00	170.00	15.00	41.00
Minimum	390.00	161.00	15.00	41.00
Maximum	419.00	176.00	23.00	49.00
Average	403.97	168.09	19.00	44.00
Limit (µg/m³)	700.00	300.00	120.00	120.00

EFFLUENT QUALITY REPORT

Period: Oct'18 to Dec'18

Industry Name: Washey Complex -TP-08

Date of Sampling	pH	TSS	COD	BOD	Oil & Grease	Phenolics
08-Oct-18	6.73	28.00	166.00	8.20	<1.0	<1.0
24-Oct-18	7.83	24.00	166.00	8.10	<1.0	<1.0
12-Nov-18	7.12	24.00	128.00	8.00	<1.0	<1.0
22-Nov-18	7.68	24.00	128.00	8.00	<1.0	<1.0
12-Dec-18	7.02	26.00	128.00	8.00	<1.0	<1.0
24-Dec-18	7.44	28.00	128.00	8.20	<1.0	<1.0
Minimum	6.73	24.00	128.00	8.00	<1.0	<1.0
Maximum	7.83	28.00	166.00	8.20	<1.0	<1.0
Average	7.28	25.20	143.20	8.06	<1.0	<1.0
Limit	5.5-9.0	100 mg/L	250 mg/L	30 mg/L	5 mg/L	1 mg/L

Note:

1. Zero Effluent Discharge (ZED) is being maintained at Washery. Effluent generated is 100% recycled and reused.
2. All values are well within limits.

AMBIENT NOISE MONITORING REPORT

Period: Oct'18 to Dec'18

Industry Name: Washey Complex (W-III)

Date of Sampling	Day Time		Night Time	
	Limit	Level	Limit	Level
08-Oct-18	75.00	68.00	70.00	58.00
24-Oct-18	75.00	66.00	70.00	56.00
12-Nov-18	75.00	63.00	70.00	52.00
22-Nov-18	75.00	68.00	70.00	58.00
12-Dec-18	75.00	62.00	70.00	55.00
24-Dec-18	75.00	68.00	70.00	57.00
Minimum	75.00	62.00	70.00	52.00
Maximum	75.00	68.00	70.00	58.00
Average	75.00	65.83	70.00	56.00

Washey Washery
Sr. Mgr. (Env. & Forest)
West Bokaro Division
Tata Steel Limited

AIR QUALITY REPORT AT WORK PLACE

(As per GSR 742 (E), dated 25th Sept 2009)

Period: Oct'18 to Dec'18

Industry Name: Power House

Date of Sampling	SPM	RPM	SO ₂	NO _x
08-Oct-18	400.00	167.00	23.00	43.00
24-Oct-18	390.00	161.00	21.00	41.00
12-Nov-18	407.90	170.28	20.00	49.00
22-Nov-18	397.90	164.28	18.00	47.00
12-Dec-18	419.00	176.00	17.00	43.00
24-Dec-18	409.00	170.00	15.00	41.00
Minimum	390.00	161.00	15.00	41.00
Maximum	419.00	176.00	23.00	49.00
Average	403.97	168.09	19.00	44.00
Limit (µg/m3)	700.00	300.00	120.00	120.00

AMBIENT NOISE MONITORING REPORT

Period: Oct'18 to Dec'18

Industry Name: Power House

Date of Sampling	Day Time		Night Time	
	Limit	Level	Limit	Level
08-Oct-18	75.00	68.00	70.00	52.00
24-Oct-18	75.00	66.00	70.00	56.00
12-Nov-18	75.00	59.00	70.00	56.00
22-Nov-18	75.00	64.00	70.00	58.00
12-Dec-18	75.00	62.00	70.00	52.00
24-Dec-18	75.00	68.00	70.00	54.00
Minimum	75.00	59.00	70.00	52.00
Maximum	75.00	68.00	70.00	58.00
Average	75.00	64.50	70.00	54.67

EFFLUENT QUALITY REPORT

Period: Oct'18 to Dec'18

Industry Name: Power House (Ash Pond)

Date of Sampling	Temp in C	Color	pH	TSS	TS	COD	BOD	Oil & Grease
08-Oct-18		Colorless	6.58	18	878	32	7.8	<1.0
24-Oct-18		Colorless	6.78	14	568	32	7.9	<1.0
12-Nov-18		Colorless	7.14	18	898	32	7.6	<1.0
22-Nov-18		Colorless	7.28	16	530	64	7.8	<1.0
12-Dec-18		Colorless	6.68	16	469	64	7.7	<1.0
24-Dec-18		Colorless	7.12	18	646	32	8.1	<1.0
Minimum	0	Colorless	6.58	14	469	32	7.6	<1.0
Maximum	0	Colorless	7.28	18	898	64	8.1	<1.0
Average	#DIV/0!	Colorless	6.9	17	665	43	7.8	<1.0
Limit	5 C difference	Colorless	6.5-8.5	100 mg/L	2200 mg/L	250 mg/L	30 mg/L	5 mg/L

Note:

Uday Kishore

Sr. Mgr.(Env. & Forest)
West Bokaro Division
Tata Steel Limited

AIR QUALITY REPORT AT WORK PLACE

(As per GSR 742 (E), dated 25th Sept 2009)

Period: Oct'18 to Dec'18**Industry Name: Logistics (Dispatch)**

Date of Sampling	SPM	RPM	SO ₂	NO _x
10-Oct-18	467.00	157.00	29.00	47.00
26-Oct-18	457.00	151.00	27.00	45.00
13-Nov-18	476.24	160.08	25.00	39.00
26-Nov-18	466.24	154.08	23.00	37.00
13-Dec-18	490.00	166.00	15.00	33.00
26-Dec-18	480.00	160.00	13.00	31.00
Minimum	457.00	151.00	13.00	31.00
Maximum	490.00	166.00	29.00	47.00
Average	472.75	158.03	22.00	38.67
Limit (µg/m3)	700.00	300.00	120.00	120.00

EFFLUENT QUALITY REPORT**Period: Oct'18 to Dec'18****Industry Name: Logistics (Dispatch)**

Date of Sampling	pH	TSS	COD	BOD	Oil & Grease	Phenolics
10-Oct-18	8.10	18.00	64.00	8.20	<1.0	<1.0
26-Oct-18	8.32	16.00	32.00	7.80	<1.0	<1.0
13-Nov-18	8.26	16.00	96.00	8.00	<1.0	<1.0
26-Nov-18	8.24	18.00	64.00	7.80	<1.0	<1.0
13-Dec-18	7.96	16.00	32.00	8.00	<1.0	<1.0
26-Dec-18	8.12	16.00	64.00	8.00	<1.0	<1.0
Minimum	7.96	16.00	32.00	7.80	<1.0	<1.0
Maximum	8.32	18.00	96.00	8.20	<1.0	<1.0
Average	8.17	16.67	58.67	7.97	<1.0	<1.0
Limit	5.5-9.0	100 mg/L	250 mg/L	30 mg/L	5 mg/L	1 mg/L

Note:

1. Zero Effluent Discharge (ZED) is being maintained at Dispatch / Logistic (Railway siding).
2. Oil tarp is installed at HEMM washing area.
3. All values are well within limits.

AMBIENT NOISE MONITORING REPORT**Period: Oct'18 to Dec'18****Industry Name: Logistics (Dispatch)**

Date of Sampling	Day Time		Night Time	
	Limit	Level	Limit	Level
10-Oct-18	75.00	67.00	70.00	56.00
26-Oct-18	75.00	66.00	70.00	58.00
13-Nov-18	75.00	62.00	70.00	50.00
26-Nov-18	75.00	68.00	70.00	52.00
13-Dec-18	75.00	63.00	70.00	54.00
26-Dec-18	75.00	66.00	70.00	58.00
Minimum	75.00	62.00	70.00	50.00
Maximum	75.00	68.00	70.00	58.00
Average	75.00	65.33	70.00	54.67

Sr. Mgr. (Env. & Forest)
West Bokaro Division
Tata Steel Limited

AMBIENT AIR QUALITY REPORT

(As per GSR 742 (E), dated 25th Sept 2009)

Period: Oct'18 to Dec'18

Industry Name: Tata Central Hospital - West Bokaro

Date of Sampling	PM ₁₀	PM _{2.5}	SO ₂	NO _x
09-Oct-18	58.00	32.00	19.00	34.00
30-Oct-18	53.00	28.00	17.00	28.00
13-Nov-18	62.00	42.00	14.00	32.00
26-Nov-18	58.00	26.00	18.00	26.00
04-Dec-18	56.00	32.00	14.00	28.00
26-Dec-18	63.00	28.00	22.00	32.00
Minimum	53.00	26.00	14.00	26.00
Maximum	63.00	42.00	22.00	34.00
Average	58.33	31.33	17.33	30.00
Limit (µg/m³)	100.00	60.00	80.00	80.00

EFFLUENT QUALITY REPORT

Period: Oct'18 to Dec'18

Industry Name: Neutralization Tank

Date of Sampling	pH	TSS	COD	BOD	Oil & Grease	Phenolics
09-Oct-18	7.84	42.00	64.00	8.20	<1.0	<1.0
30-Oct-18	7.64	48.00	64.00	8.10	<1.0	<1.0
13-Nov-18	7.82	42.00	32.00	8.20	<1.0	<1.0
26-Nov-18	7.81	44.00	64.00	7.80	<1.0	<1.0
04-Dec-18	8.01	48.00	64.00	8.10	<1.0	<1.0
26-Dec-18	7.84	46.00	64.00	7.80	<1.0	<1.0
Minimum	7.64	42.00	32.00	7.80	<1.0	<1.0
Maximum	8.01	48.00	64.00	8.20	<1.0	<1.0
Average	7.83	45.00	58.67	8.03	<1.0	<1.0
Limit	5.5-9.0	100 mg/L	250 mg/L	30 mg/L	5 mg/L	1 mg/L

Note:


1. Zero Effluent Discharge (ZED) is being maintained at the division.

AMBIENT NOISE MONITORING REPORT

Period: Oct'18 to Dec'18

Industry Name: Tata Central Hospital- West Bokaro

Date of Sampling	Day Time		Night Time	
	Limit	Level	Limit	Level
09-Oct-18	50.00	42.00	40.00	32.00
30-Oct-18	50.00	45.00	40.00	38.00
13-Nov-18	50.00	42.00	40.00	36.00
26-Nov-18	50.00	38.00	40.00	33.00
04-Dec-18	50.00	38.00	40.00	34.00
26-Dec-18	50.00	41.00	40.00	32.00
Minimum	50.00	38.00	40.00	32.00
Maximum	50.00	45.00	40.00	38.00
Average	50.00	41.00	40.00	34.17


 Sr. Mgr.(Env. & Forest)
 West Bokaro Division
 Tata Steel Limited

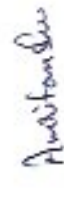
AMBIENT AIR QUALITY REPORT

(As National Ambient air quality monitoring standard dated 18th November, 2009)

Jan '19 to Mar '19

Industry Name: West Bokaro Division, Tata Steel Limited

Date of Sampling	Near Pundi					Near Banjli					Near Chainpur Mandap					Near Duni					Near Mukundbeda								
	PM ₁₀	PM _{2.5}	SO ₂	NO _x	Date of Sampling	PM ₁₀	PM _{2.5}	SO ₂	NO _x	Date of Sampling	PM ₁₀	PM _{2.5}	SO ₂	NO _x	Date of Sampling	PM ₁₀	PM _{2.5}	SO ₂	NO _x	Date of Sampling	PM ₁₀	PM _{2.5}	SO ₂	NO _x	Date of Sampling	PM ₁₀	PM _{2.5}	SO ₂	NO _x
01-Jan-19	54.00	26.00	19.00	38.00	01-Jan-19	52.00	26.00	16.00	38.00	07-Jan-19	78.00	45.00	14.00	42.00	01-Jan-19	42.00	26.00	21.00	32.00	07-Jan-19	78.00	48.00	17.00	42.00	07-Jan-19	78.00	48.00	17.00	42.00
03-Jan-19	64.00	32.00	14.00	42.00	03-Jan-19	44.00	32.00	14.00	32.00	10-Jan-19	76.00	38.00	21.00	38.00	03-Jan-19	47.00	24.00	17.00	38.00	10-Jan-19	81.00	53.00	19.00	36.00	10-Jan-19	81.00	53.00	19.00	36.00
09-Jan-19	59.00	25.00	16.00	36.00	09-Jan-19	48.00	28.00	18.00	28.00	16-Jan-19	83.00	46.00	17.00	32.00	09-Jan-19	58.00	26.00	23.00	32.00	16-Jan-19	76.00	56.00	24.00	38.00	16-Jan-19	76.00	56.00	24.00	38.00
14-Jan-19	66.00	34.00	17.00	38.00	14-Jan-19	48.00	36.00	16.00	42.00	24-Jan-19	74.00	46.00	18.00	28.00	14-Jan-19	46.00	26.00	22.00	28.00	24-Jan-19	75.00	48.00	22.00	38.00	24-Jan-19	75.00	48.00	22.00	38.00
23-Jan-19	62.00	32.00	22.00	45.00	23-Jan-19	52.00	24.00	22.00	38.00	29-Jan-19	79.00	51.00	20.00	36.00	23-Jan-19	42.00	31.00	26.00	21.00	29-Jan-19	84.00	55.00	26.00	42.00	29-Jan-19	84.00	55.00	26.00	42.00
28-Jan-19	57.00	38.00	19.00	44.00	28-Jan-19	56.00	28.00	17.00	26.00	30-Jan-19	80.00	48.00	16.00	27.00	28-Jan-19	38.00	28.00	26.00	27.00	30-Jan-19	82.00	56.00	14.00	34.00	30-Jan-19	82.00	56.00	14.00	34.00
04-Feb-19	58.00	33.00	23.00	36.00	04-Feb-19	48.00	32.00	19.00	34.00	06-Feb-19	74.00	46.00	14.00	29.00	04-Feb-19	42.00	22.00	17.00	32.00	06-Feb-19	79.00	44.00	16.00	36.00	06-Feb-19	79.00	44.00	16.00	36.00
07-Feb-19	48.00	36.00	17.00	27.00	07-Feb-19	42.00	28.00	13.00	25.00	11-Feb-19	78.00	44.00	16.00	24.00	07-Feb-19	52.00	29.00	13.00	28.00	11-Feb-19	74.00	48.00	19.00	32.00	11-Feb-19	74.00	48.00	19.00	32.00
13-Feb-19	52.00	34.00	21.00	48.00	13-Feb-19	44.00	34.00	14.00	28.00	14-Feb-19	82.00	38.00	17.00	28.00	13-Feb-19	48.00	26.00	19.00	36.00	14-Feb-19	78.00	46.00	17.00	42.00	14-Feb-19	78.00	46.00	17.00	42.00
18-Feb-19	63.00	38.00	16.00	36.00	18-Feb-19	52.00	28.00	18.00	32.00	20-Feb-19	76.00	41.00	14.00	28.00	18-Feb-19	45.00	32.00	16.00	28.00	20-Feb-19	82.00	52.00	16.00	28.00	20-Feb-19	82.00	52.00	16.00	28.00
25-Feb-19	58.00	32.00	14.00	29.00	25-Feb-19	46.00	24.00	11.00	23.00	27-Feb-19	72.00	46.00	13.00	26.00	25-Feb-19	58.00	24.00	17.00	26.00	27-Feb-19	78.00	47.00	22.00	32.00	27-Feb-19	78.00	47.00	22.00	32.00
04-Mar-19	62.00	41.00	19.00	32.00	04-Mar-19	48.00	26.00	21.00	38.00	06-Mar-19	74.00	48.00	26.00	38.00	04-Mar-19	37.00	37.00	21.00	29.00	06-Mar-19	74.00	50.00	17.00	26.00	06-Mar-19	74.00	50.00	17.00	26.00
11-Mar-19	58.00	38.00	14.00	28.00	11-Mar-19	46.00	26.00	16.00	26.00	13-Mar-19	82.00	52.00	22.00	32.00	11-Mar-19	48.00	32.00	17.00	38.00	13-Mar-19	75.00	56.00	19.00	44.00	13-Mar-19	75.00	56.00	19.00	44.00
14-Mar-19	64.00	32.00	17.00	32.00	14-Mar-19	48.00	32.00	14.00	28.00	18-Mar-19	78.00	45.00	19.00	44.00	14-Mar-19	34.00	38.00	22.00	42.00	18-Mar-19	76.00	54.00	16.00	38.00	18-Mar-19	76.00	54.00	16.00	38.00
20-Mar-19	59.00	38.00	22.00	36.00	20-Mar-19	54.00	34.00	16.00	34.00	21-Mar-19	76.00	46.00	17.00	42.00	20-Mar-19	42.00	36.00	24.00	36.00	21-Mar-19	78.00	47.00	21.00	42.00	21-Mar-19	78.00	47.00	21.00	42.00
25-Mar-19	56.00	43.00	17.00	29.00	25-Mar-19	52.00	32.00	14.00	28.00	27-Mar-19	78.00	46.00	19.00	48.00	25-Mar-19	56.00	23.00	16.00	32.00	27-Mar-19	82.00	52.00	24.00	38.00	27-Mar-19	82.00	52.00	24.00	38.00
Minimum	48.00	25.00	14.00	27.00	Minimum	42.00	24.00	11.00	23.00	Minimum	72.00	38.00	13.00	24.00	Minimum	34.00	22.00	13.00	21.00	Minimum	74.00	44.00	14.00	26.00	Minimum	74.00	44.00	14.00	26.00
Maximum	66.00	43.00	23.00	48.00	Maximum	56.00	36.00	22.00	42.00	Maximum	83.00	52.00	26.00	48.00	Maximum	58.00	38.00	26.00	42.00	Maximum	84.00	56.00	26.00	44.00	Maximum	84.00	56.00	26.00	44.00
Average	58.75	34.50	17.94	36.00	Average	48.75	29.38	16.19	31.25	Average	77.50	45.38	17.69	33.88	Average	45.94	28.88	19.81	31.56	Average	78	50.75	19.31	36.75	Average	78	50.75	19.31	36.75
Limit (µg/m ³)	100.00	60.00	80.00	80.00	Limit (µg/m ³)	100.00	60.00	80.00	80.00	Limit (µg/m ³)	100.00	60.00	80.00	80.00	Limit (µg/m ³)	100.00	60.00	80.00	80.00	Limit (µg/m ³)	100.00	60.00	80.00	80.00	Limit (µg/m ³)	100.00	60.00	80.00	80.00


Manager (Environment)
West Bokaro Division
Tata Steel Limited

AIR QUALITY REPORT AT WORK PLACE

(As per GSR 742 (E), dated 25th Sept 2009)

Jan'19 to Mar'19

Industry Name: West Bokaro Colliery									
FRS-QAB					CMC-QSE				
Date of Sampling	SPM	RPM	SO ₂	NO _x	Date of Sampling	SPM	RPM	SO ₂	NO _x
02-Jan-19	352.00	168.00	16.00	42.00	04-Jan-19	369.00	186.00	19.00	44.00
15-Jan-19	348.00	172.00	24.00	38.00	17-Jan-19	371.00	194.00	21.00	46.00
04-Feb-19	410.00	192.00	14.00	44.00	06-Feb-19	386.00	182.00	17.00	36.00
15-Feb-19	386.00	178.00	16.00	48.00	19-Feb-19	375.00	173.00	16.00	38.00
04-Mar-19	430.00	198.00	17.00	44.00	06-Mar-19	420.00	210.00	21.00	38.00
15-Mar-19	415.00	215.00	19.00	39.00	19-Mar-19	430.00	190.00	19.00	42.00
Minimum	348.00	168.00	14.00	38.00	Minimum	369.00	173.00	16.00	36.00
Maximum	430.00	215.00	24.00	48.00	Maximum	430.00	210.00	21.00	46.00
Average	390.17	187.17	17.67	42.50	Average	391.83	189.17	18.83	40.67
Limit (µg/m ³)	700.00	300.00	120.00	120.00	Limit (µg/m ³)	700.00	300.00	120.00	120.00

MINE WATER QUALITY REPORT

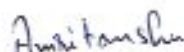
Jan'19 to Mar'19

Industry Name: West Bokaro Colliery									
Q-AB					Q-SE				
Date of Sampling	pH	TSS	COD	Oil & Grease	Date of Sampling	pH	TSS	COD	Oil & Grease
02-Jan-19	7.96	18.00	64.00	<1.0	04-Jan-19	7.88	22.00	64.00	<1.0
15-Jan-19	7.96	18.00	64.00	<1.0	17-Jan-19	7.82	22.00	64.00	<1.0
04-Feb-19	7.92	20.00	32.00	<1.0	06-Feb-19	7.86	24.00	32.00	<1.0
15-Feb-19	7.92	20.00	32.00	<1.0	19-Feb-19	7.86	24.00	32.00	<1.0
04-Mar-19	8.12	18.00	64.00	<1.0	06-Mar-19	8.04	22.00	32.00	<1.0
15-Mar-19	8.00	18.00	64.00	<1.0	19-Mar-19	7.86	24.00	32.00	<1.0
Minimum	7.92	18.00	32.00	<1.0	Minimum	7.82	22.00	32.00	<1.0
Maximum	8.12	20.00	64.00	<1.0	Maximum	8.04	24.00	64.00	<1.0
Average	7.98	18.67	53.33	<1.0	Average	7.89	23.00	42.67	<1.0
Limit	5.5-9.0	100 mg/L	250 mg/L	05 mg/L	Limit	5.5-9.0	100 mg/L	250 mg/L	05 mg/L

AMBIENT NOISE MONITORING REPORT

Jan'19 to Mar'19

Industry Name: West Bokaro Colliery									
Q-AB					Q-SE				
Date of Sampling	Day Time		Night Time		Date of Sampling	Day Time		Night Time	
	Limit	Level	Limit	Level		Limit	Level	Limit	Level
02-Jan-19	75	67	70	60	04-Jan-19	75	68	70	58
15-Jan-19	75	69	70	58	17-Jan-19	75	66	70	61
04-Feb-19	75	68	70	61	06-Feb-19	75	68	70	58
15-Feb-19	75	66	70	60	19-Feb-19	75	70	70	60
04-Mar-19	75	64	70	58	06-Mar-19	75	64	70	57
15-Mar-19	75	68	70	62	19-Mar-19	75	68	70	62
Minimum	75	64	70	61	Minimum	75	64	70	57
Maximum	75	69	70	61	Maximum	75	70	70	62
Average	75	67	70	59	Average	75	67	70	59


Manager (Environment)
West Bokaro Division
Tata Steel Limited

AIR QUALITY REPORT AT WORK PLACE

(As per GSR 742 (E), dated 25th Sept 2009)

Period: Jan'19 to Mar'19

Industry Name: Washey Complex (W-II)

Date of Sampling	SPM	RPM	SO ₂	NO _x
10-Jan-19	418.00	176.00	46.00	16.00
22-Jan-19	422.00	174.00	43.00	18.00
12-Feb-19	438.00	168.00	19.00	33.00
22-Feb-19	468.00	172.00	21.00	28.00
12-Mar-19	463.00	174.00	17.00	38.00
22-Mar-19	483.00	173.00	19.00	36.00
Minimum	418.00	168.00	17.00	16.00
Maximum	483.00	176.00	46.00	38.00
Average	448.67	172.83	27.50	28.17
Limit (µg/m ³)	700.00	300.00	120.00	120.00

EFFLUENT QUALITY REPORT

Period: Jan'19 to Mar'19

Industry Name: Washey Complex -TP-08

Date of Sampling	pH	TSS	COD	BOD	Oil & Grease	Phenolics
10-Jan-19	7.38	28.00	160.00	7.80	<1.0	<1.0
22-Jan-19	7.36	26.00	160.00	7.80	<1.0	<1.0
12-Feb-19	7.46	29.00	64.00	7.60	<1.0	<1.0
22-Feb-19	7.42	26.00	64.00	7.72	<1.0	<1.0
12-Mar-19	8.06	28.00	96.00	7.80	<1.0	<1.0
22-Mar-19	8.00	28.00	64.00	7.70	<1.0	<1.0
Minimum	7.36	26.00	64.00	7.60	<1.0	<1.0
Maximum	8.06	29.00	160.00	7.80	<1.0	<1.0
Average	7.61	27.50	101.33	7.74	<1.0	<1.0
Limit	5.5-9.0	100 mg/l.	250 mg/L.	30 mg/L.	5 mg/L.	1 mg/l.

Note:

1. Zero Effluent Discharge (ZED) is being maintained at Washery. Effluent generated is 100% recycled and reused.
2. All values are well within limits.

AMBIENT NOISE MONITORING REPORT

Period: Jan'19 to Mar'19

Industry Name: Washey Complex (W-II)

Date of Sampling	Day Time		Night Time	
	Limit	Level	Limit	Level
10-Jan-19	75	66	70	55
22-Jan-19	75	68	70	52
12-Feb-19	75	72	70	56
22-Feb-19	75	66	70	58
12-Mar-19	75	68	70	62
22-Mar-19	75	70	70	58
Minimum	75	66	70	52
Maximum	75	72	70	62
Average	75	68	70	57

Amitanshu
 Manager (Environment)
 West Bokaro Division
 Tata Steel Limited

AIR QUALITY REPORT AT WORK PLACE

(As per GSR 742 (E), dated 25th Sept 2009)

Period: Jan'19 to Mar'19

Industry Name: Washey Complex (W-III)

Date of Sampling	SPM	RPM	SO ₂	NO _x
10-Jan-19	418.00	176.00	46.00	16.00
22-Jan-19	422.00	174.00	43.00	18.00
12-Feb-19	438.00	168.00	19.00	33.00
22-Feb-19	468.00	172.00	21.00	28.00
12-Mar-19	463.00	174.00	17.00	38.00
22-Mar-19	483.00	173.00	19.00	36.00
Minimum	418.00	168.00	17.00	16.00
Maximum	483.00	176.00	46.00	38.00
Average	448.67	172.83	27.50	28.17
Limit (µg/m ³)	700.00	300.00	120.00	120.00

EFFLUENT QUALITY REPORT

Period: Jan'19 to Mar'19

Industry Name: Washey Complex -TP-08

Date of Sampling	pH	TSS	COD	BOD	Oil & Grease	Phenolics
10-Jan-19	7.38	28.00	160.00	7.80	<1.0	<1.0
22-Jan-19	7.36	26.00	160.00	7.80	<1.0	<1.0
12-Feb-19	7.46	29.00	64.00	7.60	<1.0	<1.0
22-Feb-19	7.42	26.00	64.00	7.72	<1.0	<1.0
12-Mar-19	8.06	28.00	96.00	7.80	<1.0	<1.0
22-Mar-19	8.00	28.00	64.00	7.70	<1.0	<1.0
Minimum	7.36	26.00	64.00	7.60	<1.0	<1.0
Maximum	8.06	29.00	160.00	7.80	<1.0	<1.0
Average	7.54	27.40	108.80	7.74	<1.0	<1.0
Limit	5.5-9.0	100 mg/l.	250 mg/l.	30 mg/L.	5 mg/L.	1 mg/l.

Note:

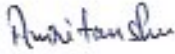
1. Zero Effluent Discharge (ZED) is being maintained at Washery. Effluent generated is 100% recycled and reused.
2. All values are well within limits.

AMBIENT NOISE MONITORING REPORT

Period: Jan'19 to Mar'19

Industry Name: Washey Complex (W-III)

Date of Sampling	Day Time		Night Time	
	Limit	Level	Limit	Level
10-Jan-19	75	62	70	56
22-Jan-19	75	68	70	54
12-Feb-19	75	65	70	56
22-Feb-19	75	70	70	58
12-Mar-19	75	66	70	58
22-Mar-19	75	68	70	69
Minimum	75	62	70	54
Maximum	75	70	70	69
Average	75	67	70	59


 Anurag Kumar
 Manager (Environment)
 West Bokaro Division
 Tata Steel Limited

AIR QUALITY REPORT AT WORK PLACE

(As per OSR 742 (I), dated 25th Sept 2005)

Period: Jan'19 to Mar'19

Industry Name: Power House

Date of Sampling	SPM	RPM	SO ₂	NO _x
10-Jan-19	418.00	176.00	46.00	16.00
22-Jan-19	422.00	174.00	43.00	18.00
12-Feb-19	438.00	168.00	19.00	33.00
22-Feb-19	468.00	172.00	21.00	28.00
12-Mar-19	463.00	174.00	17.00	38.00
22-Mar-19	483.00	173.00	19.00	26.00
Minimum	418.00	168.00	17.00	16.00
Maximum	483.00	176.00	46.00	38.00
Average	448.67	172.83	27.50	28.17
Limit (µg/m ³)	700.00	300.00	120.00	120.00

AMBIENT NOISE MONITORING REPORT

Period: Jan'19 to Mar'19

Industry Name: Power House

Date of Sampling	Day Time		Night Time	
	Limit	Level	Limit	Level
10-Jan-19	75	68	70	52
22-Jan-19	75	66	70	56
12-Feb-19	75	59	70	56
22-Feb-19	75	64	70	58
12-Mar-19	75	68	70	55
22-Mar-19	75	64	70	58
Minimum	75	59	70	52
Maximum	75	68	70	58
Average	75	65	70	56

EFFLUENT QUALITY REPORT

Period: Jan'19 to Mar'19

Industry Name: Power House (Ash Pond)

Date of Sampling	Color	pH	TSS	TS	COD	BOD	Oil & Grease
10-Jan-19	Colorless	6.72	16	478	32	7.8	<1.0
22-Jan-19	Colorless	6.68	18	472	32	7.8	<1.0
12-Feb-19	Colorless	6.84	18	492	32	8.0	<1.0
22-Feb-19	Colorless	7.20	18	469	32	7.8	<1.0
12-Mar-19	Colorless	6.96	16	353	64	7.8	<1.0
22-Mar-19	Colorless	7.20	18	478	32	7.8	<1.0
Minimum	Colorless	6.68	16	353	32	7.8	<1.0
Maximum	Colorless	7.20	18	492	64	8.0	<1.0
Average	Colorless	6.9	17	457	37	7.8	<1.0
Limit	Colorless	6.5-8.5	100 mg/l.	2200 mg/l.	250 mg/L.	30 mg/L.	5 mg/L.

Note:

Anil Kumar

Manager (Environment)
West Bokaro Division
Tata Steel Limited

AIR QUALITY REPORT AT WORK PLACE

(As per GSR 742 (E), dated 25th Sept 2009)

Period: Jan'19 to Mar'19

Industry Name: Logistics (Dispatch)

Date of Sampling	SPM	RPM	SO ₂	NO _x
11-Jan-19	488.00	168.00	13.00	32.00
24-Jan-19	492.00	172.00	16.00	38.00
12-Feb-19	488.00	172.00	14.00	28.00
26-Feb-19	498.00	184.00	17.00	44.00
13-Mar-19	493.00	182.00	21.00	44.00
26-Mar-19	510.00	184.00	19.00	38.00
Minimum	488.00	168.00	13.00	28.00
Maximum	510.00	184.00	21.00	44.00
Average	494.83	177.00	16.67	37.33
Limit (µg/m ³)	700.00	300.00	120.00	120.00

EFFLUENT QUALITY REPORT

Period: Jan'19 to Mar'19

Industry Name: Logistics (Dispatch)

Date of Sampling	pH	TSS	COD	BOD	Oil & Grease	Phenolics
11-Jan-19	8.04	16.00	32.00	8.00	<1.0	<1.0
24-Jan-19	8.46	16.00	96.00	8.00	<1.0	<1.0
12-Feb-19	7.98	18.00	32.00	7.80	<1.0	<1.0
26-Feb-19	8.11	18.00	64.00	8.20	<1.0	<1.0
13-Mar-19	8.12	16.00	32.00	7.40	<1.0	<1.0
26-Mar-19	8.20	16.00	32.00	7.60	<1.0	<1.0
Minimum	7.98	16.00	32.00	7.40	<1.0	<1.0
Maximum	8.46	18.00	96.00	8.20	<1.0	<1.0
Average	8.15	16.67	48.00	7.83	<1.0	<1.0
Limit	5.5-9.0	100 mg/L	250 mg/L	30 mg/l.	5 mg/l.	1 mg/L

Note:

1. Zero Effluent Discharge (ZED) is being maintained at Dispatch / Logistic (Railway siding).
2. Oil tarp is installed at HEMM washing area.
3. All values are well within limits.

AMBIENT NOISE MONITORING REPORT

Period: Jan'19 to Mar'19

Industry Name: Logistics (Dispatch)

Date of Sampling	Day Time		Night Time	
	Limit	Level	Limit	Level
11-Jan-19	75	71	70	58
24-Jan-19	75	66	70	54
12-Feb-19	75	68	70	52
26-Feb-19	75	68	70	56
13-Mar-19	75	66	70	58
26-Mar-19	75	68	70	54
Minimum	75	66	70	52
Maximum	75	71	70	58
Average	75	68	70	55

Amitanshu
 Manager (Environment)
 West Bokaro Division
 Tata Steel Limited

AMBIENT AIR QUALITY REPORT

(As per GSR 742 (E), dated 25th Sept 2009)

Period: Jan'19 to Mar'19

Industry Name: Tata Central Hospital - West Bokaro

Date of Sampling	PM ₁₀	PM _{2.5}	SO ₂	NO _x
07-Jan-19	52.00	28.00	17.00	32.00
29-Jan-19	56.00	36.00	21.00	26.00
07-Feb-19	54.00	32.00	14.00	38.00
27-Feb-19	58.00	34.00	19.00	29.00
07-Mar-19	62.00	28.00	14.00	42.00
26-Jan-00	64.00	34.00	21.00	38.00
Minimum	52.00	28.00	14.00	26.00
Maximum	64.00	36.00	21.00	42.00
Average	57.67	32.00	17.67	34.17
Limit (µg/m ³)	100.00	60.00	80.00	80.00

EFFLUENT QUALITY REPORT

Period: Jan'19 to Mar'19

Industry Name: Neutralization Tank

Date of Sampling	pH	TSS	COD	BOD	Oil & Grease	Phenolics
07-Jan-19	7.80	51.00	96.00	8.40	<1.0	<1.0
29-Jan-19	7.84	42.00	64.00	8.20	<1.0	<1.0
07-Feb-19	7.88	58.00	128.00	8.20	<1.0	<1.0
27-Feb-19	7.82	42.00	64.00	7.80	<1.0	<1.0
07-Mar-19	7.72	42.00	64.00	7.60	<1.0	<1.0
26-Jan-00	7.84	51.00	64.00	7.90	<1.0	<1.0
Minimum	7.72	42.00	64.00	7.60	<1.0	<1.0
Maximum	7.88	58.00	128.00	8.40	<1.0	<1.0
Average	7.82	47.67	80.00	8.02	<1.0	<1.0
Limit	5.5-9.0	100 mg/L	250 mg/L	30 mg/L	5 mg/L	1 mg/L

Note:

1. Zero Effluent Discharge (ZED) is being maintained at the division.

AMBIENT NOISE MONITORING REPORT

Period: Jan'19 to Mar'19

Industry Name: Tata Central Hospital- West Bokaro

Date of Sampling	Day Time		Night Time	
	Limit	Level	Limit	Level
07-Jan-19	50	44	40	30
29-Jan-19	50	42	40	36
07-Feb-19	50	41	40	32
27-Feb-19	50	38	40	34
07-Mar-19	50	44	40	36
26-Jan-00	50	42	40	33
Minimum	50	38	40	30
Maximum	50	44	40	36
Average	50	42	40	34

Amitanshu
 Manager (Environment)
 West Bokaro Division
 Tata Steel Limited

Annexure-II: Expenditure on Environmental Safeguards - (Apr'18-Mar'19)

Out Bound Logistics

Sl. No.	Item for expenditure	Rs. In Lakh (Apr'18-Mar'19)
1	Water sprinkling on road for Sut Suppression	7.70
2	Spillage cleaning for Waste Management	26.08
3	Cleaning at B point to reduce generation	14.55
4	Boulder stacking from new and old yard to reduce water flow	0.62
5	Transportation from yard for minimize dust generation	23.60
Sub Total =		72.55

In Bound Logistics

Sl. No.	Item for expenditure	Rs. In Lakh (Apr'18-Mar'19)
1	Nalco chemical use in water for dust suppression	9.18
2	Spillage cleaning to maintain solid waste	57.66
3	Dry Fog System operation	13.19
4	Spares for dust and Spillage control (Belt scrappers,dfds system)	25.91
5	Spares for pumps and pipe line for water spraying	10.52
Sub Total =		116.46

W-II

Sl. No.	Item for expenditure	Rs. In Lakh (Apr'18-Mar'19)
1	Installation of bluescope sheet at conveyor transfer point area and crusher house ro reduce dust pollution	10.80
2	Dust suppression (maintenance spares)	2.40
3	Water Sprinkling	7.20
4	Effluent recycling and power cost	15.00
5	Cleaning and housekeeping	39.00
6	Dilute Cone Wrapping to prevent leakage	10.00
7	Energy Efficient light	40.00
8	Modification for Conveyor Spillage Control in NC2, NC3 belt	5.00
9	Spillage Control by Hosch/Tegga Equipment's	20.00
10	Dry Fog System Operation and Maintenance	9.60
11	Fire fighting pump and spares	10.00
12	Tailing pond structural maintenance	12.00
Sub Total =		181.00

W-III

Sl. No.	Item for expenditure	Rs. In Lakh (Apr'18-Mar'19)
1	Dust suppression by sprinkling	32.82
2	New pump for water recycling	16.00
3	Effluent Recycling including power cost	26.50
4	Maintenance of Dry Fog System	27.80
5	Cleaning and Housekeeping	15.20
6	Mechanical Tailing Dewatering to ensure Zero Effluent Discharge	926.63
7	Power cost for Tailing Dewatering Plant to ensure Zero Effluent Discharge	63.50
8	Road construction for Tailing transportation to minimize dust generation	0.30
9	Spillage control in conveyors	18.40
10	Recycling of water for HRT	8.25
11	Overhauling of media filter	13.50
12	Housekeeping in office building	14.14
Sub Total =		1163.04

Annexure-II: Expenditure on Environmental Safeguards - (Apr'18-Mar'19)

Power House

Sl. No.	Item for expenditure	Rs. In Lakh (Apr'18-Mar'19)
1	Dry fog maintenance	8.40
2	Opacity meter for CEMS	0.00
3	FRP blade to reduce power consumption	0.00
4	New pump installation for water conservation	0.00
5	New Pipe laying	12.46
6	ESP field O/H maintenance and operation	14.25
7	Slurry ash line maintenance	5.80
8	Cleaning and housekeeping maintenance	3.60
9	Power cost-Tailing pond water recycling -	12.40
10	Reject shed maintenance	1.30
11	Tailing pond & ash pond embankment strengthening/toe wall	0.00
12	DM plant corrosion resistant painting to avoid seepage/ land contamination & Clarifloculator painting	0.00
13	Hiring of night vision camera	0.24
14	Upgradation of CEMS system	0.00
15	Cooling Tower maintenance to reduce evaporation loss	0.36
16	Renewal of Boiler Insulation to reduce heat loss and dust	5.40
Sub Total =		64.21

IBMD

Sl. No.	Item for expenditure	Rs. In Lakh (Apr'18-Mar'19)
1	Water sprinkling on main road	32.00
Sub Total =		32.00

QAB

Sl. No.	Item for expenditure	Rs. In Lakh (Apr'18-Mar'19)
1	Procurement of Water sprinkler with modern technology	371.86
2	Effluent recycling/new system	76.25
3	Tree plantation & lawn maintenance	2.50
4	Water tanker operation (includes wages cost)	231.61
5	Water tanker maintenance cost	120.00
6	Cleaning of workshop(In Rs Lakh)	32.00
7	Chemical mixing for dust suppression	4.88
Sub Total =		839.10

QSE

Sl. No.	Item for expenditure	Rs. In Lakh (Apr'18-Mar'19)
1	Effluent recycling system operation/maintenance	6.82
2	Water tanker operation and including wages	304.67
3	Water sprinkler maintenance cost	83.70
4	Cleaning of workshop	39.84
5	Wet drilling operation and maintenance & modification to minimize water consumption	333.32
6	Replacement /Repair of oil try & oil barrel stored	2.50
7	Cost of auto fire system	4.92
8	New pump for recycling system	0.00
Sub Total =		775.77

Annexure-II: Expenditure on Environmental Safeguards - (Apr'18-Mar'19)

Projects

Sl. No.	Item for expenditure	Rs. In Lakh (Apr'18-Mar'19)
1	Pundi Park Development (Cosultancy, Road and area preparation work)	40.00
2	Pipe Conveyor	400.00
Sub Total =		440.00

C&SM

Sl. No.	Item for expenditure	Rs. In Lakh (Apr'18-Mar'19)
1	Town cleaning/garbage dumping fogging/ drain cleaning	100.00
2	Drain for effluent discharge at CMC	3.00
3	Physiography barrier at Q-SE for dust protection to nearby resi. colony	40.00
4	PCC Road for Bhutahi Village (900 Meter in length)	25.00
5	Park development work	8.00
6	Drain repair and development at Shopping complex, main WTP, tailing pond, ash pond and near patel chowk	4.00
7	New Toilet construction at W#3, hanger shed, central garage, etc.	3.00
8	Recirculation water tank repair at Power house for Zero water discharge	1.00
9	Ash pipeline foundation job	8.50
10	Road construction near Patel chowk	45.00
11	Mechanised cleaning of septic tank and overhead water tank	10.00
12	Construction of RCC road at Reject Yard	10.00
13	Water tank at Pundi park	2.00
14	Road repair at Chainpur	15.00
15	Civil work for environment monitoring room	2.00
Sub Total =		276.50

Environment Management Cell

Sl. No.	Item for expenditure	Rs. In Lakh (Apr'18-Mar'19)
1	Parks Maintenance (Maitenance, Security, Material etc.)	109.50
3	Fountain Maintenance	7.00
7	Annual Flower Show Celebration	13.00
9	Bush Cleaning	19.00
10	New Area Development for New Parks	20.00
11	Nursery shade development	6.00
12	Poly bags & seeds	5.00
14	Bird watching & aveneu Plantation Preparation	5.00
15	Development of new lawn	7.00
16	Annual maint. Of CAAQMS	8.40
17	Environmental monitoring	57.38
18	Support for Environmental Activities and Jobs (Manpower, Vehicle etc.)	12.26
19	Awareness Programmes (World Environment Day, World Water Day, Green School Project etc.)	5.00
Sub Total =		274.54

TSRDS

Sl. No.	Item for expenditure	Rs. In Lakh (Apr'18-Mar'19)
1	Plantation in company leasehold area	41.72
2	Horticulture plantation in local villages	0.77
3	Plantation drive on world environment day	0.25
4	Exposure of farmers in flower show	0.18
5	Procurement of seeds for sapling raising by women SHGs for plantation	0.26
6	Installation of solar street light at Mayatungri	23.82
7	Renovation / construction of pond (4 nos)	12.43
8	Lift Irrigation	14.74
Sub Total =		94.17

Annexure-II: Expenditure on Environmental Safeguards - (Apr'18-Mar'19)

Hospital

Sl. No.	Item for expenditure	Rs. In Lakh (Apr'18-Mar'19)
1	Handling and Disposal of BMW	1.40
2	Procurement of BMW Color Bags	0.27
3	Bleaching Powder	0.03
4	Cleaning of Hospital	15.16
Sub Total =		16.86

Admin

Sl. No.	Item for expenditure	Rs. In Lakh (Apr'18-Mar'19)
1	Housekeeping	25.14
Sub Total =		25.14

Water Supply

Sl. No.	Item for expenditure	Rs. In Lakh (Apr'18-Mar'19)
1	Pumping arrangement for gardens & parks	8.70
2	Dis infection process chlorine dosing	2.50
3	Cleaning of potable water tank & tower	3.50
4	Foot valve cleaning	13.50
5	Servicing of vehicles	5.20
6	Installation of flowmeter at supply and consumer end	44.00
7	Aeration system to improve odour in potable water	11.50
8	Use of Grade-4 Ferric alum instead of Grade-2 to control the turbidity of treated water	28.00
9	Pressure sand filter renovation job done to improve hygiene.	6.00
10	Replacement of conventional Halogen with LED lights at Engg Shop	7.00
11	House Keeping at CWS	3.60
12	Installation of pipe light at Shed 1 &2 at CWS for getting natual light	4.50
13	House Keeping at Central Garage & treatment Plant & foot valve cleaning	14.40
14	Vehicle maintenance	5.20
15	Crane & dozzer maintenance	3.60
16	Operation & Maintenance of STP	15.00
17	Pumping Operation at TP-08	7.50
Sub Total =		183.70

CEP

Sl. No.	Item for expenditure	Rs. In Lakh (Apr'18-Mar'19)
1	Road repairing to butterfly park	57.00
2	Fencing the lease boundary of Q-E	21.50
3	Boundary wall repairing	10.00
4	Soil Spreading	10.00
5	park Development	5.00
Sub Total =		103.50

Grand Total = 4658.53