



To
The Additional Principal Chief Conservator of Forest, Eastern Central Zone
Ministry of Environment, Forests & Climate Change, Govt. of India
Bungalow no. A-2, Shyamali Colony
Ranchi-834002, Jharkhand
Email: ro.ranchi-mef@gov.in

WBD/EMC/4071/092/21

Date: 18.11.2021

Ref: Environmental Clearance letter no. J-11015/108/2016-IA.II(M) dated: 17.05.2007

Sub: Half-yearly EC Compliance Report for the period April'21 - September'21 in respect of West Bokaro Open Cast Coal Mine of Tata Steel Limited

Dear Sir,

Environmental Clearance was accorded to West Bokaro Open Cast Coal Mine of Tata Steel Limited vide Letter No. J-11015/108/2006-IA.II(M), dated: 17.05.2007. We are herewith submitting the half yearly EC Compliance Report for the period from April'21 - September'21 as per EIA Notification, 2006 to your good office on email: ro.ranchi-mef@gov.in in soft copy for your ready reference.

We trust that the measures taken towards environmental safeguards comply with the stipulated environmental conditions. We look forward to your further guidance which shall certainly help us in our endeavor for further improve upon our Environmental Management practices.

Thanking you,
Yours faithfully,

Head (Environment Management)
Raw Materials Division
TATA Steel Limited

Copy to: The Member Secretary, State Pollution Control Board, T.A. Division (Ground Floor),
H.E.C. Dhurva, Ranchi - 834004 (Jharkhand);
The Regional Officer, State Pollution Control Board, PTC Chowk, Matwari, Hazaribagh
– 825301 (Jharkhand)

TATA STEEL LIMITED

West Bokaro Division Ghatotand Jharkhand 825 314 India

Tel 91 6545 262356 (O) Fax 91 6545 262221 262172

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

Half Yearly Compliance Report
for the period April'21 – September'21
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 of the quarry area left 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 has been 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 in pit only so there is no top soil generation envisaged. However, 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 is cleaned before the monsoon. Photographs of Top Soil stack with maintained drain and use of top soil for spreading on dump for plantation are shown below.

Maintained catch drain of Top Soil Dump



Top Soil spreading on dump for plantation



Half Yearly EC Compliance Report for period: April'21 - September'21

- (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 ongoing. Apart from this, Eco restoration of dump slope is also in progress in parts. Compliance status is being submitted on half yearly basis to the Regional office of Ministry of Environment, Forests & Climate Change.

Soil & grass seed Spreading on dump slope



Grassing and Plantation on dump slope



Soil & grass Spreading on dump slope



Grassing and Plantation on dump slope



Plantation on dump slope



Half Yearly EC Compliance Report for period: April'21 - September'21

Back filling of quarry by Over Burden



Eco restoration: Before and After



- (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 de silted 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



Half Yearly EC Compliance Report for period: April'21 - September'21

Catch Drains at the toe of dumps



Catch Drains with check dam at the toe of dumps



Active mine pit for water accumulation



Abandoned mine pit as Rain Water Harvesting

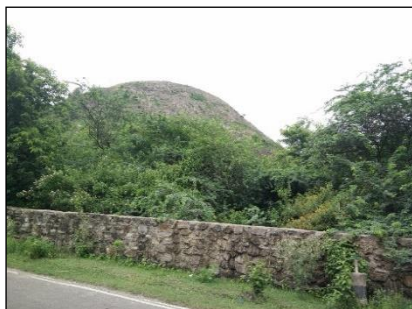


- (vi) **Dimension of the retaining wall at the toe of the dumps and OB benches within the mine to check run-off and siltation should be based on the rainfall data.**

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



Half Yearly EC Compliance Report for period: April'21 - September'21

- (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. Further, new water sprinklers have been procured to increase the capacity of the water sprinkling on the haul 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



Road Cleaner



Dry fog dust suppression system in crushing units



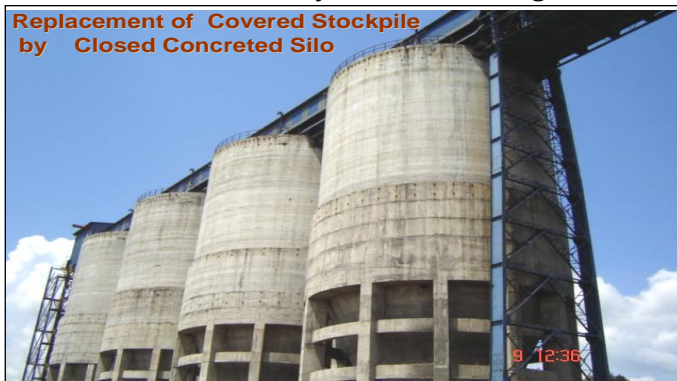
Water Mist Canon in coal stacking area



Pipe Conveyor for material transport



Concrete silos for material storage



(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 being practiced minimizing 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. This year about 9305 native trees, shrubs and grass saplings have been planted. local and native species was planted, including OB dumps, lease boundary, residential colonies, and coal dispatch area. Voluntary afforestation in & around villages are also being done with company employees and local communities. Progressive afforestation is practiced as per plan in the area. In 2020, approximate 16500 saplings was planted.

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



Minedout Area Development (Reclamation cum beautification)



Butterfly, Hibiscus and Medicinal Park development on mined out area



Spice Garden & Miyawaki Plot 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.

Soil, grass spreading and plantation on dump slope



De-coaled Q-E converted in to Water Reservoir



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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. To conserve, restore and enhance the medicinal plants in the area, a separate medicinal garden also being prepared at one of the OB dump and 33 nos. of species have been planted in the medicinal park. 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.

Medicinal Park



- (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. Active mine pits are being used for water accumulation followed by use for spraying in mine. 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.

Active mine pit for water accumulation



Abandoned mine pit as Rain Water Harvesting



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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 mechanical dewatering plant and further, recycling of water from the tailings ponds in a closed circuit.

Mechanical Tailing Dewatering Plant and Filter Press



Water Recycling from tailings ponds



- (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 of groundwater level and quality is being carried out by establishing a network of existing wells. The monitoring for quantity is being done four times a year in pre-monsoon, monsoon, post-monsoon and winter seasons and for quality in May. There are 5 nos. of piezometers in core and buffer zone for real time ground water level monitoring. Data thus collected is being submitted to the Ministry of Environment & Forests and to the Central Pollution Control Board quarterly.

Piezometers:

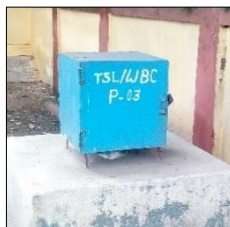
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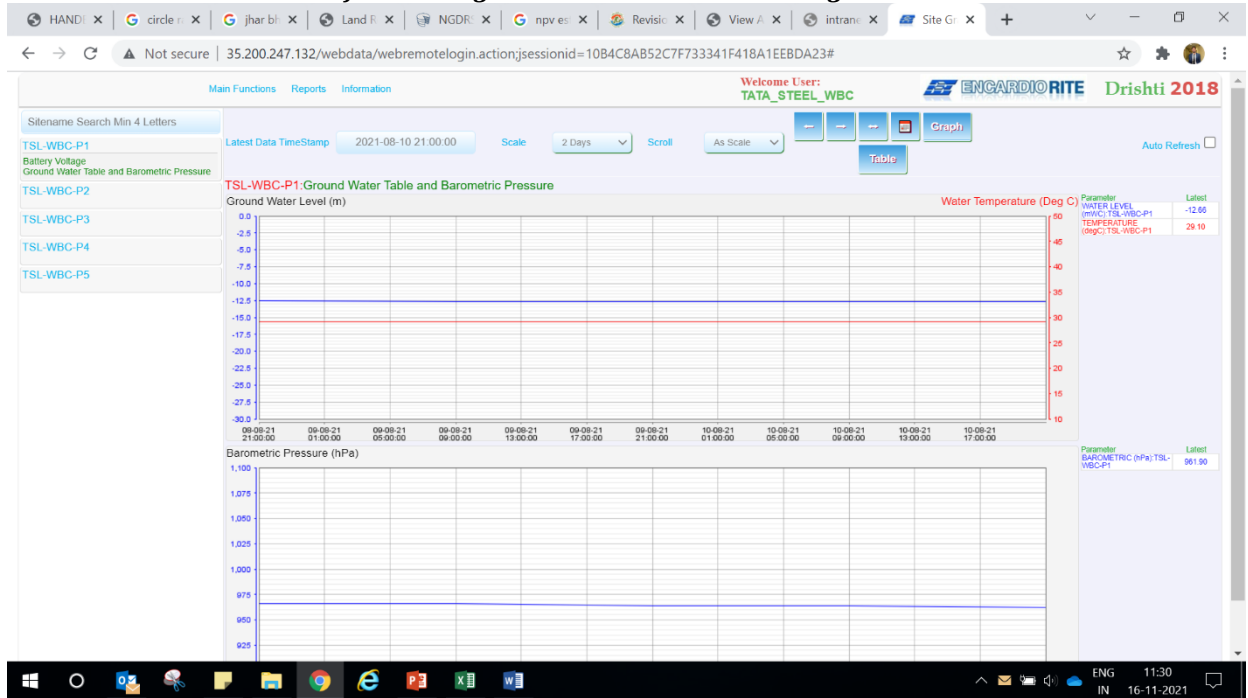


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Screenshot of real time ground water level monitoring with Piezometers



- (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.

Abandoned Mine pit converted into RWH pond



Check Dam to increase ground water recharge



Ponds cum Rain Water Harvesting structures in Village

Bhutai

Jodragora

Duni



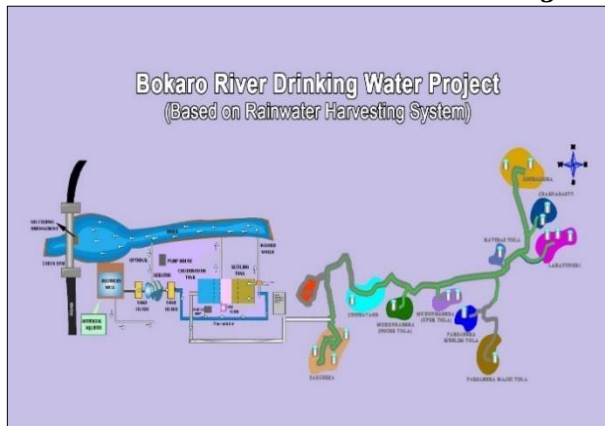
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We are supplying the drinking water to the nearby villages by pipe line network from our mine pit water followed by water softening facility and we have also constructed a Rain Water Harvesting cum water treatment facility to supply water to nearby 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 and further, recycling of water from the tailings ponds in a closed circuit.

Mechanical tailings de-watering system



Output of HFC at tailing dewatering plant



Water Recycling from tailings ponds



The water from tailing pond after proper de-silting of tailings is recycled back to washeries to maintain zero discharge. Oil traps are also installed for workshops.

Oil & Grease trap at mines



- (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. Due to undulated topography and advancement of mine, for other suitable locations of STP a detailed feasibility study was done by ISMU (IIT) Dhanbad. As per the recommendation of study by ISMU (IIT), Dhanbad, STP for suitable location in colony are being installed.

Apart from these STP, 2 more STPs of capacity 100 KLD and 300 KLD are under construction at Chainpur & Driver Hut colonies, for which groundwork like chamber construction, connection by HPDE pipes and excavation are in progress. Photographs of the installed and under construction STPs are shown below:

240 KLD STP at Mukundbeda Colony



15 KLD STP at Chainpur Colony



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5 KLD STP at Washery-2 Canteen



5 KLD STP at Washery-3 Canteen



500 KLD STP at Housing Colony



100 KLD STP at Chainpur (In Progress)



- (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 vide letter no. WBD/EMC/4071/016/21 dated: 01.03.2021.

- (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. Although we are submitting Mine Closure Fund annually in Escrow account.

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

Compliance:

Consent to operate is being obtained regularly.

Half Yearly EC Compliance Report for period: April'21 - September'21

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:

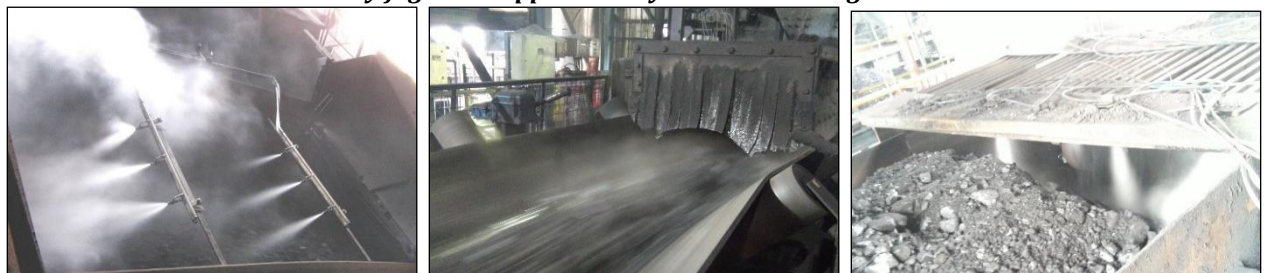
Consulted with Regional Officer of State Pollution Control Board, by considering the predominate wind direction, base line study and Air monitoring 4 station in core zone as well as in the buffer zone has been established for ambient air quality monitoring.

- (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.

Dry fog dust suppression system in crushing units



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.

Use of fixed & mobile water sprinklers



Road Cleaner



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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.

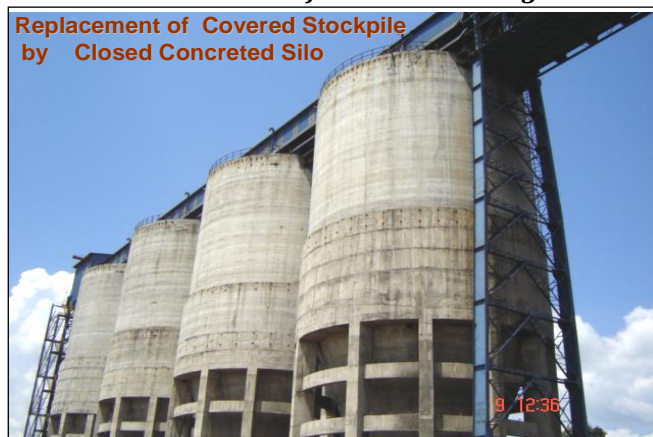
Water Mist Canon in coal stacking area



Pipe Conveyor for material transport



Concrete silos for material storage



- (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 Apr'21 to Sep'21 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. 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.

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



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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



Further, one PM₁₀ analyzer is installed for continuous PM₁₀ monitoring at Chainpur Railway Siding and continuous online data is being transmitted to JSPCB server.

Continuous PM₁₀ analyzer for PM₁₀ data



- (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.

- (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 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 mine's workshop



(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.

Pipe Conveyor



Covered Trucks



Conveyor belts



(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 NABL accredited & JSPCB recognized Environmental laboratory is functioning with adequate number of pollution monitoring and analysis instruments.

Heavy Metal Analysis by AAS



Instrumentation Room



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Wet Analysis Room



Furnace Room



Sample Room



- (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)	27 years
2	Mr. Utsav Kashyap	Sr. Manager (Environment)	11 years
3	Mr. Amritanshu	Manager (Environment)	4 years
4	Mr. Ajeet Singh	Manager (Forest)	18 years
5	Mr. Nageshwar Mahato	Lab. Asst.	20 years
6	Mr. Budhan Besra	Lab. Asst.	19 years

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Sl. No.	Name	Designation	Work Experience
7	Mr. P K Singh	Chemist	29 years
8	Mr. G A Khan	Chemist	28 years
9	Dr. Suraj Ghosh	Chemist	2 Years
10	Mr. Devalla Srinivas	Chemist	2 Year
11	Mr. Pashupati Nath Gupta	Chemist	7 Years
12	Mr. Sunil Kumar	Ministerial staff	11 years
13	Mr. Ajay Ram	-do-	12 years

- (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 FY-21 is approx. Rs.4024.80 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)

Period -April'2021 to June 2021

Industry Name: West Bokaro Division, Tata Steel Limited

Date of Sampling	Near Pundi					Near Persabera					Near Chainpur Mandap					Near EMC OFFICE					Near Duni								
	PM ₁₀	PM _{2.5}	NO _x	SO ₂	Date of Sampling	PM ₁₀	PM _{2.5}	NO _x	SO ₂	Date of Sampling	PM ₁₀	PM _{2.5}	NO _x	SO ₂	Date of Sampling	PM ₁₀	PM _{2.5}	NO _x	SO ₂	Date of Sampling	PM ₁₀	PM _{2.5}	NO _x	SO ₂	Date of Sampling	PM ₁₀	PM _{2.5}	NO _x	SO ₂
05-Apr-21	84.13	39.82	24.00	25.00	01-Apr-21	79.48	33.53	25.00	28.00	07-Apr-21	91.24	55.32	25.00	33.00	09-Apr-21	84.94	31.54	20.00	33.00	02-Apr-21	53.21	25.33	19.00	20.00	02-Apr-21	53.21	25.33	19.00	20.00
23-Apr-21	79.71	34.98	22.00	22.00	23-Apr-21	74.88	34.61	21.00	23.00	15-Apr-21	92.91	52.69	25.00	29.00	15-Apr-21	81.67	35.60	19.00	29.30	05-Apr-21	48.60	31.56	16.50	23.00	05-Apr-21	48.60	31.56	16.50	23.00
13-May-21	68.09	35.65	18.00	24.00	13-May-21	48.49	31.86	20.00	22.00	08-May-21	73.51	42.96	20.00	24.00	13-May-21	57.00	32.32	21.00	23.00	13-May-21	43.91	27.78	18.00	24.00	13-May-21	43.91	27.78	18.00	24.00
19-May-21	66.89	31.76	19.81	24.00	19-May-21	52.56	32.66	24.00	26.00	13-May-21	82.51	46.59	24.00	24.00	19-May-21	54.52	34.20	24.00	21.00	21-May-21	44.56	29.55	19.00	22.00	21-May-21	44.56	29.55	19.00	22.00
02-Jun-21	55.60	43.94	20.00	25.00	02-Jun-21	55.00	32.93	21.00	28.00	02-Jun-21	69.08	36.73	24.00	28.00	03-Jun-21	51.41	32.87	20.00	26.00	03-Jun-21	43.31	32.84	18.00	22.00	03-Jun-21	43.31	32.84	18.00	22.00
21-Jun-21	58.73	39.46	21.00	24.00	21-Jun-21	54.81	31.96	22.60	24.00	14-Jun-21	69.61	41.56	21.00	26.00	14-Jun-21	61.71	33.00	22.00	24.00	18-Jun-21	47.80	33.68	17.10	22.00	18-Jun-21	47.80	33.68	17.10	22.00
Minimum	55.60	31.76	18.00	22.00	Minimum	48.49	31.86	20.00	22.00	Minimum	69.08	36.73	20.00	24.00	Minimum	51.41	31.54	19.00	21.00	Minimum	43.31	25.33	16.50	20.00	Minimum	43.31	25.33	16.50	20.00
Maximum	84.13	43.94	24.00	25.00	Maximum	79.48	34.61	25.00	28.00	Maximum	92.91	55.32	25.00	33.00	Maximum	84.94	35.60	24.00	33.00	Maximum	53.21	33.68	19.00	24.00	Maximum	53.21	33.68	19.00	24.00
Average	68.86	37.60	20.80	24.00	Average	60.87	32.93	22.27	25.17	Average	79.81	45.98	23.17	27.33	Average	65.21	33.26	21.00	26.05	Average	46.90	30.12	17.93	22.17	Average	46.90	30.12	17.93	22.17
Limit (µg/m3)	100.00	60.00	80.00	80.00	Limit (µg/m3)	100.00	60.00	80.00	80.00	Limit (µg/m3)	100.00	60.00	80.00	80.00	Limit (µg/m3)	100.00	60.00	80.00	80.00	Limit (µg/m3)	100.00	60.00	80.00	80.00	Limit (µg/m3)	100.00	60.00	80.00	80.00


Mgr. (Env. Mgmt.)
West Bokaro Division
Tata Steel Limited

AIR QUALITY REPORT AT WORK PLACE

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

Period -April'2021 to June'2021

Industry Name: West Bokaro Colliery									
FRS-QAB					CMC-QSE				
Date of Sampling	SPM	RPM	NO _x	SO ₂	Date of Sampling	SPM	RPM	NO _x	SO ₂
02-Apr-21	537.21	274.58	25.00	25.50	06-Apr-21	410.14	221.91	26.00	32.00
07-Apr-21	611.02	233.51	24.00	26.00	07-Apr-21	526.70	282.51	24.00	31.00
07-May-21	313.66	185.65	20.00	26.00	07-May-21	374.79	214.98	24.00	23.00
17-May-21	316.88	188.86	22.00	24.50	19-May-21	361.55	166.24	26.00	34.00
03-Jun-21	358.86	212.78	22.00	24.00	02-Jun-21	396.89	202.70	24.00	25.00
14-Jun-21	348.11	217.19	22.00	26.00	16-Jun-21	378.81	209.80	22.00	24.00
Minimum	313.66	185.65	20.00	24.00	Minimum	361.6	166.24	22.00	23.00
Maximum	611.02	274.58	25.00	26.00	Maximum	526.7	282.51	26.00	34.00
Average	414.29	218.76	22.50	25.33	Average	408.1	216.36	24.33	28.17
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

Period -April'2021 to June'2021

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-Apr-21	7.29	38.00	122.10	1.6	06-Apr-21	7.09	6.00	214.60	1.6
07-Apr-21	7.46	27.00	82.00	2.0	07-Apr-21	7.56	10.00	109.00	2.0
07-May-21	7.50	37.00	47.00	2.8	07-May-21	8.04	12.00	78.00	1.6
17-May-21	7.73	42.00	53.00	2.0	19-May-21	7.84	8.00	45.40	2.0
03-Jun-21	7.87	33.00	88.00	2.4	02-Jun-21	8.00	16.00	38.00	2.4
14-Jun-21	7.94	44.00	76.00	1.6	16-Jun-21	7.91	14.00	46.00	2.4
Minimum	7.29	27.00	47.00	<1.0	Minimum	7.09	6.00	38.00	1.60
Maximum	7.94	44.00	122.10	<1.0	Maximum	8.04	16.00	214.60	2.40
Average	7.63	36.83	78.02	<1.0	Average	7.74	11.00	88.50	2.00
Limit		100 mg/L	250 mg/L	05 mg/L	Limit	5.5-9.0	100 mg/L	250 mg/L	10 mg/L

AMBIENT NOISE MONITORING REPORT

Period -April'2021 to June'2021

Industry Name: West Bokaro Colliery									
Date of Sampling	Q-AB				Q-SE				
	Day Time		Night Time		Date of Sampling	Day Time		Night Time	
	Limit	Level	Limit	Level		Limit	Level	Limit	Level
02-Apr-21	75.00	53.30	70.00	46.32	06-Apr-21	75.00	45.10	70.00	43.12
07-Apr-21	75.00	57.10	70.00	48.10	07-Apr-21	75.00	50.00	70.00	46.16
07-May-21	75.00	55.50	70.00	49.62	07-May-21	75.00	54.00	70.00	43.98
17-May-21	75.00	54.31	70.00	44.18	19-May-21	75.00	51.92	70.00	44.86
03-Jun-21	75.00	57.97	70.00	48.64	02-Jun-21	75.00	52.76	70.00	49.48
14-Jun-21	75.00	56.38	70.00	45.42	16-Jun-21	75.00	57.32	70.00	46.38
Minimum	75.00	53.30	70.00	49.62	Minimum	75.00	45.10	70.00	43.12
Maximum	75.00	57.97	70.00	49.62	Maximum	75.00	57.32	70.00	49.48
Average	75.00	55.76	70.00	47.05	Average	75.00	51.85	70.00	45.66

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**Mgr.(Env. Mgmt.)
West Bokaro Division
Tata Steel Limited**

AIR QUALITY REPORT AT WORK PLACE

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

Period -April'2021 to June'2021

Industry Name: Washey Complex (W-II)

Date of Sampling	SPM	RPM	NO _x	SO ₂
06-Apr-21	649.26	278.52	26.50	31.00
07-Apr-21	561.99	271.88	24.00	28.00
07-May-21	341.15	169.14	22.00	20.00
24-May-21	371.81	219.56	26.00	22.00
04-Jun-21	291.59	142.83	20.00	25.00
21-Jun-21	439.56	261.88	23.00	26.00
Minimum	291.59	142.83	20.00	20.00
Maximum	649.26	278.52	26.50	31.00
Average	442.56	223.97	23.58	25.33
Limit (µg/m3)	700.00	300.00	120.00	120.00

EFFLUENT QUALITY REPORT

Period -April'2021 to June'2021

Industry Name: Washey Complex -TP-08

Date of Sampling	pH	TSS	COD	BOD	Oil & Grease
06-Apr-21	7.02	17.00	81.40	19.50	1.2
07-Apr-21	7.13	22.00	142.00	22.50	1.0
07-May-21	7.20	28.00	193.00	21.50	2.2
24-May-21	7.03	20.00	204.00	27.36	2.1
04-Jun-21	7.09	16.00	167.00	21.00	1.0
21-Jun-21	7.18	21.00	185.00	24.40	2.0
Minimum	7.02	16.00	81.40	44.40	1.0
Maximum	7.20	28.00	204.00	27.36	2.2
Average	7.11	20.67	162.07	22.71	1.6
Limit		100 mg/L	250 mg/L	30 mg/L	10 mg/L

Note:

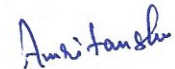
1. Zero Effluent Discharge (ZED) is being maintained at Washery. Effluent generated is 100% recycled and reused.
2. All values are well within limits.

AMBIENT NOISE MONITORING REPORT

Period -April'2021 to June'2021

Industry Name: Washey Complex (W-II)

Date of Sampling	Day Time		Night Time	
	Limit	Level	Limit	Level
06-Apr-21	75.00	58.60	70.00	46.86
07-Apr-21	75.00	53.30	70.00	44.63
07-May-21	75.00	52.06	70.00	46.12
24-May-21	75.00	54.91	70.00	49.90
04-Jun-21	75.00	55.82	70.00	43.36
21-Jun-21	75.00	53.74	70.00	50.01
Minimum	75.00	52.06	70.00	43.36
Maximum	75.00	58.60	70.00	50.01
Average	75.00	54.74	70.00	46.81



Mgr.(Env. Mgmt.)
West Bokaro Division
Tata Steel Limited

AIR QUALITY REPORT AT WORK PLACE

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

Period -April'2021 to June'2021

Industry Name: Washey Complex (W-III)

Date of Sampling	SPM	RPM	NO _x	SO ₂
06-Apr-21	649.26	278.52	26.50	31.00
07-Apr-21	561.99	271.88	24.00	28.00
07-May-21	341.15	169.14	22.00	20.00
24-May-21	371.81	219.56	26.00	22.00
04-Jun-21	291.59	142.83	20.00	25.00
21-Jun-21	439.56	261.88	23.00	26.00
Minimum	291.59	142.83	20.00	20.00
Maximum	649.26	278.52	26.50	31.00
Average	442.56	223.97	23.58	25.33
Limit (µg/m3)	700.00	300.00	120.00	120.00

EFFLUENT QUALITY REPORT

Period -April'2021 to June'2021

Industry Name: Washey Complex -TP-08

Date of Sampling	pH	TSS	COD	BOD	Oil & Grease
06-Apr-21	7.02	17.00	81.40	19.50	1.2
07-Apr-21	7.13	22.00	142.00	22.50	1.0
07-May-21	7.20	28.00	193.00	21.50	2.2
24-May-21	7.03	20.00	204.00	27.36	2.1
04-Jun-21	7.09	16.00	167.00	21.00	1.0
21-Jun-21	7.18	21.00	185.00	24.40	2.0
Minimum	7.02	16.00	81.40	19.50	1.0
Maximum	7.20	28.00	204.00	27.36	2.2
Average	7.09	20.60	157.48	22.37	1.5
Limit		100 mg/L	250 mg/L	30 mg/L	10 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 -April'2021 to June'2021

Industry Name: Washey Complex (W-III)

Date of Sampling	Day Time		Night Time	
	Limit	Level	Limit	Level
06-Apr-21	75.00	61.32	70.00	51.30
07-Apr-21	75.00	60.64	70.00	48.14
07-May-21	75.00	56.92	70.00	41.13
24-May-21	75.00	58.84	70.00	39.18
04-Jun-21	75.00	60.17	70.00	46.82
21-Jun-21	75.00	62.02	70.00	43.76
Minimum	75.00	56.92	70.00	39.18
Maximum	75.00	62.02	70.00	51.30
Average	75.00	59.99	70.00	45.06



Mgr.(Env. Mgmt.)
West Bokaro Division
Tata Steel Limited

AIR QUALITY REPORT AT WORK PLACE

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

Period -April'2021 to June'2021

Industry Name: Logistics (Dispatch)

Date of Sampling	SPM	RPM	NO _x	SO ₂
06-Apr-21	306.00	138.00	22.00	24.00
07-Apr-21	382.25	142.00	20.00	26.00
07-May-21	227.21	119.46	18.00	21.00
24-May-21	237.55	126.56	24.00	22.00
04-Jun-21	363.72	215.00	22.00	27.00
24-Jun-21	352.61	214.55	26.00	22.00
Minimum	227.21	119.46	18.0	21.0
Maximum	382.25	215.00	26.0	27.0
Average	311.56	159.26	22.0	23.7
Limit (µg/m3)	700.00	300.00	120.00	120.00

EFFLUENT QUALITY REPORT

Period -April'2021 to June'2021

Industry Name: Logistics (Dispatch)

Date of Sampling	pH	TSS	COD	BOD	Oil & Grease
06-Apr-21	6.48	90.00	188.40	22.30	2.8
07-Apr-21	6.99	70.00	187.00	24.80	2.8
07-May-21	7.38	62.00	185.00	27.10	3.2
24-May-21	7.78	85.00	140.00	27.60	2.0
04-Jun-21	8.04	93.00	195.00	21.17	3.2
24-Jun-21	8.21	89.00	158.00	23.60	2.2
Minimum	6.48	62.00	140.00	21.17	2.0
Maximum	8.21	93.00	195.00	27.60	3.2
Average	7.48	81.50	175.57	24.43	2.7
Limit		100 mg/L	250 mg/L	30 mg/L	10 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 -April'2021 to June'2021

Industry Name: Logistics (Dispatch)

Date of Sampling	Day Time		Night Time	
	Limit	Level	Limit	Level
06-Apr-21	75.00	51.90	70.00	48.72
07-Apr-21	75.00	58.30	70.00	41.36
07-May-21	75.00	52.60	70.00	49.63
24-May-21	75.00	56.40	70.00	46.18
04-Jun-21	75.00	54.79	70.00	44.71
24-Jun-21	75.00	55.93	70.00	48.30
Minimum	75.00	51.90	70.00	41.36
Maximum	75.00	58.30	70.00	49.63
Average	75.00	54.99	70.00	46.48



Mgr.(Env. Mgmt.)
West Bokaro Division
Tata Steel Limited

AIR QUALITY REPORT AT WORK PLACE

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

Period -April'2021 to June'2021

Industry Name: Power House

Date of Sampling	SPM	RPM	NO _x	SO ₂
06-Apr-21	649.26	278.52	26.50	31.00
07-Apr-21	561.99	271.88	24.00	28.00
07-May-21	341.15	169.14	22.00	20.00
24-May-21	371.81	219.56	26.00	22.00
04-Jun-21	291.59	142.83	20.00	25.00
21-Jun-21	439.56	261.88	23.00	26.00
Minimum	291.59	142.83	20.00	20.00
Maximum	649.26	278.52	26.50	31.00
Average	442.56	223.97	23.58	25.33
Limit (µg/m3)	700.00	300.00	120.00	120.00

AMBIENT NOISE MONITORING REPORT

Period -April'2021 to June'2021

Industry Name: Power House

Date of Sampling	Day Time		Night Time	
	Limit	Level	Limit	Level
06-Apr-21	75.00	60.18	70.00	48.90
07-Apr-21	75.00	58.34	70.00	46.06
07-May-21	75.00	56.46	70.00	50.01
24-May-21	75.00	61.18	70.00	48.08
04-Jun-21	75.00	60.36	70.00	46.68
21-Jun-21	75.00	56.68	70.00	41.98
Minimum	75.00	56.46	70.00	41.98
Maximum	75.00	61.18	70.00	50.01
Average	75.00	58.87	70.00	46.95

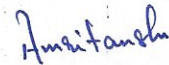
EFFLUENT QUALITY REPORT

Period -April'2021 to June'2021

Industry Name: Power House (Ash Pond)

Date of Sampling	Color	pH	TSS	COD	BOD	Oil & Grease
06-Apr-21	Colorless	7.17	9	108	25.9	1.6
07-Apr-21	Colorless	7.13	12	120.0	28.8	2.0
07-May-21	Colorless	7.04	16	92	23.9	2.8
24-May-21	Colorless	7.09	8	135	24.6	3.2
04-Jun-21	Colorless	7.22	13	104.0	27.0	1.6
21-Jun-21	Colorless	7.24	18	118	28.3	2.4
Minimum	Colorless	7.04	8	92	23.9	1.6
Maximum	Colorless	7.24	18	135	28.8	3.2
Average	Colorless	7.1	13	113	26.4	2.3
Limit	Colorless		100 mg/L	2200 mg/L	30 mg/L	10 mg/L

Note:



Mgr.(Env. Mgmt.)
West Bokaro Division
Tata Steel Limited

AMBIENT AIR QUALITY REPORT

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

Period -July'2021 to Sep'2021

Industry Name: West Bokaro Division, Tata Steel Limited

Date of Sampling	Near Persabera					Near Chainpur Mandap					Near EMC OFFICE/TCH					Near Duni								
	PM ₁₀	PM _{2.5}	NO _x	SO ₂	Date of Sampling	PM ₁₀	PM _{2.5}	NO _x	SO ₂	Date of Sampling	PM ₁₀	PM _{2.5}	NO _x	SO ₂	Date of Sampling	PM ₁₀	PM _{2.5}	NO _x	SO ₂	Date of Sampling	PM ₁₀	PM _{2.5}	NO _x	SO ₂
01-Jul-21	63.31	27.42	18.00	16.00	02-Jul-21	46.52	35.58	22.00	19.00	02-Jul-21	27.96	24.35	20.00	18.00	01-Jul-21	30.08	13.60	22.00	17.00	01-Jul-21	30.08	13.60	22.00	17.00
20-Jul-21	59.16	24.60	21.00	14.00	20-Jul-21	42.41	31.23	26.00	11.00	21-Jul-21	26.57	23.92	19.00	14.00	22-Jul-21	31.96	22.76	19.00	16.00	22-Jul-21	31.96	22.76	19.00	16.00
17-Aug-21	23.82	18.44	15.00	15.00	03-Aug-21	39.62	26.28	21.00	18.00	04-Aug-21	27.19	22.72	17.00	15.00	13-Aug-21	19.32	11.64	18.00	17.00	13-Aug-21	19.32	11.64	18.00	17.00
19-Aug-21	24.56	19.22	17.00	14.00	19-Aug-21	38.12	24.55	19.00	14.00	20-Aug-21	27.24	22.62	14.00	11.00	19-Aug-21	27.96	22.10	16.00	14.00	19-Aug-21	27.96	22.10	16.00	14.00
02-Sep-21	25.88	17.53	18.00	16.00	01-Sep-21	32.21	24.49	20.00	18.00	01-Sep-21	21.42	18.06	19.00	18.00	02-Sep-21	28.14	21.18	18.00	17.00	02-Sep-21	28.14	21.18	18.00	17.00
22-Sep-21	25.11	19.25	15.00	11.00	22-Sep-21	33.17	22.94	17.00	14.00	21-Sep-21	22.10	19.12	16.00	14.00	22-Sep-21	28.09	20.76	21.00	19.00	22-Sep-21	28.09	20.76	21.00	19.00
Minimum	23.82	17.53	15.00	11.00	Minimum	32.21	22.94	17.00	11.00	Minimum	21.42	18.06	14.00	11.00	Minimum	19.32	11.64	16.00	14.00	Minimum	19.32	11.64	16.00	14.00
Maximum	63.31	27.42	21.00	16.00	Maximum	46.52	35.58	26.00	19.00	Maximum	27.96	24.35	20.00	18.00	Maximum	31.96	22.76	22.00	19.00	Maximum	31.96	22.76	22.00	19.00
Average	36.97	21.08	17.33	14.33	Average	38.68	27.51	20.83	15.67	Average	25.41	21.80	17.50	15.00	Average	27.59	18.67	19.00	16.67	Average	27.59	18.67	19.00	16.67
Limit (µg/m3)	100.00	60.00	80.00	80.00	Limit (µg/m3)	100.00	60.00	80.00	80.00	Limit (µg/m3)	100.00	60.00	80.00	80.00	Limit (µg/m3)	100.00	60.00	80.00	80.00	Limit (µg/m3)	100.00	60.00	80.00	80.00

F. Anand

Mgr. (Env. Mgmt.)

West Bokaro Division

Tata Steel Limited

AIR QUALITY REPORT AT WORK PLACE

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

Period -July'2021 to Sep'2021

Industry Name: West Bokaro Colliery									
FRS-QAB					CMC-QSE				
Date of Sampling	SPM	RPM	NO _x	SO ₂	Date of Sampling	SPM	RPM	NO _x	SO ₂
15-Jul-21	158.93	109.94	20.00	22.00	15-Jul-21	172.58	104.00	22.00	25.00
14-Jul-21	163.10	112.96	19.00	22.00	16-Jul-21	168.52	101.72	19.00	21.00
18-Aug-21	79.16	49.12	21.00	22.00	18-Aug-21	59.53	32.02	21.00	22.00
31-Aug-21	81.13	51.54	19.00	24.00	22-Aug-21	61.66	33.56	20.00	24.00
08-Sep-21	152.33	96.41	20.00	21.00	08-Sep-21	102.77	62.47	21.00	22.00
14-Sep-21	98.14	86.23	17.00	19.00	16-Sep-21	107.22	59.83	17.00	22.00
Minimum	79.16	49.12	17.00	19.00	Minimum	59.5	32.02	17.00	21.00
Maximum	163.10	112.96	21.00	24.00	Maximum	172.6	104.00	22.00	25.00
Average	122.13	84.37	19.33	21.67	Average	112.0	65.60	20.00	22.67
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

Period -July'2021 to Sep'2021

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
07-Jul-21	8.01	39.0	41.3	2.8	07-Jul-21	7.84	21.0	8.2	3.6
					30-Jul-21	7.82	6.0	33.0	2.0
05-Aug-21	7.75	12.0	16.5	1.6	05-Aug-21	7.89	8.0	29.7	2.0
10-Sep-21	7.67	13.0	15.5	2.0	10-Sep-21	7.50	14.0	11.6	1.6
Minimum	7.67	12.00	15.50	<1.0	Minimum	7.50	6.00	8.20	1.60
Maximum	8.01	39.00	41.30	<1.0	Maximum	7.89	21.00	33.00	3.60
Average	7.81	21.33	24.43	<1.0	Average	7.76	12.25	20.63	2.30
Limit		100 mg/L	250 mg/L	10 mg/L	Limit		100 mg/L	250 mg/L	10 mg/L

AMBIENT NOISE MONITORING REPORT

Period -July'2021 to Sep'2021

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
15-Jul-21	75.00	56.67	70.00	45.23	17-Jul-21	75.00	50.92	70.00	42.15
31-Aug-21	75.00	55.57	70.00	46.12	18-Aug-21	75.00	65.59	70.00	44.12
08-Sep-21	75.00	56.07	70.00	47.21	08-Sep-21	75.00	53.00	70.00	42.30
Minimum	75.00	55.57	70.00	47.21	Minimum	75.00	50.92	70.00	42.15
Maximum	75.00	56.67	70.00	47.21	Maximum	75.00	65.59	70.00	44.12
Average	75.00	56.10	70.00	46.19	Average	75.00	56.50	70.00	42.86


Mgr.(Env. Mgmt.)
West Bokaro Division
Tata Steel Limited

AIR QUALITY REPORT AT WORK PLACE

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

Period -July'2021 to Sep'2021**Industry Name: Washey Complex (W-II)**

Date of Sampling	SPM	RPM	NO _x	SO ₂
09-Jul-21	167.33	106.96	20.00	22.00
21-Jul-21	158.23	103.76	19.00	24.00
02-Aug-21	69.98	46.33	17.00	20.00
20-Aug-21	67.88	47.23	19.00	21.00
13-Sep-21	122.77	92.00	18.00	22.00
21-Sep-21	117.25	81.23	17.00	24.00
Minimum	67.88	46.33	17.00	20.00
Maximum	167.33	106.96	20.00	24.00
Average	117.24	79.59	18.33	22.17
Limit (µg/m³)	700.00	300.00	120.00	120.00

EFFLUENT QUALITY REPORT**Period -July'2021 to Sep'2021****Industry Name: Washey Complex -TP-08**

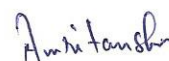
Date of Sampling	pH	TSS	COD	BOD	Oil & Grease
07-Jul-21	7.02	17.0	202.4	22.0	2.4
05-Aug-21	7.36	95.0	90.9	24.0	2.0
10-Sep-21	7.74	22.0	60.1	15.6	1.6
Minimum	7.02	17.00	60.10	44.40	1.6
Maximum	7.74	95.00	202.40	24.00	2.4
Average	7.37	44.67	117.80	20.53	2.0
Limit		100 mg/L	250 mg/L	30 mg/L	10 mg/L

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 -July'2021 to Sep'2021****Industry Name: Washey Complex (W-II)**

Date of Sampling	Day Time		Night Time	
	Limit	Level	Limit	Level
09-Jul-21	75.00	57.40	70.00	47.62
02-Aug-21	75.00	54.81	70.00	46.61
13-Sep-21	75.00	55.55	70.00	49.12
Minimum	75.00	54.81	70.00	46.61
Maximum	75.00	57.40	70.00	49.12
Average	75.00	55.92	70.00	47.78



Mgr.(Env. Mgmt.)
West Bokaro Division
Tata Steel Limited

AIR QUALITY REPORT AT WORK PLACE

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

Period -July'2021 to Sep'2021**Industry Name: Washey Complex (W-III)**

Date of Sampling	SPM	RPM	NO _x	SO ₂
09-Jul-21	167.33	106.96	20.00	22.00
21-Jul-21	158.23	103.76	19.00	24.00
02-Aug-21	69.98	46.33	17.00	20.00
20-Aug-21	67.88	47.23	19.00	21.00
13-Sep-21	122.77	92.00	18.00	22.00
21-Sep-21	117.25	81.23	17.00	24.00
Minimum	67.88	46.33	17.00	20.00
Maximum	167.33	106.96	20.00	24.00
Average	117.24	79.59	18.33	22.17
Limit (µg/m3)	700.00	300.00	120.00	120.00

EFFLUENT QUALITY REPORT**Period -July'2021 to Sep'2021****Industry Name: Washey Complex -TP-08**

Date of Sampling	pH	TSS	COD	BOD	Oil & Grease
07-Jul-21	7.02	17.0	202.4	22.0	2.4
05-Aug-21	7.36	95.0	90.9	24.0	2.0
10-Sep-21	7.74	22.0	60.1	15.6	1.6
Minimum	7.02	17.00	60.10	15.60	1.6
Maximum	7.74	95.00	202.40	24.00	2.4
Average	7.37	44.67	117.80	20.53	2.0
Limit		100 mg/L	250 mg/L	30 mg/L	10 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 -July'2021 to Sep'2021****Industry Name: Washey Complex (W-III)**

Date of Sampling	Day Time		Night Time	
	Limit	Level	Limit	Level
09-Jul-21	75.00	57.40	70.00	49.53
02-Aug-21	75.00	54.81	70.00	51.02
13-Sep-21	75.00	55.55	70.00	44.63
Minimum	75.00	54.81	70.00	44.63
Maximum	75.00	57.40	70.00	51.02
Average	75.00	55.92	70.00	48.39

Amitanshu
Mgr.(Env. Mgmt.)
West Bokaro Division
Tata Steel Limited

AIR QUALITY REPORT AT WORK PLACE

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

Period -July'2021 to Sep'2021**Industry Name: Logistics (Dispatch)**

Date of Sampling	SPM	RPM	NO _x	SO ₂
09-Jul-21	151.84	98.12	18.00	21.00
26-Jul-21	147.53	92.63	16.00	19.00
05-Aug-21	49.16	36.63	16.00	18.00
25-Aug-21	51.96	41.76	19.00	24.00
10-Sep-21	98.76	76.12	18.00	21.00
24-Sep-21	125.65	98.26	17.00	19.00
Minimum	49.16	36.63	16.0	18.0
Maximum	151.84	98.20	19.0	24.0
Average	104.15	73.91	17.3	20.3
Limit (µg/m3)	700.00	300.00	120.00	120.00

EFFLUENT QUALITY REPORT**Period -July'2021 to Sep'2021****Industry Name: Logistics (Dispatch)**

Date of Sampling	pH	TSS	COD	BOD	Oil & Grease
07-Jul-21	8.21	258.00	314.00	84.00	4
30-Jul-21	7.56	157.00	214.80	58.00	3.6
05-Aug-21	7.54	27.00	132.20	34.80	2.4
10-Sep-21	7.32	70.00	128.40	38.40	2.0
Minimum	7.32	27.00	128.40	34.80	2.0
Maximum	8.21	258.00	314.00	84.00	4.0
Average	7.66	128.00	197.35	53.80	3.0

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 -July'2021 to Sep'2021****Industry Name: Logistics (Dispatch)**

Date of Sampling	Day Time		Night Time	
	Limit	Level	Limit	Level
09-Jul-21	75.00	53.92	70.00	44.50
05-Aug-21	75.00	62.67	70.00	47.56
24-Sep-21	75.00	54.64	70.00	48.62
Minimum	75.00	53.92	70.00	44.50
Maximum	75.00	62.67	70.00	48.62
Average	75.00	57.08	70.00	46.89



Mgr.(Env. Mgmt.)
West Bokaro Division
Tata Steel Limited

AIR QUALITY REPORT AT WORK PLACE

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

Period -July'2021 to Sep'2021

Industry Name: Power House

Date of Sampling	SPM	RPM	NO _x	SO ₂
09-Jul-21	167.33	106.96	20.00	22.00
21-Jul-21	158.23	103.76	19.00	24.00
02-Aug-21	69.98	46.33	17.00	20.00
20-Aug-21	67.88	47.23	19.00	21.00
13-Sep-21	122.77	92.00	18.00	22.00
21-Sep-21	117.25	81.23	17.00	24.00
Minimum	67.88	46.33	17.00	20.00
Maximum	167.33	106.96	20.00	24.00
Average	117.24	79.59	18.33	22.17
Limit (µg/m3)	700.00	300.00	120.00	120.00

AMBIENT NOISE MONITORING REPORT

Period -July'2021 to Sep'2021

Industry Name: Power House

Date of Sampling	Day Time		Night Time	
	Limit	Level	Limit	Level
09-Jul-21	75.00	57.40	70.00	47.53
02-Aug-21	75.00	54.81	70.00	48.60
13-Sep-21	75.00	55.55	70.00	49.63
Minimum	75.00	54.81	70.00	47.53
Maximum	75.00	57.40	70.00	49.63
Average	75.00	55.92	70.00	48.59

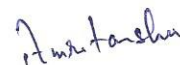
EFFLUENT QUALITY REPORT

Period -July'2021 to Sep'2021

Industry Name: Power House (Ash Pond)

Date of Sampling	pH	TSS	COD	BOD	Oil & Grease
07-Jul-21	7.22	19	111.5	28.0	3.2
05-Aug-21	7.26	18	28.9	6.9	2.0
10-Sep-21	7.03	62	19.4	4.5	1.6
Minimum	7.03	18	19.4	4.5	1.6
Maximum	7.26	62	111.5	28.0	3.2
Average	7.2	33	53	13.1	2.3
Limit		100 mg/L	250 mg/L	30 mg/L	10 mg/L

Note:



Mgr.(Env. Mgmt.)
West Bokaro Division
Tata Steel Limited

Annexure-II: Expenditure on Environmental Safeguards - FY'21

QAB

Sl. No.	Item for expenditure	Rs. In Lakh	
		Capital	Revenue
1	Effluent recycling/new system		2.00
2	Tree plantation & lawn maintenance		2.16
3	Water tanker operation (includes wages cost)		89.19
4	Water tanker maintenance cost		159.23
5	Cleaning of workshop(In Rs Lakh)		56.22
Sub Total =		0.00	308.79

QSE

Sl. No.	Item for expenditure	Rs. In Lakh	
		Capital	Revenue
1	Effluent recycling system operation/maintenance		7.78
2	Water tanker operation and including wages		239.70
3	Water sprinkler maintenance cost		105.10
4	Cleaning of workshop		49.57
5	Wet drilling operation and maintenance & modification to minimize water consumption		322.87
6	Replacement /Repair of oil try & oil barrel stored		3.30
7	Cost of auto fire system		4.92
8	New pump for recycling system		1.37
Sub Total =		0.00	734.61

Power House

Sl. No.	Item for expenditure	Rs. In Lakh	
		Capital	Revenue
1	Dry fog maintenance to prevent dust suppression		11.92
2	Opacity meter for Continuous Emission Monitoring Station		0.00
3	New pump installation for IJ Sector to reduce truck transportation of ash to prevent spillage		37.50
4	New Pipe laying to reduce truck transportation of ash to prevent spillage		4.50
5	ESP field O/H maintenance and operation		27.76
6	Slurry ash line maintenance to prevent spillage		34.50
7	Cleaning and housekeeping maintenance of power house area to prevent fugitive dust		27.20
8	Power cost-Tailing pond water recycling system		14.50
9	Reject shed maintenance to reduce fugitive dust		2.70
10	Tailing pond & ash pond embankment strengthening/toe wall to prevent spillage		2.50
11	DM plant corrosion resistant painting to avoid seepage/ land contamination & Clarifloculator painting		1.50
12	Maintenance of Continuous Emission Monitoring Station		2.40
13	Renewal of Boiler Insulation to reduce heat loss and dust		18.80
Sub Total =		0.00	185.78

W-II

Sl. No.	Item for expenditure	Rs. In Lakh	
		Capital	Revenue
1	Installation of bluescope sheet at conveyor transfer point area and crusher house to reduce fugitive dust pollution		2.48
2	Dust suppression (maintenance spares)		8.00
3	Water Sprinkling for dust suppression		8.09
4	Effluent recycling for resource conservation and zero effluent discharge		17.50
5	Cleaning and housekeeping to reduce fugitive emission in washery area		53.90
6	Over dense Cone Wrapping to prevent leakage		3.00
7	Better efficient Light replacement and repair to reduce power consumption		9.21
8	Modification for Conveyor Spillage Control in conveyor belts to prevent soil contamination		3.44
9	Spillage Control by Hosch/Tegga Equipment's to prevent soil contamination		19.77
10	Dry Fog System Operation and Maintenance for dust suppression		19.54
11	Automation in pollution tank to eliminate chance of effluent discharge		0.80
12	Tailing pond structural maintenance to maintain zero effluent discharge		12.00
Sub Total =		0.00	157.73

Annexure-II: Expenditure on Environmental Safeguards - FY'21

W-III

Sl. No.	Item for expenditure	Rs. In Lakh	
		Capital	Revenue
1	Dust suppression by sprinkling		10.32
2	New pump for water recycling		3.11
3	Effluent Recycling including power cost for zero effluent discharge		1.21
4	Maintenance of Dry Fog System for dust suppression		18.42
5	Cleaning and Housekeeping for fugitive dust suppression		27.95
6	Mechanical Tailing Dewatering to ensure Zero Effluent Discharge		1050.25
7	Power cost for Tailing Dewatering Plant to ensure Zero Effluent Discharge		58.44
8	Road construction for Tailing transportation to minimize dust generation		14.76
9	Spillage control in conveyors		9.24
10	Recycling of water for HRT		8.72
11	Overhauling of media filter		5.25
12	Housekeeping in office building		6.87
Sub Total =		0.00	1214.54

Out Bound Logistics

Sl. No.	Item for expenditure	Rs. In Lakh	
		Capital	Revenue
1	Water sprinkling on road for dust suppression		5.65
2	Spillage cleaning for Waste Management		61.60
3	Cleaning at B point to reduce fugitive dust generation		10.47
4	Boulder stacking from new and old yard to reduce water flow		0.00
5	Transportation from yard for minimize dust generation		36.26
Sub Total =		0.00	113.98

Environment Management Cell

Sl. No.	Item for expenditure	Rs. In Lakh	
		Capital	Revenue
1	Annual maintenance of environmental monitoring station (CAAQMS, CEMS & PM10 analyser)		3.20
2	Environmental monitoring		1.00
3	Support for Environmental Activities and Jobs (Manpower, Vehicle etc.)		7.00
4	NABL Consultancy & Chemists for Environmental laboratory		21.00
5	Environmental Laboratory consumables		2.00
6	Awareness Programmes (World Environment Day, World Water Day, Green School Project etc.)		2.00
Sub Total =		0.00	36.20

IBMD

Sl. No.	Item for expenditure	Rs. In Lakh	
		Capital	Revenue
1	Dust suppression by water sprinkling with chemical on main road		75.80
Sub Total =		0.00	75.80

Projects

Sl. No.	Item for expenditure	Rs. In Lakh	
		Capital	Revenue
1	Pundi dump Park Development (Road , architectural and area development work)		116.55
2	ETP cum STP for hospital	21.91	5.00
3	UV vis spectrophotometer and air monitoring equipment	17.42	
4	Long pipe conveyor for dust and spillage control	515.70	
Sub Total =		555.03	121.55

E&P

Sl. No.	Item for expenditure	Rs. In Lakh	
		Capital	Revenue
1	STP Installation	4.15	0.00
Sub Total =		4.15	0.00

Annexure-II: Expenditure on Environmental Safeguards - FY'21

C&SM

Sl. No.	Item for expenditure	Rs. In Lakh	
		Capital	Revenue
1	Town cleaning/garbage dumping fogging/ drain cleaning		90.35
2	Physiography barrier: 1.Pit office of Q-AB (length = 110 RM) Green cloth changed: 1. Q-SEB (Length= 250 Rm) 2. Near Kali Bari (Length= 100 Rm) 3. New weigh bridge (Length= 140 Rm)		9.00
3	PCC road at different location of Township		5.00
4	Park development work		2.00
5	Drain repair and development at Township		5.00
6	PCC Road at Pit office of Q-AB and New Weigh Bridge		19.00
7	RCC road at New Weigh Bridge and Parking area at Jharna basti of IBMD (650 RM)		48.00
8	PCC road in Railway yard (Total Length=300 RM)		2.00
9	6 Nos. civil foundation at Power House for Ash Disposal		5.00
10	Mechanised cleaning of septic tank and overhead water tank		5.00
11	Re-surfacing of road in township area		30.00
Sub Total =		0.00	220.35

TSRDS

Sl. No.	Item for expenditure	Rs. In Lakh	
		Capital	Revenue
1	Renovation and desilting of 4 nos. of Ponds for natural ground water recharging		8.96
2	Construction of Pond outlets		1.07
Sub Total =		0.00	10.03

Planning & Horticulture

Sl. No.	Item for expenditure	Rs. In Lakh	
		Capital	Revenue
1	Parks Maintenance (Maintenance, Security, Material etc.) to maintain green cover		70.00
2	New Area Development for New Parks at pundi for restoration of dump site		28.00
3	Annual Plantation		15.00
4	Golf ground-80000 area in first phase (soil & Fly ash spreading)		35.00
5	Ground preparation work for dump reclamation		26.96
Sub Total =		0.00	174.96

Hospital

Sl. No.	Item for expenditure	Rs. In Lakh	
		Capital	Revenue
1	Handling and Disposal of BMW		2.51
2	Procurement of BMW Color Bags for BMW management		0.72
3	Bleaching Powder for effluent treatment		0.10
4	Cleaning of hospital including effluent treatment		19.97
Sub Total =		0.00	23.30

Water Supply

Sl. No.	Item for expenditure	Rs. In Lakh	
		Capital	Revenue
1	Expenditure occurred for Environment related activities in pundi area		88.00
Sub Total =		0.00	88.00
Expenditure incurred towards environmental safeguard activities of West Bokaro Division =		559.18	3465.62