



To,
**The Additional Principal Chief Conservator of Forest,
Regional Office (Eastern Central Zone)
Ministry of Environment, Forests and Climate Change, Govt. of India
Bungalow No. A-2, Shyamali Colony, Ranchi – 834002, Jharkhand.**

Ref No. - JMB/ENV/JCPP/38/ 879 /2021
November 27, 2021

Ref.: Environmental Clearance letter no. - J-11015/203/2011-IA.II(M) dated- 3rd March 2014.

Sub: Half Yearly Compliance Status Report of Environment Clearance conditions issued by MoEFCC, New Delhi to Jamadoba Coal Washery, Tata Steel Limited, Dhanbad for the period April'21 to September'21

Dear Sir,

We are enclosing herewith compliance report for the period **April'21 to September'21** for the EC granted vide letter no.- J-11015/203/2011-IA.II(M) dated- 3rd March 2014 issued by Ministry of Environment, Forest and Climate Change, New Delhi.

We trust the information furnished is in line with your requirement.

Thanking you,

Yours faithfully,

**Head (Planning)
Jharia Division, Tata Steel Ltd.**

Encl: As above.

Copy to: Member Secretary, CPCB, Eastern Zonal Office, Southend Conclave, 502, 5th Floor
1582, Rajdanga Main Road, Kolkata -700107.

Copy to: Member Secretary, JSPCB, T.A. Division Building (Ground Floor), H.E.C, Dhurwa,
Ranchi - 834004.

Copy to: Regional Officer, JSPCB, HIG-1 Sardar Patel Nagar, Housing Colony, Hirapur, Dhanbad

**HALF YEARLY COMPLIANCE REPORT
(PERIOD: APRIL'21 – SEPTEMBER'21)**

**JAMADOBA COAL WASHERY
(CAPACITY: EXPANSION FROM 1 TO 2 MTPA RAW COAL
THROUGHPUT)
TEHSIL: JHARIA, DIST: DHANBAD, JHARKHAND**



TATA STEEL LIMITED, JHARIA DIVISION

**P.O.- JAMADOBA, DIST. - DHANBAD,
STATE- JHARKHAND, PIN CODE – 828112.**

**ENVIRONMENTAL CLEARANCE GRANTED VIDE LETTER NO. - J-
11015/203/2011-IA.II(M) DATED- 03.03.2014 ISSUED BY GOVT. OF INDIA,
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE, NEW
DELHI.**

Compliance status of Expansion of Jamadoba Coal washery (1 MTPA to 2 MTPA in 7 ha Area) of M/s Tata Steel Ltd. Tehsil Jharia, dist. Dhanbad, Jharkhand vide MoEFCC Letter no J-11015/203/2011-IA.II (M) dated March 3, 2014

S. No.	Condition	Compliance Status
Specific Condition		
(i)	Adequate green belt shall be provided around coal handling and other areas.	Greenery has been developed in many areas around the washery premises. Since the expansion job has been completed, remaining area is also being developed.
(ii)	Action plan be developed and implemented for abandoned tailing ponds and for their restoration to the original land use.	Action plan for cut-off of tailing ponds from tailing management system is in place. Abandoned tailing ponds have been reclaimed by backfilling. Technical reclamation have taken place in two large ponds. Biological reclamation is going on by planting native species.
(iii)	Fly ash generated from the captive power plant of the washery be utilized for house construction, roads and such uses, strictly complying to the timeline in the EIA Notification, 2006 and maintaining proper records.	This is not applicable as we have ceased the operation of our captive Jamadoba power plant since April'15.
(iv)	No use of fly ash with sand will take place for stowing in underground mines.	This will be strictly followed for our captive underground mines.
(v)	Transportation of fly ash to be done properly by mechanically covered trucks.	This is not applicable as there is no fly ash being generated since April'15.
(vi)	The proponent shall connect all the villages in the leasehold area with water pipeline connection.	All the villages in the leasehold areas will be supplied safe drinking water through pipeline connection. A network of more than 22000 metres of pipeline connection has been established along with 33 water tanks (capacity of 4500 litres).
(vii)	The proponent shall expedite and implement the pilot plant to convert mine water into drinking/domestic water to supply the same to the population of Dhanbad and surrounding areas and shall continue to carry out this activity.	Mine water is already being converted into potable water by Tata Steel in our 4 nos. Water Treatments Plants (located at Jamadoba, Digwadiah, Bhelatand and Malkera having cumulative capacity of around 8000 KL/D). The treated water is then supplied to

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		our colonies and leasehold villages. This will continue in future too.
(viii)	Tanks/ponds shall be regularly cleaned and maintained. Plantation activities shall be intensified in the mine areas.	Tanks/ ponds are regularly cleaned and maintained by TSRDS. Plantation activities are undertaken every year in the barren mine leasehold areas. Further, TSRDS engages with the villagers for plantation in the village lands.
(ix)	The proponent shall expedite the activities undertaken by TSRDS in over 30 villages in the leasehold area over 15000 households covering a population of about 1.4 lakh.	CSR activities of TSRDS are managed by a team of experts who are dedicatedly involved in providing benefits and improving standard of living in over 30 villages. The list of activities are developed in consultation with the village representatives and implemented in a time-bound manner.
(x)	CSR activities of TSRDS are managed by a team of experts who are dedicatedly involved in providing benefits and improving standard of living in over 30 villages. The list of activities are developed in consultation with the village representatives and implemented in a time-bound manner.	The proposed CSR expenditure for the entire company is decided as per the new Company Rules. Once the CSR budget for company is fixed, a share of that amount is dedicated and utilized for implementing the CSR activities at our Jharia Division level. The CSR expenditure for FY21 is Rs.3.29 crores.
(xi)	Cost for additional environmental protection measures shall be not less than Rs. 503.00 lakhs. The status of implementation including costs incurred shall be regularly reported to this Ministry and its respective Regional Office in the region as part of the compliance report and also uploaded on the company website.	The regular expenditure incurred for environment protection and management are submitted to MoEF&CC & SPCB in Annual Environment Statement and the status is uploaded on company website as a part of compliance report of AES.
(xii)	The slope of the embankment towards the river shall be at least 1:3 for stability and shall be stabilized with plantation using native species selected from the study area.	The washery is about 1.5 kms away from the Damodar River. Hence it is not applicable.

Compliance status of Expansion of Jamadoba Coal washery (1 MTPA to 2 MTPA in 7 ha Area) of M/s Tata Steel Ltd. Tehsil Jharia, dist. Dhanbad, Jharkhand vide MoEFCC Letter no J-11015/203/2011-IA.II (M) dated March 3, 2014

(xiii)	Top soil shall be stored in the earmarked area and used within a year of its generation for green belt development and for plantation/reclamation.	There are no top soil dumps hence it is not applicable.
(xiv)	No external OB dump shall be created for the expansion project. Monitoring and management of existing reclaimed dumpsites shall continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment & Forests and its respective Regional Office on yearly basis.	Not applicable as this is a washery project.
(xv)	Catch drains and siltation ponds of appropriate size shall be constructed to arrest silt and sediment flows from soil, OB and mineral dumps. The water so collected shall be utilised for watering the mine area, roads, green belt development, etc. The drains shall be regularly desilted and maintained properly.	There are no soil or OB dumps in the washery premises. Only the by-products are stored in the stockyards located in the washery premises which are sold off within a week.
(xvi)	Garland drains (size, gradient and length) and sump capacity shall 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 shall also provide adequate retention period to allow proper settling of silt material.	Garland drains of adequate size and gradient already exist around the washery area to channelize the surface runoff. The runoff is diverted to the tailing ponds and clear water is utilized in the washery. It is further strengthened under washery expansion jobs
(xvii)	Dimension of the retaining wall at the toe of the dumps and OB benches within the mine to check run-off and siltation shall be based on the rainfall data.	Not applicable as we do not have any opencast mines.
(xviii)	Crushers at the CHP shall be operated with high efficiency bag filters/water sprinkling system shall be provided to check fugitive emissions from crushing operations, conveyor system which shall	The following measures have been implemented: i) Dry-fog system at all transfer points of CHP and further extension in expansion project.

Compliance status of Expansion of Jamadoba Coal washery (1 MTPA to 2 MTPA in 7 ha Area) of M/s Tata Steel Ltd. Tehsil Jharia, dist. Dhanbad, Jharkhand vide MoEFCC Letter no J-11015/203/2011-IA.II (M) dated March 3, 2014

	be closed, haulage roads, transfer points, etc.	<ul style="list-style-type: none"> ii) Enclosures around crushers. iii) Belts have been covered on top and both sides. These arrangements will protect the coal mass moving on belt from blowing wind. In this way, the dust getting air borne is being minimized. iv) Fixed water sprinklers on the haulage roads. v) In addition, movable water sprinklers are also being deployed on the roads for dust suppression. vi) Dust Extraction System vii) Strengthening of tailing management system viii) Concretisation of working complex
(xix)	Drills shall be wet operated only.	Not applicable as this is coal beneficiation plant
(xx)	Controlled blasting shall be practiced with use of delay detonators and only during daytime. The mitigative measures for control of ground vibrations and to arrest the fly rocks and boulders shall be implemented.	Not applicable as this is coal beneficiation plant
(xxi)	The Washery shall be a zero-discharge and no wastewater shall be discharged from the washery into the drains/natural watercourses. No groundwater shall be used for washery operations. Recycled water shall be used for development and maintenance of green belt and in the plant operations.	Washery is already operating on a zero-discharge principle. No waste-water is discharged into the drains/ natural water systems. Only mine water is utilized for the washery operations as make up water requirement. The recycled water is again used for plant operations and green-belt development.
(xxii)	The raw coal, washed coal and middling and coal wastes (rejects) shall be stacked properly at earmarked site(s) within sheds/stockyards fitted with wind breakers/shields. Adequate measures shall be taken to ensure that the stored minerals do not catch fire. The storage period shall be not more than 2-3 days.	The material is being stacked properly at stockyards located within the washery. We have a well-established system for disposal of rejects/ tailings to consumers so that storage period is not more than 2-3 days.

Compliance status of Expansion of Jamadoba Coal washery (1 MTPA to 2 MTPA in 7 ha Area) of M/s Tata Steel Ltd. Tehsil Jharia, dist. Dhanbad, Jharkhand vide MoEFCC Letter no J-11015/203/2011-IA.II (M) dated March 3, 2014

(xxiii)	The proponent shall maintain proper records of the ash content of raw (ROM) coal, clean coal, middling and coal rejects along with quantum of raw coal obtained and washed and dispatched every month and the same shall be uploaded on the company website every month.	Proper records are being maintained and the details are uploaded on the company website.
(xxiv)	All internal roads shall be concreted or black topped and the approach roads used for the project shall be blacked topped. Facilities for parking of trucks carrying raw coal from the linked coalmines shall be created within the Unit.	All the internal roads have been concreted while the approach roads are black-topped. There is a facility for parking of trucks within the unit.
(xxv)	Roads used for coal transportation to the linked DRI/TPP shall be developed with 3-tier avenue plantation using a mix of native species. The trucks used for coal transportation shall be high capacity trucks. Drivers of trucks for coal transportation shall be engaged based on past records of road safety and compliance of safety regulations and shall be suitably sensitized about road safety and maintenance of vehicles to keep vehicular emissions to be within prescribed limits.	<p>There is no linked DRI/TPP.</p> <ul style="list-style-type: none"> - Raw coal is received via underground coal conveyor belt network from captive collieries. - Clean coal is dispatched via rail from the Rail-yard situated on the washery premises. The clean coal is kept in storage bins and directly transferred to the rail wagons through covered coal-conveying system. - As for the trucks moving for transportation of tailings and rejects are properly covered with tarpaulin. All the given provisions related to road safety and driver competence are being strictly complied with.
(xxvi)	The roads (internal/approach and roads used for the project) shall be regularly cleaned with mechanical sweepers and with water sprinklers. A 3-tier avenue plantation shall be developed along the major approach roads, internal roads and nearby roads used by the company.	Fixed Water sprinklers have already been installed in the washery premises. Plantation along the road-side is done wherever feasible. A three-tier green belt development is in progress
(xxvii)	Green belt shall be developed along the areas such as the washery unit, crushing unit, and stockyards and at transfer	Greenery has been developed in many areas around the washery premises. Saplings have

Compliance status of Expansion of Jamadoba Coal washery (1 MTPA to 2 MTPA in 7 ha Area) of M/s Tata Steel Ltd. Tehsil Jharia, dist. Dhanbad, Jharkhand vide MoEFCC Letter no J-11015/203/2011-IA.II (M) dated March 3, 2014

	points and in between mine operations and habitations.	been planted along the boundary of washery for greenbelt development.
(xxviii)	Hoppers of the coal crushing unit at the crushing shed and washery unit shall be fitted with high efficiency bag filters/Dust extractors and mist spray water sprinkling system shall be installed and operated effectively at all times of operation to check fugitive emissions from crushing operations, transfer points of belt conveyor systems which shall be closed and from transportation roads.	Dry-fog dust suppression system has been already installed to suppress the dust generated at CHP and transfer points of belt conveyor systems. Fixed-type water sprinklers are also installed on the internal roads of the washery. These are always operated effectively to check the fugitive emissions. Fugitive dust emission monitoring is done on regularly. The values are within the stipulated norms.
(xxix)	The proponent shall ensure that coal such as stones, shale and other wastes of an ash content of 77% or more only shall be dumped into the mine voids. Coal rejects with an ash content of 76% or less shall be fully utilized for power generation in linked TPP.	It is being followed.
(xxx)	Regular monitoring of groundwater level and quality including levels of heavy metals such as Hg, Cd, Cr, Se, etc shall be carried out by establishing a network of existing wells and construction of new peizometers. The monitoring for quantity and quality of ground water as per IS: 10500 shall be done four times a year in pre-monsoon (May), monsoon (August), post-monsoon (November) and winter (January) seasons. Proper records of the data thus collected shall be maintained submitted to the Ministry of Environment & Forests and to the Central Pollution Control Board quarterly within one month of monitoring.	The monitoring of groundwater level and quality is done regularly as per the requirements. The groundwater quality report & groundwater level are provided in Annexure I . The monitoring of heavy metals such as Hg, Cd, Cr, Se, etc in the groundwater is done on quarterly basis by NABL accredited third party and the report has been provided in Annexure-I .
(xxxi)	As the entire mine water is proposed to be used for the mine-cum-washery operations, measures shall be taken for	Some of the water pumped out during underground mining activity is re-circulated back into the mine for the purpose of stowing.

Compliance status of Expansion of Jamadoba Coal washery (1 MTPA to 2 MTPA in 7 ha Area) of M/s Tata Steel Ltd. Tehsil Jharia, dist. Dhanbad, Jharkhand vide MoEFCC Letter no J-11015/203/2011-IA.II (M) dated March 3, 2014

	<p>recharging ground water in and around the mine in the study area. A Plan for water conservation and recharge measures of ground water along with budgetary provisions be prepared and implemented in consultation with the Central/State Ground Water Board to mitigate the adverse impact of mining which may lead to depletion of ground water in the area. The Company shall put up artificial groundwater recharge measures for augmentation of groundwater resource in case monitoring of groundwater levels indicate decline of water table. Any additional water requirement for mining operation shall be met from rainwater use only. The project authorities shall meet water requirement of nearby village(s) in case the village wells go dry due to dewatering of mine.</p>	<p>Backfilling of mine voids by stowing is done using sand which is having the porosity to hold the underground water thus helping aquifer to retain the underground water.</p> <p>Further, there are a number of ponds existing on the surface of the mining lease which act as natural reservoirs for recharging ground water. These ponds/ tanks are regularly cleaned and maintained by our CSR department. As per the hydro-geological report, the variation in the ground water level is only seasonal.</p> <p>The water requirement of the nearby villages is being met by the company already. Now piped drinking water is being provided.</p>
(xxxii)	<p>ETP shall also be provided for treatment of effluents from workshop, CHP and an STP shall be provided in the colony and the treated effluents shall be used for green belt development. Outflow of rainfall, if any, from the mine shall meet prescribed norms and the water quality of such discharge including levels of heavy metals such as Hg, Cd, Cr., Se, etc shall be monitored at the exit points and records maintained thereof and also uploaded on the company website. Online monitoring equipment shall be installed by the proponent to ensure that the water quality parameters of mine water discharge are well within the General Discharge Standards under EP, Rules, 1986.</p>	<p>No effluent is discharged outside of the washery. There is no separate workshop in the washery premises. A central workshop exists in Jamadoba Colliery with Effluent Treatment Plant facility having Oil and Grease Trap. One Sewage Treatment Plant (STP) of 50 KLD and one STP of 10 KLD has been installed in one of the colonies of Jamadoba and Jamadoba canteen. Their treated water is used for gardening and other purpose.</p>
(xxxiii)	<p>Besides carrying out regular periodic health check-up of their workers, 10% of the workers identified from workforce</p>	<p>Not applicable as this is coal beneficiation plant. Though PME is done for washery workers periodically at our Occupational</p>

Compliance status of Expansion of Jamadoba Coal washery (1 MTPA to 2 MTPA in 7 ha Area) of M/s Tata Steel Ltd. Tehsil Jharia, dist. Dhanbad, Jharkhand vide MoEFCC Letter no J-11015/203/2011-IA.II (M) dated March 3, 2014

	engaged in active mining operations shall be subjected to health check-up for occupational diseases and hearing impairment, if any, through a recognised agency found in the district, and the results reported to this Ministry and to DGMS.	Health centre. Records of the same has been furnished earlier.
(xxxiv)	For monitoring land use pattern and for post mining land use, a time series of landuse 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 concerned Regional Office in the region.	Complied. The land use study has been completed by Indian School of Mines (IIT-ISM) Dhanbad and the report is submitted vide letter no. JMB/ENV/BAC/38/467/2021 dated: 27.06.2021 to Regional Office, MoEFCC at Ranchi
(xxxv)	Land oustees shall be compensated as per the norms laid out R&R Policy of CIL or the National R&R Policy or R&R Policy of the State Government whichever is higher.	Not applicable
(xxxvi)	A Final Mine Closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment & Forests five year before mine closure for approval. Habitat Restoration Plan of the mine area shall be carried out using a mix of native species found in the original ecosystem, which were conserved in-situ and ex-situ in an identified area within the lease for reintroduction in the mine during mine reclamation and at the post mining stage for habitat restoration and for development of grasslands.	Not applicable.
(xxxvii)	Corporate Environment Responsibility: a) The Company shall have a well laid down Environment Policy approved by the Board of Directors.	The Company already has an Environment Policy approved by the Managing Director and it addresses all the issues mentioned.

Compliance status of Expansion of Jamadoba Coal washery (1 MTPA to 2 MTPA in 7 ha Area) of M/s Tata Steel Ltd. Tehsil Jharia, dist. Dhanbad, Jharkhand vide MoEFCC Letter no J-11015/203/2011-IA.II (M) dated March 3, 2014

	<p>b) The Environment Policy shall prescribe for standard operating process/procedures to bring into focus any infringements/deviation/violation of the environmental or forest norms/conditions.</p> <p>c) The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions shall be furnished.</p> <p>d) To have proper checks and balances, the company shall have a well laid down system of reporting of non-compliances/violations of environmental norms to the Board of Directors of the company and/or shareholders or stakeholders at large.</p>	<p>The status of adherence to the policy and compliance to Environmental laws and regulations is regularly discussed at higher levels. Any non-compliance noticed is corrected at divisional level. If any issue is beyond our control, it is brought to the notice of higher management.</p> <p>Moreover, Jamadoba Coal Washery is IMS (Integrated Management System: Quality Management System, Environment Management System and OHSAS) certified unit addressing all environment aspects, impacts and needs and expectation of interested parties with respect to environment protection.</p>
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B.	GENERAL CONDITIONS	
(i)	No change in mining technology and scope of working shall be made without prior approval of the Ministry of Environment and Forests.	The points mentioned in the EC letter will be strictly followed.
(ii)	No change in the calendar plan of production for quantum of mineral coal shall be made.	It will be strictly followed.
(iii)	Four ambient air quality monitoring stations shall be established in the core zone as well as in the buffer zone for PM10, PM2.5, SO2 and NOx monitoring. Location of the stations shall be decided based on the meteorological data, topographical features and environmentally and	The Air quality monitoring stations are: (i) Jamadoba Group Office (Core Zone) (ii) New Village Colony, Jamadoba (Buffer Zone) (iii) Digwadiah 12 No. Colony (Buffer Zone) (iv) 6&7 Pits Kalimandir area (Buffer Zone)

Compliance status of Expansion of Jamadoba Coal washery (1 MTPA to 2 MTPA in 7 ha Area) of M/s Tata Steel Ltd. Tehsil Jharia, dist. Dhanbad, Jharkhand vide MoEFCC Letter no J-11015/203/2011-IA.II (M) dated March 3, 2014

	ecologically sensitive targets in consultation with the State Pollution Control Board. Monitoring of heavy metals such as Hg, As, Ni, Cd, Cr, etc carried out at least once in six months.	Monitoring of heavy metals in ambient air is being performed by an independent laboratory (recognised by NABL and JSPCB). The results are enclosed as Annexure-I .
(iv)	Data on ambient air quality (PM10, PM 2.5, SO2 and NOx) and heavy metals such as Hg, As, Ni, Cd, Cr and other monitoring data shall be regularly submitted to the Ministry including its concerned Regional Office and to the State Pollution Control Board and the Central Pollution Control Board once in six months. Random verification of samples through analysis from independent laboratories recognized under the EPA rules, 1986 shall be furnished as part of compliance report.	Ambient air quality report (PM10, PM 2.5, SO2 and NOx) for the period from Apr'21 to Sep'21 is attached as Annexure-I . Additionally, the third party monitoring is being done through a JSPCB & NABL accredited Laboratory for ambient air quality (PM10, PM 2.5, SO2, NOx, CO, NH3, O3) and heavy metals (As, Ni, Cd and Cr). The results are enclosed as Annexure-I .
(v)	Adequate measures shall be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in blasting and drilling operations, operation of HEMM, etc shall be provided with ear plugs/muffs.	Regular noise survey is being conducted in the underground work environment. Workers are provided with ear-plugs/ muffs in high noise areas.
(vi)	Industrial wastewater (workshop and wastewater from the mine) shall be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19th May 1993 and 31st December 1993 or as amended from time to time before discharge. Oil and grease trap shall be installed before discharge of workshop effluents.	No waste-water is discharged outside the washery premises. 100% water is recirculated back for re-use in the washery. There is a central workshop and garage in Jamadoba Effluent Treatment Plant which includes oil and grease trap has been provided.
(vii)	Vehicular emissions shall be kept under control and regularly monitored. Vehicles used for transporting the mineral shall be covered with tarpaulins and optimally loaded.	Only the vehicles having valid PUC certificates are being allowed to operate. Coal transportation through trucks is done only from BCCL mines till washery and it is ensured that only optimally loaded trucks with proper tarpaulin cover are allowed into the washery premises.

Compliance status of Expansion of Jamadoba Coal washery (1 MTPA to 2 MTPA in 7 ha Area) of M/s Tata Steel Ltd. Tehsil Jharia, dist. Dhanbad, Jharkhand vide MoEFCC Letter no J-11015/203/2011-IA.II (M) dated March 3, 2014

(viii)	Monitoring of environmental quality parameters shall be carried out through establishment of adequate number and type of pollution monitoring and analysis equipment in consultation with SPCB and data got analysed through a laboratory recognized under EP Rules, 1986.	We have a fully equipped Environment Cell Laboratory with qualified personnel. The monitoring and analysis is also done at regular intervals by a JSPCB & NABL recognized laboratory. We have also installed a Continuous Ambient Air Quality Monitoring Station at Jamadoba for real time monitoring.
(ix)	Personnel working in dusty areas shall wear protective respiratory devices and they shall also be provided with adequate training and information on safety and health aspects.	Persons working in dusty area have been provided with dust masks & have been given awareness training on safety & health aspects. Regular PME (Periodic Medical Examinations) are being done.
(x)	Occupational health surveillance programme of the workers shall be undertaken periodically to observe any contractions due to exposure to dust and to take corrective measures, if needed and records maintained thereof. The quality of environment due to outsourcing and the health and safety issues of the outsourced manpower should be addressed by the company while outsourcing.	The occupational health surveillance programme of the workers is done regularly by our Occupational Health Department, Tata Central Hospital, Jamadoba. We have a PME (Periodic Medical Examination) centre approved by DGMS where annually 20% of the workers identified from workforce engaged in active mining operations are subjected to full medical checkup including hearing impairment checkup, etc. These results are regularly submitted to DGMS as per mines rules. Contractual workers health examination is also done by PME centre.
(xi)	A separate environmental management cell with suitable qualified personnel shall be set up under the control of a Senior Executive, who will report directly to the Head of the company.	We have a separate Environmental Management Cell with qualified personnel. The reporting of Environmental Cell is directly to General Manager of the Division.
(xii)	The funds earmarked for environmental protection measures shall be kept in separate account and shall not be diverted for other purpose. Year-wise expenditure shall be reported to this Ministry and its Regional Office at Bhubaneswar.	The Environment Cell has a separate fund for Environmental protection measures and for complying with legal requirements. The annual environmental expenditure for the financial year 2020-21 is Rs. 292.71 lakhs.

Compliance status of Expansion of Jamadoba Coal washery (1 MTPA to 2 MTPA in 7 ha Area) of M/s Tata Steel Ltd. Tehsil Jharia, dist. Dhanbad, Jharkhand vide MoEFCC Letter no J-11015/203/2011-IA.II (M) dated March 3, 2014

(xiii)	The Project authorities shall 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 .	It has been complied with.
(xiv)	A copy of the environmental clearance letter shall be marked to concerned Panchayat/Zila Parishad, Municipal Corporation or Urban Local Body and local NGO, if any, from whom any suggestion/representation has been received while processing the proposal. A copy of the clearance letter shall also be displayed on the company's website.	It has been complied with.
(xv)	A copy of the clearance letter shall be displayed on the website of the concerned State Pollution Control Board. The EC letter shall also be displayed at the Regional Office, District Industry Centre and Collector's Office/Tehsildar's Office for 30 days.	It has been complied with.
(xvi)	The clearance letter shall be uploaded on the company's website. The compliance status of the stipulated EC conditions shall also be uploaded by the project authorities on their website and updated at least once every six months so as to bring the same in the public domain. The monitoring data of environmental quality parameters (air, water, noise and soil) and critical pollutants such as PM10, PM2.5, SO2 and NOx (ambient and stack if any) and	The clearance letter has been uploaded on the company's website. The compliance status (as Half-yearly compliance report) is being uploaded in company's website. The display of information near the washery's office has been provided.

Compliance status of Expansion of Jamadoba Coal washery (1 MTPA to 2 MTPA in 7 ha Area) of M/s Tata Steel Ltd. Tehsil Jharia, dist. Dhanbad, Jharkhand vide MoEFCC Letter no J-11015/203/2011-IA.II (M) dated March 3, 2014

	critical sectoral parameters shall also be displayed at the entrance of the project premises and mines office and in corporate office and on the company's website.	
(xvii)	The project proponent shall submit six monthly reports on the status of compliance of the stipulated environmental clearance conditions (both in hard copy and in e-mail) to the respective Regional Office of the MOEF, the respective Zonal offices of CPCB and the SPCB.	It has been complied with.
(xviii)	The Regional Office of this Ministry located at Bhopal 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.	It will be complied with.
(xix)	The environmental statement for each financial year ending 31st March in Form-V is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be uploaded on the company's website along with the status of compliance of EC conditions and shall be sent to the respective Regional Offices of the MOEF by E-mail.	The environmental statement for financial year 2020-21 has been submitted to JSPCB on 28th September 2021 vide letter no. JMB/ENV/ESSA/05/736/2021 and it is also uploaded on the company website. The soft copy of Environment Statement is also sent to MOEF by email at ro.ranchi-mef@gov.in.

AIR QUALITY REPORT
Core zone & Buffer zone

Period- April'21 to June'21

No. of sampling points: 4

Core zone (as per Air quality standards for coal mines in EPA Notification, 1988)							
Location	Latitude/ Longitude	Date	Weather Condition	SPM 24 Hourly Limit- 700 $\mu\text{g}/\text{m}^3$	RSPM 24 Hourly Limit- 300 $\mu\text{g}/\text{m}^3$	SO ₂ 24 Hourly Limit- 120 $\mu\text{g}/\text{m}^3$	NO _x 24 Hourly Limit-120 $\mu\text{g}/\text{m}^3$
Jamadoba Group Office	23°42'15.3" N/ 86°24'11" E	21.04.21	Clear	206.8	78.6	12.6	14.8
		04.05.21	Rainy	178.4	68.2	10.6	11.4
		18.06.21	Rainy	162.7	64.3	10.8	11.9
Buffer zone (as per NAAQS 2009 for ambient air quality standards)							
Location	Latitude/ Longitude	Date	Weather Condition	PM10 24 Hourly Limit- 100 $\mu\text{g}/\text{m}^3$	PM2.5 24 Hourly Limit- 60 $\mu\text{g}/\text{m}^3$	SO ₂ 24 Hourly Limit- 80 $\mu\text{g}/\text{m}^3$	NO ₂ 24 Hourly Limit- 80 $\mu\text{g}/\text{m}^3$
Digwadih 12 No. Colony	23°41'42" N/ 86°24'45.3" E	12.04.21	Clear	84.3	39.7	12.8	10.8
		10.05.21	Clear	78.6	38.2	11.6	12.5
		08.06.21	Clear	76.5	37.9	12.4	13.7
New Village Colony, Jamadoba	23°41'51" N/ 86°23'19" E	26.04.21	Clear	90.5	44.7	10.2	12.7
		06.05.21	Rainy	72.6	39.4	10.9	11.8
		17.06.21	Rainy	69.7	33.2	11.3	12.4
6&7 Pits Kalimandir colony	23°43'15" N/ 86°24'12" E	22.04.21	Clear	88.7	38.0	11.6	10.3
		12.05.21	Clear	80.7	41.3	11.4	12.2
		15.06.21	Rainy	70.4	34.8	11.8	12.7



Sr. Manager (Environment)

AIR QUALITY REPORT
Core zone & Buffer zone

Period- July'21 to September'21

No. of sampling points: 4

Core zone (as per Air quality standards for coal mines in EPA Notification, 1988)							
Location	Latitude/ Longitude	Date	Weather Condition	SPM 24 Hourly Limit- 700 $\mu\text{g}/\text{m}^3$	RSPM 24 Hourly Limit- 300 $\mu\text{g}/\text{m}^3$	SO ₂ 24 Hourly Limit- 120 $\mu\text{g}/\text{m}^3$	NO _x 24 Hourly Limit-120 $\mu\text{g}/\text{m}^3$
Jamadoba Group Office	23°42'15.3" N/ 86°24'11" E	05.07.21	Cloudy	168.2	60.8	11.5	12.3
		19.08.21	Cloudy	170.4	63.2	11.2	12.0
		06.09.21	Cloudy	164.8	69.4	10.4	11.6
Buffer zone (as per NAAQS 2009 for ambient air quality standards)							
Location	Latitude/ Longitude	Date	Weather Condition	PM10 24 Hourly Limit- 100 $\mu\text{g}/\text{m}^3$	PM2.5 24 Hourly Limit- 60 $\mu\text{g}/\text{m}^3$	SO ₂ 24 Hourly Limit- 80 $\mu\text{g}/\text{m}^3$	NO ₂ 24 Hourly Limit- 80 $\mu\text{g}/\text{m}^3$
Digwadih 12 No. Colony	23°41'42" N/ 86°24'45.3" E	06.07.21	Clear	78.4	39.2	10.7	11.2
		16.08.21	Clear	79.4	40.2	10.8	11.6
		15.09.21	Cloudy	74.2	37.4	10.0	11.2
New Village Colony, Jamadoba	23°41'51" N/ 86°23'19" E	12.07.21	Cloudy	67.2	34.6	11.7	12.9
		18.08.21	Cloudy	65.8	32.1	11.0	12.2
		09.09.21	Clear	76.2	39.2	11.8	12.7
6&7 Pits Kalimandir colony	23°43'15" N/ 86°24'12" E	08.07.21	Cloudy	69.8	37.2	10.5	11.8
		23.08.21	Clear	71.4	38.7	11.2	12.8
		08.09.21	Cloudy	69.7	33.6	10.8	11.6



Sr. Manager (Environment)

**Ground Water Quality Analysis (Hand Pump & Dung Well)
(Pre- Monsoon Season- May'2021)**

S.No	Date	Location	Time	Depth in meter	pH	Electrical Conductivity, $\mu\text{S/m}$
1	11.05.21	Purnadih (Jorapokhar)	09:45 AM	7.95	7.4	784
2	11.05.21	Bhowra 13 No	10:20 AM	3.20	7.2	697
3	11.05.21	Mohalbani Basti	10:45 AM	6.78	7.3	810
4	11.05.21	Digwadih 12 No	11:10 AM	4.72	7.4	782
5	11.05.21	Digwadih 10 No F & J	11:35 AM	3.88	7.2	1038
6	11.05.21	Kalimela Shivmandir	01:10 PM	2.38	7.3	836
7	11.05.21	Kalimela Kalimandir	01:25 PM	4.56	7.2	798
8	11.05.21	Lower Dungari	01:55 PM	5.69	7.4	662
9	11.05.21	Upper Dungari	02:25 PM	4.18	7.5	748
10	11.05.21	Pattia Basti	02:45 PM	4.20	7.3	810
11	11.05.21	Kenduadih Basti	03:10 PM	4.65	7.4	768
12	11.05.21	Jorapokhar Kushtand	09:15 AM	4.10	7.3	798
13	11.05.21	Jamadoba 3 No	04:00 PM	5.68	7.2	766
14	11.05.21	6&7 Pits (Ayodhya Nagri)	12:10 PM	3.96	7.4	698



Sr. Manager (Environment)

**Ground Water Quality Analysis (Hand Pump & Dung Well)
(Monsoon Season- August'2021)**

S.No	Date	Location	Time	Depth in meter	pH	Electrical Conductivity $\mu\text{S/m}$
1	25.08.21	Purnadih (Jorapokhar)	09:35 AM	1.78	7.2	712
2	25.08.21	Bhowra 13 No	10:10 AM	0.92	7.3	658
3	25.08.21	Mohalbani Basti	10:40 AM	3.58	7.2	720
4	25.08.21	Digwadih 12 No	11:05 AM	1.26	7.1	694
5	25.08.21	Digwadih 10 No F & J	11:35 AM	1.82	7.0	984
6	25.08.21	Kalimela Shivmandir	12:30 PM	0.98	7.2	812
7	25.08.21	Kalimela Kalimandir	12:45 PM	2.71	7.1	772
8	25.08.21	Lower Dungari	01:10 PM	2.56	7.2	624
9	25.08.21	Upper Dungari	01:35 PM	1.84	7.0	728
10	25.08.21	Pattia Basti	02:25 PM	1.06	7.2	736
11	25.08.21	Kenduadih Basti	02:05 PM	0.65	7.1	710
12	25.08.21	Jorapokhar Kushtand	09:15 AM	2.25	7.2	738
13	25.08.21	Jamadoba 3 No	02:45 PM	1.62	7.3	722
14	25.08.21	6&7 Pits (Ayodhya Nagri)	12:10 PM	1.67	7.1	668



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FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AAQ-1/05/21

TEST REPORT ISSUE DATE: 04/06/2021

TEST REPORT OF AMBIENT AIR*

Name of the Customer : Tata Steel Colliery (Jamadoba Group)
Address of the Customer : Jamadoba, Distt. Dhanbad
Jharkhand
Sample Collected By : Mr. Arvind Singh
Sampling Method : IS: 5182
Date of Sampling : May 28th, 2021
Date of Testing : 29.05.2021 to 04.06.2021
Environmental Condition : A.Temp(°C) : 36°C, Humidity(%) : 66,
Weather Condition -Shiny
Instrument Name & Lab ID : Fine Dust Sampler / Respirable Dust Sampler
Location : Central Work Shop Area, Jamadoba

Sl. No.	Tests Conducted	Method	Results	Detection Range	NAAQ Standards as per CPCB, New Delhi, Nov. 18 th , 2009
1	PM ₁₀ (µg/m ³)	IS:5182(Part-23)	78.86	2-1000(µg/m ³)	100
2	PM _{2.5} (µg/m ³)	IS:5182(Part-24)	42.12	2-100(µg/m ³)	60
3	SO ₂ (µg/m ³)	IS:5182 (Part-2)	26.30	5-200(µg/m ³)	80
4	NO _x (µg/m ³)	IS:5182 (Part-6)	24.12	5-200(µg/m ³)	80
5	NH ₃ (µg/m ³)	IS:5182(Part-25)	21.05	0.02-700(µg/m ³)	400
6	O ₃ (µg/m ³)	IS:5182(Part-9)	18.15	1-200(µg/m ³)	180
7	CO (mg/m ³)	IS:5182 (Part-10)	0.795	0-500(mg/l)	4.0
8	Pb(µg/m ³)	IS:5182(Part-22)	BDL	1-100(µg/m ³)	1.0
9	C ₆ H ₆ (µg/m ³)	IS:5182(Part-11)	BDL	-	05
10	BaP (ng/m ³)	IS:5182(Part-12)	BDL	>2(ng/m ³)	01
11	As (ng/m ³)	NAAQM Guideline Volume-I by CPCB	BDL	1-100(ng/m ³)	06
12	Ni (ng/m ³)	IS:5182(Part-26)	BDL	1-100(ng/m ³)	20

*The results is related only to tested item.

Note: Below Detection Limit

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FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AAQ-2/05/21

TEST REPORT ISSUE DATE: 04/06/2021

TEST REPORT OF AMBIENT AIR*

Name of the Customer : Tata Steel Colliery (Jamadoba Group)
Address of the Customer : Jamadoba, Distt. Dhanbad
Jharkhand
Sample Collected By : Mr. Arvind Singh
Sampling Method : IS: 5182
Date of Sampling : May 28th, 2021
Date of Testing : 29.05.2021 to 04.06.2021
Environmental Condition : A.Temp(°C) : 36°C, Humidity(%) : 66,
Weather Condition -Shiny
Instrument Name & Lab ID : Fine Dust Sampler / Respirable Dust Sampler
Location : Officers Colony, 12 No. Digwadih

No.	Sl. Tests Conducted	Method	Results	Detection Range	NAAQ Standards as per CPCB, New Delhi, Nov. 18 th , 2009
1	PM ₁₀ (µg/m ³)	IS:5182(Part-23)	76.92	2-1000(µg/m ³)	100
2	PM _{2.5} (µg/m ³)	IS:5182(Part-24)	47.38	2-100(µg/m ³)	60
3	SO ₂ (µg/m ³)	IS:5182 (Part-2)	23.84	5-200(µg/m ³)	80
4	NO _x (µg/m ³)	IS:5182 (Part-6)	26.08	5-200(µg/m ³)	80
5	NH ₃ (µg/m ³)	IS:5182(Part-25)	20.18	0.02-700(µg/m ³)	400
6	O ₃ (µg/m ³)	IS:5182(Part-9)	17.86	1-200(µg/m ³)	180
7	CO (mg/m ³)	IS:5182 (Part-10)	0.724	0-500(mg/l)	4.0
8	Pb(µg/m ³)	IS:5182(Part-22)	BDL	1-100(µg/m ³)	1.0
9	C ₆ H ₆ (µg/m ³)	IS:5182(Part-11)	BDL	-	05
10	BaP (ng/m ³)	IS:5182(Part-12)	BDL	>2(ng/m ³)	01
11	As (ng/m ³)	NAAQM Guideline Volume-I by CPCB	BDL	1-100(ng/m ³)	06
12	Ni (ng/m ³)	IS:5182(Part-26)	BDL	1-100(ng/m ³)	20

*The results is related only to tested item.

Note: Below Detection Limit.

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FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AAQ-3/05/21

TEST REPORT ISSUE DATE: 04/06/2021


TEST REPORT OF AMBIENT AIR*


Name of the Customer : Tata Steel Colliery (Jamadoba Group)
 Address of the Customer : Jamadoba, Distt. Dhanbad
 Jharkhand
 Sample Collected By : Mr. Arvind Singh
 Sampling Method : IS: 5182
 Date of Sampling : May 28th, 2021
 Date of Testing : 29.05.2021 to 04.06.2021
 Environmental Condition : A.Temp(°C) : 36°C, Humidity(%) : 66,
 Weather Condition -Shiny
 Instrument Name & Lab ID : Fine Dust Sampler / Respirable Dust Sampler
 Location : General Manager's Office Area

Sl. No.	Tests Conducted	Method	Results	Detection Range	NAAQ Standards as per CPCB, New Delhi, Nov. 18 th , 2009
1	PM ₁₀ (µg/m ³)	IS:5182(Part-23)	74.24	2-1000(µg/m ³)	100
2	PM _{2.5} (µg/m ³)	IS:5182(Part-24)	24.82	2-100(µg/m ³)	60
3	SO ₂ (µg/m ³)	IS:5182 (Part-2)	21.46	5-200(µg/m ³)	80
4	NO _x (µg/m ³)	IS:5182 (Part-6)	23.68	5-200(µg/m ³)	80
5	NH ₃ (µg/m ³)	IS:5182(Part-25)	14.29	0.02-700(µg/m ³)	400
6	O ₃ (µg/m ³)	IS:5182(Part-9)	12.00	1-200(µg/m ³)	180
7	CO (mg/m ³)	IS:5182 (Part-10)	0.715	0-500(mg/l)	4.0
8	Pb(µg/m ³)	IS:5182(Part-22)	BDL	1-100(µg/m ³)	1.0
9	C ₆ H ₆ (µg/m ³)	IS:5182(Part-11)	BDL	-	05
10	BaP (ng/m ³)	IS:5182(Part-12)	BDL	>2(ng/m ³)	01
11	As (ng/m ³)	NAAQM Guideline Volume-I by CPCB	BDL	1-100(ng/m ³)	06
12	Ni (ng/m ³)	IS:5182(Part-26)	BDL	1-100(ng/m ³)	20

*The results is related only to tested item.

Note: Below Detection Limit


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FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AAQ-4/05/21

TEST REPORT ISSUE DATE: 04/06/2021

TEST REPORT OF AMBIENT AIR*

Name of the Customer : Tata Steel Colliery (Jamadoba Group)
Address of the Customer : Jamadoba, Distt. Dhanbad
Jharkhand
Sample Collected By : Mr. Arvind Singh
Sampling Method : IS: 5182
Date of Sampling : May 27th, 2021
Date of Testing : 29.05.2021 to 04.06.2021
Environmental Condition : A.Temp(°C) : 36°C, Humidity(%) : 66,
Weather Condition -Shiny
Instrument Name & Lab ID : Fine Dust Sampler / Respirable Dust Sampler
Location : Jamadoba Colliery

Sl. No.	Tests Conducted	Method	Results	Detection Range	NAAQ Standards as per CPCB, New Delhi, Nov. 18 th , 2009
1	PM ₁₀ (µg/m ³)	IS:5182(Part-23)	81.25	2-1000(µg/m ³)	100
2	PM _{2.5} (µg/m ³)	IS:5182(Part-24)	42.16	2-100(µg/m ³)	60
3	SO ₂ (µg/m ³)	IS:5182 (Part-2)	25.84	5-200(µg/m ³)	80
4	NO _x (µg/m ³)	IS:5182 (Part-6)	26.20	5-200(µg/m ³)	80
5	NH ₃ (µg/m ³)	IS:5182(Part-25)	23.90	0.02-700(µg/m ³)	400
6	O ₃ (µg/m ³)	IS:5182(Part-9)	17.16	1-200(µg/m ³)	180
7	CO (mg/m ³)	IS:5182 (Part-10)	0.705	0-500(mg/l)	4.0
8	Pb(µg/m ³)	IS:5182(Part-22)	BDL	1-100(µg/m ³)	1.0
9	C ₆ H ₆ (µg/m ³)	IS:5182(Part-11)	BDL	-	05
10	BaP (ng/m ³)	IS:5182(Part-12)	BDL	>2(ng/m ³)	01
11	As (ng/m ³)	NAAQM Guideline Volume-I by CPCB	BDL	1-100(ng/m ³)	06
12	Ni (ng/m ³)	IS:5182(Part-26)	BDL	1-100(ng/m ³)	20

*The results is related only to tested item.

Note: Below Detection Limit.

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/05/21

TEST REPORT ISSUE DATE: 04.06.2021

TEST REPORT OF DRINKING WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : Digwadih Club

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff:2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Odour	APHA, 23rd Ed. 2017, 2150 B	Agreeable	Qualitative	Agreeable	Agreeable
3.	Taste	APHA, 23rd Ed. 2017, 2160 A+B	Agreeable	Qualitative	Agreeable	Agreeable
4.	Turbidity as (NTU)	APHA, 23rd Ed. 2017, 2130-A+B	1.16	1-100	1.0	5.0
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.36	2-12	6.5-8.5	No Relax.
6.	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540-C	520.0	5-5000	500	2000
7.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+ B	188.0	5-1500	200	600
8.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	212.0	5-1500	200.0	600.0
9.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	56.0	5-1000	75.0	200.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.25	0.02-50	0.3	No Relax.
12.	Manganese as Mn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.1-5	0.10	0.30
13.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	34.0	5-1000	250.0	1000.0
14.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	45.0	1.0-250	200.0	400.0
15.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	14.5	5-100	45.0	No Relax.
16.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.36	0.05-10	1.0	1.5
17.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
18.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.08	0.02-50	5	15
22.	Aluminium as Al (mg/l)	APHA, 23rd Ed. 2017, 3500Al A+B	BDL	1-100	0.03	0.2
23.	Chromium as Cr+6 (mg/l)	APHA, 23rd Ed. 2017, 3111A+B	BDL	0.05-100	0.05	No Relax.
24.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN , A+D	BDL	0.02-10	0.05	No Relax.
25.	Free Residual Chlorine (mg/l)	APHA, 23rd Ed. 2017, 4500-Cl B	BDL	0.1-5	0.20	1.0
26.	Phenolic Compounds as C ₆ H ₅ OH (mg/l)	APHA, 23rd Ed. 2017, 5530 A+C	BDL	1-10	0.001	0.002
27.	Mineral Oil 6 (mg/l)	APHA, 23rd Ed. 2017, Class -6 Infrared Partition Method	BDL	0.01-10	0.5	No Relax.
28.	Boron as B (mg/l)	APHA, 23rd Ed. 2017, 4500 B A+C	0.21	0.2-10	0.5	1.0
29.	Total Coliform (MPN/100ml)	APHA, 23rd Ed. 2017, 9221 A+B	Absent	1.8	Absent	Absent

*The result are related only to item tested. BDL = Below Detection Limit

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An approved Laboratory from Ministry of Environment , Forests and climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/05/21

TEST REPORT ISSUE DATE: 04.06.2021

TEST REPORT OF DRINKING WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : 6&7 Pits Canteen

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff:2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Odour	APHA, 23rd Ed. 2017, 2150 B	Agreeable	Qualitative	Agreeable	Agreeable
3.	Taste	APHA, 23rd Ed. 2017, 2160 A+B	Agreeable	Qualitative	Agreeable	Agreeable
4.	Turbidity as (NTU)	APHA, 23rd Ed. 2017, 2130-A+B	1.10	1-100	1.0	5.0
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.56	2-12	6.5-8.5	No Relax.
6.	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540-C	590.0	5-5000	500	2000
7.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+ B	204.0	5-1500	200	600
8.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	220.0	5-1500	200.0	600.0
9.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	65.60	5-1000	75.0	200.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.23	0.02-50	0.3	No Relax.
12.	Manganese as Mn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.1-5	0.10	0.30
13.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	42.0	5-1000	250.0	1000.0
14.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	46.75	1.0-250	200.0	400.0
15.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	15.0	5-100	45.0	No Relax.
16.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.39	0.05-10	1.0	1.5
17.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
18.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.09	0.02-50	5	15
22.	Aluminium as Al (mg/l)	APHA, 23rd Ed. 2017, 3500Al A+B	BDL	1-100	0.03	0.2
23.	Chromium as Cr+6 (mg/l)	APHA, 23rd Ed. 2017, 3111A+B	BDL	0.05-100	0.05	No Relax.
24.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN , A+D	BDL	0.02-10	0.05	No Relax.
25.	Free Residual Chlorine (mg/l)	APHA, 23rd Ed. 2017, 4500-Cl B	BDL	0.1-5	0.20	1.0
26.	Phenolic Compounds as C ₆ H ₅ OH (mg/l)	APHA, 23rd Ed. 2017, 5530 A+C	BDL	1-10	0.001	0.002
27.	Mineral Oil 6 (mg/l)	APHA, 23rd Ed. 2017, Class -6 Infrared Partition Method	BDL	0.01-10	0.5	No Relax.
28.	Boron as B (mg/l)	APHA, 23rd Ed. 2017, 4500 B A+C	0.26	0.2-10	0.5	1.0
29.	Total Coliform (MPN/100ml)	APHA, 23rd Ed. 2017, 9221 A+B	Absent	1.8	Absent	Absent

*The result are related only to item tested. BDL = Below Detection Limit

Ravi Bhargava
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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/05/21

TEST REPORT ISSUE DATE: 04.06.2021

TEST REPORT OF GROUND WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : Purnadih (Jorapokhar)

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff:2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Temperature (0C)	APHA, 23rd Ed. 2017, (2550 A+B)	28.5	10-100	-	-
3.	Electrical Conductivity (μ mhos/cm)	APHA, 23rd Ed. 2017, 2510-A+B	1020.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA, 23rd Ed. 2017 (2540B)	684.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.72	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+ B	224.0	5-1500	200	600
7.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	252.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	64.0	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 23 rd Ed. 2017, 3500 Mg A+B	22.35	5-1000	30.0	100.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.19	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	76.0	5-1000	250.0	1000.0
13.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	68.20	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	12.56	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.87	0.05-10	1.0	1.5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax
18.	Nickel as Ni (mg/l)	APHA, 23 rd Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.10	0.02-50	5	15
22.	Total Chromium as Cr (mg/l)	APHA, 23 rd Ed. 2017, 3111 A+B	BDL	0.05-50	0.05	No Relax
23.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN, A+D	BDL	0.02-10	0.05	No Relax.

*The result are related only to item tested.

BDL = Below Detection Limit

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/05/21

TEST REPORT ISSUE DATE: 04.06.2021

TEST REPORT OF GROUND WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : Digwadiah 10 No, F&J

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff:2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Temperature (0C)	APHA,23rd Ed.2017, (2550 A+B)	29.7	10-100	-	-
3.	Electrical Conductivity (µmhos/cm)	APHA,23 rd Ed.2017, 2510-A+B	820.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA,23 rd Ed.2017 (2540B)	564.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.46	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+ B	168.0	5-1500	200	600
7.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	228.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	68.80	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 23 rd Ed. 2017, 3500 Mg A+B	13.60	5-1000	30.0	100.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.08	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	62.0	5-1000	250.0	1000.0
13.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	46.78	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	13.50	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.64	0.05-10	1.0	1.5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax
18.	Nickel as Ni (mg/l)	APHA, 23 rd Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.14	0.02-50	5	15
22.	Total Chromium as Cr (mg/l)	APHA, 23 rd Ed. 2017,3111 A+B	BDL	0.05-50	0.05	No Relax
23.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN , A+D	BDL	0.02-10	0.05	No Relax.

*The result are related only to item tested.BDL = Below Detection Limit

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Analyst

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/05/21

TEST REPORT ISSUE DATE: 04.06.2021

TEST REPORT OF GROUND WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : Kalimela Kalimandir

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff:2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Temperature (0C)	APHA,23rd Ed.2017, (2550 A+B)	30.5	10-100	-	-
3.	Electrical Conductivity (µmhos/cm)	APHA,23 rd Ed.2017, 2510-A+B	896.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA,23 rd Ed.2017 (2540B)	572.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.25	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+ B	176.0	5-1500	200	600
7.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	212.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	52.80	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 23 rd Ed. 2017, 3500 Mg A+B	19.44	5-1000	30.0	100.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.06	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	56.0	5-1000	250.0	1000.0
13.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	49.50	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	11.90	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.68	0.05-10	1.0	1.5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax
18.	Nickel as Ni (mg/l)	APHA, 23 rd Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.16	0.02-50	5	15
22.	Total Chromium as Cr (mg/l)	APHA, 23 rd Ed. 2017,3111 A+B	BDL	0.05-50	0.05	No Relax
23.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN , A+D	BDL	0.02-10	0.05	No Relax.

*The result are related only to item tested.BDL = Below Detection Limit

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/05/21

TEST REPORT ISSUE DATE: 04.06.2021

TEST REPORT OF GROUND WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : Upper Dungari

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff:2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Temperature (0C)	APHA, 23rd Ed. 2017, (2550 A+B)	32.0	10-100	-	-
3.	Electrical Conductivity (μ mhos/cm)	APHA, 23rd Ed. 2017, 2510-A+B	1120.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA, 23rd Ed. 2017 (2540B)	720.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4500HI+ A+B	7.42	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+ B	216.0	5-1500	200	600
7.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	264.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	72.0	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 23rd Ed. 2017, 3500 Mg A+B	20.41	5-1000	30.0	100.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.12	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	60.0	5-1000	250.0	1000.0
13.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	44.50	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	15.25	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.61	0.05-10	1.0	1.5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax
18.	Nickel as Ni (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.21	0.02-50	5	15
22.	Total Chromium as Cr (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-50	0.05	No Relax
23.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN, A+D	BDL	0.02-10	0.05	No Relax.

*The result are related only to item tested. BDL = Below Detection Limit

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An approved Laboratory from Ministry of Environment , Forests and climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/05/21

TEST REPORT ISSUE DATE: 04.06.2021

TEST REPORT OF GROUND WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : Kenduadih Basti

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff:2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Temperature (0C)	APHA, 23rd Ed. 2017, (2550 A+B)	31.0	10-100	-	-
3.	Electrical Conductivity (µmhos/cm)	APHA, 23rd Ed. 2017, 2510-A+B	854.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA, 23rd Ed. 2017 (2540B)	532.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.45	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+ B	208.0	5-1500	200	600
7.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	232.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	59.20	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 23rd Ed. 2017, 3500 Mg A+B	20.41	5-1000	30.0	100.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.12	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	46.0	5-1000	250.0	1000.0
13.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	35.75	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	18.75	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.65	0.05-10	1.0	1.5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax
18.	Nickel as Ni (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.15	0.02-50	5	15
22.	Total Chromium as Cr (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-50	0.05	No Relax
23.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN, A+D	BDL	0.02-10	0.05	No Relax.

*The result are related only to item tested. BDL = Below Detection Limit

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/05/21

TEST REPORT ISSUE DATE: 04.06.2021

TEST REPORT OF GROUND WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : 6&7 Pits (Ayodhya Nagar)

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff:2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Temperature (0C)	APHA,23rd Ed.2017, (2550 A+B)	30.50	10-100	-	-
3.	Electrical Conductivity (µmhos/cm)	APHA,23 rd Ed.2017, 2510-A+B	840.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA,23 rd Ed.2017 (2540B)	564.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.32	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+ B	204.0	5-1500	200	600
7.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	264.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	70.40	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 23 rd Ed. 2017, 3500 Mg A+B	21.38	5-1000	30.0	100.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.21	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	58.0	5-1000	250.0	1000.0
13.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	39.50	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	13.56	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.57	0.05-10	1.0	1.5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax
18.	Nickel as Ni (mg/l)	APHA, 23 rd Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.22	0.02-50	5	15
22.	Total Chromium as Cr (mg/l)	APHA, 23 rd Ed. 2017,3111 A+B	BDL	0.05-50	0.05	No Relax
23.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN , A+D	BDL	0.02-10	0.05	No Relax.

*The result are related only to item tested.BDL = Below Detection Limit

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FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/ AN/05/21

TEST REPORT ISSUE DATE: 04.06.2021

TEST REPORT OF AMBIENT NOISE LEVEL

Name of the Customer : Tata Steel Colliery (Jamadoba Group)
Address of the Customer : Jamadoba, Distt. Dhanbad
Jharkhand
Sample Collected By : Mr. Arvind Singh
Instrument Used : Noise Meter (HTC)

Sl. No.	Locations	Date of Monitoring	Day Time			Night Time		
			Max.	Min.	Leq.	Max.	Min.	Leq.
1.	Central Work Shop Area Jamadoba	28.05.2021	68.2	54.2	56.2	62.6	47.8	54.2
2.	Officer's Colony, 12 No. Digwadih	28.05.2021	56.4	53.6	52.8	48.2	42.4	44.7
3.	General Manager's Office Area	28.05.2021	53.8	49.3	48.7	46.5	42.6	41.2
4.	Jamadoba Colliery	27.05.2021	68.8	56.8	66.8	64.6	49.8	52.8

Noise (Ambient Standard)

Area Code	Category of area	Limit in dB (A) Leq	
		Day Time	Night Time
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40

Note:

1. Day time is reckoned in between 6:00 AM and 10:00 PM.
2. Night time is reckoned in between 10:00 PM and 6:00 AM
3. Silence zone is defined as area up to 100m around such premises as hospitals, Educational institutions & courts. The silence zones are to be declared by a competent authority.
4. Mixed categories of areas should be declared as one of the four above-mentioned Categories by the competent authority and the corresponding standard shall apply.

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/SW/05/21

TEST REPORT ISSUE DATE: 04.06.2021

TEST REPORT OF SURFACE WATER

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : Damodar River, Up Stream

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	IS:2296 Class-C
1.	pH	APHA,23 rd Ed.2017,4500H+A+B,	7.36	2-12	8.5
2.	Turbidity as (NTU)	APHA, 23 rd Ed. 2017, 2130-A+B	13.50	1-100	-
3.	Total Dissolved Solids as TDS (mg/l)	APHA,23 rd Ed.2017 (2540C)	664.0	5-10000	1500
4.	Dissolved Oxygen as DO (mg/l)	APHA,23 rd Ed.2017 (4500 A+C)	6.5	2-10	4.0
5.	Biochemical Oxygen Demand as BOD (mg/l)	APHA,23 rd Ed.2017 (5210A+ B)	BDL	5-10000	3.0
6.	Chloride as Cl (mg/l)	APHA, 23 rd Ed. 2017, 4500 Cl A+B	56.0	5-1000	-
7.	Fluorides as F (mg/l)	APHA,23 rd Ed.2017 (4500 -C)	0.54	0.05-10	1.5
8.	Sulfate as SO ₄ (mg/l)	APHA,23 rd Ed.2017 (4500 -SO ₄ ²⁻ E)	32.50	1.0-250	400.0

*The result are related only to item tested - The parameters are not included in IS: 2296 Class-C
BDL – Below Detection Limit

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/SW/05/21

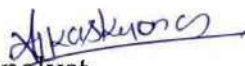
TEST REPORT ISSUE DATE: 04.06.2021

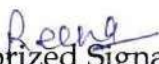
TEST REPORT OF SURFACE WATER

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : Damodar River, Down Stream

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	IS:2296 Class-C
1.	pH	APHA, 23 rd Ed. 2017, 4500H+A+B,	7.62	2-12	8.5
2.	Turbidity as (NTU)	APHA, 23 rd Ed. 2017, 2130-A+B	10.50	1-100	-
3.	Total Dissolved Solids as TDS (mg/l)	APHA, 23 rd Ed. 2017 (2540C)	676.0	5-10000	1500
4.	Dissolved Oxygen as DO (mg/l)	APHA, 23 rd Ed. 2017 (4500 A+C)	5.6	2-10	4.0
5.	Biochemical Oxygen Demand as BOD (mg/l)	APHA, 23 rd Ed. 2017 (5210A+ B)	BDL	5-10000	3.0
6.	Chloride as Cl (mg/l)	APHA, 23 rd Ed. 2017, 4500 Cl A+B	58.0	5-1000	-
7.	Fluorides as F (mg/l)	APHA, 23 rd Ed. 2017 (4500 - C)	0.56	0.05-10	1.5
8.	Sulfate as SO ₄ (mg/l)	APHA, 23 rd Ed. 2017 (4500 -SO ₄ ²⁻ E)	48.50	1.0-250	400.0

*The result are related only to item tested - The parameters are not included in IS: 2296 Class-C
BDL - Below Detection Limit


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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/05/21

TEST REPORT ISSUE DATE: 04.06.2021

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : 3 Pit Jamadoba Colliery

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H' A+B	7.64	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	21.50	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	646.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	10.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	42.0	5-50000	250.0

*The result are related only to item tested.

BDL = Below Detection Limit

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TEST REPORT NO: ECO LAB/WW/05/21

TEST REPORT ISSUE DATE: 04.06.2021

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : 2 Incline Jamadoba Colliery

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H' A+B	7.62	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	18.50	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	520.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	13.50	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	26.0	5-50000	250.0

*The result are related only to item tested.

BDL = Below Detection Limit

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/05/21

TEST REPORT ISSUE DATE: 04.06.2021

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : 6&7 Pit Colliery

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23 rd Ed. 2017, 4500H' A+B	7.50	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23 rd Ed. 2017, 2540D	12.50	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23 rd Ed. 2017, 2540C	590.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23 rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23 rd Ed. 2017, 5210 A+B	9.50	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 rd Ed. 2017, 5220 A+B	36.0	5-50000	250.0

*The result are related only to item tested.

BDL = Below Detection Limit

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An approved Laboratory from Ministry of Environment , Forests and climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/05/21

TEST REPORT ISSUE DATE: 04.06.2021

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : Digwadih Colliery

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23 rd Ed. 2017, 4500H' A+B	7.42	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23 rd Ed. 2017, 2540D	16.8	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23 rd Ed. 2017, 2540C	610.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23 rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23 rd Ed. 2017, 5210 A+B	8.50	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 rd Ed. 2017, 5220 A+B	32.0	5-50000	250.0

*The result are related only to item tested.

BDL = Below Detection Limit

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TEST REPORT ISSUE DATE: 04.06.2021

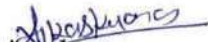
TEST REPORT OF WASTE WATER*


Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : JCPP (Final Settling Pond)

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection
1	Ph	APHA, 23rd Ed. 2017, 4500H' A+B	7.35	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	17.0	5-5000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	926.0	10-10,000
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	6.90	5-600
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017,5210 A+B	13.50	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	40.0	5-50000

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TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : T.C.H Point -1 (Near Children's Ward)

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23 rd Ed. 2017, 4500H ¹ A+B	7.21	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23 rd Ed. 2017, 2540D	42.0	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23 rd Ed. 2017, 2540C	860.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23 rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23 rd Ed. 2017, 5210 A+B	11.50	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 rd Ed. 2017, 5220 A+B	96.0	5-50000	250.0

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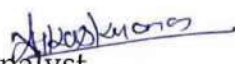
TEST REPORT OF WASTE WATER*

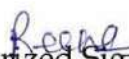
Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : ETP Inlet Jamadoba Canteen

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23 rd Ed. 2017, 4500H' A+B	8.56	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23 rd Ed. 2017, 2540D	162.0	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23 rd Ed. 2017, 2540C	936.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23 rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23 rd Ed. 2017,5210 A+B	23.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 rd Ed. 2017, 5220 A+B	156.0	5-50000	250.0

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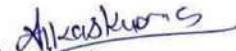
TEST REPORT OF WASTE WATER*

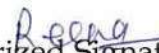
Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : ETP Outlet Jamadoba Canteen

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23 rd Ed. 2017, 4500H' A+B	7.52	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23 rd Ed. 2017, 2540D	47.5	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23 rd Ed. 2017, 2540C	890.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23 rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23 rd Ed. 2017,5210 A+B	14.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 rd Ed. 2017, 5220 A+B	72.0	5-50000	250.0

*The result are related only to item tested.

BDL = Below Detection Limit


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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/05/21

TEST REPORT ISSUE DATE: 04.06.2021

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : ETP Inlet JCPP canteen

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection
1	pH	APHA, 23 rd Ed. 2017, 4500H' A+B	7.46	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23 rd Ed. 2017, 2540D	152.0	5-5000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23 rd Ed. 2017, 2540C	1168.0	10-10,000
4	Oil & Grease as O & G (mg/l)	APHA, 23 rd Ed. 2017, 5520 (A+D)	BDL	5-600
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23 rd Ed. 2017, 5210 A+B	24.50	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 rd Ed. 2017, 5220 A+B	178.0	5-50000

*The result are related only to item tested.

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Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : ETP Outlet JCPP canteen

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23 rd Ed. 2017, 4500H' A+B	7.18	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23 rd Ed. 2017, 2540D	39.0	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23 rd Ed. 2017, 2540C	780.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23 rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23 rd Ed. 2017, 5210 A+B	20.5	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 rd Ed. 2017, 5220 A+B	76.0	5-50000	250.0

*The result are related only to item tested.

BDL = Below Detection Limit

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Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
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Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : ETP Inlet TCH

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection
1	pH	APHA, 23rd Ed. 2017, 4500H' A+B	6.90	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	142.0	5-5000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	810.0	10-10,000
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017,5210 A+B	26.0	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	184.0	5-50000

*The result are related only to item tested.

BDL = Below Detection Limit

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Analyst

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[Signature]
Quality Manager

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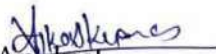
TEST REPORT OF WASTE WATER*

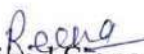
Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : ETP Outlet TCH

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23 rd Ed. 2017, 4500H ¹ A+B	7.46	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23 rd Ed. 2017, 2540D	38.50	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23 rd Ed. 2017, 2540C	748.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23 rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23 rd Ed. 2017, 5210 A+B	18.50	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 rd Ed. 2017, 5220 A+B	78.0	5-50000	250.0

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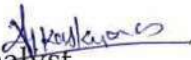
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Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : ETP Inlet Garage

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection
1	pH	APHA, 23rd Ed. 2017, 4500H' A+B	7.59	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	176.0	5-5000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	980.0	10-10,000
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017,5210 A+B	27.0	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	188.0	5-50000

*The result are related only to item tested.

BDL = Below Detection Limit


Analyst


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An approved Laboratory from Ministry of Environment , Forests and climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/05/21

TEST REPORT ISSUE DATE: 04.06.2021


TEST REPORT OF WASTE WATER*


Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : ETP Outlet Garage

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23 rd Ed. 2017, 4500H' A+B	7.35	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23 rd Ed. 2017, 2540D	34.0	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23 rd Ed. 2017, 2540C	1136.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23 rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23 rd Ed. 2017,5210 A+B	22.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 rd Ed. 2017, 5220 A+B	86.0	5-50000	250.0

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/05/21

TEST REPORT ISSUE DATE: 04.06.2021

TEST REPORT OF WASTE WATER*

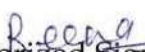
Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : STP Inlet Railway Colony

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection
1	pH	APHA, 23rd Ed. 2017, 4500H ¹ A+B	8.15	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	160.0	5-5000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	856.0	10-10,000
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	47.50	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	384.0	5-50000

*The result are related only to item tested.

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/05/21

TEST REPORT ISSUE DATE: 04.06.2021

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 24.05.2021 to 28.05.2021
Date of Sample Receiving : 29.05.2021
Date of Analysis : 29.05.2021 to 03.06.2021
Source of Sample : STP Outlet Railway Colony

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23 rd Ed. 2017, 4500H' A+B	7.42	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23 rd Ed. 2017, 2540D	42.0	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23 rd Ed. 2017, 2540C	824.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23 rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23 rd Ed. 2017, 5210 A+B	17.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 rd Ed. 2017, 5220 A+B	80.0	5-50000	250.0

*The result are related only to item tested.

BDL = Below Detection Limit

Shweta
Analyst

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FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/MCPM/05/21

TEST REPORT ISSUE DATE: 04.06.2021

MINERALOGICAL COMPOSITION OF PARTICULATE MATTER

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Month : May, 2021

S.NO.	Locations	Date of Sampling	Mineralogical Composition (in %)			
			Silica (SiO ₂)	Ferrous oxide (FeO)	Alumina (Al ₂ O ₃)	Calcium Oxide CaO
1	Officer's Colony, 12 No. Digwadih	28.05.2021	1.64	0.08	1.36	2.98
2	Central Work Shop Area Jamadoba	28.05.2021	2.9	0.19	1.42	2.84

Ravi Bhargava
Analyst

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Abhishek
Quality Manager

ENVIRONMENTAL MONITORING REPORT

OF

M/S TATA STEEL LIMITED

DHANBAD

for

AUGUST - 2021

Prepared by:

ADITI R&D SERVICES

PLOT NO. I-B/17(P), SINDRI INDUSTRIAL AREA,

P.O.- DOMGARH, DIST. – DHANBAD-828107

(JHARKHAND)

M/S TATA STEEL LIMITED
(JAMADOBA GROUP)



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(A Constituent Board of Quality Council of India)

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Mobile: 09471358492, 09431512608

Ref. No.: - ARDS/21-22/2647

Date: 10.08.2021

TEST REPORT OF AMBIENT AIR QUALITY

- Name of the industry : M/S TATA STEEL, JAMADOBA, TATA STEEL LIMITED, JAMADOBA GROUP PLANT, DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO. : 4700092573/932 Dt. 20.07.2021
- Date of Sample Collection : 06.08.2021 TO 07.08.2021
- Date of Testing : 09.08.2021
- Test Procedure : As per IS-5182

TEST RESULTS

LOCATION - JAMADOBA COLLIERY				
	Avg. Ambient Temperature	31 ^o C	Avg. Humidity	72%
Sl No.	Particulars	Value	CPCB STANDARD	
1.	Particulate Matter (PM ₁₀), µg/m ³	89.96	100 µg/m ³	
2.	Particulate Matter (PM _{2.5}), µg/m ³	40.61	60 µg/m ³	
3.	SO ₂ , µg/m ³	21.73	80 µg/m ³	
4.	NO ₂ , µg/m ³	27.29	80 µg/m ³	
5.	Ozone, µg/m ³	21.10	180 µg/m ³	
6.	NH ₃ , µg/m ³	19.82	400 µg/m ³	
7.	CO, mg/m ³	1.12	4 mg/m ³	
8.	Pb, µg/m ³	BDL	1 µg/m ³	
9.	As, ng/m ³	BDL	6 ng/m ³	
10.	Ni, ng/m ³	BDL	20 ng/m ³	
11.	Benzene, µg/m ³	BDL	5 µg/m ³	
12.	Benzoapyrene ng/m ³	BDL	1 ng/m ³	

NOTE: BDL - Below Detection Limit

S. R. Rishy
Sr. Chemist
Aditi R&D Services



[Signature]
Technical Manager
Aditi R&D Services, Sindri

Statements :

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Ref. No.: - ARDS/21-22/2648

Date: 10.08.2021

TEST REPORT OF AMBIENT AIR QUALITY

- Name of the industry : M/S TATA STEEL, JAMADOBA, TATA STEEL LIMITED, JAMADOBA GROUP PLANT, DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700092573/932 Dt. 20.07.2021
- Date of Sample Collection : 06.08.2021 TO 07.08.2021
- Date of Testing : 09.08.2021
- Test Procedure : As per IS-5182

TEST RESULTS

LOCATION – GENERAL MANAGER'S OFFICE AREA			
	Avg. Ambient Temperature	31°C	Avg. Humidity
Sl No.	Particulars	Value	72%
1.	Particulate Matter (PM ₁₀), µg/m ³	86.98	100 µg/m ³
2.	Particulate Matter (PM _{2.5}), µg/m ³	53.10	60 µg/m ³
3.	SO ₂ , µg/m ³	16.65	80 µg/m ³
4.	NO ₂ , µg/m ³	29.76	80 µg/m ³
5.	Ozone, µg/m ³	18.6	180 µg/m ³
6.	NH ₃ , µg/m ³	15.2	400 µg/m ³
7.	CO, mg/m ³	1.72	4 mg/m ³
8.	Pb, µg/m ³	BDL	1 µg/m ³
9.	As, ng/m ³	BDL	6 ng/m ³
10.	Ni, ng/m ³	BDL	20 ng/m ³
11.	Benzene, µg/m ³	BDL	5 µg/m ³
12.	Benzoapyrene ng/m ³	BDL	1 ng/m ³

NOTE: BDL - Below Detection Limit

Sr. Chemist
Aditi R&D Services



Technical Manager
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/21-22/2649

Date: 10.08.2021

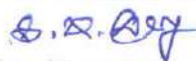
TEST REPORT OF AMBIENT AIR QUALITY

- Name of the industry : M/S TATA STEEL, JAMADOBA, TATA STEEL LIMITED, JAMADOBA GROUP PLANT, DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700092573/932 Dt. 20.07.2021
- Date of Sample Collection : 06.08.2021 TO 07.08.2021
- Date of Testing : 09.08.2021
- Test Procedure : As per IS-5182

TEST RESULTS

LOCATION – OFFICERS COLONY, 12 NO. DIGWADIH				
	Avg. Ambient Temperature	31°C	Avg. Humidity	71%
Sl No.	Particulars	Value	NAAQ - CPCB STANDARD	
1.	Particulate Matter (PM ₁₀), µg/m ³	76.83	100 µg/m ³	
2.	Particulate Matter (PM _{2.5}), µg/m ³	41.00	60 µg/m ³	
3.	SO ₂ , µg/m ³	15.16	80 µg/m ³	
4.	NO ₂ , µg/m ³	27.22	80 µg/m ³	
5.	Ozone, µg/m ³	19.94	180 µg/m ³	
6.	NH ₃ , µg/m ³	16.53	400 µg/m ³	
7.	CO, mg/m ³	0.74	4 mg/m ³	
8.	Pb, µg/m ³	BDL	1 µg/m ³	
9.	As, ng/m ³	BDL	6 ng/m ³	
10.	Ni, ng/m ³	BDL	20 ng/m ³	
11.	Benzene, µg/m ³	BDL	5 µg/m ³	
12.	Benzoapyrene ng/m ³	BDL	1 ng/m ³	

NOTE: BDL - Below Detection Limit


Sr. Chemist
Aditi R&D Services




Technical Manager
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/21-22/2650

Date: 10.08.2021

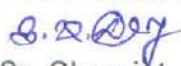
TEST REPORT OF AMBIENT AIR QUALITY

- Name of the industry : M/S TATA STEEL, JAMADOBA,
TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700092573/932 Dt. 20.07.2021
- Date of Sample Collection : 06.08.2021 TO 07.08.2021
- Date of Testing : 09.08.2021
- Test Procedure : As per IS-5182

TEST RESULTS

LOCATION – CENTRAL WORKSHOP AREA , JAMADOBA				
	Avg. Ambient Temperature	31 ^o C	Avg. Humidity	71%
Sl No.	Particulars	Value	NAAQ - CPCB STANDARD	
1.	Particulate Matter (PM ₁₀), µg/m ³	88.2	100 µg/m ³	
2.	Particulate Matter (PM _{2.5}), µg/m ³	42.52	60 µg/m ³	
3.	SO ₂ , µg/m ³	18.68	80 µg/m ³	
4.	NO ₂ , µg/m ³	24.27	80 µg/m ³	
5.	Ozone, µg/m ³	18.1	180 µg/m ³	
6.	NH ₃ , µg/m ³	19.53	400 µg/m ³	
7.	CO, mg/m ³	1.01	4 mg/m ³	
8.	Pb, µg/m ³	BDL	1 µg/m ³	
9.	As, ng/m ³	BDL	6 ng/m ³	
10.	Ni, ng/m ³	BDL	20 ng/m ³	
11.	Benzene, µg/m ³	BDL	5 µg/m ³	
12.	Benzoapyrene ng/m ³	BDL	1 ng/m ³	

NOTE: BDL - Below Detection Limit


Sr. Chemist
Aditi R&D Services




Technical Manager
Aditi R&D Services, Sindri

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TEST REPORT OF NOISE (AMBIENT) LEVEL MONITORING

Ref. No. & Date	NAME AND ADDRESS OF THE CLIENT			
ARDS/21-22/2651 Date:10.08.2021	M/S TATA STEEL, JAMADOBA,			
Date of Monitoring	TATA STEEL LIMITED, JAMADOBA GROUP PLANT, DIST. - DHANBAD (JHARKHAND)			
06.08.2021 – 07.08.2021	Avg. Ambient Temperature(°C)	Average Humidity (%)	Weather Condition	Status of the plant
Work Order 4700092573/932 Dt. 20.07.2021	29	68	Clear	Running

MONITORING RESULTS

Sl. No	Place of Monitoring	Day Time (6 AM to 10 PM) Avg. dB(A)			Night Time (10 PM to 6 AM) Avg. dB(A)			Noise level (Ambient standard) for Industrial Area as per CPCB Noise Pollution (Regulation and Control) (Amendment) Rules, 2000 notified vide S.O. 1046(E) Dt. 22.11.2020 Limit in dB(A) Leq	
		MAX	MIN	AVG. dB(A) Leq	MAX	MIN	AVERAGE dB(A) Leq	Day Time	Night Time
LOCATION								Industrial Area	Industrial Area
JAMADOBA GROUP									
1.	Central Workshop	69.8	56.7	67.0	55.8	50.1	53.82	75	70
2.	Jamadoba Colliery	72.8	63.8	70.30	61.7	54.2	59.40		
3.	GM Office Area	52.6	50.2	51.49	50.9	46.7	49.29		
								Residential Area	Residential Area
4.	Officer Colony 12 No. Digwadih	50.5	46.8	49.03	44.6	42.2	43.56	55	45


Sr. Chemist
Aditi R&D Services




Technical Manager
Aditi R&D Services, Sindri

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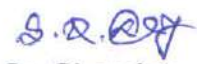
Date: 18.08.2021

TEST REPORT OF MINERALOGICAL COMPOSITION OF PARTICULATE MATTER

- Name of the industry : M/S TATA STEEL, JAMADOBA,
TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700092573/932 Dt. 20.07.2021
- Date of Sample Collection : 07.08.2021
- Date of Testing : 09.08.2021 – 12.08.2021

TEST RESULTS

Sl No.	Particulars	Mineralogical Composition (%)			
		SiO ₂	FeO	Al ₂ O ₃	CaO
1.	General Manager's Office Area	1.74	0.05	1.19	2.3
2.	Jamadoba Colliery	2.05	0.12	1.24	2.95


Sr. Chemist
Aditi R&D Services




Technical Manager
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/21-22/ 2792

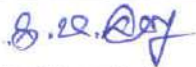
Date: 18.08.2021

TEST REPORT OF SURFACE WATER

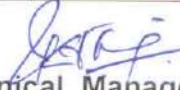
- Name of the industry : M/S TATA STEEL, JAMADOBA,
TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700092573/932 Dt. 20.07.2021
- Sample Code : 1. Damodar River Up Stream
2. Damodar River Dn Stream
- Date of Sample Collection: 06.08.2021
- Date of Testing : 09.08.2021 – 13.08.2021
- Test : pH, TDS, Turbidity, DO, BOD, Cl, F, SO₄

TEST RESULT

Sl. No.	PARAMETERS OF TEST	VALUE		Limit as per IS 2296 Class - C	Test Method
		Damodar River Up Stream	Damodar River Dn Stream		
1.	pH,	7.4	7.7	6.5 -8.5	IS-3025 (P-11): 1983
2.	Total Dissolved Solids, mg/l	618	672	1500	IS-3025 (P-16): 1984
3.	Turbidity, NTU	11.8	15.5	-	IS-3025 (P-10):1984
4.	Dissolved Oxygen, mg/l	6.5	5.4	4.0	IS-3025 (P-38):1989
5.	Bio chemical Oxygen Demand, mg/l	1.0	1.5	3.0	IS-3025 (P-44):1994
6.	Chloride as Cl, mg/l	48.0	70.0	-	IS-3025 (P-32):1988
7.	Fluoride as F, mg/l	0.55	0.61	1.5	IS-3025 (P-60):2008
8.	Sulphate as SO ₄ , mg/l	42.12	60.24	400	IS-3025 (P-24):1986


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Aditi R&D Services




Technical Manager
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/21-22/2793


Date: 18.08.2021

TEST REPORT OF MINE WATETR DISCHARGE

- Name of the industry : M/S TATA STEEL, JAMADOBA, TATA STEEL LIMITED JAMADOBA GROUP PLANT, DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700092573/932 Dt. 20.07.2021
- Sample Code : 1. 2 Pit Jamadoba Colliery
2. 3 Pit Jamadoba Colliery
3. 2 Incline Jamadoba Colliery
4. 6 & 7 Pits Colliery
- Date of Sample Collection: 06.08.2021
- Date of Testing : 09.08.2021 – 16.08.2021
- Test : pH, TDS, TSS, BOD, COD, OIL & GREASE.

TEST RESULT

Sl. No.	PARAMETERS OF TEST	VALUE				Limit as per IS-2296 Class B (For Bathing)	Test Method
		2 Pit Jamadoba Colliery	3 Pit Jamadoba Colliery	2 Incline Jamadoba Colliery	6 & 7 Pits Colliery		
1.	pH,	7.88	7.70	7.58	8.08	6.5-8.5	IS-3025 (P-11): 1983
2.	Total Dissolved Solids, mg/l	672	674	610	692	-	IS-3025 (P-16): 1984
3.	Total Suspended Solids, mg/l	13.0	11.8	10.6	10.28	-	IS-3025(P-17): 1984
4.	Bio chemical Oxygen Demand, mg/l	2.0	1.8	1.6	1.7	3	IS-3025 (P-44):1994
5.	Chemical Oxygen Demand, mg/l	32	30.0	25.2	28.8	-	IS-3025 (P-58):2006
6.	Oil & Grease, mg/l	BDL	BDL	BDL	BDL	-	IS-3025 (P-39):2021


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Ref. No.: - ARDS/21-22/2793


Date: 18.08.2021

TEST REPORT OF EFFLUENT

- Name of the industry : M/S TATA STEEL, JAMADOBA, TATA STEEL LIMITED, JAMADOBA GROUP PLANT, DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700092573/932 Dt. 20.07.2021
- Sample Code : 1. JCPP (Final Settling Pond)
2. T.C.H, Point- 2 (Near Casualty)
- Date of Sample Collection: 06.08.2021
- Date of Testing : 09.08.2021 – 16.08.2021
- Test : pH, TDS, TSS, BOD, COD, OIL & GREASE.

TEST RESULT

Sl. No.	PARAMETERS OF TEST	VALUE		MoEF&C Notification 1 st Jan.2016 Permissible Max. Desirable Limit	Test Method
		JCPP (Final Settling Pond)	TCH Point 2 (Near Casualty)		
1.	pH,	8.20	7.22	6.0-9.0	IS-3025 (P-11): 1983
2.	Total Dissolved Solids, mg/l	972	852	2100	IS-3025 (P-16): 1984
3.	Total Suspended Solids, mg/l	14.10	50.1	100	IS-3025(P-17): 1984
4.	Bio chemical Oxygen Demand, mg/l	1.9	2.0	30	IS-3025 (P-44): 1994
5.	Chemical Oxygen Demand, mg/l	31.0	96.0	250	IS-3025 (P-58): 2006
6.	* Oil & Grease, mg/l	BDL	BDL	10	IS-3025 (P-39): 2021


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Ref. No.: - ARDS/21-22/ 2794

Date: 18.08.2021

TEST REPORT OF DRINKING WATER

- Name of the industry : M/S TATA STEEL, JAMADOBA,
TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700092573/932 Dt. 20.07.2021
- Sample Code : 1. W. T. P. (Jamadoba)
2. W. T. P. (Digwadih)
- Date of Sample Collection: 06.08.2021
- Date of Testing : 09.08.2021 – 13.08.2021
- Test :

Res. Colour, Odour, Taste, Turbidity, pH, Total Hardness, Iron, Chloride,

Free chlorine, Total Dissolved Solids, Calcium, Copper, Manganese, Sulphate, Nitrate, Fluoride, Phenolic Compound, Mercury, Cadmium, Arsenic, Cyanide, Lead, Zinc, Total Coliform, Hexavalent Chromium, Mineral Oil, Alkalinity, Aluminium & Boron.

TEST RESULT

Sl. No.	PARAMETERS OF TEST	VALUE		IS as per IS 10500:2012		Test Method
		W.T.P. Jamadoba	W.T.P. Digwadih	Desirable	Permissible	
1.	Colour, (Hazen Unit)	1	1	5.00	15.0	IS 3025 (P-4):2021
2.	Odour	Agreeable	Agreeable	Agreeable	Agreeable	IS 3025 (P-5):2018
3.	Taste	Agreeable	Agreeable	Agreeable	Agreeable	IS 3025 (P-7):2017
4.	Turbidity, NTU	1	1	1.0	5.0	IS 3025 (P-10):1984
5.	pH	7.4	7.1	6.5-8.5	No. Relax.	IS-3025 (P-11):1983
6.	Total Hardness as CaCO ₃ , mg/l	284.42	295.68	200	600	IS 3025 (P-21):2009
7.	Chloride as Cl, mg/l	44.0	46.6	250	1000	IS 3025 (P-32):1988
8.	Res. Free chlorine as Cl ₂ mg/l	NIL	NIL	0.20	1.0	IS 3025 (P-26):2021
9.	Total Dissolved Solids, mg/l	660	670	500	2000	IS 3025 (P-16):1984
10.	Calcium as CaCO ₃ , mg/l	84	92	75	200	IS 3025 (P-40):1991
11.	Copper as Cu, mg/l	BDL	BDL	0.05	1.5	IS 3025 (P-42):1992

Continued on Page 2



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- 2 -

Sl. No.	PARAMETERS OF TEST	VALUE		IS as per IS 10500:1991		Test Method
		W. T. P. Jamadoba	W.T.P. Digwadih	Desirable	Permissibl e	
12.	Manganese as Mn, mg/l	BDL	BDL	0.10	0.30	IS 3025 (P-59):2006
13.	Sulphate as SO ₄ , mg/l	42	56	200	400	IS 3025 (P-24):1986
14.	Nitrate as NO ₃ , mg/l	4.0	3.2	45	No. Relax	IS 3025 (P-34):1988
15.	Fluoride as F, mg/l	0.3	0.2	1.0	1.5	IS 3025 (P-60):2008
16.	Phenolic Compound as (C ₆ H ₅ OH) mg/l	BDL	BDL	0.001	0.002	IS 3025 (P-43):1992
17.	Mercury as Hg, mg/l	BDL	BDL	0.001	No. Relax	IS 3025 (P-48):1994
18.	Cadmium as Cd, mg/l	BDL	BDL	0.003	No. Relax	IS 3025 (P-41):1992
19.	Arsenic as As, mg/l	BDL	BDL	0.01	No. Relax	IS 3025 (P-37):1988
20.	Cyanide as CN, mg/l	BDL	BDL	0.05	No. Relax	IS 3025 (P-27):1986
21.	Lead as Pb, mg/l	BDL	BDL	0.01	No. Relax	IS 3025 (P-47):1994
22.	Zinc as Zn, mg/l,	0.1	0.15	5	15	IS 3025 (P-42):1992
23.	Total Coliform, No./100ml	Absent	Absent	Absent	Absent	IS 3025 (P-49):1994
24.	Hexavalent Chromium as Cr, mg/l	BDL	BDL	0.05	No. Relax	IS 3025 (P-52):2003
25.	Mineral Oil, mg/l	BDL	BDL	0.5	No. Relax	IS 3025 (P-39):1989
26.	Alkalinity as CaCO ₃ , mg/l,	391	412	200	600	IS 3025 (P-23):1983
27.	Aluminium as Al, mg/l	BDL	BDL	0.03	0.2	IS 3025 (P-55):2003
28.	Boran as B, mg/l	BDL	BDL	0.5	1.0	IS 3025 (P-57):2005

NOTE: BDL - Below Detection Limit


Sr. Chemist
Aditi R&D Services




Technical Manager
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/21-22/ 2795

Date: 18.08.2021

TEST REPORT OF GROUND WATER

- Name of the industry : M/S TATA STEEL, JAMADOBA, TATA STEEL LIMITED, JAMADOBA GROUP PLANT, DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO. : 4700092573/932 Dt. 20.07.2021
- Sample Code :
 1. Bhowra 13 No
 2. Mohalbani Basti
 3. Lower Dungari
 4. Jorapokhar Kushtand
 5. Jamadoba 3 No
- Date of Sample Collection : 06.08.2021
- Date of Testing : 09.08.2021 – 13.08.2021
- Test : Colour, Odour, Taste, Turbidity, pH, Total Hardness, Iron, Chloride, Res. Free chlorine, Total Dissolved Solids, Calcium, Copper, Manganese, Sulphate, Nitrate, Fluoride, Phenolic Compound, Mercury, Cadmium, Arsenic, Cyanide, Lead, Zinc, Total Coliform, Hexavalent Chromium, Mineral Oil, Alkalinity, Aluminium & Boron.

TEST RESULT

Sl. No	PARAMETERS OF TEST	VALUE					IS as per IS 10500:1991		Test Method
		Bhowra 13 No	Mohalbani Basti	Lower Dungari	Jorapokhar Kushland	Jamadoba 3 No	Desirable	Permissible	
1.	Colour, (Hazen Unit)	2	1	1	2	1	5	15	IS 3025 (P-4):2021
2.	Temperature °C	28.2	27.8	28.3	27	26	-	-	-
3.	Electrical Conductivity, µmhos/cm	950	1250	1070	1012	970	-	-	-
4.	Total Dissolved Solids, mg/l	636	837	749	594	650	-	-	IS 3025(P-16):1984
5.	pH	7.6	7.8	7.5	7.7	7.5	6.5-8.5	No Relax	IS-3025(P-11):1983
6.	Total Hardness as CaCO ₃ , mg/l	340	171.78	128.56	252	245	200	600	IS 3025(P-21):2009
7.	Calcium as Ca, mg/l	95	48	30.7	60	64	75	200	IS 3025(P-40):1991
8.	Magnesium as Mg, mg/l	26	12.8	12.8	25	24.5	30	100	IS 3025(P-46):1994
9.	Chloride as Cl, mg/l	36.5	30.1	52.1	40.1	55	250	1000	IS 3025(P-32):1988
10.	Fluoride as F, mg/l	0.30	0.32	0.4	0.35	0.38	1.0	1.5	IS 3025(P-60):2008

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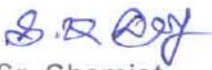
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2

Sl. No	PARAMETERS OF TEST	VALUE					IS as per IS 10500:1991		Test Method
		Bhowra 13 No	Mohalban i Basti	Lower Dungari	Jorapokhar Kushtand	Jamadoha 3 No	Desirable	Permissible	
11	Sulphate as SO ₄ , mg/l	40.4	38.5	38.2	44.1	38.5	200	400	IS 3025(P-24):1986
12	Nitrate as NO ₃ , mg/l	12.6	16.3	7.25	12.6	10.5	45	No. Relax	IS 3025(P-34):1988
13	Alkalinity as CaCO ₃ , mg/l	241	204	252	125	432	200	600	IS 3025(P-23):1983
14	Lead as Pb, mg/l	BDL	BDL	BDL	BDL	BDL	0.01	No. Relax	IS 3025(P-47):1994
15	Zinc as Zn, mg/l	0.18	0.16	0.12	0.11	0.1	5	15	IS 3025(P-42):1992
16	Iron as Fe, mg/l	0.16	0.18	0.15	0.17	0.14	0.3	No. Relax	IS 3025(P-53):2003
17	Copper as Cu, mg/l	BDL	BDL	BDL	BDL	BDL	0.05	1.5	IS 3025(P-42):1992
18	Mercury as Hg, mg/l	BDL	BDL	BDL	BDL	BDL	0.001	No. Relax	IS 3025(P-48):1994
19	Cadmium as Cd, mg/l	BDL	BDL	BDL	BDL	BDL	0.003	No. Relax	IS 3025(P-41):1992
20	Nickel as Ni, mg/l	BDL	BDL	BDL	BDL	BDL	0.02	No. Relax	IS 3025(P-37):1992
21	Arsenic as As, mg/l	BDL	BDL	BDL	BDL	BDL	0.01	No. Relax	IS 3025(P-37):1988
22	Cyanide as CN, mg/l	BDL	BDL	BDL	BDL	BDL	0.05	No. Relax	IS 3025(P-27):1986
23	Total Chromium as Cr, mg/l	BDL	BDL	BDL	BDL	BDL	0.05	No. Relax	IS 3025(P-52):2003

NOTE: BDL - Below Detection Limit


Sr. Chemist
Aditi R&D Services




Technical Manager
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/21-22/2796


Date: 18.08.2021

TEST REPORT OF ETP

- Name of the industry : M/S TATA STEEL, JAMADOBA,
TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700092573/932 Dt. 20.07.2021
- Sample Code : ETP – TCH (Inlet and Outlet)
- Date of Sample Collection: 06.08.2021
- Date of Testing : 09.08.2021 – 16.08.2021
- Test : pH, TDS, TSS, BOD, COD AND OIL & GREASE

TEST RESULT

Sl. No.	PARAMETERS OF TEST	VALUE		G.S.R 422 (E) Max. Desirable Limit	Test Method
		ETP INLET-TCH	ETP OUTLET-TCH		
1.	pH,	7.2	7.5	5.5-9.0	IS-3025 (P-11): 1983
2.	Total Dissolved Solids, mg/l	1052	824	-	IS-3025 (P-16): 1984
3.	Total Suspended Solids	140	40.8	100	IS-3025 (P-17): 1984
4.	Bio chemical Oxygen Demand, mg/l	25.4	19.0	30.0	IS-3025 (P-44):1994
5.	Chemical Oxygen Demand, mg/l	172	65	250	IS-3025 (P-58):2006
6.	Oil & Grease	2.5	BDL	10	IS-3025 (P-39):2021


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Ref. No.: - ARDS/21-22/2797

Date: 18.08.2021

TEST REPORT OF ETP

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JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700092573/932 Dt. 20.07.2021
- Sample Code : ETP - GARAGE (Inlet and Outlet)
- Date of Sample Collection: 06.08.2021
- Date of Testing : 09.08.2021 - 13.08.2021
- Test : pH, TDS, TSS, BOD, COD AND OIL & GREASE

TEST RESULT

Sl. No.	PARAMETERS OF TEST	VALUE		G.S.R 422(E) Desirable Limit	Test Method
		ETP INLET-GARAGE	ETP OUTLET-GARAGE		
1.	pH,	7.50	7.66	5.5-9.0	IS-3025 (P-11): 1983
2.	Total Dissolved Solids, mg/l	875	751	-	IS-3025 (P-16): 1984
3.	Total Suspended Solids	82	10	100	IS-3025 (P-17): 1984
4.	Bio chemical Oxygen Demand, mg/l	24	9.5	30.0	IS-3025 (P-44):1994
5.	Chemical Oxygen Demand, mg/l	196	81.4	250	IS-3025 (P-58):2006
6.	Oil & Grease	2.5	BDL	10	IS-3025 (P-39):2021

Sr. Chemist
Aditi R&D Services



Technical Manager
Aditi R&D Services, Sindri

Statements :

- The test report refers only to the particular item(s) submitted for testing.
- The test results reported in this report are valid at the time of and under the stated condition of measurement.
- This particular test report cannot be reproduced except in full without prior permission of Quality Manager of the laboratory.



ADITI R&D SERVICES

Testing Laboratory

NABL ACCREDITED

(A Constituent Board of Quality Council of India)

ISO/IEC 17025:2017, ISO 9001:2015, ISO (OHSAS) 45001:2018 Certified

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Ref. No.: - ARDS/21-22/ 2798


Date: 18.08.2021

TEST REPORT OF STP

- Name of the industry : M/S TATA STEEL, JAMADOBA,
TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700092573/932 Dt. 20.07.2021
- Sample Code : STP – RAILWAY COLONY (Inlet and Outlet)
- Date of Sample Collection: 07.08.2021
- Date of Testing : 09.08.2021 – 13.08.2021
- Test : pH, TDS, TSS, BOD, COD AND OIL & GREASE

TEST RESULT

Sl. No.	PARAMETERS OF TEST	VALUE		LIMIT G.S.R 422(E) (Inland Surface Water Discharge)		Test Method
		STP INLET- RAILWAY COLONY	STP OUTLET- RAILWAY COLONY	Inlet	Outlet	
2.	Total Dissolved Solids, mg/l	774	864	-	-	IS-3025 (P-16): 1984
3.	Total Suspended Solids	148	42	-	100	IS-3025 (P-17): 1984
4.	Bio chemical Oxygen Demand, mg/l	44.0	18.2	-	30.0	IS-3025 (P-44):1994
5.	Chemical Oxygen Demand, mg/l	354	86.0	-	250	IS-3025 (P-58):2006
6.	Oil & Grease	BDL	BDL	-	10	IS-3025 (P-39):2021


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