



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/6&7/36/ 865 /2022

November 24, 2022

Ref.: Environmental Clearance letter no. - J-11015/373/2010-IA .II (M) dated- 3rd March 2014.

SUB: Half Yearly Compliance Status Report of Environment Clearance conditions issued by MoEFCC, New Delhi to 6 & 7 Pits Colliery, Tata Steel Limited, Dhanbad for the period April'22 to September'22.


Dear Sir,

We are enclosing herewith compliance report for the period **April'22 to September'22** for the EC granted vide letter no.- J-11015/373/2010-IA.II(M) dated- 3rd March 2014 issued by Ministry of Environment, Forest and Climate Change, New Delhi.

Copy of the compliance report is also being sent in soft format through email at ro.ranchi-mef@gov.in for your kind perusal. 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: Head, 6 & 7 Pits Colliery

Copy to: Sr. Manager (Environment)

HALF YEARLY COMPLIANCE REPORT
(PERIOD: APRIL'22 – SEPTEMBER'22)

6&7 PITS COLLIERY
(CAPACITY: EXPANSION FROM 0.28 TO 0.6 MTPA RAW COAL)
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-11015/373/2010-IA.II
(M) DATED- 03.03.2014 ISSUED BY GOVT. OF INDIA, MINISTRY OF ENVIRONMENT,
FOREST AND CLIMATE CHANGE, NEW DELHI.**

Compliance status of Environmental Clearance of Expansion of 6 and 7 Pits Colliery from 0.28 MTPA to 0.6 MTPA in an ML area 168.12 ha) of M/s Tata Steel Ltd., Village Jamadoba, Tehsil Jharia, dist. Dhanbad, Jharkhand vide MoEFCC Letter no J-11015/373/2010-IA.II (M) dated March 3, 2014

S. No.	Condition	Compliance Status
Specific Condition		
(i)	Adequate measures be taken so as to prevent and control of manifestation of health problems due to coal mining activities.	The control measures implemented are as follows- i. Water spraying is carried out in underground workings ii. Water sprinkling arrangements are present at all coal transfer points in underground iii. Plantation within the mine lease area iv. Trucks carrying sand are properly covered as well as optimally loaded. v. Underground workings of the mine are well ventilated and meet the required standards prescribed by DGMS.
(ii)	Adequate green belt shall be provided around coal handling and other areas.	Green belt has been developed around the CHP of washery and mass plantation activities are taking place every year in the leasehold area.
(iii)	Transportation of coal shall be by mechanically covered trucks.	No coal transportation takes place by trucks. All coal is transported to the washery via underground conveyor belt system.
(iv)	No dumping of fly ash in low lying areas and in mine voids are permitted.	It is not applicable as there is no generation of fly-ash due to closure of our power plant since April'2015.
(v)	Utmost care be taken to prevent spillage of sand during transportation of sand.	The trucks that are being used for the transportation of sand are properly covered using tarpaulin sheets. Larger trucks have been engaged for reducing no of cycles. To ensure the compliance, every vehicle is checked as per vehicle checklist on PUC, Tyre/body condition, emission check at every entry point. Quality checks are done on trucks to ensure its health.
(vi)	No use of fly ash with sand will take place for stowing in underground mines.	Office Memorandum F.No. 22-13/2019-IA.III dated 28 th Aug'19 by MOEFCC is being followed.
(vii)	The maximum production from the mine at any given time shall not exceed the limit as prescribed in the EC.	It will be strictly followed. The EC capacity is for 0.6 MTPA raw coal while the raw coal production for 6&7 Pits Colliery is well below the limit.
(viii)	Regular monitoring of subsidence movement on the surface over and around the working area and impact on natural drainage pattern, water bodies, vegetation,	Regular monitoring of subsidence is done by Central Institute for Mining and Fuel Research, Dhanbad. According to the subsidence reports, the impact of subsidence

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	structure, roads, and surroundings shall be continued till movement ceases completely. In case of observation of any high rate of subsidence movement, appropriate effective corrective measures shall be taken to avoid loss of life and material. Cracks shall be effectively plugged with ballast and clayey soil/suitable material.	is negligible since the underground mine workings are now at great depth and proper filling of voids through sand stowing is being done.
(ix)	If subsidence is found exceeding the permitted limits, then the landowners shall be adequately compensated with mutual agreement of the landowners.	It will be strictly followed.
(x)	Mining shall be carried out as per statuette at a safe distance from the river/nallah flowing adjacent to the lease boundary.	The Damodar River flows at an approx. aerial distance of 2.5 kms from the lease boundary. Since this is an underground mine, no impact on the surface water bodies is expected. Though, regular monitoring on upstream and downstream of Damodar river is performed by own as well as NABL accredited laboratory.
(xi)	High root density tree species shall be selected and planted over areas likely to be affected by subsidence.	Impact on land by subsidence has been found to be negligible as per the subsidence monitoring reports prepared by CIMFR, Dhanbad. Though, high root density trees of native species are covered under annual plantation program.
(xii)	Coal Extraction shall also be optimised in areas where agricultural production is continuing. Some pillars shall be left below the agricultural land. No depillaring & coal extraction should be carried out below habitation, H.T. Lines & beneath road, water bodies.	It is strictly followed.
(xiii)	Subsidence shall be monitored closely and if subsidence is found exceeding the permitted limits, then the landowners shall be adequately compensated with mutual agreement with the landowners.	Regular monitoring of subsidence is being done by CIMFR, Dhanbad and it is well within under statutory limit.
(xiv)	3-tier plantation should be developed 2 km stretch of road from the mine using native species.	Plantation along the stretches of road has been done with native species and it is a continuous process under our green belt development programme
(xv)	Garland drains (size, gradient and length) around the safety areas such as mine shaft and low lying areas and sump capacity shall be designed keeping 50% safety margin over and above the peak sudden rainfall and	Garland drains of adequate size and gradient already exist around the colliery area to channelize the surface runoff. Details of the same are as follows:

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	maximum discharge in the area adjoining the mine sites. Sump capacity shall also provide adequate retention period to allow proper settling of silt material.	S. No	Location	Length	Width	Height	Gradient
(xvi)	Water sprinkling system shall be provided to check fugitive emissions from loading operations, conveyor system, haulage roads, transfer points, etc. Major approach roads shall be black topped and properly maintained.	1.	Office Area	850 m	2.5 m	1 m	1 in 75
(xvii)	Coal transportation to washery shall be through a network of underground belt conveyor system and hence there is no surface transportation of coal. Transportation of men from surface to underground and back shall be via shaft. The material transport shall be through the shaft and by means of haulage in the underground.	2.	Magazine Area	800 m	2.5 m	1 m	1 in 200
(xviii)	A progressive afforestation plan shall be prepared and implemented over the mine lease area acquired and shall include areas under green belt development, areas along roads, infrastructure, along ML boundary and township etc., by planting native species in consultation with the local DFO/Agriculture Department.	3.	PH area	550 m	2.5 m	1 m	1 in 97
(xix)	Regular monitoring of groundwater level and quality shall be carried out by establishing a network of existing wells and construction of new peizometers. The monitoring for quantity shall be done four times a year in pre-monsoon (May), monsoon (August), post-monsoon (November) and winter (January) seasons	4.	Jitpur Area	550 m	3.0 m	1 m	1 in 60
		5.	Brick field area	850 m	1.5 m	1 m	1 in 70
		Water spraying arrangement is present in the underground mines at all transfer points. Water spraying via tankers is done on sand transportation routes. Major approach roads have been black-topped and maintained regularly.					
		It is already being followed and will continue in future too.					
		Tree plantation activities are carried out every year on the barren/ degraded areas, areas along road-side, infrastructure, etc of the colliery leasehold. Apart from these, fruit plants are distributed to employees and also to villagers, schools, institutions, etc. The environment department is responsible for implementing the afforestation plan which is prepared along with the mine management. High root density trees of native species are planted under annual plantation program every year.					
		The monitoring of groundwater level and quality is done four times a year. The groundwater quality report & groundwater level are provided in Annexure-I .					

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	and for quality in May. Data thus collected shall be submitted to the Ministry of Environment & Forests and to the Central Pollution Control Board quarterly within one month of monitoring.	
(xx)	Acid Water Treatment Plant, volume of water to be treated and disposal of brine should be provided.	6&7 Pits Colliery is an underground mine. No acid mine drainage occur.
(xxi)	Mine discharge water outside the ML shall be monitored, particularly for TDS and treated to conform to prescribed levels before discharge into the natural environment.	There is one mine-water outlet point in the colliery which is regularly monitored by the Environmental Laboratory.
(xxii)	The Company shall put up artificial groundwater recharge measures for augmentation of groundwater resource, in case water table shows a declining trend. The project authorities shall meet water requirement of nearby village(s) in case the village wells go dry due to dewatering of mine.	<ul style="list-style-type: none"> •The water pumped out during underground mining activity is re-circulated back into the mine for the purpose of stowing. 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. •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. •The water requirement of the nearby villages is being met by the company already. Now piped drinking water is being provided.
(xxiii)	Besides carrying out regular periodic health checkup of their workers, 10% of the workers identified from workforce engaged in active mining operations shall be subjected to health checkup for occupational diseases and hearing impairment, if any, through an agency such as NIOH, Ahmadabad within a period of one year and the results reported to this Ministry and to DGMS.	The periodic health checkup 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 20 % of the workers identified from workforce engaged in active mining operations are subjected to full medical check up including hearing impairment check up, etc. These results are regularly submitted to DGMS as per mines rules. Some sample reports and as well as past records have been submitted in previous compliance reports.

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(xxiv)	The mining in the existing mines should be phased out after expiry of the current mining lease and after reclamation of mined over area. The operating mines may be analysed and monitored for compliance of conditions, bearing with movement of wildlife and until such time they are closed/phased out.	It is not applicable in our case.
(xxv)	Project specific CSR for an amount of Rs5/Tonne of coal production, as adjusted as per the annual inflation, should be provided for the CSR activities undertaken and the progress made thereon shall be uploaded annually on the company website. Monitoring of the impacts of activities under CSR shall be carried out periodically.	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 FY22 is Rs. 5.07 crores. CSR data submitted is for Jharia Division which comprises all 5 collieries and 2 washeries. Jamadoba Washery, Digwadih Colliery and 6&7 Pits Colliery are adjacent to each other and fall under same leasehold area i.e. Jamadoba group of collieries. The core zone and buffer zone of all above units overlap to each other and in many cases, the villages are same where CSR work is going on. Therefore, we have a central budget for CSR which is managed by a team of experts who are dedicatedly involved in providing benefits and improving standard of living in over 50+ villages and municipal wards. Hence, separate CSR expenditure for individual unit cannot be estimated. For calculation/ statutory reporting purpose, the consolidated CSR expenditure can be divided into unit-wise based on size of leasehold area of individual units. The progress report is uploaded every year on the company website. Internal social audits are carried out regularly to assess the impact of CSR activities.
(xxvi)	A Final Mine Closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval.	Mine Closure Plan has been approved by Ministry of Coal, New Delhi. Details on deposition of closure cost in escrow account along with expenditure incurred for progressive closure is regularly submitted to Office of Coal controller. Final mine closure along with details of corpus fund will be submitted to MoEF&CC 5 years in advance.

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(xxvii)	The commitment made by the Proponent to the issue raised during Public Hearing shall be implemented by the Proponent.	The commitment made by project proponent has been taken up and are being addressed gradually. Roads have been maintained in the colliery and along sand transportation routes. Subsidence studies are done every year. All the ash dumps have been reclaimed. Village ponds are cleaned as per requirement. Laying of drinking water pipeline network has been extended to more villages. A network of more than 22000 metres of pipeline connection has been established along with 33 water tanks (capacity of 4500 litres). Health camps are regularly organized by TSRDS. Training to SHEs, women, youth and children are provided in various fields.
(xxvii)	<p>Corporate Environment Responsibility:</p> <p>a) The Company shall have a well laid down Environment Policy approved by the Board of Directors.</p> <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 Company already has an Environment Policy approved by the Managing Director and it addresses all the issues mentioned.</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, 6&7 Pits Colliery 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>

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. Board and Pillar method is being used for mining.

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(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 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.	The Air quality monitoring in the core zone as well as buffer zone is done regularly by NABL recognized lab as well as by our inhouse lab. Monitoring of heavy metals in ambient air is being performed by an independent laboratory (recognised by NABL). 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'22 to Sep'22 is attached as Annexure-I . Additionally, third party monitoring is done through a JSPCBC and NABL recognised Laboratory on ambient air quality (PM10, PM 2.5, SO2, NOx, CO, NH3, O3) and heavy metals (As, Ni, Cd and Cr) and 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 industrial wastewater is generated in 6&7 Pits Colliery premises. There is a central workshop and garage in Jamadoba where Effluent Treatment Plant having oil and grease trap facility 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 for sand transportation. Coal transportation is done through underground belt network. Only sand transportation is done through trucks which

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		are covered with tarpaulins as well as optimally loaded.
(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 recognised 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 approved & NABL accredited 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 periodic health check-up 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 20 % of the workers identified from workforce engaged in active mining operations are subjected to full medical check-up including hearing impairment check-up, etc. These results are regularly submitted to DGMS as per mines rules. We are doing similar medical examination for our contractor workers in Tata central hospital.
(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 Dhanbad.	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 2021-22 is Rs. 258.45 Lakhs

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(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 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.	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 once in every six months. The display of information near the mine's office has also been done.

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(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 is being complied.
(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 2021-22 has been submitted to JSPCB vide letter no. JMB/ENV/ESSA/05/714/2022 on 28 th September 2022 and it is also uploaded on the company website. The soft copy of Environment Statement is also sent to MOEFCC by email at ro.ranchi-mef@gov.in.

AIR QUALITY REPORT

Core zone & Buffer zone

Period- April'22 to June'22

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	18.04.22	Clear	233.4	89.5	13.2	14.6
		06.05.22	Cloudy	214.2	80.5	11.6	13.0
		10.06.22	Clear	210.6	77.5	13.3	14.8
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	13.04.22	Clear	78.3	36.6	13.7	14.9
		10.05.22	Cloudy	75.3	35.2	10.8	11.3
		08.06.22	Clear	78.4	40.2	11.5	12.7
New Village Colony, Jamadoba	23°41'51" N/ 86°23'19" E	15.04.22	Clear	88.7	45.1	12.5	13.5
		05.05.22	Cloudy	85.7	43.0	13.2	14.0
		06.06.22	Clear	82.7	42.8	12.3	13.1
6&7 Pits Kalimandir colony	23°43'15" N/ 86°24'12" E	11.04.22	Clear	84.4	42.3	13.1	15.2
		09.05.22	Clear	87.9	46.3	12.0	13.9
		07.06.22	Cloudy	75.2	36.4	12.4	14.6

Sr. Manager (Environment)

AIR QUALITY REPORT
Core zone & Buffer zone

Period- July'22 to September'22

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	22.07.22	Cloudy	186.4	69.5	11.3	13.7
		11.08.22	Cloudy	188.7	70.2	12.0	13.4
		02.09.22	Clear	192.3	72.3	13.8	15.6
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	20.07.22	Clear	70.3	36.2	12.2	13.5
		09.08.22	Cloudy	65.3	32.5	11.2	12.9
		05.09.22	Cloudy	67.2	34.4	12.5	13.7
New Village Colony, Jamadoba	23°41'51" N/ 86°23'19" E	18.07.22	Cloudy	68.4	34.6	10.8	11.5
		12.08.22	Clear	76.8	38.4	13.6	14.3
		07.09.22	Clear	75.1	40.8	11.8	12.2
6&7 Pits Kalimandir colony	23°43'15" N/ 86°24'12" E	21.07.22	Clear	71.3	37.1	11.5	12.2
		08.08.22	Cloudy	67.1	33.7	12.5	13.6
		06.09.22	Cloudy	69.5	36.1	12.9	14.3



Sr. Manager (Environment)

**Ground Water Quality Analysis (Hand Pump & Dung Well)
(Pre- Monsoon Season- May'2022)**

S.No	Date	Location	Time	Depth in meter	pH	Electrical Conductivity, $\mu\text{S/m}$
1	10.05.22	Purnadih (Jorapokhar)	12:10 PM	6.98	7.6	812
2	10.05.22	Bhowra 13 No	12:45 PM	4.26	7.5	758
3	10.05.22	Mohalbani Basti	01:10 PM	7.12	7.4	910
4	10.05.22	Digwadih 12 No	01:30 PM	5.14	7.6	799
5	10.05.22	Digwadih 10 No F & J	01:50 PM	4.25	7.3	956
6	10.05.22	Kalimela Shivmandir	11:15 AM	3.10	7.5	820
7	10.05.22	Kalimela Kalimandir	11:35 AM	4.28	7.6	935
8	10.05.22	Lower Dungari	10:50 AM	5.62	7.5	768
9	10.05.22	Upper Dungari	10:20 AM	4.38	7.4	884
10	10.05.22	Pattia Basti	09:55 AM	5.10	7.6	858
11	10.05.22	Kenduadih Basti	09:30 AM	3.36	7.5	812
12	10.05.22	Jorapokhar Kushtand	03:00 PM	5.78	7.6	836
13	10.05.22	Jamadoba 3 No	04:10 PM	5.84	7.7	794
14	10.05.22	6&7 Pits (Ayodhya Nagri)	02:20 PM	4.23	7.4	786



Sr. Manager (Environment)

**Ground Water Quality Analysis (Hand Pump & Dung Well)
(Monsoon Season- August'2022)**

S.No	Date	Location	Time	Depth in meter	pH	Electrical Conductivity $\mu\text{S/m}$
1	12.08.22	Purnadih (Jorapokhar)	12:00 PM	2.48	7.1	719
2	12.08.22	Bhowra 13 No	12:25 PM	1.98	7.2	698
3	12.08.22	Mohalbani Basti	12:50 PM	3.68	7.0	726
4	12.08.22	Digwadih 10 No F & J	01:10 PM	2.84	7.3	721
5	12.08.22	Kalimela Shivmandir	01:30 PM	1.24	7.2	994
6	12.08.22	Kalimela Kalimandir	10:55 AM	2.29	7.2	824
7	12.08.22	Lower Dungari	11:10 AM	3.32	7.3	782
8	12.08.22	Upper Dungari	10:40 AM	2.98	7.4	710
9	12.08.22	Pattia Basti	10:20 AM	2.64	7.1	714
10	12.08.22	Kenduadih Basti	09:55 AM	1.96	7.2	738
11	12.08.22	Jorapokhar Kushtand	09:35 AM	1.24	7.1	824
12	12.08.22	Jamadoba 3 No	11:40 AM	2.48	7.3	748
13	12.08.22	6&7 Pits (Ayodhya Nagri)	02:25 PM	1.98	7.2	732
14	12.08.22	Jorapokhar Basti Chhattand	01:50 PM	1.68	7.1	698



Sr. Manager (Environment)



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Ref. No.: - ARDS/22-23/495

Date: 23.05.2022


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 : 18.05.2022 to 19.05.2022
- Date of Testing : 20.05.2022 to 21.05.2022
- Test Procedure : As per IS-5182

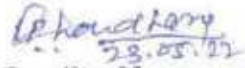
TEST RESULTS

LOCATION - 6 & 7 PITS COLLOIERY OFFICE			
	Avg. Ambient Temperature	35 ^o C	Avg. Humidity
Sl No.	Particulars	Value	50% NAAQ - CPCB STANDARD
1.	Particulate Matter (PM ₁₀), µg/m ³	81.69	100 µg/m ³
2.	Particulate Matter (PM _{2.5}), µg/m ³	44.71	60 µg/m ³
3.	SO ₂ , µg/m ³	20.37	80 µg/m ³
4.	NO ₂ , µg/m ³	28.92	80 µg/m ³
5.	Ozone, µg/m ³	20.38	180 µg/m ³
6.	NH ₃ , µg/m ³	18.88	400 µg/m ³
7.	CO, mg/m ³	1.16	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




Quality Manager
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/22-23/496

Date: 23.05.2022


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 : 18.05.2022 to 19.05.2022
- Date of Testing : 20.05.2022 to 21.05.2022
- Test Procedure : As per IS-5182

TEST RESULTS

LOCATION – OFFICERS COLONY, 12 NO. DIGWADIH					
Avg. Ambient Temperature		33°C	Avg. Humidity		51%
Sl No.	Particulars	Value	NAAQ - CPCB STANDARD		
1.	Particulate Matter (PM ₁₀), µg/m ³	75.32	100 µg/m ³		
2.	Particulate Matter (PM _{2.5}), µg/m ³	42.14	60 µg/m ³		
3.	SO ₂ , µg/m ³	16.72	80 µg/m ³		
4.	NO ₂ , µg/m ³	26.61	80 µg/m ³		
5.	Ozone, µg/m ³	18.84	180 µg/m ³		
6.	NH ₃ , µg/m ³	16.38	400 µg/m ³		
7.	CO, mg/m ³	0.69	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




Quality Manager
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/22-23/497

Date: 23.05.2022

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 : 18.05.2022 To 19.05.2022
- Date of Testing : 20.05.2022 To 21.05.2022
- Test Procedure : As per IS-5182

TEST RESULTS

LOCATION - CENTRAL WORKSHOP AREA, JAMADOBA

SI No.	Avg. Ambient Temperature	35°C	Avg. Humidity	49%
	Particulars	Value	NAAQ - CPCB STANDARD	
1.	Particulate Matter (PM ₁₀), µg/m ³	78.84	100 µg/m ³	
2.	Particulate Matter (PM _{2.5}), µg/m ³	43.93	60 µg/m ³	
3.	SO ₂ , µg/m ³	17.86	80 µg/m ³	
4.	NO ₂ , µg/m ³	25.79	80 µg/m ³	
5.	Ozone, µg/m ³	16.42	180 µg/m ³	
6.	NH ₃ , µg/m ³	18.50	400 µg/m ³	
7.	CO, mg/m ³	0.96	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. D. Roy
Sr. Chemist
Aditi R&D Services



Pratibha
23.05.22
Quality Manager
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/22-23/498

Date: 23.05.2022

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TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
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- Work Order Ref. NO.: : 4700092573/932 Dt. 20.07.2021
- Date of Sample Collection : 18.05.2022 To 19.05.2022
- Date of Testing : 20.05.2022 To 21.05.2022
- Test Procedure : As per IS-5182

TEST RESULTS

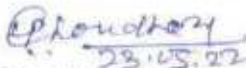
LOCATION - TATA CENTRAL HOSPITAL

SI No.	Particulars	Avg. Ambient Temperature 35°C Value	Avg. Humidity 49%	NAAQ - CPCB STANDARD
1.	Particulate Matter (PM ₁₀), µg/m ³	86.99		100 µg/m ³
2.	Particulate Matter (PM _{2.5}), µg/m ³	48.16		60 µg/m ³
3.	SO ₂ , µg/m ³	22.37		80 µg/m ³
4.	NO ₂ , µg/m ³	29.92		80 µg/m ³
5.	Ozone, µg/m ³	21.54		180 µg/m ³
6.	NH ₃ , µg/m ³	20.16		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




23.05.22
Quality 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/22-23/465 Date: 20.05.2022	M/S TATA STEEL, JAMADOBA,			
Date of Monitoring	TATA STEEL LIMITED, JAMADOBA GROUP PLANT,			
	DIST. - DHANBAD (JHARKHAND)			
18.05.2022 TO 19.05.2022	Avg. Ambient Temperature (°C)	Average Humidity (%)	Weather Condition	Status of the plant
Work Order 4700092573/932 Dt. 20.07.2021	35	49	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. 1048(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	56	49	53.78	49	42	46.78	75	70
2.	6&7 Pits Colliery Office	52	49	50.75	44	41	42.75		
								Residential Area	Residential Area
3.	Officer Colony 12 No. Digwadih	53	48	51.18	44	40	42.45	65	55
								Silence Zone	Silence Zone
4.	Tata Central Hospital	49	46	47.75	36	32	34.45	50	40

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



Pradyumn
20.05.22
Quality Manager
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/22-23/499

Date: 23.05.2022

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 : 19.05.2022
- Date of Testing : 20.05.2022 - 21.05.2022

TEST RESULTS

Sl No.	Particulars	Mineralogical Composition (%)			
		SiO ₂	FeO	Al ₂ O ₃	CaO
1.	Officer's Colony, 12 No, Digwadih	1.47	0.12	1.22	2.6
2.	Central Workshop Area Jamadoba	1.89	0.19	1.31	2.59

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



U. Phouchar
23.05.22
Quality Manager
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/22-23/555

Date: 28.05.2022

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 Down Stream
- Date of Sample Collection: 18.05.2022 To 19.05.2022
- Date of Testing : 20.05.2022 to 27.05.2022
- 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	7.71	7.80	6.5 - 8.5	IS-3025 (P-11): 1983
2.	Total Dissolved Solids, mg/l	570	605	1500	IS-3025 (P-16): 1984
3.	Turbidity, NTU	9.8	11.4	-	IS-3025 (P-10):1984
4.	Dissolved Oxygen, mg/l	5.9	6.2	4.0	IS-3025 (P-38):1989
5.	Bio chemical Oxygen Demand, mg/l	1.4	1.6	3.0	IS-3025 (P-44):1994
6.	Chloride as Cl, mg/l	53	58	-	IS-3025 (P-32):1988
7.	Fluoride as F, mg/l	0.52	0.56	1.5	IS-3025 (P-60):2008
8.	Sulphate as SO ₄ , mg/l	40	52	400	IS-3025 (P-24):1986

S. K. Roy
Sr. Chemist
Aditi R&D Services



[Signature]
28.05.22
Quality Manager
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/22-23/556

Date: 28.05.2022

TEST REPORT OF MINE WATER 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
5. Digwadih Colliery
- Date of Sample Collection: 18.05.2022 to 19.05.2022
- Date of Testing : 20.05.2022 to 27.05.2022
- 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	Digwadih Colliery		
1.	pH,	7.6	7.7	7.8	7.6	7.2	6.5-8.5	IS-3025 (P-11): 1983
2.	Total Dissolved Solids, mg/l	657	666	584	670	645	-	IS-3025 (P-16): 1984
3.	Total Suspended Solids, mg/l	18	16	22	18	23	-	IS-3025(P-17): 1984
4.	Bio chemical Oxygen Demand, mg/l	2.2	1.8	1.7	1.7	1.9	3	IS-3025 (P-44):1994
5.	Chemical Oxygen Demand, mg/l	46.08	38.4	61.44	38.8	53.76	-	IS-3025 (P-58):2006
6.	Oil & Grease, mg/l	BDL	BDL	BDL	BDL	1.1	-	IS-3025 (P-39):2021

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



Pranab Kumar
28.05.2022
Quality Manager
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/22-23/557

Date: 28.05.2022

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 : J.C.P.P. Final Setting Pond
- Date of Sample Collection: 18.05.2022 to 19.05.2022
- Date of Testing : 20.05.2022 to 27.05.2022
- 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
		J.C.P.P. Final Settling Pond		
1.	pH,	DRY POND	6.5-8.5	IS-3025 (P-11): 1983
2.	Total Dissolved Solids, mg/l		-	IS-3025 (P-16): 1984
3.	Total Suspended Solids, mg/l		-	IS-3025(P-17): 1984
4.	Bio chemical Oxygen Demand, mg/l		3	IS-3025 (P-44):1994
5.	Chemical Oxygen Demand, mg/l		-	IS-3025 (P-58):2006
6.	Oil & Grease, mg/l		-	IS-3025 (P-39):2021

E. R. Ray
Sr. Chemist
Aditi R&D Services



A. Phani
Quality Manager
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/22-23/562

Date: 28.05.2022

TEST REPORT OF SEWAGE

- 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. S.T.P. Outlet Jamadoba Canteen
2. S.T.P. Outlet J.C.P.P. Canteen
3. S.T.P. Outlet Railway Colony
- Date of Sample Collection: 18.05.2022 To 19.05.2022
- Date of Testing : 20.05.2022 To 27.05.2022
- 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
		S.T.P. Outlet Jamadoba Canteen	S.T.P. Outlet J.C.P.P. Canteen	S.T.P. Outlet Railway Colony		
1.	pH,	7.7	7.9	7.8	6.0-9.0	IS-3025 (P-11):1983
2.	Total Dissolved Solids, mg/l	624	648	690	2100	IS-3025 (P-16):1984
3.	Total Suspended Solids, mg/l	25	29	26	100	IS-3025(P-17):1984
4.	Bio chemical Oxygen Demand, mg/l	12.3	13.1	13.5	30	IS-3025 (P-44):1994
5.	Chemical Oxygen Demand, mg/l	61.44	53.76	58	250	IS-3025 (P-58):2006
6.	Oil & Grease, mg/l	B.D.L	B.D.L	B.D.L	10	IS-3025 (P-39):2021

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



Chhotanay
28.05.22
Quality Manager
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/22-23/563

Date: 28.05.2022

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. E.T.P. Outlet Garage
2. E.T.P. Outlet T.C.H.
- Date of Sample Collection: 18.05.2022 To 19.05.2022
- Date of Testing : 20.05.2022 To 27.05.2022
- 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
		E.T.P. Outlet T.C.H	E.T.P. Outlet Garage		
1.	pH,	8.1	8.2	6.0-9.0	IS-3025 (P-11): 1983
2.	Total Dissolved Solids, mg/l	672	680	2100	IS-3025 (P-16): 1984
3.	Total Suspended Solids, mg/l	22	24	100	IS-3025(P-17) : 1984
4.	Bio chemical Oxygen Demand, mg/l	8.2	7.9	30	IS-3025 (P-44):1994
5.	Chemical Oxygen Demand, mg/l	38.4	46	250	IS-3025 (P-58):2006
6.	Oil & Grease, mg/l	B.D.L	B.D.L	10	IS-3025 (P-39):2021


Sr. Chemist
Aditi R&D Services




28.05.22
Quality Manager
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/22-23/564

Date: 28.05.2022

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. Canteen Jamadoba Colliery
2. Canteen Jamadoba Washery
3. Canteen Digwadih Colliery
4. Canteen 6&7 Pit Colliery
- Date of Sample Collection: 18.05.2022 To 19.05.2022
- Date of Testing : 20.05.2022 To 27.05.2022
- 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 10500:2012		Test Method
		Canteen Jamadoba Colliery	Canteen Jamadoba Washery	Canteen Digwadih Colliery	Canteen 6&7 Pit Colliery	Desirable	Permissible	
1.	Colour, (Hazen Unit)	1	1	1	1	5.00	15.0	IS 3025 (P-4):2021
2.	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	IS 3025 (P-5):2018
3.	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	IS 3025 (P-7):2017
4.	Turbidity, NTU	1	1	1	1	1.0	5.0	IS 3025 (P-10):1984
5.	pH	7.5	7.7	7.6	7.2	6.5-8.5	No. Relax.	IS-3025 (P-11):1983
6.	Total Hardness as CaCO ₃ , mg/l	321.44	329.28	301.84	278.32	200	600	IS 3025 (P-21):2009
7.	Chloride as Cl, mg/l	51.61	55.58	47.64	31.76	250	1000	IS 3025 (P-32):1988
8.	Res. Free chlorine as Cl ₂ mg/l	NIL	NIL	NIL	NIL	0.20	1.0	IS 3025 (P-26):2021
9.	Total Dissolved Solids, mg/l	590	545	530	445	500	2000	IS 3025 (P-16):1984
10.	Calcium as CaCO ₃ , mg/l	94.08	98	82.32	58.8	75	200	IS 3025 (P-40):1991
11.	Copper as Cu, mg/l	BDL	BDL	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
		Jamadoba Canteen Colliery	Jamadoba Canteen Washery	Canteen Digwadih Colliery	Canteen 6&7 Pit Colliery	Desirable	Permissible	
12.	Manganese as Mn, mg/l	BDL	BDL	BDL	BDL	0.10	0.30	IS 3025 (P-59):2006
13.	Sulphate as SO ₄ , mg/l	64	66	76	60	200	400	IS 3025 (P-24):1986
14.	Nitrate as NO ₃ , mg/l	2.8	3.4	3.2	2.6	45	No. Relax	IS 3025 (P-34):1988
15.	Fluoride as F, mg/l	0.26	0.38	0.29	0.30	1.0	1.5	IS 3025 (P-60):2008
16.	Phenolic Compound as (C ₆ H ₅ OH) mg/l	BDL	BDL	BDL	BDL	0.001	0.002	IS 3025 (P-43):1992
17.	Mercury as Hg, mg/l	BDL	BDL	BDL	BDL	0.001	No. Relax	IS 3025 (P-48):1994
18.	Cadmium as Cd, mg/l	BDL	BDL	BDL	BDL	0.003	No. Relax	IS 3025 (P-41):1992
19.	Arsenic as As, mg/l	BDL	BDL	BDL	BDL	0.01	No. Relax	IS 3025 (P-37):1988
20.	Cyanide as CN, mg/l	BDL	BDL	BDL	BDL	0.05	No. Relax	IS 3025 (P-27):1986
21.	Lead as Pb, mg/l	BDL	BDL	BDL	BDL	0.01	No. Relax	IS 3025 (P-47):1994
22.	Zinc as Zn, mg/l,	0.13	0.1	0.14	0.12	5	15	IS 3025 (P-42):1992
23.	Total Coliform, No./100ml	Absent	Absent	Absent	Absent	Absent	Absent	IS 3025 (P-49):1994
24.	Hexavalent Chromium as Cr, mg/l	BDL	BDL	BDL	BDL	0.05	No. Relax	IS 3025 (P-52):2003
25.	Mineral Oil, mg/l	BDL	BDL	BDL	BDL	0.5	No. Relax	IS 3025 (P-39):1989
26.	Alkalinity as CaCO ₃ , mg/l,	460	456	428	376	200	600	IS 3025 (P-23):1983
27.	Aluminium as Al, mg/l	BDL	BDL	BDL	BDL	0.03	0.2	IS 3025 (P-55):2003
28.	Boran as B, mg/l	BDL	BDL	BDL	BDL	0.5	1.0	IS 3025 (P-57):2005

NOTE: BDL - Below Detection Limit


Sr. Chemist
Aditi R&D Services




Quality Manager
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/22-23/565

Date: 28.05.2022

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. Purnadih Jorapokhar
2. Digwadih 10 No. F&S
3. Kalimela Kalimandir
4. Upper Dungri
5. Kenduadih Basti
6. 6 & 7 Pit Ayodhya Nagari
- Date of Sample Collection : 18.05.2022 To 19.05.2022
- Date of Testing : 20.05.2022 To 27.05.2022
- 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
		Purnadih Jorapokhar	Digwadih 10 No. F&S	Kalimela Kalimandir	Upper Dungri	Kenduadih Basti	6&7 Pit Ayodhya Nagari	Desirable	Permissible	
1.	Colour, (Hazen Unit)	2	1	2	2	1	2	5	15	IS 3025 (P-4):2021
2.	Temperature °C	34	36	35	34	36	35	-	-	-
3.	Electrical Conductivity, $\mu\text{mhos/cm}$	810	950	935	980	795	790	-	-	-
4.	Total Dissolved Solids, mg/l	524	615	605	635	515	510	-	-	IS 3025(P-16):1984
5.	pH	7.7	7.8	7.5	7.4	7.6	7.7	6.5-8.5	No Relax	IS-3025(P-11):1983
6.	Total Hardness as CaCO ₃ , mg/l	415.52	423.36	411.6	427.28	399.84	388.08	200	600	IS 3025(P-21):2009
7.	Calcium as Ca, mg/l	90.94	92.51	84.67	89.38	81.54	78.40	75	200	IS 3025(P-40):1991
8.	Magnesium as Mg, mg/l	43.84	44.75	44.58	47.49	45.67	44.75	30	100	IS 3025(P-46):1994
9.	Chloride as Cl, mg/l	83.37	79.40	75.43	87.35	71.47	63.53	250	1000	IS 3025(P-32):1988
10.	Fluoride as F, mg/l	0.32	0.42	0.38	0.44	0.48	0.40	1.0	1.5	IS 3025(P-60):2008

Continued on Page -2

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2

Sl. No	PARAMETERS OF TEST	VALUE						IS as per IS 10500:1991		Test Method
		Purnadi h Jorapok har	Digwadih 10 No. F&5	Kalimela Kaliman dir	Upper Dungri	Kendua- dih Basti	6&7 Pit Ayodh ya Nagri	Desir -able	Permi -sible	
11	Sulphate as SO ₄ , mg/l	48	62	68	58	52	66	200	400	IS 3025(P-24):1986
12	Nitrate as NO ₃ , mg/l	11.4	14.6	8.2	10.4	10.5	12.2	45	No. Relax	IS 3025(P-34):1988
13	Alkalinity as CaCO ₃ , mg/l,	390	410	380	430	370	365	200	600	IS 3025(P-23):1983
14	Lead as Pb, mg/l	BDL	BDL	BDL	BDL	BDL	BDL	0.01	No. Relax	IS 3025(P-47):1994
15	Zinc as Zn, mg/l,	0.18	0.16	0.19	0.11	0.12	0.15	5	15	IS 3025(P-42):1992
16	Iron a Fe, mg/l	0.16	0.11	0.10	0.14	0.13	0.17	0.3	No. Relax	IS 3025(P-53):2003
17	Copper as Cu, mg/l	BDL	BDL	BDL	BDL	BDL	BDL	0.05	1.5	IS3025 (P-42):1992
18	Mercury as Hg, mg/l	BDL	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	BDL	0.003	No. Relax	IS 3025(P-41):1992
20	Nickel as Ni, mg/l	BDL	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	BDL	0.01	No. Relax	IS 3025(P-37):1988
22	Cyanide as CN, mg/l	BDL	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	BDL	0.05	No. Relax	IS 3025(P-52):2003

NOTE: BDL - Below Detection Limit


Sr. Chemist
Aditi R&D Services




Quality Manager
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/22-23/1450

Date: 29.08.2022

TEST REPORT OF AMBIENT AIR QUALITY

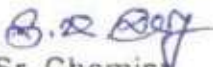
- Name of the industry : M/S TATA STEEL, JAMADOBA,
TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700092573/932 Dt. 20.07.2021
- Date of Sample Collection : 24.08.2022 to 25.08.2022
- Date of Testing : 26.08.2022 to 27.08.2022
- Test Procedure : As per IS-5182

TEST RESULTS

LOCATION - 6 & 7 PITS COLLOIERY OFFICE

Sl No.	Particulars	Value	NAAQ - CPCB STANDARD
	Avg. Ambient Temperature	30°C	Avg. Humidity 83%
1.	Particulate Matter (PM ₁₀), µg/m ³	77.20	100 µg/m ³
2.	Particulate Matter (PM _{2.5}), µg/m ³	38.65	60 µg/m ³
3.	SO ₂ , µg/m ³	18.80	80 µg/m ³
4.	NO ₂ , µg/m ³	25.00	80 µg/m ³
5.	Ozone, µg/m ³	16.45	180 µg/m ³
6.	NH ₃ , µg/m ³	15.60	400 µg/m ³
7.	CO, mg/m ³	1.10	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/22-23/1451

Date: 29.08.2022

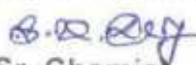
TEST REPORT OF AMBIENT AIR QUALITY

- 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 : 24.08.2022 to 25.08.2022
- Date of Testing : 26.08.2022 to 27.08.2022
- Test Procedure : As per IS-5182

TEST RESULTS

LOCATION – OFFICERS COLONY, 12 NO. DIGWADIH				
	Avg. Ambient Temperature	30°C	Avg. Humidity	83%
Sl No.	Particulars	Value	NAAQ - CPCB STANDARD	
1.	Particulate Matter (PM ₁₀), µg/m ³	70.20	100 µg/m ³	
2.	Particulate Matter (PM _{2.5}), µg/m ³	38.84	60 µg/m ³	
3.	SO ₂ , µg/m ³	14.10	80 µg/m ³	
4.	NO ₂ , µg/m ³	22.65	80 µg/m ³	
5.	Ozone, µg/m ³	15.10	180 µg/m ³	
6.	NH ₃ , µg/m ³	12.65	400 µg/m ³	
7.	CO, mg/m ³	0.5	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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Phone: 0326-2952377 (O)
Mobile: 09471358492, 09431512608

Ref. No.: - ARDS/22-23/1452

Date: 29.08.2022

TEST REPORT OF AMBIENT AIR QUALITY

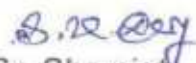
- Name of the industry : M/S TATA STEEL, JAMADOBA,
TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO. : 4700092573/932 Dt. 20.07.2021
- Date of Sample Collection : 24.08.2022 To 25.08.2022
- Date of Testing : 26.08.2022 To 27.08.2022
- Test Procedure : As per IS-5182

TEST RESULTS

LOCATION - CENTRAL WORKSHOP AREA, JAMADOBA

SI No.	Particulars	Value	NAAQ - CPCB STANDARD
	Avg. Ambient Temperature	29°C	Avg. Humidity 84%
1.	Particulate Matter (PM ₁₀), µg/m ³	81.69	100 µg/m ³
2.	Particulate Matter (PM _{2.5}), µg/m ³	39.65	60 µg/m ³
3.	SO ₂ , µg/m ³	15.20	80 µg/m ³
4.	NO ₂ , µg/m ³	22.40	80 µg/m ³
5.	Ozone, µg/m ³	13.20	180 µg/m ³
6.	NH ₃ , µg/m ³	15.65	400 µg/m ³
7.	CO, mg/m ³	0.72	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




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Ref. No.: - ARDS/22-23/1453

Date: 29.08.2022

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 : 24.08.2022 To 25.08.2022
- Date of Testing : 26.08.2022 To 27.08.2022
- Test Procedure : As per IS-5182

TEST RESULTS

LOCATION – TATA CENTRAL HOSPITAL

SI No.	Particulars	Value	NAAQ - CPCB STANDARD
	Avg. Ambient Temperature	29°C	Avg. Humidity 84%
1.	Particulate Matter (PM ₁₀), µg/m ³	79.58	100 µg/m ³
2.	Particulate Matter (PM _{2.5}), µg/m ³	42.51	60 µg/m ³
3.	SO ₂ , µg/m ³	19.66	80 µg/m ³
4.	NO ₂ , µg/m ³	21.54	80 µg/m ³
5.	Ozone, µg/m ³	18.31	180 µg/m ³
6.	NH ₃ , µg/m ³	15.86	400 µg/m ³
7.	CO, mg/m ³	0.82	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


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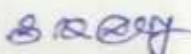
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TEST REPORT OF NOISE (AMBIENT) LEVEL MONITORING

Ref. No. & Date		NAME AND ADDRESS OF THE CLIENT							
ARDS/22-23/1435 Date: 26.08.2022		M/S TATA STEEL, JAMADOBA,							
Date of Monitoring		TATA STEEL LIMITED, JAMADOBA GROUP PLANT, DIST. - DHANBAD (JHARKHAND)							
24.08.2022 TO 25.08.2022		Avg. Ambient Temperature (°C)		Average Humidity (%)		Weather Condition		Status of the plant	
Work Order 4700092573/932 Dt. 20.07.2021		29		84		Cloudy		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	59	50	56.50	47	33	44.16		
2.	6 & 7 Pits Colliery Office	52	48	50.45	39	31	36.63	75	70
								Residential Area	Residential Area
3.	Officer Colony 12 No. Digwadih	58	53	56.18	44	34	41.40	65	55
								Silence Zone	Silence Zone
4.	Tata Central Hospital	48	42	45.96	37	33	35.45	50	40


Sr. Chemist
Aditi R&D Services




Technical Manager
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Ref. No.: - ARDS/22-23/1454


Date: 29.08.2022

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 : 25.08.2022
- Date of Testing : 26.08.2022 - 27.08.2022

TEST RESULTS

Sl No.	Particulars	Mineralogical Composition (%)			
		SiO ₂	FeO	Al ₂ O ₃	CaO
1.	6 & 7 Pits Colliery Officer	1.62	0.13	1.16	2.01
2.	Tata Central Hospital	1.31	0.06	1.09	1.9


Sr. Chemist
Aditi R&D Services




Technical Manager
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/22-23/1503

Date: 03.09.2022

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 Down Stream
- Date of Sample Collection: 24.08.2022 To 25.08.2022
- Date of Testing : 26.08.2022 To 02.09.2022
- 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	7.2	7.2	6.5 - 8.5	IS-3025 (P-11): 1983
2.	Total Dissolved Solids, mg/l	228	220	1500	IS-3025 (P-16): 1984
3.	Turbidity, NTU	12.5	14.8	-	IS-3025 (P-10): 1984
4.	Dissolved Oxygen, mg/l	4.1	4.6	4.0	IS-3025 (P-38): 1989
5.	Bio chemical Oxygen Demand, mg/l	2.7	2.8	3.0	IS-3025 (P-44): 1994
6.	Chloride as Cl, mg/l	14	16	-	IS-3025 (P-32): 1988
7.	Fluoride as F, mg/l	0.46	0.36	1.5	IS-3025 (P-60): 2008
8.	Sulphate as SO ₄ , mg/l	42	60	400	IS-3025 (P-24): 1986

B. D. Ray
Sr. Chemist
Aditi R&D Services



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

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Ref. No.: - ARDS/22-23/1504

Date: 03.09.2022

TEST REPORT OF MINE WATER 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
5. Digwadih Colliery
- Date of Sample Collection: 24.08.2022 to 25.08.2022
- Date of Testing : 26.08.2022 to 02.09.2022
- 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	Digwadih Colliery		
1.	pH,	7.8	7.8	7.9	7.5	8.1	6.5-8.5	IS-3025 (P-11): 1983
2.	Total Dissolved Solids, mg/l	565	678	566	682	616	-	IS-3025 (P-16): 1984
3.	Total Suspended Solids, mg/l	28	22	32	34	38	-	IS-3025(P-17): 1984
4.	Bio chemical Oxygen Demand, mg/l	1.8	2.5	2.4	2.5	2.1	3	IS-3025 (P-44):1994
5.	Chemical Oxygen Demand, mg/l	32	64	36	38	42	-	IS-3025 (P-58):2006
6.	Oil & Grease, mg/l	BDL	BDL	BDL	BDL	1.2	-	IS-3025 (P-39):2021

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Aditi R&D Services



Technical Manager
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/22-23/1505

Date: 04.09.2022

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. E.T.P. Outlet Garage
2. E.T.P. Outlet T.C.H.
- Date of Sample Collection: 24.08.2022 To 25.08.2022
- Date of Testing : 26.08.2022 To 02.09.2022
- 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
		E.T.P. Outlet T.C.H	E.T.P. Outlet Garage		
1.	pH,	8.6	8.8	6.0-9.0	IS-3025 (P-11): 1983
2.	Total Dissolved Solids, mg/l	584	690	2100	IS-3025 (P-16): 1984
3.	Total Suspended Solids, mg/l	36	28	100	IS-3025(P-17) : 1984
4.	Bio chemical Oxygen Demand, mg/l	19	12	30	IS-3025 (P-44):1994
5.	Chemical Oxygen Demand, mg/l	80	48	250	IS-3025 (P-58):2006
6.	Oil & Grease, mg/l	B.D.L	B.D.L	10	IS-3025 (P-39):2021

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Aditi R&D Services



Technical Manager
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/22-23/1506

Date: 04.09.2022

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. Canteen Jamadoba Colliery
2. Canteen Jamadoba Washery
3. Canteen Digwadih Colliery
4. Canteen 6&7 Pit Colliery
- Date of Sample Collection: 24.08.2022 To 25.08.2022
- Date of Testing : 26.08.2022 To 02.09.2022
- 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 10500:2012		Test Method
		Canteen Jamadoba Colliery	Canteen Jamadoba Washery	Canteen Digwadih Colliery	Canteen 6&7 Pit Colliery	Desira ble	Permiss ible	
1.	Colour, (Hazen Unit)	1	1	1	1	5.00	15.0	IS 3025 (P-4):2021
2.	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	IS 3025 (P-5):2018
3.	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	IS 3025 (P-7):2017
4.	Turbidity, NTU	1	1	1	1	1.0	5.0	IS 3025 (P-10):1984
5.	pH	8.0	8.2	8.3	8.0	6.5-8.5	No. Relax.	IS-3025 (P-11):1983
6.	Total Hardness as CaCO ₃ , mg/l	380	372	405	362	200	600	IS 3025 (P-21):2009
7.	Chloride as Cl ₂ , mg/l	58	60	62	52	250	1000	IS 3025 (P-32):1988
8.	Res. Free chlorine as Cl ₂ mg/l	NIL	NIL	NIL	NIL	0.20	1.0	IS 3025 (P-26):2021
9.	Total Dissolved Solids, mg/l	767	825	773	767	500	2000	IS 3025 (P-16):1984
10.	Calcium as CaCO ₃ , mg/l	104	96	96	90	75	200	IS 3025 (P-40):1991
11.	Copper as Cu, mg/l	BDL	BDL	BDL	BDL	0.05	1.5	IS 3025 (P-42):1992

Continued on Page 2

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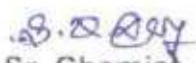
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- 2 -

Sl. No.	PARAMETERS OF TEST	VALUE				IS as per IS 10500:1991		Test Method
		Jamadoba Canteen Colliery	Jamadoba Canteen Washery	Canteen Digwadih Colliery	Canteen 6&7 Pit Colliery	Desirable	Permissible	
12.	Manganese as Mn, mg/l	BDL	BDL	BDL	BDL	0.10	0.30	IS 3025 (P-59):2006
13.	Sulphate as SO ₄ , mg/l	69	62	79	66	200	400	IS 3025 (P-24):1986
14.	Nitrate as NO ₃ , mg/l	2.6	3.2	2.9	2.8	45	No. Relax	IS 3025 (P-34):1988
15.	Fluoride as F, mg/l	0.29	0.32	0.33	0.34	1.0	1.5	IS 3025 (P-60):2008
16.	Phenolic Compound as (C ₆ H ₅ OH) mg/l	BDL	BDL	BDL	BDL	0.001	0.002	IS 3025 (P-43):1992
17.	Mercury as Hg, mg/l	BDL	BDL	BDL	BDL	0.001	No. Relax	IS 3025 (P-48):1994
18.	Cadmium as Cd, mg/l	BDL	BDL	BDL	BDL	0.003	No. Relax	IS 3025 (P-41):1992
19.	Arsenic as As, mg/l	BDL	BDL	BDL	BDL	0.01	No. Relax	IS 3025 (P-37):1988
20.	Cyanide as CN, mg/l	BDL	BDL	BDL	BDL	0.05	No. Relax	IS 3025 (P-27):1986
21.	Lead as Pb, mg/l	BDL	BDL	BDL	BDL	0.01	No. Relax	IS 3025 (P-47):1994
22.	Zinc as Zn, mg/l,	0.12	0.14	0.18	0.15	5	15	IS 3025 (P-42):1992
23.	Total Coliform, No./100ml	Absent	Absent	Absent	Absent	Absent	Absent	IS 3025 (P-49):1994
24.	Hexavalent Chromium as Cr, mg/l	BDL	BDL	BDL	BDL	0.05	No. Relax	IS 3025 (P-52):2003
25.	Mineral Oil, mg/l	BDL	BDL	BDL	BDL	0.5	No. Relax	IS 3025 (P-39):1989
26.	Alkalinity as CaCO ₃ , mg/l,	496	492	496	348	200	600	IS 3025 (P-23):1983
27.	Aluminium as Al, mg/l	BDL	BDL	BDL	BDL	0.03	0.2	IS 3025 (P-55):2003
28.	Boran as B, mg/l	BDL	BDL	BDL	BDL	0.5	1.0	IS 3025 (P-57):2005

NOTE: BDL - Below Detection Limit


Sr. Chemist
Aditi R&D Services




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Aditi R&D Services, Sindri

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Ref. No.: - ARDS/22-23/1507

Date: 04.09.2022

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 Dungi
 4. Jorapokhar Khustand
 5. Jamadoba 3 No.
- Date of Sample Collection : 24.08.2022 To 25.08.2022
- Date of Testing : 26.08.2022 To 02.09.2022
- 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 Dungi	Jorapokhar Khustand	Jamadoba 3 No.	Desirable	Permissible	
1.	Colour, (Hazen Unit)	2	1	2	2	1	5	15	IS 3025 (P-4):2021
2.	Temperature °C	28	29	28	29	28	-	-	-
3.	Electrical Conductivity, µmhos/cm	880	1030	1270	865	1370	-	-	-
4.	Total Dissolved Solids, mg/l	572	669	825	562	890	-	-	IS 3025(P-16):1984
5.	pH	7.0	7.3	6.9	7.6	7.6	6.5-8.5	No Relax	IS-3025(P-11):1983
6.	Total Hardness as CaCO ₃ , mg/l	276	388	424	576	344	200	600	IS 3025(P-21):2009
7.	Calcium as Ca, mg/l	78.4	97.6	110.2	132.8	84.8	75	200	IS 3025(P-40):1991
8.	Magnesium as Mg, mg/l	19.2	39.4	34.58	56.85	30.8	30	100	IS 3025(P-46):1994
9.	Chloride as Cl, mg/l	64	54	82	42	94	250	1000	IS 3025(P-32):1988
10.	Fluoride as F, mg/l	0.33	0.40	0.42	0.43	0.46	1.0	1.5	IS 3025(P-60):2008

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[Signature]



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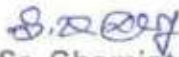
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Sl. No	PARAMETERS OF TEST	VALUE					IS as per IS 10500:1991		Test Method
		Bhowra 13 No.	Mohalbani Basti	Lower Dungi	Jorap okhar Khust and	Jamado ba 3 No.	Desir-able	Permis-sible	
11	Sulphate as SO ₄ , mg/l	52	66	70	62	58	200	400	IS 3025(P-24):1986
12	Nitrate as NO ₃ , mg/l	11.2	13.8	9.5	11.2	10.3	45	No. Relax	IS 3025(P-34):1988
13	Alkalinity as CaCO ₃ , mg/l,	304	500	408	285	295	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,	0.13	0.18	0.15	0.14	0.16	5	15	IS 3025(P-42):1992
16	Iron a Fe, mg/l	0.15	0.2	0.15	0.25	0.18	0.3	No. Relax	IS 3025(P-53):2003
17	Copper as Cu, mg/l	BDL	BDL	BDL	BDL	BDL	0.05	1.5	IS3025 (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/22-23/1506


Date: 03.09.2022

TEST REPORT OF SEWAGE

- 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. S.T.P. Outlet Jamadoba Canteen
2. S.T.P. Outlet Railway Colony
- Date of Sample Collection: 24.08.2022 To 25.08.2022
- Date of Testing : 26.08.2022 To 02.09.2022
- 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
		S.T.P. Outlet Jamadoba Canteen	S.T.P. Outlet Railway Colony		
1.	pH,	7.6	8.0	6.0 - 9.0	IS-3025 (P-11):1983
2.	Total Dissolved Solids, mg/l	648	698	2100	IS-3025 (P-16):1984
3.	Total Suspended Solids, mg/l	37	29	100	IS-3025(P-17):1984
4.	Bio chemical Oxygen Demand, mg/l	14	16	30	IS-3025 (P-44):1994
5.	Chemical Oxygen Demand, mg/l	56	64	250	IS-3025 (P-58):2006
6.	Oil & Grease, mg/l	B.D.L	B.D.L	10	IS-3025 (P-39):2021


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Aditi R&D Services




Technical Manager
Aditi R&D Services, Sindri

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