



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/DIG/37/343/2022

May 27, 2022

Ref.: Environmental Clearance letter No.-J-11015/372/2010-IA.II(M)dated-30<sup>th</sup> September 2013.

**Sub: Half Yearly Compliance Status Report of Environment Clearance conditions issued by MoEF&CC, New Delhi to Digwadih Colliery, Tata Steel Limited, Dhanbad for the period October'21 to March'22**

Dear Sir,

We are enclosing herewith compliance report for the period **October'21 to March'22** for the EC granted vide letter no.- J-11015/372/2010-IA.II(M) dated- 30<sup>th</sup> September 2013 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, 5<sup>th</sup> 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

**TATA STEEL LIMITED**

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**HALF YEARLY COMPLIANCE REPORT**  
**(PERIOD: OCTOBER'21 – MARCH'22)**

**DIGWADIH COLLIERY**  
**(CAPACITY: EXPANSION FROM 0.38 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-  
11015/372/2010-IA.II(M) DATED- 30.09.2013 ISSUED BY GOVT. OF INDIA,  
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE, NEW  
DELHI.**

**Compliance status of Digwadih Colliery of M/s Tata Steel Ltd. for (Expansion from 0.38 MTPA to 0.6 MTPA in ML area 314.57 ha), dist. Dhanbad, Jharkhand vide MoEFCC Letter no J-11015/372/2010-IA.II (M) dated September 30, 2013**

| S. No.                    | Condition  | Compliance Status  |
|---------------------------|--|--|
| <b>Specific Condition</b> |  |  |
| (i)                       | The maximum production from the mines shall not exceed beyond that for which environmental clearance has been granted.   | It is being strictly followed. The EC capacity is for 0.6 MTPA raw coal while the raw coal production for Digwadih Colliery is well below the limit.   |
| (ii)                      | The impact on the Damodar river due to mining activity which is at a distance of 2 km be studied through a reputed 3 <sup>rd</sup> Party and submitted to the SPCB and the regional office of the MoEF for monitoring. | <p>The underground coal mines operated by Tata Steel Ltd are adjacent to the Damodar River. Other coal mines of BCCL &amp; SAIL are also in close proximity to the river basin. Major source of pollution of Damodar River is the flow of industrial effluents and untreated sewage water into the river. A number of OB dumps lie close to the river banks causing the flow of sediments into the river.</p> <p>As per the hydrology study conducted by Indian School of Mines, Dhanbad, the impact of the underground mines of Tata Steel Ltd is minimal. This is due to the following reasons</p> <ul style="list-style-type: none"> <li>• The mining activity does not require any diversion of river/streams or natural drain. As land profile does not change appreciably in case of underground mines with backfilling of mined out areas, there is no change in surface drainage till date and unlikely to occur in future.</li> <li>• Surface water quality also does not undergo any change, as there is no discharge to surface drainage in dry season. In Monsoon, the excess mine water discharged gets mixed with storm water.</li> <li>• Large settling tanks are available for storage and sedimentation of mine water before its discharge to conform to the norms. The industrial wastewater generated during vehicle washing from the central workshop catering to all the mines is treated in oil and grease trap followed by recycling of water.</li> </ul> |

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|       |  | <ul style="list-style-type: none"> <li>• The two coal washeries of Tata Steel are operating on Zero Liquid discharge (ZLD) principle.</li> <li>• Sewage water generated from our townships is treated in Soak pit and Septic tank arrangement. Now we are replacing it with Packaged Sewage Treatment Plant (PSTP). Already one STP of 200 KLD and another STP of 50 KLD has been installed in two colonies and remaining colonies are also proposed to be covered with STP.</li> </ul> |
| (iii) | Details of underground transportation of coal from mine to coal yard/ rail yard be submitted to the MoEF for record.                               | Coal from the mine is sent to the captive Jamadoba coal washery for beneficiation purpose through a network of underground conveyer belts. The detailed diagram of transportation network has already been submitted in earlier compliance reports.   |
| (iv)  | Adequate care be taken to prevent sand spillages from the trucks/tippers.  | 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.  |
| (v)   | The test results of the study of leaching of heavy metals from bottom-ash be submitted to SPCB and the regional office of the MoEF for monitoring. | A study conducted in 2013, by Indian School of Mines, Dhanbad to assess the leachability characteristics of fly ash and bottom ash samples taken from us, has determined that the concentration of heavy metals in the leachates were invariably well below the permissible limits for discharge of effluents as per the Indian standards IS 2490 (1993). The test results have already been submitted in December'13 and also re-submitted in April'18.                                |
| (vi)  | The CSR activities shall be need based and detailed CSR plan be prepared for implementation.   | The CSR plan for each financial year is prepared by TSRDS (Tata Steel Rural Development Society) only after proper discussions to assess the needs have been held   |

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|        |   | with the elected/ senior members of the communities where our CSR activities are to be undertaken.  |
| (vii)  | The detailed breakup of funds during 2012-13 be submitted to the MoEF for record. A social audit to be got done annually by a reputed institute and uploaded on the company's website.  | The detailed breakup has already been submitted to MOEF.<br>The Corporate Sustainability Reports viz. Integrated Reports are made annually for the company which is certified by an assurance agency. It also includes the Social Audit of the company. All the reports are uploaded on the Tata Steel website.<br>Further, an internal Social audit is also conducted once in five years   |
| (viii) | There should be no OB dumps at the end of the mining.   | Since this is an underground mine, it is not applicable.  |
| (ix)   | Regular monitoring of subsidence movement on the surface over and around the working area and impact on natural drainage pattern, water bodies, vegetation, 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. | Regular monitoring of subsidence is done by Central Institute for Mining and Fuel Research, Dhanbad. According to the subsidence reports, the impact of subsidence is negligible since the underground mine workings are now at great depth and proper filling of voids through sand stowing is being done. The latest subsidence report has been submitted to MoEFCC, Regional Office, Ranchi in hard copy and soft copy vide mail dt. 19.04.2018. |
| (x)    | 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.   |
| (xi)   | Mining shall be carried out as per statuette at a safe distance from the river/nallah flowing adjacent to the lease boundary.   | Since this is an underground project, there is hardly any impact on the river/ nallah. The closest jore is at a distance of about 2kms from the mine office area. Therefore, no impact on the course of flow in the jore is anticipated.  |
| (xii)  | 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  |

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|         |  | monitoring reports prepared by CIMFR, Dhanbad.   |
| (xiii)  | Coal extraction shall also be optimized 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 will be strictly followed.  |
| (xiv)   | 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.  |
| (xv)    | 3-tier plantation should be developed 2 km stretch of road from the mine using native species.   | Plantation along stretches of road has been done. 3-tier plantation is not feasible due to presence of private land around the periphery of colliery. However plantation has been done on vacant plots and areas   |
| (xvi)   | 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 maximum discharge in the area adjoining the mine sites. 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 colliery area to channelize the surface runoff. The details of size of garland drain mapped in surface plan has been submitted earlier in April'18.  |
| (xviii) | The locations of monitoring stations in the Jharia Coalfields should be finalized in consultation with the Jharkhand State Pollution Control Board. The smoke/dust emission varies from source to source (fuel wood, coal, flyash from TPPs, silica from natural dust, etc). Mineralogical composition study should be undertaken on the composition of the suspended particulate matter (PM10 and PM2.5) in Jharia Coalfields and also quantified. These studies would help | The locations of monitoring stations for our colliery have already been finalized in consultation with JSPCB, Dhanbad. The mineralogical composition study has being carried out by an independent laboratory (recognized by JSPCB and NABL) and the results are provided in <b>Annexure-I</b> . |

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|        | ascertain source and extent of the air pollution, based on which appropriate mitigative measures could be taken.   |   |
| (xix)  | 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.   | 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.  |
| (xx)   | Transportation of coal from the mine to railway siding should be by 20T mechanically covered trucks.   | Not applicable due to transportation of coal via underground belt conveyor network system directly to washery.  |
| (xxi)  | 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.  | 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 and we have covered around 10 Nos of species under tree plantation jobs this year |
| (xxii) | Regular monitoring of groundwater level and quality shall be carried out by establishing a network of existing wells and construction of new piezometers. The monitoring for quantity shall be done four times a year in pre-monsoon (May), monsoon (August), post-monsoon (November) and winter (January) seasons and for quality in May. Data thus collected shall be submitted to the MoEF&CC and to the CPCB quarterly within one month of monitoring. | The regular monitoring of groundwater level and quality is done as per the requirement. The groundwater quality report & groundwater level reports are provided in <b>Annexure-I.</b>   |

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| (xxiii) | Acid Water Treatment Plant, volume of water to be treated and disposal of brine should be provided.   | Not applicable.   |
| (xxiv)  | 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.  |
| (xxv)   | 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.  | Most of 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. |
| (xxvi)  | 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, Ahmedabad 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 checkup including hearing impairment checkup, 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.  |
| (xxvii) | The mining in the existing mines would be phased out after expiry of the current  | It is not applicable in our case.   |



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|          | mining lease and after reclamation of mined over area. The operating mines may be analyzed and monitored for compliance of conditions, having bearing with movement of wild life until such time they are closed/ phased out.   |  |
| (xxviii) | Project specific CSR for an amount of Rs 5/Tonne of coal production should be provided for the activities under CSR undertaken for the neighboring villages shall be for not less than Rs 10 per tonne of coal and the progress made thereon shall be uploaded by the company annually on the company website. Monitoring of the impacts of activities under CSR shall be carried out periodically. | <p>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.</p> <p>CSR data submitted is for Jharia Division which comprises all 5 collieries and 2 washeries. Jamadoba Washery, Digwadih Colliery and 6&amp;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.</p> <p>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.</p> |
| (xxix)   | A Final Mine Closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment & Forests 5 years in  | 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  |

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|       | advance of final mine closure for approval.   | 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.  |
| (xxx) | <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, Digwadih 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> |

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| <b>B.</b> | <b>GENERAL CONDITIONS</b>  |  |
| (i)       | No change in technology and scope of working shall be made without prior approval of the MoEF.           | It is being strictly followed. Board and Pillar method is being used for mining. |
| (ii)      | No change in the calendar plan including quantum of mineral coal and waste being produced shall be made. | It will be strictly followed.  |
| (iii)     | Four ambient air quality monitoring stations shall be established in the core                            | The Air quality monitoring stations are:   |

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|      | <p>zone as well as in the buffer zone for monitoring PM10, PM2.5, SO2 and NOx. 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, in RSPM etc. shall be carried out at least once in six months.</p>                             | <p>(i)Jamadoba Group Office (Core Zone)<br/>(ii)New Village Colony, Jamadoba (Buffer Zone)<br/>(iii)Digwadih 12 No. Colony (Buffer Zone)<br/>(iv)6&amp;7 Pits Kalimandir area (Buffer Zone)</p> <p>Monitoring of heavy metals in ambient air is being performed by an independent laboratory (recognized by JSPCB &amp; NABL) on quarterly basis. The results are enclosed as <b>Annexure-I.</b></p> |
| (iv) | <p>Data on ambient air quality (PM10, PM2.5, SO2 and NOx and heavy metals such as Hg, As, Ni, Cr, etc) and other monitoring data shall be regularly submitted to the Ministry including its Regional Office at Bhubaneswar and to the SPCB and the CPCB once in six months. Random verification of samples through analysis from independent laboratories recognised under the EP Rules, 1986 shall be furnished as part of the compliance report.</p> | <p>Ambient air quality report (PM10, PM 2.5, SO2 and NOx) for the period from Apr'21 to Sep'21 is attached as <b>Annexure-I.</b> Additionally, third party monitoring is being done through a JSPCB and NABL recognized Laboratory for PM10, PM 2.5, SO2, NOx, CO, NH3, O3 and heavy metals (As, Ni, Cd and Cr). The results are enclosed as <b>Annexure-I.</b></p>                                  |
| (v)  | <p>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.</p>  | <p>Regular noise survey is being conducted in the underground work environment. Workers are provided with ear-plugs/ muffs in high noise areas.</p>  |
| (vi) | <p>Industrial wastewater (workshop and wastewater from the mine) shall be properly collected, and treated so as to conform to the standards including for heavy metals before discharge prescribed under GSR 422 (E) dated 19th May 1993 and 31st December 1993 or as amended from time to time. Oil and grease trap shall be installed before discharge of workshop effluents.</p>  | <p>No industrial wastewater is generated in Digwadih Colliery premises. There is a central workshop and garage in Jamadoba where Effluent Treatment Plant having oil and grease trap facility has been provided.</p>   |

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| (vii)  | Vehicular emissions shall be kept under control and regularly monitored. Vehicles used for transportation of 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 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 & NABL accredited laboratory<br><br>We have also installed a Continuous Ambient Air Quality Monitoring Station at Jamadoba for real time monitoring. |
| (ix)   | Monitoring of outlet points should be carried out and records of same should be maintained and submitted to the Regional Office of the MOEF as part of the Compliance Report.  | There is one mine-water outlet point in the colliery which is regularly monitored by the Environmental Laboratory. The analysis results have been provided as <b>Annexure-1</b>  |
| (x)    | 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. 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. | 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.  |
| (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  | 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 2020-2021 is Rs. 782.85 lakhs.   |

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|        | reported to this Ministry and its Regional Office at Bhubaneswar.   |  |
| (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 <a href="http://envfor.nic.in">http://envfor.nic.in</a> . | 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  | 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 mine's office has been done. |

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|                | 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.  |  |
| <b>(xvii)</b>  | 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   |
| <b>(xviii)</b> | 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.  |
| <b>(xix)</b>   | 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 vide letter no. JMB/ENV/ESSA/05/732/2020 on 28 <sup>th</sup> September 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. |

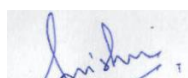
**AIR QUALITY REPORT**

Core zone &amp; Buffer zone

Period- October'21 to December'21

No. of sampling points: 4

| Core zone (as per Air quality standards for coal mines in EPA Notification, 1988) |                                  |          |                      |   |   |  |   |
|---|----------------------------------|----------|----------------------|---|---|--|---|
| Location  | Latitude/<br>Longitude           | Date     | Weather<br>Condition | SPM<br>24 Hourly<br>Limit- 700<br>$\mu\text{g}/\text{m}^3$  | RSPM<br>24 Hourly<br>Limit- 300<br>$\mu\text{g}/\text{m}^3$ | SO <sub>2</sub><br>24 Hourly<br>Limit- 120<br>$\mu\text{g}/\text{m}^3$ | NO <sub>x</sub><br>24 Hourly<br>Limit-120<br>$\mu\text{g}/\text{m}^3$ |
| Jamadoba<br>Group Office  | 23°42'15.3"<br>N/ 86°24'11"<br>E | 07.10.21 | Clear                | 176.8   | 73.9  | 11.6   | 10.8  |
|   |                                  | 17.11.21 | Clear                | 194.7   | 85.2  | 10.4   | 11.6  |
|   |                                  | 09.12.21 | Clear                | 198.7   | 86.9  | 11.4   | 10.4  |
| Buffer zone (as per NAAQS 2009 for ambient air quality standards)                 |                                  |          |                      |   |   |  |   |
| Location  | Latitude/<br>Longitude           | Date     | Weather<br>Condition | PM10<br>24 Hourly<br>Limit-<br>100 $\mu\text{g}/\text{m}^3$ | PM2.5<br>24 Hourly<br>Limit-<br>60 $\mu\text{g}/\text{m}^3$ | SO <sub>2</sub><br>24 Hourly<br>Limit-<br>80 $\mu\text{g}/\text{m}^3$  | NO <sub>2</sub><br>24 Hourly<br>Limit-<br>80 $\mu\text{g}/\text{m}^3$ |
| Digwadih 12<br>No. Colony   | 23°41'42" N/<br>86°24'45.3" E    | 04.10.21 | Clear                | 68.4  | 32.6  | 11.8   | 10.7  |
|   |                                  | 23.11.21 | Clear                | 82.7  | 40.1  | 11.3   | 12.6  |
|   |                                  | 06.12.21 | Clear                | 84.5  | 41.6  | 10.1   | 11.7  |
| New Village<br>Colony,<br>Jamadoba  | 23°41'51" N/<br>86°23'19" E      | 06.10.21 | Clear                | 79.8  | 40.3  | 12.4   | 11.6  |
|   |                                  | 22.11.21 | Clear                | 77.2  | 38.7  | 10.5   | 11.8  |
|   |                                  | 08.12.21 | Clear                | 79.8  | 40.2  | 11.9   | 12.3  |
| 6&7 Pits<br>Kalimandir<br>colony  | 23°43'15" N/<br>86°24'12" E      | 05.10.21 | Clear                | 72.4  | 35.2  | 11.8   | 12.3  |
|   |                                  | 16.11.21 | Clear                | 84.3  | 42.5  | 11.6   | 12.8  |
|   |                                  | 10.12.21 | Clear                | 87.3  | 45.6  | 10.7   | 11.2  |



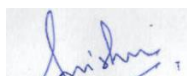
Sr. Manager (Environment)

**AIR QUALITY REPORT**  
Core zone & Buffer zone

Period- January'22 to March'22

No. of sampling points: 4

| Core zone (as per Air quality standards for coal mines in EPA Notification, 1988) |                                  |          |                      |   |   |  |   |
|---|----------------------------------|----------|----------------------|---|---|--|---|
| Location  | Latitude/<br>Longitude           | Date     | Weather<br>Condition | SPM<br>24 Hourly<br>Limit- 700<br>$\mu\text{g}/\text{m}^3$  | RSPM<br>24 Hourly<br>Limit- 300<br>$\mu\text{g}/\text{m}^3$ | SO <sub>2</sub><br>24 Hourly<br>Limit- 120<br>$\mu\text{g}/\text{m}^3$ | NO <sub>x</sub><br>24 Hourly<br>Limit-120<br>$\mu\text{g}/\text{m}^3$ |
| Jamadoba<br>Group Office  | 23°42'15.3"<br>N/ 86°24'11"<br>E | 13.01.22 | Clear                | 174.6   | 80.2  | 10.9   | 12.4  |
|   |                                  | 10.02.22 | Clear                | 216.4   | 82.6  | 12.3   | 13.8  |
|   |                                  | 21.03.22 | Clear                | 220.6   | 83.9  | 10.3   | 12.7  |
| Buffer zone (as per NAAQS 2009 for ambient air quality standards)                 |                                  |          |                      |   |   |  |   |
| Location  | Latitude/<br>Longitude           | Date     | Weather<br>Condition | PM10<br>24 Hourly<br>Limit-<br>100 $\mu\text{g}/\text{m}^3$ | PM2.5<br>24 Hourly<br>Limit-<br>60 $\mu\text{g}/\text{m}^3$ | SO <sub>2</sub><br>24 Hourly<br>Limit-<br>80 $\mu\text{g}/\text{m}^3$  | NO <sub>2</sub><br>24 Hourly<br>Limit-<br>80 $\mu\text{g}/\text{m}^3$ |
| Digwadih 12<br>No. Colony   | 23°41'42" N/<br>86°24'45.3" E    | 10.01.22 | Clear                | 86.7  | 44.2  | 11.7   | 12.5  |
|   |                                  | 07.02.22 | Clear                | 79.3  | 40.5  | 10.2   | 11.9  |
|   |                                  | 16.03.22 | Clear                | 89.6  | 47.2  | 12.5   | 13.9  |
| New Village<br>Colony,<br>Jamadoba  | 23°41'51" N/<br>86°23'19" E      | 12.01.22 | Clear                | 77.8  | 38.4  | 10.2   | 11.7  |
|   |                                  | 11.02.22 | Clear                | 86.9  | 45.1  | 11.3   | 12.4  |
|   |                                  | 22.03.22 | Clear                | 92.7  | 49.5  | 13.5   | 14.8  |
| 6&7 Pits<br>Kalimandir<br>colony  | 23°43'15" N/<br>86°24'12" E      | 11.01.22 | Clear                | 82.7  | 42.6  | 11.4   | 12.9  |
|   |                                  | 09.02.22 | Clear                | 88.2  | 48.3  | 12.2   | 13.5  |
|   |                                  | 14.03.22 | Clear                | 78.2  | 36.4  | 11.3   | 13.9  |

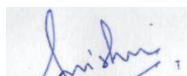


**Sr. Manager (Environment)**



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

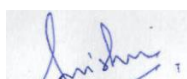
| S.No | Date     | Location                 | Time     | Depth in meter | pH  | Electrical Conductivity, $\mu\text{S/m}$ |
|------|----------|--------------------------|----------|----------------|-----|--|
| 1    | 25.11.21 | Purnadih (Jorapokhar)    | 09:20 AM | 3.10           | 7.2 | 764                                      |
| 2    | 25.11.21 | Bhowra 13 No             | 10:00 AM | 2.24           | 7.1 | 710                                      |
| 3    | 25.11.21 | Mohalbani Basti          | 10:30 AM | 4.86           | 7.0 | 784                                      |
| 4    | 25.11.21 | Digwadih 12 No           | 10:50 AM | 2.74           | 7.2 | 720                                      |
| 5    | 25.11.21 | Digwadih 10 No F & J     | 11:10 AM | 2.10           | 7.1 | 993                                      |
| 6    | 25.11.21 | Kalimela Shivmandir      | 01:30 PM | 1.98           | 7.2 | 832                                      |
| 7    | 25.11.21 | Kalimela Kalimandir      | 01:20 PM | 2.98           | 7.3 | 786                                      |
| 8    | 25.11.21 | Lower Dungari            | 01:10 PM | 2.82           | 7.2 | 684                                      |
| 9    | 25.11.21 | Upper Dungari            | 12:50 PM | 2.12           | 7.3 | 795                                      |
| 10   | 25.11.21 | Pattia Basti             | 12:35 PM | 2.24           | 7.1 | 812                                      |
| 11   | 25.11.21 | Kenduadih Basti          | 12:10 PM | 1.36           | 7.2 | 754                                      |
| 12   | 25.11.21 | Jorapokhar Kushtand      | 09:10 AM | 3.48           | 7.0 | 772                                      |
| 13   | 25.11.21 | Jamadoba 3 No            | 01:45 PM | 2.84           | 7.1 | 758                                      |
| 14   | 25.11.21 | 6&7 Pits (Ayodhya Nagri) | 11:40 AM | 2.63           | 7.2 | 726                                      |



**Sr. Manager (Environment)**

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

| S.No | Date     | Location                 | Time     | Depth in meter | pH  | Electrical Conductivity $\mu\text{S/m}$ |
|------|----------|--------------------------|----------|----------------|-----|---|
| 1    | 17.01.22 | Purnadih (Jorapokhar)    | 09:50 AM | 3.18           | 7.3 | 764                                     |
| 2    | 17.01.22 | Bhowra 13 No             | 10:25 AM | 2.86           | 7.4 | 728                                     |
| 3    | 17.01.22 | Mohalbani Basti          | 10:55 AM | 5.12           | 7.6 | 896                                     |
| 4    | 17.01.22 | Digwadih 12 No           | 11:15 AM | 2.98           | 7.3 | 793                                     |
| 5    | 17.01.22 | Digwadih 10 No F & J     | 11:40 AM | 2.36           | 7.4 | 998                                     |
| 6    | 17.01.22 | Kalimela Shivmandir      | 02:15 PM | 2.24           | 7.2 | 826                                     |
| 7    | 17.01.22 | Kalimela Kalimandir      | 02:30 PM | 3.12           | 7.3 | 815                                     |
| 8    | 17.01.22 | Lower Dungari            | 01:55 PM | 3.24           | 7.3 | 726                                     |
| 9    | 17.01.22 | Upper Dungari            | 01:30 PM | 2.48           | 7.2 | 758                                     |
| 10   | 17.01.22 | Pattia Basti             | 01:20 PM | 2.76           | 7.4 | 836                                     |
| 11   | 17.01.22 | Kenduadih Basti          | 12:55 PM | 1.84           | 7.3 | 782                                     |
| 12   | 17.01.22 | Jorapokhar Kushtand      | 09:30 AM | 3.92           | 7.4 | 824                                     |
| 13   | 17.01.22 | Jamadoba 3 No            | 02:45 PM | 2.98           | 7.3 | 782                                     |
| 14   | 17.01.22 | 6&7 Pits (Ayodhya Nagri) | 12:20 PM | 2.86           | 7.2 | 728                                     |



**Sr. Manager (Environment)**



# 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

Plot No - I-B-17 (P)  
Sindri, Industrial Area,  
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Jharkhand - 828107  
Email ID: sindriaditi@gmail.com  
Website: aditirndservices.com  
Phone: 0326-2952377 (O)  
Mobile: 09471358492, 09431512608

Ref. No.: - ARDS/21-22/4584

Date: 20.11.2021

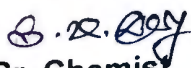
## TEST REPORT OF AMBIENT AIR QUALITY

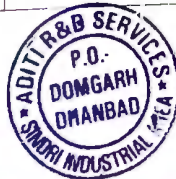
- Name of the industry : M/S TATA STEEL, JAMADOBA,  
TATA STEEL LIMITED  
JAMADOBA GROUP PLANT,  
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700092573/932 Dt. 20.07.2021
- Date of Sample Collection : 17.11.2021 TO 18.11.2021
- Date of Testing : 19.11.2021
- Test Procedure : As per IS-5182

### TEST RESULTS

| LOCATION - OFFICERS COLONY, 12 NO. DIGWADIH |  |       |                       |
|---|--|-------|-----------------------|
|   | Avg. Ambient Temperature                                   | 24°C  | Avg. Humidity         |
| SI No.                                      | Particulars  | Value | 62%                   |
| 1.  | Particulate Matter (PM <sub>10</sub> ), µg/m <sup>3</sup>  | 71.42 | 100 µg/m <sup>3</sup> |
| 2.  | Particulate Matter (PM <sub>2.5</sub> ), µg/m <sup>3</sup> | 38.41 | 60 µg/m <sup>3</sup>  |
| 3.  | SO <sub>2</sub> , µg/m <sup>3</sup>                        | 13.65 | 80 µg/m <sup>3</sup>  |
| 4.  | NO <sub>2</sub> , µg/m <sup>3</sup>                        | 24.10 | 80 µg/m <sup>3</sup>  |
| 5.  | Ozone, µg/m <sup>3</sup>                                   | 17.12 | 180 µg/m <sup>3</sup> |
| 6.  | NH <sub>3</sub> , µg/m <sup>3</sup>                        | 14.35 | 400 µg/m <sup>3</sup> |
| 7.  | CO, mg/m <sup>3</sup>                                      | 0.72  | 4 mg/m <sup>3</sup>   |
| 8.  | Pb, µg/m <sup>3</sup>                                      | BDL   | 1 µg/m <sup>3</sup>   |
| 9.  | As, ng/m <sup>3</sup>                                      | BDL   | 6 ng/m <sup>3</sup>   |
| 10.   | Ni, ng/m <sup>3</sup>                                      | BDL   | 20 ng/m <sup>3</sup>  |
| 11.   | Benzene, µg/m <sup>3</sup>                                 | BDL   | 5 µg/m <sup>3</sup>   |
| 12.   | Benzoapyrene ng/m <sup>3</sup>                             | BDL   | 1 ng/m <sup>3</sup>   |

NOTE: BDL - Below Detection Limit

  
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.
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Jharkhand - 828107  
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Mobile: 09471358492, 09431512608

Ref. No.: - ARDS/21-22/4585

Date: 20.11.2021

## TEST REPORT OF AMBIENT AIR QUALITY

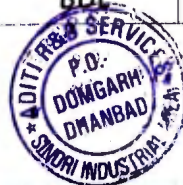
- Name of the industry : M/S TATA STEEL, JAMADOBA,  
TATA STEEL LIMITED  
JAMADOBA GROUP PLANT,  
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700092573/932 Dt. 20.07.2021
- Date of Sample Collection : 17.11.2021 TO 18.11.2021
- Date of Testing : 19.11.2021
- Test Procedure : As per IS-5182

### TEST RESULTS

| LOCATION – CENTRAL WORKSHOP AREA , JAMADOBA |  |       |                       |     |
|---|--|-------|-----------------------|-----|
|   | Avg. Ambient Temperature                                   | 24°C  | Avg. Humidity         | 62% |
| Sl No.                                      | Particulars  | Value | NAAQ - CPCB STANDARD  |     |
| 1.  | Particulate Matter (PM <sub>10</sub> ), µg/m <sup>3</sup>  | 84.8  | 100 µg/m <sup>3</sup> |     |
| 2.  | Particulate Matter (PM <sub>2.5</sub> ), µg/m <sup>3</sup> | 38.10 | 60 µg/m <sup>3</sup>  |     |
| 3.  | SO <sub>2</sub> , µg/m <sup>3</sup>                        | 15.33 | 80 µg/m <sup>3</sup>  |     |
| 4.  | NO <sub>2</sub> , µg/m <sup>3</sup>                        | 21.15 | 80 µg/m <sup>3</sup>  |     |
| 5.  | Ozone, µg/m <sup>3</sup>                                   | 16.80 | 180 µg/m <sup>3</sup> |     |
| 6.  | NH <sub>3</sub> , µg/m <sup>3</sup>                        | 17.35 | 400 µg/m <sup>3</sup> |     |
| 7.  | CO, mg/m <sup>3</sup>                                      | 1.08  | 4 mg/m <sup>3</sup>   |     |
| 8.  | Pb, µg/m <sup>3</sup>                                      | BDL   | 1 µg/m <sup>3</sup>   |     |
| 9.  | As, ng/m <sup>3</sup>                                      | BDL   | 6 ng/m <sup>3</sup>   |     |
| 10.   | Ni, ng/m <sup>3</sup>                                      | BDL   | 20 ng/m <sup>3</sup>  |     |
| 11.   | Benzene, µg/m <sup>3</sup>                                 | BDL   | 5 µg/m <sup>3</sup>   |     |
| 12.   | Benzoapyrene ng/m <sup>3</sup>                             | BDL   | 1 ng/m <sup>3</sup>   |     |

NOTE: BDL - Below Detection Limit

  
Sr. Chemist  
Aditi R&D Services



  
Technical Manager  
Aditi R&D Services, Sindri

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Website: aditirnds-services.com  
Phone: 0326-2952377 (O)  
Mobile: 09471358492, 09431512608

## TEST REPORT OF NOISE (AMBIENT) LEVEL MONITORING

| Ref. No. & Date                             | NAME AND ADDRESS OF THE CLIENT   |                      |                   |                     |
|---|--|----------------------|-------------------|---------------------|
| ARDS/21-22/4586 Date: 20.11.2021            | M/S TATA STEEL, JAMADOBA,  |                      |                   |                     |
| Date of Monitoring                          | TATA STEEL LIMITED, JAMADOBA GROUP PLANT,<br>DIST. - DHANBAD (JHARKHAND) |                      |                   |                     |
| 17.11.2021 - 18.11.2021                     | Avg. Ambient Temperature(°C)   | Average Humidity (%) | Weather Condition | Status of the plant |
| Work Order 4700092573/932<br>Dt. 20.07.2021 | 24   | 65                   | Clear             | Running             |

### MONITORING RESULTS

| Sl. No         | Place of Monitoring                  | Day Time<br>(6 AM to 10 PM)<br>Avg. dB(A) |      |                   | Night Time<br>(10 PM to 6 AM)<br>Avg. dB(A) |       |                      | Noise level (Ambient standard)<br>for Industrial Area as per<br>CPCB Noise Pollution<br>(Regulation and Control)<br>(Amendment) Rules, 2000<br>notified vide S.O. 1046(E)<br>Dt. 22.11.2020<br>Limit in dB(A) Leq |                     |
|----------------|--------------------------------------|---|------|-------------------|---|-------|----------------------|---|---------------------|
|                |                                      | MAX                                       | MIN  | AVG. dB(A)<br>Leq | MAX   | MIN   | AVERAGE<br>dB(A) Leq | Day<br>Time   | Night<br>Time       |
| LOCATION       |                                      | MAX                                       | MIN  | AVG. dB(A)<br>Leq | MAX   | MIN   | AVERAGE<br>dB(A) Leq | Industrial<br>Area  | Industrial<br>Area  |
| JAMADOBA GROUP |                                      |   |      |                   |   |       |                      |   |                     |
| 1.             | Central Workshop                     | 66.8                                      | 54.2 | 64.02             | 52.2  | 46.8  | 50.29                | 75  | 70                  |
| 2.             | Jamadoba Colliery                    | 69.6                                      | 60.5 | 67.09             | 57.8  | 50.33 | 55.51                |   |                     |
| 3.             | GM Office Area                       | 49.2                                      | 47.4 | 48.39             | 47.3  | 42.9  | 45.63                |   |                     |
|                |                                      |   |      |                   |   |       |                      | Residential<br>Area   | Residential<br>Area |
| 4.             | Officer Colony<br>12 No.<br>Digwadih | 47.2                                      | 42.6 | 45.48             | 43.2  | 39.8  | 41.82                | 55  | 45                  |

Sr. Chemist

Aditi R&D Services



Technical Manager

Aditi R&D Services, Sindri

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Testing Laboratory

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

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Phone: 0326-2952377 (O)  
Mobile: 09471358492, 09431512608

Ref. No.: - ARDS/21-22/4625


Date: 23.11.2021

## 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 : 18.11.2021
- Date of Testing : 19.11.2021 – 21.11.2021

### TEST RESULTS

| Sl No. | Particulars                       | Mineralogical Composition (%) |      |                                |      |
|--------|-----------------------------------|-------------------------------|------|--------------------------------|------|
|        |                                   | SiO <sub>2</sub>              | FeO  | Al <sub>2</sub> O <sub>3</sub> | CaO  |
| 1.     | Central Workshop Area, Jamadoba   | 1.68                          | 0.04 | 1.13                           | 2.2  |
| 2.     | Officer's Colony, 12 No. Digwadih | 2.02                          | 0.10 | 1.21                           | 2.88 |

  
Sr. Chemist  
Aditi R&D Services



  
Technical Manager  
Aditi R&D Services, Sindri

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# ADITI R&D SERVICES

## Testing Laboratory

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

Sindri, Industrial Area,  
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Ref. No.: - ARDS/21-22/4626


Date: 23.11.2021

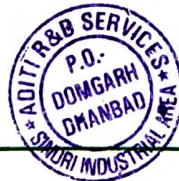
### TEST REPORT OF SURFACE WATER

- 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: 17.11.2021
- Date of Testing : 19.11.2021 - 22.11.2021
- Test : pH, TDS, Turbidity, DO, BOD, Cl, F, SO<sub>4</sub>

#### 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                                 | 7.6                     | 7.8                     | 6.5 -8.5                       | IS-3025 (P-11): 1983 |
| 2.      | Total Dissolved Solids, mg/l       | 590                     | 610                     | 1500                           | IS-3025 (P-16): 1984 |
| 3.      | Turbidity, NTU                     | 10.5                    | 12.8                    | -                              | IS-3025 (P-10):1984  |
| 4.      | Dissolved Oxygen, mg/l             | 6.7                     | 5.8                     | 4.0                            | IS-3025 (P-38):1989  |
| 5.      | Bio chemical Oxygen Demand, mg/l   | 1.2                     | 1.8                     | 3.0                            | IS-3025 (P-44):1994  |
| 6.      | Chloride as Cl, mg/l               | 54                      | 64                      | -                              | IS-3025 (P-32):1988  |
| 7.      | Fluoride as F, mg/l                | 0.58                    | 0.63                    | 1.5                            | IS-3025 (P-60):2008  |
| 8.      | Sulphate as SO <sub>4</sub> , mg/l | 45.15                   | 57.18                   | 400                            | IS-3025 (P-24):1986  |

  
Sr. Chemist  
Aditi R&D Services



  
Technical Manager  
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/21-22/4627


Date: 23.11.2021

## 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. Digwadih Colliery  
3. 2 Incline Jamadoba Colliery  
4. 6 & 7 Pits Colliery
- Date of Sample Collection: 18.11.2021
- Date of Testing : 19.11.2021 – 22.11.2021
- 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 | Digwadih Colliery | 2 Incline Jamadoba Colliery | 6 & 7 Pits Colliery |  |                      |
| 1.      | pH,                              | 7.7                     | 7.8               | 7.6                         | 7.9                 | 6.5-8.5                                    | IS-3025 (P-11): 1983 |
| 2.      | Total Dissolved Solids, mg/l     | 648                     | 658               | 590                         | 680                 | -  | IS-3025 (P-16): 1984 |
| 3.      | Total Suspended Solids, mg/l     | 15                      | 12                | 20                          | 10                  | -  | IS-3025(P-17): 1984  |
| 4.      | Bio chemical Oxygen Demand, mg/l | 2.1                     | 1.6               | 1.8                         | 1.9                 | 3  | IS-3025 (P-44):1994  |
| 5.      | Chemical Oxygen Demand, mg/l     | 36                      | 34                | 28                          | 30                  | -  | IS-3025 (P-58):2006  |
| 6.      | Oil & Grease, mg/l               | BDL                     | BDL               | BDL                         | BDL                 | -  | IS-3025 (P-39):2021  |

  
Sr. Chemist  
Aditi R&D Services



  
Technical Manager  
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/21-22/4628


Date: 23.11.2021

## 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 (Near Casualty)
- Date of Sample Collection: 18.11.2021
- Date of Testing : 19.11.2021 – 22.11.2021
- Test : pH, TDS, TSS, BOD, COD, OIL & GREASE.

### TEST RESULT

| Sl. No. | PARAMETERS OF TEST               | VALUE                      |                           | MoEF&C Notification 1 <sup>st</sup> Jan.2016 Permissible Max. Desirable Limit | Test Method          |
|---------|----------------------------------|----------------------------|---------------------------|---|----------------------|
|         |                                  | JCPP (Final Settling Pond) | TCH Point (Near Casualty) |   |                      |
| 1.      | pH,                              | 8.10                       | 7.3                       | 6.0-9.0   | IS-3025 (P-11): 1983 |
| 2.      | Total Dissolved Solids, mg/l     | 960                        | 845                       | 2100  | IS-3025 (P-16): 1984 |
| 3.      | Total Suspended Solids, mg/l     | 14                         | 52                        | 100   | IS-3025(P-17): 1984  |
| 4.      | Bio chemical Oxygen Demand, mg/l | 1.6                        | 2.1                       | 30  | IS-3025 (P-44):1994  |
| 5.      | Chemical Oxygen Demand, mg/l     | 28                         | 98                        | 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



  
Technical Manager  
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/21-22/4629

Date: 23.11.2021

## 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: 17.11.2021
- Date of Testing : 19.11.2021 – 22.11.2021
- 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 10500:2012 |             | Test Method         |
|---------|--|-------------------------|----------------------|-------------------------|-------------|---------------------|
|         |  | W.T.P. Jamadoba Canteen | W.T.P. Digwadih Club | 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   | 7.80                    | 7.90                 | 6.5-8.5                 | No. Relax.  | IS-3025 (P-11):1983 |
| 6.      | Total Hardness as CaCO <sub>3</sub> , mg/l | 290.45                  | 305.45               | 200                     | 600         | IS 3025 (P-21):2009 |
| 7.      | Chloride as Cl, mg/l                       | 48                      | 52                   | 250                     | 1000        | IS 3025 (P-32):1988 |
| 8.      | Res. Free chlorine as Cl <sub>2</sub> mg/l | NIL                     | NIL                  | 0.20                    | 1.0         | IS 3025 (P-26):2021 |
| 9.      | Total Dissolved Solids, mg/l               | 670                     | 680                  | 500                     | 2000        | IS 3025 (P-16):1984 |
| 10.     | Calcium as CaCO <sub>3</sub> , mg/l        | 87                      | 95                   | 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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*[Signature]*



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- 2 -

| SI. No. | PARAMETERS OF TEST   | VALUE             |                 | IS as per IS 10500:1991 |             | Test Method         |
|---------|--|-------------------|-----------------|-------------------------|-------------|---------------------|
|         |  | W. T. P. Jamadoba | W.T.P. Digwadih | Desirable               | Permissible |                     |
|         |  |                   |                 |                         |             |                     |
| 12.     | Manganese as Mn, mg/l  | BDL               | BDL             | 0.10                    | 0.30        | IS 3025 (P-59):2006 |
| 13.     | Sulphate as SO <sub>4</sub> , mg/l                           | 46                | 59              | 200                     | 400         | IS 3025 (P-24):1986 |
| 14.     | Nitrate as NO <sub>3</sub> , mg/l                            | 3.1               | 3.3             | 45                      | No. Relax   | IS 3025 (P-34):1988 |
| 15.     | Fluoride as F, mg/l  | 0.2               | 0.3             | 1.0                     | 1.5         | IS 3025 (P-60):2008 |
| 16.     | Phenolic Compound as (C <sub>6</sub> H <sub>5</sub> 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 <sub>3</sub> , mg/l,                      | 380               | 390             | 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

*B. D. Roy*  
Sr. Chemist  
Aditi R&D Services



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

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Ref. No.: - ARDS/21-22/4630

Date: 23.11.2021

## 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 :
  - Purnadih Jorapokhar
  - Digwadih 10 No. F&5
  - Kalimela Kalimandir
  - Upper Dungri
  - Kenduadih Basti
  - 6 & 7 Pit Ayodhya Nagari
- Date of Sample Collection : 17.11.2021
- Date of Testing : 19.11.2021 - 22.11.2021
- 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

| PARAMETERS OF TEST                         | VALUE               |                     |                     |              |                 |                        | IS as per IS 10500:1991 |             | Test Method        |
|--|---------------------|---------------------|---------------------|--------------|-----------------|------------------------|-------------------------|-------------|--------------------|
|  | Purnadih Jorapokhar | Digwadih 10 No. F&5 | Kalimela Kalimandir | Upper Dungri | Kenduadih Basti | 6&7 Pit Ayodhya Nagari | Desirable               | Permissible |                    |
| Colour, (Hazen Unit)                       | 2                   | 1                   | 2                   | 1            | 2               | 1                      | 5                       | 15          | IS 3025 (P-4):2021 |
| Temperature °C                             | 18                  | 19                  | 18                  | 19           | 18              | 18                     | -                       | -           | -                  |
| Electrical Conductivity, µmhos/cm          | 960                 | 1320                | 1020                | 1050         | 990             | 1010                   | -                       | -           | -                  |
| Total Dissolved Solids, mg/l               | 624                 | 858                 | 665                 | 685          | 645             | 655                    | -                       | -           | IS 3025(P-16):1984 |
| pH   | 7.7                 | 7.9                 | 7.6                 | 7.8          | 7.6             | 7.7                    | 6.5-8.5                 | No Relax    | IS-3025(P-11):1983 |
| Total Hardness as CaCO <sub>3</sub> , mg/l | 355                 | 165.78              | 128.71              | 224.80       | 256.77          | 316.05                 | 200                     | 600         | IS 3025(P-21):2009 |
| Calcium as Ca, mg/l                        | 98                  | 33.7                | 25.90               | 53.04        | 62.15           | 78.15                  | 75                      | 200         | IS 3025(P-40):1991 |
| Magnesium as Mg, mg/l                      | 26                  | 20.28               | 15.99               | 23.05        | 25.35           | 30.18                  | 30                      | 100         | IS 3025(P-46):1994 |
| Chloride as Cl, mg/l                       | 33                  | 30                  | 48.5                | 40.2         | 53              | 60                     | 250                     | 1000        | IS 3025(P-32):1988 |
| Fluoride as F, mg/l                        | 0.27                | 0.26                | 0.52                | 0.41         | 0.38            | 0.38                   | 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 s-sible |                    |
| 11     | Sulphate as SO <sub>4</sub> , mg/l      | 40.5                  | 44.2                | 46.5                 | 48           | 52                | 58.4                   | 200                     | 400           | IS 3025(P-24):1986 |
| 12     | Nitrate as NO <sub>3</sub> , mg/l       | 12.8                  | 15.8                | 7.8                  | 10.8         | 9.5               | 9.3                    | 45                      | No. Relax     | IS 3025(P-34):1988 |
| 13     | Alkalinity as CaCO <sub>3</sub> , mg/l, | 265                   | 290                 | 305                  | 395          | 340               | 340                    | 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,                       | 0.12                  | 0.10                | 0.14                 | 0.12         | 0.17              | 0.15                   | 5                       | 15            | IS 3025(P-42):1992 |
| 16     | Iron a Fe, mg/l                         | 0.15                  | 0.13                | 0.16                 | 0.14         | 0.18              | 0.18                   | 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



  
Technical Manager  
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/21-22/4631

Date: 23.11.2021

## 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: 18.11.2021
- Date of Testing : 19.11.2021 - 22.11.2021
- Test : pH, TDS, TSS, BOD, COD AND OIL & GREASE

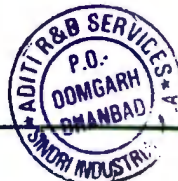
## TEST RESULT

| Sl. No. | PARAMETERS OF TEST               | VALUE         |                | G.S.R 422 (E)<br>Max. Desirable Limit | Test Method          |
|---------|----------------------------------|---------------|----------------|---------------------------------------|----------------------|
|         |                                  | ETP INLET-TCH | ETP OUTLET-TCH |                                       |                      |
| 1.      | pH,                              | 7.5           | 7.8            | 5.5-9.0                               | IS-3025 (P-11): 1983 |
| 2.      | Total Dissolved Solids, mg/l     | 1025          | 812            | -                                     | IS-3025 (P-16): 1984 |
| 3.      | Total Suspended Solids           | 132           | 37             | 100                                   | IS-3025 (P-17): 1984 |
| 4.      | Bio chemical Oxygen Demand, mg/l | 23.4          | 18.2           | 30.0                                  | IS-3025 (P-44):1994  |
| 5.      | Chemical Oxygen Demand, mg/l     | 165.8         | 60             | 250                                   | IS-3025 (P-58):2006  |
| 6.      | Oil & Grease                     | 2.2           | BDL            | 10                                    | IS-3025 (P-39):2021  |



Sr. Chemist

Aditi R&D Services



  
Technical Manager

Aditi R&D Services, Sindri

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Mobile: 09471358492, 09431512608

Ref. No.: - ARDS/21-22/4632


Date: 23.11.2021

## 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 – GARAGE (Inlet and Outlet)
- Date of Sample Collection: 18.11.2021
- Date of Testing : 19.11.2021 – 22.11.2021
- Test : pH, TDS, TSS, BOD, COD AND OIL & GREASE

## TEST RESULT

| Sl. No. | PARAMETERS OF TEST                  | VALUE                |                       | G.S.R 422(E)<br>Desirable Limit | Test Method          |
|---------|-------------------------------------|----------------------|-----------------------|---------------------------------|----------------------|
|         |                                     | ETP INLET-<br>GARAGE | ETP OUTLET-<br>GARAGE |                                 |                      |
| 1.      | pH,                                 | 7.70                 | 7.60                  | 5.5-9.0                         | IS-3025 (P-11): 1983 |
| 2.      | Total Dissolved Solids,<br>mg/l     | 925                  | 765                   | -                               | IS-3025 (P-16): 1984 |
| 3.      | Total Suspended<br>Solids           | 73                   | 18                    | 100                             | IS-3025 (P-17): 1984 |
| 4.      | Bio chemical Oxygen<br>Demand, mg/l | 22.8                 | 8.4                   | 30.0                            | IS-3025 (P-44):1994  |
| 5.      | Chemical Oxygen<br>Demand, mg/l     | 180.5                | 76.5                  | 250                             | IS-3025 (P-58):2006  |
| 6.      | Oil & Grease                        | 2.8                  | BDL                   | 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/21-22/4633


Date: 23.11.2021

## 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: 17.11.2021
- Date of Testing : 19.11.2021 – 22.11.2021
- 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  |                      |
|         |                                  |                           |                            |   |         |                      |
| 1.      | pH,                              | 8.30                      | 7.90                       | -   | 5.5-9.0 | IS-3025 (P-11): 1983 |
| 2.      | Total Dissolved Solids, mg/l     | 790                       | 745                        | -   | -       | IS-3025 (P-16): 1984 |
| 3.      | Total Suspended Solids           | 128                       | 85                         | -   | 100     | IS-3025 (P-17): 1984 |
| 4.      | Bio chemical Oxygen Demand, mg/l | 41.8                      | 15.8                       | -   | 30.0    | IS-3025 (P-44):1994  |
| 5.      | Chemical Oxygen Demand, mg/l     | 365                       | 95                         | -   | 250     | IS-3025 (P-58):2006  |
| 6.      | Oil & Grease                     | BDL                       | BDL                        | -   | 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/21-22/4634

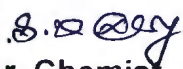
Date: 23.11.2021

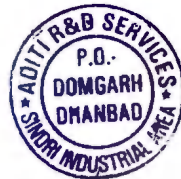
## TEST REPORT OF ETP

- 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 : JAMADOBA CANTEEN (Inlet and Outlet)
- Date of Sample Collection: 18.11.2021
- Date of Testing : 19.11.2021 – 22.11.2021
- Test : pH, TDS, TSS, BOD, COD AND OIL & GREASE

## TEST RESULT

| Sl. No. | PARAMETERS OF TEST                  | VALUE                             |                                    | G.S.R 422(E)<br>Desirable Limit | Test Method          |
|---------|-------------------------------------|-----------------------------------|------------------------------------|---------------------------------|----------------------|
|         |                                     | ETP INLET-<br>JAMADOBA<br>CANTEEN | ETP OUTLET-<br>JAMADOBA<br>CANTEEN |                                 |                      |
| 1.      | pH,                                 | 7.48                              | 7.91                               | 5.5-9.0                         | IS-3025 (P-11): 1983 |
| 2.      | Total Dissolved Solids,<br>mg/l     | 985                               | 795                                | -                               | IS-3025 (P-16): 1984 |
| 3.      | Total Suspended<br>Solids           | 142                               | 39                                 | 100                             | IS-3025 (P-17): 1984 |
| 4.      | Bio chemical Oxygen<br>Demand, mg/l | 22.8                              | 17.5                               | 30.0                            | IS-3025 (P-44):1994  |
| 5.      | Chemical Oxygen<br>Demand, mg/l     | 170.5                             | 65                                 | 250                             | IS-3025 (P-58):2006  |
| 6.      | Oil & Grease                        | 2.1                               | BDL                                | 10                              | IS-3025 (P-39):2021  |

  
Sr. Chemist  
Aditi R&D Services



  
Technical Manager  
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/21-22/4635


Date: 23.11.2021

## 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 – JCPP CANTEEN (Inlet and Outlet)
- Date of Sample Collection: 18.11.2021
- Date of Testing : 19.11.2021 – 22.11.2021
- Test : pH, TDS, TSS, BOD, COD AND OIL & GREASE

## TEST RESULT

| Sl. No. | PARAMETERS OF TEST                  | VALUE                         |                                | G.S.R 422(E)<br>Desirable Limit | Test Method          |
|---------|-------------------------------------|-------------------------------|--------------------------------|---------------------------------|----------------------|
|         |                                     | ETP INLET-<br>JCPP<br>CANTEEN | ETP OUTLET-<br>JCPP<br>CANTEEN |                                 |                      |
| 1.      | pH,                                 | 7.6                           | 7.7                            | 5.5-9.0                         | IS-3025 (P-11): 1983 |
| 2.      | Total Dissolved Solids,<br>mg/l     | 960                           | 880                            | -                               | IS-3025 (P-16): 1984 |
| 3.      | Total Suspended<br>Solids           | 122                           | 28                             | 100                             | IS-3025 (P-17): 1984 |
| 4.      | Bio chemical Oxygen<br>Demand, mg/l | 21.8                          | 16.8                           | 30.0                            | IS-3025 (P-44):1994  |
| 5.      | Chemical Oxygen<br>Demand, mg/l     | 158.5                         | 70                             | 250                             | IS-3025 (P-58):2006  |
| 6.      | Oil & Grease                        | 1.8                           | BD L                           | 10                              | IS-3025 (P-39):2021  |

  
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Aditi R&D Services



  
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Aditi R&D Services, Sindri

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**ENVIRONMENTAL MONITORING REPORT**

**OF**

**M/S TATA STEEL LIMITED**

**DHANBAD**

*for*

**FEBRUARY - 2022**

*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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Phone: 0326-2952377 (O)  
Mobile: 09471358492, 09431512608

Ref. No.: - ARDS/21-22/6561

Date: 26.02.2022

## 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 : 23.02.2022 TO 24.02.2022
- Date of Testing : 25.02.2022
- Test Procedure : As per IS-5182

### TEST RESULTS

LOCATION - OFFICERS COLONY, 12 NO. DIGWADIH

| Sl No. | Particulars  | Avg. Ambient Temperature<br>21°C<br>Value | Avg. Humidity<br>49%                          |
|--------|--|---|---|
| 1.     | Particulate Matter (PM <sub>10</sub> ), µg/m <sup>3</sup>  | 82.44                                     | NAAQ - CPCB STANDARD<br>100 µg/m <sup>3</sup> |
| 2.     | Particulate Matter (PM <sub>2.5</sub> ), µg/m <sup>3</sup> | 41.50                                     | 60 µg/m <sup>3</sup>                          |
| 3.     | SO <sub>2</sub> , µg/m <sup>3</sup>                        | 15.10                                     | 80 µg/m <sup>3</sup>                          |
| 4.     | NO <sub>2</sub> , µg/m <sup>3</sup>                        | 23.36                                     | 80 µg/m <sup>3</sup>                          |
| 5.     | Ozone, µg/m <sup>3</sup>                                   | 14.25                                     | 180 µg/m <sup>3</sup>                         |
| 6.     | NH <sub>3</sub> , µg/m <sup>3</sup>                        | 12.62                                     | 400 µg/m <sup>3</sup>                         |
| 7.     | CO, mg/m <sup>3</sup>                                      | 0.64                                      | 4 mg/m <sup>3</sup>                           |
| 8.     | Pb, µg/m <sup>3</sup>                                      | BDL                                       | 1 µg/m <sup>3</sup>                           |
| 9.     | As, ng/m <sup>3</sup>                                      | BDL                                       | 6 ng/m <sup>3</sup>                           |
| 10.    | Ni, ng/m <sup>3</sup>                                      | BDL                                       | 20 ng/m <sup>3</sup>                          |
| 11.    | Benzene, µg/m <sup>3</sup>                                 | BDL                                       | 5 µg/m <sup>3</sup>                           |
| 12.    | Benzoapyrene ng/m <sup>3</sup>                             | BDL                                       | 1 ng/m <sup>3</sup>                           |

NOTE: BDL - Below Detection Limit

S. R. Singh  
Sr. Chemist

Aditi R&D Services



Technical Manager  
Aditi R&D Services, Sindri

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Mobile: 09471358492, 09431512608

Ref. No.: - ARDS/21-22/6562

Date: 26.02.2022

## TEST REPORT OF AMBIENT AIR QUALITY

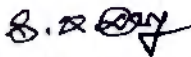
- Name of the industry : M/S TATA STEEL, JAMADOBA,  
TATA STEEL LIMITED  
JAMADOBA GROUP PLANT,  
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700092573/932 Dt. 20.07.2021
- Date of Sample Collection : 23.02.2022 TO 24.02.2022
- Date of Testing : 25.02.2022
- Test Procedure : As per IS-5182

### TEST RESULTS

LOCATION – CENTRAL WORKSHOP AREA , JAMADOBA

| SI No. | Particulars  | Value | NAAQ - CPCB STANDARD  |
|--------|--|-------|-----------------------|
| 1.     | Particulate Matter (PM <sub>10</sub> ), µg/m <sup>3</sup>  | 79.24 | 100 µg/m <sup>3</sup> |
| 2.     | Particulate Matter (PM <sub>2.5</sub> ), µg/m <sup>3</sup> | 33.68 | 60 µg/m <sup>3</sup>  |
| 3.     | SO <sub>2</sub> , µg/m <sup>3</sup>                        | 12.80 | 80 µg/m <sup>3</sup>  |
| 4.     | NO <sub>2</sub> , µg/m <sup>3</sup>                        | 20.46 | 80 µg/m <sup>3</sup>  |
| 5.     | Ozone, µg/m <sup>3</sup>                                   | 11.22 | 180 µg/m <sup>3</sup> |
| 6.     | NH <sub>3</sub> , µg/m <sup>3</sup>                        | 13.63 | 400 µg/m <sup>3</sup> |
| 7.     | CO, mg/m <sup>3</sup>                                      | 0.97  | 4 mg/m <sup>3</sup>   |
| 8.     | Pb, µg/m <sup>3</sup>                                      | BDL   | 1 µg/m <sup>3</sup>   |
| 9.     | As, ng/m <sup>3</sup>                                      | BDL   | 6 ng/m <sup>3</sup>   |
| 10.    | Ni, ng/m <sup>3</sup>                                      | BDL   | 20 ng/m <sup>3</sup>  |
| 11.    | Benzene, µg/m <sup>3</sup>                                 | BDL   | 5 µg/m <sup>3</sup>   |
| 12.    | Benzoapyrene ng/m <sup>3</sup>                             | BDL   | 1 ng/m <sup>3</sup>   |

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/ 6563 Date:26.02.2022            | M/S TATA STEEL, JAMADOBA,  |                      |                   |                     |
| Date of Monitoring                          | TATA STEEL LIMITED, JAMADOBA GROUP PLANT,<br>DIST. - DHANBAD (JHARKHAND) |                      |                   |                     |
| 23.02.2022 – 24.02.2022                     | Avg. Ambient Temperature (°C)  | Average Humidity (%) | Weather Condition | Status of the plant |
| Work Order 4700092573/932<br>Dt. 20.07.2021 | 21   | 49                   | Clear             | Running             |

#### MONITORING RESULTS

| Sl. No | Place of Monitoring                  | Day Time<br>(6 AM to 10 PM)<br>Avg. dB(A) |      |                | Night Time<br>(10 PM to 6 AM)<br>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       |
|        | JAMADOBA GROUP                       |   |      |                |   |       |                   | Industrial Area  | Industrial Area  |
| 1.     | Central Workshop                     | 72.8                                      | 54.2 | 69.85          | 56.3  | 49.2  | 54.06             | 75   | 70               |
| 2.     | Jamadoba Colliery                    | 65.3                                      | 60.5 | 63.53          | 52.1  | 51.80 | 51.95             |  |                  |
| 3.     | GM Office Area                       | 56.8                                      | 48.3 | 54.36          | 43.6  | 39.2  | 41.93             |  |                  |
|        |                                      |   |      |                |   |       |                   | Residential Area   | Residential Area |
| 4.     | Officer Colony<br>12 No.<br>Digwadih | 51.8                                      | 46.3 | 49.87          | 41.4  | 36.2  | 39.54             | 55   | 45               |

*B. R. Singh*  
Sr. Chemist  
Aditi R&D Services



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

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Mobile: 09471358492, 09431512608

Ref. No.: - ARDS/21-22/6569

Date: 27.02.2022

## 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 : 24.02.2022 TO 25.02.2022
- Date of Testing : 26.02.2022
- Test Procedure : As per IS-5182

### TEST RESULTS

| LOCATION - JAMADOBA COLLIERY |  |       |                       |     |
|------------------------------|--|-------|-----------------------|-----|
| SI No.                       | Particulars  | Value | CPCB STANDARD         |     |
|                              | Avg. Ambient Temperature                                   | 21°C  | Avg. Humidity         | 49% |
| 1.                           | Particulate Matter (PM <sub>10</sub> ), µg/m <sup>3</sup>  | 93.14 | 100 µg/m <sup>3</sup> |     |
| 2.                           | Particulate Matter (PM <sub>2.5</sub> ), µg/m <sup>3</sup> | 42.50 | 60 µg/m <sup>3</sup>  |     |
| 3.                           | SO <sub>2</sub> , µg/m <sup>3</sup>                        | 24.66 | 80 µg/m <sup>3</sup>  |     |
| 4.                           | NO <sub>2</sub> , µg/m <sup>3</sup>                        | 29.40 | 80 µg/m <sup>3</sup>  |     |
| 5.                           | Ozone, µg/m <sup>3</sup>                                   | 22.28 | 180 µg/m <sup>3</sup> |     |
| 6.                           | NH <sub>3</sub> , µg/m <sup>3</sup>                        | 21.23 | 400 µg/m <sup>3</sup> |     |
| 7.                           | CO, mg/m <sup>3</sup>                                      | 1.02  | 4 mg/m <sup>3</sup>   |     |
| 8.                           | Pb, µg/m <sup>3</sup>                                      | BDL   | 1 µg/m <sup>3</sup>   |     |
| 9.                           | As, ng/m <sup>3</sup>                                      | BDL   | 6 ng/m <sup>3</sup>   |     |
| 10.                          | Ni, ng/m <sup>3</sup>                                      | BDL   | 20 ng/m <sup>3</sup>  |     |
| 11.                          | Benzene, µg/m <sup>3</sup>                                 | BDL   | 5 µg/m <sup>3</sup>   |     |
| 12.                          | Benzoapyrene ng/m <sup>3</sup>                             | BDL   | 1 ng/m <sup>3</sup>   |     |

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/21-22/6589

Date: 28.02.2022

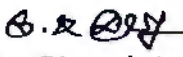
## TEST REPORT OF MINERALOGICAL COMPOSITION

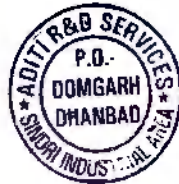
### OF PARTICULATE MATTER

- 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 : 24.02.2022
- Date of Testing : 25.02.2022 – 27.02.2022

### TEST RESULTS

| Sl No. | Particulars       | Mineralogical Composition (%) |      |                                |     |
|--------|-------------------|-------------------------------|------|--------------------------------|-----|
|        |                   | SiO <sub>2</sub>              | FeO  | Al <sub>2</sub> O <sub>3</sub> | CaO |
| 1.     | Jamadoba Colliery | 1.79                          | 0.06 | 1.10                           | 1.9 |

  
Sr. Chemist  
Aditi R&D Services



  
Technical Manager  
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/21-22/6622

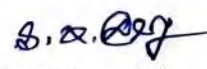
Date: 01.03.2022

## 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. JCPP (Final Settling Pond)  
2. T.C.H, Point (Near Casualty)
- Date of Sample Collection: 24.02.2022
- Date of Testing : 25.02.2022 – 28.02.2022
- Test : pH, TDS, TSS, BOD, COD, OIL & GREASE.

### TEST RESULT

| Sl. No. | PARAMETERS OF TEST               | VALUE                      |                           | MoEF&C Notification 1 <sup>st</sup> Jan.2016 Permissible Max. Desirable Limit | Test Method          |
|---------|----------------------------------|----------------------------|---------------------------|---|----------------------|
|         |                                  | JCPP (Final Settling Pond) | TCH Point (Near Casualty) |   |                      |
| 1.      | pH,                              | 8.15                       | 7.9                       | 6.0-9.0   | IS-3025 (P-11): 1983 |
| 2.      | Total Dissolved Solids, mg/l     | 935                        | 860                       | 2100  | IS-3025 (P-16): 1984 |
| 3.      | Total Suspended Solids, mg/l     | 19                         | 57                        | 100   | IS-3025(P-17) : 1984 |
| 4.      | Bio chemical Oxygen Demand, mg/l | 1.8                        | 2.4                       | 30  | IS-3025 (P-44):1994  |
| 5.      | Chemical Oxygen Demand, mg/l     | 36                         | 104                       | 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



  
Technical Manager  
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/21-22/6623

Date: 01.03.2022

## 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. Digwadih Canteen  
2. W. T. P. (Jamadoba)
- Date of Sample Collection: 24.02.2022
- Date of Testing : 25.02.2022 – 28.02.2022
- 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         |
|---------|--|------------------|----------------|-------------------------|-------------|---------------------|
|         |  | Digwadih Canteen | W.T.P Jamadoba | 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   | 7.85             | 8.15           | 6.5-8.5                 | No. Relax.  | IS-3025 (P-11):1983 |
| 6.      | Total Hardness as CaCO <sub>3</sub> , mg/l | 270.48           | 312.45         | 200                     | 600         | IS 3025 (P-21):2009 |
| 7.      | Chloride as Cl, mg/l                       | 52               | 56             | 250                     | 1000        | IS 3025 (P-32):1988 |
| 8.      | Res. Free chlorine as Cl <sub>2</sub> mg/l | NIL              | NIL            | 0.20                    | 1.0         | IS 3025 (P-26):2021 |
| 9.      | Total Dissolved Solids, mg/l               | 482              | 510            | 500                     | 2000        | IS 3025 (P-16):1984 |
| 10.     | Calcium as CaCO <sub>3</sub> , mg/l        | 77               | 107            | 75                      | 200         | IS 3025 (P-40):1991 |
| 11.     | Copper as Cu, mg/l                         | 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         |
|---------|--|------------------|----------------|-------------------------|-------------|---------------------|
|         |  | Digwadih Canteen | W.T.P Jamadoba | Desirable               | Permissible |                     |
| 12.     | Manganese as Mn, mg/l  | BDL              | BDL            | 0.10                    | 0.30        | IS 3025 (P-59):2006 |
| 13.     | Sulphate as SO <sub>4</sub> , mg/l                           | 51               | 62             | 200                     | 400         | IS 3025 (P-24):1986 |
| 14.     | Nitrate as NO <sub>3</sub> , mg/l                            | 3.2              | 3.4            | 45                      | No. Relax   | IS 3025 (P-34):1988 |
| 15.     | Fluoride as F, mg/l  | 0.28             | 0.32           | 1.0                     | 1.5         | IS 3025 (P-60):2008 |
| 16.     | Phenolic Compound as (C <sub>6</sub> H <sub>5</sub> 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,  | 0.12             | 0.17           | 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 <sub>3</sub> , mg/l,                      | 376              | 388            | 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

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



*S. R. Roy*  
Technical Manager  
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/21-22/6624

Date: 01.03.2022

### 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. Jamadoba 3 No.  
4. Jorapokhar Kushtand  
5. Lower Dungri
- Date of Sample Collection : 23.02.2022 – 24.02.2022
- Date of Testing : 25.02.2022 – 28.02.2022
- 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

| PARAMETERS OF TEST                         | VALUE        |                 |                |                     |              | IS as per IS 10500:1991 |             | Test Method        |
|--|--------------|-----------------|----------------|---------------------|--------------|-------------------------|-------------|--------------------|
|  | Bhowra 13 No | Mohalbani Basti | Jamadoba 3 No. | Jorapokhar Kushtand | Lower Dungri | Desirable               | Permissible |                    |
| Colour, (Hazen Unit)                       | 2            | 1               | 2              | 1                   | 2            | 5                       | 15          | IS 3025 (P-4):2021 |
| Temperature °C                             | 26           | 27              | 26             | 27                  | 26           | -                       | -           | -                  |
| Electrical Conductivity, µmhos/cm          | 605          | 740             | 830            | 640                 | 710          | -                       | -           | -                  |
| Total Dissolved Solids, mg/l               | 390          | 368             | 524            | 430                 | 452          | -                       | -           | IS 3025(P-16):1984 |
| pH   | 7.8          | 7.7             | 7.6            | 7.8                 | 7.9          | 6.5-8.5                 | No Relax    | IS-3025(P-11):1983 |
| Total Hardness as CaCO <sub>3</sub> , mg/l | 352          | 431.2           | 435.12         | 413.44              | 399.84       | 200                     | 600         | IS 3025(P-21):2009 |
| Calcium as Ca, mg/l                        | 72.12        | 89.78           | 93.15          | 98.78               | 105.05       | 75                      | 200         | IS 3025(P-40):1991 |
| Magnesium as Mg, mg/l                      | 56.8         | 31.97           | 20.96          | 38.79               | 31.97        | 30                      | 100         | IS 3025(P-46):1994 |
| Chloride as Cl, mg/l                       | 49.98        | 69.90           | 89.97          | 78.95               | 78.95        | 83.90                   | 1000        | IS 3025(P-32):1988 |
| Fluoride as F, mg/l                        | 0.25         | 0.32            | 0.42           | 0.52                | 0.48         | 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         |
|---------|--|--------------|------------------|--------------|-----------------------|--------------|-------------------------|-------------|---------------------|
|         |  | Bhowra 13 No | Mohalban i Basti | Jamado 3 No. | Jorap okhar Kusht and | Lower Dungri | Desirable               | Permissible |                     |
| 11      | Sulphate as SO <sub>4</sub> , mg/l     | 43.2         | 47.4             | 49.5         | 44.8                  | 54           | 200                     | 400         | IS 3025(P-24):1986  |
| 12      | Nitrate as NO <sub>3</sub> , mg/l      | 12.3         | 15.2             | 7.3          | 10.3                  | 9.7          | 45                      | No. Relax   | IS 3025(P-34):1988  |
| 13      | Alkalinity as CaCO <sub>3</sub> , mg/l | 285          | 235              | 377          | 296                   | 305          | 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                       | 0.14         | 0.12             | 0.13         | 0.15                  | 0.14         | 5                       | 15          | IS 3025(P-42):1992  |
| 16      | Iron as Fe, mg/l                       | 0.18         | 0.15             | 0.16         | 0.18                  | 0.2          | 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

*S.K. Singh*  
Sr. Chemist  
Aditi R&D Services



*S.K. Singh*  
Technical Manager  
Aditi R&D Services, Sindri

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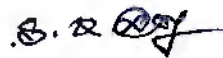
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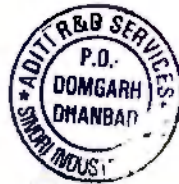
## TEST REPORT OF ETP

- 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: 24.02.2022
- Date of Testing : 25.02.2022 – 28.02.2022
- Test : pH, TDS, TSS, BOD, COD AND OIL & GREASE

### TEST RESULT

| Sl. No. | PARAMETERS OF TEST               | VALUE         |                | G.S.R 422 (E)<br>Max. Desirable Limit | Test Method          |
|---------|----------------------------------|---------------|----------------|---------------------------------------|----------------------|
|         |                                  | ETP INLET-TCH | ETP OUTLET-TCH |                                       |                      |
| 1.      | pH,                              | 8.90          | 8.56           | 5.5-9.0                               | IS-3025 (P-11): 1983 |
| 2.      | Total Dissolved Solids, mg/l     | 1030          | 845            | -                                     | IS-3025 (P-16): 1984 |
| 3.      | Total Suspended Solids           | 125           | 32             | 100                                   | IS-3025 (P-17): 1984 |
| 4.      | Bio chemical Oxygen Demand, mg/l | 22.8          | 17.4           | 30.0                                  | IS-3025 (P-44):1994  |
| 5.      | Chemical Oxygen Demand, mg/l     | 182.4         | 69.6           | 250                                   | IS-3025 (P-58):2006  |
| 6.      | Oil & Grease                     | 2.3           | BDL            | 10                                    | IS-3025 (P-39):2021  |

  
Sr. Chemist  
Aditi R&D Services



  
Technical Manager  
Aditi R&D Services, Sindri

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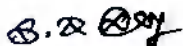
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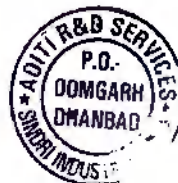
## TEST REPORT OF ETP


- 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 - GARAGE (Inlet and Outlet)
- Date of Sample Collection: 24.02.2022
- Date of Testing : 25.02.2022 - 28.02.2022
- Test : pH, TDS, TSS, BOD, COD AND OIL & GREASE

### TEST RESULT

| Sl. No. | PARAMETERS OF TEST               | VALUE            |                   | G.S.R 422(E)    | Test Method          |
|---------|----------------------------------|------------------|-------------------|-----------------|----------------------|
|         |                                  | ETP INLET-GARAGE | ETP OUTLET-GARAGE | Desirable Limit |                      |
| 1.      | pH,                              | 8.84             | 8.70              | 5.5-9.0         | IS-3025 (P-11): 1983 |
| 2.      | Total Dissolved Solids, mg/l     | 965              | 745               | -               | IS-3025 (P-16): 1984 |
| 3.      | Total Suspended Solids           | 78               | 22                | 100             | IS-3025 (P-17): 1984 |
| 4.      | Bio chemical Oxygen Demand, mg/l | 23.2             | 8.2               | 30.0            | IS-3025 (P-44):1994  |
| 5.      | Chemical Oxygen Demand, mg/l     | 185.6            | 65.6              | 250             | IS-3025 (P-58):2006  |
| 6.      | Oil & Grease                     | 2.6              | BDL               | 10              | IS-3025 (P-39):2021  |

  
Sr. Chemist  
Aditi R&D Services



  
Technical Manager  
Aditi R&D Services, Sindri

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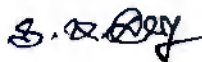
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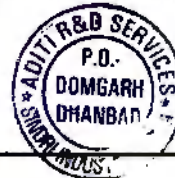
## TEST REPORT OF STP

- 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: 23.02.2022
- Date of Testing : 24.02.2022 - 28.02.2022
- 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     | 810                       | 760                        | -   | -      | IS-3025 (P-16): 1984 |
| 3.      | Total Suspended Solids           | 136                       | 82                         | -   | 100    | IS-3025 (P-17): 1984 |
| 4.      | Bio chemical Oxygen Demand, mg/l | 40.2                      | 14.4                       | -   | 30.0   | IS-3025 (P-44):1994  |
| 5.      | Chemical Oxygen Demand, mg/l     | 321.6                     | 90.5                       | -   | 250    | IS-3025 (P-58):2006  |
| 6.      | Oil & Grease                     | BDL                       | BDL                        | -   | 10     | IS-3025 (P-39):2021  |

  
Sr. Chemist  
Aditi R&D Services



  
Technical Manager  
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/21-22/6628

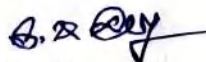
Date: 01.03.2022

## 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 : JAMADOBA CANTEEN (Inlet and Outlet)
- Date of Sample Collection: 23.02.2022
- Date of Testing : 24.02.2022 – 28.02.2022
- Test : pH, TDS, TSS, BOD, COD AND OIL & GREASE

### TEST RESULT

| Sl. No. | PARAMETERS OF TEST                  | VALUE                             |                                    | G.S.R 422(E)<br>Desirable Limit | Test Method          |
|---------|-------------------------------------|-----------------------------------|------------------------------------|---------------------------------|----------------------|
|         |                                     | ETP INLET-<br>JAMADOBA<br>CANTEEN | ETP OUTLET-<br>JAMADOBA<br>CANTEEN |                                 |                      |
| 1.      | pH,                                 | 7.90                              | 7.60                               | 5.5-9.0                         | IS-3025 (P-11): 1983 |
| 2.      | Total Dissolved Solids,<br>mg/l     | 780                               | 730                                | -                               | IS-3025 (P-16): 1984 |
| 3.      | Total Suspended<br>Solids           | 132                               | 89                                 | 100                             | IS-3025 (P-17): 1984 |
| 4.      | Bio chemical Oxygen<br>Demand, mg/l | 38.8                              | 16.2                               | 30.0                            | IS-3025 (P-44):1994  |
| 5.      | Chemical Oxygen<br>Demand, mg/l     | 310.40                            | 78                                 | 250                             | IS-3025 (P-58):2006  |
| 6.      | Oil & Grease                        | BDL                               | BDL                                | 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/21-22/6629

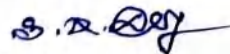
Date: 01.03.2022

## 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 – JCPP CANTEEN (Inlet and Outlet)
- Date of Sample Collection: 23.02.2022
- Date of Testing : 24.02.2022 – 28.02.2022
- Test : pH, TDS, TSS, BOD, COD AND OIL & GREASE

## TEST RESULT

| Sl. No. | PARAMETERS OF TEST                  | VALUE                         |                                | G.S.R 422(E)<br>Desirable Limit | Test Method          |
|---------|-------------------------------------|-------------------------------|--------------------------------|---------------------------------|----------------------|
|         |                                     | ETP INLET-<br>JCPP<br>CANTEEN | ETP OUTLET-<br>JCPP<br>CANTEEN |                                 |                      |
| 1.      | pH,                                 | 7.94                          | 7.6                            | 5.5-9.0                         | IS-3025 (P-11): 1983 |
| 2.      | Total Dissolved Solids,<br>mg/l     | 935                           | 870                            | -                               | IS-3025 (P-16): 1984 |
| 3.      | Total Suspended<br>Solids           | 128                           | 34                             | 100                             | IS-3025 (P-17): 1984 |
| 4.      | Bio chemical Oxygen<br>Demand, mg/l | 22.5                          | 17.2                           | 30.0                            | IS-3025 (P-44):1994  |
| 5.      | Chemical Oxygen<br>Demand, mg/l     | 180.8                         | 65.8                           | 250                             | IS-3025 (P-58):2006  |
| 6.      | Oil & Grease                        | 1.6                           | BD 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/21-22/6640

Date: 02.03.2022

## 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 Dn Stream
- Date of Sample Collection: 24.02.2022
- Date of Testing : 25.02.2022 - 01.03.2022
- Test : pH, TDS, Turbidity, DO, BOD, Cl, F, SO<sub>4</sub>

### 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                                 | 7.90                    | 7.95                    | 6.5 -8.5                       | IS-3025 (P-11): 1983 |
| 2.      | Total Dissolved Solids, mg/l       | 583                     | 615                     | 1500                           | IS-3025 (P-16): 1984 |
| 3.      | Turbidity, NTU                     | 10.2                    | 12.3                    | -                              | IS-3025 (P-10):1984  |
| 4.      | Dissolved Oxygen, mg/l             | 6.8                     | 5.9                     | 4.0                            | IS-3025 (P-38):1989  |
| 5.      | Bio chemical Oxygen Demand, mg/l   | 1.3                     | 1.6                     | 3.0                            | IS-3025 (P-44):1994  |
| 6.      | Chloride as Cl, mg/l               | 59                      | 62                      | -                              | IS-3025 (P-32):1988  |
| 7.      | Fluoride as F, mg/l                | 0.56                    | 0.60                    | 1.5                            | IS-3025 (P-60):2008  |
| 8.      | Sulphate as SO <sub>4</sub> , mg/l | 42.18                   | 53.15                   | 400                            | IS-3025 (P-24):1986  |

*B. R. Singh*

Sr. Chemist  
Aditi R&D Services



*S. Singh*  
Technical Manager  
Aditi R&D Services, Sindri

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Phone: 0326-2952377 (O)  
Mobile: 09471358492, 09431512608

Ref. No.: - ARDS/21-22/6641

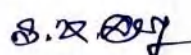
Date: 02.03.2022

## 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. Digwadih Colliery  
3. 3 Pit Jamadoba Colliery  
4. 6 & 7 Pits Colliery
- Date of Sample Collection: 24.02.2022
- Date of Testing : 25.02.2022 – 01.03.2022
- 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 | Digwadih Colliery | 2 Incline Jamadoba Colliery | 6 & 7 Pits Colliery |  |                      |
| 1.      | pH,                              | 7.9                     | 7.6               | 7.8                         | 7.7                 | 6.5-8.5                                    | IS-3025 (P-11): 1983 |
| 2.      | Total Dissolved Solids, mg/l     | 658                     | 642               | 585                         | 665                 | -  | IS-3025 (P-16): 1984 |
| 3.      | Total Suspended Solids, mg/l     | 18                      | 22                | 25                          | 15                  | -  | IS-3025(P-17): 1984  |
| 4.      | Bio chemical Oxygen Demand, mg/l | 2.3                     | 1.9               | 1.6                         | 1.8                 | 3  | IS-3025 (P-44):1994  |
| 5.      | Chemical Oxygen Demand, mg/l     | 54                      | 36                | 24                          | 28                  | -  | IS-3025 (P-58):2006  |
| 6.      | Oil & Grease, mg/l               | BDL                     | BDL               | BDL                         | BDL                 | -  | IS-3025 (P-39):2021  |

  
Sr. Chemist  
Aditi R&D Services



  
Technical Manager  
Aditi R&D Services, Sindri

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