



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/ 401 /2021

May 28, 2021

Ref.: Environmental Clearance letter No.-J-11015/372/2010-IA.II(M)dated-30th 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'20 to March'21

Dear Sir,

We are enclosing herewith compliance report for the period **October'20 to March'21** for the EC granted vide letter no.- J-11015/372/2010-IA.II(M) dated- 30th September 2013 issued by Ministry of Environment, Forest and Climate Change, New Delhi.

Copy of the compliance report is also being sent in soft format through email at ro.ranchi-mef@gov.in for your kind perusal. We trust the information furnished is in line with your requirement.

Thanking you,

Yours faithfully,

Head (Planning)
Jharia Division, Tata Steel Ltd.

Encl: As above.

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

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

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

TATA STEEL LIMITED

Jharia Collieries Jamadoba 828 112 Dhanbad India
Tel 91 326 2320263/2320265/2320267 Fax 91 326 2320268

HALF YEARLY COMPLIANCE REPORT
(PERIOD: OCTOBER'20 – MARCH'21)

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
Specific Condition		
(i)	The maximum production from the mines shall not exceed beyond that for which environmental clearance has been granted.	<p>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. The production details are:</p> <p>FY21 - 0.143 MTPA FY20 - 0.231 MTPA FY19 - 0.261 MTPA FY18 – 0.259 MTPA FY17 – 0.262 MTPA</p>
(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 rd 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 & 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"> • 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. • 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. • 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

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		<p>the central workshop catering to all the mines is treated in oil and grease trap followed by recycling of water.</p> <ul style="list-style-type: none"> • The two coal washeries of Tata Steel are operating on Zero Liquid discharge (ZLD) principle. • 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.
(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 conveyor 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.

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(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 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. 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. 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

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		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 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	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 MoEF&CC and NABL) and the results are provided in Annexure-I .

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	be undertaken on the composition of the suspended particulate matter (PM10 and PM2.5) in Jharia Coalfields and also quantified. These studies would help 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	The regular monitoring of groundwater level and quality is done as per the requirement. The groundwater quality report & groundwater level reports are provided in Annexure-I.

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	quarterly within one month of monitoring.	
(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.

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(xxvii)	The mining in the existing mines would be phased out after expiry of the current 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.	It is not applicable in our case.
(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 FY21 is Rs.3.29 crores.</p> <p>CSR data submitted is for Jharia Division which comprises all 5 collieries and 2 washeries. Jamadoba Washery, Digwadih Colliery and 6&7 Pits Colliery are adjacent to each other and fall under same leasehold area i.e. Jamadoba group of collieries. The core zone and buffer zone of all above units overlap to each other and in many cases, the villages are same where CSR work is going on. Therefore, we have a central budget for CSR which is managed by a team of experts who are dedicatedly involved in providing benefits and improving standard of living in over 50+ villages and municipal wards. Hence, separate CSR expenditure for individual unit cannot be estimated. For calculation/ statutory reporting purpose, the consolidated CSR expenditure can be divided into unit-wise based on size of leasehold area of individual units.</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	Mine Closure Plan has been approved by Ministry of Coal, New Delhi. Details on

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	submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval.	deposition of closure cost in escrow account along with expenditure incurred for progressive closure is regularly submitted to Office of Coal controller. Final mine closure along with details of corpus fund will be submitted to MoEF&CC 5 years in advance.
(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>

B.	GENERAL CONDITIONS	
(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.

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(iii)	Four ambient air quality monitoring stations shall be established in the core 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.	The Air quality monitoring stations are: (i)Jamadoba Group Office (Core Zone) (ii)New Village Colony, Jamadoba (Buffer Zone) (iii)Digwadih 12 No. Colony (Buffer Zone) (iv)6&7 Pits Kalimandir area (Buffer Zone) Monitoring of heavy metals in ambient air is being performed by an independent laboratory (recognized by MoEF&CC/NABL) once in six months. The results are enclosed as Annexure-I.
(iv)	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.	Ambient air quality report (PM10, PM 2.5, SO2 and NOx) for the period from Oct'20 to Mar'21 is attached as Annexure-I. Additionally, M/s Ecomen Laboratories Pvt. Ltd (an MoEF&CC and NABL recognized Laboratory) has done monitoring on ambient air quality (PM10, PM 2.5, SO2, NOx, CO, NH3, O3) and heavy metals (As, Ni, Cd and Cr). The results are enclosed as Annexure-I.
(v)	Adequate measures shall be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in blasting and drilling operations, operation of HEMM, etc shall be provided with ear plugs/muffs.	Regular noise survey is being conducted in the underground work environment. Workers are provided with ear-plugs/ muffs in high noise areas.
(vi)	Industrial wastewater (workshop and wastewater from the mine) shall be properly collected, 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.	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.

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	Oil and grease trap shall be installed before discharge of workshop effluents.	
(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 M/s Ecomen Laboratories Pvt. Ltd., an MoEF&CC recognized laboratory (vide its notification 03.01.2014). 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 has been provided as Annexure-1
(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.

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(xii)	The funds earmarked for environmental protection measures shall be kept in separate account and shall not be diverted for other purpose. Year-wise expenditure shall be reported to this Ministry and its Regional Office at Bhubaneswar.	The Environment Cell has a separate fund for Environmental protection measures and for complying with legal requirements. The annual environmental expenditure for the financial year 2019-2020 is Rs. 1298.41 lakhs.
(xiii)	The Project authorities shall advertise at least in two local newspapers widely circulated around the project, one of which shall be in the vernacular language of the locality concerned within seven days of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution control Board and may also be seen at the website of the ministry of Environment & Forests at http://envfor.nic.in .	It has been complied with.
(xiv)	A copy of the environmental clearance letter shall be marked to concerned Panchayat/Zila Parishad, Municipal Corporation or Urban Local Body and local NGO, if any, from whom any suggestion/representation has been received while processing the proposal. A copy of the clearance letter shall also be displayed on the company's website.	It has been complied with.
(xv)	A copy of the clearance letter shall be displayed on the website of the concerned State Pollution Control Board. The EC letter shall also be displayed at the Regional Office, District Industry Centre and Collector's Office/Tehsildar's Office for 30 days.	It has been complied with.
(xvi)	The clearance letter shall be uploaded on the company's website. The compliance status of the stipulated EC conditions shall also be uploaded by the project authorities on their website and	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

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	updated at least once every six months so as to bring the same in the public domain. The monitoring data of environmental quality parameters (air, water, noise and soil) and critical pollutants such as PM10, PM2.5, SO2 and NOx (ambient and stack if any) and critical sectoral parameters shall also be displayed at the entrance of the project premises and mines office and in corporate office and on the company's website.	information near the mine's office has been done.
(xvii)	The project proponent shall submit six monthly reports on the status of compliance of the stipulated environmental clearance conditions (both in hard copy and in e-mail) to the respective Regional Office of the MOEF, the respective Zonal offices of CPCB and the SPCB.	It is being complied
(xviii)	The Regional Office of this Ministry located at Bhopal shall monitor compliance of the stipulated conditions. The Project authorities shall extend full cooperation to the office(s) of the Regional Office by furnishing the requisite data/information/monitoring reports.	It will be complied with.
(xix)	The environmental statement for each financial year ending 31st March in Form-V is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be uploaded on the company's website along with the status of compliance of EC conditions and shall be sent to the respective Regional Offices of the MOEF by E-mail.	The environmental statement for financial year 2019-20 has been submitted to JSPCB vide letter no. JMB/ENV/ESSA/05/898/2020 on 28 th September 2020 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.

Environment Quality Report (Period- October'20 to March'21)

Annexure- I

AIR QUALITY REPORT Core zone & Buffer zone

Period- October'20 to December'20

No. of sampling points: 4

Core zone (as per Air quality standards for coal mines in EPA Notification, 1988)							
Location	Latitude/ Longitude	Date	Weather Condition	SPM	RSPM	SO ₂	NO _x
				24 Hourly Limit- 700 µg/m ³	24 Hourly Limit- 300 µg/m ³	24 Hourly Limit- 120 µg/m ³	24 Hourly Limit-120 µg/m ³
Jamadoba Group Office	23°42'15.3"	08.10.20	Cloudy	176.8	84.9	14.7	15.3
	N/ 86°24'11" E	17.11.20	Clear	215.6	87.5	15.2	14.0
		07.12.20	Cloudy	198.8	86.9	14.4	13.8
Buffer zone (as per NAAQS 2009 for ambient air quality standards)							
Location	Latitude/ Longitude	Date	Weather Condition	PM10	PM2.5	SO ₂	NO ₂
				24 Hourly Limit100µg/m ³	24 Hourly Limit60µg/m ³	24 Hourly Limit80µg/m ³	24 Hourly Limit80µg/m ³
Digwadih 12 No. Colony	23°41'42"	27.10.20	Rainy	86.4	50.2	14.1	14.8
	N/ 86°24'45.3"	18.11.20	Clear	85.4	52.5	14.7	13.2
	E	23.12.20	Clear	87.2	49.7	13.6	14.2
New Village Colony, Jamadoba	23°41'51"	05.10.20	Clear	85.7	46.7	11.8	12.2
	N/ 86°23'19" E	23.11.20	Clear	85.5	48.7	13.5	13.0
		21.12.20	Cloudy	84.8	43.6	12.3	13.6
6&7 Pits Kalimandir colony	23°43'15"	23.10.20	Rainy	85.3	48.6	10.8	11.4
	N/ 86°24'12" E	19.11.20	Clear	86.5	48.4	12.6	12.5
		10.12.20	Clear	87.4	46.5	13.1	12.8



Sr. Manager (Environment)

Environment Quality Report (Period- October'20 to March'21)

Annexure- I

AIR QUALITY REPORT Core zone & Buffer zone

Period- January'21 to March'21

No. of sampling points: 4

Core zone (as per Air quality standards for coal mines in EPA Notification, 1988)							
Location	Latitude/ Longitude	Date	Weather Condition	SPM	RSPM	SO ₂	NO _x
				24 Hourly Limit- 700 µg/m ³	24 Hourly Limit- 300 µg/m ³	24 Hourly Limit- 120 µg/m ³	24 Hourly Limit-120 µg/m ³
Jamadoba Group Office	23°42'15.3"	18.01.21	Clear	186.2	84.9	15.7	14.2
	N/ 86°24'11" E	22.02.21	Clear	224.6	92.4	14.2	13.1
		08.03.21	Clear	215.7	89.6	15.8	13.9
Buffer zone (as per NAAQS 2009 for ambient air quality standards)							
Location	Latitude/ Longitude	Date	Weather Condition	PM10	PM2.5	SO ₂	NO ₂
				24 Hourly Limit100µg/m ³	24 Hourly Limit60µg/m ³	24 Hourly Limit80µg/m ³	24 Hourly Limit- 80µg/m ³
Digwadih 12 No. Colony	23°41'42"	05.01.21	Clear	84.2	45.8	12.6	13.1
	N/ 86°24'45.3" E	04.02.21	Clear	82.3	40.8	11.6	12.4
		03.03.21	Clear	87.9	42.1	13.6	12.7
New Village Colony, Jamadoba	23°41'51"	04.01.21	Clear	86.8	44.3	11.4	12.2
	N/ 86°23'19" E	10.02.21	Clear	89.4	43.6	12.8	13.5
		10.03.21	Clear	92.8	48.3	11.4	12.6
6&7 Pits Kalimandir colony	23°43'15"	06.01.21	Clear	88.4	49.5	12.6	12.1
	N/ 86°24'12" E	17.02.21	Clear	92.7	46.5	10.4	11.2
		02.03.21	Clear	89.4	43.5	12.3	13.4



Sr. Manager (Environment)

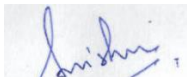
Environment Quality Report (Period- October'20 to March'21)

Annexure- I

Ground Water Quality Analysis (Hand Pump & Dug Well)

(Post- Monsoon Season- November'2020)

S.No	Date	Location	Time	Depth in meter	pH	Electrical Conductivity, $\mu\text{S/m}$	Total Hardness (as CaCO_3), mg/l
1	06.11.20	Purnadih (Jorapokhar)	12:20 PM	4.78	7.4	758	542
2	06.11.20	Bhowra 13 No	12:05 PM	2.10	7.2	648	552
3	06.11.20	Mohalbani Basti	01:45 PM	6.50	7.2	722	584
4	06.11.20	Digwadih 12 No	01:58 PM	3.12	7.1	580	816
5	06.11.20	Digwadih 10 No F & J	02:18 PM	2.63	7.3	1030	584
6	06.11.20	Kalimela Shivmandir	11:30 AM	2.03	7.2	799	682
7	06.11.20	Kalimela Kalimandir	11:40 AM	2.84	7.2	788	564
8	06.11.20	Lower Dungari	11:15 AM	3.48	7.3	619	532
9	06.11.20	Upper Dungari	10:55 AM	2.32	7.2	698	528
10	06.11.20	Pattia Basti	10:25 AM	2.48	7.3	692	706
11	06.11.20	Kenduadih Basti	10:10 AM	1.98	7.1	724	586
12	06.11.20	Jorapokhar Kushtand	12:40 PM	3.65	7.3	742	602
13	06.11.20	Jamadoba 3 No	09:35AM	3.12	7.1	720	584
14	06.11.20	6&7 Pits (Ayodhya Nagri)	01:25 PM	2.88	7.2	668	622



Sr. Manager (Environment)

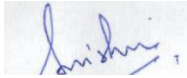
Environment Quality Report (Period- October'20 to March'21)

Annexure- I

Ground Water Quality Analysis (Hand Pump & Dug Well)

(Winter Season- January'2021)

S.No	Date	Location	Time	Depth in meter	pH	Electrical Conductivity $\mu\text{S/m}$	Total Hardness(as CaCO_3),mg/l
1	07.01.21	Purnadih (Jorapokhar)	09:40 AM	5.10	7.3	768	548
2	07.01.21	Bhowra 13 No	10:15 AM	2.28	7.4	652	546
3	07.01.21	Mohalbani Basti	10:45 AM	6.64	7.1	748	588
4	07.01.21	Digwadih 12 No	11:05 AM	3.48	7.2	584	812
5	07.01.21	Digwadih 10 No F & J	11:30 AM	2.98	7.3	1028	586
6	07.01.21	Kalimela Shivmandir	01:10 PM	2.26	7.4	812	688
7	07.01.21	Kalimela Kalimandir	01:25 PM	2.98	7.5	782	552
8	07.01.21	Lower Dungari	01:50 PM	3.62	7.2	630	546
9	07.01.21	Upper Dungari	02:20 PM	2.63	7.3	720	532
10	07.01.21	Pattia Basti	02:45 PM	2.62	7.4	706	686
11	07.01.21	Kenduadih Basti	03:10 PM	2.12	7.2	732	590
12	07.01.21	Jorapokhar Kushtand	09:15 AM	3.74	7.1	764	610
13	07.01.21	Jamadoba 3 No	04:00 PM	3.42	7.0	724	588
14	07.01.21	6&7 Pits (Ayodhya Nagri)	12:05 PM	2.92	7.1	672	568



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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AAQ-1/11/20

TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF AMBIENT AIR*

Name of the Customer : Tata Steel Colliery (Jamadoba Group)
Address of the Customer : Jamadoba, Distt. Dhanbad
Jharkhand
Date of Sampling : 13.11.2020
Sample Collected By : Mr. Virendra Pandey
Sampling Method : IS: 5182
Instrument Used : RDS & FDS
Location : Central Work Shop Area, Jamadoba

Sl. No.	Tests Conducted	Method	Results	Detection Range	NAAQ Standards as per CPCB, New Delhi, Nov. 18 th , 2009
1.	PM _{2.5} (µg/m ³)	SOP NO. A -15, Issue No.1 date 26.07.2016 (Gravimetric Method)	47.5	12.5-1000	60
2.	PM ₁₀ (µg/m ³)	IS:5182 (Part-23)	92.5	12.5-1000	100
3.	SO ₂ (µg/m ³)	IS:5182 (Part-2)	23.5	9-200	80
4.	NO ₂ (µg/m ³)	IS:5182 (Part-6)	30.5	6-200	80
5.	NH ₃ (µg/m ³)	SOP NO. A -26, Issue No.1 date 26.07.2016 (Indophenol Method)	17.5	2-700	400
6.	O ₃ (µg/m ³)	IS:5182(Part-9)	18.8	2-200	180
7.	CO (mg/m ³)	IS:5182 (Part-10)	1.05	0.2-500	04
8.	Pb (µg/m ³)	IS:5182(Part-22)	BDL	1-100	1.0
9.	Cr (µg/m ³)	SOP NO. A -23, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	-
10.	Cd (µg/m ³)	SOP NO. A -24, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	-
11.	As (ng/m ³)	SOP NO. A -22, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	06
12.	Ni (ng/m ³)	SOP NO. A -21, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	20

*The results is related only to tested item. **Note:** Below Detection Limit


Analyst


Authorized Signatory


Quality Manager

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FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AAQ-2/11/20

TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF AMBIENT AIR*

Name of the Customer : Tata Steel Colliery (Jamadoba Group)
Address of the Customer : Jamadoba, Distt. Dhanbad
Jharkhand
Date of Sampling : 08.11.2020
Sample Collected By : Mr. Virendra Pandey
Sampling Method : IS: 5182
Instrument Used : RDS & FDS
Location : Officers Colony, 12 No. Digwadih

Sl. No.	Tests Conducted	Method	Results	Detection Range	NAAQ Standards as per CPCB, New Delhi, Nov. 18 th , 2009
1.	PM _{2.5} (µg/m ³)	SOP NO. A -15, Issue No.1 date 26.07.2016 (Gravimetric Method)	41.5	12.5-1000	60
2.	PM ₁₀ (µg/m ³)	IS:5182 (Part-23)	88.6	12.5-1000	100
3.	SO ₂ (µg/m ³)	IS:5182 (Part-2)	18.5	9-200	80
4.	NO ₂ (µg/m ³)	IS:5182 (Part-6)	36.3	6-200	80
5.	NH ₃ (µg/m ³)	SOP NO. A -26, Issue No.1 date 26.07.2016 (Indophenol Method)	17.8	2-700	400
6.	O ₃ (µg/m ³)	IS:5182(Part-9)	20.6	2-200	180
7.	CO (mg/m ³)	IS:5182 (Part-10)	1.8	0.2-500	04
8.	Pb (µg/m ³)	IS:5182(Part-22)	BDL	1-100	1.0
9.	Cr (µg/m ³)	SOP NO. A -23, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	-
10.	Cd (µg/m ³)	SOP NO. A -24, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	-
11.	As (ng/m ³)	SOP NO. A -22, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	06
12.	Ni (ng/m ³)	SOP NO. A -21, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	20

*The results is related only to tested item. Note: Below Detection Limit.


Analyst


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FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AAQ-3/11/20

TEST REPORT ISSUE DATE: 11.12.2020


TEST REPORT OF AMBIENT AIR*

Name of the Customer : Tata Steel Colliery (Jamadoba Group)
Address of the Customer : Jamadoba, Distt. Dhanbad
Jharkhand
Date of Sampling : 09.11.2020
Sample Collected By : Mr. Virendra Pandey
Sampling Method : IS: 5182
Instrument Used : RDS & FDS
Location : General Manager's Office Area

Sl. No.	Tests Conducted	Method	Results	Detection Range	NAAQ Standards as per CPCB, New Delhi, Nov. 18 th , 2009
1.	PM _{2.5} (µg/m ³)	SOP NO. A -15, Issue No.1 date 26.07.2016 (Gravimetric Method)	40.5	12.5-1000	60
2.	PM ₁₀ (µg/m ³)	IS:5182 (Part-23)	83.6	12.5-1000	100
3.	SO ₂ (µg/m ³)	IS:5182 (Part-2)	18.5	9-200	80
4.	NO ₂ (µg/m ³)	IS:5182 (Part-6)	32.4	6-200	80
5.	NH ₃ (µg/m ³)	SOP NO. A -26, Issue No.1 date 26.07.2016 (Indophenol Method)	13.7	2-700	400
6.	O ₃ (µg/m ³)	IS:5182(Part-9)	18.6	2-200	180
7.	CO (mg/m ³)	IS:5182 (Part-10)	1.65	0.2-500	04
8.	Pb(µg/m ³)	IS:5182(Part-22)	BDL	1-100	1.0
9.	Cr (µg/m ³)	SOP NO. A -23, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	-
10.	Cd (µg/m ³)	SOP NO. A -24, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	-
11.	As (ng/m ³)	SOP NO. A -22, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	06
12.	Ni (ng/m ³)	SOP NO. A -21, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	20

*The results is related only to tested item. Note: Below Detection Limit


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Quality Manager

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FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AAQ-4/11/20
TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF AMBIENT AIR*

Name of the Customer : Tata Steel Colliery (Jamadoba Group)
Address of the Customer : Jamadoba, Distt. Dhanbad
Jharkhand
Date of Sampling : 12.11.2020
Sample Collected By : Mr. Virendra Pandey
Sampling Method : IS: 5182
Instrument Used : RDS & FDS
Location : Jamadoba Colliery

Sl. No.	Tests Conducted	Method	Results	Detection Range	NAAQ Standards as per CPCB, New Delhi, Nov. 18 th , 2009
1.	PM _{2.5} ($\mu\text{g}/\text{m}^3$)	SOP NO. A -15, Issue No.1 date 26.07.2016 (Gravimetric Method)	41.5	12.5-1000	60
2.	PM ₁₀ ($\mu\text{g}/\text{m}^3$)	IS:5182 (Part-23)	80.5	12.5-1000	100
3.	SO ₂ ($\mu\text{g}/\text{m}^3$)	IS:5182 (Part-2)	15.3	9-200	80
4.	NO ₂ ($\mu\text{g}/\text{m}^3$)	IS:5182 (Part-6)	18.8	6-200	80
5.	NH ₃ ($\mu\text{g}/\text{m}^3$)	SOP NO. A -26, Issue No.1 date 26.07.2016 (Indophenol Method)	32.8	2-700	400
6.	O ₃ ($\mu\text{g}/\text{m}^3$)	IS:5182(Part-9)	19.6	2-200	180
7.	CO (mg/m ³)	IS:5182 (Part-10)	1.04	0.2-500	04
8.	Pb($\mu\text{g}/\text{m}^3$)	IS:5182(Part-22)	BDL	1-100	1.0
9.	Cr ($\mu\text{g}/\text{m}^3$)	SOP NO. A -23, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	-
10.	Cd ($\mu\text{g}/\text{m}^3$)	SOP NO. A -24, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	-
11.	As (ng/m ³)	SOP NO. A -22, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	06
12.	Ni (ng/m ³)	SOP NO. A -21, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	20

*The results is related only to tested item. Note: Below Detection Limit.

Ravi Bhargava
Analyst

Ravi Bhargava
Authorized Signatory

Abhishek
Quality Manager

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FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AN/11/20

TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF AMBIENT NOISE LEVEL

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

Sl. No.	Locations	Date of Monitoring	Day Time			Night Time		
			Max.	Min.	Leq.	Max.	Min.	Leq.
1.	Central Work Shop Area Jamadoba	11.11.2020	69.3	56.8	58.1	63.5	50.5	54.0
2.	Officer's Colony, 12 No, Digwadih	11.11.2020	60.8	54.1	56.3	49.8	45.3	47.2
3.	General Manager's Office Area	09.11.2020	54.2	48.9	51.4	47.4	41.4	43.0
4.	Jamadoba Colliery	11.11.2020	71.7	55.6	67.5	67.5	50.3	53.6

Noise (Ambient Standard)

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

Note:

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


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FORMAT NO. ECO/QS/FORMAT/10 TEST REPORT NO: ECO LAB/MCPM/11/20
TEST REPORT ISSUE DATE: 11.12.2020

MINERALOGICAL COMPOSITION OF PARTICULATE MATTER


Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)

Address of the Customer: Jamadoba,
Distt. Dhanbad - 828 112

Month : November, 2020

S.NO.	Locations	Date of Sampling	Mineralogical Composition (in %)			
			Silica (SiO ₂)	Ferrous oxide (FeO)	Alumina (Al ₂ O ₃)	Calcium Oxide CaO
1	Central Workshop Area, Jamadoba	09.11.2020	2.7	0.19	1.38	2.84
2	Officer's Colony, 12 No Digwadih	10.11.2020	1.64	0.08	1.41	2.88


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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/1244/11/20
TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF DRINKING WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : Jamadoba Canteen
Sample ID Code : ELW-12619

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 18506:1991(Reaff.2012)	
					Desirable	Permissible
1.	Colour (Hazem unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Odour	APHA, 23rd Ed. 2017, 2130 B	Agreeable	Qualitative	Agreeable	Agreeable
3.	Taste	APHA, 23rd Ed. 2017, 2140 A+B	Agreeable	Qualitative	Agreeable	Agreeable
4.	Turbidity as (NTU)	APHA, 23rd Ed. 2017, 2130 A+B	1.51	1-100	1.0	5.0
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.14	2-12	6.5-8.5	No Relax.
6.	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540-C	685.0	5-5000	500	2000
7.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+B	192.0	5-1500	200	600
8.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	204.0	5-1500	200.0	600.0
9.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	56.0	5-1000	75.0	200.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.21	0.02-50	0.3	No Relax.
12.	Manganese as Mn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.1-5	0.10	0.30
13.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	30.0	5-1000	250.0	1000.0
14.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO ₄ -E	43.1	1.0-250	200.0	400.0
15.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO ₃ -B	9.22	5-100	45.0	No Relax.
16.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.30	0.05-10	1.0	1.5
17.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
18.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax.
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax.
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.26	0.02-80	5	15
22.	Aluminium as Al (mg/l)	APHA, 23rd Ed. 2017, 3500Al A+B	BDL	1-100	0.03	0.2
23.	Chromium as Cr+6 (mg/l)	APHA, 23rd Ed. 2017, 3111A+B	BDL	0.05-100	0.05	No Relax.
24.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN, A+D	BDL	0.02-10	0.05	No Relax.
25.	Free Residual Chlorine (mg/l)	APHA, 23rd Ed. 2017, 4500-Cl B	BDL	0.1-5	0.20	1.0
26.	Phenolic Compounds as C ₆ H ₅ OH (mg/l)	APHA, 23rd Ed. 2017, 5530 A+C	BDL	1-10	0.001	0.002
27.	Mineral Oil (mg/l)	APHA, 23rd Ed. 2017, Class -4 Infrared Partition Method	BDL	0.01-10	0.5	No Relax.
28.	Boron as B (mg/l)	APHA, 23rd Ed. 2017, 4500 B A+C	0.27	0.2-10	0.5	1.0
29.	Total Coliform (MPN/100ml)	APHA, 23rd Ed. 2017, 9221 A+B	Absent	LR	Absent	Absent

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

Ravi Bhargava
Analyst

Ravi Bhargava
Authorized Signatory

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

TEST REPORT NO: ECO LAB/DW/1244/11/20


TEST REPORT ISSUE DATE: 11.12.2020

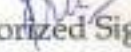
TEST REPORT OF DRINKING WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : Digwadih Club
Sample ID Code : ELW-12620

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff.2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Odour	APHA, 23rd Ed. 2017, 2150 B	Agreeable	Qualitative	Agreeable	Agreeable
3.	Taste	APHA, 23rd Ed. 2017, 2160 A+B	Agreeable	Qualitative	Agreeable	Agreeable
4.	Turbidity as (NTU)	APHA, 23rd Ed. 2017, 2120 A+B	1.26	1-100	1.0	5.0
5.	pH	APHA, 23rd Ed. 2017, 4500B+ A+B	7.36	2-12	6.5-8.5	No Relax.
6.	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540-C	651.0	5-5000	500	2000
7.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+B	188.0	5-1500	200	600
8.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	212.0	5-1500	200.0	600.0
9.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	44.0	5-1000	75.0	200.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.26	0.02-50	0.3	No Relax.
12.	Manganese as Mn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.1-5	0.10	0.30
13.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	36.0	5-1000	250.0	1000.0
14.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	41.1	1.0-250	200.0	400.0
15.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	12.02	5-100	45.0	No Relax.
16.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.30	0.05-10	1.0	1.5
17.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
18.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax.
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax.
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.05	0.02-50	5	15
22.	Aluminium as Al (mg/l)	APHA, 23rd Ed. 2017, 3500Al A+B	BDL	1-100	0.03	0.2
23.	Chromium as Cr+6 (mg/l)	APHA, 23rd Ed. 2017, 3111A+B	BDL	0.05-100	0.05	No Relax.
24.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN, A+D	BDL	0.02-10	0.05	No Relax.
25.	Free Residual Chlorine (mg/l)	APHA, 23rd Ed. 2017, 4500-Cl B	BDL	0.1-5	0.20	1.0
26.	Phenolic Compounds as C ₆ H ₅ OH (mg/l)	APHA, 23rd Ed. 2017, 5530 A+C	BDL	1-10	0.001	0.002
27.	Mineral Oil 6 (mg/l)	APHA, 23rd Ed. 2017, Class-6 Infrared Partition Method	BDL	0.01-10	0.5	No Relax.
28.	Boron as B (mg/l)	APHA, 23rd Ed. 2017, 4500 B A+C	0.22	0.2-10	0.5	1.0
29.	Total Coliform (MPN/100ml)	APHA, 23rd Ed. 2017, 9221 A+B	Absent	1.8	Absent	Absent

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


Analyst


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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF GROUND WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : Purnadih (Jorapokhar)
Sample ID Code : ELW-12623

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per 15 10500:1991(Reaff:2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Temperature (°C)	APHA, 23rd Ed. 2017, (2950 A+B)	27.3	10-100	-	-
3.	Electrical Conductivity (µmhos/cm)	APHA, 23rd Ed. 2017, 2510-A+B	932.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA, 23rd Ed. 2017 (2540B)	639.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.56	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+B	220.0	5-1500	200	600
7.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	240.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	62.4	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 23rd Ed. 2017, 3500 Mg A+B	20.41	5-1000	30.0	100.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.13	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	80.0	5-1000	250.0	1000.0
13.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- I	63.5	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	10.2	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.40	0.05-10	1.0	1.5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax.
18.	Nickel as Ni (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax.
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax.
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.10	0.02-50	5	15
22.	Total Chromium as Cr (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-50	0.05	No Relax.
23.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN, A+D	BDL	0.02-10	0.05	No Relax.

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


Analyst


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Quality Manager

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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF GROUND WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : Digwadih 10 No, F&J
Sample ID Code : ELW-12624

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff:2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Temperature (°C)	APHA, 23rd Ed. 2017, (2560 A+B)	26.5	10-100	-	-
3.	Electrical Conductivity (µmhos/cm)	APHA, 23rd Ed. 2017, 2510-A+B	768.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA, 23rd Ed. 2017 (2540B)	520.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.62	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+B	196.0	5-1500	200	600
7.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	228.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	52.8	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 23rd Ed. 2017, 3500 Mg A+B	23.32	5-1000	30.0	100.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.23	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	70.0	5-1000	250.0	1000.0
13.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	55.01	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	13.21	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.39	0.05-10	1.0	1.5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax.
18.	Nickel as Ni (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax.
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax.
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.13	0.02-50	5	15
22.	Total Chromium as Cr (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-50	0.05	No Relax.
23.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN, A+D	BDL	0.02-10	0.05	No Relax.

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


Analyst


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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF GROUND WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : Kalimela Kalimandir
Sample ID Code : ELW-12625

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991 (Reaff:2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Temperature (°C)	APHA, 23rd Ed. 2017, (2550 A+B)	26.7	10-100	-	-
3.	Electrical Conductivity (µmhos/cm)	APHA, 23rd Ed. 2017, 2510-A+B	812.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA, 23rd Ed. 2017 (2540B)	505.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.37	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+B	176.0	5-1500	200	600
7.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	192.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	48.0	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 23rd Ed. 2017, 3500 Mg A+B	17.49	5-1000	30.0	100.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.16	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	48.0	5-1000	250.0	1000.0
13.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	54.27	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	9.99	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.69	0.05-10	1.0	1.5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax.
18.	Nickel as Ni (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax.
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax.
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.09	0.02-50	5	15
22.	Total Chromium as Cr (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-50	0.05	No Relax.
23.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN, A+D	BDL	0.02-10	0.05	No Relax.

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


Analyst


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Quality Manager

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF GROUND WATER*


Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : Upper Dungari
Sample ID Code : ELW-12626

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff.2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Temperature (°C)	APHA, 23rd Ed. 2017, (2550 A+B)	26.1	10-100	-	-
3.	Electrical Conductivity (µmhos/cm)	APHA, 23rd Ed. 2017, 2510-A+B	1020.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA, 23rd Ed. 2017 (2540B)	695.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.50	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+B	216.0	5-1500	200	600
7.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	240.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	65.6	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 23rd Ed. 2017, 3500 Mg A+B	18.46	5-1000	30.0	100.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.20	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	64.0	5-1000	250.0	1000.0
13.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	60.2	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	15.3	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.61	0.05-10	1.0	1.5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax.
18.	Nickel as Ni (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax.
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax.
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.20	0.02-50	5	15
22.	Total Chromium as Cr (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-50	0.05	No Relax.
23.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN, A+D	BDL	0.02-10	0.05	No Relax.

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


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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/1244/11/20

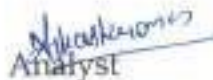
TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF GROUND WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : Kenduadih Basti
Sample ID Code : ELW-12627

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991 (Reaff:2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Temperature (°C)	APHA, 23rd Ed. 2017, (2550 A+B)	27.3	10-100	-	-
3.	Electrical Conductivity (µmhos/cm)	APHA, 23rd Ed. 2017, 2510-A+B	817.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA, 23rd Ed. 2017 (2540B)	433.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.20	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+ B	196.0	5-1500	200	600
7.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	212.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	49.6	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 23rd Ed. 2017, 3500 Mg A+B	21.38	5-1000	30.0	100.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.26	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	38.0	5-1000	250.0	1000.0
13.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	36.21	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	10.11	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.61	0.05-10	1.0	1.5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax.
18.	Nickel as Ni (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax.
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax.
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.09	0.02-50	5	15
22.	Total Chromium as Cr (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-50	0.05	No Relax.
23.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN, A+D	BDL	0.02-10	0.05	No Relax.

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


Analyst


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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF GROUND WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : 6&7 Pits (Ayodhya Nagar)
Sample ID Code : ELW-12628

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff:2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Temperature (°C)	APHA, 23rd Ed. 2017, (2550 A+B)	26.5	10-100	-	-
3.	Electrical Conductivity (µmhos/cm)	APHA, 23rd Ed. 2017, 2510-A+B	796.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA, 23rd Ed. 2017 (2540B)	524.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.39	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+B	220.0	5-1500	200	600
7.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	264.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	67.2	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 23rd Ed. 2017, 3500 Mg A+B	23.32	5-1000	30.0	100.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.16	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	58.0	5-1000	250.0	1000.0
13.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO ₄ -E	42.05	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO ₃ -B	13.95	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.67	0.05-10	1.0	1.5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax.
18.	Nickel as Ni (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax.
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax.
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.22	0.02-50	5	15
22.	Total Chromium as Cr (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-50	0.05	No Relax.
23.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN, A+D	BDL	0.02-10	0.05	No Relax.

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


Analyst


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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/SW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020


TEST REPORT OF SURFACE WATER

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : Damodar River, Up Stream
Sample ID Code : ELW-12601

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	IS:2296 Class-C
1.	pH	APHA, 23rd Ed. 2017 (4500H+A+B)	7.34	2-12	8.5
2.	Turbidity as (NTU)	APHA, 23rd Ed. 2017, 2130-A+B	11.0	1-100	-
3.	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017 (2540C)	635.0	5-10000	1500
4.	Dissolved Oxygen as DO (mg/l)	APHA, 23rd Ed. 2017 (4500 A+C)	6.5	2-10	4.0
5.	Biochemical Oxygen Demand as BOD (mg/l)	APHA, 23rd Ed. 2017 (5210A+ B)	BDL	5-10000	3.0
6.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	50.0	5-1000	-
7.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017 (4500 -C)	0.55	0.05-10	1.5
8.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017 (4500 -SO ₄ ²⁻ E)	46.2	1.0-250	400.0

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


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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/SW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF SURFACE WATER

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112.
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : Damodar River, Down Stream
Sample ID Code : ELW-12602

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	IS:2296 Class-C
1.	pH	APHA, 23rd Ed. 2017, 4500H+A+B,	7.67	2-12	8.5
2.	Turbidity as (NTU)	APHA, 23rd Ed. 2017, 2130-A+B	14.0	1-100	-
3.	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017 (2540C)	679.0	5-10000	1500
4.	Dissolved Oxygen as DO (mg/l)	APHA, 23rd Ed. 2017 (4500 A+C)	5.8	2-10	4.0
5.	Biochemical Oxygen Demand as BOD (mg/l)	APHA, 23rd Ed. 2017 (5210A+ B)	BDL	5-10000	3.0
6.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	60.0	5-1000	-
7.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017 (4500 - C)	0.55	0.05-10	1.5
8.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017 (4500 -SO ₄ E)	53.6	1.0-250	400.0

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

BDL - Below Detection Limit


Analyst


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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : 2Pit Jamadoba Colliery
Sample ID Code : ELW-12609

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4000H A+B	7.76	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	15.5	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	622.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5820 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	8.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	34.0	5-50000	250.0

*The result are related only to item tested.

BDL = Below Detection Limit.


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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : 2 Incline Jamadoba Colliery
Sample ID Code : ELW-12610

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H ⁺ A+B	7.49	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	13.6	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	591.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	9.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	20.0	5-50000	250.0

*The result are related only to item tested.

BDL = Below Detection Limit


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TEST REPORT NO: ECO LAB/WW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : 6&7 Pit Colliery
Sample ID Code : ELW-12611

SL No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H A+B	8.11	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	9.63	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	746.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	6.5	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	28.0	5-50000	250.0

*The result are related only to item tested.

BDL = Below Detection Limit


 Analyst


 Authorized Signatory


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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : Digwadih Colliery
Sample ID Code : ELW-12612

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H ⁺ A+B	7.53	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	14.1	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	678.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5820 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	7.5	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	24.0	5-50000	250.0

*The result are related only to item tested.

BDL = Below Detection Limit


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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : JCPP (Final Settling Pond)
Sample ID Code : ELW-12613

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection
1	Ph	APHA, 23rd Ed. 2017, 4500H A+B	8.20	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	17.4	5-5000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	925.0	10-10,000
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	6.53	5-600
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	11.0	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	32.0	5-50000

*The result are related only to item tested.

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : T.C.H Point -1 (Near Children's Ward)
Sample ID Code : ELW-12614

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4900F A+B	7.06	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	43.6	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	822.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	13.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	96.0	5-50000	250.0

*The result are related only to item tested.

BDL = Below Detection Limit


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TEST REPORT NO: ECO LAB/WW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
 Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112
 Sampling Method : APHA, 23rd Ed. 2017
 Sample Collected by : Mr. Virendra Pandey
 Sample Quantity : As per requirement
 Date of Sampling : 10.11.2020 to 12.11.2020
 Date of Sample Receiving : 18.11.2020
 Date of Analysis : 18.11.2020 to 02.12.2020
 Source of Sample : ETP Inlet Jamadoba Canteen
 Sample ID Code : ELW-12634

SL No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H ⁺ A+B	8.23	3-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	148.0	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	933.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 5days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	25.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	158.0	5-50000	250.0

*The result are related only to item tested.

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

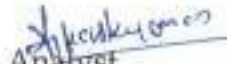
TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : ETP Outlet Jamadoba Canteen
Sample ID Code : ELW-12635

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23 rd Ed. 2017, 4500F A+B	7.59	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23 rd Ed. 2017, 2540D	42.2	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23 rd Ed. 2017, 2540C	861.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23 rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23 rd Ed. 2017, 5210 A+B	14.5	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 rd Ed. 2017, 5220 A+B	63.0	5-50000	250.0

*The result are related only to item tested.

BDL = Below Detection Limit


Analyst


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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
 Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112
 Sampling Method : APHA, 23rd Ed. 2017
 Sample Collected by : Mr. Virendra Pandey
 Sample Quantity : As per requirement
 Date of Sampling : 10.11.2020 to 12.11.2020
 Date of Sample Receiving : 18.11.2020
 Date of Analysis : 18.11.2020 to 02.12.2020
 Source of Sample : ETP Inlet JCPP canteen
 Sample ID Code : ELW-12636

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection
1	pH	APHA, 23rd Ed. 2017, 4500H ⁺ A+B	7.49	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	134.0	5-5000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	1124.0	10-10,000
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	28.0	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	160.0	5-50000

*The result are related only to item tested.

BDL = Below Detection Limit


 Analyst


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FORMAT NO. ECO/Q5/FORMAT/07

TEST REPORT NO: ECO LAB/WW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : ETP Outlet JCPP canteen
Sample ID Code : ELW-12637

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H ⁺ A+B	7.05	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	32.55	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	756.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	17.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	74.0	5-50000	250.0

*The result are related only to item tested.

BDL = Below Detection Limit


Analyst


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FORMAT NO. ECO/Q5/FORMAT/07

TEST REPORT NO: ECO LAB/WW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF WASTE WATER*

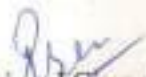
Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : ETP Inlet TCH
Sample ID Code : ELW-12638

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection
1	pH	APHA, 23rd Ed. 2017, 4500F A+B	6.90	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	131.4	5-5000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	784.0	10-10,000
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	29.0	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	180.0	5-50000

*The result are related only to item tested.

BDL = Below Detection Limit


Analyst


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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : ETP Outlet TCH
Sample ID Code : ELW-12639

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H ⁺ A+B	7.51	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	34.5	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	1002.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	19.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	80.0	5-50000	250.0

*The result are related only to item tested.

BDL = Below Detection Limit


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FORMAT NO. ECO/Q5/FORMAT/07

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TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : ETP Inlet Garage
Sample ID Code : ELW-12640

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection
1	pH	APHA, 23rd Ed. 2017, 4500H A+B	7.45	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	177.0	5-5000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	916.0	10-10,000
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	27.0	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	176.0	5-50000

*The result are related only to item tested.

BDL = Below Detection Limit


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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : ETP Outlet Garage
Sample ID Code : ELW-12641

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H A+B	7.38	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	30.62	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	1110.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5620 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	21.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	84.0	5-50000	250.0

*The result are related only to item tested.

BDL = Below Detection Limit


Analyst


Authorized Signatory


Quality Manager

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/1244/11/20

TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : STP Inlet Railway Colony
Sample ID Code : ELW-12642

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection
1	pH	APHA, 23rd Ed. 2017, 4500H ⁺ A+B	8.20	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	149.0	5-5000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	815.0	10-10,000
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	44.0	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	374.0	5-50000

*The result are related only to item tested.

BDL = Below Detection Limit


Analyst


Authorized Signatory


Quality Manager

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FORMAT NO. ECO/Q5/FORMAT/07

TEST REPORT NO: ECO LAB/WW/1244/11/20
TEST REPORT ISSUE DATE: 11.12.2020

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Virendra Pandey
Sample Quantity : As per requirement
Date of Sampling : 10.11.2020 to 12.11.2020
Date of Sample Receiving : 18.11.2020
Date of Analysis : 18.11.2020 to 02.12.2020
Source of Sample : STP Outlet Railway Colony
Sample ID Code : ELW-12643

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H A+B	7.35	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	46.3	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	796.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 5days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	16.5	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	70.0	5-50000	250.0

*The result are related only to item tested.

BDL = Below Detection Limit


Analyst


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FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AAQ-1/02/21

TEST REPORT ISSUE DATE: 09.04.2021

TEST REPORT OF AMBIENT AIR*

Name of the Customer : Tata Steel Colliery (Jamadoba Group)
 Address of the Customer : Jamadoba, Distt. Dhanbad
 Jharkhand
 Date of Sampling : 08.02.2021
 Sample Collected By : Mr. Arvind Singh
 Sampling Method : IS: 5182
 Instrument Used : RDS & FDS
 Location : Central Work Shop Area, Jamadoba

Sl. No.	Tests Conducted	Method	Results	Detection Range	NAAQ Standards as per CPCB, New Delhi, Nov. 18 th , 2009
1.	PM _{2.5} (µg/m ³)	SOP NO. A -15, Issue No.1 date 26.07.2016 (Gravimetric Method)	44.8	12.5-1000	60
2.	PM ₁₀ (µg/m ³)	IS:5182 (Part-23)	85.5	12.5-1000	100
3.	SO ₂ (µg/m ³)	IS:5182 (Part-2)	20.5	9-200	80
4.	NO ₂ (µg/m ³)	IS:5182 (Part-6)	28.5	6-200	80
5.	NH ₃ (µg/m ³)	SOP NO. A -26, Issue No.1 date 26.07.2016 (Indophenol Method)	16.5	2-700	400
6.	O ₃ (µg/m ³)	IS:5182(Part-9)	18.3	2-200	180
7.	CO (mg/m ³)	IS:5182 (Part-10)	0.95	0.2-500	04
8.	Pb (µg/m ³)	IS:5182(Part-22)	BDL	1-100	1.0
9.	Cr (µg/m ³)	SOP NO. A -23, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	-
10.	Cd (µg/m ³)	SOP NO. A -24, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	-
11.	As (ng/m ³)	SOP NO. A -22, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	06
12.	Ni (ng/m ³)	SOP NO. A -21, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	20

*The results is related only to tested item. **Note:** Below Detection Limit

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Analyst

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Rocna
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FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AAQ-2/02/21

TEST REPORT ISSUE DATE: 09.04.2021

TEST REPORT OF AMBIENT AIR*

Name of the Customer : Tata Steel Colliery (Jamadoba Group)
 Address of the Customer : Jamadoba, Distt. Dhanbad
 Jharkhand
 Date of Sampling : 08.02.2021
 Sample Collected By : Mr. Arvind Singh
 Sampling Method : IS: 5182
 Instrument Used : RDS & FDS
 Location : Officers Colony, 12 No. Digwadih

Sl. No.	Tests Conducted	Method	Results	Detection Range	NAAQ Standards as per CPCB, New Delhi, Nov. 18 th , 2009
1.	PM _{2.5} (µg/m ³)	SOP NO. A -15, Issue No.1 date 26.07.2016 (Gravimetric Method)	41.28	12.5-1000	60
2.	PM ₁₀ (µg/m ³)	IS:5182 (Part-23)	88.96	12.5-1000	100
3.	SO ₂ (µg/m ³)	IS:5182 (Part-2)	18.70	9-200	80
4.	NO ₂ (µg/m ³)	IS:5182 (Part-6)	34.20	6-200	80
5.	NH ₃ (µg/m ³)	SOP NO. A -26, Issue No.1 date 26.07.2016 (Indophenol Method)	22.84	2-700	400
6.	O ₃ (µg/m ³)	IS:5182(Part-9)	21.50	2-200	180
7.	CO (mg/m ³)	IS:5182 (Part-10)	1.82	0.2-500	04
8.	Pb (µg/m ³)	IS:5182(Part-22)	BDL	1-100	1.0
9.	Cr (µg/m ³)	SOP NO. A -23, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	-
10.	Cd (µg/m ³)	SOP NO. A -24, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	-
11.	As (ng/m ³)	SOP NO. A -22, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	06
12.	Ni (ng/m ³)	SOP NO. A -21, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	20

*The results is related only to tested item. Note: Below Detection Limit.

Archan
Analyst

Rosna
Authorized Signatory

Rosna
Quality Manager

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FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AAQ-3/02/21

TEST REPORT ISSUE DATE: 09.04.2021

TEST REPORT OF AMBIENT AIR*

Name of the Customer : Tata Steel Colliery (Jamadoba Group)
 Address of the Customer : Jamadoba, Distt. Dhanbad
 Jharkhand
 Date of Sampling : 09.02.2021
 Sample Collected By : Mr. Arvind Singh
 Sampling Method : IS: 5182
 Instrument Used : RDS & FDS
 Location : General Manager's Office Area

Sl. No.	Tests Conducted	Method	Results	Detection Range	NAAQ Standards as per CPCB, New Delhi, Nov. 18 th , 2009
1.	PM _{2.5} (µg/m ³)	SOP NO. A -15, Issue No.1 date 26.07.2016 (Gravimetric Method)	41.86	12.5-1000	60
2.	PM ₁₀ (µg/m ³)	IS:5182 (Part-23)	87.28	12.5-1000	100
3.	SO ₂ (µg/m ³)	IS:5182 (Part-2)	21.20	9-200	80
4.	NO ₂ (µg/m ³)	IS:5182 (Part-6)	33.9	6-200	80
5.	NH ₃ (µg/m ³)	SOP NO. A -26, Issue No.1 date 26.07.2016 (Indophenol Method)	12.7	2-700	400
6.	O ₃ (µg/m ³)	IS:5182(Part-9)	17.4	2-200	180
7.	CO (mg/m ³)	IS:5182 (Part-10)	1.70	0.2-500	04
8.	Pb (µg/m ³)	IS:5182(Part-22)	BDL	1-100	1.0
9.	Cr (µg/m ³)	SOP NO. A -23, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	-
10.	Cd (µg/m ³)	SOP NO. A -24, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	-
11.	As (ng/m ³)	SOP NO. A -22, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	06
12.	Ni (ng/m ³)	SOP NO. A -21, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	20

*The results is related only to tested item. **Note:** Below Detection Limit

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Analyst

Archana
Authorized Signatory

Archana
Quality Manager

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FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AAQ-4/02/21

TEST REPORT ISSUE DATE: 09.04.2021

TEST REPORT OF AMBIENT AIR*

Name of the Customer : Tata Steel Colliery (Jamadoba Group)
 Address of the Customer : Jamadoba, Distt. Dhanbad
 Jharkhand
 Date of Sampling : 09.02.2021
 Sample Collected By : Mr. Arvind Singh
 Sampling Method : IS: 5182
 Instrument Used : RDS & FDS
 Location : Jamadoba Colliery

Sl. No.	Tests Conducted	Method	Results	Detection Range	NAAQ Standards as per CPCB, New Delhi, Nov. 18 th , 2009
1.	PM _{2.5} (µg/m ³)	SOP NO. A -15, Issue No.1 date 26.07.2016 (Gravimetric Method)	39.2	12.5-1000	60
2.	PM ₁₀ (µg/m ³)	IS:5182 (Part-23)	81.2	12.5-1000	100
3.	SO ₂ (µg/m ³)	IS:5182 (Part-2)	14.5	9-200	80
4.	NO ₂ (µg/m ³)	IS:5182 (Part-6)	18.2	6-200	80
5.	NH ₃ (µg/m ³)	SOP NO. A -26, Issue No.1 date 26.07.2016 (Indophenol Method)	34.6	2-700	400
6.	O ₃ (µg/m ³)	IS:5182(Part-9)	21.2	2-200	180
7.	CO (mg/m ³)	IS:5182 (Part-10)	1.16	0.2-500	04
8.	Pb(µg/m ³)	IS:5182(Part-22)	BDL	1-100	1.0
9.	Cr (µg/m ³)	SOP NO. A -23, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	-
10.	Cd (µg/m ³)	SOP NO. A -24, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	-
11.	As (ng/m ³)	SOP NO. A -22, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	06
12.	Ni (ng/m ³)	SOP NO. A -21, Issue No.1 date 26.07.2016 (CPCB-NAAQM Guideline)	BDL	1-100	20

*The results is related only to tested item. Note: Below Detection Limit.

Archana
AnalystReena
Authorized SignatoryReena
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FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AN/03/21

TEST REPORT ISSUE DATE: 09.04.2021

TEST REPORT OF AMBIENT NOISE LEVEL

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

Sl. No.	Locations	Date of Monitoring	Day Time			Night Time		
			Max.	Min.	Leq.	Max.	Min.	Leq.
1.	Central Work Shop Area Jamadoba	08.02.2021	67.5	55.8	57.4	62.8	47.9	53.2
2.	Officer's Colony, 12 No. Digwadiah	08.02.2021	57.8	52.9	52.5	48.6	44.2	45.1
3.	General Manager's Office Area	09.02.2021	52.6	48.6	50.2	46.3	40.2	41.3
4.	Jamadoba Colliery	09.02.2021	71.1	54.2	67.2	66.2	47.3	53.2

Noise (Ambient Standard)

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

Note:

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

Anchana
Analyst

Roena
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Quality Manager

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FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/MCPM/02/21

TEST REPORT ISSUE DATE: 09.04.2021

MINERALOGICAL COMPOSITION OF PARTICULATE MATTER**Name of the Customer** : M/s Tata Steel Ltd. (Jamadoba Group)**Address of the Customer** : Jamadoba,

Distt. Dhanbad - 828 112

Month

: February, 2021

S.NO.	Locations	Date of Sampling	Mineralogical Composition (in %)			
			Silica (SiO ₂)	Ferrous oxide (FeO)	Alumina (Al ₂ O ₃)	Calcium Oxide CaO
1	General Manager's Office Area	09.02.2021	1.72	0.08	1.42	2.96
2	Jamadoba Colliery	09.02.2021	2.80	0.17	1.41	2.89

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/02/21

TEST REPORT ISSUE DATE: 09.04.2021

TEST REPORT OF DRINKING WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 10.02.2021 to 13.02.2021
Date of Sample Receiving : 16.02.2021
Date of Analysis : 16.02.2021 to 27.02.2021
Source of Sample : Jamadoba Canteen

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff.2017)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Odour	APHA, 23rd Ed. 2017, 2150 B	Agreeable	Qualitative	Agreeable	Agreeable
3.	Taste	APHA, 23rd Ed. 2017, 2160 A+B	Agreeable	Qualitative	Agreeable	Agreeable
4.	Turbidity as (NTU)	APHA, 23rd Ed. 2017, 2130-A+B	1.53	1-100	1.0	5.0
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.24	2-12	6.5-8.5	No Relax.
6.	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540-C	480.0	5-5000	500	2000
7.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2520 A+B	184.0	5-1500	200	600
8.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 1040 A+C	196.0	5-1500	200.0	600.0
9.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	49.60	5-1000	75.0	200.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.20	0.02-50	0.3	No Relax.
12.	Manganese as Mn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.1-5	0.10	0.30
13.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	32.6	5-1000	250.0	1000.0
14.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO ₄ -E	45.7	1.0-250	200.0	400.0
15.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO ₃ -B	9.36	5-100	45.0	No Relax.
16.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.33	0.05-10	1.0	1.5
17.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
18.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax.
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax.
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.28	0.02-50	5	15
22.	Aluminium as Al (mg/l)	APHA, 23rd Ed. 2017, 3500Al A+B	BDL	1-100	0.03	0.2
23.	Chromium as Cr+6 (mg/l)	APHA, 23rd Ed. 2017, 3111A+B	BDL	0.05-100	0.05	No Relax.
24.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN, A+B	BDL	0.02-10	0.05	No Relax.
25.	Free Residual Chlorine (mg/l)	APHA, 23rd Ed. 2017, 4500-Cl B	BDL	0.1-5	0.20	1.0
26.	Phenolic Compounds as C ₆ H ₅ OH (mg/l)	APHA, 23rd Ed. 2017, 5530 A+C	BDL	1-10	0.001	0.002
27.	Mineral Oil 4 (mg/l)	APHA, 23rd Ed. 2017, Class-4 Infrared Partition Method	BDL	0.01-10	0.5	No Relax.
28.	Boron as B (mg/l)	APHA, 23rd Ed. 2017, 4500 B A+C	0.26	0.2-10	0.5	1.0
29.	Total Coliform (MPN/100ml)	APHA, 23rd Ed. 2017, 9221 A+B	Absent	1.8	Absent	Absent

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

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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/02/21

TEST REPORT ISSUE DATE: 09.04.2021

TEST REPORT OF DRINKING WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 10.02.2021 to 13.02.2021
Date of Sample Receiving : 16.02.2021
Date of Analysis : 16.02.2021 to 27.02.2021
Source of Sample : Digwadih Club

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Odour	APHA, 23rd Ed. 2017, 2150 B	Agreeable	Qualitative	Agreeable	Agreeable
3.	Taste	APHA, 23rd Ed. 2017, 2160 A+B	Agreeable	Qualitative	Agreeable	Agreeable
4.	Turbidity as (NTU)	APHA, 23rd Ed. 2017, 2130 A+B	1.24	1-100	1.0	5.0
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.32	3-12	6.5-8.5	No Relax.
6.	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540-C	502.0	5-5000	500	2000
7.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+B	180.0	5-1500	200	600
8.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	200.0	5-1500	200.0	600.0
9.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	52.80	5-1000	75.0	200.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.27	0.02-50	0.3	No Relax.
12.	Manganese as Mn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.1-5	0.10	0.30
13.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	38.0	5-1000	250.0	1000.0
14.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO4- E	43.1	1.0-250	200.0	400.0
15.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	13.0	5-100	45.0	No Relax.
16.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.34	0.05-10	1.0	1.5
17.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
18.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax.
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax.
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.96	0.02-50	5	15
22.	Aluminium as Al (mg/l)	APHA, 23rd Ed. 2017, 3500Al A+B	BDL	1-100	0.03	0.2
23.	Chromium as Cr+6 (mg/l)	APHA, 23rd Ed. 2017, 3111A+B	BDL	0.05-100	0.05	No Relax.
24.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN, A+D	BDL	0.02-10	0.05	No Relax.
25.	Free Residual Chlorine (mg/l)	APHA, 23rd Ed. 2017, 4500-Cl B	BDL	0.1-5	0.20	1.0
26.	Phenolic Compounds as C ₆ H ₅ OH (mg/l)	APHA, 23rd Ed. 2017, 5530 A+C	BDL	1-10	0.001	0.002
27.	Mineral Oil 6 (mg/l)	APHA, 23rd Ed. 2017, Class-6 Infrared Partition Method	BDL	0.01-10	0.5	No Relax.
28.	Boron as B (mg/l)	APHA, 23rd Ed. 2017, 4500 B A+C	0.24	0.2-10	0.5	1.0
29.	Total Coliform (MPN/100ml)	APHA, 23rd Ed. 2017, 9221 A+B	Absent	1-8	Absent	Absent

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

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Rachna
Authorized Signatory

Rachna
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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/02/21

TEST REPORT ISSUE DATE: 09.04.2021

TEST REPORT OF GROUND WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 10.02.2021 to 13.02.2021
Date of Sample Receiving : 16.02.2021
Date of Analysis : 16.02.2021 to 27.02.2021
Source of Sample : Purnadih (Jorapokhar)

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff:2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Temperature (0C)	APHA, 23rd Ed. 2017, (2850 A+B)	30.8	10-100	-	-
3.	Electrical Conductivity (µmhos/cm)	APHA, 23rd Ed. 2017, 2510-A+B	946.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA, 23rd Ed. 2017 (2540B)	650.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.60	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+ B	216.0	5-1500	200	600
7.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	244.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	59.2	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 23rd Ed. 2017, 3500 Mg A+B	23.32	5-1000	30.0	100.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.16	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	82.4	5-1000	250.0	1000.0
13.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO ₄ - E	66.2	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO ₃ - B	10.3	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.91	0.05-10	1.0	1.5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax.
18.	Nickel as Ni (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax.
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax.
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.12	0.02-50	5	15
22.	Total Chromium as Cr (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-50	0.05	No Relax.
23.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN, A+D	BDL	0.02-10	0.05	No Relax.

*The result are related only to item tested.

BDL = Below Detection Limit

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/02/21

TEST REPORT ISSUE DATE: 09.04.2021

TEST REPORT OF GROUND WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
 Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112
 Sampling Method : APHA, 23rd Ed. 2017
 Sample Collected by : Mr. Arvind Singh
 Sample Quantity : As per requirement
 Date of Sampling : 10.02.2021 to 13.02.2021
 Date of Sample Receiving : 16.02.2021
 Date of Analysis : 16.02.2021 to 27.02.2021
 Source of Sample : Digwadih 10 No, F&J

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff:2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Temperature (°C)	APHA, 23rd Ed. 2017, (2550 A+B)	30.8	10-100	-	-
3.	Electrical Conductivity (µmhos/cm)	APHA, 23rd Ed. 2017, 2510-A+B	786.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA, 23rd Ed. 2017 (2540B)	528.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.50	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+B	188.0	5-1500	200	600
7.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	236.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	60.80	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 23rd Ed. 2017, 3500 Mg A+B	20.41	5-1000	30.0	100.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.05	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	72.6	5-1000	250.0	1000.0
13.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO ₄ -E	56.8	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO ₃ -B	14.08	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.62	0.05-10	1.0	1.5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax.
18.	Nickel as Ni (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax.
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax.
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.16	0.02-50	5	15
22.	Total Chromium as Cr (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-50	0.05	No Relax.
23.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN, A+D	BDL	0.02-10	0.05	No Relax.

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

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/02/21

TEST REPORT ISSUE DATE: 09.04.2021

TEST REPORT OF GROUND WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
 Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112
 Sampling Method : APHA, 23rd Ed. 2017
 Sample Collected by : Mr. Arvind Singh
 Sample Quantity : As per requirement
 Date of Sampling : 10.02.2021 to 13.02.2021
 Date of Sample Receiving : 16.02.2021
 Date of Analysis : 16.02.2021 to 27.02.2021
 Source of Sample : Kalimela Kalimandir

SL No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991 (Reaff.2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Temperature (0C)	APHA, 23rd Ed. 2017, (2550 A+B)	31.3	10-100	-	-
3.	Electrical Conductivity (umhos/cm)	APHA, 23rd Ed. 2017, 2910-A+B	816.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA, 23rd Ed. 2017 (2540B)	512.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.40	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+ B	180.0	5-1500	200	600
7.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	205.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	56.0	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 23rd Ed. 2017, 3500 Mg A+B	15.6	5-1000	30.0	100.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.085	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	52.0	5-1000	250.0	1000.0
13.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	56.0	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	10.5	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.72	0.05-10	1.0	1.5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.001-1	0.001	No Relax.
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax.
18.	Nickel as Ni (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax.
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax.
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.12	0.02-50	5	15
22.	Total Chromium as Cr (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-50	0.05	No Relax.
23.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN, A+D	BDL	0.02-10	0.05	No Relax.

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

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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/02/21

TEST REPORT ISSUE DATE: 09.04.2021

TEST REPORT OF GROUND WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
 Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112
 Sampling Method : APHA, 23rd Ed. 2017
 Sample Collected by : Mr. Arvind Singh
 Sample Quantity : As per requirement
 Date of Sampling : 10.02.2021 to 13.02.2021
 Date of Sample Receiving : 16.02.2021
 Date of Analysis : 16.02.2021 to 27.02.2021
 Source of Sample : Upper Dungari

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991 (Reaff:2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Temperature (0C)	APHA, 23rd Ed. 2017, (2550 A+B)	32.5	10-100	-	-
3.	Electrical Conductivity (umhos/cm)	APHA, 23rd Ed. 2017, 2510-A+B	1088.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA, 23rd Ed. 2017 (2540B)	698.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.56	2-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+B	208.0	5-1500	200	600
7.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	256.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	68.8	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 23rd Ed. 2017, 3500 Mg A+B	20.41	5-1000	30.0	100.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.10	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	64.0	5-1000	250.0	1000.0
13.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	48.0	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	16.8	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.64	0.05-10	1.0	1.5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax.
18.	Nickel as Ni (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax.
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax.
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.18	0.02-50	5	15
22.	Total Chromium as Cr (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-50	0.05	No Relax.
23.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN, A+D	BDL	0.02-10	0.05	No Relax.

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

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/02/21

TEST REPORT ISSUE DATE: 09.04.2021

TEST REPORT OF GROUND WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
 Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112
 Sampling Method : APHA, 23rd Ed. 2017
 Sample Collected by : Mr. Arvind Singh
 Sample Quantity : As per requirement
 Date of Sampling : 10.02.2021 to 13.02.2021
 Date of Sample Receiving : 16.02.2021
 Date of Analysis : 16.02.2021 to 27.02.2021
 Source of Sample : Kenduadih Basti

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff:2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Temperature (0C)	APHA, 23rd Ed. 2017, (2550 A+B)	30.0	10-100	-	-
3.	Electrical Conductivity (μ mhos/cm)	APHA, 23rd Ed. 2017, 2510 A+B	829.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA, 23rd Ed. 2017 (2540B)	480.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.30	3-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+B	200.0	5-1500	200	600
7.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	220.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	56.0	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 23rd Ed. 2017, 3500 Mg A+B	19.44	5-1000	30.0	100.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3500 Fe B	0.13	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4500 Cl A+B	42.0	5-1000	250.0	1000.0
13.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- I	38.60	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	20.0	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.63	0.05-10	1.0	1.5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.005	No Relax.
18.	Nickel as Ni (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax.
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax.
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.12	0.02-50	5	15
22.	Total Chromium as Cr (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-50	0.05	No Relax.
23.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN, A+D	BDL	0.02-10	0.05	No Relax.

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

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TEST REPORT OF GROUND WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
 Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112
 Sampling Method : APHA, 23rd Ed. 2017
 Sample Collected by : Mr. Arvind Singh
 Sample Quantity : As per requirement
 Date of Sampling : 10.02.2021 to 13.02.2021
 Date of Sample Receiving : 16.02.2021
 Date of Analysis : 16.02.2021 to 27.02.2021
 Source of Sample : 6&7 Pits (Ayodhya Nagar)

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:1991(Reaff:2012)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Temperature (°C)	APHA, 23rd Ed. 2017, (2550 A+B)	32.4	10-100	-	-
3.	Electrical Conductivity (µmhos/cm)	APHA, 23rd Ed. 2017, 2510-A+B	818.0	1-2000	-	-
4.	Dissolved Solids (mg/l)	APHA, 23rd Ed. 2017 (2540B)	536.0	5-10000	-	-
5.	pH	APHA, 23rd Ed. 2017, 4500H+ A+B	7.46	3-12	6.5-8.5	No Relax.
6.	Alkalinity (mg/l)	APHA, 23rd Ed. 2017, 2320 A+B	212.0	5-1500	200	600
7.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23rd Ed. 2017, 2340 A+C	252.0	5-1500	200.0	600.0
8.	Calcium as Ca (mg/l)	APHA, 23rd Ed. 2017, 3500 Ca A+B	64.0	5-1000	75.0	200.0
9.	Magnesium as Mg (mg/l)	APHA, 23rd Ed. 2017, 3500 Mg A+B	22.35	5-1000	30.0	100.0
10.	Copper as Cu (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
11.	Iron as Fe (mg/l)	APHA, 23rd Ed. 2017, 3560 Fe B	0.19	0.02-50	0.3	No Relax.
12.	Chloride as Cl (mg/l)	APHA, 23rd Ed. 2017, 4560 Cl A+B	62.2	5-1000	250.0	1000.0
13.	Sulfate as SO ₄ (mg/l)	APHA, 23rd Ed. 2017, 4500-SO42- E	43.0	1.0-250	200.0	400.0
14.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23rd Ed. 2017, 4500-NO3- B	14.26	5-100	45.0	No Relax.
15.	Fluorides as F (mg/l)	APHA, 23rd Ed. 2017, 4500-C	0.60	0.05-10	1.0	1.5
16.	Mercury as Hg (mg/l)	APHA, 23rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
17.	Cadmium as Cd (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax.
18.	Nickel as Ni (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.02-2	0.02	No Relax.
19.	Arsenic as As (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-2.0	0.01	No Relax.
20.	Lead as Pb (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.01-1.0	0.01	No Relax.
21.	Zinc as Zn (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	0.24	0.02-50	5	15
22.	Total Chromium as Cr (mg/l)	APHA, 23rd Ed. 2017, 3111 A+B	BDL	0.05-50	0.05	No Relax.
23.	Cyanide as CN (mg/l)	APHA, 23rd Ed. 2017, 4500CN, A+D	BDL	0.02-10	0.05	No Relax.

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

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TEST REPORT ISSUE DATE: 09.04.2021

TEST REPORT OF SURFACE WATER

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
 Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112
 Sampling Method : APHA, 23rd Ed. 2017
 Sample Collected by : Mr. Arvind Singh
 Sample Quantity : As per requirement
 Date of Sampling : 10.02.2021 to 13.02.2021
 Date of Sample Receiving : 16.02.2021
 Date of Analysis : 16.02.2021 to 27.02.2021
 Source of Sample : Damodar River, Up Stream

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	IS:2296 Class-C
1.	pH	APHA,23 rd Ed.2017,4500H+A+B,	7.42	2-12	8.5
2.	Turbidity as (NTU)	APHA, 23 rd Ed. 2017, 2130-A+B	12.5	1-100	-
3.	Total Dissolved Solids as TDS (mg/l)	APHA,23 rd Ed.2017 (2540C)	654.0	5-10000	1500
4.	Dissolved Oxygen as DO (mg/l)	APHA,23 rd Ed.2017 (4500 A+C)	6.8	2-10	4.0
5.	Biochemical Oxygen Demand as BOD (mg/l)	APHA,23 rd Ed.2017 (5210A+B)	BDL	5-10000	3.0
6.	Chloride as Cl (mg/l)	APHA, 23 rd Ed. 2017, 4500 Cl A+B	52.0	5-1000	-
7.	Fluorides as F (mg/l)	APHA,23 rd Ed.2017 (4500 -C)	0.58	0.05-10	1.5
8.	Sulfate as SO ₄ (mg/l)	APHA,23 rd Ed.2017 (4500 -SO ₄ E)	36.0	1.0-250	400.0

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

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TEST REPORT OF SURFACE WATER

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
 Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112
 Sampling Method : APHA, 23rd Ed. 2017
 Sample Collected by : Mr. Arvind Singh
 Sample Quantity : As per requirement
 Date of Sampling : 10.02.2021 to 13.02.2021
 Date of Sample Receiving : 16.02.2021
 Date of Analysis : 16.02.2021 to 27.02.2021
 Source of Sample : Damodar River, Down Stream

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	IS:2296 Class-C
1.	pH	APHA, 23 rd Ed. 2017, 4500H+A+B,	7.70	2-12	8.5
2.	Turbidity as (NTU)	APHA, 23 rd Ed. 2017, 2130-A+B	11.0	1-100	-
3.	Total Dissolved Solids as TDS (mg/l)	APHA, 23 rd Ed. 2017 (2540C)	688.0	5-10000	1500
4.	Dissolved Oxygen as DO (mg/l)	APHA, 23 rd Ed. 2017 (4500 A+C)	5.9	2-10	4.0
5.	Biochemical Oxygen Demand as BOD (mg/l)	APHA, 23 rd Ed. 2017 (5210A+B)	BDL	5-10000	3.0
6.	Chloride as Cl (mg/l)	APHA, 23 rd Ed. 2017, 4500 Cl A+B	63.2	5-1000	-
7.	Fluorides as F (mg/l)	APHA, 23 rd Ed. 2017 (4500 - C)	0.52	0.05-10	1.5
8.	Sulfate as SO ₄ (mg/l)	APHA, 23 rd Ed. 2017 (4500 -SO ₄ ²⁻ E)	46.0	1.0-250	400.0

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

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/02/21

TEST REPORT ISSUE DATE: 09.04.2021

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
 Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112
 Sampling Method : APHA, 23rd Ed. 2017
 Sample Collected by : Mr. Arvind Singh
 Sample Quantity : As per requirement
 Date of Sampling : 10.02.2021 to 13.02.2021
 Date of Sample Receiving : 16.02.2021
 Date of Analysis : 16.02.2021 to 27.02.2021
 Source of Sample : 2Pit Jamadoba Colliery

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H ⁺ A+B	7.72	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	20.0	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	634.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	9.2	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	38.6	5-50000	250.0

*The result are related only to item tested.

BDL = Below Detection Limit

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Address of the Customer : Jamadoba,
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Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 10.02.2021 to 13.02.2021
Date of Sample Receiving : 16.02.2021
Date of Analysis : 16.02.2021 to 27.02.2021
Source of Sample : 2 Incline Jamadoba Colliery

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23 rd Ed. 2017, 4500F A+B	7.53	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23 rd Ed. 2017, 2540D	16.0	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23 rd Ed. 2017, 2540C	508.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23 rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23 rd Ed. 2017, 5210 A+B	12.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 rd Ed. 2017, 5220 A+B	28.0	5-30000	250.0

*The result are related only to item tested.

BDL = Below Detection Limit

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Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 10.02.2021 to 13.02.2021
Date of Sample Receiving : 16.02.2021
Date of Analysis : 16.02.2021 to 27.02.2021
Source of Sample : 6&7 Pit Colliery

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 421(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H ⁺ A+B	7.6	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	10.5	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	620.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5320 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	8.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 21ed Ed. 2017, 5220 A+B	32.0	5-50000	250.0

*The result are related only to item tested.

BDL = Below Detection Limit

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Analyst

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An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/02/21

TEST REPORT ISSUE DATE: 09.04.2021

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
 Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112
 Sampling Method : APHA, 23rd Ed. 2017
 Sample Collected by : Mr. Arvind Singh
 Sample Quantity : As per requirement
 Date of Sampling : 10.02.2021 to 13.02.2021
 Date of Sample Receiving : 16.02.2021
 Date of Analysis : 16.02.2021 to 27.02.2021
 Source of Sample : Digwadih Colliery

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23 rd Ed. 2017, 4500H A+B	7.50	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23 rd Ed. 2017, 2540D	15.5	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23 rd Ed. 2017, 2540C	580.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23 rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23 rd Ed. 2017, 5210 A+B	8.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 rd Ed. 2017, 5220 A+B	27.5	5-50000	250.0

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TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 10.02.2021 to 13.02.2021
Date of Sample Receiving : 16.02.2021
Date of Analysis : 16.02.2021 to 27.02.2021
Source of Sample : JCPP (Final Settling Pond)

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection
1	Ph	APHA, 23rd Ed. 2017, 4500H A+B	7.25	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	18.5	5-5000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	915.0	10-10,000
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	6.48	5-600
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	12.3	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	38.2	5-50000

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TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 10.02.2021 to 13.02.2021
Date of Sample Receiving : 16.02.2021
Date of Analysis : 16.02.2021 to 27.02.2021
Source of Sample : T.C.H Point -1 (Near Children's Ward)

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H ⁺ A+B	7.14	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	46.2	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	840.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	12.0	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	92.3	5-50000	250.0

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TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 10.02.2021 to 13.02.2021
Date of Sample Receiving : 16.02.2021
Date of Analysis : 16.02.2021 to 27.02.2021
Source of Sample : ETP Inlet Jamadoba Canteen

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500F A+B	8.42	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	154.0	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	954.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	24.2	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	162.0	5-50000	250.0

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TEST REPORT ISSUE DATE: 09.04.2021

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 10.02.2021 to 13.02.2021
Date of Sample Receiving : 16.02.2021
Date of Analysis : 16.02.2021 to 27.02.2021
Source of Sample : ETP Outlet Jamadoba Canteen

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H ⁺ A+B	7.60	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	44.3	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	868.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	15.2	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	68.6	5-50000	250.0

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TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 10.02.2021 to 13.02.2021
Date of Sample Receiving : 16.02.2021
Date of Analysis : 16.02.2021 to 27.02.2021
Source of Sample : ETP Inlet JCPP canteen

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection
1	pH	APHA, 23rd Ed. 2017, 4500F A+B	7.54	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	142.0	5-3000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	1156.0	10-10,000
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	26.8	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	164.3	5-50000

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BDL = Below Detection Limit

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TEST REPORT NO: ECO LAB/WW/02/21

TEST REPORT ISSUE DATE: 09.04.2021

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 10.02.2021 to 13.02.2021
Date of Sample Receiving : 16.02.2021
Date of Analysis : 16.02.2021 to 27.02.2021
Source of Sample : ETP Outlet JCPP canteen

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500F A+B	7.11	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	34.60	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	764.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	19.6	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	78.4	5-50000	250.0

*The result are related only to item tested.

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TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 10.02.2021 to 13.02.2021
Date of Sample Receiving : 16.02.2021
Date of Analysis : 16.02.2021 to 27.02.2021
Source of Sample : ETP Inlet TCH

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection
1	pH	APHA, 23rd Ed. 2017, 4500H ⁺ A+B	6.82	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	136.2	5-5000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	792.8	10-10,000
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	25.5	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	177.0	5-50000

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Rachna
Authorized Signatory

Rachna
Quality Manager

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TEST REPORT ISSUE DATE: 09.04.2021

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 10.02.2021 to 13.02.2021
Date of Sample Receiving : 16.02.2021
Date of Analysis : 16.02.2021 to 27.02.2021
Source of Sample : ETP Outlet TCH

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H ⁺ A+B	7.58	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	36.2	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	1016.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	20.8	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	83.2	5-50000	250.0

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Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112
Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 10.02.2021 to 13.02.2021
Date of Sample Receiving : 16.02.2021
Date of Analysis : 16.02.2021 to 27.02.2021
Source of Sample : ETP Inlet Garage

Sl No.	TESTS	PROTOCOL	RESULT	Limits of Detection
1	pH	APHA, 23rd Ed. 2017, 4500H' A+B	7.53	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	182.0	5-5000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	932.0	10-10,000
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	28.5	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	181.0	5-50000

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LABORATORIES PVT LTD.

An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi

FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/WW/02/21

TEST REPORT ISSUE DATE: 09.04.2021

TEST REPORT OF WASTE WATER*

Name of the Customer : M/s Tata Steel Ltd. (Jamadoba Group)
 Address of the Customer : Jamadoba,
 Distt. Dhanbad - 828 112
 Sampling Method : APHA, 23rd Ed. 2017
 Sample Collected by : Mr. Arvind Singh
 Sample Quantity : As per requirement
 Date of Sampling : 10.02.2021 to 13.02.2021
 Date of Sample Receiving : 16.02.2021
 Date of Analysis : 16.02.2021 to 27.02.2021
 Source of Sample : ETP Outlet Garage

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23 rd Ed. 2017, 4500F A+B	7.43	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23 rd Ed. 2017, 2540D	32.80	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23 rd Ed. 2017, 2540C	1124.0	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23 rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23 rd Ed. 2017, 5210 A+B	23.8	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 rd Ed. 2017, 5220 A+B	82.3	5-50000	250.0

*The result are related only to item tested.

BDL - Below Detection Limit

Archan
Analyst

Reena
Authorized Signatory
 Ecomen Laboratories Pvt. Ltd.
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Reena
Quality Manager

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Sampling Method : APHA, 23rd Ed. 2017
Sample Collected by : Mr. Arvind Singh
Sample Quantity : As per requirement
Date of Sampling : 10.02.2021 to 13.02.2021
Date of Sample Receiving : 16.02.2021
Date of Analysis : 16.02.2021 to 27.02.2021
Source of Sample : STP Inlet Railway Colony

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection
1	pH	APHA, 23rd Ed. 2017, 4500F A+B	8.26	2-12
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	153.0	5-5000
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	822.0	10-10,000
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	46.3	5-10000
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	378.2	5-50000

*The result are related only to item tested.

BDL - Below Detection Limit

Archana
Analyst

Reena
Authorized Signatory

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Quality Manager

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Sample Quantity : As per requirement
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Date of Sample Receiving : 16.02.2021
Date of Analysis : 16.02.2021 to 27.02.2021
Source of Sample : STP Outlet Railway Colony

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable Limit
1	pH	APHA, 23rd Ed. 2017, 4500H A+B	7.38	2-12	5.5-9.0
2	Total Suspended Solid as TSS (mg/l)	APHA, 23rd Ed. 2017, 2540D	48.7	5-5000	100.0
3	Total Dissolved Solids as TDS (mg/l)	APHA, 23rd Ed. 2017, 2540C	806.2	10-10,000	-
4	Oil & Grease as O & G (mg/l)	APHA, 23rd Ed. 2017, 5520 (A+D)	BDL	5-600	10.0
5	Biochemical Oxygen Demand as BOD (mg/l) 3days at 27°C	APHA, 23rd Ed. 2017, 5210 A+B	18.3	5-10000	30.0
6	Chemical Oxygen Demand as COD (mg/l)	APHA, 23rd Ed. 2017, 5220 A+B	76.3	5-50000	250.0

*The result are related only to item tested.

BDL = Below Detection Limit

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