



The Deputy Director General of Forests (C),
Ministry of Environment, Forest and Climate Change,
Integrated Regional Office, (IRO) - Ranchi
2nd floor, Headquarter, Jharkhand State Housing Board Harmu Chowk,
Harmu Housing Colony, Argora, Jharkhand - 834002.

Ref No. - JMB/ENV/ JCPP/38/255/2025.
May 28th, 2025

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

SUB: Half Yearly Compliance Status Report of Environment Clearance conditions issued by MoEFCC, New Delhi to Jamadoba Coal washery, Tata Steel Limited, Dhanbad for the period October-24 to March-2025.


Dear Sir,

We are enclosing herewith compliance report for the period **October-24 to March-2025** for the EC granted vide letter no.- J-11015/203/2011-IA.II(M) dated- 3rd March 2014 issued by Ministry of Environment, Forest and Climate Change, New Delhi.

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

Thanking you,

Yours faithfully,


Head (Planning)
Jharia Division, Tata Steel Ltd.

Encl: As above.

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

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

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

TATA STEEL LIMITED

Jharia Collieries Jamadoba 828 112 Dhanbad India

Tel 91 326 2320263/2320265/2320267 Fax 91 326 2320268

Regd. Office Bombay House 24 Homi Mody Street Fort Mumbai 400 001

Tel 91 22 66658282 Fax 91 22 66657724

Corporate Identity Number L27100MH1907PLC000260 Website www.tatasteel.com

Your (**Half Yearly Compliance Report**) has been **Submitted** with following details

Proposal No	IA/JH/CMIN/7813/2012
Compliance ID	128011522
Compliance Number(For Tracking)	EC/M/COMPLIANCE/128011522/2025
Reporting Year	2025
Reporting Period	01 Jun(01 Oct - 31 Mar)
Submission Date	31-05-2025
RO/SRO Name	Shri Senthil Kumar Sampath
RO/SRO Email	agmu156@ifs.nic.in
State	JHARKHAND
RO/SRO Office Address	Integrated Regional Offices, Ranchi
Note:- SMS and E-Mail has been sent to Shri Senthil Kumar Sampath, JHARKHAND with Notification to Project Proponent.	

**Half Yearly Compliance Report
2025
01 Jun(01 Oct - 31 Mar)**

Acknowledgement

Proposal Name	Expansion of Jamadoba Coal washery (1 MTPA to 2 MTPA in 7 ha Area and 24° 31' 30" to 24° 32' 30" N & 87° 25' 00" to 87° 30' 00" E) of M/s Tata Steel Ltd. Tehsil Jharia, dist. Dhanbad, Jharkhand		
Name of Entity / Corporate Office	Tata Steel Ltd.		
Village(s)	N/A		
District	DHANBAD		
Proposal No.	IA/JH/CMIN/7813/2012	Category	Coal Mining
Plot / Survey / Khasra No.	N/A	Sub-District	N/A
State	JHARKHAND	Entity's PAN	*****2803M
MoEF File No.	J-11015/203/2011-IA.II(M)	Entity name as per PAN	UTSAV KASHYAP

Compliance Reporting Details

Reporting Year 2025

Remarks (if any) Half Yearly Compliance submission for October - 2024 to March -2025

Reporting Period 01 Jun(01 Oct - 31 Mar)

Details of Production and Project Area

Name of Entity / Corporate Office	Tata Steel Ltd.	
	Project Area as per EC Granted	Actual Project Area in Possession
Private	0	0
Revenue Land	0	0
Forest	0	0
Others	07	7
Total	7	7

Production Capacity

Sr. no	Product Name	units	Valid Upto	Capacity	Production last year	Capacity as per CTO
1	Raw Coal	Million Tons per Annum (MTPA)	N/A	2	0.06	

Conditions

Specific Conditions

Sr.No.	Condition Type	Condition Details
1	LAND RECLAMATION	Action plan be developed and implemented for abandoned tailing ponds and for their restoration to the original land use.
PPs Submission: Complied Action plan for cut-off of tailing ponds from tailing management system is in place. Abandoned tailing ponds have been reclaimed by backfilling. Biological reclamation is going on by planting native species.		Date: 30/05/2025
2	WASTE MANAGEMENT	Fly ash generated from the captive power plant of the washery be utilized for house construction, roads and such uses, strictly complying to the timeline in the EIA Notification, 2006 and maintaining proper records.
PPs Submission: Complied This is not applicable as we have ceased the operation of our captive Jamadoba power plant since April-2015.		Date: 26/05/2025
3	WASTE MANAGEMENT	Transportation of fly ash to be done properly by mechanically covered trucks.
PPs Submission: Complied This is not applicable as there is no fly ash being generated since April-2015.		Date: 26/05/2025
4	Corporate Environmental Responsibility	The proponent shall expedite the activities undertaken by TSRDS in over 30 villages in the leasehold area over 15000 households covering a population of about 1.4 lakh.
PPs Submission: Complied CSR activities of TSRDS are managed by a team of experts who are dedicatedly involved in providing benefits and improving standard of living in over 30 villages. The list of activities are developed in consultation with the village representatives and implemented in a time-bound manner.		Date: 26/05/2025
5	Corporate Environmental Responsibility	The CSR cost should be Rs 5 per Tonnes of Coal produced which should be adjusted as per the annual inflation.
PPs Submission: Complied 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 FY25 is Rs.20.50 crores.		Date: 26/05/2025
6	Corporate Environmental Responsibility	Cost for additional environmental protection measures shall be not less than Rs. 503.00 lakhs. The status of implementation including costs incurred shall be regularly reported to this Ministry and its respective Regional Office in the region as part of the compliance report and also uploaded on the company website.

PPs Submission: Complied The regular expenditure incurred for environment protection and management are submitted to MoEFCC and SPCB in Annual Environment Statement and the status is uploaded on company website as a part of compliance report of AES.		Date: 26/05/2025
7	GREENBELT	The slope of the embankment towards the river shall be at least 1:3 for stability and shall be stabilized with plantation using native species selected from the study area
PPs Submission: Complied The washery is about 1.5 kms away from the Damodar River. Hence it is not applicable.		Date: 26/05/2025
8	GREENBELT	Top soil shall be stored in the earmarked area and used within a year of its generation for green belt development and for plantation/reclamation.
PPs Submission: Complied There are no topsoil dumps hence it is not applicable.		Date: 26/05/2025
9	MINING PLAN	No external OB dump shall be created for the expansion project. Monitoring and management of existing reclaimed dumpsites shall continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment & Forests and its respective Regional Office on yearly basis.
PPs Submission: Complied Not applicable as this is a washery project.		Date: 26/05/2025
10	MINING PLAN	Catch drains and siltation ponds of appropriate size shall be constructed to arrest silt and sediment flows from soil, OB and mineral dumps. The water so collected shall be utilised for watering the mine area, roads, green belt development, etc. The drains shall be regularly desilted and maintained properly.
PPs Submission: Complied There are no soil or OB dumps in the washery premises. Only the by-products are stored in the stockyards located in the washery premises which are sold off within a week.		Date: 26/05/2025
11	Risk Mitigation and Disaster Management	Garland drains (size, gradient and length) and sump capacity shall be designed keeping 50% safety margin over and above the peak sudden rainfall and maximum discharge in the area adjoining the mine site. Sump capacity shall also provide adequate retention period to allow proper settling of silt material.
PPs Submission: Complied Garland drains of adequate size and gradient already exist around the washery area to channelize the surface runoff. The runoff is diverted to the tailing ponds and clear water is utilized in the washery.		Date: 26/05/2025
12	Risk Mitigation and Disaster Management	Dimension of the retaining wall at the toe of the dumps and OB benches within the mine to check run-off and siltation shall be based on the rainfall data.
PPs Submission: Complied Not applicable as we do not have any opencast mines.		Date: 26/05/2025
13	AIR QUALITY MONITORING AND	Crushers at the CHP shall be operated with high efficiency bag filters/water sprinkling system shall be provided to check fugitive

	PRESERVATION	emissions from crushing operations, conveyor system which shall be closed, haulage roads, transfer points, etc.
PPs Submission: Complied The following measures have been implemented: i) Dry-fog system at all transfer points of CHP ii) Enclosures around crushers. iii) Belts have been covered on top and both sides. These arrangements will protect the coal mass moving on belt from blowing wind. In this way, the dust getting air borne is being minimized. iv) Fixed water sprinklers on the haulage roads. v) In addition, movable water sprinklers are also being deployed on the roads for dust suppression. vi) Dust Extraction System vii) Strengthening of tailing management system viii) Concretization of working complex		Date: 26/05/2025
14	MISCELLANEOUS	Drills shall be wet operated only.
PPs Submission: Complied Not applicable as this is coal beneficiation plant		Date: 26/05/2025
15	Risk Mitigation and Disaster Management	Controlled blasting shall be practiced with use of delay detonators and only during daytime. The mitigative measures for control of ground vibrations and to arrest the fly rocks and boulders shall be implemented.
PPs Submission: Complied Not applicable as this is coal beneficiation plant.		Date: 26/05/2025
16	WATER QUALITY MONITORING AND PRESERVATION	The Washery shall be a zero-discharge and no wastewater shall be discharged from the washery into the drains/natural watercourses. No groundwater shall be used for washery operations. Recycled water shall be used for development and maintenance of green belt and in the plant operations.
PPs Submission: Complied Washery is already operating on a zero-discharge principle. No wastewater is discharged into the drains/ natural water systems. Only mine water is utilized for the washery operations as make up water requirement. The recycled water is again used for plant operations and green-belt development.		Date: 26/05/2025
17	Risk Mitigation and Disaster Management	The raw coal, washed coal and middling and coal wastes (rejects) shall be stacked properly at earmarked site(s) within sheds/stockyards fitted with wind breakers/shields. Adequate measures shall be taken to ensure that the stored minerals do not catch fire. The storage period shall be not more than 2-3 days.
PPs Submission: Complied The material is being stacked properly at stockyards located within the washery. We have a well-established system for disposal of rejects/ tailings to consumers so that storage period is not more than 2-3 days.		Date: 26/05/2025
18	Statutory compliance	The proponent shall maintain proper records of the ash content of raw (ROM) coal, clean coal, middling and coal rejects along with quantum of raw coal obtained and washed and dispatched every month and the same shall be uploaded on the company website every month.
PPs Submission: Complied Proper records are being maintained and the details are uploaded on the company website.		Date: 26/05/2025
19	MISCELLANEOUS	All internal roads shall be concreted or black topped and the approach roads used for the project shall be blacked topped. Facilities

		for parking of trucks carrying raw coal from the linked coalmines shall be created within the Unit.
PPs Submission: Complied All the internal roads have been concreted while the approach roads are black topped. There is a facility for parking of trucks within the unit.		Date: 26/05/2025
20	Statutory compliance	Roads used for coal transportation to the linked DRI/TPP shall be developed with 3-tier avenue plantation using a mix of native species. The trucks used for coal transportation shall be high capacity trucks. Drivers of trucks for coal transportation shall be engaged based on past records of road safety and compliance of safety regulations and shall be suitably sensitized about road safety and maintenance of vehicles to keep vehicular emissions to be within prescribed limits.
PPs Submission: Complied There is no linked DRI/TPP. - Raw coal is received via underground coal conveyor belt network from captive collieries. - Clean coal is dispatched via rail from the Rail-yard situated on the washery premises. The clean coal is kept in storage bins and directly transferred to the rail wagons through covered coal-conveying system. - As for the trucks moving for transportation of tailings and rejects are properly covered with tarpaulin. All the given provisions related to road safety and driver competence are being strictly complied with.		Date: 26/05/2025
21	Statutory compliance	The roads (internal/approach and roads used for the project) shall be regularly cleaned with mechanical sweepers and with water sprinklers. A 3-tier avenue plantation shall be developed along the major approach roads, internal roads and nearby roads used by the company.
PPs Submission: Complied Fixed Water sprinklers have already been installed in the washery premises. Plantation along the road-side is done wherever feasible. A three-tier green belt development is in progress		Date: 26/05/2025
22	GREENBELT	Green belt shall be developed along the areas such as the washery unit, crushing unit, and stockyards and at transfer points and in between mine operations and habitations.
PPs Submission: Complied Greenery has been developed in many areas around the washery premises. Saplings have been planted along the boundary of washery for greenbelt development.		Date: 26/05/2025
23	AIR QUALITY MONITORING AND PRESERVATION	Hoppers of the coal crushing unit at the crushing shed and washery unit shall be fitted with high efficiency bag filters/Dust extractors and mist spray water sprinkling system shall be installed and operated effectively at all times of operation to check fugitive emissions from crushing operations, transfer points of belt conveyor systems which shall be closed and from transportation roads.
PPs Submission: Complied Dry-fog dust suppression system has been already installed to suppress the dust generated at CHP and transfer points of belt conveyor systems. Fixed-type water sprinklers are also installed on the internal roads of the washery. These are always operated effectively to check the fugitive emissions. Fugitive dust emission monitoring is done on regularly. The values are within the stipulated norms.		Date: 26/05/2025
24	WASTE MANAGEMENT	The proponent shall ensure that coal such as stones, shale and other wastes of an ash content of 77% or more only shall be dumped into the mine voids. Coal rejects with an ash content of 76% or less shall be fully utilized for power generation in linked TPP.

PPs Submission: Complied It is being followed.		Date: 26/05/2025
25	WATER QUALITY MONITORING AND PRESERVATION	Regular monitoring of groundwater level and quality including levels of heavy metals such as Hg, Cd, Cr, Se, etc shall be carried out by establishing a network of existing wells and construction of new peizometers. The monitoring for quantity and quality of ground water as per IS: 10500 shall be done four times a year in pre-monsoon (May), monsoon (August), post-monsoon (November) and winter (January) seasons. Proper records of the data thus collected shall be maintained submitted to the Ministry of Environment & Forests and to the Central Pollution Control Board quarterly within one month of monitoring.
PPs Submission: Complied The monitoring of groundwater level and quality is done regularly as per the requirements. The groundwater quality report and groundwater level are provided in Annexure II. The monitoring of heavy metals such as Hg, Cd, Cr, Se, etc in the groundwater is done on quarterly basis by NABL accredited third party and the report has been provided in Annexure II.		Date: 26/05/2025
26	WATER QUALITY MONITORING AND PRESERVATION	As the entire mine water is proposed to be used for the mine-cum-washery operations, measures shall be taken for recharging ground water in and around the mine in the study area. A Plan for water conservation and recharge measures of ground water along with budgetary provisions be prepared and implemented in consultation with the Central/State Ground Water Board to mitigate the adverse impact of mining which may lead to depletion of ground water in the area. The Company shall put up artificial groundwater recharge measures for augmentation of groundwater resource in case monitoring of groundwater levels indicate decline of water table. Any additional water requirement for mining operation shall be met from rainwater use only. The project authorities shall meet water requirement of nearby village(s) in case the village wells go dry due to dewatering of mine.
PPs Submission: Complied Some 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 several 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.		Date: 26/05/2025
27	WATER QUALITY MONITORING AND PRESERVATION	ETP shall also be provided for treatment of effluents from workshop, CHP and an STP shall be provided in the colony and the treated effluents shall be used for green belt development. Outflow of rainfall, if any, from the mine shall meet prescribed norms and the water quality of such discharge including levels of heavy metals such as Hg, Cd, Cr., Se, etc shall be monitored at the exit points and records maintained thereof and also uploaded on the company website. Online monitoring equipment shall be installed by the proponent to ensure that the water quality parameters of mine water discharge are well within the General Discharge Standards under EP, Rules, 1986.
PPs Submission: Complied No effluent is discharged outside of the washery. There is no separate workshop in the washery premises. A central workshop exists in Jamadoba Colliery with Effluent Treatment Plant facility		Date: 26/05/2025

having Oil and Grease Trap. One Sewage Treatment Plant (STP) of 50 KLD and one STP of 10 KLD has been installed in one of the colonies of Jamadoba and Jamadoba canteen. Their treated water is used for gardening and other purpose.		
28	Human Health Environment	Besides carrying out regular periodic health check-up of their workers, 10% of the workers identified from workforce engaged in active mining operations shall be subjected to health check-up for occupational diseases and hearing impairment, if any, through a recognised agency found in the district, and the results reported to this Ministry and to DGMS.
PPs Submission: Complied Not applicable as this is coal beneficiation plant. Though PME is done for washery workers periodically at our Occupational Health centre. Records of the same has been furnished earlier.		Date: 26/05/2025
29	Statutory compliance	For monitoring land use pattern and for post mining land use, a time series of landuse maps, based on satellite imagery (on a scale of 1: 5000) of the core zone and buffer zone, from the start of the project until end of mine life shall be prepared once in 3 years (for any one particular season which is consistent in the time series), and the report submitted to MOEF and its concerned Regional Office in the region.
PPs Submission: Complied It has been complied. The LULC study has been done in 2025 by Natural Resources Division, Tata Steel Limited, Jamshedpur, Jharkhand - 831001 (A QCI-NABET Accredited Agency). Report is attached as Annexure-III.		Date: 30/05/2025
30	Statutory compliance	Land oustees shall be compensated as per the norms laid out R&R Policy of CIL or the National R&R Policy or R&R Policy of the State Government whichever is higher.
PPs Submission: Complied Not applicable		Date: 26/05/2025
31	MINING PLAN	A Final Mine Closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment & Forests five year before mine closure for approval. Habitat Restoration Plan of the mine area shall be carried out using a mix of native species found in the original ecosystem, which were conserved in-situ and ex-situ in an identified area within the lease for reintroduction in the mine during mine reclamation and at the post mining stage for habitat restoration and for development of grasslands.
PPs Submission: Complied Not applicable		Date: 26/05/2025
32	Corporate Environmental Responsibility	Corporate Environment Responsibility: a) The Company shall have a well laid down Environment Policy approved by the Board of Directors. 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. 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. 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.

PPs Submission: Complied The Company already has an Environment Policy approved by the Managing Director and it addresses all the issues mentioned. 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. Moreover, Jamadoba Coal Washery is IMS (Integrated Management System: Quality Management System, Environment Management System and OHSAS) certified unit addressing all environment aspects, impacts and needs and expectation of interested parties with respect to environment protection.		Date: 30/05/2025
33	MISCELLANEOUS	No use of fly ash with sand will take place for stowing in underground mines.
PPs Submission: Complied This will be strictly followed for our captive underground mines.		Date: 26/05/2025
34	Corporate Environmental Responsibility	The proponent shall expedite and implement the pilot plant to convert mine water into drinking/domestic water to supply the same to the population of Dhanbad and surrounding areas and shall continue to carry out this activity.
PPs Submission: Complied Mine water is already being converted into potable water by Tata Steel in our 4 nos. Water Treatments Plants (located at Jamadoba, Digwadih, Bhelatand and Malkera having cumulative capacity of around 9000 KL/D). The treated water is then supplied to our colonies and leasehold villages. This will continue in future too.		Date: 30/05/2025
35	Corporate Environmental Responsibility	Tanks/ponds shall be regularly cleaned and maintained. Plantation activities shall be intensified in the mine areas.
PPs Submission: Complied Tanks/ ponds are regularly cleaned and maintained by TSRDS. Plantation activities are undertaken every year in the barren mine leasehold areas. Further, TSRDS engages with the villagers for plantation in the village lands.		Date: 26/05/2025
36	GREENBELT	Adequate green belt shall be provided around coal handling and other areas.
PPs Submission: Complied Greenery has been developed in many areas around the washery premises. Since the expansion job has been completed, remaining area is also being developed. Attached as Annexure I.		Date: 30/05/2025
37	Corporate Environmental Responsibility	The proponent shall connect all the villages in the leasehold area with water pipeline connection.
PPs Submission: Complied All the villages in the leasehold areas are being supplied safe drinking water through pipeline connection.		Date: 30/05/2025
General Conditions		
Sr.No.	Condition Type	Condition Details
1	MINING PLAN	No change in mining technology and scope of working shall be made without prior approval of the Ministry of Environment and Forests.

PPs Submission: Complied The points mentioned in the EC letter will be strictly followed.		Date: 26/05/2025
2	MISCELLANEOUS	No change in the calendar plan of production for quantum of mineral coal shall be made.
PPs Submission: Complied It will be strictly followed.		Date: 26/05/2025
3	AIR QUALITY MONITORING AND PRESERVATION	Four ambient air quality monitoring stations shall be established in the core zone as well as in the buffer zone for PM10, PM2.5, SO2 and NOx monitoring. Location of the stations shall be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the State Pollution Control Board. Monitoring of heavy metals such as Hg, As, Ni, Cd, Cr, etc carried out at least once in six months.
PPs Submission: Complied 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 and 7 Pits Kalimandir area (Buffer Zone) Monitoring of heavy metals in ambient air is being performed by an independent laboratory (recognised by NABL and JSPCB). The results are enclosed as Annexure II.		Date: 26/05/2025
4	Statutory compliance	Data on ambient air quality (PM10, PM 2.5, SO2 and NOx) and heavy metals such as Hg, As, Ni, Cd, Cr and other monitoring data shall be regularly submitted to the Ministry including its concerned Regional Office and to the State Pollution Control Board and the Central Pollution Control Board once in six months. Random verification of samples through analysis from independent laboratories recognized under the EPA rules, 1986 shall be furnished as part of compliance report.
PPs Submission: Complied Ambient air quality report (PM10, PM 2.5, SO2 and NOx) for the period from Oct-2024 to March - 2025 is attached as Annexure II. Additionally, the third party monitoring is being done through a JSPCB and NABL accredited Laboratory for ambient air quality (PM10, PM 2.5, SO2, NOx, CO, NH3, O3) and heavy metals (As, Ni, Cd and Cr). The results are enclosed as Annexure II.		Date: 26/05/2025
5	Noise Monitoring & Prevention	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.
PPs Submission: Complied Regular noise survey is being conducted in the underground work environment. Workers are provided with ear-plugs/ muffs in high noise areas.		Date: 26/05/2025
6	WATER QUALITY MONITORING AND PRESERVATION	Industrial wastewater (workshop and wastewater from the mine) shall be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19th May 1993 and 31st December 1993 or as amended from time to time before discharge. Oil and grease trap shall be installed before discharge of workshop effluents.
PPs Submission: Complied No waste-water is discharged outside the washery premises. 100 percentage water is recirculated back for re-use in the washery. There is a central workshop and garage in Jamadoba Effluent Treatment Plant which includes oil and grease trap has been provided.		Date: 26/05/2025

7	AIR QUALITY MONITORING AND PRESERVATION	Vehicular emissions shall be kept under control and regularly monitored. Vehicles used for transporting the mineral shall be covered with tarpaulins and optimally loaded.
PPs Submission: Complied Only the vehicles having valid PUC certificates are being allowed to operate. Coal transportation through trucks is done only from BCCL mines till washery and it is ensured that only optimally loaded trucks with proper tarpaulin cover are allowed into the washery premises.		Date: 26/05/2025
8	Statutory compliance	Monitoring of environmental quality parameters shall be carried out through establishment of adequate number and type of pollution monitoring and analysis equipment in consultation with SPCB and data got analysed through a laboratory recognized under EP Rules, 1986.
PPs Submission: Complied We have a fully equipped Environment Cell Laboratory with qualified personnel. The monitoring and analysis is also done at regular intervals by a JSPCB and NABL recognized laboratory. We have also installed a Continuous Ambient Air Quality Monitoring Station at Jamadoba for real time monitoring.		Date: 26/05/2025
9	Human Health Environment	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.
PPs Submission: Complied Persons working in dusty area have been provided with dust masks and have been given awareness training on safety and health aspects. Regular PME (Periodic Medical Examinations) are being done.		Date: 26/05/2025
10	Human Health Environment	Occupational health surveillance programme of the workers shall be undertaken periodically to observe any contractions due to exposure to dust and to take corrective measures, if needed and records maintained thereof. The quality of environment due to outsourcing and the health and safety issues of the outsourced manpower should be addressed by the company while outsourcing.
PPs Submission: Complied The occupational health surveillance programme of the workers is done regularly by our Occupational Health Department, Tata Central Hospital, Jamadoba. We have a PME (Periodic Medical Examination) centre approved by DGMS where annually 20 percentage of the workers identified from workforce engaged in active mining operations are subjected to full medical checkup including hearing impairment checkup, etc. These results are regularly submitted to DGMS as per mines rules. Contractual workers health examination is also done by PME centre.		Date: 26/05/2025
11	MISCELLANEOUS	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.
PPs Submission: Complied We have a separate Environmental Management Cell with qualified personnel. The reporting of Environmental Cell is directly to General Manager of the Division.		Date: 26/05/2025
12	Corporate Environmental Responsibility	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.
PPs Submission: Complied 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 2023-24 is		Date: 26/05/2025

Rs.1134.36 lakhs.		
13	Statutory compliance	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 .
PPs Submission: Complied It has been complied with.		Date: 30/05/2025
14	Statutory compliance	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.
PPs Submission: Complied It has been complied with.		Date: 30/05/2025
15	Statutory compliance	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.
PPs Submission: Complied It has been complied with.		Date: 26/05/2025
16	Statutory compliance	The clearance letter shall be uploaded on the company's website. The compliance status of the stipulated EC conditions shall also be uploaded by the project authorities on their website and updated at least once every six months so as to bring the same in the public domain. The monitoring data of environmental quality parameters (air, water, noise and soil) and critical pollutants such as PM10, PM2.5, SO2 and NOx (ambient and stack if any) and critical sectoral parameters shall also be displayed at the entrance of the project premises and mines office and in corporate office and on the company's website.
PPs Submission: Complied The clearance letter has been uploaded on the companies website. The compliance status (as Half-yearly compliance report) is being uploaded in companies website. The display of information near the washeries office has been provided.		Date: 26/05/2025
17	Statutory compliance	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.
PPs Submission: Complied It has been complied with.		Date: 26/05/2025
18	Statutory compliance	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.
PPs Submission: Complied It will be complied with.		Date: 26/05/2025
19	Statutory compliance	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.
PPs Submission: Complied The environmental statement for financial year 2023-24 has been submitted to JSPCB on 27th September 2024 vide letter no. JMB/ENV/ESSA/05/569/2024 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-mefgov.in.		Date: 26/05/2025
<div style="text-align: center;">Visit Remarks</div>		
Last Site Visit Report Date:		N/A
Additional Remarks:		
<p>Note: This acknowledgement is as per the details submitted by project proponent. In no way is this document to be considered as conclusion on any action on the compliance of the project. This is strictly for the project proponent's reference purpose.</p>		

HALF YEARLY COMPLIANCE REPORT

(PERIOD: OCTOBER'24 – MARCH'25)

JAMADOBA COAL WASHERY

**(CAPACITY: EXPANSION FROM 1 TO 2 MTPA RAW COAL
THROUGHPUT)**

TEHSIL: JHARIA, DIST: DHANBAD, JHARKHAND



TATA STEEL LIMITED, JHARIA DIVISION

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

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

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

S. No.	Condition	Compliance Status
Specific Condition		
(i)	Adequate green belt shall be provided around coal handling and other areas.	Greenery has been developed in many areas around the washery premises. Since the expansion job has been completed, remaining area is also being developed. Attached as Annexure I.
(ii)	Action plan be developed and implemented for abandoned tailing ponds and for their restoration to the original land use.	Action plan for cut-off of tailing ponds from tailing management system is in place. Abandoned tailing ponds have been reclaimed by backfilling. Biological reclamation is going on by planting native species.
(iii)	Fly ash generated from the captive power plant of the washery be utilized for house construction, roads and such uses, strictly complying to the timeline in the EIA Notification, 2006 and maintaining proper records.	This is not applicable as we have ceased the operation of our captive Jamadoba power plant since April'15.
(iv)	No use of fly ash with sand will take place for stowing in underground mines.	This will be strictly followed for our captive underground mines.
(v)	Transportation of fly ash to be done properly by mechanically covered trucks.	This is not applicable as there is no fly ash being generated since April'15.
(vi)	The proponent shall connect all the villages in the leasehold area with water pipeline connection.	All the villages in the leasehold areas are being supplied safe drinking water through pipeline connection.
(vii)	The proponent shall expedite and implement the pilot plant to convert mine water into drinking/domestic water to supply the same to the population of Dhanbad and surrounding areas and shall continue to carry out this activity.	Mine water is already being converted into potable water by Tata Steel in our 4 nos. Water Treatments Plants (located at Jamadoba, Digwadiah, Bhelatand and Malkera having cumulative capacity of around 9000 KL/D). The treated water is then supplied to our colonies and leasehold villages. This will continue in future too.

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(viii)	Tanks/ponds shall be regularly cleaned and maintained. Plantation activities shall be intensified in the mine areas.	Tanks/ ponds are regularly cleaned and maintained by TSF. Plantation activities are undertaken every year in the barren mine leasehold areas. Further, TSF engages with the villagers for plantation in the village lands.
(ix)	The proponent shall expedite the activities undertaken by TSRDS in over 30 villages in the leasehold area over 15000 households covering a population of about 1.4 lakh.	CSR activities of TSF are managed by a team of experts who are dedicatedly involved in providing benefits and improving standard of living in over 30 villages. The list of activities are developed in consultation with the village representatives and implemented in a time-bound manner.
(x)	The CSR cost should be Rs 5 per Tonnes of Coal produced which should be adjusted as per the annual inflation.	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.
(xi)	Cost for additional environmental protection measures shall be not less than Rs. 503.00 lakhs. The status of implementation including costs incurred shall be regularly reported to this Ministry and its respective Regional Office in the region as part of the compliance report and also uploaded on the company website.	The regular expenditure incurred for environment protection and management are submitted to MoEF&CC & SPCB in Annual Environment Statement and the status is uploaded on company website as a part of compliance report of AES.
(xii)	The slope of the embankment towards the river shall be at least 1:3 for stability and shall be stabilized with plantation using native species selected from the study area.	The washery is about 1.5 kms away from the Damodar River. Hence it is not applicable.
(xiii)	Top soil shall be stored in the earmarked area and used within a year of its generation for green belt development and for plantation/reclamation.	There are no topsoil dumps hence it is not applicable.

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(xiv)	No external OB dump shall be created for the expansion project. Monitoring and management of existing reclaimed dumpsites shall continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment & Forests and its respective Regional Office on yearly basis.	Not applicable as this is a washery project.
(xv)	Catch drains and siltation ponds of appropriate size shall be constructed to arrest silt and sediment flows from soil, OB and mineral dumps. The water so collected shall be utilised for watering the mine area, roads, green belt development, etc. The drains shall be regularly desilted and maintained properly.	There are no soil or OB dumps in the washery premises. Only the by-products are stored in the stockyards located in the washery premises which are sold off within a week.
(xvi)	Garland drains (size, gradient and length) and sump capacity shall be designed keeping 50% safety margin over and above the peak sudden rainfall and maximum discharge in the area adjoining the mine site. Sump capacity shall also provide adequate retention period to allow proper settling of silt material.	Garland drains of adequate size and gradient already exist around the washery area to channelize the surface runoff. The runoff is diverted to the tailing ponds and clear water is utilized in the washery.
(xvii)	Dimension of the retaining wall at the toe of the dumps and OB benches within the mine to check run-off and siltation shall be based on the rainfall data.	Not applicable as we do not have any opencast mines.
(xviii)	Crushers at the CHP shall be operated with high efficiency bag filters/water sprinkling system shall be provided to check fugitive emissions from crushing operations, conveyor system which shall be closed, haulage roads, transfer points, etc.	The following measures have been implemented: i) Dry-fog system at all transfer points of CHP ii) Enclosures around crushers. iii) Belts have been covered on top and both sides. These arrangements will protect the coal mass moving on belt from blowing wind. In this way, the dust getting air borne is being minimized. iv) Fixed water sprinklers on the haulage roads.

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		<p>v) In addition, movable water sprinklers are also being deployed on the roads for dust suppression.</p> <p>vi) Dust Extraction System</p> <p>vii) Strengthening of tailing management system</p> <p>viii) Concretization of working complex</p>
(xix)	Drills shall be wet operated only.	Not applicable as this is coal beneficiation plant
(xx)	Controlled blasting shall be practiced with use of delay detonators and only during daytime. The mitigative measures for control of ground vibrations and to arrest the fly rocks and boulders shall be implemented.	Not applicable as this is coal beneficiation plant.
(xxi)	The Washery shall be a zero-discharge and no wastewater shall be discharged from the washery into the drains/natural watercourses. No groundwater shall be used for washery operations. Recycled water shall be used for development and maintenance of green belt and in the plant operations.	Washery is already operating on a zero-discharge principle. No wastewater is discharged into the drains/ natural water systems. Only mine water is utilized for the washery operations as make up water requirement. The recycled water is again used for plant operations and green-belt development.
(xxii)	The raw coal, washed coal and middling and coal wastes (rejects) shall be stacked properly at earmarked site(s) within sheds/stockyards fitted with wind breakers/shields. Adequate measures shall be taken to ensure that the stored minerals do not catch fire. The storage period shall be not more than 2-3 days.	The material is being stacked properly at stockyards located within the washery. We have a well-established system for disposal of rejects/ tailings to consumers so that storage period is not more than 2-3 days.
(xxiii)	The proponent shall maintain proper records of the ash content of raw (ROM) coal, clean coal, middling and coal rejects along with quantum of raw coal obtained and washed and dispatched every month and the same shall be uploaded on the company website every month.	Proper records are being maintained and the details are uploaded on the company website.
(xxiv)	All internal roads shall be concreted or black topped and the approach roads used for the project shall be blacked topped. Facilities for parking of trucks	All the internal roads have been concreted while the approach roads are black topped. There is a facility for parking of trucks within the unit.

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

	carrying raw coal from the linked coalmines shall be created within the Unit.	
(xxv)	Roads used for coal transportation to the linked DRI/TPP shall be developed with 3-tier avenue plantation using a mix of native species. The trucks used for coal transportation shall be high capacity trucks. Drivers of trucks for coal transportation shall be engaged based on past records of road safety and compliance of safety regulations and shall be suitably sensitized about road safety and maintenance of vehicles to keep vehicular emissions to be within prescribed limits.	<p>There is no linked DRI/TPP.</p> <ul style="list-style-type: none"> - Raw coal is received via underground coal conveyor belt network from captive collieries. - Clean coal is dispatched via rail from the Rail-yard situated on the washery premises. The clean coal is kept in storage bins and directly transferred to the rail wagons through covered coal-conveying system. - As for the trucks moving for transportation of tailings and rejects are properly covered with tarpaulin. All the given provisions related to road safety and driver competence are being strictly complied with.
(xxvi)	The roads (internal/approach and roads used for the project) shall be regularly cleaned with mechanical sweepers and with water sprinklers. A 3-tier avenue plantation shall be developed along the major approach roads, internal roads and nearby roads used by the company.	Fixed Water sprinklers have already been installed in the washery premises. Plantation along the road-side is done wherever feasible. A three-tier green belt development is in progress
(xxvii)	Green belt shall be developed along the areas such as the washery unit, crushing unit, and stockyards and at transfer points and in between mine operations and habitations.	Greenery has been developed in many areas around the washery premises. Saplings have been planted along the boundary of washery for greenbelt development.
(xxviii)	Hoppers of the coal crushing unit at the crushing shed and washery unit shall be fitted with high efficiency bag filters/Dust extractors and mist spray water sprinkling system shall be installed and operated effectively at all times of operation to check fugitive emissions from crushing operations, transfer points of belt conveyor systems which shall be closed and from transportation roads.	<p>Dry-fog dust suppression system has been already installed to suppress the dust generated at CHP and transfer points of belt conveyor systems. Fixed-type water sprinklers are also installed on the internal roads of the washery. These are always operated effectively to check the fugitive emissions.</p> <p>Fugitive dust emission monitoring is done on regularly. The values are within the stipulated norms.</p>

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(xxix)	The proponent shall ensure that coal such as stones, shale and other wastes of an ash content of 77% or more only shall be dumped into the mine voids. Coal rejects with an ash content of 76% or less shall be fully utilized for power generation in linked TPP.	It is being followed.
(xxx)	Regular monitoring of groundwater level and quality including levels of heavy metals such as Hg, Cd, Cr, Se, etc shall be carried out by establishing a network of existing wells and construction of new piezometers. The monitoring for quantity and quality of ground water as per IS: 10500 shall be done four times a year in pre-monsoon (May), monsoon (August), post-monsoon (November) and winter (January) seasons. Proper records of the data thus collected shall be maintained submitted to the Ministry of Environment & Forests and to the Central Pollution Control Board quarterly within one month of monitoring.	<p>The monitoring of groundwater level and quality is done regularly as per the requirements. The groundwater quality report & groundwater level are provided in Annexure II.</p> <p>The monitoring of heavy metals such as Hg, Cd, Cr, Se, etc in the groundwater is done on quarterly basis by NABL accredited third party and the report has been provided in Annexure II.</p>
(xxxi)	As the entire mine water is proposed to be used for the mine-cum-washery operations, measures shall be taken for recharging ground water in and around the mine in the study area. A Plan for water conservation and recharge measures of ground water along with budgetary provisions be prepared and implemented in consultation with the Central/State Ground Water Board to mitigate the adverse impact of mining which may lead to depletion of ground water in the area. The Company shall put up artificial groundwater recharge measures for augmentation of groundwater resource in case monitoring of groundwater levels indicate decline of water table. Any additional water requirement for mining operation shall	<p>Some 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.</p> <p>Further, there are several ponds existing on the surface of the mining lease which act as natural reservoirs for recharging ground water. These ponds/ tanks are regularly cleaned and maintained by our CSR department. As per the hydro-geological report, the variation in the ground water level is only seasonal.</p> <p>The water requirement of the nearby villages is being met by the company already. Now piped drinking water is being provided.</p>

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	be met from rainwater use only. The project authorities shall meet water requirement of nearby village(s) in case the village wells go dry due to dewatering of mine.	
(xxxii)	ETP shall also be provided for treatment of effluents from workshop, CHP and an STP shall be provided in the colony and the treated effluents shall be used for green belt development. Outflow of rainfall, if any, from the mine shall meet prescribed norms and the water quality of such discharge including levels of heavy metals such as Hg, Cd, Cr., Se, etc shall be monitored at the exit points and records maintained thereof and also uploaded on the company website. Online monitoring equipment shall be installed by the proponent to ensure that the water quality parameters of mine water discharge are well within the General Discharge Standards under EP, Rules, 1986.	No effluent is discharged outside of the washery. There is no separate workshop in the washery premises. A central workshop exists in Jamadoba Colliery with Effluent Treatment Plant facility having Oil and Grease Trap. One Sewage Treatment Plant (STP) of 50 KLD and one STP of 10 KLD has been installed in one of the colonies of Jamadoba and Jamadoba canteen. Their treated water is used for gardening and other purpose.
(xxxiii)	Besides carrying out regular periodic health check-up of their workers, 10% of the workers identified from workforce engaged in active mining operations shall be subjected to health check-up for occupational diseases and hearing impairment, if any, through a recognised agency found in the district, and the results reported to this Ministry and to DGMS.	Not applicable as this is coal beneficiation plant. Though PME is done for washery workers periodically at our Occupational Health centre. Records of the same has been furnished earlier.
(xxxiv)	For monitoring land use pattern and for post mining land use, a time series of land use maps, based on satellite imagery (on a scale of 1: 5000) of the core zone and buffer zone, from the start of the project until end of mine life shall be prepared once in 3 years (for any one particular season which is consistent in the time series), and the report submitted	It has been complied. The LULC study has been done in 2025 by Natural Resources Division, Tata Steel Limited, Jamshedpur, Jharkhand – 831001 (A QCI-NABET Accredited Agency). Report is attached as Annexure-III.

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	to MOEF and its concerned Regional Office in the region.	
(xxxv)	Land oustees shall be compensated as per the norms laid out R&R Policy of CIL or the National R&R Policy or R&R Policy of the State Government whichever is higher.	Not applicable
(xxxvi)	A Final Mine Closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment & Forests five year before mine closure for approval. Habitat Restoration Plan of the mine area shall be carried out using a mix of native species found in the original ecosystem, which were conserved in-situ and ex-situ in an identified area within the lease for reintroduction in the mine during mine reclamation and at the post mining stage for habitat restoration and for development of grasslands.	Not applicable.
(xxxvii)	<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-</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, Jamadoba Coal Washery is IMS (Integrated Management System: Quality Management System, Environment Management System and OHSAS) certified unit addressing all environment aspects, impacts and needs and expectation of interested parties with respect to environment protection.</p>

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	compliances/violations of environmental norms to the Board of Directors of the company and/or shareholders or stakeholders at large.	
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B.	GENERAL CONDITIONS	
(i)	No change in mining technology and scope of working shall be made without prior approval of the Ministry of Environment and Forests.	The points mentioned in the EC letter will be strictly followed.
(ii)	No change in the calendar plan of production for quantum of mineral coal shall be made.	It will be strictly followed.
(iii)	Four ambient air quality monitoring stations shall be established in the core zone as well as in the buffer zone for PM10, PM2.5, SO2 and NOx monitoring. Location of the stations shall be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the State Pollution Control Board. Monitoring of heavy metals such as Hg, As, Ni, Cd, Cr, etc carried out at least once in six months.	The Air quality monitoring 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 (recognised by NABL and JSPCB). The results are enclosed as Annexure II .
(iv)	Data on ambient air quality (PM10, PM 2.5, SO2 and NOx) and heavy metals such as Hg, As, Ni, Cd, Cr and other monitoring data shall be regularly submitted to the Ministry including its concerned Regional Office and to the State Pollution Control Board and the Central Pollution Control Board once in six months. Random verification of samples through analysis from independent laboratories recognized under the EPA rules, 1986 shall be furnished as part of compliance report.	Ambient air quality report (PM10, PM 2.5, SO2 and NOx) for the period from Oct'24 to Mar'25 is attached as Annexure II . Additionally, the third party monitoring is being done through a JSPCB & NABL accredited Laboratory for ambient air quality (PM10, PM 2.5, SO2, NOx, CO, NH3, O3) and heavy metals (As, Ni, Cd and Cr). The results are enclosed as Annexure II .
(v)	Adequate measures shall be taken for control of noise levels below 85 dBA	Regular noise survey is being conducted in the underground work environment. Workers are

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	in the work environment. Workers engaged in blasting and drilling operations, operation of HEMM, etc shall be provided with ear plugs/muffs.	provided with ear-plugs/ muffs in high noise areas.
(vi)	Industrial wastewater (workshop and wastewater from the mine) shall be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19th May 1993 and 31st December 1993 or as amended from time to time before discharge. Oil and grease trap shall be installed before discharge of workshop effluents.	No waste-water is discharged outside the washery premises. 100% water is recirculated back for re-use in the washery. There is a central workshop and garage in Jamadoba Effluent Treatment Plant which includes oil and grease trap has been provided.
(vii)	Vehicular emissions shall be kept under control and regularly monitored. Vehicles used for transporting the mineral shall be covered with tarpaulins and optimally loaded.	Only the vehicles having valid PUC certificates are being allowed to operate. Coal transportation through trucks is done only from BCCL mines till washery and it is ensured that only optimally loaded trucks with proper tarpaulin cover are allowed into the washery premises.
(viii)	Monitoring of environmental quality parameters shall be carried out through establishment of adequate number and type of pollution monitoring and analysis equipment in consultation with SPCB and data got analysed through a laboratory recognized under EP Rules, 1986.	We have a fully equipped Environment Cell Laboratory with qualified personnel. The monitoring and analysis is also done at regular intervals by a JSPCB & NABL recognized laboratory. We have also installed a Continuous Ambient Air Quality Monitoring Station at Jamadoba for real time monitoring.
(ix)	Personnel working in dusty areas shall wear protective respiratory devices and they shall also be provided with adequate training and information on safety and health aspects.	Persons working in dusty area have been provided with dust masks & have been given awareness training on safety & health aspects. Regular PME (Periodic Medical Examinations) are being done.
(x)	Occupational health surveillance programme of the workers shall be undertaken periodically to observe any contractions due to exposure to dust and to take corrective measures, if needed and records maintained thereof. The quality of environment due to outsourcing and the health and safety	The occupational health surveillance programme of the workers is done regularly by our Occupational Health Department, Tata Central Hospital, Jamadoba. We have a PME (Periodic Medical Examination) centre approved by DGMS where annually 20% of the workers identified from workforce engaged in active mining operations are

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	issues of the outsourced manpower should be addressed by the company while outsourcing.	subjected to full medical checkup including hearing impairment checkup, etc. These results are regularly submitted to DGMS as per mines rules. Contractual workers health examination is also done by PME centre.
(xi)	A separate environmental management cell with suitable qualified personnel shall be set up under the control of a Senior Executive, who will report directly to the Head of the company.	We have a separate Environmental Management Cell with qualified personnel. The reporting of Environmental Cell is directly to General Manager of the Division.
(xii)	The funds earmarked for environmental protection measures shall be kept in separate account and shall not be diverted for other purpose. Year-wise expenditure shall be reported to this Ministry and its Regional Office at Bhubaneswar.	The Environment Cell has a separate fund for Environmental protection measures and for complying with legal requirements. The annual environmental expenditure for the financial year 2023-24 is Rs.1134.36 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	It has been complied with.

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	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.	
(xvi)	The clearance letter shall be uploaded on the company's website. The compliance status of the stipulated EC conditions shall also be uploaded by the project authorities on their website and updated at least once every six months so as to bring the same in the public domain. The monitoring data of environmental quality parameters (air, water, noise and soil) and critical pollutants such as PM10, PM2.5, SO2 and NOx (ambient and stack if any) and critical sectoral parameters shall also be displayed at the entrance of the project premises and mines office and in corporate office and on the company's website.	The clearance letter has been uploaded on the company's website. The compliance status (as Half-yearly compliance report) is being uploaded in company's website. The display of information near the washery's office has been provided.
(xvii)	The project proponent shall submit six monthly reports on the status of compliance of the stipulated environmental clearance conditions (both in hard copy and in e-mail) to the respective Regional Office of the MOEF, the respective Zonal offices of CPCB and the SPCB.	It has been complied with.
(xviii)	The Regional Office of this Ministry located at Bhopal shall monitor compliance of the stipulated conditions. The Project authorities shall extend full cooperation to the office(s) of the Regional Office by furnishing the requisite data/ information/monitoring reports.	It will be complied with.
(xix)	The environmental statement for each financial year ending 31st March in Form-V is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as	The environmental statement for financial year 2023-24 has been submitted to JSPCB on 27th September 2024 vide letter no. JMB/ENV/ESSA/05/569/2024 and it is also uploaded on the company website. The soft

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

	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.	copy of Environment Statement is also sent to MOEF by email at ro.ranchi-mef@gov.in.
--	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------

Statement showing measures taken for increasing tree and forest cover

Plantation activities are carried out in the barren land of the colliery leasehold area to increase the green cover as well as in the washery premises. Care is taken to plant only the native species so that native ecosystem is preserved. Following are the details of mass plantation in our leasehold area of Jharia Division for greenery development.

Year	No. of trees planted
FY14	10195
FY15	15800
FY16	10000
FY17	10900
FY18	8500
FY19	10000
FY20	50235
FY21	3000
FY22	10005
FY23	25117
FY24	12452
FY25	12313

Glimpses of plantation activities for FY25:





Before



After



Before



After



Before



After



Before



After



Before



After



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

Ref. No.: - ARDS/24-25/AAQ/1

Date: 04/12/2024

TEST REPORT OF AMBIENT AIR QUALITY

- Name of the industry : M/S TATA STEEL, JAMADOBA,
TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700126557/932 Date:- 29/05/2024
- Date of Sample Collection : 26/11/2024 To 27/11/2024
- Date of Testing : 28/11/2024 To 02/12/2024
- Test Procedure : As per IS-5182

TEST RESULTS

LOCATION – 6 & 7 PITS COLLIERY OFFICE				
	Avg. Ambient Temperature	25°C	Avg. Humidity	46%
Sl No.	Particulars	Value	NAAQ - CPCB STANDARD	
1.	Particulate Matter (PM ₁₀), µg/m ³	83.98	100 µg/m ³	
2.	Particulate Matter (PM _{2.5}), µg/m ³	48.49	60 µg/m ³	
3.	SO ₂ , µg/m ³	19.30	80 µg/m ³	
4.	NO ₂ , µg/m ³	28.15	80 µg/m ³	
5.	Ozone, µg/m ³	16.23	180 µg/m ³	
6.	NH ₃ , µg/m ³	13.49	400 µg/m ³	
7.	CO, mg/m ³	0.78	4 mg/m ³	
8.	Pb, µg/m ³	BDL	1 µg/m ³	
9.	As, ng/m ³	BDL	6 ng/m ³	
10.	Ni, ng/m ³	BDL	20 ng/m ³	
11.	Benzene, µg/m ³	BDL	5 µg/m ³	
12.	Benzoapyrene ng/m ³	BDL	1 ng/m ³	

NOTE: BDL - Below Detection Limit

Sr. Chemist
Aditi R&D Services



Technical Manager
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/24-25/ AAQ/2

Date: 04/12/2024

TEST REPORT OF AMBIENT AIR QUALITY

- Name of the industry : M/S TATA STEEL, JAMADOBA,
TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700126557/932 Date:- 29/05/2024
- Date of Sample Collection : 26/11/2024 to 27/11/2024
- Date of Testing : 28/11/2024 to 02/12/2024
- Test Procedure : As per IS-5182

TEST RESULTS

LOCATION – OFFICERS COLONY, 12 NO. DIGWADIH				
	Avg. Ambient Temperature	25°C	Avg. Humidity	46%
Sl No.	Particulars	Value	NAAQ - CPCB STANDARD	
1.	Particulate Matter (PM ₁₀), µg/m ³	76.58	100 µg/m ³	
2.	Particulate Matter (PM _{2.5}), µg/m ³	41.36	60 µg/m ³	
3.	SO ₂ , µg/m ³	18.73	80 µg/m ³	
4.	NO ₂ , µg/m ³	26.65	80 µg/m ³	
5.	Ozone, µg/m ³	16.76	180 µg/m ³	
6.	NH ₃ , µg/m ³	13.78	400 µg/m ³	
7.	CO, mg/m ³	0.71	4 mg/m ³	
8.	Pb, µg/m ³	BDL	1 µg/m ³	
9.	As, ng/m ³	BDL	6 ng/m ³	
10.	Ni, ng/m ³	BDL	20 ng/m ³	
11.	Benzene, µg/m ³	BDL	5 µg/m ³	
12.	Benzoapyrene ng/m ³	BDL	1 ng/m ³	

NOTE: BDL - Below Detection Limit

Sr. Chemist
Aditi R&D Services



Technical Manager
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/24-25/ AAQ/3

Date: 04/12/2024

TEST REPORT OF AMBIENT AIR QUALITY

- Name of the industry : M/S TATA STEEL, JAMADOBA,
TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO. : 4700126557/932 Date:- 29/05/2024
- Date of Sample Collection : 25/11/2024 to 26/11/2024
- Date of Testing : 28/11/2024 to 02/12/2024
- Test Procedure : As per IS-5182

TEST RESULTS

LOCATION – CENTRAL WORKSHOP AREA, JAMADOBA				
	Avg. Ambient Temperature	25°C	Avg. Humidity	46%
Sl No.	Particulars	Value	NAAQ - CPCB STANDARD	
1.	Particulate Matter (PM ₁₀), µg/m ³	86.84	100 µg/m ³	
2.	Particulate Matter (PM _{2.5}), µg/m ³	49.26	60 µg/m ³	
3.	SO ₂ , µg/m ³	21.78	80 µg/m ³	
4.	NO ₂ , µg/m ³	29.96	80 µg/m ³	
5.	Ozone, µg/m ³	18.84	180 µg/m ³	
6.	NH ₃ , µg/m ³	16.76	400 µg/m ³	
7.	CO, mg/m ³	0.94	4 mg/m ³	
8.	Pb, µg/m ³	BDL	1 µg/m ³	
9.	As, ng/m ³	BDL	6 ng/m ³	
10.	Ni, ng/m ³	BDL	20 ng/m ³	
11.	Benzene, µg/m ³	BDL	5 µg/m ³	
12.	Benzoapyrene ng/m ³	BDL	1 ng/m ³	

NOTE: BDL - Below Detection Limit

Sr. Chemist
Aditi R&D Services



Technical Manager
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/24-25/ AAQ/4

Date: 04/12/2024

TEST REPORT OF AMBIENT AIR QUALITY

- Name of the industry : M/S TATA STEEL, JAMADOBA,
TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700126557/932 Date:- 29/05/2024
- Date of Sample Collection : 25/11/2024 To 26/11/2024
- Date of Testing : 28/11/2024 to 02/12/2024
- Test Procedure : As per IS-5182

TEST RESULTS

LOCATION – TATA CENTRAL HOSPITAL

	Avg. Ambient Temperature	25°C	Avg. Humidity	46%
Sl No.	Particulars	Value	NAAQ - CPCB STANDARD	
1.	Particulate Matter (PM ₁₀), µg/m ³	69.80	100 µg/m ³	
2.	Particulate Matter (PM _{2.5}), µg/m ³	38.75	60 µg/m ³	
3.	SO ₂ , µg/m ³	16.38	80 µg/m ³	
4.	NO ₂ , µg/m ³	26.58	80 µg/m ³	
5.	Ozone, µg/m ³	17.75	180 µg/m ³	
6.	NH ₃ , µg/m ³	15.63	400 µg/m ³	
7.	CO, mg/m ³	0.83	4 mg/m ³	
8.	Pb, µg/m ³	BDL	1 µg/m ³	
9.	As, ng/m ³	BDL	6 ng/m ³	
10.	Ni, ng/m ³	BDL	20 ng/m ³	
11.	Benzene, µg/m ³	BDL	5 µg/m ³	
12.	Benzoapyrene ng/m ³	BDL	1 ng/m ³	

NOTE: BDL - Below Detection Limit

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Aditi R&D Services




Technical Manager
Aditi R&D Services, Sindri

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	<h3 style="margin:0;">TEST REPORT OF NOISE (AMBIENT) LEVEL MONITORING</h3>								
	Ref. No. & Date ARDS/24-25/NOISE/1 Date: 04/12/2024		NAME AND ADDRESS OF THE CLIENT M/S TATA STEEL, JAMADOBA, TATA STEEL LIMITED, JAMADOBA GROUP PLANT, DIST. - DHANBAD (JHARKHAND)						
Date of Monitoring 25/11/2024 To 27/11/2024		Avg. Ambient Temperature (°C) 25	Average Humidity (%) 49	Weather Condition Clear	Status of the plant Running				
Work Order 4700126557/932 Date:- 29/05/2024									
MONITORING RESULTS									
Sl. No	Place of Monitoring	Day Time (6 AM to 10 PM) Avg. dB(A)			Night Time (10 PM to 6 AM) Avg. dB(A)			Noise level (Ambient standard) for Industrial Area as per CPCB Noise Pollution (Regulation and Control) (Amendment) Rules, 2000 notified vide S.O. 1046(E) Dt. 22.11.2020 Limit in dB(A) Leq	
		MAX	MIN	AVG. dB(A) Leq	MAX	MIN	AVERAGE dB(A) Leq	Day Time	Night Time
LOCATION								Industrial Area	Industrial Area
JAMADOBA GROUP									
1.	Central Workshop Area	57.9	54.3	56.46	49.6	42.1	47.3	75	70
2.	6 & 7 Pits Colliery Office	59.7	51.9	57.36	46.8	40.6	44.72		
								Residential Area	Residential Area
3.	Officer Colony 12 No. Digwadih	53.4	49.6	51.9	45.6	42.7	44.39	65	55
								Silence Zone	Silence Zone
4.	Tata Central Hospital	47.2	42.8	45.53	39.4	36.4	38.15	50	40


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Ref. No.: - ARDS/24-25/MINER./1


Date: 04/12/2024

TEST REPORT OF MINERALOGICAL COMPOSITION OF PARTICULATE MATTER

- Name of the industry : M/S TATA STEEL, JAMADOBA,
TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO. : 4700126557/932 Date:- 29/05/2024
- Date of Sample Collection : 26/11/2024 and 27/11/2024
- Date of Testing : 28/11/2024 To 30/11/2024

TEST RESULTS

Sl No.	Particulars	Mineralogical Composition (%)			
		SiO ₂	FeO	Al ₂ O ₃	CaO
1.	Central Work Shop Area, Jamadoba	1.90	0.14	1.41	2.8
2.	Officer Colony 12 No. Digwadih	1.87	0.12	1.35	2.36


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Ref. No.: - ARDS/24-25/SW/1

Date: 04/12/2024

TEST REPORT OF SURFACE WATER

- Name of the industry : M/S TATA STEEL, JAMADOBA,
TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700126557/932 Date:- 29/05/2024
- Sample Code : 1. Damodar River Up Stream
2. Damodar River Down Stream
- Date of Sample Collection: 27/11/2024
- Date of Testing : 28/11/2024 To 03/12/2024
- Test : pH, TDS, Turbidity, DO, BOD, Cl, F, SO₄

TEST RESULT

Sl. No.	PARAMETERS OF TEST	VALUE		Test Method
		Damodar River Up Stream	Damodar River Dn Stream	
1.	pH	7.2	7.3	IS-3025 (P-11): 1983
2.	Total Dissolved Solids, mg/l	410	428	IS-3025 (P-16): 1984
3.	Turbidity, NTU	2	2	IS-3025 (P-10):1984
4.	Dissolved Oxygen, mg/l	5.6	5.8	IS-3025 (P-38):1989
5.	Bio chemical Oxygen Demand, mg/l	1.6	1.9	IS-3025 (P-44):1994
6.	Chloride as Cl, mg/l	28	27.5	IS-3025 (P-32):1988
7.	Fluoride as F, mg/l	0.58	0.62	IS-3025 (P-60):2008
8.	Sulphate as SO ₄ , mg/l	65.0	60.4	IS-3025 (P-24):1986

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Aditi R&D Services



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Aditi R&D Services, Sindri

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Ref. No.: - ARDS/24-25/MWD/1

Date: 04/12/2024

TEST REPORT OF MINE WATER DISCHARGE

- Name of the industry : M/S TATA STEEL, JAMADOBA, TATA STEEL LIMITED JAMADOBA GROUP PLANT, DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700126557/932 Date:- 29/05/2024
- Sample Code :
 - 2 Pit Jamadoba Colliery
 - 3 Pit Jamadoba Colliery
 - 6 & 7 Pits Colliery
 - Digwadih Colliery
- Date of Sample Collection: 25/11/2024 To 26/11/2024
- Date of Testing : 28/11/2024 To 03/12/2024
- Test : pH, TDS, TSS, BOD, COD, OIL & GREASE.

TEST RESULT

Sl. No.	PARAMETERS OF TEST	VALUE				Test Method
		2 Pit Jamadoba Colliery	3 Pit Jamadoba Colliery	6 & 7 Pits Colliery	Digwadih Colliery	
1.	pH,	7.5	7.7	7.5	7.4	IS-3025 (P-11):1983
2.	Total Dissolved Solids, mg/l	865	839	915	790	IS-3025 (P-16):1984
3.	Total Suspended Solids, mg/l	39	42	46	38	IS-3025(P-17): 1984
4.	Bio chemical Oxygen Demand, mg/l	2.2	3.4	2.9	2.7	IS-3025 (P-4):1994
5.	Chemical Oxygen Demand, mg/l	66	72	62	69	IS-3025 (P-8):2006
6.	Oil & Grease, mg/l	BDL	0.9	0.8	BDL	IS-3025 (P-39):2021





Sr. Chemist
Aditi R&D Services







Technical Manager
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/24-25/STP/1		Date: 04/12/2024					
TEST REPORT OF SEWAGE							
• Name of the industry :		M/S TATA STEEL, JAMADOBA, TATA STEEL LIMITED JAMADOBA GROUP PLANT, DIST. - DHANBAD (JHARKHAND)					
• Work Order Ref. NO.:		4700126557/932 Date:- 29/05/2024					
• Sample Code :		1. STP Outlet- Railway Colony 2. STP Outlet -Digwadih 12 No Officers Colony 3. STP Outlet -Digwadih 12 No. Supervisor flat 4. STP Outlet- Jmb. Canteen 5. STP Outlet- JCPP Canteen					
• Date of Sample Collection:		25/11/2024 To 26/11/2024					
• Date of Testing :		28/11/2024 To 03/12/2024					
• Test :		pH, TDS, TSS, BOD, COD, OIL & GREASE, and Fecal Coliform.					
TEST RESULT							
Sl. No.	PARAMETERS OF TEST	VALUE					Test Method
		STP Outlet Railway Colony	STP Outlet Digwadih 12 No Officers Colony	STP Outlet Digwadih 12 No. Supervisor flat	STP Outlet Jmb. Canteen	STP Outlet- JCPP Canteen	
1.	pH,	7.9	7.8	7.8	7.6	7.5	IS-3025(P-11):1983
2.	Total Dissolved Solids, mg/l	855	850	910	812	710	IS-3025(P-16):1984
3.	Total Suspended Solids, mg/l	39	42	46	38	42	IS-3025(P-17):1984
4.	Bio chemical Oxygen Demand, mg/l	3.2	5.9	7.4	2.8	6.4	IS-3025(P-44):1994
5.	Chemical Oxygen Demand, mg/l	88	79	90	65	70	IS-3025(P-58):2006
6.	Oil & Grease, mg/l	1.0	0.7	0.9	0.9	0.8	IS-3025(P-39):2021
7.	Fecal Coliform (FC) (MPN/100ml)	720	620	592	570	518	IS - 1622
 Sr. Chemist Aditi R&D Services				 Technical Manager Aditi R&D Services, Sindri			
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Ref. No.: - ARDS/24-25/ETP/1				Date: 04/12/2024	
<u>TEST REPORT OF EFFLUENT</u>					
<ul style="list-style-type: none">Name of the industry : M/S TATA STEEL, JAMADOBA, TATA STEEL LIMITED JAMADOBA GROUP PLANT, DIST. - DHANBAD (JHARKHAND)Work Order Ref. NO.: : 4700126557/932 Date:- 29/05/2024Sample Code : 1. E.T.P. Outlet T.C.H. 2. E.T.P. Outlet GarageDate of Sample Collection: 25/11/2024 To 26/11/2024Date of Testing : 28/11/2024 To 03/12/2024Test : pH, TDS, TSS, BOD, COD, OIL & GREASE.					
<u>TEST RESULT</u>					
Sl. No.	PARAMETERS OF TEST	VALUE		Test Method	
		E.T.P. Outlet T.C.H.	E.T.P. Outlet Garage		
1.	pH,	8.2	8.0	IS-3025 (P-11): 1983	
2.	Total Dissolved Solids, mg/l	788	895	IS-3025 (P-16): 1984	
3.	Total Suspended Solids, mg/l	39	43	IS-3025(P-17) : 1984	
4.	Bio chemical Oxygen Demand, mg/l	2.4	7.2	IS-3025 (P-44):1994	
5.	Chemical Oxygen Demand, mg/l	58	89	IS-3025 (P-58):2006	
6.	Oil & Grease, mg/l	0.9	2.4	IS-3025 (P-39):2021	
Note : BDL - Below Detection Limit					
 Sr. Chemist Aditi R&D Services				 Technical Manager Aditi R&D Services, Sindri	
Statements : 1. The test report refers only to the particular item(s) submitted for testing. 2. The test results reported in this report are valid at the time of and under the stated condition of measurement. 3. This particular test report cannot be reproduced except in full, without prior written permission of Quality Manager of the laboratory.					



ADITI R&D SERVICES

Testing Laboratory

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Plot No. - I-B-17 (P)
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Ref. No.: - ARDS/24-25/DW/1

Date: 04/12/2024

TEST REPORT OF DRINKING WATER

- Name of the industry : M/S TATA STEEL, JAMADOBA,
TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700126557/932 Date:- 29/05/2024
- Sample Code :
 - 1. Canteen- Jamadoba Colliery
 - 2. Canteen- Jamadoba Washery
 - 3. Canteen- Digwadih Colliery
 - 4. Canteen- 6&7 Pits Colliery
- Date of Sample Collection: 07.08.2024 To 09.08.2024
- Date of Testing : 10.08.2024 To 16.08.2024
- Test :
Colour, Odour, Taste, Turbidity, pH, Total Hardness, Iron, Chloride, Res. Free chlorine, Total Dissolved Solids, Calcium, Copper, Manganese, Sulphate, Nitrate, Fluoride, Phenolic Compound, Mercury, Cadmium, Arsenic, Cyanide, Lead, Zinc, Total Coliform, Total Chromium, Mineral Oil, Alkalinity, Aluminium & Boron.

TEST RESULT

Sl. No	PARAMETERS OF TEST	VALUE				IS as per IS 10500:2012		Test Method
		Canteen-Jamadoba Colliery	Canteen-Jamadoba Washery	Canteen Digwadih Colliery	Canteen- 6&7 Pits Colliery	Desirab le	Permi ssible	
1.	Colour, (Hazen Unit)	1	1	1	1	5.00	15.0	IS 3025 (P-4):2021
2.	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeabl e	Agree able	IS 3025 (P-5):2018
3.	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeabl e	Agree able	IS 3025 (P-7):2017
4.	Turbidity, NTU	1.0	0.8	0.2	3.0	1.0	5.0	IS 3025 (P-10):1984
5.	pH	7.52	7.76	7.92	7.80	6.5-8.5	No. Relax.	IS-3025 (P-11):1983
6.	Total Hardness as CaCO ₃ , mg/l	400	580	540	304	200	600	IS 3025 (P-21):2009
7.	Chloride as Cl, mg/l	65.77	80.81	67.65	33.82	250	1000	IS 3025 (P-32):1988
8.	Res. Free chlorine as Cl ₂ mg/l	NIL	NIL	NIL	NIL	0.20	1.0	IS 3025 (P-26):2021
9.	Total Dissolved Solids, mg/l	535	540	595	280	500	2000	IS 3025 (P-16):1984
10.	Calcium as CaCO ₃ , mg/l	188	160	128	136	75	200	IS 3025 (P-40):1991
11.	Copper as Cu, mg/l	BDL	BDL	BDL	BDL	0.05	1.5	IS 3025 (P-42):1992

Continued on Page 2

Statements :

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Mobile: 09471358492, 09431512608

- 2 -

Sl. No.	PARAMETERS OF TEST	VALUE				IS as per IS 10500:1991		Test Method
		Canteen-Jamadoba Colliery	Canteen Jamadoba Washery	Canteen Digwadih Colliery	Canteen - 6&7 Pits Colliery	Desirable	Permissible	
12.	Manganese as Mn, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	0.10	0.30	IS 3025 (P-59):2006
13.	Sulphate as SO ₄ , mg/l	48.10	41.70	51.4	42.6	200	400	IS 3025 (P-24):1986
14.	Nitrate as NO ₃ , mg/l	3.3	5.6	4.9	4.2	45	No. Relax	IS 3025 (P-34):1988
15.	Fluoride as F, mg/l	0.34	0.30	0.32	0.37	1.0	1.5	IS 3025 (P-60):2008
16.	Phenolic Compound as (C ₆ H ₅ OH) mg/l	B.D.L	B.D.L	B.D.L	B.D.L	0.001	0.002	IS 3025 (P-43):1992
17.	Mercury as Hg, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	0.001	No. Relax	IS 3025 (P-48):1994
18.	Cadmium as Cd, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	0.003	No. Relax	IS 3025 (P-41):1992
19.	Arsenic as As, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	0.01	No. Relax	IS 3025 (P-37):1988
20.	Cyanide as CN, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	0.05	No. Relax	IS 3025 (P-27):1986
21.	Lead as Pb, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	0.01	No. Relax	IS 3025 (P-47):1994
22.	Zinc as Zn, mg/l,	0.12	0.18	0.23	0.16	5	15	IS 3025 (P-42):1992
23.	Total Coliform, No./100ml	Absent	Absent	Absent	Absent	Absent	Absent	IS 3025 (P-49):1994
24.	Total Chromium as Cr, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	0.05	No. Relax	IS 3025 (P-52):2003
25.	Mineral Oil, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	0.5	No. Relax	IS 3025 (P-39):1989
26.	Alkalinity as CaCO ₃ , mg/l,	424	388	400	568	200	600	IS 3025 (P-23):1983
27.	Aluminium as Al, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	0.03	0.2	IS 3025 (P-55):2003
28.	Boron as B, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	0.5	1.0	IS 3025 (P-57):2005

NOTE: BDL - Below Detection Limit


Sr. Chemist
Aditi R&D Services




Technical Manager
Aditi R&D Services, Sindri

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	<h2 style="margin:0;">ADITI R&D SERVICES</h2> <h3 style="margin:0;">Testing Laboratory</h3> <p style="margin:0;">NABL ACCREDITED</p> <p style="margin:0;">(A Constituent Board of Quality Council of India)</p> <p style="margin:0;">ISO/IEC 17025:2017, ISO 9001:2015, ISO (OHSAS) 45001:2018 Certified</p>		Plot No. - I-B-17 (P) Sindri, Industrial Area, P.O. - Domgarh, Dist. - Dhanbad Jharkhand - 828107 Email ID: sindriaditi@gmail.com Website: aditimdservices.com Phone: 0326-2952377 (O), Fax: 0326-2952377 Mobile: 09471358492, 09431512608							
	Ref. No.: - ARDS/24-25/GW/1 Date: 04/12/2024									
	<h3 style="margin:0;">TEST REPORT OF GROUND WATER</h3>									
<ul style="list-style-type: none"> • Name of the industry : M/S TATA STEEL, JAMADOBA, TATA STEEL LIMITED, JAMADOBA GROUP PLANT, DIST. - DHANBAD (JHARKHAND) • Work Order Ref. NO. : 4700126557/932 Date:- 29/05/2024 • Sample Code : <ul style="list-style-type: none"> 1. Purnadih (Jorapokhar) 2. Digwadih 10 No F&J. 3. Kali Mela Kali Mandir 4. Upper Dungari 5. Kenduadih Basti 6. 6&7 Pits (Ayodhya Nagri) • Date of Sample Collection : 25/11/2024 to 26/11/2024 • Date of Testing : 28/11/2024 To 04/12/2024 • Test : Colour, Odour, Taste, Turbidity, pH, Total Hardness, Iron, Chloride, Res. Free chlorine, Total Dissolved Solids, Calcium, Copper, Manganese, Sulphate, Nitrate, Fluoride, Phenolic Compound, Mercury, Cadmium, Arsenic, Cyanide, Lead, Zinc, Total Coliform, Chromium, Mineral Oil, Alkalinity, Aluminium & Boron. 										
<h3 style="margin:0;">TEST RESULT</h3>										
Sl. No	PARAMETER S OF TEST	VALUE						IS as per IS 10500:1991		Test Method
		Purnadih	Digwadih 10 NoF&J.	Kali Mela KaliMandir	Upper Dungari	Kenduadih Basti	6 & 7Pit (Ayodhya Nagri)	Desir - able	Permi- ssible	
1.	Colour, (Hazen Unit)	2	1	2	2	1	1	5	15	IS 3025 (P-4):2021
2.	Temperature °C	25	24	25	24	25	24	-	-	-
3.	Electrical Conductivity, µmhos/cm	1414	1390	1070	590	780	810	-	-	-
4.	Total Dissolved Solids, mg/l	710	680	513	539	577	510	500	2000	IS 3025(P-16):1984
5.	pH	7.9	7.8	7.4	7.7	7.3	7.8	6.5-8.5	No Relax	IS-3025(P-11):1983
6.	Total Hardness as CaCO ₃ , mg/l	575	480	496	336	380	362	200	600	IS 3025(P-21):2009
7.	Calcium as Ca, mg/l	155.2	163.4	95	144	78	67.5	75	200	IS 3025(P-40):1991
8.	Magnesium as Mg, mg/l	50.4	20.2	62.8	48.2	43.5	48.4	30	100	IS 3025(P-46):1994
9.	Chloride as Cl, mg/l	347.69	199	107.12	30.02	35.70	57.2	250	1000	IS 3025(P-32):1988
10.	Fluoride as F, mg/l	0.42	0.32	0.39	0.50	0.40	0.38	1.0	1.5	IS 3025(P-60):2008
Continued on Page -2										
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	<p style="margin:0;">- 2 -</p>									

Sl. No	PARAMETERS OF TEST	VALUE						IS as per IS 10500:1991		Test Method
		Purnadih	Digwadih 10 NoF&J.	KaliMela KaliMandir	Upper Dungari	Kenduadi h Basti	6 & 7Pit (Ayodhya Nagri)	Desir-able	Perm is-sible	
11	Sulphate as SO ₄ , mg/l	47.2	53.4	59.0	52.0	54.80	39.2	200	400	IS 3025(P-24):1986
12	Nitrate as NO ₃ , mg/l	7.2	7.9	8.4	7.5	8.0	7.8	45	No. Relax	IS 3025(P-34):1988
13	Alkalinity as CaCO ₃ , mg/l,	15.0	16.0	5.8	4.8	7.0	418	200	600	IS 3025(P-23):1983
14	Lead as Pb, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	B.D.L	B.D.L	0.01	No. Relax	IS 3025(P-47):1994
15	Zinc as Zn, mg/l,	0.19	0.12	0.13	0.2	0.18	0.19	5	15	IS 3025(P-42):1992
16	Iron a Fe, mg/l	0.13	0.20	0.24	0.22	0.25	0.12	1.0	No. Relax	IS 3025(P-53):2003
17	Copper as Cu, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	B.D.L	B.D.L	0.05	1.5	IS3025 (P-42):1992
18	Mercury as Hg, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	B.D.L	B.D.L	0.001	No. Relax	IS 3025(P-48):1994
19	Cadmium as Cd, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	B.D.L	B.D.L	0.003	No. Relax	IS 3025(P-41):1992
20	Nickel as Ni, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	B.D.L	B.D.L	0.02	No. Relax	IS 3025(P-37):1992
21	Arsenic as As, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	B.D.L	B.D.L	0.01	No. Relax	IS 3025(P-37):1988
22	Cyanide as CN, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	B.D.L	B.D.L	0.05	No. Relax	IS 3025(P-27):1986
23	Total Chromium as Cr, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	B.D.L	B.D.L	0.05	No. Relax	IS 3025(P-52):2003

NOTE: BDL - Below Detection Limit


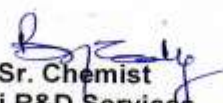



Sr. Chemist
 Aditi R&D Services




Technical Manager
 Aditi R&D Services, Sindri

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<u>TEST REPORT OF AMBIENT AIR QUALITY</u>																																																																											
<ul style="list-style-type: none">Name of the industry : M/S TATA STEEL, JAMADOBA, TATA STEEL LIMITED JAMADOBA GROUP PLANT, DIST. - DHANBAD (JHARKHAND)Work Order Ref. NO.: : 4700126557/932 Date:- 29/05/2024Date of Sample Collection : 12/02/2025 To 13/02/2025Date of Testing : 14/02/2025 To 18/02/2025Test Procedure : As per IS-5182																																																																											
<u>TEST RESULTS</u>																																																																											
LOCATION – 6 & 7 PITS COLLIERY OFFICE																																																																											
<table border="1"><thead><tr><th colspan="2">Avg. Ambient Temperature</th><th>29°C</th><th>Avg. Humidity</th><th>28%</th></tr><tr><th>Sl No.</th><th>Particulars</th><th>Value</th><th colspan="2">NAAQ - CPCB STANDARD</th></tr></thead><tbody><tr><td>1.</td><td>Particulate Matter (PM₁₀), µg/m³</td><td>79.78</td><td colspan="2">100 µg/m³</td></tr><tr><td>2.</td><td>Particulate Matter (PM_{2.5}), µg/m³</td><td>46.06</td><td colspan="2">60 µg/m³</td></tr><tr><td>3.</td><td>SO₂, µg/m³</td><td>18.33</td><td colspan="2">80 µg/m³</td></tr><tr><td>4.</td><td>NO₂, µg/m³</td><td>26.74</td><td colspan="2">80 µg/m³</td></tr><tr><td>5.</td><td>Ozone, µg/m³</td><td>15.42</td><td colspan="2">180 µg/m³</td></tr><tr><td>6.</td><td>NH₃, µg/m³</td><td>12.81</td><td colspan="2">400 µg/m³</td></tr><tr><td>7.</td><td>CO, mg/m³</td><td>0.74</td><td colspan="2">4 mg/m³</td></tr><tr><td>8.</td><td>Pb, µg/m³</td><td>BDL</td><td colspan="2">1 µg/m³</td></tr><tr><td>9.</td><td>As, ng/m³</td><td>BDL</td><td colspan="2">6 ng/m³</td></tr><tr><td>10.</td><td>Ni, ng/m³</td><td>BDL</td><td colspan="2">20 ng/m³</td></tr><tr><td>11.</td><td>Benzene, µg/m³</td><td>BDL</td><td colspan="2">5 µg/m³</td></tr><tr><td>12.</td><td>Benzoapyrene ng/m³</td><td>BDL</td><td colspan="2">1 ng/m³</td></tr></tbody></table>						Avg. Ambient Temperature		29°C	Avg. Humidity	28%	Sl No.	Particulars	Value	NAAQ - CPCB STANDARD		1.	Particulate Matter (PM ₁₀), µg/m ³	79.78	100 µg/m ³		2.	Particulate Matter (PM _{2.5}), µg/m ³	46.06	60 µg/m ³		3.	SO ₂ , µg/m ³	18.33	80 µg/m ³		4.	NO ₂ , µg/m ³	26.74	80 µg/m ³		5.	Ozone, µg/m ³	15.42	180 µg/m ³		6.	NH ₃ , µg/m ³	12.81	400 µg/m ³		7.	CO, mg/m ³	0.74	4 mg/m ³		8.	Pb, µg/m ³	BDL	1 µg/m ³		9.	As, ng/m ³	BDL	6 ng/m ³		10.	Ni, ng/m ³	BDL	20 ng/m ³		11.	Benzene, µg/m ³	BDL	5 µg/m ³		12.	Benzoapyrene ng/m ³	BDL	1 ng/m ³	
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Mobile: 09471358492, 09431512608

Ref. No.: - ARDS/24-25/ AAQ/2

Date: 19/02/2025

TEST REPORT OF AMBIENT AIR QUALITY

- Name of the industry : M/S TATA STEEL, JAMADOBA,
TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700126557/932 Date:- 29/05/2024
- Date of Sample Collection : 12/02/2025 to 13/02/2025
- Date of Testing : 14/02/2025 to 18/02/2025
- Test Procedure : As per IS-5182

TEST RESULTS

LOCATION – OFFICERS COLONY, 12 NO. DIGWADIH				
	Avg. Ambient Temperature	29°C	Avg. Humidity	28%
Sl No.	Particulars	Value	NAAQ - CPCB STANDARD	
1.	Particulate Matter (PM ₁₀), µg/m ³	72.75	100 µg/m ³	
2.	Particulate Matter (PM _{2.5}), µg/m ³	39.29	60 µg/m ³	
3.	SO ₂ , µg/m ³	17.79	80 µg/m ³	
4.	NO ₂ , µg/m ³	25.32	80 µg/m ³	
5.	Ozone, µg/m ³	15.92	180 µg/m ³	
6.	NH ₃ , µg/m ³	13.09	400 µg/m ³	
7.	CO, mg/m ³	0.67	4 mg/m ³	
8.	Pb, µg/m ³	BDL	1 µg/m ³	
9.	As, ng/m ³	BDL	6 ng/m ³	
10.	Ni, ng/m ³	BDL	20 ng/m ³	
11.	Benzene, µg/m ³	BDL	5 µg/m ³	
12.	Benzoapyrene ng/m ³	BDL	1 ng/m ³	

NOTE: BDL - Below Detection Limit

Sr. Chemist
Aditi R&D Services



Technical Manager
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/24-25/ AAQ/3

Date: 19/02/2025

TEST REPORT OF AMBIENT AIR QUALITY

- Name of the industry : M/S TATA STEEL, JAMADOBA,
TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO. : 4700126557/932 Date:- 29/05/2024
- Date of Sample Collection : 11/02/2025 to 12/02/2025
- Date of Testing : 14/02/2025 to 18/02/2025
- Test Procedure : As per IS-5182

TEST RESULTS

LOCATION – CENTRAL WORKSHOP AREA , JAMADOBA				
Avg. Ambient Temperature		29°C	Avg. Humidity	28%
Sl No.	Particulars	Value	NAAQ - CPCB STANDARD	
1.	Particulate Matter (PM ₁₀), µg/m ³	82.45	100 µg/m ³	
2.	Particulate Matter (PM _{2.5}), µg/m ³	46.79	60 µg/m ³	
3.	SO ₂ , µg/m ³	20.69	80 µg/m ³	
4.	NO ₂ , µg/m ³	28.46	80 µg/m ³	
5.	Ozone, µg/m ³	17.89	180 µg/m ³	
6.	NH ₃ , µg/m ³	15.92	400 µg/m ³	
7.	CO, mg/m ³	0.89	4 mg/m ³	
8.	Pb, µg/m ³	BDL	1 µg/m ³	
9.	As, ng/m ³	BDL	6 ng/m ³	
10.	Ni, ng/m ³	BDL	20 ng/m ³	
11.	Benzene, µg/m ³	BDL	5 µg/m ³	
12.	Benzoapyrene ng/m ³	BDL	1 ng/m ³	

NOTE: BDL - Below Detection Limit

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Ref. No.: - ARDS/24-25/ AAQ/4

Date: 19/02/2025

TEST REPORT OF AMBIENT AIR QUALITY

- Name of the industry : M/S TATA STEEL, JAMADOBA,
TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700126557/932 Date:- 29/05/2024
- Date of Sample Collection : 11/02/2025 To 12/02/2025
- Date of Testing : 14/02/2025 to 18/02/2025
- Test Procedure : As per IS-5182

TEST RESULTS

LOCATION – TATA CENTRAL HOSPITAL

Avg. Ambient Temperature		29°C	Avg. Humidity	28%
Sl No.	Particulars	Value	NAAQ - CPCB STANDARD	
1.	Particulate Matter (PM ₁₀), µg/m ³	66.31	100 µg/m ³	
2.	Particulate Matter (PM _{2.5}), µg/m ³	36.81	60 µg/m ³	
3.	SO ₂ , µg/m ³	15.56	80 µg/m ³	
4.	NO ₂ , µg/m ³	25.06	80 µg/m ³	
5.	Ozone, µg/m ³	16.86	180 µg/m ³	
6.	NH ₃ , µg/m ³	14.85	400 µg/m ³	
7.	CO, mg/m ³	0.79	4 mg/m ³	
8.	Pb, µg/m ³	BDL	1 µg/m ³	
9.	As, ng/m ³	BDL	6 ng/m ³	
10.	Ni, ng/m ³	BDL	20 ng/m ³	
11.	Benzene, µg/m ³	BDL	5 µg/m ³	
12.	Benzoapyrene ng/m ³	BDL	1 ng/m ³	

NOTE: BDL - Below Detection Limit


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TEST REPORT OF NOISE (AMBIENT) LEVEL MONITORING

Ref. No. & Date				NAME AND ADDRESS OF THE CLIENT							
ARDS/24-25/NOISE/1 Date: 19/02/2025				M/S TATA STEEL, JAMADOBA, TATA STEEL LIMITED, JAMADOBA GROUP PLANT, DIST. - DHANBAD (JHARKHAND)							
Date of Monitoring											
11/02/2025 To 13/02/2025				Avg. Ambient Temperature (°C)		Average Humidity (%)		Weather Condition		Status of the plant	
Work Order 4700126557/932 Date:- 29/05/2024				29		30		Clear		Running	
MONITORING RESULTS											
Sl. No	Place of Monitoring	Day Time (6 AM to 10 PM) Avg. dB(A)			Night Time (10 PM to 6 AM) Avg. dB(A)			Noise level (Ambient standard) for Industrial Area as per CPCB Noise Pollution (Regulation and Control) (Amendment) Rules, 2000 notified vide S.O. 1046(E) Dt. 22.11.2020 Limit in dB(A) Leq			
		MAX	MIN	AVG. dB(A) Leq	MAX	MIN	AVERAGE dB(A) Leq	Day Time	Night Time		
LOCATION								Industrial Area	Industrial Area		
JAMADOBA GROUP											
1.	Central Workshop Area	62.68	57.01	60.71	52.08	44.21	49.73	75	70		
2.	6 & 7 Pits Colliery Office	60.79	54.49	58.69	49.14	42.63	47.01				
								Residential Area	Residential Area		
3.	Officer Colony 12 No. Digwadih	56.07	58.87	57.69	47.88	44.83	46.62	65	55		
								Silence Zone	Silence Zone		
4.	Tata Central Hospital	48.56	49.5	49.06	41.37	38.22	40.07	50	40		

[Signature]
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Ref. No.: - ARDS/24-25/MINER./1

Date: 19/02/2025

TEST REPORT OF MINERALOGICAL COMPOSITION OF PARTICULATE MATTER

- Name of the industry : M/S TATA STEEL, JAMADOBA,
TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO. : 4700126557/932 Date:- 29/05/2024
- Date of Sample Collection : 12/02/2025 and 13/02/2025
- Date of Testing : 14/02/2025 To 18/02/2025

TEST RESULTS

Sl No.	Particulars	Mineralogical Composition (%)			
		SiO ₂	FeO	Al ₂ O ₃	CaO
1.	6 & 7 Pits Colliery Office	1.81	0.13	1.34	2.70
2.	Tata Central Hospital	1.78	0.11	1.28	2.24


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Ref. No.: - ARDS/24-25/SW/1

Date: 19/02/2025

TEST REPORT OF SURFACE WATER

- Name of the industry : M/S TATA STEEL, JAMADOBA,
TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700126557/932 Date:- 29/05/2024
- Sample Code : 1. Damodar River Up Stream
2. Damodar River Down Stream
- Date of Sample Collection: 11/02/2025
- Date of Testing : 14/02/2025 To 18/02/2025
- Test : pH, TDS, Turbidity, DO, BOD, Cl, F, SO₄

TEST RESULT

Sl. No.	PARAMETERS OF TEST	VALUE		Limit as per IS 2296 Class - C	Test Method
		Damodar River Up Stream	Damodar River Dn Stream		
1.	pH	7.9	7.6	6.5 -8.5	IS-3025 (P-11): 1983
2.	Total Dissolved Solids, mg/l	434	532	1500	IS-3025 (P-16): 1984
3.	Turbidity, NTU	1	1	-	IS-3025 (P-10):1984
4.	Dissolved Oxygen, mg/l	5.1	5.2	4.0 (Min)	IS-3025 (P-38):1989
5.	Bio chemical Oxygen Demand, mg/l	1.7	2.2	3.0	IS-3025 (P-44):1994
6.	Chloride as Cl, mg/l	44.6	36.8	600 (Max.)	IS-3025 (P-32):1988
7.	Fluoride as F, mg/l	0.4	0.4	1.5	IS-3025 (P-60):2008
8.	Sulphate as SO ₄ , mg/l	28.2	24.6	400	IS-3025 (P-24):1986


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Ref. No.: - ARDS/24-25/MWD/1

Date: 21/02/2025

TEST REPORT OF MINE WATER DISCHARGE

- Name of the industry : M/S TATA STEEL, JAMADOBA,
TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700126557/932 Date:- 29/05/2024
- Sample Code : 1. 2 Pit Jamadoba Colliery
2. 3 Pit Jamadoba Colliery
3. 6 & 7 Pits Colliery
4. Digwadih Colliery
- Date of Sample Collection: 11/02/2025 To 12/02/2025
- Date of Testing : 14/02/2025 To 18/02/2025
- Test : pH, TDS, TSS, BOD, COD, OIL & GREASE.

TEST RESULT

Sl. No.	PARAMETERS OF TEST	VALUE				Limit as per IS-2296 Class B (For Bathing)	Test Method
		2 Pit Jamadoba Colliery	3 Pit Jamadoba Colliery	6 & 7 Pits Colliery	Digwadih Colliery		
1.	pH,	7.9	7.6	7.9	7.8	6.5-8.5	IS-3025 (P-11): 1983
2.	Total Dissolved Solids, mg/l	1209	897	624	987	-	IS-3025 (P-16): 1984
3.	Total Suspended Solids, mg/l	22	25	27	29	-	IS-3025(P-17) : 1984
4.	Bio chemical Oxygen Demand, mg/l	2.0	1.6	1.5	2.4	3	IS-3025 (P-44):1994
5.	Chemical Oxygen Demand, mg/l	96	84	78	110	-	IS-3025 (P-58):2006
6.	Oil & Grease, mg/l	2.1	1.9	1.6	1.2	-	IS-3025 (P-39):2021


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Ref. No.: - ARDS/24-25/ETP/1

Date: 19/02/2025

TEST REPORT OF EFFLUENT

- Name of the industry : M/S TATA STEEL, JAMADOBA,
TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700126557/932 Date:- 29/05/2024
- Sample Code : 1. E.T.P. Outlet T.C.H.
2. E.T.P. Outlet Garage
- Date of Sample Collection: 11/02/2025 To 12/02/2025
- Date of Testing : 14/02/2025 To 18/02/2025
- Test : pH, TDS, TSS, BOD, COD, OIL & GREASE.

TEST RESULT

Sl. No.	PARAMETERS OF TEST	VALUE		General Standard for discharge of Environmental Pollutants, Inland Surface water by the MoEF&C	Test Method
		E.T.P. Outlet T.C.H.	E.T.P. Outlet Garage		
1.	pH,	8.5	8.3	5.5-9.0	IS-3025 (P-11): 1983
2.	Total Dissolved Solids, mg/l	845	715	-	IS-3025 (P-16): 1984
3.	Total Suspended Solids, mg/l	26	65	100	IS-3025(P-17) : 1984
4.	Bio chemical Oxygen Demand, mg/l	5.0	7.0	30	IS-3025 (P-44):1994
5.	Chemical Oxygen Demand, mg/l	40	56	250	IS-3025 (P-58):2006
6.	Oil & Grease, mg/l	1.6	3.2	10	IS-3025 (P-39):2021

Note : BDL - Below Detection Limit

Sr. Chemist
Aditi R&D Services



Technical Manager
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/24-25/DW/1

Date: 21/02/2025

TEST REPORT OF DRINKING WATER

- Name of the industry : M/S TATA STEEL, JAMADOBA,
TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700126557/932 Date:- 29/05/2024
- Sample Code : 1. Canteen- Jamadoba Colliery
2. Canteen- Jamadoba Washery
3. Canteen- Digwadih Colliery
4. Canteen- 6&7 Pits Colliery
- Date of Sample Collection: 11/02/2025 To 12/02/2025
- Date of Testing : 14/02/2025 To 20/02/2025
- Test :
Colour, Odour, Taste, Turbidity, pH, Total Hardness, Iron, Chloride, Res. Free chlorine, Total Dissolved Solids, Calcium, Copper, Manganese, Sulphate, Nitrate, Fluoride, Phenolic Compound, Mercury, Cadmium, Arsenic, Cyanide, Lead, Zinc, Total Coliform, Total Chromium, Mineral Oil, Alkalinity, Aluminium & Boron.

TEST RESULT

Sl. No	PARAMETERS OF TEST	VALUE				IS as per IS 10500:2012		Test Method
		Canteen-Jamadoba Colliery	Canteen-Jamadoba Washery	Canteen Digwadih Colliery	Canteen- 6&7 Pits Colliery	Desirab le	Permi ssible	
1.	Colour, (Hazen Unit)	1	1	1	1	5.00	15.0	IS 3025 (P-4):2021
2.	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeabl e	Agree able	IS 3025 (P-5):2018
3.	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeabl e	Agree able	IS 3025 (P-7):2017
4.	Turbidity, NTU	2	2	1	1	1.0	5.0	IS 3025 (P-10):1984
5.	pH	7.8	7.7	7.9	7.9	6.5-8.5	No. Relax.	IS-3025 (P-11):1983
6.	Total Hardness as CaCO ₃ , mg/l	583.8	567.0	441.0	344.4	200	600	IS 3025 (P-21):2009
7.	Chloride as Cl, mg/l	71.8	74.0	75.0	40.7	250	1000	IS 3025 (P-32):1988
8.	Res. Free chlorine as Cl ₂ mg/l	NIL	NIL	NIL	NIL	0.20	1.0	IS 3025 (P-26):2021
9.	Total Dissolved Solids, mg/l	792	840	752	418	500	2000	IS 3025 (P-16):1984
10.	Calcium as Ca, mg/l	80.6	65.5	57.1	68.8	75	200	IS 3025 (P-40):1991
11.	Copper as Cu, mg/l	BDL	BDL	BDL	BDL	0.05	1.5	IS 3025 (P-42):1992

Continued on Page 2



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Sl. No.	PARAMETERS OF TEST	VALUE				IS as per IS 10500:1991		Test Method
		Canteen-Jamadoba Colliery	Canteen Jamadoba Washery	Canteen Digwadih Colliery	Canteen - 6&7 Pits Colliery	Desirable	Permissible	
12.	Manganese as Mn, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	0.10	0.30	IS 3025 (P-59):2006
13.	Sulphate as SO ₄ , mg/l	35.6	37.8	34.8	38.6	200	400	IS 3025 (P-24):1986
14.	Nitrate as NO ₃ , mg/l	5.4	5.3	5.2	5.0	45	No. Relax	IS 3025 (P-34):1988
15.	Fluoride as F, mg/l	0.3	0.4	0.2	0.2	1.0	1.5	IS 3025 (P-60):2008
16.	Phenolic Compound as (C ₆ H ₅ OH) mg/l	B.D.L	B.D.L	B.D.L	B.D.L	0.001	0.002	IS 3025 (P-43):1992
17.	Mercury as Hg, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	0.001	No. Relax	IS 3025 (P-48):1994
18.	Cadmium as Cd, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	0.003	No. Relax	IS 3025 (P-41):1992
19.	Arsenic as As, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	0.01	No. Relax	IS 3025 (P-37):1988
20.	Cyanide as CN, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	0.05	No. Relax	IS 3025 (P-27):1986
21.	Lead as Pb, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	0.01	No. Relax	IS 3025 (P-47):1994
22.	Zinc as Zn, mg/l,	2	3	2	2	5	15	IS 3025 (P-42):1992
23.	Total Coliform, No./100ml	Absent	Absent	Absent	Absent	Absent	Absent	IS 3025 (P-49):1994
24.	Total Chromium as Cr, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	0.05	No. Relax	IS 3025 (P-52):2003
25.	Mineral Oil, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	0.5	No. Relax	IS 3025 (P-39):1989
26.	Alkalinity as CaCO ₃ , mg/l,	448	424	400	184	200	600	IS 3025 (P-23):1983
27.	Aluminium as Al, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	0.03	0.2	IS 3025 (P-55):2003
28.	Boron as B, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	0.5	1.0	IS 3025 (P-57):2005

NOTE: BDL - Below Detection Limit

[Signature]
Sr. Chemist
Aditi R&D Services



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

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ADITI R&D SERVICES

Testing Laboratory

NABL ACCREDITED

(A Constituent Board of Quality Council of India)

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

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

TEST REPORT OF STACK EMISSION

Ref. No & Dt.	NAME AND ADDRESS OF THE CLIENT			
ARDS/23-24/S/1 Date: 20/02/2025	M/S TATA STEEL, JAMADOBA, TATA STEEL LIMITED, JAMADOBA GROUP PLANT, DIST. - DHANBAD (JHARKHAND)			
Date of Sample Collection				
14/02/2025				
Date of Testing	Nature of Sampling Collection: ISO – KINETIC SAMPLING			
17/02/2025 to 18/02/2025	Weather condition	Status of the Plant	Ambient Temperature (°C)	R.Humidity (%)
	Clear	Running	28	49

GENERAL INFORMATION

1.	Nature of the Plant	M.S.
2.	Capacity of DG Set	2.0+2.0+2.0 MVA (6.0 MVA)
3.	Location	Central Workshop Area, Jamadoba
4.	No. of Stack	1
5.	Stack Height from G.L. in Meter	30
6.	Inner Shape & Size of Stack (in meter)φ	2.5
7.	Stack attached to	DG Set
8.	Type of Fuel used	HSD

GASEOUS EMISSION ANALYSIS RESULTS

Sl. No	Particulars	Method	Value	As per CPCB STANDARD mg/Nm ³
1.	Flue gas temperature (°C)	IS : 11255 (Part-3)	103	–
2.	Velocity of flue gas (m/sec)	IS : 11255 (Part-3)	9.2	–
3.	Flow Rate of Flue gas (Nm ³ /Hr)	IS : 11255 (Part-3)	128903.11	–
4.	Concentration of Particulate Matter (mg/ Nm ³) at 15% O ₂	IS : 11255 (Part-1)	62.36	75
5.	Concentration of SOX as SO ₂ (mg/ Nm ³) at 15% O ₂	IS : 11255 (Part-2)	54.76	–
6.	Concentration of NOX as NO ₂ (mg/ Nm ³) at 15% O ₂	IS : 11255 (Part-7)	126.41	360
7.	Non Methane Hydrocarbon (NMHC) at 15% O ₂	IS : 13270	46.79	100
8.	Carbon Monoxide (CO) (mg/Nm) ³	IS : 13270	37.2	150

Sr. Chemist
Aditi R&D Services



Technical Manager
Aditi R&D Services, Sindri

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	<h2 style="margin:0;">ADITI R&D SERVICES</h2> <h3 style="margin:0;">Testing Laboratory</h3> <p style="margin:0;">NABL ACCREDITED</p> <p style="margin:0;">(A Constituent Board of Quality Council of India)</p> <p style="margin:0;">ISO/IEC 17025:2017, ISO 9001:2015, ISO (OHSAS) 45001:2018 Certified</p>	<p>Plot No. - I-B-17 (P) Sindri, Industrial Area, P.O.- Domgarh, Dist.- Dhanbad Jharkhand - 828107 Email ID: sindriaditi@gmail.com Website: aditimdservices.com Phone: 0326-2952377 (O), Fax: 0326-2952377 Mobile: 09471358492, 09431512608</p>
-----------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

TEST REPORT OF NOISE (AMBIENT) LEVEL MONITORING

Ref. No. & Date	NAME AND ADDRESS OF THE CLIENT			
ARDS/23-24/N/S/1 Date: 20/02/2025	M/S TATA STEEL, JAMADOBA, TATA STEEL LIMITED, JAMADOBA GROUP PLANT, DIST. - DHANBAD (JHARKHAND)			
Date of Monitoring				
12/02/2025	Avg. Ambient Temperature (°C)	Average Humidity (%)	Weather Condition	Status of the plant
Work Order 4700092573/932 Dt. 20.07.2021	28	49	Clear	Running
MONITORING RESULTS				

Sl. No	Place of Monitoring	Day Time (6 AM to 10 PM) dB(A)		Noise level (Ambient standard) for Industrial Area as per CPCB Noise Pollution (Regulation and Control) (Amendment) Rules , 2000 notified vide S.O. 1046(E) Dt. 22.11.2020 Limit in dB(A) Leq	
				Day Time	Night Time
LOCATION		MAX	MIN	Industrial Area	Industrial Area
JAMADOBA GROUP					
Central Workshop Area Jamadoba near DG Set		71.2	66.4	75	70

Remarks: Noise level is well within the standard specified limit for Industrial Area.


Sr. Technician
 Aditi R&D Services




Technical Manager
 Aditi R&D Services, Sindri

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ADITI R&D SERVICES Testing Laboratory NABL ACCREDITED (A Constituent Board of Quality Council of India) ISO/IEC 17025:2017, ISO 9001:2015, ISO (OHSAS) 45001:2018 Certified		Plot No. - I-B-17 (P) Sindri, Industrial Area, P.O. - Domgarh, Dist. - Dhanbad Jharkhand - 828107 Email ID: sindriaditi@gmail.com Website: aditimdservices.com Phone: 0326-2952377 (O), Fax: 0326-2952377 Mobile: 09471358492, 09431512608						
Ref. No.: ARDS/24-25/STP/1		Date: 21/02/2025						
TEST REPORT OF SEWAGE								
• Name of the industry :		M/S TATA STEEL, JAMADOBA, TATA STEEL LIMITED JAMADOBA GROUP PLANT, DIST. - DHANBAD (JHARKHAND)						
• Work Order Ref. NO.:		4700126557/932 Date:- 29/05/2024						
• Sample Code :		1. STP Outlet- Railway Colony 2. STP Outlet -Digwadih 12 No Officers Colony 3. STP Outlet -Digwadih 12 No. Supervisor flat 4. STP Outlet- Jmb. Canteen 5. STP Outlet- JCPP Canteen						
• Date of Sample Collection:		11/02/2025 To 12/02/2025						
• Date of Testing :		14/02/2025 To 18/02/2025						
• Test :		pH, TDS, TSS, BOD, COD, OIL & GREASE, and Fecal Coliform, Total Nitrogen, Total Phosphorous.						
TEST RESULT								
Sl. No.	PARAMETERS OF TEST	VALUE					As per MoEF&CC Notification for Sewage Treatment Plant	Test Method
		STP Outlet Railway Colony	STP Outlet Digwadih 12 No Officers Colony	STP Outlet Digwadih 12 No. Supervisor flat	STP Outlet Jmb. Canteen	STP Outlet- JCPP Canteen		
1.	pH,	7.6	8.1	7.8	7.6	8.3	5.5-9.0.	IS-3025(P-11):1983
2.	Total Dissolved Solids, mg/l	1306.5	916.5	1144	1105	760.5	-	IS-3025(P-16):1984
3.	Total Suspended Solids, mg/l	12	10	20	15	19	20	IS-3025(P-17):1984
4.	Bio chemical Oxygen Demand, mg/l	8.2	6.5	8.0	9.0	9.8	10	IS-3025(P-44):1994
5.	Chemical Oxygen Demand, mg/l	30	45	48	48.8	47.6	50	IS-3025(P-58):2006
6.	Oil & Grease, mg/l	1.3	1.5	1.9	2.3	2.5	-	IS-3025(P-39):2021
7.	Fecal Coliform (FC) (MPN/100ml)	125	116	122	128	136	Desirable 100 & Permissible 230	IS - 1622
8.	Total Nitrogen as N, mg/l	8.2	7.7	8.9	7.8	8.0	10	IS - 3025 (P-34):1988
9.	Total Phosphorus as P, mg/l	0.68	0.65	0.69	0.74	0.71	10	IS - 3025 (P-31):1988
Sr. Chemist Aditi R&D Services		ADITI R&D SERVICES P.O. - DOMGARH DHANBAD JHARKHAND		Technical Manager Aditi R&D Services, Sindri				
Statements :								
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ADITI R&D SERVICES

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Mobile: 09471358492, 09431512608

Ref. No.: - ARDS/23-24/GW/1

Date: 21/02/2025

TEST REPORT OF GROUND WATER

- Name of the industry : M/S TATA STEEL, JAMADOBA, TATA STEEL LIMITED JAMADOBA GROUP PLANT, DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO. : 4700126557/932 Date:- 29/05/2024
- Sample Code :
 - 1. Jorapokhar Kustand
 - 2. Bhowra 13 No.
 - 3. Mohalbani Basti
 - 4. Lower Dungari
 - 5. Jamadoba 3 No.
- Date of Sample Collection : 11/02/2025 to 12/02/2025
- Date of Testing : 14/02/2025 to 20/02/2025
- Test : Colour, Odour, Taste, Turbidity, pH, Total Hardness, Iron, Chloride, Res. Free chlorine, Total Dissolved Solids, Calcium, Copper, Manganese, Sulphate, Nitrate, Fluoride, Phenolic Compound, Mercury, Cadmium, Arsenic, Cyanide, Lead, Zinc, Total Coliform, Chromium, Mineral Oil, Alkalinity, Aluminium & Boron.

TEST RESULT

Sl. No	PARAMETERS OF TEST	VALUE					IS as per IS 10500:1991		Test Method
		Jorapokhar Kustand	Bhowra 13 No.	Mohalbani Basti	Lower Dungari	Jamado 3 No	Desirable	Permissible	
1.	Colour, (Hazen Unit)	2	2	2	2	1	5	15	IS 3025 (P-4):2021
2.	Temperature °C	27	28	27	28	27	-	-	-
3.	Electrical Conductivity, µmhos/cm	2030	730	1030	660	840	-	-	-
4.	Total Dissolved Solids, mg/l	1308	460	650	415	546	500	2000	IS 3025(P-16):1984
5.	pH	7.8	7.5	7.1	6.7	7.3	6.5-8.5	No Relax	IS-3025(P-11):1983
6.	Total Hardness as CaCO ₃ , mg/l	399	281.4	340.2	298.2	310	200	600	IS 3025(P-21):2009
7.	Calcium as Ca, mg/l	124	86.6	116.0	67.2	80.4	75	200	IS 3025(P-40):1991
8.	Magnesium as Mg, mg/l	21.4	16.2	12.0	31.2	26.2	30	100	IS 3025(P-46):1994
9.	Chloride as Cl, mg/l	248	64	106.7	85.3	72.6	250	1000	IS 3025(P-32):1988
10.	Fluoride as F, mg/l	0.2	0.2	0.5	0.2	0.1	1.0	1.5	IS 3025(P-60):2008

Continued on Page -2

[Signature]



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Fax: 0326-2952377
Mobile: 09471358492, 09431512608

Sl. No	PARAMETERS OF TEST	VALUE					IS as per IS 10500:1991		Test Method
		Jorapokhar Kustand	Bhowra 13 No.	Mohalbani Basti	Lower Dungari	Jamado ba 3 No	Desir - able	Permis - sible	
11	Sulphate as SO ₄ , mg/l	45.5	40.6	50.6	45.2	56.4	200	400	IS 3025(P-24):1986
12.	Nitrate as NO ₃ , mg/l	4.9	4.8	5.6	4.8	4.9	45	No. Relax	IS 3025(P-34):1988
13.	Alkalinity as CaCO ₃ , mg/l,	676	252	236	168	268	200	600	IS 3025(P-23):1983
14.	Lead as Pb, mg/l	B.D.L	B.D.L	B.D.L	B.D.L.	B.D.L.	0.01	No. Relax	IS 3025(P-47):1994
15.	Zinc as Zn, mg/l,	3	3	3	2	2	5	15	IS 3025(P-42):1992
16.	Iron a Fe, mg/l	0.17	0.15	0.15	0.17	0.18	1.0	No. Relax	IS 3025(P-53):2003
17.	Copper as Cu, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	B.D.L.	0.05	1.5	IS3025 (P-42):1992
18.	Mercury as Hg, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	B.D.L.	0.001	No. Relax	IS 3025(P-48):1994
19.	Cadmium as Cd, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	B.D.L.	0.003	No. Relax	IS 3025(P-41):1992
20.	Nickel as Ni, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	B.D.L.	0.02	No. Relax	IS 3025(P-37):1992
21.	Arsenic as As, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	B.D.L.	0.01	No. Relax	IS 3025(P-37):1988
22.	Cyanide as CN, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	B.D.L.	0.05	No. Relax	IS 3025(P-27):1986
23.	Total Chromium as Cr, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	B.D.L.	0.05	No. Relax	IS 3025(P-52):2003

NOTE: BDL - Below Detection Limit


Sr. Chemist
Aditi R&D Services




Technical Manager
Aditi R&D Services, Sindri

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TATA STEEL LIMITED
JHARIA DIVISION

Area. Manager, Digwadih Colliery
Area. Manager, 6 & 7 Pits Colliery
Head, Jamadoba Coal Washery
CMO, Tata Central Hospital, Jamadoba

Ref: JMB/ENV/LAB/02/ 687 / 24

Date: 12/11/2024

Re: AIR QUALITY REPORT

We wish to inform you that Air Quality Monitoring was carried out in **JAMADOBA GROUP** in the month of **OCTOBER'2024**. The results are as given below.

Core zone (as per Ambient Air quality standards for coal mines notified vide notification G.S.R. 742(E) dated-25.09.2000

S.No	Location	Latitude/ Longitude	Date of Sampling	Weather Condition	SPM 24 Hourly Limit-700 µg/m ³	RSPM 24 Hourly Limit-300 µg/m ³	SO ₂ 24 Hourly Limit-120 µg/m ³	NO _x 24 Hourly Limit-120 µg/m ³
1	6&7 Pits Kalimandir area	23°43'15" N/ 86°24'12" E	04.10.24	Cloudy	190.7	66.3	17.8	20.5

Buffer zone (as per NAAQS 2009 for Ambient Air quality standards)

S.No	Location	Latitude/ Longitude	Date of Sampling	Weather Condition	PM ₁₀ 24 Hourly Limit-100 µg/m ³	PM _{2.5} 24 Hourly Limit- 60 µg/m ³	SO ₂ 24 Hourly Limit-80 µg/m ³	NO _x 24 Hourly Limit-80 µg/m ³
1	Jamadoba Group Office	23°42'15.3" N/ 86°24'11" E	03.10.24	Cloudy	70.6	35.8	16.5	19.2
2	Digwadih 12 No. Colony	23°41'42" N/ 86°24'45.3" E	07.10.24	Clear	86.3	42.8	17.2	20.8
3	New Village Colony, Jamadoba	23°41'51" N/ 86°23'19" E	08.10.24	Clear	80.1	40.7	18.6	21.1
4	Tata Central Hospital	23°42'36" N/ 86°24'10.4"E	09.10.24	Clear	76.2	38.5	15.4	18.3

Note: PM₁₀ - Less than 10-micron Particulate Matter
PM_{2.5} - Less than 2.5-micron Particulate Matter
µg - Microgram

This is for your information and necessary action please.


Lab. Assistant (Environment)


Area Manager (Environment)

TATA STEEL LIMITED
JHARIA DIVISION

Area Manager, Jamadoba Colliery
Area. Manager, Digwadih Colliery
Area. Manager, 6 & 7 Pits Colliery
Head, Jamadoba Coal Washery
CMO, Tata Central Hospital, Jamadoba

Ref: JMB /ENV /LAB /02 / 770 / 24

Date: 09/12/2024

Re: AIR QUALITY REPORT

We wish to inform you that Air Quality Monitoring was carried out in **JAMADOBA GROUP** in the month of **NOVEMBER'2024**. The results are as given below.

Core zone (as per Ambient Air quality standards for coal mines notified vide notification G.S.R. 742(E) dated-25.09.2000

S.No	Location	Latitude/ Longitude	Date of Sampling	Weather Condition	SPM 24 Hourly Limit-700 µg/m ³	RSPM 24 Hourly Limit-300 µg/m ³	SO ₂ 24 Hourly Limit-120 µg/m ³	NO _x 24 Hourly Limit-120 µg/m ³
1	6&7 Pits Kalimandir area	23°43'15" N/ 86°24'12" E	12.11.24	Clear	216.9	84.6	15.2	17.0

Buffer zone (as per NAAQS 2009 for Ambient Air quality standards)

S.No	Location	Latitude/ Longitude	Date of Sampling	Weather Condition	PM ₁₀ 24 Hourly Limit-100 µg/m ³	PM _{2.5} 24 Hourly Limit- 60 µg/m ³	SO ₂ 24 Hourly Limit-80 µg/m ³	NO _x 24 Hourly Limit-80 µg/m ³
1	Jamadoba Group Office	23°42'15.3" N/ 86°24'11" E	12.11.24	Clear	90.2	54.6	19.7	22.3
2	Digwadih 12 No. Colony	23°41'42" N/ 86°24'45.3" E	12.11.24	Clear	82.5	41.3	16.1	18.4
3	New Village Colony, Jamadoba	23°41'51" N/ 86°23'19" E	13.11.24	Clear	78.4	37.5	17.8	20.4
4	Tata Central Hospital	23°42'36" N/ 86°24'10.4"E	13.11.24	Clear	80.6	39.2	18.3	21.7

Note: PM₁₀ - Less than 10-micron Particulate Matter
PM_{2.5} - Less than 2.5-micron Particulate Matter
µg - Microgram

This is for your information and necessary action please.


Lab. Assistant (Environment)


Manager (Environment)

TATA STEEL LIMITED
JHARIA DIVISION

Area Manager, Jamadoba Colliery
Area. Manager, Digwadih Colliery
Area. Manager, 6 & 7 Pits Colliery
Head, Jamadoba Coal Washery
CMO, Tata Central Hospital, Jamadoba

Ref: JMB /ENV /LAB /02 / 910 /24

Date: 31/12/2024

Re: AIR QUALITY REPORT

We wish to inform you that Air Quality Monitoring was carried out in **JAMADOBA GROUP** in the month of **DECEMBER'2024**. The results are as given below.

Core zone (as per Ambient Air quality standards for coal mines notified vide notification G.S.R. 742(E) dated-25.09.2000

S.No	Location	Latitude/ Longitude	Date of Sampling	Weather Condition	SPM 24 Hourly Limit-700 µg/m ³	RSPM 24 Hourly Limit-300 µg/m ³	SO ₂ 24 Hourly Limit-120 µg/m ³	NO _x 24 Hourly Limit-120 µg/m ³
1	6&7 Pits Kalimandir area	23°43'15" N/ 86°24'12" E	06.12.24	Clear	248.9	82.5	16.8	18.3

Buffer zone (as per NAAQS 2009 for Ambient Air quality standards)

S.No	Location	Latitude/ Longitude	Date of Sampling	Weather Condition	PM ₁₀ 24 Hourly Limit-100 µg/m ³	PM _{2.5} 24 Hourly Limit- 60 µg/m ³	SO ₂ 24 Hourly Limit-80 µg/m ³	NO _x 24 Hourly Limit-80 µg/m ³
1	Jamadoba Group Office	23°42'15.3" N/ 86°24'11" E	06.12.24	Clear	88.7	47.5	17.2	19.1
2	Digwadih 12 No. Colony	23°41'42" N/ 86°24'45.3" E	06.12.24	Clear	80.6	39.7	18.2	20.3
3	New Village Colony, Jamadoba	23°41'51" N/ 86°23'19" E	10.12.24	Clear	76.2	32.1	15.9	17.2
4	Tata Central Hospital	23°42'36" N/ 86°24'10.4"E	10.12.24	Clear	92.5	51.8	19.7	22.4

Note: PM₁₀ - Less than 10-micron Particulate Matter
PM_{2.5} - Less than 2.5-micron Particulate Matter
µg - Microgram

This is for your information and necessary action please.


Lab. Assistant (Environment)


Manager (Environment)

TATA STEEL LIMITED
JHARIA DIVISION

Area Manager, Jamadoba Colliery
Area. Manager, Digwadih Colliery
Area. Manager, 6 & 7 Pits Colliery
Head, Jamadoba Coal Washery
CMO, Tata Central Hospital, Jamadoba

Ref: JMB /ENV /LAB /02 / 44 / 25
Date: 31 / 01 / 2025

Re: AIR QUALITY REPORT

We wish to inform you that Air Quality Monitoring was carried out in **JAMADOBA GROUP** in the month of **JANUARY'2025**. The results are as given below.

Core zone (as per Ambient Air quality standards for coal mines notified vide notification G.S.R. 742(E) dated-25.09.2000

S.No	Location	Latitude/ Longitude	Date of Sampling	Weather Condition	SPM 24 Hourly Limit-700 µg/m ³	RSPM 24 Hourly Limit-300 µg/m ³	SO ₂ 24 Hourly Limit-120 µg/m ³	NO _x 24 Hourly Limit-120 µg/m ³
1	6&7 Pits Kalimandir area	23°43'15" N/ 86°24'12" E	07.01.25	Clear	239.5	80.3	17.2	20.4

Buffer zone (as per NAAQS 2009 for Ambient Air quality standards)

S.No	Location	Latitude/ Longitude	Date of Sampling	Weather Condition	PM ₁₀ 24 Hourly Limit-100 µg/m ³	PM _{2.5} 24 Hourly Limit- 60 µg/m ³	SO ₂ 24 Hourly Limit-80 µg/m ³	NO _x 24 Hourly Limit-80 µg/m ³
1	Jamadoba Group Office	23°42'15.3" N/ 86°24'11" E	07.01.25	Clear	86.5	42.1	16.8	18.3
2	Digwadih 12 No. Colony	23°41'42" N/ 86°24'45.3" E	07.01.25	Clear	82.1	40.3	15.9	17.6
3	New Village Colony, Jamadoba	23°41'51" N/ 86°23'19" E	08.01.25	Clear	70.8	30.9	17.3	19.5
4	Tata Central Hospital	23°42'36" N/ 86°24'10.4"E	08.01.25	Clear	90.4	46.7	18.2	21.3

Note: PM₁₀ - Less than 10-micron Particulate Matter
PM_{2.5} - Less than 2.5-micron Particulate Matter
µg - Microgram

This is for your information and necessary action please.


Lab. Assistant (Environment)


Manager (Environment)

TATA STEEL LIMITED
JHARIA DIVISION

Area Manager, Jamadoba Colliery
Area. Manager, Digwadih Colliery
Area. Manager, 6 & 7 Pits Colliery
Head, Jamadoba Coal Washery
CMO, Tata Central Hospital, Jamadoba

Ref: JMB /ENV /LAB /02 / 89 / 25
Date: 28/02/2025

Re: AIR QUALITY REPORT

We wish to inform you that Air Quality Monitoring was carried out in **JAMADOBA GROUP** in the month of **FEBRUARY'2025**. The results are as given below.

Core zone (as per Ambient Air quality standards for coal mines notified vide notification G.S.R. 742(E) dated-25.09.2000

S.No	Location	Latitude/ Longitude	Date of Sampling	Weather Condition	SPM 24 Hourly Limit-700 µg/m ³	RSPM 24 Hourly Limit-300 µg/m ³	SO ₂ 24 Hourly Limit-120 µg/m ³	NO _x 24 Hourly Limit-120 µg/m ³
1	6&7 Pits Kalimandir area	23°43'15" N/ 86°24'12" E	11.02.25	Clear	231.7	84.6	18.3	21.7

Buffer zone (as per NAAQS 2009 for Ambient Air quality standards)

S.No	Location	Latitude/ Longitude	Date of Sampling	Weather Condition	PM ₁₀ 24 Hourly Limit-100 µg/m ³	PM _{2.5} 24 Hourly Limit- 60 µg/m ³	SO ₂ 24 Hourly Limit-80 µg/m ³	NO _x 24 Hourly Limit-80 µg/m ³
1	Jamadoba Group Office	23°42'15.3" N/ 86°24'11" E	11.02.25	Clear	78.9	37.2	15.0	17.2
2	Digwadih 12 No. Colony	23°41'42" N/ 86°24'45.3" E	11.02.25	Clear	80.6	39.5	17.2	19.1
3	New Village Colony, Jamadoba	23°41'51" N/ 86°23'19" E	12.02.25	Clear	76.2	33.1	16.4	18.5
4	Tata Central Hospital	23°42'36" N/ 86°24'10.4"E	12.02.25	Clear	87.5	42.2	19.2	22.4

Note: PM₁₀ - Less than 10-micron Particulate Matter
PM_{2.5} - Less than 2.5-micron Particulate Matter
µg - Microgram

This is for your information and necessary action please.


Lab. Assistant (Environment)


Manager (Environment)

TATA STEEL LIMITED
JHARIA DIVISION

Area Manager, Jamadoba Colliery
Area. Manager, Digwadih Colliery
Area. Manager, 6 & 7 Pits Colliery
Head, Jamadoba Coal Washery
CMO, Tata Central Hospital, Jamadoba

Ref: JMB /ENV /LAB /02 / 153 / 25

Date: 07/04 / 2025

Re: AIR QUALITY REPORT

We wish to inform you that Air Quality Monitoring was carried out in **JAMADOBA GROUP** in the month of **MARCH'2025**. The results are as given below.

Core zone (as per Ambient Air quality standards for coal mines notified vide notification G.S.R. 742(E) dated-25.09.2000

S.No	Location	Latitude/ Longitude	Date of Sampling	Weather Condition	SPM 24 Hourly Limit-700 µg/m ³	RSPM 24 Hourly Limit-300 µg/m ³	SO ₂ 24 Hourly Limit-120 µg/m ³	NO _x 24 Hourly Limit-120 µg/m ³
1	6&7 Pits Kalimandir area	23°43'15" N/ 86°24'12" E	05.03.25	Clear	247.6	86.2	19.1	22.6

Buffer zone (as per NAAQS 2009 for Ambient Air quality standards)

S.No	Location	Latitude/ Longitude	Date of Sampling	Weather Condition	PM ₁₀ 24 Hourly Limit-100 µg/m ³	PM _{2.5} 24 Hourly Limit- 60 µg/m ³	SO ₂ 24 Hourly Limit-80 µg/m ³	NO _x 24 Hourly Limit-80 µg/m ³
1	Jamadoba Group Office	23°42'15.3" N/ 86°24'11" E	05.03.25	Clear	92.4	51.6	18.2	21.7
2	Digwadih 12 No. Colony	23°41'42" N/ 86°24'45.3" E	05.03.25	Clear	84.5	42.3	16.8	18.3
3	New Village Colony, Jamadoba	23°41'51" N/ 86°23'19" E	06.03.25	Clear	78.6	36.5	15.1	17.4
4	Tata Central Hospital	23°42'36" N/ 86°24'10.4"E	06.03.25	Clear	83.1	40.9	17.8	20.1

Note: PM₁₀ - Less than 10-micron Particulate Matter
PM_{2.5} - Less than 2.5-micron Particulate Matter
µg - Microgram

This is for your information and necessary action please.


Lab. Assistant (Environment)


Manager (Environment)

TATA STEEL LIMITED
JHARIA DIVISION

Head, Jamadoba Colliery
Head, Jamadoba Coal Washery
Sr. Manager, Digwadih Colliery
Sr. Manager, 6 & 7 Pits Colliery

Ref : JMB/ ENV/ LAB/ 05/ 64/ 24

Dated: 01/11/2024

Re: Ambient Noise Level Report

We wish to inform you that Ambient Noise Level Monitoring was carried out in **JAMADOBA GROUP** in the month of **OCTOBER'2024**. The results are as given below:

S.No	Monitoring Station	Date	Day (06.00 – 22.00 Hrs.)			Night (22.00-06.00 Hrs)		
			CPCB Standard- 55			CPCB Standard- 45		
	Residential Area (Buffer Zone)		Min.	Max.	Avg.	Min.	Max.	Avg.
1	Digwadih 12 No. Colony	24.10.24	42.2	44.5	43.4	34.3	36.7	35.5
2	New Village Colony, Jamadoba	24.10.24	43.5	45.7	44.6	35.7	37.8	36.8
3	6&7 Pits Kalimandir Colony	24.10.24	42.4	44.7	43.6	34.5	36.4	35.5
4	Digwadih 10 No. Colony	24.10.24	43.1	45.6	44.4	35.3	37.5	36.4

S.No	Monitoring Station	Date	Day (06.00 – 22.00 Hrs.)			Night (22.00-06.00 Hrs)		
			CPCB Standard- 75			CPCB Standard- 70		
	Industrial Area (Core Zone)		Min.	Max.	Avg.	Min.	Max.	Avg.
1	2 Pit Main Gate Security Post	24.10.24	53.4	56.7	55.1	45.2	48.4	46.8
2	2 Pit Top Kalimandir, Jamadoba	24.10.24	52.1	55.4	53.8	44.3	47.6	46.0
3	Weigh Bridge, Digwadih	24.10.24	49.7	52.6	51.2	41.5	44.7	43.1
4	Canteen Complex, Digwadih	24.10.24	46.4	47.7	47.1	38.1	40.3	39.2
5	Head Office Complex, Digwadih	24.10.24	46.2	48.5	47.4	38.4	40.6	39.5
6	Check Post Security Gate, 6&7 Pits	24.10.24	50.5	53.8	52.2	42.7	45.9	44.3
7	Canteen Complex, 6&7 Pits	24.10.24	46.3	47.6	47.0	38.5	40.7	39.6
8	Fan house- Nitrogen Plant, 6&7 Pits	24.10.24	72.3	73.5	72.9	64.2	65.6	64.9
9	Joota Gate, JCPP	24.10.24	58.8	61.9	60.4	50.6	53.4	52.0
10	Main Gate Stores, JCPP	24.10.24	53.6	56.4	55.0	45.4	48.6	47.0
11	Railway Siding Yard, JCPP	24.10.24	50.4	53.7	52.1	42.7	45.4	44.1

Analysis: All the values are within permissible limit.

This is for your information please.


Lab. Assistant (Environment)


Area Manager (Environment)

Copy to: Specialist (OH). TCH

TATA STEEL LIMITED
JHARIA DIVISION

Head, Jamadoba Colliery
Head, Jamadoba Coal Washery
Sr. Manager, Digwadih Colliery
Sr. Manager, 6 & 7 Pits Colliery

Ref : JMB/ ENV/ LAB/ 05/ 731 /24
Dated: 04 /12/ 2024

Re: Ambient Noise Level Report

We wish to inform you that Ambient Noise Level Monitoring was carried out in **JAMADOBA GROUP** in the month of **NOVEMBER'2024**. The results are as given below:

S.No	Monitoring Station	Date	Day (06.00 – 22.00 Hrs.)			Night (22.00-06.00 Hrs)		
			CPCB Standard- 55			CPCB Standard- 45		
	Residential Area (Buffer Zone)		Min.	Max.	Avg.	Min.	Max.	Avg.
1	Digwadih 12 No. Colony	22.11.24	42.4	44.7	43.6	34.7	36.5	35.6
2	New Village Colony, Jamadoba	22.11.24	43.1	45.3	44.2	35.3	37.6	36.5
3	6&7 Pits Kalimandir Colony	22.11.24	42.3	44.5	43.4	34.5	36.3	35.4
4	Digwadih 10 No. Colony	22.11.24	43.5	45.7	44.6	35.2	37.4	36.3

S.No	Monitoring Station	Date	Day (06.00 – 22.00 Hrs.)			Night (22.00-06.00 Hrs)		
			CPCB Standard- 75			CPCB Standard- 70		
	Industrial Area (Core Zone)		Min.	Max.	Avg.	Min.	Max.	Avg.
1	2 Pit Main Gate Security Post	22.11.24	51.5	54.8	53.2	43.3	46.5	44.9
2	2 Pit Top Kalimandir, Jamadoba	22.11.24	50.3	53.5	51.9	42.4	45.7	44.1
3	Weigh Bridge, Digwadih	22.11.24	48.4	50.7	49.6	40.2	42.5	41.4
4	Canteen Complex, Digwadih	22.11.24	44.2	46.4	45.3	36.5	38.6	37.6
5	Head Office Complex, Digwadih	22.11.24	44.1	46.3	45.2	36.3	38.5	37.4
6	Check Post Security Gate, 6&7 Pits	22.11.24	50.4	52.6	51.5	42.6	44.8	43.7
7	Canteen Complex, 6&7 Pits	22.11.24	44.4	46.7	45.6	36.2	38.6	37.4
8	Fan house- Nitrogen Plant, 6&7 Pits	22.11.24	72.2	73.4	72.8	64.2	65.7	65.0
9	Joota Gate, JCPP	22.11.24	56.5	59.7	58.1	48.7	51.9	50.3
10	Main Gate Stores, JCPP	22.11.24	52.4	55.6	54.0	44.5	47.8	46.2
11	Railway Siding Yard, JCPP	22.11.24	50.1	53.3	51.7	42.3	45.4	43.9

Analysis: All the values are within permissible limit.

This is for your information please.


Lab. Assistant (Environment)


Manager (Environment)

Copy to: Specialist (OH). TCH

TATA STEEL LIMITED
JHARIA DIVISION

Head, Jamadoba Colliery
Head, Jamadoba Coal Washery
Sr. Manager, Digwadih Colliery
Sr. Manager, 6 & 7 Pits Colliery

Ref : JMB/ ENV/ LAB/ 05/ 817/24

Dated: 31/12/2024

Re: Ambient Noise Level Report


We wish to inform you that Ambient Noise Level Monitoring was carried out in **JAMADOBA GROUP** in the month of **DECEMBER'2024**. The results are as given below:

S.No	Monitoring Station	Date	Day (06.00 – 22.00 Hrs.)			Night (22.00-06.00 Hrs)		
			CPCB Standard- 55			CPCB Standard- 45		
	Residential Area (Buffer Zone)		Min.	Max.	Avg.	Min.	Max.	Avg.
1	Digwadih 12 No. Colony	20.12.24	42.2	44.5	43.4	34.4	36.7	35.6
2	New Village Colony, Jamadoba	20.12.24	44.3	45.7	45.0	36.5	38.8	37.7
3	6&7 Pits Kalimandir Colony	20.12.24	42.7	44.6	43.7	34.3	36.5	35.4
4	Digwadih 10 No. Colony	20.12.24	43.1	45.3	44.2	35.6	37.9	36.8


S.No	Monitoring Station	Date	Day (06.00 – 22.00 Hrs.)			Night (22.00-06.00 Hrs)		
			CPCB Standard- 75			CPCB Standard- 70		
	Industrial Area (Core Zone)		Min.	Max.	Avg.	Min.	Max.	Avg.
1	2 Pit Main Gate Security Post	20.12.24	52.2	55.6	53.9	44.5	47.8	46.2
2	2 Pit Top Kalimandir, Jamadoba	20.12.24	50.5	53.7	52.1	42.1	45.5	43.8
3	Weigh Bridge, Digwadih	20.12.24	48.2	50.4	49.3	40.3	42.6	41.5
4	Canteen Complex, Digwadih	20.12.24	44.7	45.6	45.2	36.2	38.4	37.3
5	Head Office Complex, Digwadih	20.12.24	44.4	46.5	45.5	36.5	38.7	37.6
6	Check Post Security Gate, 6&7 Pits	20.12.24	51.3	53.2	52.3	43.1	45.3	44.2
7	Canteen Complex, 6&7 Pits	20.12.24	44.6	45.4	45.0	36.4	38.7	37.6
8	Fan house- Nitrogen Plant, 6&7 Pits	20.12.24	72.3	73.5	72.9	64.4	65.6	65.0
9	Joota Gate, JCPP	20.12.24	57.4	60.7	59.1	49.5	52.8	51.2
10	Main Gate Stores, JCPP	20.12.24	51.6	54.9	53.3	43.2	46.5	44.9
11	Railway Siding Yard, JCPP	20.12.24	50.3	53.6	52.0	42.5	45.7	44.1

Analysis: All the values are within permissible limit.

This is for your information please.


Lab. Assistant (Environment)

Copy to: Specialist (OH). TCH


Manager (Environment)

TATA STEEL LIMITED
JHARIA DIVISION

Head, Jamadoba Colliery
Head, Jamadoba Coal Washery
Sr. Manager, Digwadih Colliery
Sr. Manager, 6 & 7 Pits Colliery

Ref : JMB/ ENV/ LAB/ 05/ 51 /25

Dated: 31 /01 / 2025

Re: Ambient Noise Level Report

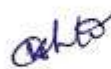
We wish to inform you that Ambient Noise Level Monitoring was carried out in **JAMADOBA GROUP** in the month of **JANUARY'2025**. The results are as given below:

S.No	Monitoring Station	Date	Day (06.00 – 22.00 Hrs.)			Night (22.00-06.00 Hrs)		
			CPCB Standard- 55			CPCB Standard- 45		
	Residential Area (Buffer Zone)		Min.	Max.	Avg.	Min.	Max.	Avg.
1	Digwadih 12 No. Colony	13.01.25	41.7	43.4	42.6	33.5	35.8	34.7
2	New Village Colony, Jamadoba	13.01.25	42.5	44.6	43.6	34.3	36.5	35.4
3	6&7 Pits Kalimandir Colony	13.01.25	42.3	44.5	43.4	34.6	36.8	35.7
4	Digwadih 10 No. Colony	13.01.25	43.6	45.8	44.7	35.4	37.6	36.5

S.No	Monitoring Station	Date	Day (06.00 – 22.00 Hrs.)			Night (22.00-06.00 Hrs)		
			CPCB Standard- 75			CPCB Standard- 70		
	Industrial Area (Core Zone)		Min.	Max.	Avg.	Min.	Max.	Avg.
1	2 Pit Main Gate Security Post	13.01.25	52.6	55.8	54.2	44.5	47.7	46.1
2	2 Pit Top Kalimandir, Jamadoba	13.01.25	51.4	54.6	53.0	43.2	46.4	44.8
3	Weigh Bridge, Digwadih	13.01.25	49.7	51.5	50.6	41.6	43.8	42.7
4	Canteen Complex, Digwadih	13.01.25	45.2	47.5	46.4	37.3	39.6	38.5
5	Head Office Complex, Digwadih	13.01.25	44.8	46.6	45.7	36.5	38.7	37.6
6	Check Post Security Gate, 6&7 Pits	13.01.25	52.5	54.8	53.7	44.7	46.8	45.8
7	Canteen Complex, 6&7 Pits	13.01.25	44.1	46.3	45.2	36.3	38.5	37.4
8	Fan house- Nitrogen Plant, 6&7 Pits	13.01.25	72.4	73.6	73.0	64.5	65.7	65.1
9	Joota Gate, JCPP	13.01.25	56.7	59.9	58.3	48.4	51.6	50.0
10	Main Gate Stores, JCPP	13.01.25	52.5	55.7	54.1	44.2	47.5	45.9
11	Railway Siding Yard, JCPP	13.01.25	51.4	54.5	53.0	43.5	46.7	45.1

Analysis: All the values are within permissible limit.

This is for your information please.


Lab. Assistant (Environment)


Manager (Environment)

Copy to: Specialist (OH). TCH

TATA STEEL LIMITED
JHARIA DIVISION

Head, Jamadoba Colliery
Head, Jamadoba Coal Washery
Sr. Manager, Digwadih Colliery
Sr. Manager, 6 & 7 Pits Colliery

Ref : JMB/ ENV/ LAB/ 05/ 102/25

Dated: 28/02/2025

Re: Ambient Noise Level Report


We wish to inform you that Ambient Noise Level Monitoring was carried out in **JAMADOBA GROUP** in the month of **FEBRUARY'2025**. The results are as given below:

S.No	Monitoring Station	Date	Day (06.00 – 22.00 Hrs.)			Night (22.00-06.00 Hrs)		
			CPCB Standard- 55			CPCB Standard- 45		
	Residential Area (Buffer Zone)		Min.	Max.	Avg.	Min.	Max.	Avg.
1	Digwadih 12 No. Colony	26.02.25	44.8	46.5	45.7	36.4	38.6	37.5
2	New Village Colony, Jamadoba	26.02.25	42.4	44.6	43.5	34.6	36.8	35.7
3	6&7 Pits Kalimandir Colony	26.02.25	48.4	50.2	49.3	40.3	42.5	41.4
4	Digwadih 10 No. Colony	26.02.25	45.6	47.7	46.7	37.5	39.8	38.7

S.No	Monitoring Station	Date	Day (06.00 – 22.00 Hrs.)			Night (22.00-06.00 Hrs)		
			CPCB Standard- 75			CPCB Standard- 70		
	Industrial Area (Core Zone)		Min.	Max.	Avg.	Min.	Max.	Avg.
1	2 Pit Main Gate Security Post	26.02.25	56.5	59.7	58.1	48.3	51.5	49.9
2	2 Pit Top Kalimandir, Jamadoba	26.02.25	52.2	55.1	53.7	44.5	47.7	46.1
3	Weigh Bridge, Digwadih	26.02.25	50.4	52.6	51.5	42.2	44.5	43.4
4	Canteen Complex, Digwadih	26.02.25	48.6	50.4	49.5	40.4	42.7	41.6
5	Head Office Complex, Digwadih	26.02.25	43.2	45.5	44.4	35.5	37.6	36.6
6	Check Post Security Gate, 6&7 Pits	26.02.25	50.1	53.3	51.7	42.3	45.5	43.9
7	Canteen Complex, 6&7 Pits	26.02.25	47.4	49.6	48.5	39.6	41.8	40.7
8	Fan house- Nitrogen Plant, 6&7 Pits	26.02.25	61.7	63.8	62.8	53.4	52.6	53.0
9	Joota Gate, JCPP	26.02.25	59.3	62.5	60.9	51.2	54.4	52.8
10	Main Gate Stores, JCPP	26.02.25	54.6	57.7	56.2	46.4	49.5	48.0
11	Railway Siding Yard, JCPP	26.02.25	52.1	55.3	53.7	44.5	47.7	46.1

Analysis: All the values are within permissible limit.

This is for your information please.


Lab. Assistant (Environment)

Copy to: Specialist (OH). TCH


Manager (Environment)

TATA STEEL LIMITED
JHARIA DIVISION

Head, Jamadoba Colliery
Head, Jamadoba Coal Washery
Sr. Manager, Digwadih Colliery
Sr. Manager, 6 & 7 Pits Colliery

Ref : JMB/ ENV/ LAB/ 05/ 149 /25

Dated: 07/04/2025

Re: Ambient Noise Level Report

We wish to inform you that Ambient Noise Level Monitoring was carried out in **JAMADOBA GROUP** in the month of **MARCH'2025**. The results are as given below:

S.No	Monitoring Station	Date	Day (06.00 – 22.00 Hrs.)			Night (22.00-06.00 Hrs)		
			CPCB Standard- 55			CPCB Standard- 45		
	Residential Area (Buffer Zone)		Min.	Max.	Avg.	Min.	Max.	Avg.
1	Digwadih 12 No. Colony	24.03.25	42.3	44.6	43.5	34.5	36.7	35.6
2	New Village Colony, Jamadoba	24.03.25	43.5	45.8	44.7	35.3	37.5	36.4
3	6&7 Pits Kalimandir Colony	24.03.25	46.7	48.5	47.6	38.4	40.7	39.6
4	Digwadih 10 No. Colony	24.03.25	44.5	46.7	45.6	36.7	38.9	37.8

S.No	Monitoring Station	Date	Day (06.00 – 22.00 Hrs.)			Night (22.00-06.00 Hrs)		
			CPCB Standard- 75			CPCB Standard- 70		
	Industrial Area (Core Zone)		Min.	Max.	Avg.	Min.	Max.	Avg.
1	2 Pit Main Gate Security Post	24.03.25	57.2	60.5	58.9	49.4	52.7	51.1
2	2 Pit Top Kalimandir, Jamadoba	24.03.25	51.4	54.7	53.1	43.1	46.3	44.7
3	Weigh Bridge, Digwadih	24.03.25	49.8	51.6	50.7	41.5	43.7	42.6
4	Canteen Complex, Digwadih	24.03.25	48.3	50.2	49.3	40.4	42.5	41.5
5	Head Office Complex, Digwadih	24.03.25	42.6	44.7	43.7	34.3	36.6	35.5
6	Check Post Security Gate, 6&7 Pits	24.03.25	50.3	52.5	51.4	42.5	44.8	43.7
7	Canteen Complex, 6&7 Pits	24.03.25	48.2	50.1	49.2	40.1	42.4	41.3
8	Fan house- Nitrogen Plant, 6&7 Pits	24.03.25	58.4	60.3	59.4	50.6	52.7	51.7
9	Joota Gate, JCPP	24.03.25	60.2	63.5	61.9	52.4	55.6	54.0
10	Main Gate Stores, JCPP	24.03.25	52.7	55.6	54.2	44.5	47.8	46.2
11	Railway Siding Yard, JCPP	24.03.25	52.4	54.7	53.6	44.2	46.5	45.4

Analysis: All the values are within permissible limit.

This is for your information please.


Lab. Assistant (Environment)


Manager (Environment)

Copy to: Specialist (OH). TCH

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- **October'24 to March'25**)

Annexure- II

TATA STEEL LIMITED
JHARIA DIVISION

Area Manager, Jamadoba Colliery
Area Manager, Digwadih Colliery
Area Manager, 6&7 Pits Colliery

Ref. No. - JMB / ENV / LAB / 03 / **681** / 2024

Dated - **12/11** / 2024

Sub: MINE WATER ANALYSIS REPORT.

We wish to inform you that Trade Effluent Sampling was carried out in **JAMADOBA GROUP** in the month of **OCTOBER'2024**.
The results are as given below:

S. No	Location (Final Discharge Point) (Mine's Water)	Sampling Date	Sampling Time	Temp	pH	TSS	TDS	BOD	COD	Oil & Grease
				< 40°C	5.5 - 9.0	100 mg/l	2100 mg/l	30 mg/l	250 mg/l	10 mg/l
1	2 Pit Jamadoba Colliery	24.10.24	05:05 PM	30	7.7	20	773	2.4	68	0.5
2	3 Pit Jamadoba Colliery	24.10.24	04:50 PM	31	7.2	16	793	2.5	56	0.3
3	2 Incline Jamadoba Colliery	24.10.24	04:15 PM	No Discharge						
4	6 & 7 Pits Colliery	24.10.24	02:20 PM	30	7.3	14	724	2.8	92	0
5	Digwadih Colliery	24.10.24	02:40 PM	No Discharge						

All the parameters are within the limit, and you are requested to maintain the same.
This is for your information and necessary action please.


Lab.Assistant (Environment)


Area Manager (Environment)

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- **October'24 to March'25**)

Annexure- II

TATA STEEL LIMITED
JHARIA DIVISION

Head, Jamadoba Coal Preparation Plant
Area Manager Jamadoba Colliery
Area Manager Digwadih Colliery

Ref. No. - JMB / ENV / LAB / 03 / **680** / 2024

Dated - **12/11** / 2024

Sub: STP WATER ANALYSIS REPORT.

We wish to inform you that Trade Effluent Sampling was carried out in **JAMADOBA GROUP** in the month of **OCTOBER'2024**.
The results are as given below:

S. No	Location (Final Discharge Point)	Sampling Date	Sampling Time	Temp	pH	TSS	TDS	BOD	COD	Oil & Grease
				< 40°C	5.5 - 9.0	100 mg/l	2100 mg/l	30 mg/l	250 mg/l	10 mg/l
1	STP, Jmb. Canteen- Inlet	24.10.24	12:30 PM	27	7.8	145	1024	31.8	290	2.5
2	STP, Jmb. Canteen- Outlet	24.10.24	12:35 PM	26	7.5	24	726	7.0	84	0.7
3	STP, JCPP Canteen- Inlet	24.10.24	01:40 PM	27	7.9	137	924	32.9	306	3.7
4	STP, JCPP Canteen- Outlet	24.10.24	01:45 PM	26	7.6	20	654	5.2	70	0.4
5	STP, Railway Colony- Inlet	24.10.24	03:45 PM	28	8.4	178	1067	34.8	319	3.1
6	STP, Railway Colony-Outlet	24.10.24	03:50 PM	27	8.1	36	953	6.9	52	1.4
7	STP, Digwadih 12 No. Officer's colony-Inlet	24.10.24	03:15 PM	27	8.0	117	921	33.7	284	2.9
8	STP, Digwadih 12 No. Officer's colony- Outlet	24.10.24	03:20 PM	26	7.7	39	637	4.6	102	1.3
9	STP, Digwadih 12 No. Supervisor flat -Inlet	24.10.24	02:55 PM	27	7.8	122	974	29.8	332	3.2
10	STP, Digwadih 12 No. Supervisor flat -Outlet	24.10.24	03:00 PM	26	7.6	18	735	6.2	64	0.9

All the parameters are within the limit, and you are requested to maintain the same.

This is for your information and necessary action please.



Lab.Assistant (Environment)



Area Manager (Environment)

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- **October'24 to March'25**)

Annexure- II

TATA STEEL LIMITED
JHARIA DIVISION

Head, Jamadoba Coal Preparation Plant
Area Manager Jamadoba Colliery
C.M.O, TCH, Jamadoba

Ref. No. - JMB / ENV / LAB / 03 / 682 / 2024

Dated - 12/11 / 2024

Sub: ETP WATER ANALYSIS REPORT.

We wish to inform you that Trade Effluent Sampling was carried out in **JAMADOBA GROUP** in the month of **OCTOBER'2024**.
The results are as given below:

S. No	Location (Final Discharge Point)	Sampling Date	Sampling Time	Temp	pH	TSS	TDS	BOD	COD	Oil & Grease
				< 40°C	5.5 - 9.0	100 mg/l	2100 mg/l	30 mg/l	250 mg/l	10 mg/l
1	ETP, TCH- Inlet	24.10.24	02:00 PM	27	8.3	98	742	28.2	260	1.5
2	ETP, TCH- Outlet	24.10.24	02:05 PM	26	8.1	19	675	6.4	52	0.3
3	ETP, Garage- Inlet	24.10.24	12:45 PM	27	8.2	161	972	31.2	326	3.8
4	ETP, Garage- Outlet	24.10.24	12:50 PM	26	7.8	34	816	7.2	94	1.6
5	Final Settling Pond JCPP	24.10.24	04:35 PM	Dry Pond						

All the parameters are within the limit, and you are requested to maintain the same.
This is for your information and necessary action please.


Lab.Assistant (Environment)


Area Manager (Environment)

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- **October'24 to March'25**)

Annexure- II

TATA STEEL LIMITED
JHARIA DIVISION

Head, Jamadoba Coal Preparation Plant
Area Manager Jamadoba Colliery
C.M.O, TCH, Jamadoba

Ref. No. - JMB / ENV / LAB / 03 / 766 / 2024

Dated - 09/12 / 2024

Sub: ETP WATER ANALYSIS REPORT.

We wish to inform you that Trade Effluent Sampling was carried out in **JAMADOBA GROUP** in the month of **NOVEMBER'2024**.
The results are as given below:

S. No	Location (Final Discharge Point)	Sampling Date	Sampling Time	Temp	pH	TSS	TDS	BOD	COD	Oil & Grease
				< 40°C	5.5 - 9.0	100 mg/l	2100 mg/l	30 mg/l	250 mg/l	10 mg/l
1	ETP, TCH- Inlet	22.11.24	12:25 PM	28	8.4	116	736	27.8	294	1.8
2	ETP, TCH- Outlet	22.11.24	12:30 PM	27	8.2	26	658	5.2	48	0.7
3	ETP, Garage- Inlet	22.11.24	01:30 PM	27	8.1	139	928	29.1	316	4.1
4	ETP, Garage- Outlet	22.11.24	01:35 PM	26	7.9	27	821	6.9	102	1.7
5	Final Settling Pond JCPP	22.11.24	09:55 AM	Dry Pond						

All the parameters are within the limit, and you are requested to maintain the same.

This is for your information and necessary action please.



Lab.Assistant (Environment)



Manager (Environment)

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- **October'24 to March'25**)

Annexure- II

TATA STEEL LIMITED
JHARIA DIVISION

Area Manager, Jamadoba Colliery
Area Manager, Digwadih Colliery
Area Manager, 6&7 Pits Colliery

Ref. No. - JMB / ENV / LAB / 03 / 768 / 2024

Dated - 09 / 12 / 2024

Sub: MINE WATER ANALYSIS REPORT.

We wish to inform you that Trade Effluent Sampling was carried out in **JAMADOBA GROUP** in the month of **NOVEMBER'2024**.
The results are as given below:

S. No	Location (Final Discharge Point) (Mine's Water)	Sampling Date	Sampling Time	Temp	pH	TSS	TDS	BOD	COD	Oil & Grease
				< 40°C	5.5 - 9.0	100 mg/l	2100 mg/l	30 mg/l	250 mg/l	10 mg/l
1	2 Pit Jamadoba Colliery	22.11.24	09:25 AM	No Discharge						
2	3 Pit Jamadoba Colliery	22.11.24	09:40 AM	30	7.5	23	806	2.9	68	0.6
3	2 Incline Jamadoba Colliery	22.11.24	10:15 AM	No Discharge						
4	6 & 7 Pits Colliery	22.11.24	12:10 PM	31	7.7	32	789	2.6	74	0.4
5	Digwadih Colliery	22.11.24	11:50 AM	No Discharge						

All the parameters are within the limit, and you are requested to maintain the same.

This is for your information and necessary action please.


Lab.Assistant (Environment)


Manager (Environment)

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- **October'24 to March'25**)

Annexure- II

TATA STEEL LIMITED
JHARIA DIVISION

Head, Jamadoba Coal Preparation Plant
Area Manager Jamadoba Colliery
Area Manager Digwadih Colliery

Ref. No. - JMB / ENV / LAB / 03 / 767 / 2024

Dated - 09/12/2024

Sub: STP WATER ANALYSIS REPORT.

We wish to inform you that Trade Effluent Sampling was carried out in **JAMADOBA GROUP** in the month of **NOVEMBER'2024**.
The results are as given below:

S. No	Location (Final Discharge Point)	Sampling Date	Sampling Time	Temp	pH	TSS	TDS	BOD	COD	Oil & Grease
				< 40°C	5.5 - 9.0	100 mg/l	2100 mg/l	30 mg/l	250 mg/l	10 mg/l
1	STP, Jmb. Canteen- Inlet	22.11.24	01:10 PM	27	8.0	137	916	34.6	316	2.6
2	STP, Jmb. Canteen- Outlet	22.11.24	01:15 PM	26	7.7	31	694	6.9	72	0.5
3	STP, JCPP Canteen- Inlet	22.11.24	12:50 PM	27	8.1	126	896	33.1	294	3.4
4	STP, JCPP Canteen- Outlet	22.11.24	12:55 PM	26	7.8	34	672	6.2	108	0.6
5	STP, Railway Colony- Inlet	22.11.24	10:35 AM	28	8.2	156	1025	33.2	332	2.9
6	STP, Railway Colony-Outlet	22.11.24	10:40 AM	27	8.0	27	876	7.1	85	1.3
7	STP, Digwadih 12 No. Officer's colony-Inlet	22.11.24	11:05 AM	28	8.1	124	936	34.1	310	3.2
8	STP, Digwadih 12 No. Officer's colony- Outlet	22.11.24	11:10 AM	27	7.8	21	716	5.4	54	1.0
9	STP, Digwadih 12 No. Supervisor flat - Inlet	22.11.24	11:25 AM	27	8.0	167	963	32.5	296	3.5
10	STP, Digwadih 12 No. Supervisor flat -Outlet	22.11.24	11:30 AM	26	7.7	26	769	5.8	78	1.2

All the parameters are within the limit, and you are requested to maintain the same.

This is for your information and necessary action please.


Lab.Assistant (Environment)


Manager (Environment)

TATA STEEL LIMITED
JHARIA DIVISION

Well Water Quality Report of Jamadoba Group for the month of NOVEMBER'2024

JAMADOBA GROUP

S.No	Date	Location	Time	Depth in meter	pH	Electrical Conductivity $\mu\text{S/m}$
1	22.11.24	Purnadih (Jorapokhar)	01:15 PM	4.13	7.3	1243
2	22.11.24	Bhowra 13 No	12:55 PM	1.27	7.4	1014
3	22.11.24	Mohalbani Basti	02:25 PM	2.13	7.3	1041
4	22.11.24	Digwadih 10 No F & J	12:10 PM	1.52	7.1	1639
5	22.11.24	Kalimela Shivmandir	11:05 AM	0.98	7.2	917
6	22.11.24	Kalimela Kalimandir	11:20 AM	3.13	7.5	1358
7	22.11.24	Lower Dungari	10:45 AM	3.67	7.3	725
8	22.11.24	Upper Dungari	10:25 AM	1.72	7.2	756
9	22.11.24	Pattia Basti	10:00 AM	3.48	7.0	894
10	22.11.24	Kenduadih Basti	09:35 AM	1.32	7.2	972
11	22.11.24	Jorapokhar Kushtand	01:55 PM	3.84	7.4	1637
12	22.11.24	6&7 Pits (Ayodhya Nagri)	11:45 AM	1.76	7.2	1242
13	22.11.24	Jorapokhar Basti Chhattand	12:25 PM	1.13	7.4	1384
14	22.11.24	Jorapokhar Babu Basa	01:30 PM	2.11	7.1	1169


Lab.Assistant (Environment)


Manager (Environment)

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- **October'24 to March'25**)

Annexure- II

TATA STEEL LIMITED
JHARIA DIVISION

Head, Jamadoba Coal Preparation Plant
Area Manager Jamadoba Colliery
C.M.O, TCH, Jamadoba

Ref. No. - JMB / ENV / LAB / 03 / 2 / 2024

Dated - 31 / 12 / 2024

Sub: ETP WATER ANALYSIS REPORT.

We wish to inform you that Trade Effluent Sampling was carried out in **JAMADOBA GROUP** in the month of **DECEMBER'2024**.
The results are as given below:

S. No	Location (Final Discharge Point)	Sampling Date	Sampling Time	Temp	pH	TSS	TDS	BOD	COD	Oil & Grease
				< 40°C	5.5 - 9.0	100 mg/l	2100 mg/l	30 mg/l	250 mg/l	10 mg/l
1	ETP, TCH- Inlet	20.12.24	12:30 PM	26	8.3	164	816	29.1	264	1.4
2	ETP, TCH- Outlet	20.12.24	12:35 PM	25	8.1	39	786	4.9	54	0.5
3	ETP, Garage- Inlet	20.12.24	01:35 PM	25	8.3	142	941	30.5	310	3.6
4	ETP, Garage- Outlet	20.12.24	01:40 PM	24	8.0	32	894	7.1	88	1.6
5	Final Settling Pond JCPP	20.12.24	09:55 AM	Dry Pond						

All the parameters are within the limit, and you are requested to maintain the same.

This is for your information and necessary action please.



Lab.Assistant (Environment)



Manager (Environment)

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- **October'24 to March'25**)

Annexure- II

TATA STEEL LIMITED
JHARIA DIVISION

Area Manager, Jamadoba Colliery
Area Manager, Digwadih Colliery
Area Manager, 6&7 Pits Colliery


Ref. No. - JMB / ENV / LAB / 03 / / 2024
Dated - / / 2024

Sub: MINE WATER ANALYSIS REPORT.

We wish to inform you that Trade Effluent Sampling was carried out in **JAMADOBA GROUP** in the month of **DECEMBER'2024**
The results are as given below:

S. No	Location (Final Discharge Point) (Mine's Water)	Sampling Date	Sampling Time	Temp	pH	TSS	TDS	BOD	COD	Oil & Grease
				< 40°C	5.5 - 9.0	100 mg/l	2100 mg/l	30 mg/l	250 mg/l	10 mg/l
1	2 Pit Jamadoba Colliery	20.12.24	09:30 AM	No Discharge						
2	3 Pit Jamadoba Colliery	20.12.24	09:45 AM	32	7.7	36	837	3.4	42	0.9
3	2 Incline Jamadoba Colliery	20.12.24	10:20 AM	No Discharge						
4	6 & 7 Pits Colliery	20.12.24	12:15 PM	30	7.5	21	912	2.8	68	0.8
5	Digwadih Colliery	20.12.24	11:55 AM	No Discharge						

All the parameters are within the limit, and you are requested to maintain the same.
This is for your information and necessary action please.


Lab.Assistant (Environment)


Manager (Environment)

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- **October'24 to March'25**)

Annexure- II

TATA STEEL LIMITED
JHARIA DIVISION

Head, Jamadoba Coal Preparation Plant
Area Manager Jamadoba Colliery
Area Manager Digwadih Colliery

Ref. No. - JMB / ENV / LAB / 03 / 813 / 2024

Dated - 31 / 12 / 2024

Sub: STP WATER ANALYSIS REPORT.

We wish to inform you that Trade Effluent Sampling was carried out in **JAMADOBA GROUP** in the month of **DECEMBER'2024**
The results are as given below:

S. No	Location (Final Discharge Point)	Sampling Date	Sampling Time	Temp	pH	TSS	TDS	BOD	COD	Oil & Grease
				< 40°C	5.5 - 9.0	100 mg/l	2100 mg/l	30 mg/l	250 mg/l	10 mg/l
1	STP, Jmb. Canteen- Inlet	20.12.24	01:15 PM	25	7.9	126	924	35.7	338	2.9
2	STP, Jmb. Canteen- Outlet	20.12.24	01:20 PM	24	7.6	34	810	4.8	65	0.9
3	STP, JCPP Canteen- Inlet	20.12.24	12:55 PM	25	8.0	135	873	32.4	284	3.5
4	STP, JCPP Canteen- Outlet	20.12.24	01:00 PM	24	7.5	29	712	6.4	72	0.8
5	STP, Railway Colony- Inlet	20.12.24	10:40 AM	26	8.1	143	987	30.1	294	3.5
6	STP, Railway Colony-Outlet	20.12.24	10:45 AM	25	7.9	22	855	5.2	87	1.0
7	STP, Digwadih 12 No. Officer's colony-Inlet	20.12.24	11:10 AM	26	8.0	167	987	36.4	316	3.7
8	STP, Digwadih 12 No. Officer's colony- Outlet	20.12.24	11:15 AM	25	7.7	36	845	5.9	79	0.8
9	STP, Digwadih 12 No. Supervisor flat - Inlet	20.12.24	11:30 AM	25	8.2	128	1016	34.0	284	3.7
10	STP, Digwadih 12 No. Supervisor flat -Outlet	20.12.24	11:35 AM	24	7.8	31	910	7.2	90	0.9

All the parameters are within the limit, and you are requested to maintain the same.

This is for your information and necessary action please.


Lab.Assistant (Environment)


Manager (Environment)

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- **October'24 to March'25**)

Annexure- II

TATA STEEL LIMITED
JHARIA DIVISION

Head, Jamadoba Coal Preparation Plant
Area Manager Jamadoba Colliery
C.M.O, TCH, Jamadoba

Ref. No. - JMB / ENV / LAB / 03 / 31 / 2025

Dated - 31 / 01 / 2025

Sub: ETP WATER ANALYSIS REPORT.

We wish to inform you that Trade Effluent Sampling was carried out in **JAMADOBA GROUP** in the month of **JANUARY'2025**.
The results are as given below:

S. No	Location (Final Discharge Point)	Sampling Date	Sampling Time	Temp	pH	TSS	TDS	BOD	COD	Oil & Grease
				< 40°C	5.5 - 9.0	100 mg/l	2100 mg/l	30 mg/l	250 mg/l	10 mg/l
1	ETP, TCH- Inlet	13.01.25	10:45 AM	27	8.2	108	824	28.6	276	1.6
2	ETP, TCH- Outlet	13.01.25	10:50 AM	26	8	32	774	5.1	72	0.4
3	ETP, Garage- Inlet	13.01.25	01:20 PM	26	8.1	135	976	31.3	284	3.8
4	ETP, Garage- Outlet	13.01.25	01:25 PM	25	7.9	29	872	6.8	76	1.2
5	Final Settling Pond JCPP	13.01.25	09:50 AM	Dry Pond						

All the parameters are within the limit, and you are requested to maintain the same.

This is for your information and necessary action please.


Lab.Assistant (Environment)


Manager (Environment)

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- **October'24 to March'25**)

Annexure- II

TATA STEEL LIMITED
JHARIA DIVISION

Area Manager, Jamadoba Colliery
Area Manager, Digwadih Colliery
Area Manager, 6&7 Pits Colliery

Ref. No. - JMB / ENV / LAB / 03 / 30 / 2025
Dated - 31 / 01 / 2025

Sub: MINE WATER ANALYSIS REPORT.

We wish to inform you that Trade Effluent Sampling was carried out in **JAMADOBA GROUP** in the month of **JANUARY'2025**.
The results are as given below:

S. No	Location (Final Discharge Point) (Mine's Water)	Sampling Date	Sampling Time	Temp	pH	TSS	TDS	BOD	COD	Oil & Grease
				< 40°C	5.5 - 9.0	100 mg/l	2100 mg/l	30 mg/l	250 mg/l	10 mg/l
1	2 Pit Jamadoba Colliery	13.01.25	09:20 AM	No Discharge						
2	3 Pit Jamadoba Colliery	13.01.25	09:35 AM	32	7.6	23	796	3.2	72	0.7
3	2 Incline Jamadoba Colliery	13.01.25	10:05 AM	No Discharge						
4	6 & 7 Pits Colliery	13.01.25	11:10 AM	30	7.7	21	874	2.5	62	0.5
5	Digwadih Colliery	13.01.25	12:15 PM	32	7.8	36	916	2.7	80	0

All the parameters are within the limit, and you are requested to maintain the same.
This is for your information and necessary action please.


Lab.Assistant (Environment)


Manager (Environment)

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- October'24 to March'25)

Annexure- II

TATA STEEL LIMITED
JHARIA DIVISION

Head, Jamadoba Coal Preparation Plant
Area Manager Jamadoba Colliery
Area Manager Digwadih Colliery

Ref. No. - JMB / ENV / LAB / 03 / 29 / 2025

Dated - 31/01/2025

Sub: STP WATER ANALYSIS REPORT.

We wish to inform you that Trade Effluent Sampling was carried out in JAMADOBA GROUP in the month of JANUARY'2025.
The results are as given below:

S. No	Location (Final Discharge Point)	Sampling Date	Sampling Time	Temp	pH	TSS	TDS	BOD	COD	Oil & Grease
				< 40°C	5.5 - 9.0	100 mg/l	2100 mg/l	30 mg/l	250 mg/l	10 mg/l
1	STP, Jmb. Canteen- Inlet	13.01.25	01:05 PM	26	8.1	122	918	34.8	332	3.1
2	STP, Jmb. Canteen- Outlet	13.01.25	01:10 PM	25	7.8	25	779	4.5	84	0.7
3	STP, JCPP Canteen- Inlet	13.01.25	12:40 PM	26	7.9	164	857	31.2	296	3.2
4	STP, JCPP Canteen- Outlet	13.01.25	12:45 PM	25	7.6	26	772	5.7	102	0.3
5	STP, Railway Colony- Inlet	13.01.25	10:25 AM	27	8.3	128	971	32.2	319	3.8
6	STP, Railway Colony-Outlet	13.01.25	10:30 AM	26	8.0	36	832	5.8	98	1.2
7	STP, Digwadih 12 No. Officer's colony-Inlet	13.01.25	11:30 AM	27	8.0	141	974	34.2	260	3.5
8	STP, Digwadih 12 No. Officer's colony- Outlet	13.01.25	11:35 AM	26	7.6	34	836	5.7	62	0.2
9	STP, Digwadih 12 No. Supervisor flat - Inlet	13.01.25	11:50 AM	26	8.1	152	987	33.6	324	3.8
10	STP, Digwadih 12 No. Supervisor flat -Outlet	13.01.25	11:55 AM	25	7.9	22	896	6.9	106	0.7

All the parameters are within the limit, and you are requested to maintain the same.

This is for your information and necessary action please.


Lab.Assistant (Environment)


Manager (Environment)

TATA STEEL LIMITED
JHARIA DIVISION

Well Water Quality Report of Jamadoba Group for the month of JANUARY'2025

JAMADOBA GROUP

S.No	Date	Location	Time	Depth in meter	pH	Electrical Conductivity $\mu\text{S/m}$
1	24.01.25	Purnadih (Jorapokhar)	09:55 AM	4.45	7.2	1236
2	24.01.25	Bhowra 13 No	10:15 AM	1.82	7.3	1024
3	24.01.25	Mohalbani Basti	02:10 PM	2.46	7.4	1082
4	24.01.25	Digwadih 10 No F & J	10:40 AM	1.95	7.5	1726
5	24.01.25	Kalimela Shivmandir	01:30 PM	1.13	7.3	908
6	24.01.25	Kalimela Kalimandir	01:45 PM	3.47	7.4	1339
7	24.01.25	Lower Dungari	01:10 PM	3.85	7.2	762
8	24.01.25	Upper Dungari	12:45 PM	1.98	7.4	768
9	24.01.25	Pattia Basti	12:25 PM	3.72	7.2	905
10	24.01.25	Kenduadih Basti	12:05 PM	1.67	7.3	968
11	24.01.25	Jorapokhar Kushtand	11:20 AM	4.15	7.2	1708
12	24.01.25	6&7 Pits (Ayodhya Nagri)	11:40 AM	1.97	7.3	1216
13	24.01.25	Jorapokhar Basti Chhattand	10:55 AM	1.27	7.2	1372
14	24.01.25	Jorapokhar Babu Basa	09:40 AM	2.21	7.4	1176

P. Mahabo.

Lab.Assistant (Environment)

Chmsh

Manager (Environment)

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- **October'24 to March'25**)

Annexure- II

TATA STEEL LIMITED
JHARIA DIVISION

Head, Jamadoba Coal Preparation Plant
Area Manager Jamadoba Colliery
C.M.O, TCH, Jamadoba

Ref. No. - JMB / ENV / LAB / 03 / *87* / 2025

Dated - *28/02* / 2025

Sub: ETP WATER ANALYSIS REPORT.

We wish to inform you that Trade Effluent Sampling was carried out in **JAMADOBA GROUP** in the month of **FEBRUARY'2025**.
The results are as given below:

S. No	Location (Final Discharge Point)	Sampling Date	Sampling Time	Temp	pH	TSS	TDS	BOD	COD	Oil & Grease
				< 40°C	5.5 - 9.0	100 mg/l	2100 mg/l	30 mg/l	250 mg/l	10 mg/l
1	ETP, TCH- Inlet	26.02.25	10:50 AM	28	8.2	135	914	29.8	294	1.3
2	ETP, TCH- Outlet	26.02.25	10:55 AM	27	7.9	29	846	5.6	72	1.0
3	ETP, Garage- Inlet	26.02.25	01:25 PM	27	8.0	163	872	30.2	306	3.1
4	ETP, Garage- Outlet	26.02.25	01:30 PM	26	7.8	33	715	7.2	74	1.7
5	Final Settling Pond JCPP	26.02.25	09:55 AM	Dry Pond						

All the parameters are within the limit, and you are requested to maintain the same.

This is for your information and necessary action please.

P. Mahato

Lab.Assistant (Environment)

Umesh

Manager (Environment)

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- **October'24 to March'25**)

Annexure- II

TATA STEEL LIMITED
JHARIA DIVISION

Area Manager, Jamadoba Colliery
Area Manager, Digwadih Colliery
Area Manager, 6&7 Pits Colliery

Ref. No. - JMB / ENV / LAB / 03 / *85* / 2025
Dated - *28/02/2025*

Sub: MINE WATER ANALYSIS REPORT.

We wish to inform you that Trade Effluent Sampling was carried out in **JAMADOBA GROUP** in the month of **FEBRUARY'202**
The results are as given below:

S. No	Location (Final Discharge Point) (Mine's Water)	Sampling Date	Sampling Time	Temp	pH	TSS	TDS	BOD	COD	Oil & Grease
				< 40°C	5.5 - 9.0	100 mg/l	2100 mg/l	30 mg/l	250 mg/l	10 mg/l
1	2 Pit Jamadoba Colliery	26.02.25	09:25 AM	No Discharge						
2	3 Pit Jamadoba Colliery	26.02.25	09:40 AM	30	7.5	20	896	2.1	86	1.2
3	2 Incline Jamadoba Colliery	26.02.25	10:10 AM	No Discharge						
4	6 & 7 Pits Colliery	26.02.25	11:15 AM	No Discharge						
5	Digwadih Colliery	26.02.25	12:20 PM	No Discharge						

All the parameters are within the limit, and you are requested to maintain the same.
This is for your information and necessary action please.

P. Mahato
Lab.Assistant (Environment)

Umesh
Manager (Environment)

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- October'24 to March'25)

Annexure- II

TATA STEEL LIMITED
JHARIA DIVISION

Head, Jamadoba Coal Preparation Plant
Area Manager Jamadoba Colliery
Area Manager Digwadih Colliery

Ref. No. - JMB / ENV / LAB / 03 / 86 / 2025

Dated - 28/02/2025

Sub: STP WATER ANALYSIS REPORT.

We wish to inform you that Trade Effluent Sampling was carried out in JAMADOBA GROUP in the month of FEBRUARY'2025
The results are as given below:

S. No	Location (Final Discharge Point)	Sampling Date	Sampling Time	Temp	pH	TSS	TDS	BOD	COD	Oil & Grease
				< 40°C	5.5 - 9.0	100 mg/l	2100 mg/l	30 mg/l	250 mg/l	10 mg/l
1	STP, Jmb. Canteen- Inlet	26.02.25	01:10 PM	27	8.0	154	998	36.1	320	?
2	STP, Jmb. Canteen- Outlet	26.02.25	01:15 PM	26	7.6	38	906	8.7	98	1.4
3	STP, JCPP Canteen- Inlet	26.02.25	12:45 PM	28	8.1	132	836	33.4	327	2.9
4	STP, JCPP Canteen- Outlet	26.02.25	12:50 PM	27	7.8	25	760	7.4	144	1.7
5	STP, Railway Colony- Inlet	26.02.25	10:30 AM	28	8.0	167	1036	35.4	336	3.4
6	STP, Railway Colony-Outlet	26.02.25	10:35 AM	27	7.6	41	996	8.9	82	1.5
7	STP, Digwadih 12 No. Officer's colony-Inlet	26.02.25	11:35 AM	28	8.2	127	1016	33.1	290	3.8
8	STP, Digwadih 12 No. Officer's colony- Outlet	26.02.25	11:40 AM	27	8.0	32	910	6.5	68	1.3
9	STP, Digwadih 12 No. Supervisor flat - Inlet	26.02.25	11:55 AM	27	8.2	173	1038	31.9	296	2.9
10	STP, Digwadih 12 No. Supervisor flat -Outlet	26.02.25	12:05 PM	26	7.8	39	987	7.8	84	1.9

All the parameters are within the limit, and you are requested to maintain the same.

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P. Mahabo.

Lab.Assistant (Environment)

Umesh

Manager (Environment)

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- **October'24 to March'25**)

Annexure- II

TATA STEEL LIMITED
JHARIA DIVISION

Head, Jamadoba Coal Preparation Plant
Area Manager Jamadoba Colliery
C.M.O, TCH, Jamadoba

Ref. No. - JMB / ENV / LAB / 03 / 145 / 2025

Dated - 07/04/2025

Sub: ETP WATER ANALYSIS REPORT.

We wish to inform you that Trade Effluent Sampling was carried out in **JAMADOBA GROUP** in the month of **MARCH'2025**.
The results are as given below:

S. No	Location (Final Discharge Point)	Sampling Date	Sampling Time	Temp	pH	TSS	TDS	BOD	COD	Oil & Grease
				< 40°C	5.5 - 9.0	100 mg/l	2100 mg/l	30 mg/l	250 mg/l	10 mg/l
1	ETP, TCH- Inlet	24.03.25	02:00 PM	27	8.3	147	935	31.7	286	2.1
2	ETP, TCH- Outlet	24.03.25	02:05 PM	26	8.0	39	822	5.2	98	1.2
3	ETP, Garage- Inlet	24.03.25	12:45 PM	27	8.1	163	867	29.5	316	3.5
4	ETP, Garage- Outlet	24.03.25	12:50 PM	26	7.9	24	754	6.8	106	1.3
5	Final Settling Pond JCPP	24.03.25	04:35 PM	Dry Pond						

All the parameters are within the limit, and you are requested to maintain the same.

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Lab.Assistant (Environment)



Manager (Environment)

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- **October'24 to March'25**)

Annexure- II

TATA STEEL LIMITED
JHARIA DIVISION

Area Manager, Jamadoba Colliery
Area Manager, Digwadih Colliery
Area Manager, 6&7 Pits Colliery

Ref. No. - JMB / ENV / LAB / 03 / 147 / 2025

Dated - 07/04/2025

Sub: MINE WATER ANALYSIS REPORT.

We wish to inform you that Trade Effluent Sampling was carried out in **JAMADOBA GROUP** in the month of **MARCH'2025**.
The results are as given below:

S. No	Location (Final Discharge Point) (Mine's Water)	Sampling Date	Sampling Time	Temp	pH	TSS	TDS	BOD	COD	Oil & Grease
				< 40°C	5.5 - 9.0	100 mg/l	2100 mg/l	30 mg/l	250 mg/l	10 mg/l
1	2 Pit Jamadoba Colliery	24.03.25	05:05 PM	No Discharge						
2	3 Pit Jamadoba Colliery	24.03.25	04:50 PM	32	7.6	26	874	2.3	84	1.4
3	2 Incline Jamadoba Colliery	24.03.25	04:15 PM	No Discharge						
4	6 & 7 Pits Colliery	24.03.25	02:20 PM	No Discharge						
5	Digwadih Colliery	24.03.25	02:40 PM	No Discharge						

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Ref. No. - JMB / ENV / LAB / 03 / 146 / 2025
Dated - 07/04 / 2025

Sub: STP WATER ANALYSIS REPORT.

We wish to inform you that Trade Effluent Sampling was carried out in **JAMADOBA GROUP** in the month of **MARCH'2025**.
The results are as given below:

S. No	Location (Final Discharge Point)	Sampling Date	Sampling Time	Temp	pH	TSS	TDS	BOD	COD	Oil & Grease
				< 40°C	5.5 - 9.0	100 mg/l	2100 mg/l	30 mg/l	250 mg/l	10 mg/l
1	STP, Jmb. Canteen- Inlet	24.03.25	12:30 PM	28	7.9	133	954	35.2	316	3.9
2	STP, Jmb. Canteen- Outlet	24.03.25	12:35 PM	27	7.5	28	872	7.2	116	0.8
3	STP, JCPP Canteen- Inlet	24.03.25	01:40 PM	28	8.0	143	824	35.1	298	3.5
4	STP, JCPP Canteen- Outlet	24.03.25	01:45 PM	27	7.7	31	728	6.9	112	1.4
5	STP, Railway Colony- Inlet	24.03.25	03:45 PM	27	8.1	141	936	36.8	328	3.6
6	STP, Railway Colony-Outlet	24.03.25	03:50 PM	26	7.7	21	872	8.2	86	1.0
7	STP, Digwadih 12 No. Officer's colony-Inlet	24.03.25	03:15 PM	27	8.0	164	974	35.5	312	2.9
8	STP, Digwadih 12 No. Officer's colony- Outlet	24.03.25	03:20 PM	26	7.8	27	873	6.4	114	1.5
9	STP, Digwadih 12 No. Supervisor flat - Inlet	24.03.25	02:55 PM	27	7.9	135	1024	33.1	260	2.5
10	STP, Digwadih 12 No. Supervisor flat -Outlet	24.03.25	03:00 PM	26	7.6	34	946	7.3	94	1.2

All the parameters are within the limit, and you are requested to maintain the same.
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Lab.Assistant (Environment)


Manager (Environment)

Land Use & Land Cover Study of Jamadoba Colliery



Applicant:

**Tata Steel
Jharia Division**



TATA

TATA STEEL

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LAND USE & LAND COVER STUDY OF JAMADoba COLLIERY

1. Introduction:

1.1 Location

Jamadoba colliery is in the south-eastern part of Jharia Coalfield and is a part of Jamadoba Mining lease owned by Tata Steel Limited. Jamadoba Mining lease is a part of Jamadoba Mouza in Dhanbad district of the state of Jharkhand. Total leasehold area of Jamadoba colliery is 927.17 Ha and it lies in the Survey of India Toposheet no.73-I/6. The nearest railway station is Bhaga which is situated at a distance of 3 km from Jamadoba colliery. Jharia is the nearest town located at a distance of 6 km and district town Dhanbad is about 12 km away from the block.

Digwadih Colliery, owned by Tata Steel Limited is falling along the eastern boundary of the lease. In all other directions, this lease is surrounded with several leases/ collieries of Bharat Coking Coal Limited (BCCL).

1.2 Objective of the study

The purpose of this study is to understand and predict, Land Use and Land Cover (LULC) change using remote sensing and GIS techniques in core zone of Jamadoba Group of Collieries (Combined mining lease area of Jamadoba Colliery, Digwadih Colliery and 6&7 Pit Colliery: 1410 ha) and buffer zone (10 km from the mining lease boundary). The Jamadoba Group consists of three units, namely -

- i) Jamadoba Colliery and Washery
- ii) Digwadih Colliery and
- iii) 6&7 Pits Colliery

All these collieries are adjacent to each other for which separate LULC report are being submitted.

1.3 Physiography and Drainage

Topography of the lease area is mildly undulating. Surface elevation varies from the highest at 178 m to the lowest at 140 m above Mean Sea Level (MSL). General slope is grading towards Southerly and Westerly as per the meandering flow of Damodar River.

There are two jores – Kari/ Puttiya and Dungri jore. Kari/ Puttiya jore flows through North-East part of the lease and falls into Damodar River. Dungri jore flows centrally from the north side of the lease to south side where it meet Damodar River near Bhowrah North Colliery boundary.

1.4 Climate, Temperature and Rainfall

The climate of Jharia coalfield is typical monsoon type with maximum precipitation in the month of June to September. Annual rainfall varied from 772 mm to 1704 mm during 1992 - 2010. Average annual rainfall during this period is ~ 1200 mm. The lowest recorded temperature is 5° – 7° during winter (December-January) and the highest temperature is 46° – 48° during peak summer (May-June). Predominant wind direction is Westerly and North-westerly other than monsoon season.

2. Remote Sensing Concepts and Methodology:

2.1 Remote sensing

Remote sensing is the science and art of obtaining information about an object or area through the analysis of data acquired by a device that is not in physical contact with the object or area under investigation. The term remote sensing is commonly restricted to methods that employ electro-magnetic energy (such as light, heat and radio waves) as the means of detecting and measuring object characteristics. All physical objects on the earth surface continuously emit electromagnetic radiation because of the oscillations of their atomic particles. Remote sensing is largely concerned with the measurement of electro-magnetic energy from the SUN, which is reflected, scattered, or emitted by the objects on the surface of the earth.

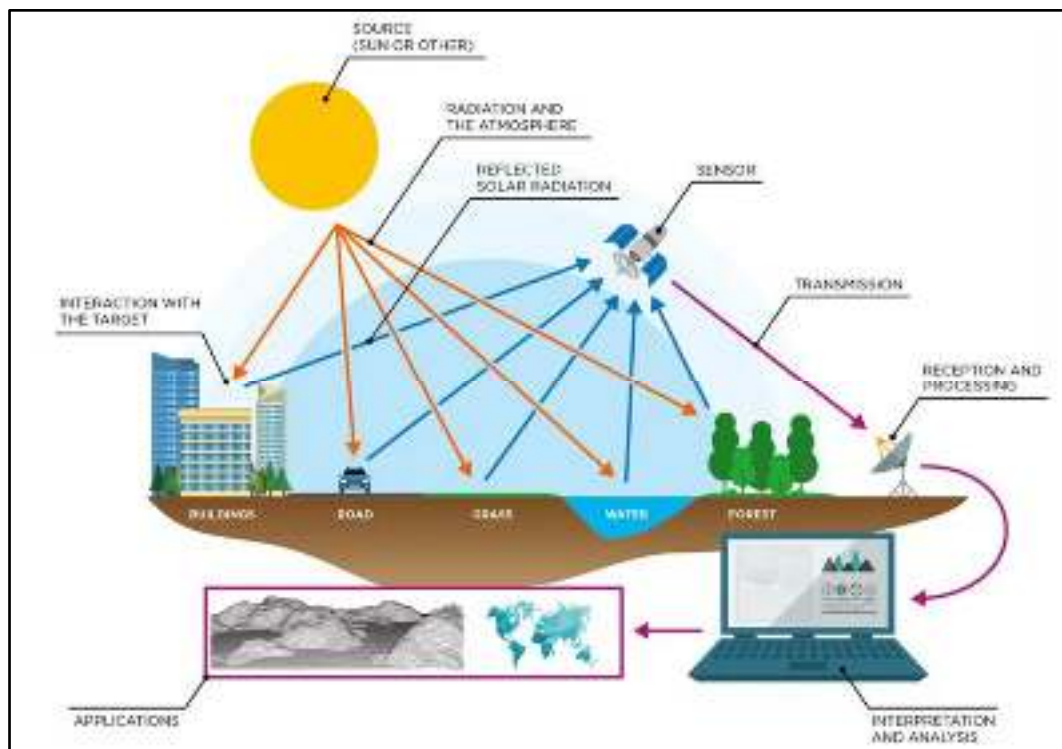


Figure 2.1: Radiation System

2.2 Electromagnetic Spectrum

The electromagnetic (EM) spectrum is the continuum of energy that ranges from meters to nanometres in wavelength and travels at the speed of light. Different objects on the earth surface reflect different amounts of energy in various wavelengths of the EM spectrum. The EM spectrum ranges from the very short wavelengths of the gamma-ray region to the long wavelengths of the radio region. The visible region (0.4-0.7 μ m wavelengths) occupies only a small portion of the entire EM spectrum. Energy reflected from the objects on the surface of the earth is recorded as a function of wavelength. During daytime, the maximum amount of energy is reflected at 0.5 μ m wavelengths, which corresponds to the green band of the visible region and is called the reflected energy peak (Figure 2.2). The earth also radiates energy both day and night, with the maximum energy 9.7 μ m wavelength. This radiant energy peak occurs in the thermal band of the IR region.

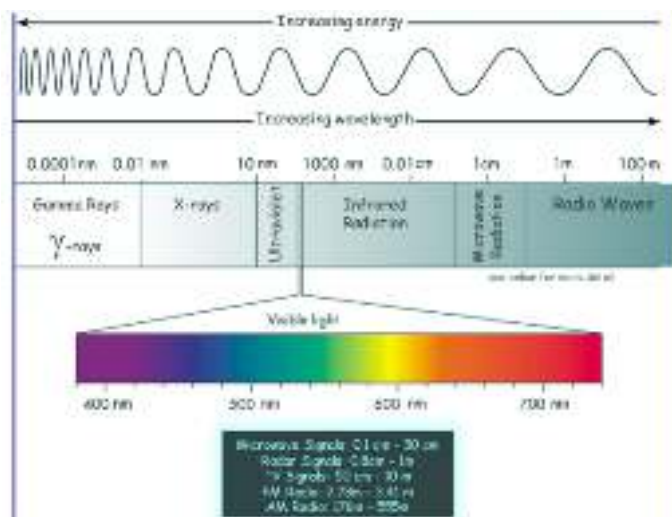


Figure 2.1: Electromagnetic spectrum

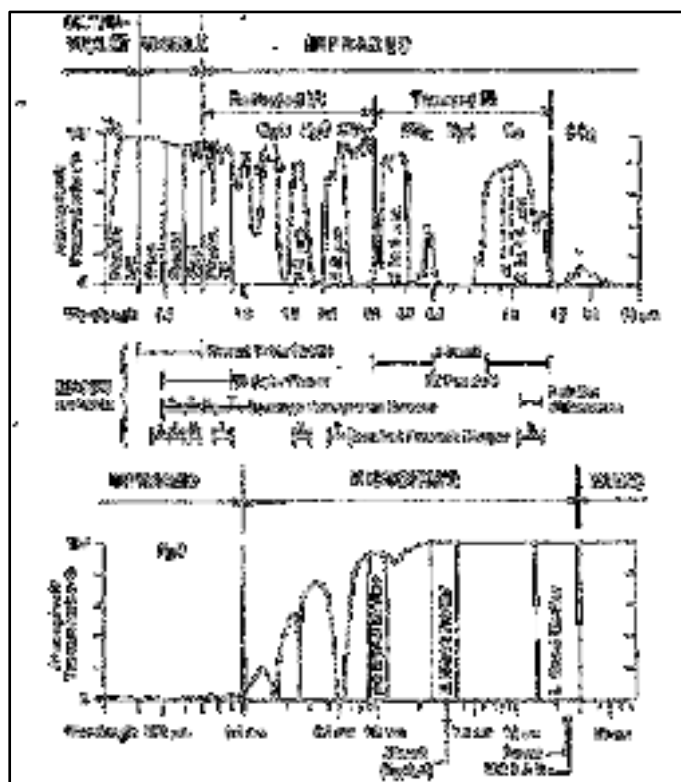


Figure 2.1: Expanded diagram of the visible and infrared regions (upper) and the microwave regions (lower) showing atmospheric windows. Wavelength bands commonly used remote sensing system are indicated. Gases responsible for atmospheric absorption are shown.

Table 2.1: Electromagnetic Spectral Regions

Region	Wavelength	Remarks
Gamma ray	< 0.03 nm	Incoming radiation is completely absorbed by the upper atmosphere and is not available for remote sensing.
X-ray	0.03 to 3.00 nm	Completely absorbed by atmosphere. Not employed in remote sensing.

Region	Wavelength	Remarks
Ultraviolet	0.03 to 0.40 um	Incoming wavelengths less than 0.3mm are completely absorbed by Ozone in the upper atmosphere.
Photographic UV band	0.30 to 0.40 um	Transmitted through atmosphere. Detectable with film and photo detectors, but atmospheric scattering is severe.
Visible	0.40 to 0.70 um	Imaged with film and photo detectors. Includes reflected energy peak of earth at 0.5mm.
Infrared	0.70 to 100.00 um	Interaction with matter varies with wavelength. Absorption bands separate atmospheric transmission windows.
Reflected IR band	0.70 to 3.00 um	Reflected solar radiation that contains no information about thermal properties of materials. The band from 0.7-0.9 mm is detectable with film and is called the photographic IR band.
Thermal IR band	3.00 to 5.00 um 8.00 to 14.00 um	Principal atmospheric windows in the thermal region. Images at these wavelengths are acquired by optical-mechanical scanners and special Videocon systems but not by film.
Microwave	0.10 to 30.00 cm	Longer wavelengths can penetrate clouds, fog, and rain. Images may be acquired in the active or passive mode.
Radar	0.10 to 30.00 cm	Active form of microwave remote sensing
Radio	>30.00 cm	Longest wavelength portion of electromagnetic spectrum. Some classified radar with very long wavelength operate in this region.

The earth's atmosphere absorbs energy in the gamma-ray, X-ray and most of the ultraviolet (UV) region; therefore, these regions are not used for remote sensing. Wavelength regions with high transmission are called atmospheric windows and are used to acquire remote sensing data. Detection and measurement of the recorded energy enables identification of surface objects (by their characteristic wavelength patterns or spectral signatures), both from air-borne and space-borne platforms.

2.3 Scanning System

The sensing device in a remotely placed platform (aircraft/satellite) records EM radiation using a scanning system. In scanning system, a sensor, with a narrow field of view is employed; this sweeps across the terrain to produce an image. The sensor receives electromagnetic energy radiated or reflected from the terrain and converts them into signal that is recorded as numerical data. In a remote sensing satellite, multiple arrays of linear sensors are used, with each array recording simultaneously a separate band of EM energy. The array of sensors employs a spectrometer to disperse the incoming energy into a spectrum. Sensors (or detectors) are positioned to record specific wavelength bands of energy. The information received by the sensor is suitably manipulated and transported back to the ground receiving station. The data are reconstructed on ground into digital images. The digital image data on magnetic/optical media consist of picture elements arranged in regular rows and columns. The position of any picture element, pixel, is determined on a x-y co-ordinate system. Each pixel has a numeric value, called digital number (DN) that records the intensity of electromagnetic energy measured for the ground resolution cell represented by that pixel. The range of digital numbers in an image data is controlled by the radiometric resolution of the satellite's sensor system. The digital image data are further processed to produce master images of the study area. By analysing the digital data/imagery,

digitally/visually, it is possible to detect, identify and classify various objects and phenomenon on the earth surface.

Remote sensing technique (airborne/satellite) in conjunction with traditional techniques harbours in an efficient, speedy, and cost-effective method for natural re-source management due to its inherited capabilities of being multispectral, repetitive, and synoptic areal coverage. Generation of environmental 'Data Base' on land use, soil, forest, surface and subsurface water, topography and terrain characteristics, settlement, and transport network, etc., and their monitoring in near real - time is very useful for environmental management planning; this is possible only with remote sensing data.

2.4 Data Source

- **Primary Data**

Remote Sensing Satellite data viz. Resourcesat-2A of February 2025 having 5.0 m. spatial resolution was used in the present study.

- **Secondary Data**

Secondary (ancillary) and ground data constitute important baseline information in remote sensing, as they improve the interpretation accuracy and reliability of remotely sensed data by enabling verification of the interpreted details and by supplementing it with the information that cannot be obtained directly from the remotely sensed data. For Jamadoba colliery, Survey of India toposheet no. 73I/5 (F45C5), 73I/6 (F45C6), 73I/9 (F45C9) & 73I/10 (F45C10) have been utilised for lease as well as Buffer zone of 10 km.

2.5 Characteristics of Satellite/Sensor

The basic properties of a satellite's sensor system can be summarised as:

- (a) Spectral coverage/resolution, i.e., band locations/width;
- (b) spectral dimensionality: number of bands;
- (c) radiometric resolution: quantisation;
- (d) spatial resolution/instantaneous field of view or IFOV; and
- (e) temporal resolution.

Table 2.2: Table illustrates the basic properties of Resourcesat-2A satellite sensor that was used in the present study.

Table 2.2 Characteristics of the satellite/sensor used in the present project work											
Platform	Sensor	Spectral Bands in μm				Radiometric Resolution	Spatial Resolution	Temporal Resolution	Country		
Re-source-sat- 2	LISS-IV	B2	0.52	-	0.59	Green	16-bit	5.0 m	24 days	India	
		B3	0.62	-	0.68						Red
		B4	0.77	-	0.86						NIR
NIR: Near Infra-Red											

2.6 Data Processing

The details of data processing carried out in the present study are shown in Figure 2.4. The processing methodology involves the following major steps:

- Geometric correction, rectification and geo-referencing
- Image enhancement
- Training set selection
- Signature generation and classification
- Creation/overlay of vector database
- Validation of classified image
- Final thematic map preparation

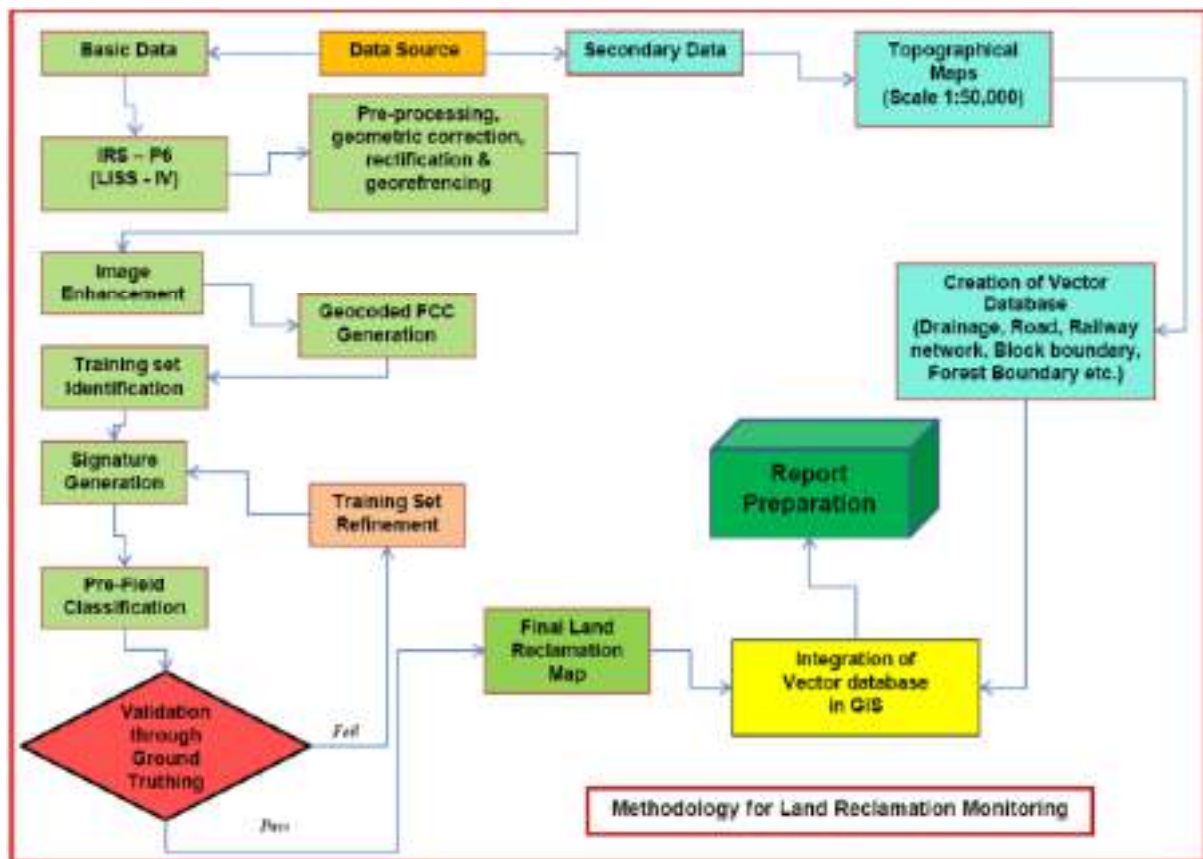


Figure 2.1: Data processing flowchart

2.6.1 Geometric correction, rectification, and geo-referencing

Inaccuracies in digital imagery may occur due to ‘systematic errors’ attributed to earth curvature and rotation as well as ‘non-systematic errors’ attributed to intermittent sensor malfunctions, etc. Systematic errors are corrected at the satellite receiving station itself while non-systematic errors/ random errors are corrected in pre-processing stage. In spite of ‘System / Bulk correction’ carried out at supplier end; some residual errors in respect of attitude attributes remains even after correction. Therefore, fine tuning is required for correcting the image geometrically using ground control points (GCP).

Raw digital images contain geometric distortions, which make them unusable as maps. A map is defined as a flat representation of part of the earth’s spheroidal surface that should conform to an internationally accepted type of cartographic projection, so that any measurements made on the map will be accurate with those made on the ground. Any map has two basic characteristics: (a) scale and (b) projection. While scale is the ratio between reduced depiction of geographical features on a map and the

geographical features in the real world, projection is the method of transforming map information from a sphere (round Earth) to a flat (map) sheet. Therefore, it is essential to transform the digital image data from a generic co-ordinate system (i.e., from line and pixel co-ordinates) to a projected co-ordinate system. In the present study georeferencing was done with the help of Survey of India (SoI) topo-sheets so that information from various sources can be compared and integrated on a GIS platform, if required.

An understanding of the basics of projection system is required before selecting any transformation model. While maps are flat surfaces, Earth however is an irregular sphere, slightly flattened at the poles and bulging at the Equator. Map projections are systemic methods for “flattening the orange peel” in measurable ways. When transferring the Earth and its irregularities onto the plane surface of a map, the following three factors are involved: (a) geoid (b) ellipsoid and (c) projection. Figure 2.5 illustrates the relationship between these three factors. The geoid is the rendition of the irregular spheroidal shape of the Earth; here the variations in gravity are considered. The observation made on the geoid is then transferred to a regular geometric reference surface, the ellipsoid. Finally, the geographical relationships of the ellipsoid (in 3-D form) are transformed into the 2-D plane of a map by a transformation process called map projection. As shown in the Figure 2.5 most projections are based upon cones, cylinders and planes.

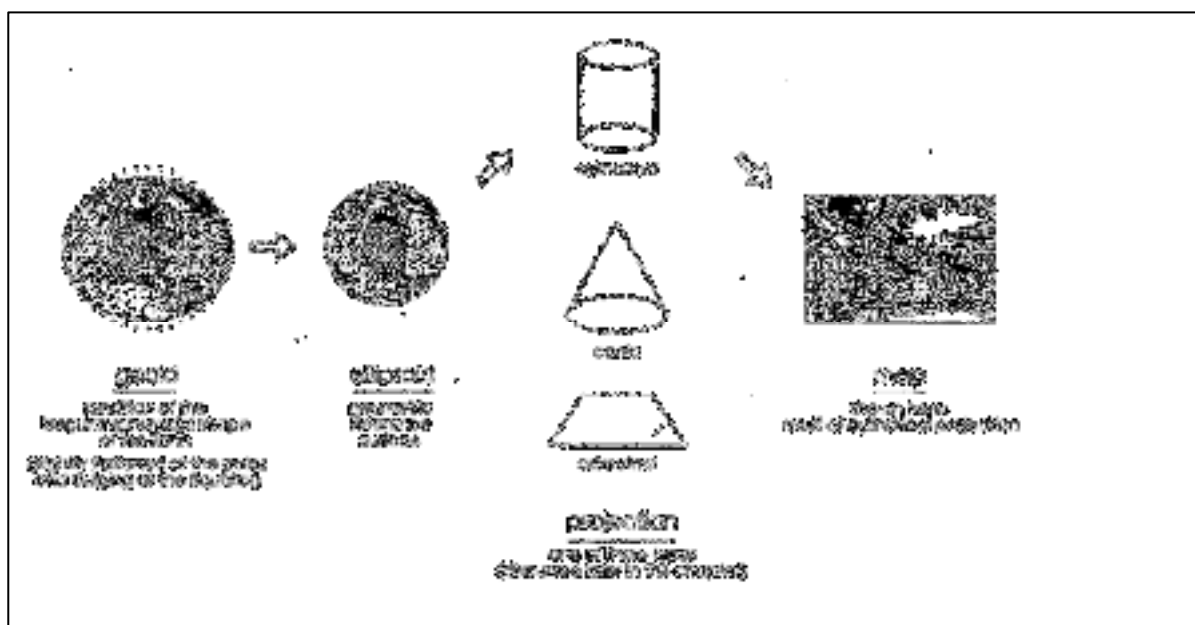


Figure 2.1: Geoid – Ellipsoid – Projection Relationship

In the present study, *UTM projection along with WGS 1984 Coordinate system* was used to prepare the map compatible with the SoI topo-sheets. Maps prepared using these projections are a compromise of many properties; it is neither conformal perspective nor equal area. Distances, areas, and shapes are true only along central meridian. Distortion increases away from central meridian. Image transformation from generic co-ordinate system to a projected co-ordinate system was carried out using IMAGINE v.2022 digital image processing system.

2.6.2 Image enhancement

To improve the interpretability of the raw data, image enhancement is necessary. Most of the digital image enhancement techniques are categorised as either point or local operations. Point operations modify the value of each pixel in the image data independently. However, local operations modify the value of each pixel based on brightness value of neighbouring pixels. Contrast manipulations/ stretching technique based on local operation was applied on the image data using IMAGINE s/w.

Training set selection

The image data were analysed based on the interpretation keys. These keys are evolved from certain fundamental image-elements such as tone/colour, size, shape, texture, pattern, location, association and shadow. Based on the image-elements and other geo-technical elements like landform, drainage pattern and physiography; training sets were selected/identified for each land use/cover class. Field survey was carried out by taking selective traverses to collect the ground information (or reference data) so that training sets are selected accurately in the image. This was intended to serve as an aid for classification. Based on the variability of land use/cover condition and terrain characteristics and accessibility, nearly 150 points were selected to generate the training sets.

2.6.3 Signature generation and classification

Image classification was carried out using the maximum likelihood algorithm. The classification proceeds through the following steps:

- Calculation of statistics [i.e., signature generation] for the identified training areas, and
- The decision boundary of maximum probability based on the mean vector, variance, covariance and correlation matrix of the pixels.

After evaluating the statistical parameters of the training sets, reliability test of training sets was conducted by measuring the statistical separation between the classes that resulted from computing divergence matrix. The overall accuracy of the classification was finally assessed with reference to ground truth data. The aerial extent of each land use class in the coalfield was determined using ERDAS IMAGINE s/w. The Land use / Land Cover map of core zone and buffer zone of Jamadoba Colliery for the year 2025 for are shown in Figure no. 3.1 and 3.5 respectively.

2.6.4 Creation/overlay of vector database

Plan showing coal block boundary are superimposed on the image as vector layer in the Arc GIS database. Road network, rail network and drainage network are also digitised on Arc GIS database and superimposed on the classified image.

2.6.5 Final land use/land cover map preparation

Final land use/land cover map of core zone and buffer zone of Jamadoba Colliery was printed using HP Design jet 4500 Colour Plotter. The maps are prepared on 1:5000 scale but plotted on scale “Fit to A3 Size”.

3. Detailed Land Use and Land Cover estimation of Jamadoba Collieries:

3.1 Introduction:

It is expected that by understanding the spatial phenomenon of Land Use-Land Cover (LULC) and developing and applying techniques to detect and predict changes in LULC using remote sensing and GIS, it will be possible to reduce the misallocation of resources and mismanagement of land use in the study area. It is anticipated that this study will be great assistance in formulation of policies that will help in improving land use planning and land resources management in study area. It is being carried out to reveal how much of a region is covered by forests, wetlands, impervious surfaces, agriculture, and other land and water types. As explained above, Land use and land cover map of Jamadoba Colliery comprises of Jamadoba mining lease area including Jamadoba Coal washery of Tata Steel Limited in Jharkhand state. The detailed objectives of this study area are as follows:

- 1) Preparation of land use land cover classification report with likely land uses such as -
 - Agriculture;
 - Forest;
 - Mining/ Built-up area:
 - Wasteland with and without vegetation,
 - Waterlogged (inland wetland));
 - Habitation (Urban area delineation with approx. buffer zone) and water body (including rivers and streams), roads and other distinctly visible feature classes if any.
- 2) To detect and determine land use-land cover change dynamics using remote sensing techniques by preparation of time series land use map.
- 3) To analyze the spatial dimension of LULC change dynamics associated with demographic pressure, economic and physical environment.
- 4) Generation of shape files of all units for submission.
- 5) To comply specific condition no. 26 of EC conditions that states “For monitoring land use pattern and for post mining land use, a time series of land use maps, based on satellite imagery (on a scale of 1:5000) of the core zone and buffer zone, from the start of the project until end of mine life shall be prepared once in 3 years (for any one particular season which is consistent in the time series), and the report submitted to MoEF and its concerned Regional office.

The broad classification alongwith the description is given in Table 3.1, as per the of framework of Land Use Land Cover by NRSC/ ISRO. The areas under each of these classes shall be estimated on the basis of the pixel grid cell process in Erdas Imagine software following the rules of NRSC/ISRO Land Use and Cover Monitoring.

Table 3.1: Descriptions of land use and land cover classes (Source- NRSC/ISRO)

Sl. No.	Description - 1	Description - 2	Remarks
1	Built-up area	Urban	Residential, mixed built up, Public / Semi Public, Communication, Public utilities /facility, Commercial, Transportation, Reclaimed land, Vegetated Area, Recreational, Industrial, Industrial / Mine dump, Ash/ Cooling pond.
		Rural	Rural
		Mining	Mine / Quarry, Abandoned Mine Pit, Land fill area

Sl. No.	Description - 1	Description - 2	Remarks
2	Agriculture land	Crop land	Kharif, Rabi, Zaid, Two cropped, More than two cropped
		Plantation	Plantation-Agricultural, Horticultural, Agro Horticultural.
		Fallow	Current and Long Fallow
		Current Shifting Cultivation	Current Shifting cultivation.
3	Forest Land	Evergreen/Semi evergreen	Dense / Closed and Open category of Evergreen / Semi evergreen.
		Deciduous	Dense / Closed and Open category of Deciduous and Tree Clad Area.
		Forest Plantation	Forest Plantation
		Scrub Forest	Scrub Forest, Forest Blank, Current & Abandoned Shifting Cultivation.
		Swamp/Mangroves	Dense / Closed & Open Mangrove
4	Grass/ grazing	Grass/ grazing	Grassland: Alpine / Sub-Alpine, Temperate / Sub tropical, Tropical / Desertic
5	Barren/ uncultivable/ Waste land	Salt affected land	Slight, Moderate & Strong Salt Affected Land
		Scrub land	Dense. Closed and Open category of scrub land
		Sandy area	Desertic, Coastal, Riverine sandy area.
		Barren rocky	Barren rocky
		Rann	Rann
6	Wetlands/ Water bodies	Inland wetland	Inland Natural and Inland Manmade wetland
		Coastal wetland	Coastal Natural and Coastal Manmade wetland
		River / Stream / canals	Perennial & Dry River/stream and line & unlined canal/ drain
		Water bodies	Perennial, Dry, Kharif, Rabi & Zaid extent of lake/pond and reservoir and tanks

Definitions of all the major classes are mentioned below:

- Built-up land:**

It is an area of human habitation developed due to non-agricultural use and that has a cover of buildings, transport and communication, utilities in association with water, vegetation and vacant land. LULC map consists of 3 classes under built-up viz., urban, rural and mining.

- Agricultural land:**

These are the lands primarily used for farming and for production of food, fiber, and other commercial and horticultural crops. Agricultural Land may be defined broadly as land used primarily for production of food and fiber. These are the areas with standing crop as on the date of Satellite overpass. Cropped areas appear in bright red to red in colour with varying shape and size in a contiguous to non-contiguous pattern. They are widely distributed indifferent terrains; prominently appear in the irrigated are as irrespective of the source of irrigation. It includes Kharif, Rabi and Zaid croplands along with areas under double or triple crops.

- **Forest:**

The term forest is used to refer to land with a tree canopy cover of more than 10 percent and area of more than 0.5 ha. Forests are determined by both the presence of trees and the absence of other predominant land uses. The trees should be able to reach a minimum height of 5 m. The two categories i.e., open forest and dense forest is predominant in Jamadoba Colliery.

- **Wetland:**

Wetlands are those areas where the water table is at, near, or above the land surface for a significant part of most years. The hydrologic regime is such that aquatic or hydrophyte vegetation usually is established, although alluvial and tidal flats may be no vegetated. Wastelands frequently are associated and topographic lows, even in mountainous regions.

- **Water body:**

This category comprises areas with surface water in the form of ponds, river, lakes, tanks and reservoirs. Rivers/streams are natural course of water flowing on the land surface along a definite channel/slope regularly or intermittently towards a sea in most cases or into a lake or an inland basin in desert areas or a marsh or another river. Canals are artificial watercourse constructed for irrigation, navigation or to drain out excess water from agricultural lands.

3.2 Land use and Land cover mapping of Jamadoba Colliery:

Land use and land cover mapping for the year 2025 -

The Jamadoba colliery (927.17 ha) was classified for land use and land cover mapping by using supervised classification technique. Six classes are identified over the study area namely built-up (195.378 ha), mining (65.633 ha), grazing/scrub land (25.143 ha), agricultural land (469.857 ha), water body (86.425 ha) and barren land/waste land (74.884 ha) shown in Figure 3.1 below.

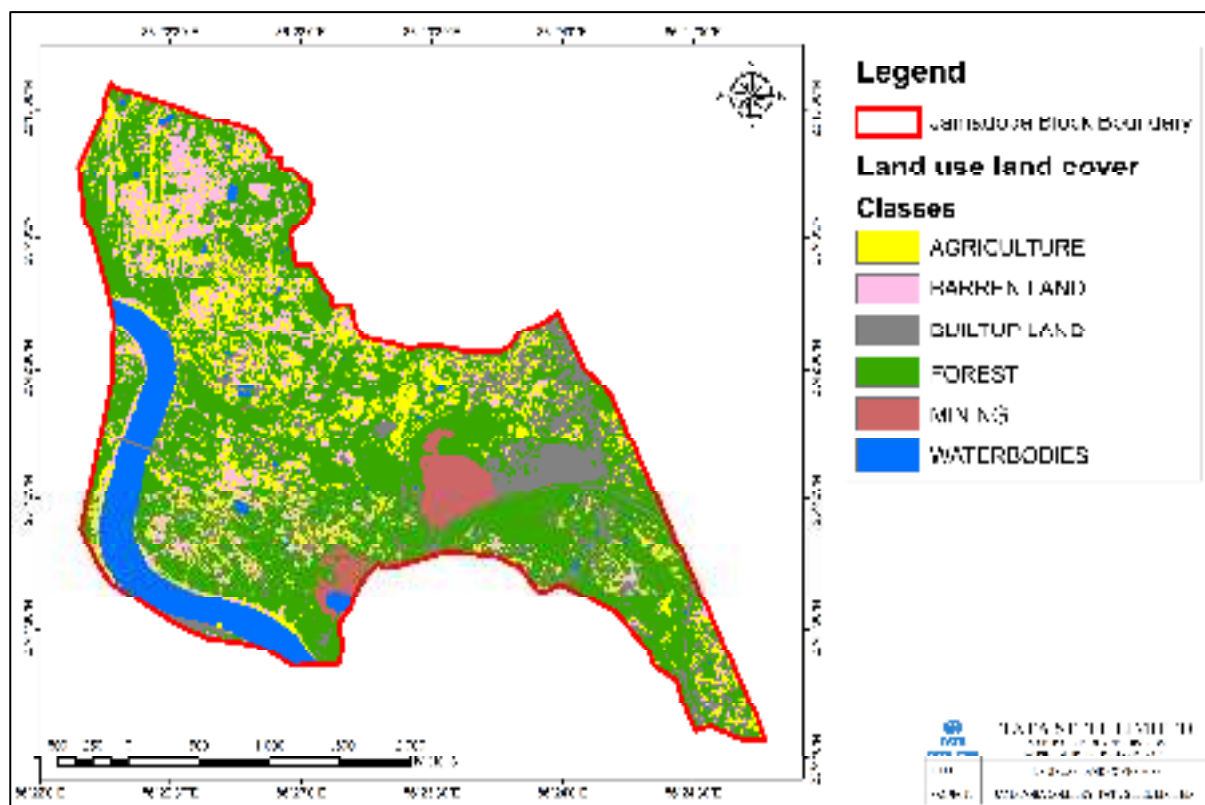


Figure 3.1: LULC map of Jamadoba Colliery including Jamadoba Washery in year 2025

Table 3.2: Assessment of Land use/Land cover of Jamadoba colliery on yearly basis

Sl. no.	Description	Year – 2018*	Year – 2021*	Year - 2025
1	Built-up land	204.200	205.166	195.378
2	Built-up Mining land	65.633	65.633	65.633
3	Dense forest	0.000	0.000	0.000
4	Grazing/Scrub land	37.743	24.677	25.143
5	Agriculture land	404.204	450.874	469.857
6	Agricultural Fallow land	18.581	8.812	9.850
7	Water Body/ River	81.120	81.120	86.425
8	Barren land/waste land	115.689	90.888	74.884
Total		927.17	927.17	927.17

*Study report prepared by Indian Institute of Technology - ISM in March'2021

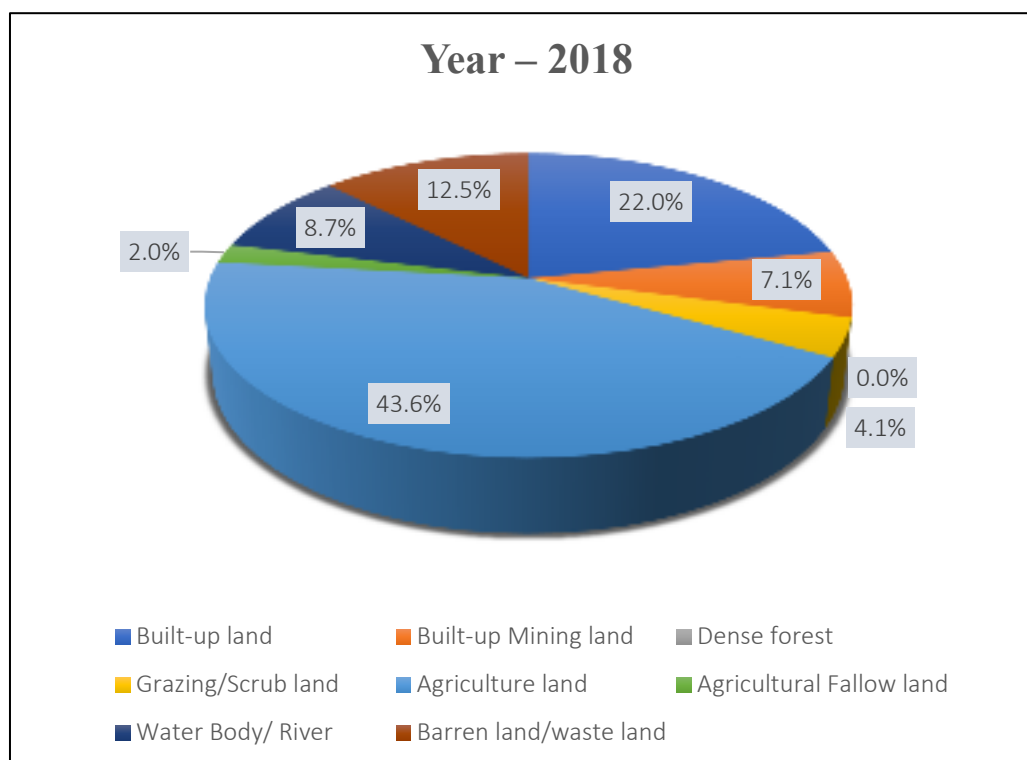


Figure 3.2: LULC distribution of Jamadoba colliery (Year 2018)

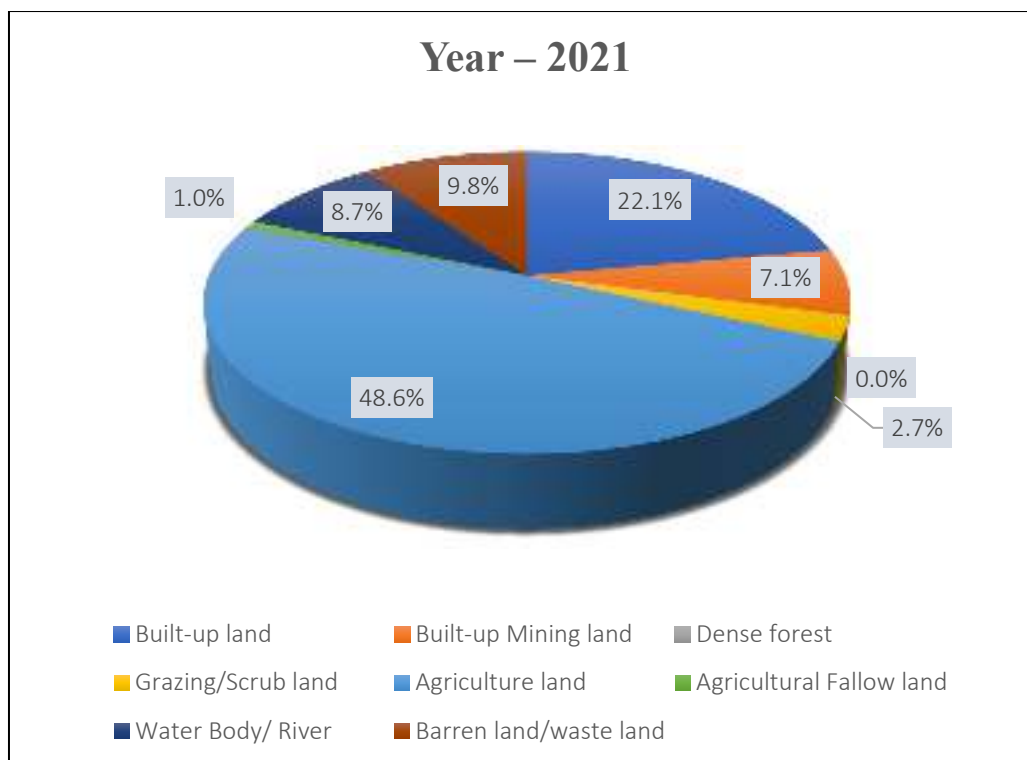


Figure 3.3: LULC distribution of Jamadoba colliery (Year 2021)

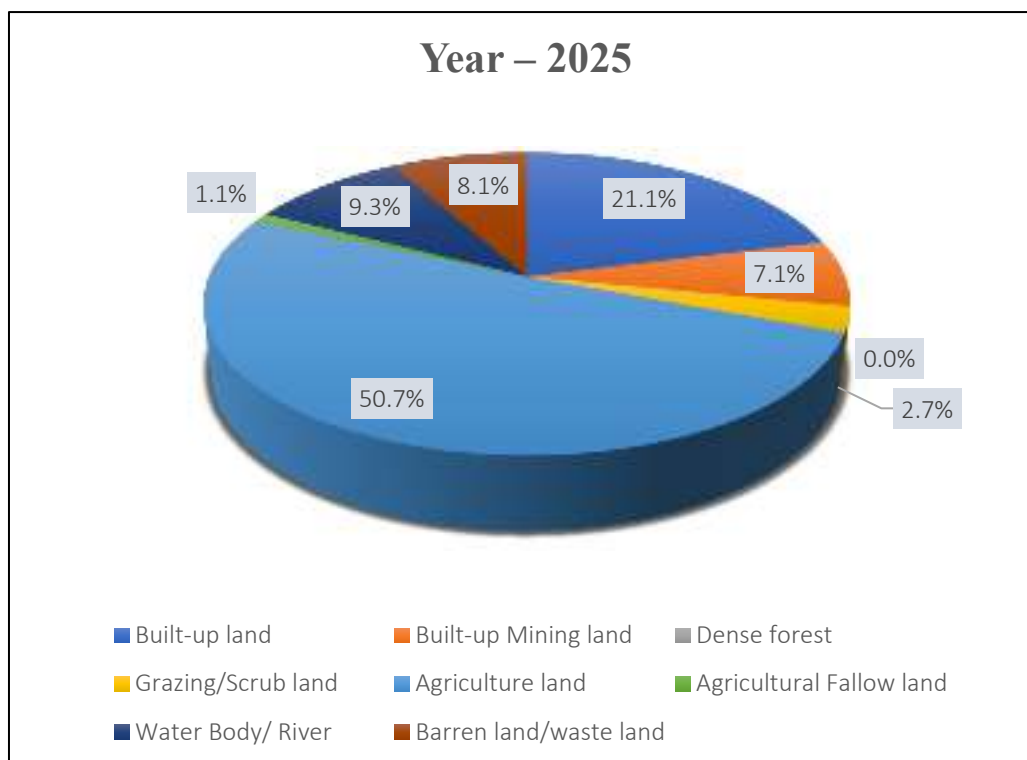


Figure 2.1: LULC distribution of Jamadoba colliery (Year 2025)

3.3 Land use and Land cover mapping of Jamadoba colliery with 10 km buffer zone:

Land use and land cover map for the year 2025 –

The Jamadoba colliery with 10 km buffer zone (47358.068 ha) was classified for land use and land cover mapping by using supervised classification technique. Nine classes are identified over the study area namely built-up (7655.100 ha), mining (4256.855 ha), dense forest (6700.195 ha), open forest (2328.085 ha), grazing/scrub land (1417.223 ha), agricultural land (15125.053 ha), agricultural fallow land (3504.380 ha), water body (1019.935 ha) and barren land/waste land (5351.243 ha). The land use/land cover map of Jamadoba colliery with 10KM buffer zone is shown in Figure-3.5.

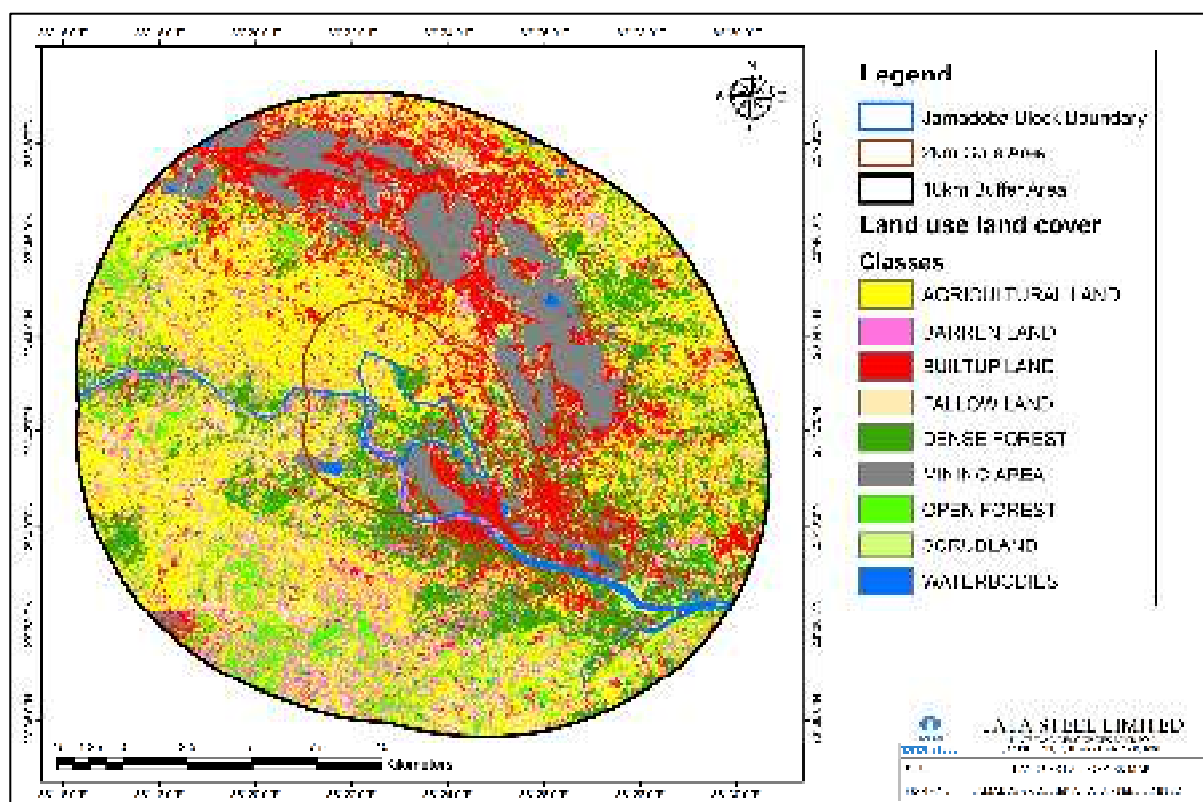


Figure 2.1: LULC map of Jamadoba colliery including Jamadoba Washery with 10km buffer zone in year 2025

Table 3.3: Assessment of Land use/Land cover with the Buffer Zone of Jamadoba colliery on yearly basis

Sl. no.	Description	Year – 2018*	Year – 2021*	Year - 2025
1	Built-up land	9899.919	9955.544	7655.100
2	Built-up Mining land	4526.092	4513.832	4256.855
3	Dense forest	1259.534	1227.004	6700.195
4	Open forest	568.416	564.446	2328.085
5	Grazing/Scrub land	37.743	44.767	1417.2225
6	Agriculture land	23130.762	23033.217	15125.053
7	Agricultural fallow land	1477.343	1533.789	3504.380
8	Water Body/ River	1249.206	1257.946	1019.935
9	Barren land/waste land	5206.498	5224.968	5351.2425
Total		47355.513	47355.513	47358.068

*Study report prepared by Indian Institute of Technology - ISM in March'2021

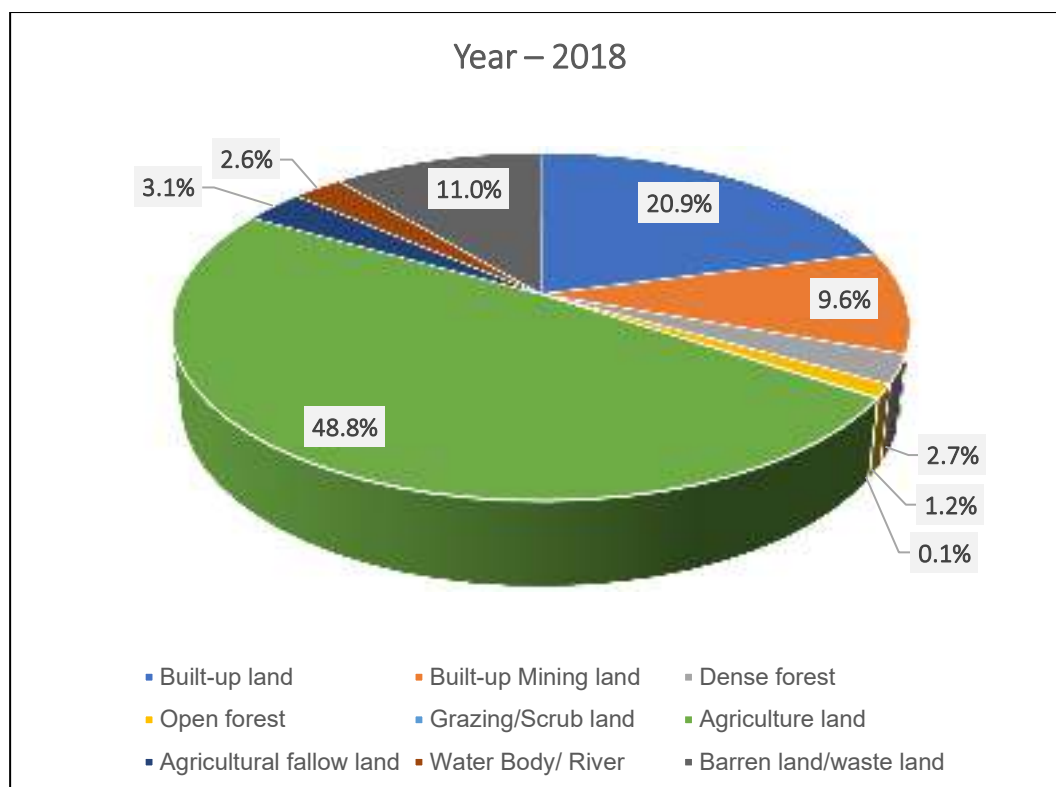


Figure 2.1: LULC distribution of Buffer Zone of Jamadoba colliery (Year 2018)

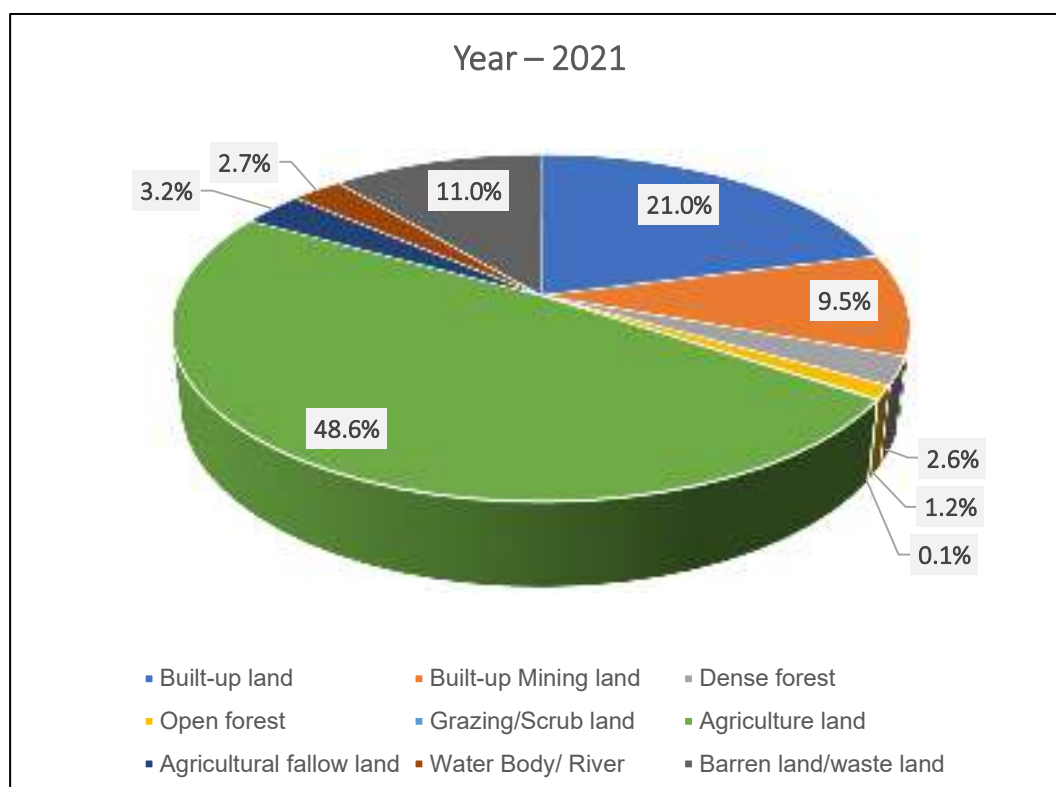


Figure 2.1: LULC distribution of Buffer Zone of Jamadoba colliery (Year 2021)

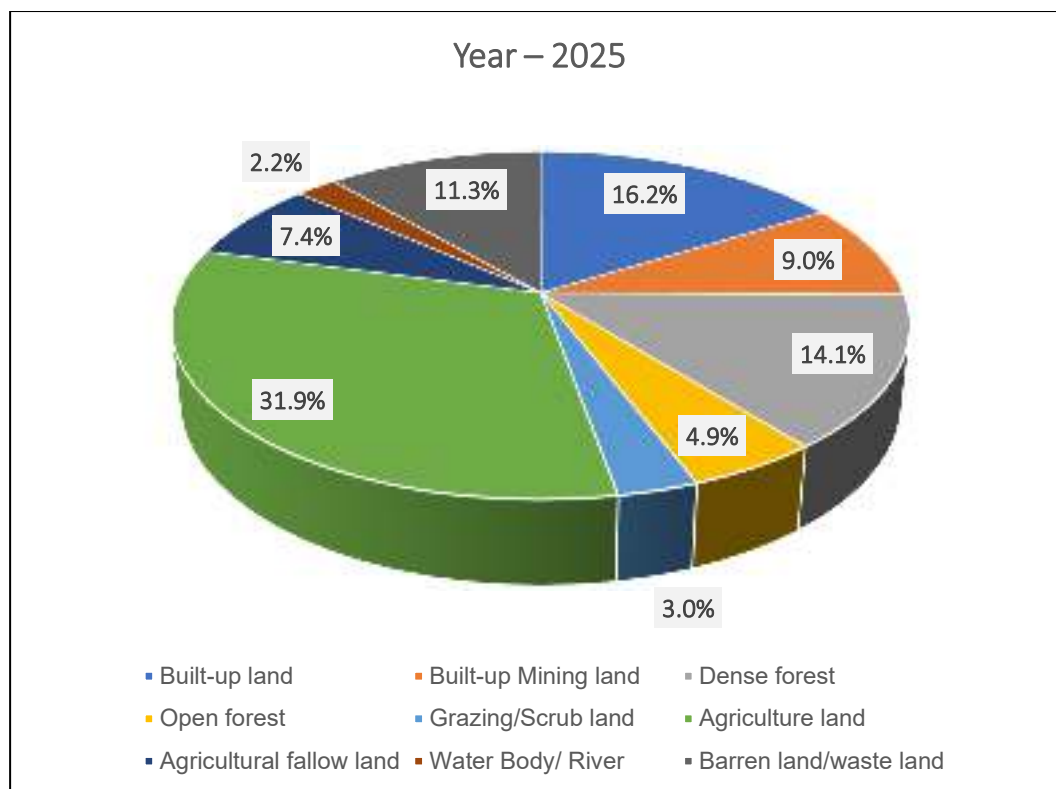


Figure 2.1: LULC distribution of Buffer Zone of Jamadoba colliery (Year 2025)

3.4 Change Detection:

In the core zone of Jamadoba collieries overall built-up area is reduced from 205.166 Ha to 195.378 Ha. No change on Built-up area of Mining land is observed. Small amount of enhancement over grazing land has observed from 24.677 Ha to 25.143 Ha. Agricultural land is also observed to be increased from 450.874 Ha to 469.857 Ha. Increase over waterbody area is observed from 81.120 ha to 86.425 ha. Reduction in Barren/ Waste land is observed from 90.888 Ha to 74.884 Ha.

In the buffer zone of Jamadoba collieries Built-up land is observed to be reduced from 9955.5 Ha to 7655.1 Ha; Mining built-up area has been reduced from 4513.83 Ha to 4256.85 Ha; Dense forest has been increased from 1227.0 Ha to 6700.19 Ha; Open forest also has been increased significantly from 564.44 Ha to 2328.08 Ha; Grazing/ Scrub land increased from 44.76 Ha to 1417.22 Ha; Agricultural land has been reduced from 23033.217 Ha to 15125.05 Ha; Small amount of reduction over water-bodies is observed from 1257.94 Ha to 1019.935 Ha and meagre enhancement over barren land is observed from 5224.96 Ha to 5351.24 Ha.

4. Conclusions:

- In the present study, land use/ vegetation cover mapping has been carried out based on Resourcesat 2A satellite sensor data of February'2025 in order to monitor the impact of coal mining on land environment which may help in formulating the mitigation measures required, if any.
- Technical limitation of the analysis process lies with the resolution of the Satellite image which is usually available at 5m resolution. Therefore, sometimes it is difficult to assess the land classification remotely in case of Agricultural land with low vegetation Scrub land or Barren land through False Colour Composite (FCC) of remote sensing.