



**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/JMB/87/ 710 /2024
November 27th, 2024

Ref.: Environmental Clearance letter no. - J-11015/91/2017-IA .II (M) dated- 11th July 2022.

**SUB: Half Yearly Compliance Status Report of Environment Clearance conditions issued
by MoEFCC, New Delhi to Jamadoba Colliery, Tata Steel Limited, Dhanbad for the
period April-24 to September-24.**

Dear Sir,

We are enclosing herewith compliance report for the period **April-24 to September-24** for the EC granted vide letter no.- J-11015/91/2017-IA. II (M) dated- 11th July 2022 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/109757/2019
Compliance ID	111655127
Compliance Number(For Tracking)	EC/M/COMPLIANCE/111655127/2024
Reporting Year	2024
Reporting Period	01 Dec(01 Apr - 30 Sep)
Submission Date	29-11-2024
RO/SRO Name	ARTATRANA MISHRA
RO/SRO Email	jhk109@ifs.nic.in
State	JHARKHAND
RO/SRO Office Address	Integrated Regional Offices, Ranchi

Note:- SMS and E-Mail has been sent to ARTATRANA MISHRA, JHARKHAND with Notification to Project Proponent.



परिवेश
PARIVESH
(CPC GREEN)

पयविरण, वन और जलवायु परिवर्तन मंत्रालय

Ministry of Environment, Forest and Climate Change



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View Half Yearly Compliance Report at Project Proponent

Proposal Details

Proposal No

IA/JH/CMIN/109757/2019

Category

Coal Mining

Name of Project

Modernization of Jamadoba Underground coal mine of 0.34 MTPA in ML area of 927.17 Ha by M/s Tata Steel Limited at Jorapokhar, Puttiya Dungri village, Jharia, Tehsil, Dhanbad (Jharkhand)

Plot / Survey/ Khasra No.

Village(s)

Sub-District(s)

State

JHARKHAND

District

DHANBAD

MoEF File No

J-11015/91/2017- IA.II (M)

Name of the Entity/

Corporate Office

Tata Steel Ltd.

Entity's PAN

*****2803M

Entity Name as per PAN

UTSAV KASHYAP

Entity details mentioned above is correct ?

Agree

Covering Letter

Covering Letter

Compliance Reporting Details

Reporting Year

2024

Reporting Period

01 Dec(01 Apr - 30 Sep)

Remark(if any)

Half Yearly Compliance Submission for April 2024 to September 2024.

Details of Production and Project Area

Date of Commencement of Project/Activity

01-01-1918

	Project Area as per EC Granted(ha.)	Actual Project Area in Possession(ha.)
Private	0	0
Revenue Land	0	0
Forest	0	0
Others	927.17	927.17
Total	927.17	927.17

Land Documents

NA

Sr.No.	Name of the Product	Units	As per EC Granted	As per CTO Granted	CTO ID	Valid Up To	Production during last financial year
1	Raw Coal	Million Tons per Annum (MTPA)	0.34			null	0.05

Conditions

Specific Conditions

Sr.No.	Condition Heading	Condition Details	Status of Compliance,Remarks / Reason and Supporting Documents	
1	Statutory compliance	PP to obtain the CTO for 0.34 MTPA capacities	PPs Submission	Consent to Operate for the existing capacity has been obtained from the State PCB

		immediately after grant of EC.		on 14.11.2022 and is valid till 31.12.2024. The production from the mines have been discontinued since January 2024. Complied 29-11-2024 Attachment:NA
2	WATER QUALITY MONITORING AND PRESERVATION	PP to conserve the Kari jhore, Dungri jhore, Damodar River following within the core area of the project and the measure taken for its conservation to be furnished in every six-monthly compliance to be reported to respective IRO and SPCB.	PPs Submission	The conservation measures are ongoing, and the report shall be submitted to IRO, MoEFCC and SPCB as required. Complied 16-11-2024 Attachment:NA
3	Statutory compliance	Since there is also Jamadoba Coal washery located within mine lease having separated EC vide Letter No.- J- 11015/203/2011-II-IA(M) dated 3rd March 2014 so the adequate EMP measure to be adopted to minimize the cumulative impact, also the utilization of rejects generated from washery should be managed as per norms. PP shall obtain integrated EC for future coal/washery expansion.	PPs Submission	There are existing environmental measures for the Jamadoba Coal preparation plant. The rejects like tailing, middling etc are utilized as per norms. The integrated EC shall be taken in case of washery expansion. Complied 16-11-2024 Attachment:NA
4	Statutory compliance	PP shall obtain No objection certificate from Ground water	PPs Submission	The renewal NOC from central Ground Water Authority for extraction of ground water has been

		Authority for extraction of ground water within six months and submit to IRO Ranchi.		granted vide NOC No. CGWA/NOC/MIN/REN/1/2024/10124; dated: 05.11.2024. Complied 29-11-2024 Attachment:NA
5	WASTE MANAGEMENT	PP Shall reduce river sand used for stowing and explore usage of sand segregated from OB dump from any nearest mine (either its own or any mine) and submit detailed report to IRO Ranchi.	PPs Submission	We are in the process of technological exploration of sand from OB dump. Complied 16-11-2024 Attachment:NA
6	Statutory compliance	PP to accomplish the requirement of a full fledge qualified manpower with Environmental Engineer/Env. Science degree background in Environmental Management Cell etc. within six months and same shall be reported to IRO, MoEF&CC	PPs Submission	We have a full-fledged Environment cell with Environment professionals and field monitoring staff. Complied 16-11-2024 Attachment:NA
7	PUBLIC HEARING	PP to fulfil all the commitment made to address the public hearing issued in time bound manner as committed in EIA EMP report in Chapter & table 7.1 and a progressive report to be furnished to IRO with six monthly compliance report	PPs Submission	The commitment are in various levels of compliance. The commitments made during the public hearing are being complied in time bound manner. The report shall be furnished to IRO, Ranchi as required. Complied 29-11-2024 Attachment:NA
8	AIR QUALITY MONITORING	PP to maintain the transportation	PPs Submission	The production from the mine has been discontinued

	AND PRESERVATION	road properly to minimize the dust emission. PP to also develop puce roads by seeking consent from the panchayat with widening of roads especially roads inters linking the villages within the study area of 10 Km radius buffer zone.		from January 2024. Transportation of coal from colliery to washery was done through covered conveyor belts. Road transportation is done through covered truck only. Complied 29-11-2024 Attachment:NA
9	Corporate Environmental Responsibility	PP to complete the estimated allocated budgetary expenditure for EMP capital cost is Rs.273.0 lakhs & Recurring cost is Rs.1359.4 Lakhs per year as per its letter dated JMB/115/001339 dated 3rd September, 2021. Capital EMP budget shall be completed within strict timeline.	PPs Submission	It is under progress. The completion within strict timeline shall be complied. Complied 16-11-2024 Attachment:NA
10	WATER QUALITY MONITORING AND PRESERVATION	PP to monitor the water quality of the ground water and surface water body located within the core zone and 5 Km radius from the periphery of the mine boundary as per procedure laid down by CPCB.	PPs Submission	It has been complied. Complied 16-11-2024 Attachment:NA
11	AIR QUALITY MONITORING AND PRESERVATION	PP to install More continuous ambient air quality stations at suitable locations preferably village side with consultation of SPCB. The real time data so	PPs Submission	A CAAQMS is being installed in Jamadoba group since 2014. A new CAAQMS has been installed recently in July 2022 and the data connectivity to SPCB, Jharkhand has been done. Complied

		generated shall be uploaded on company website and linked it with website of CPCB & SPCB. In addition, data should also be displayed digitally at entry and exit gate of mine lease for public display.		16-11-2024 Attachment:NA
12	WATER QUALITY MONITORING AND PRESERVATION	PP shall develop rainwater harvesting in Jamadoba coal washery as proposed by PP in vide Letter dated JMB/115/001339 dated 3rd September, 2021 & water harvesting ponds near the villages of suitable area as suggested by EAC in consultation with Gram Panchayat within year and with cultivation of Lotus.	PPs Submission	It shall be complied. Work has been initiated and under progress. Complied 16-11-2024 Attachment:NA
13	MISCELLANEOUS	PP must seek the input of experts for phytoremediation of Slurry and accordingly work on it with proper scientific approach.	PPs Submission	There is no generation of slurry during raw coal production. Complied 16-11-2024 Attachment:NA
14	GREENBELT	PP to plant additional 100,000 plants with three tier plantations along the transportation route, if not completed, and identified areas with consent to	PPs Submission	It is under progress. Plantation and green belt development is a continuous process. Green belt report has been attached as Annexure I. Complied 29-11-2024 Attachment: Click to View

		the gram panchayat within two year and plant for remaining within 2 years for their proper growth.		
15	ENERGY PRESERVATION MEASURES	PP to install solar lights along the road used for transportation of minerals to avoid the accidents at night and also seek its maintenance. PP is asked to also identify the rural areas for installation of solar light with in its maintenance within the study area of 10 km radius buffer zone within one year	PPs Submission	Adequate lighting facilities have been installed along the roads. Several facilities under CSR, including lights have been provided in the area. Complied 29-11-2024 Attachment:NA
16	Human Health Environment	Proponent shall appoint an occupational Health Specialist for Regular and Periodical medical examination of the workers engaged in the project and maintain records accordingly also Occupational health check-up for workers having some ailments like BP, diabetes, habitual smoking etc. shall be undertaken once in six months and necessary redial/preventive measures taken accordingly. The recommendations of National Institute for	PPs Submission	It has been complied. Its a continuous process. There is fully developed Tata Central Hospital in Jamadoba to take care of all these types of concerns of community. Complied 16-11-2024 Attachment:NA

		ensuring good occupational environment for mine workers shall be implemented. The prevention measure for burns, malaria and provision of anti-snake venom including all other paramedical safeguards may be ensured before initiating the mining activities.		
17	MISCELLANEOUS	Persons of nearby villages shall be given training on livelihood and skill development makes them employable with its proper records.	PPs Submission	It is a continuous process and has been complied. Separate training cell (JNTVTI) has been developed for skill based training of local youth. Complied 16-11-2024 Attachment:NA
18	Noise Monitoring & Prevention	The illumination and sound at night at project sites disturb the villages in respect of both human and animal population. Consequent sleeping disorders and stress may effects the health in the village located aloes tom mining operations. Habitations have a right for darkness and minimal noise levels at nights, PPs must ensure that the biological clock of the villages is not distributed by orienting the floodlights/masks	PPs Submission	It has been noted and shall be complied strictly. Complied 29-11-2024 Attachment:NA

		away from the villagers and keeping the noise levels well within the prescribed limits for day lights/night hours		
19	Statutory compliance	PP shall pay to farmers of agricultural land if there is any loss due to pollution found by concerned District Commissioner as per extent rules or norms.	PPs Submission	It has been noted and shall be complied. Complied 16-11-2024 Attachment:NA
20	Statutory compliance	PP should establish in house (at project site) environment laboratory for measurement of environment parameter with respect to air quality and water (surface and ground A dedicated team to oversee environment management shall be setup which should comprise of Environmental Engineer, Laboratory chemist and staff for monitoring of air , water quality parameters on routine basis. Any non-compliance or infringement should be reported to the concerned authority.	PPs Submission	We have a full-fledged Environment cell with Environment professionals and field monitoring staff. Complied 16-11-2024 Attachment:NA
21	MISCELLANEOUS	PP shall follow the recommendation of subsidence	PPs Submission	The subsidence is monitored regularly, and the recommendations are

	study and monitor the degree of subsidence regularly and shall be submitted to IRO-Ranchi.	implemented. Report attached as Annexure IV. Complied 29-11-2024 Attachment: Click to View
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General Conditions

Sr.No.	Condition Heading	Condition Details	Status of Compliance, Remarks / Reas Supporting Documents	
1	Statutory compliance	The Environmental clearance shall be subject orders of Hon'ble Supreme Court of India. Hon'ble High Courts, NGT and any other Court of Law, from time to time, and as applicable to the project.	PPs Submission	It has been not Complied 16-11-2024 Attachment:NA
2	Statutory compliance	The project proponent shall obtain forest clearance under the provisions of Forest (Conservation) Act, 1986, in case of the diversion of forest land for non- forest purpose involved in the project.	PPs Submission	It is not applica Complied 16-11-2024 Attachment:NA
3	Statutory compliance	The Project proponent shall obtain clearance from the National Board for Wildlife, if applicable.	PPs Submission	Not Applicable Complied 16-11-2024 Attachment:NA
4	Statutory compliance	The project proponent shall prepare a site-specific conservation plan/wildlife management Plan and approved by the Chief Wildlife Warden. The recommendation of the approved Site-Specific Conservation Plan/Wildlife Management Plan shall be implemented in consultation with the State Forest Department. The implementation report shall be furnished along with the six-monthly compliance report (in case of the presence of schedule I species in the study area)	PPs Submission	There is no Sch species in the s Complied 29-11-2024 Attachment:NA

5	Statutory compliance	The project proponent shall obtain Consent to Establish/Operate under the provisions of Air (Prevention & Control of Pollution) Act, 1981 and Water (Prevention & Control of Pollution) Act, 1974 from the Concerned State Pollution Control Board/Committee.	PPs Submission	The CTE has been from JSPCB vide JSPCB/HO/RNC 14115974/2022 dated 12.11.2022 and received from J No. JSPCB/HO/13955624/2022 dated 14.11.2022. Complied 16-11-2024 Attachment:NA
6	Statutory compliance	The project proponent shall obtain the necessary permission from the Central Ground Water Authority.	PPs Submission	The NOC from central Authority for extraction water has been granted No. CGWA/NOC/MIN/REN/ dated: 05.11.2024. Complied 29-11-2024 Attachment:NA
7	Statutory compliance	Solid Waste/Hazardous Waste generated in the mines needs to be addressed in accordance to the Solid Waste Management Rules, 2016/ Hazardous & Other Waste Management Rules, 2016	PPs Submission	It has not been complied. Complied 16-11-2024 Attachment:NA
8	AIR QUALITY MONITORING AND PRESERVATION	Adequate ambient air quality monitoring stations shall be established in core zone as well as in the buffer zone for monitoring of pollutants, namely particulates, SO ₂ and NO _x . Location of the station shall be decided based on the metrological data, topographical features and environmentally and ecologically sensitive in consultation with the State Pollution Control Board. Monitoring of heavy metal such as Hg, As, Ni, Cd, Cr, etc. to be carried out at least once in six months. Online ambient air quality monitoring station may also be installed in addition to the regular air monitoring stations as per the requirement	PPs Submission	It has been complied 16-11-2024 Attachment: Cli

		and /or in consultation with the SPCB.		
9	AIR QUALITY MONITORING AND PRESERVATION	The Ambient Air Quality monitoring in the core zone shall be carried out to ensure the coal Industry Standards notified vide GSR 742 E dated 25.09.2000 and as amended from time to time by the Central Pollution Control Board. Data on ambient air quality and heavy metals such as Hg, As, Ni, Cd, Cr and other monitoring data shall be regularly reported to the Ministry/Regional Office and to the CPCB/SPCB.	PPs Submission	Ambient air quality as well as buffer zone measures by in environmental well as third party recognised lab. been attached Complied 29-11-2024 Attachment: Clim
10	AIR QUALITY MONITORING AND PRESERVATION	Transportation of coal, to the extent permitted by road shall be carried out by covered trucks/conveyors. Effective control measure such as regular water sprinkling /rain gun/mist sprinkling etc. shall be carried out in critical areas prone to air pollution with higher level of particulate matter all through the coal; transport roads, loading /Unloading and transfer points. Fugitive dust emissions from all sources shall be controlled regularly. It shall be ensured that the ambient air quality parameters conform to the norms prescribed by the Central/ State Pollution Control Board.	PPs Submission	The production mine has been from January 21 Transportation colliery to wash through covered belts. Road transport done through covered only. Complied 29-11-2024 Attachment:NA
11	AIR QUALITY MONITORING AND PRESERVATION	Major approach roads shall be black topped and properly maintained.	PPs Submission	It has been complied Complied 16-11-2024 Attachment:NA

12	AIR QUALITY MONITORING AND PRESERVATION	The transportation of coal shall be carried out as per the provision and route proposed in the approved mining plan. Transportation of coal through the exiting road passing through any village shall be avoided. In case it is proposed to construct a bypass road it should be so constructed that the impact of sound, dust and accidents could be appropriately mitigated.	PPs Submission	The production mine has been from January 21 Transportation colliery to wash through cover belts. Road track done through c only. Complied 29-11-2024 Attachment:NA
13	AIR QUALITY MONITORING AND PRESERVATION	Vehicular emissions shall be kept under control and regularly monitored. All the vehicles engaged in mining and allied activities shall operate only after obtaining PUC' certificate from the authorized pollution testing centres.	PPs Submission	It has been con Complied 16-11-2024 Attachment:NA
14	AIR QUALITY MONITORING AND PRESERVATION	Coal Stock pile/crusher/feeder and breaker material transfer points shall invariably be provided with dust suppression system. Belt conveyors shall be fully covered to avoid air borne dust Side cladding all along the conveyor gantry should be made to avoid air borne dust. Drills shall be wet operated or fitted with dust extractors.	PPs Submission	It has been con Complied 16-11-2024 Attachment:NA
15	AIR QUALITY MONITORING AND PRESERVATION	Coal handling plant shall be operated with effective control measures w.r.t various environmental parameters. Environmental friendly sustainable technology should be implemented for mitigating such parameters.	PPs Submission	CHP is being op dry fog system, sprinklers, mist other various e control measur Complied 16-11-2024 Attachment:NA
16	WATER QUALITY MONITORING AND PRESERVATION	The effluent discharge(mine waste water, workshop effluent) shall be monitored in terms of the parameters notified under the Water Act, 1974 Coal Industry Standard vide GSR 742 E, dated 25.09.2000 as amended from time to time by the Central Pollution Control Board .	PPs Submission	Water quality a discharge from effluent treatm sewage treatm done regularly. Complied 16-11-2024 Attachment:NA

17	WATER QUALITY MONITORING AND PRESERVATION	The Monitoring data shall be uploaded on the company's website and displayed at the project site at a suitable location. The Circular NO. J-20012/1/2006-1A.11 (M) dated 27.05.2009 issued by Ministry of Environment, Forest and Climate Change shall also be referred in this regards for its compliance.	PPs Submission	Monitoring data uploaded along yearly compliance Tata Steel Limited Complied 16-11-2024 Attachment:NA
18	WATER QUALITY MONITORING AND PRESERVATION	Regular monitoring of ground water level and quality shall be carried out in and around the mine lease area by establishing a network of existing wells and construction new piezometers during the mining operations. The monitoring of ground water levels shall be carried out four times in a year i.e, pre monsoon monsoon, post monsoon and winter. The ground water quality shall be monitored once a year, and the data thus collected shall be sent regularly to MoEFCC/RO.	PPs Submission	It is being complied Complied 16-11-2024 Attachment:NA
19	WATER QUALITY MONITORING AND PRESERVATION	Monitoring of Water quality upstream and downstream of water bodies shall be carried out once in six months and records of monitoring data shall be maintained and submitted to the Ministry of environment, Forest and Climate Change/ Regional Office,	PPs Submission	Water quality upstream and downstream of water bodies are complied Complied 16-11-2024 Attachment:NA
20	WATER QUALITY MONITORING AND PRESERVATION	Ground Water, excluding mine water, shall not be used for mining operations rainwater harvesting shall be implemented for conservation and augmentation of ground water resources.	PPs Submission	It has been not be complied Complied 16-11-2024 Attachment:NA
21	WATER QUALITY MONITORING AND PRESERVATION	The Project proponent shall not alter major water channels around the site. Appropriate embankment shall be provided along the side of the river/nallah flowing near or adjacent to the mine. The embankment constructed along river/nallah boundary shall be suitable dimensions and critical patches shall be strengthened by stone pitching on the river front side,	PPs Submission	It has been not to comply. Complied 16-11-2024 Attachment:NA

		Stabilized with plantation so as to withstand the peak water pressure preventing any chance of mine inundation.		
22	WATER QUALITY MONITORING AND PRESERVATION	Garland drains (of suitable size, gradient and length) around the critical areas i.e. mine shaft and low lying areas, shall be designed keeping at least 50% safety margin the mine sites. The sump capacity shall also provide adequate retention period to allow proper settling of slit material of the surface runoff.	PPs Submission	It is being complied Complied 16-11-2024 Attachment:NA
23	WATER QUALITY MONITORING AND PRESERVATION	The Water pumped out from the mine, after siltation, shall be utilized for industrial purpose viz. watering the mine area, roads green belt development etc. The drains shall be regularly distilled particularly after monsoon and maintained properly.	PPs Submission	The pumped water from mine are being stowing, coal washing, green development and a treatment plant for community. Complied 16-11-2024 Attachment:NA
24	WATER QUALITY MONITORING AND PRESERVATION	Industrial waste water from coal handling plant and mine water shall be properly collected and treated so as to conform to the standard prescribed under the Environment Protection Act, 1986 and the rules made thereunder, and as amended from time to time. Oil and grease trap shall be installed before discharge of workshop effluent. Sewage treatment plant of adequate capacity shall be installed for treatment of domestic waste water.	PPs Submission	Industrial waste water from coal handling plant is collected, treated and used for the coal washing activities. Complied 16-11-2024 Attachment:NA
25	WATER QUALITY MONITORING AND PRESERVATION	Adequate ground water recharge measure shall be taken up for augmentation of ground water. The project authorities shall meet water requirement of nearby villages in case the village wells go dry to dewatering of mine.	PPs Submission	Water recharge is being constructed and renewed regularly in nearby villages. Complied 16-11-2024 Attachment:NA
26	WATER QUALITY MONITORING	The surface drainage plan including surface water conservation of area of influence	PPs Submission	It has been not Complied

	AND PRESERVATION	affected by the said mining operations shall be prepared, considering the presence of any river/rivulet/pond/lake etc. with impact of mining activities on it. And implemented by the project proponent. The surface drainage plan and /or any diversion of natural water courses shall be as per the provisions of the approved Mining Plan /EIA/EMP submitted to this Ministry and the same should be as per the approved mining plan and as per the permission of DGMS.		16-11-2024 Attachment:NA
27	WATER QUALITY MONITORING AND PRESERVATION	The project proponent shall take all precautionary measure to ensure reverian/riparian ecosystem in and around the coal mine up to a distance of 5 km. a revarian/riparian ecosystem conservation and management plan should be prepared and implemented in consultation with the irrigation/water resources department in the state government.	PPs Submission	It has been not be complied. Complied 16-11-2024 Attachment:NA
28	Noise Monitoring & Prevention	Adequate measures shall be taken for control of noise levels below 85 db. (A) in the work environment. Workers engaged in underground mining operations of HEMM etc. shall be provided with personal protective equipment's (PPE) like ear plugs/muffs in conformity with the prescribed norms/guidelines in this regards. Progress in usage of such accessories to be monitored. Adequate awareness programme for users to be conducted.	PPs Submission	It has been con Complied 16-11-2024 Attachment:NA
29	Noise Monitoring & Prevention	The noise level survey shall be carried out as per the prescribed gridlines to assess noise exposure of the workmen at vulnerable points in the mines premises, and report in this regard shall be submitted to the Ministry/RO on six monthly basis.	PPs Submission	It has been con report has beer Annexure-II. Complied 29-11-2024 Attachment: Cli
30	MINING PLAN	Mining shall be carried out under strict adherence to provisions of Mines Act 1952 and subordinate	PPs Submission	It has been not be complied.

		legislations made there under as applicable.		Complied 16-11-2024 Attachment:NA
31	MINING PLAN	No change in mining method i.e. UG to OC, calendar programme and scope of work shall be made without obtaining prior approval of the Ministry of Environment Forest, and Climate Change (MoEFCC)	PPs Submission	It has been not be complied. Complied 16-11-2024 Attachment:NA
32	MINING PLAN	Mining shall be carried out as per the approved mining plan (including mines closure plan) abiding by mining laws related to coal mining and the relevant circulars issued by Directorate General of Mines Safety (DGMS)	PPs Submission	It has been not be complied. Complied 16-11-2024 Attachment:NA
33	MINING PLAN	Underground work place environment conditions shall be rendered ergonomic and air breathable with adequate illumination in conformance with DGMS Standards.	PPs Submission	It has been con Complied 16-11-2024 Attachment:NA
34	MINING PLAN	No mining activity shall be carried out in forest land without forestry clearance as per forest (Conservations) Act, 1980 and also adhering to the Scheduled tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act,2006 read with provisions of Indian Forest Act,1927	PPs Submission	It has been not land involved. Complied 16-11-2024 Attachment:NA
35	MINING PLAN	Efforts should be made to reduce energy and fuel consumption by conservation, efficiency improvements and use of renewable energy.	PPs Submission	It has been not be complied Complied 16-11-2024 Attachment:NA
36	LAND RECLAMATION	Digital Survey of entire lease hold area/core zone using Satellite Remote Sensing survey shall be carried out at least once in three years for monitoring land use pattern and report in 1:50,000 scale or as notified by Ministry of Environment, Forest and Climate Change (MoEFCC) from time to time shall be	PPs Submission	It has been con LULC study was and the report to IRO, Ranchi Complied 16-11-2024 Attachment:NA

		submitted to MoEFCC/ Regional Office (RO)		
37	LAND RECLAMATION	Post mining I/Forestry purpose and shall be handled over to the respective State Government, as specified in the Guidelines for preparation of Mine closure Plan, issued by the Ministry of Coal dated 27th August, 2009 and subsequent amendments	PPs Submission	It has been not be complied Complied 16-11-2024 Attachment:NA
38	LAND RECLAMATION	Regular Monitoring of subsidence movement on the surface over and around the working areas and its impact on natural drainage pattern, water bodies, vegetation, structure, roads and surroundings shall be continued till movement ceases completely. In case of observation of any high rate of subsidence beyond the limit prescribed, appropriately effective mitigation measures shall be taken to avoid loss of life and materials. Cracks should be effectively plugged in with ballast and clay soil/suitable material.	PPs Submission	It has been con Complied 16-11-2024 Attachment:NA
39	LAND RECLAMATION	Fly ash shall be used for external dump of overburden, backfilling, or stowing of mines as per provision contained in clause (I) and (ii) of subparagraph (8) of fly ash notification issued vide SO 2804 E dated 3rd Nov. 2009 as amended from time to time. Efforts shall be made to utilize gypsum generated from flue Gas Desulfurization (FGD) if any along with fly ash for external dump of overburden, backfilling or stowing of mines. Compliance report shall be submitted to Regional office of MoEFCC, CPCB, and SPCB.	PPs Submission	It is being com Complied 16-11-2024 Attachment:NA
40	LAND RECLAMATION	A separate team for subsidence monitoring and surface mitigation measures shall be constituted and continuous monitoring & implementation of mitigation measures be carried out.	PPs Submission	A separate team of surveyors has been constituted for continuous monitoring and implementation of mitigation measures. Complied

				16-11-2024 Attachment:NA
41	LAND RECLAMATION	Through inspection of the mines lease area of any cracks developed at the surface due to mining activities below ground shall be carried out to prevent inrush of water in the mine.	PPs Submission	It is being complied Complied 16-11-2024 Attachment:NA
42	LAND RECLAMATION	Native tree species shall be selected and planted over areas affected by subsidence.	PPs Submission	Generally, no area much affected. However, native trees are planted for the reclamation. Complied 16-11-2024 Attachment:NA
43	LAND RECLAMATION	The Project proponent shall make necessary alternative arrangements, if grazing land is for livestock grazing, if any. In this context the project proponent shall implement the direction of Hon'ble Supreme Court with regards to acquiring grazing land.	PPs Submission	Not applicable underground. Complied 16-11-2024 Attachment:NA
44	GREENBELT	The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered flora/fauna, if any spotted/ reported in the study area. Action plan, in this regard, if any, shall be prepared and implemented in consultation with the State Forest and Wildlife Department.	PPs Submission	It has not been complied. Complied 16-11-2024 Attachment:NA
45	GREENBELT	Green belt, consisting of three-tier plantation, of which not less than 7.5 m shall be developed all along the mines lease area in a phased manner. The green belt comprising a mix of native species shall be developed all along the major roads/ coal transportation roads.	PPs Submission	It is an ongoing plantation. It is being carried out regularly. Details are attached as an annexure. Complied 29-11-2024 Attachment: Click here

46	Human Health Environment	Adequate illumination shall be ensured in all mine location (as per DGMS standards) and monitored.	PPs Submission	Illumination mc done on regula DGMS norms. Complied 16-11-2024 Attachment:NA
47	Human Health Environment	The project proponent shall undertake occupational Health survey for initial and Periodical medical examination of the workers engaged in the project and maintain records accordingly as per the provision of the Mines Rule, 1995 and DGMS Circulars. Besides carrying out regular periodic health check-up of their workers, 20% of the workers engaged in active mining operations shall be subjected to health check-up for occupational disease and hearing impairment, if any.	PPs Submission	IME and PME r; regular basis th inhouse Tata Ce Complied 16-11-2024 Attachment:NA
48	Human Health Environment	Personal (including outsourcing employees) working in dusty area shall wear protective respiratory devices and shall also be provide with adequate training and information on safety and health aspects.	PPs Submission	Adequate on si job training are deployment of PPEs are being wear from safe environment pr Complied 16-11-2024 Attachment:NA
49	PUBLIC HEARING	Skill training as per safety norms specified by DGMS shall be provided to all workmen including the outsourcing employees to ensure high safety standards in mines.	PPs Submission	Skill training al safety training ; before deployn employees to v Complied 16-11-2024 Attachment:NA
50	PUBLIC HEARING	Effective arrangements shall be made to provide and maintain at suitable point's conveniently situated, a sufficient supply of drinking water for all the persons employed.	PPs Submission	Water treatmer operated for sa water supply in community. Complied 16-11-2024 Attachment:NA

51	PUBLIC HEARING	Implementation of Action Plan on the issues raised during the public hearing shall be ensured. The Project Proponent shall undertake all the tasks as per the Action Plan Submitted with budgetary provisions during the Public Hearing. Land outies shall be compensated as per the norms laid out R&R Policy of the Company/or the National R&R Polity/R & R Policy of State Government as applicable.	PPs Submission	It is under prog be complied. TI action plans are stages of comp Complied 16-11-2024 Attachment:NA
52	PUBLIC HEARING	The project proponent shall follow the mitigation measures provided in the Ministry's OM No. Z- 11013/5712014-IA.II (M) dated 29th October, 2014, titled 'Impact of mining activities on habitations issues related to the mining projects where habitation and villages are the part of mines lease areas or habitations and villages are surrounded by the mine lease area'.	PPs Submission	It has been not be complied Complied 16-11-2024 Attachment:NA
53	Corporate Environmental Responsibility	The company shall have a well laid down environmental policy duly approve by the Board of Directors. The environmental policy should prescribe for standard operating procedures have proper checks and balances and to bring in focus any infringements/deviation/violation of the environment/forest /wildlife norms/conditions. The company shall have defined system of reporting infringements /deviation/violation of their environment /forest/wildlife norms/conditions and /or shareholder/ stockholders. The copy of the board resolution in this regards shall be submitted to MoEF&CC as a part of six monthly reports.	PPs Submission	The company h down Environr Attached as An Complied 29-11-2024 Attachment: Cli
54	Corporate Environmental Responsibility	A separate Environmental Cell both at the project and company head quarter level, with qualified personal shall be set up under the control of senior Executive, who will directly to the head of the organization.	PPs Submission	It has been con Complied 16-11-2024 Attachment:NA

55	Corporate Environmental Responsibility	Action Plan for implementation EMP and environmental conditions along with responsibility matrix of the company shall be prepared and shall be duly approved by competent authority. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to be providing for any other purpose. Year wise progress of implementation of action plan shall be reported to the Ministry/Regional Office along with the six Monthly Compliance Report.	PPs Submission	It has been not be complied Complied 16-11-2024 Attachment:NA
56	Corporate Environmental Responsibility	Self-Environmental audit shall be conducted annually. Every three year third party environmental audit shall be carried out.	PPs Submission	Self-audit is conducted annually and IR EMS 14001:201 conducted. Complied 29-11-2024 Attachment:NA
57	MISCELLANEOUS	The project proponent shall make public the environmental clearance granted for their project along with the environmental conditions and safeguards at their cost by prominently advertising it at least in two local newspaper of District or State of which one shall be in the vernacular language within seven days and in addition this shall also be displayed in the projects proponents website permanently.	PPs Submission	It has been complied Complied 16-11-2024 Attachment:NA
58	MISCELLANEOUS	The copies of the environmental clearance shall be submitted by the projects proponents to the head of local bodies, panchayats and Municipal Bodies in addition to relevant offices of the Government who in turn has to display the same for 30 days from the date of receipt.	PPs Submission	It has been complied Complied 16-11-2024 Attachment:NA
59	MISCELLANEOUS	The project proponent shall upload the status of compliance of the Stipulated environment	PPs Submission	It has been not be complied

		clearance conditions, including results of monitored data on their website and update the same on half yearly basis.		Complied 16-11-2024 Attachment:NA
60	MISCELLANEOUS	The project proponent shall monitor the criteria pollutants level namely; PM10, So2, NOx (ambient level) or critical sectoral parameters, indicated for the projects and display the same at a convenient location for disclosure to public and put on the website of the company.	PPs Submission	It has been con Complied 16-11-2024 Attachment:NA
61	MISCELLANEOUS	The project proponent shall submit six monthly monthly reports on the status of the compliance of stipulated environment conditions on the and Climate Change at environmental clearance portal.	PPs Submission	It has been not be complied Complied 16-11-2024 Attachment:NA
62	MISCELLANEOUS	The project proponent shall follow the mitigation measure provided in this Ministry's OM No. Z-11013/5712014-IA.II (M) dated 29th October, 2014, Titled "Impact of mining activities on habitation - issues related to the mining projects wherein habitations and villages are the apart of mine lease areas or habitations and villages are surrounded by the mines lease area.	PPs Submission	It has been not be complied Complied 16-11-2024 Attachment:NA
63	MISCELLANEOUS	The project proponent shall submit the environmental statement for each financial year in FORM-V the concerned State pollution Control Board as prescribe under the Environment Rule, 1986 as amended subsequently and put on the Website of the company.	PPs Submission	Environmental been submitte the concerned vide letter no. JMB/ENV/ESSA on 27th Septen Complied 16-11-2024 Attachment:NA
64	MISCELLANEOUS	The project authorities shall inform to the regional Office of MoEF&CC regarding commencement of mining operations.	PPs Submission	The mining act ongoing since 1 years. Complied 16-11-2024 Attachment:NA

65	MISCELLANEOUS	The project authorities must strictly adhere to the stipulation made by the State Pollution Control Board and the State Government.	PPs Submission	Shall be complied 16-11-2024 Attachment:NA
66	MISCELLANEOUS	The project proponent shall abide by all the commitments and recommendations made in the EIA/EMP report, commitment made during public hearing and also that during their presentation to the Expert Appraisal Committee.	PPs Submission	It has been not be complied Complied 16-11-2024 Attachment:NA
67	MISCELLANEOUS	Concealing factual data or submission of false /fabricated data may result in revocation of this environmental clearance and attract action under this provision of Environment (Protection) Act, 1986.	PPs Submission	It has been not Complied 16-11-2024 Attachment:NA
68	MISCELLANEOUS	The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.	PPs Submission	It has been agr Complied 16-11-2024 Attachment:NA
69	MISCELLANEOUS	The Ministry reserve the right to stipulate additional condition if found necessary .The company in a time bound manner shall implement these conditions.	PPs Submission	Agreed Complied 16-11-2024 Attachment:NA
70	MISCELLANEOUS	The Regional office of this Ministry shall monitor compliance of the stipulated conditions The project authorities should extend full cooperation to the officers of the Regional Office by furnishing the requisite data /information/monitoring reports.	PPs Submission	Agreed Complied 16-11-2024 Attachment:NA
71	MISCELLANEOUS	The above conditions shall be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1986, Hazardous and Other Waste (Managements and Trans- Boundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 along with their amendments	PPs Submission	It has been agr Complied 16-11-2024 Attachment:NA

		and Rules and any other orders by the Hon'ble Supreme Court of India/ High Court and any other Court of Law relating to the subject matter.		
72	MISCELLANEOUS	The Proponent shall abide by all the commitments and recommendation made in the EIA/EMP report and also that during presentation to the EAC. All the commitments made on the issues raised during public hearing shall also be implemented in letter and spirit.	PPs Submission	All the commitments per Public hearing process of compliance Complied 16-11-2024 Attachment:NA
73	MISCELLANEOUS	The proponent shall obtain all necessary Clearance /approvals that may be required before the start of the project. The Ministry or any other competent authority may stipulate any further condition for environmental protection. Ministry or any other competent authority may stipulate any further condition for Environment protection.	PPs Submission	It has been agreed Complied 16-11-2024 Attachment:NA
74	MISCELLANEOUS	Any appeal against this environmental clearance shall lie with the Green Tribunal if Preferred, within a period of 30 days as prescribed under section 16 of the National Green Tribunal Act, 2010.	PPs Submission	Not required Complied 16-11-2024 Attachment:NA
75	MISCELLANEOUS	The coal company/project proponent shall be liable to pay compensation against the illegal mining, if any, and raised by the respective state Government at any point of time in terms of the orders dated 2nd August, 2017 of Hon'ble Supreme Court in WP (Civil) No.-114/2014 in the matter of Common Cause Vs Union of India & others.	PPs Submission	Agreed Complied 16-11-2024 Attachment:NA
76	MISCELLANEOUS	The concerned State Government shall ensure no mining operations to commence till the entire compensation for illegal mining if any is paid by the project proponents through their respective Department Of Mining & Geology, in strict compliance of judgement of Hon'ble Supreme Court.	PPs Submission	It has been not Complied 16-11-2024 Attachment:NA

77	MISCELLANEOUS	This environmental clearance shall not be operational till time the project proponent complies with the above said judgement of Hon'ble Supreme Court, as applicable, and other statutory requirements.	PPs Submission	Agreed Complied 16-11-2024 Attachment:NA
78	MISCELLANEOUS	No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment, Forest and Climate Change.	PPs Submission	It has been Agr Complied 16-11-2024 Attachment:NA

Document uploaded by the PP

Last Site Visit Report (if available)

NA

Last Site Visit Report Date (if available)

Additional Attachment (if any)

NA

Additional Remarks (if any)

- ☒ I 'Tata Steel Ltd.' hereby give undertaking that the data and information given in the filed compliance and enclosures are true to be best of my knowledge and belief and I am aware that if any part of the data and information found to be false or misleading at any stage, the clearance given to the project will be revoked at our risk and cost. In addition to above, I hereby give undertaking that no activity such as change in project layout, construction, expansion, etc. has been taken up without due approval.

Cover Letter From RO/SRO

Cover Letter From RO/SRO

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HALF YEARLY COMPLIANCE REPORT

(PERIOD: APRIL'24 – SEPTEMBER'24)

JAMADOBA UNDERGROUND COAL MINE

(CAPACITY: 0.34 MTPA)
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-11015/91/2017-
IA.II (M) dated July 11, 2022 ISSUED BY GOVT. OF INDIA, MINISTRY OF
ENVIRONMENT, FOREST AND CLIMATE CHANGE, NEW DELHI.**

Compliance status of Jamadoba Underground Coal Mine 0.34 MTPA in ML Area of 927.17 ha by M/s Tata Steel Ltd. At village Jorapokhar, Pattiya Dungri, Tehsil Jharia, District- Dhanbad, Jharkhand vide MoEFCC Letter no J-11015/91/2017-IA.II (M) dated July 11, 2022

Sl. No.	Consent Condition	Compliance Status
i	PP to obtain the CTO for 0.34 MTPA capacities immediately after grant of EC.	Consent to Operate for the existing capacity has been obtained from the State PCB on 14.11.2022 and is valid till 31.12.2024. The production from the mines have been discontinued since January 2024.
ii	PP to conserve the Kari jhore, Dungri jhore, Damodar River following within the core area of the project and the measure taken for its conservation to be furnished in every six-monthly compliance to be reported to respective IRO and SPCB.	Garland drains have been constructed around the boundary premises of the mines. Several other conservation measures are ongoing, and the report shall be submitted to IRO, MoEFCC & SPCB as required.
iii	Since there is also Jamadoba Coal washery located within mine lease having separated EC vide Letter No.- J-11015/203/2011-II-IA(M) dated 3rd March 2014 so the adequate EMP measure to be adopted to minimize the cumulative impact, also the utilization of rejects generated from washery should be managed as per norms. PP shall obtain integrated EC for future coal/washery expansion.	There are existing environmental measures for the Jamadoba Coal preparation plant. The rejects like tailing, middling etc are utilized as per norms. The integrated EC shall be taken in case of washery expansion.
iv	PP shall obtain No objection certificate from Ground water Authority for extraction of ground water within six months and submit to IRO Ranchi.	The NOC from central Ground Water Authority for extraction of ground water was granted vide NOC No. CGWA/NOC/MIN/REN/1/2024/10124; dated: 05.11.2024.
v	PP Shall reduce river sand used for stowing and explore usage of sand segregated from OB dump from any nearest mine (either its own or any mine) and submit detailed report to IRO Ranchi.	We are in the process of technological exploration of sand from OB dump.
vi	PP shall follow the recommendation of subsidence study and monitor the degree of subsidence regularly and shall be submitted to IRO- Ranchi.	The subsidence is monitored regularly, and the recommendations are implemented. Report attached as Annexure IV.
vii	PP to accomplish the requirement of a full fledge qualified manpower with Environmental Engineer/Env. Science degree background in Environmental Management Cell etc. within six months and same shall be reported to IRO, MoEF&CC	We have a full-fledged Environment cell with Environment professionals and field monitoring staff.

Compliance status of Jamadoba Underground Coal Mine 0.34 MTPA in ML Area of 927.17 ha by M/s Tata Steel Ltd. At village Jorapokhar, Pattiya Dungri, Tehsil Jharia, District- Dhanbad, Jharkhand vide MoEFCC Letter no J-11015/91/2017-IA.II (M) dated July 11, 2022

viii	PP to fulfil all the commitment made to address the public hearing issued in time bound manner as committed in EIA EMP report in Chapter & table 7.1 and a progressive report to be furnished to IRO with six monthly compliance report	The commitment are in various levels of compliance. The commitments made during the public hearing are being complied in time bound manner. The report shall be furnished to IRO, Ranchi as required.
ix	PP to maintain the transportation road properly to minimize the dust emission. PP to also develop puce roads by seeking consent from the panchayat with widening of roads especially roads inters linking the villages within the study area of 10 Km radius buffer zone.	The transportation roads in core and buffer zones are maintained properly to minimize the dust emission. The construction of roads in nearby villages are continuous process in consent with panchayat.
x	PP to complete the estimated allocated budgetary expenditure for EMP capital cost is Rs.273.0 lakhs & Recurring cost is Rs.1359.4 Lakhs per year as per its letter dated JMB/115/001339 dated 3rd September, 2021. Capital EMP budget shall be completed within strict timeline.	It is under progress. The completion within strict timeline shall be complied. The expenditure against environment management activity for FY24 was INR 408.92 Lakhs.
xi	PP to monitor the water quality of the ground water and surface water body located within the core zone and 5 Km radius from the periphery of the mine boundary as per procedure laid down by CPCB.	It has been complied.
xii	PP to install More continuous ambient air quality stations at suitable locations preferably village side with consultation of SPCB. The real time data so generated shall be uploaded on company website and linked it with website of CPCB & SPCB. In addition, data should also be displayed digitally at entry and exit gate of mine lease for public display.	A CAAQMS is being installed in Jamadoba group since 2014. A new CAAQMS has been installed recently in July 2022 and the data connectivity to SPCB, Jharkhand has been done.
xiii	PP shall develop rainwater harvesting in Jamadoba coal washery as proposed by PP in vide Letter dated JMB/115/001339 dated 3rd September, 2021 & water harvesting ponds near the villages of suitable area as suggested by EAC in consultation with Gram Panchayat within year and with cultivation of Lotus.	There are a number of ponds developed 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. Rain water harvesting structure inside the washery premises shall be complied. Work has been initiated and under progress.

Compliance status of Jamadoba Underground Coal Mine 0.34 MTPA in ML Area of 927.17 ha by M/s Tata Steel Ltd. At village Jorapokhar, Pattiya Dungri, Tehsil Jharia, District- Dhanbad, Jharkhand vide MoEFCC Letter no J-11015/91/2017-IA.II (M) dated July 11, 2022

xiv	PP must seek the input of experts for phytoremediation of Slurry and accordingly work on it with proper scientific approach.	There is no generation of slurry during raw coal production.
xv	PP to plant additional 100,000 plants with three tier plantations along the transportation route, if not completed, and identified areas with consent to the gram panchayat within two year and plant for remaining within 2 years for their proper growth.	Plantation and green belt development is a continuous process. For FY 24, around 12452 saplings have been planted. For FY25 12263 saplings have been planted till September 2024. Green belt report has been attached as Annexure-I.
xvi	PP to install solar lights along the road used for transportation of minerals to avoid the accidents at night and also seek its maintenance. PP is asked to also identify the rural areas for installation of solar light with in its maintenance within the study area of 10 km radius buffer zone within one year	Adequate lighting facilities have been installed along the roads. Several facilities under CSR, including lights have been provided in the area.
xvii	Proponent shall appoint an occupational Health Specialist for Regular and Periodical medical examination of the workers engaged in the project and maintain records accordingly also Occupational health check-up for workers having some ailments like BP, diabetes, habitual smoking etc. shall be undertaken once in six months and necessary redial/preventive measures taken accordingly. The recommendations of National Institute for ensuring good occupational environment for mine workers shall be implemented. The prevention measure for burns, malaria and provision of anti-snake venom including all other paramedical safeguards may be ensured before initiating the mining activities.	It has been complied. It's a continuous process. There is fully developed Tata Central Hospital in Jamadoba to take care of all these types of concerns of community.
xviii	Persons of nearby villages shall be given training on livelihood and skill development makes them employable with its proper records.	It is a continuous process and has been complied. Separate training cell (JNTVTI) has been developed for skill based training of local youth.
xix	The illumination and sound at night at project sites disturb the villages in respect of both human and animal population. Consequent sleeping disorders and stress may effects the health in the village located aloes tom mining operations. Habitations have a right for darkness and minimal noise levels at nights, PPs must ensure that the biological clock of the villages is not distributed by orienting the floodlights/masks away from the villagers and keeping the noise levels well within the prescribed limits for day lights/night hours	It has been noted and shall be complied strictly.

Compliance status of Jamadoba Underground Coal Mine 0.34 MTPA in ML Area of 927.17 ha by M/s Tata Steel Ltd. At village Jorapokhar, Pattiya Dungri, Tehsil Jharia, District- Dhanbad, Jharkhand vide MoEFCC Letter no J-11015/91/2017-IA.II (M) dated July 11, 2022

xx	PP shall pay to farmers of agricultural land if there is any loss due to pollution found by concerned District Commissioner as per extent rules or norms.	It has been noted and shall be complied.
xxi	PP should establish in house (at project site) environment laboratory for measurement of environment parameter with respect to air quality and water (surface and ground A dedicated team to oversee environment management shall be setup which should comprise of Environmental Engineer, Laboratory chemist and staff for monitoring of air , water quality parameters on routine basis. Any non-compliance or infringement should be reported to the concerned authority.	We have a full-fledged Environment cell with Environment professionals and field monitoring staff.
4.1	The grant of Environment Compliance (EC) is further subject to compliance of the Standard EC Conditions as under:	
(a)	Statutory Compliance:	
i	The Environmental clearance shall be subject orders of Hon'ble Supreme Court of India. Hon'ble High Courts, NGT and any other Court of Law, from time to time, and as applicable to the project.	It has been noted.
ii	The project proponent shall obtain forest clearance under the provisions of Forest (Conservation) Act, 1986, in case of the diversion of forest land for non- forest purpose involved in the project.	It is not applicable.
iii	The Project proponent shall obtain clearance from the National Board for Wildlife, if applicable.	Not Applicable
iv	The project proponent shall prepare a site-specific conservation plan/wildlife management Plan and approved by the Chief Wildlife Warden. The recommendation of the approved Site-Specific Conservation Plan/Wildlife Management Plan shall be implemented in consultation with the State Forest Department. The implementation report shall be furnished along with the six-monthly compliance report (in case of the presence of schedule I species in the study area)	There is no Schedule-I species in the study area.
v	The project proponent shall obtain Consent to Establish/Operate under the provisions of Air (Prevention & Control of Pollution) Act, 1981 and Water (Prevention & Control of Pollution) Act, 1974 from the Concerned State Pollution Control Board/Committee.	The CTE has been obtained from JSPCB vide letter no. JSPCB/HO/RNC/CTE-14115974/2022/523 dated 12.11.2022 & CTO has been received from JSPCB with Ref No.

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		JSPCB/HO/RNC/CTO-13955624/2022/1601 dated 14.11.2022.
vi	The project proponent shall obtain the necessary permission from the Central Ground Water Authority.	The NOC from central Ground Water Authority for extraction of ground water was granted vide NOC No. CGWA/NOC/MIN/REN/1/2024/10124; dated: 05.11.2024.
vii	Solid Waste/Hazardous Waste generated in the mines needs to addressed in accordance to the Solid Waste Management Rules,2016/ Hazardous & Other Waste Management Rules,2016	It has been noted and shall be complied.
I.(a)	Air Quality Monitoring and Preservation	
i	Adequate ambient air quality monitoring stations shall be established in core zone as well as in the buffer zone for monitoring of pollutants, namely particulates ,SO ₂ and NO _x location of the Station shall be decided based on the metrological data, topographical features and environmentally and ecologically sensitive in consultation with the State Pollution Control Board. Monitoring of heavy metal such as Hg, As, Ni, Cd, Cr, etc. to be carried out at least once in six months. Online ambient air quality monitoring station may also be installed in addition to the regular air monitoring stations as per the requirement and /or in consultation with the SPCB.	It has been complied
ii	The Ambient Air Quality monitoring in the core zone shall be carried out to ensure the coal Industry Standards notifies vide GSR 742 E dated 25.09.2000 and as amended from time to time by the Central Pollution Control Board. Data on ambient air quality and heavy metals such as Hg, As, Ni, Cd, Cr and other monitoring data shall be regularly reported to the Ministry/Regional Office and to the CPCB/SPCB.	Ambient air quality of core as well as buffer zone are measures by inhouse environmental laboratory as well as third party NABL recognised lab. Report has been attached as Annexure-II.
iii	Transportation of coal, to the extent permitted by road shall be carried out by covered trucks/conveyors .Effective control measure such as regular water sprinkling /rain gun/mist sprinkling etc. shall be carried out in critical areas prone to air pollution with higher level of particulate matter all through the coal; transport roads., loading /Unloading and transfer points. Fugitive dust emissions from all sources shall be	The production from the mine has been discontinued from January 2024. Transportation of coal from colliery to washery was done through covered conveyor belts. Road transportation is done through covered truck only.

Compliance status of Jamadoba Underground Coal Mine 0.34 MTPA in ML Area of 927.17 ha by M/s Tata Steel Ltd. At village Jorapokhar, Pattiya Dungri, Tehsil Jharia, District- Dhanbad, Jharkhand vide MoEFCC Letter no J-11015/91/2017-IA.II (M) dated July 11, 2022

	controlled regularly. It shall be ensured that the ambient air quality parameters conform to the norms prescribed by the Central/ State Pollution Control Board.	
iv	Major approach roads shall be black topped and properly maintained.	It has been complied
v	The transportation of coal shall be carried out as per the provision and route proposed in the approved mining plan. Transportation of coal through the exiting road passing through any village shall be avoided. In case it is proposed to construct a bypass road it should be so constructed that the impact of sound, dust and accidents could be appropriately mitigated.	The production from the mine has been discontinued from January 2024. Transportation of coal from colliery to washery was done through covered conveyor belts. Road transportation is done through covered truck only.
vi	Vehicular emissions shall be kept under control and regularly monitored. All the vehicles engaged in mining and allied activities shall operate only after obtaining PUC' certificate from the authorized pollution testing centres.	It has been complied
vii	Coal Stock pile/crusher/feeder and breaker material transfer points shall invariably be provided with dust suppression system. Belt conveyors shall be fully covered to avoid air borne dust Side cladding all along the conveyor gantry should be made to avoid air borne dust. Drills shall be wet operated or fitted with dust extractors.	It has been complied
viii	Coal handling plant shall be operated with effective control measures w.r.t various environmental parameters. Environmental friendly sustainable technology should be implemented for mitigating such parameters.	CHP is being operated using dry fog system, water sprinklers, mist canons and other various effective dust control measures.
(b)	Water Quality Monitoring and Preservation	
i	The effluent discharge(mine waste water, workshop effluent) shall be monitored in terms of the parameters notified under the Water Act, 1974 Coal Industry Standard vide GSR 742 E, dated 25.09.2000 an as amended from time to time by the Central Pollution Control Board .	Water quality analysis discharge from mine sump, effluent treatment plants, sewage treatment plants are done regularly.
ii	The Monitoring data shall be uploaded on the company's website and displayed at the project site at a suitable location. The Circular NO. J-20012/1/2006-1A.11 (M) dated 27.05.2009 issued by Ministry of Environment, Forest and Climate Change shall also be referred in this regards for its compliance.	Monitoring data are being uploaded along with the half yearly compliance report on Tata Steel Limited website.
iii	Regular monitoring of ground water level and quality shall be carried out in and around the	It is being complied.

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	mine lease area by establishing a network of existing wells and construction new piezometers during the mining operations. The monitoring of ground water levels shall be carried out four times in a year i.e, pre monsoon monsoon, post monsoon and winter. The ground water quality shall be monitored once a year, and the data thus collected shall be sent regularly to MoEFCC/RO.	
vi	Monitoring of Water quality upstream and downstream of water bodies shall be carried out once in six months and records of monitoring data shall be maintained and submitted to the Ministry of environment, Forest and Climate Change/ Regional Office,	Water quality upstream and downstream of the water bodies are carried out.
v	Ground Water, excluding mine water, shall not be used for mining operation s rainwater harvesting shall be implemented for conservation and augmentation of ground water resources.	It has been noted and shall be complied
vi	The Project proponent shall not alter major water channels around the site. Appropriate embankment shall be provided along the side of the river/nallah flowing near or adjacent to the mine. The embankment constructed along river/nallah boundary shall be suitable dimensions and critical patches shall be strengthened by stone pitching on the river front side, Stabilized with plantation so as to withstand the peak water pressure preventing any chance of mine inundation.	It has been noted and agreed to comply.
vii	Garland drains (of suitable size, gradient and length) around the critical areas i.e. mine shaft and low lying areas, shall be designed keeping at least 50% safety margin the mine sites. The sump capacity shall also provide adequate retention period to allow proper settling of slit material of the surface runoff.	It is being complied
viii	The Water pumped out from the mine, after siltation, shall be utilized for industrial purpose viz. watering the mine area, roads green belt development etc. The drains shall be regularly distilled particularly after monsoon and maintained properly.	The pumped water from the mine are being utilized for stowing, coal washing, sprinkling, green belt development and water treatment plant for community.
ix	Industrial waste water from coal handling plant and mine water shall be properly collected and treated so as to conform to the standard prescribed under the Environment Protection Act, 1986 and the rules made thereunder, and as amended from time to time. Oil and grease trap	Industrial wastewater from coal handing plants are collected, treated and used in the coal washing and stowing activities.

Compliance status of Jamadoba Underground Coal Mine 0.34 MTPA in ML Area of 927.17 ha by M/s Tata Steel Ltd. At village Jorapokhar, Pattiya Dungri, Tehsil Jharia, District- Dhanbad, Jharkhand vide MoEFCC Letter no J-11015/91/2017-IA.II (M) dated July 11, 2022

	shall be installed before discharge of workshop affluent. Sewage treatment plant of adequate capacity shall be installed for treatment of domestic waste water.	
x	Adequate ground water recharge measure shall be taken up for augmentation of ground water. The project authorities shall meet water requirement of nearby villages in case the village wells go dry to dewatering of mine.	Water recharge structures are being constructed and renewed regularly in the nearby villages.
xi	The surface drainage plan including surface water conservation of area of influence affected by the said mining operations shall be prepared, considering the presence of any river/rivulet/pond/lake etc. with impact of mining activities on it. And implemented by the project proponent. The surface drainage plan and /or any diversion of natural water courses shall be as per the provisions of the approved Mining Plan /EIA/EMP submitted to this Ministry and the same should be as per the approved mining plan and as per the permission of DGMS.	It has been noted and shall be complied
xii	The project proponent shall take all precautionary measure to ensure reverian/riparian ecosystem in and around the coal mine up to a distance of 5 km. a revarian/riparian ecosystem conservation and management plan should be prepared and implemented in consultation with the irrigation/water resources department in the state government.	It has been noted and shall be complied
(c)	Noise and Vibration Monitoring and Prevention	
i	Adequate measures shall be taken for control of noise levels below 85 db. (A) in the work environment. Workers engaged in underground mining operations of HEMM etc. shall be provided with personal protective equipment's (PPE) like ear plugs/muffs in conformity with the prescribed norms/guidelines in this regards. Progress in usage of such accessories to be monitored. Adequate awareness programme for users to be conducted.	It has been complied
ii	The noise level survey shall be carried out as per the prescribed gridlines to assess noise exposure of the workmen at vulnerable points in the mines premises, and report in this regard shall be submitted to the Ministry/RO on six monthly basis.	It has been complied. The report has been attached in Annexure-II .

Compliance status of Jamadoba Underground Coal Mine 0.34 MTPA in ML Area of 927.17 ha by M/s Tata Steel Ltd. At village Jorapokhar, Pattiya Dungri, Tehsil Jharia, District- Dhanbad, Jharkhand vide MoEFCC Letter no J-11015/91/2017-IA.II (M) dated July 11, 2022

(d)	Mining Plan	
i	Mining shall be carried out under strict adherence to provisions of Mines Act 1952 and subordinate legislations made there under as applicable.	It has been noted and shall be complied.
ii	No change in mining method i.e. UG to OC, calendar programme and scope of work shall be made without obtaining prior approval of the Ministry of Environment Forest, and Climate Change (MoEFCC)	It has been noted and shall be complied.
iii	Mining shall be carried out as per the approved mining plan (including mines closure plan) abiding by mining laws related to coal mining and the relevant circulars issued by Directorate General of Mines Safety (DGMS)	It has been noted and shall be complied.
iv	Underground work place environment conditions shall be rendered ergonomic and air breathable with adequate illumination in conformance with DGMS Standards.	It has been complied
v	No mining activity shall be carried out in forest land without forestry clearance as per forest (Conservations) Act, 1980 and also adhering to the Scheduled tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act,2006 read with provisions of Indian Forest Act,1927	It has been noted. No forest land involved.
vi	Efforts should be made to reduce energy and fuel consumption by conservation, efficiency improvements and use of renewable energy.	It has been noted and shall be complied
(e)	Land Reclamation	
i	Digital Survey of entire lease hold area/core zone using Satellite Remote Sensing survey shall be carried out at least once in three years for monitoring land use pattern and report in 1:50,000 scale or as notified by Ministry of Environment, Forest and Climate Change (MoEFCC) from time to time shall be submitted to MoEFCC/ Regional Office (RO)	It has been complied. The LULC study was done in 2021 and the report was submitted to IRO, Ranchi
ii	Post mining I/Forestry purpose and shall be handled over to the respective State Government, as specified in the Guidelines for preparation of Mine closure Plan, issued by the Ministry of Coal dated 27th August,2009 and subsequent amendments	It has been noted and shall be complied
iii	Regular Monitoring of subsidence movement on the surface over and around the working areas and its impact on natural drainage pattern, water bodies, vegetation, structure, roads and	It has been complied

Compliance status of Jamadoba Underground Coal Mine 0.34 MTPA in ML Area of 927.17 ha by M/s Tata Steel Ltd. At village Jorapokhar, Pattiya Dungri, Tehsil Jharia, District- Dhanbad, Jharkhand vide MoEFCC Letter no J-11015/91/2017-IA.II (M) dated July 11, 2022

	surroundings shall be continued till movement ceases completely. In case of observation of any high rate of subsidence beyond the limit prescribed, appropriately effective mitigation measures shall be taken to avoid loss of life and materials. Cracks should be effectively plugged in with ballast and clay soil/suitable material.	
iv	Fly ash shall be used for external dump of overburden, backfilling, or stowing of mines as per provision contained in clause (I)and (ii) of subparagraph (8) of fly ash notification issued vide SO 2804 E dated 3rd Nov. 2009 as amended from time to time. Efforts shall be made to utilize gypsum generated from flue Gas Desulfurization (FGD) if any along with fly ash for external dump of overburden, backfilling or stowing of mines. Compliance report shall be submitted to Regional office of MoEFCC, CPCB, and SPCB.	It is being complied.
v	A separate team for subsidence monitoring and surface mitigation measures shall be constituted and continuous monitoring & implementation of mitigation measures be carried out.	A separate team including surveyors has been made for continuous measurement and monitoring subsidence and implement mitigation measures.
vi	Through inspection of the mines lease area of any cracks developed at the surface due to mining activities below ground shall be carried out to prevent inrush of water in the mine.	It is being complied
vii	Native tree species shall be selected and planted over areas affected by subsidence.	Generally, no areas are as much affected by subsidence. However, native species are planted for the land reclamation.
viii	The Project proponent shall make necessary alternative arrangements, if grazing land is for livestock grazing, if any. In this context the project proponent shall implements the direction of Hon'ble Supreme Court with regards to acquiring grazing land.	Not applicable as it is an underground mine
(f)	Green Belt	
i	The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered flora/fauna, if any spotted/ reported in the study area. Action plan, in this regards if any shall be prepared and implemented in consultation with the State Forest and Wildlife Department.	It has been noted and shall be complied
ii	Green belt, consisting of three -tier plantation, of which not less than 7.5 m shall be developed all	It is an ongoing process. Plantation is being carried out regularly. Details

Compliance status of Jamadoba Underground Coal Mine 0.34 MTPA in ML Area of 927.17 ha by M/s Tata Steel Ltd. At village Jorapokhar, Pattiya Dungri, Tehsil Jharia, District- Dhanbad, Jharkhand vide MoEFCC Letter no J-11015/91/2017-IA.II (M) dated July 11, 2022

	along the mines lease area in a phased manner. The green belt comprising of a mix of natives species shall be developed all along the major roads/ coal transportation roads.	attached as annexure.
(g)	Public Hearing and Human Health Issues	
i	Adequate illumination shall be ensured in all mine location (as per DGMS standards) and monitored.	Illumination monitoring is done on regular basis as per DGMS norms.
ii	The project proponent shall undertake occupational Health survey for initial and Periodical medical examination of the workers engaged in the project and maintain records accordingly as per the provision of the Mines Rule, 1995 and DGMS Circulars. Besides carrying out regular periodic health check-up of their workers, 20% of the workers engaged in active mining operations shall be subjected to health check-up for occupational disease and hearing impairment, if any.	IME and PME rase done on regular basis through our inhouse Tata Central Hospital.
iii	Personal (including outsourcing employees) working in dusty area shall wear protective respiratory devices and shall also be provide with adequate training and information on safety and health aspects.	Adequate on site and off-site job training are given before deployment of employees. PPEs are being ensured to wear from safety and environment point of view.
iv	Skill training as per safety norms specified by DGMS shall be provided to all workmen including the outsourcing employees to ensure high safety standards in mines.	Skill training along with basis safety training are done before deployment of employees to work.
v	Effective arrangements shall be made to provide and maintain at suitable point's conveniently situated, a sufficient supply of drinking water for all the persons employed.	Water treatment plants are operated for safe drinking water supply in nearby community.
vi	Implementation of Action Plan on the issues raised during the public hearing shall be ensured. The Project Proponent shall undertake all the tasks as peer the Action Plan Submitted with budgetary provisions during the Public Hearing. Land outies shall be compensated as per the norms laid out R&R Policy of the Company/or the National R&R Polity/R & R Policy of State Government as applicable.	It is under progress and shall be complied. The various action plans are in various stages of compliance.
vii	The project proponent shall follow the mitigation measures provided in the Ministry's OM No. Z-11013/5712014-IA.II (M) dated 29th October, 2014, titled 'Impact of mining activities on habitations issues related to the mining projects where habitation and villages are the part of mines lease areas or habitations and villages are	It has been noted and shall be complied

Compliance status of Jamadoba Underground Coal Mine 0.34 MTPA in ML Area of 927.17 ha by M/s Tata Steel Ltd. At village Jorapokhar, Pattiya Dungri, Tehsil Jharia, District- Dhanbad, Jharkhand vide MoEFCC Letter no J-11015/91/2017-IA.II (M) dated July 11, 2022

	surrounded by the mine lease area'.	
(h)	Corporate Environment Responsibility	
i	The company shall have a well laid down environmental policy duly approve by the Board of Directors. The environmental policy should prescribe for standard operating procedures have proper checks and balances and to bring in focus any infringements/deviation/violation of the environment/forest /wildlife norms/conditions. The company shall have defined system of reporting infringements /deviation/violation of their environment /forest/wildlife norms/conditions and /or shareholder/ stockholders. The copy of the board resolution in this regards shall be submitted to MoEF&CC as a part of six monthly reports.	The company has well laid down Environmental Policy. Attached as Annexure-III.
ii	A separate Environmental Cell both at the project and company head quarter level, with qualified personal shall be set up under the control of senior Executive, who will directly to the head of the organization.	It has been complied
iii	Action Plan for implementation EMP and environmental conditions along with responsibility matrix of the company shall be prepared and shall be duly approved by competent authority. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to be providing for any other purpose. Year wise progress of implementation of action plan shall be reported to the Ministry/Regional Office along with the six Monthly Compliance Report.	It has been noted and shall be complied
iv	Self-Environmental audit shall be conducted annually. Every three year third party environmental audit shall be carried out.	Self-audit is conducted annually and IRQS audit for EMS 14001:2015 are conducted every three year.
	Miscellaneous	
i	The project proponent shall make public the environmental clearance granted for their project along with the environmental conditions and safeguards at their cost by prominently advertising it at least in two local newspaper of District or State of which one shall be in the vernacular language within seven days and in addition this shall also be displayed in the projects proponents website permanently.	It has been complied

Compliance status of Jamadoba Underground Coal Mine 0.34 MTPA in ML Area of 927.17 ha by M/s Tata Steel Ltd. At village Jorapokhar, Pattiya Dungri, Tehsil Jharia, District- Dhanbad, Jharkhand vide MoEFCC Letter no J-11015/91/2017-IA.II (M) dated July 11, 2022

ii	The copies of the environmental clearance shall be submitted by the projects proponents to the head of local bodies, panchayats and Municipal Bodies in addition to relevant offices of the Government who in turn has to display the same for 30 days from the date of receipt.	It has been complied
iii	The project proponent shall upload the status of compliance of the Stipulated environment clearance conditions, including results of monitored data on their website and update the same on half yearly basis.	It has been noted and shall be complied
iv	The project proponent shall monitor the criteria pollutants level namely; MP10, So2, NO _x (ambient level) or critical sectoral parameters, indicated for the projects and display the same at a convenient location for disclosure to public and put on the website of the company.	It has been complied
v	The project proponent shall submit six monthly reports on the status of the compliance of stipulated environment conditions on the website of the Ministry of Environment, Forest and Climate Change at environmental clearance portal.	It has been noted and shall be complied
vi	The project proponent shall follow the mitigation measure provided in this Ministry's OM No. Z-11013/5712014-IA.II (M) dated 29th October, 2014, Titled "Impact of mining activities on habitation - issues related to the mining projects wherein habitations and villages are the apart of mine lease areas or habitations and villages are surrounded by the mines lease area.	Adequate mitigation measures are in place for any impact on surrounding environment/ habitations.
vii	The project proponent shall submit the environmental statement for each financial year in FORM-V the concerned State pollution Control Board as prescribe under the Environment Rule, 1986 as amended subsequently and put on the Website of the company.	Environmental Statement has been submitted on time to the concerned authorities. vide letter no. JMB/ENV/ESSA/05/564/2024 on 27th September 2024.
viii	The project authorities shall inform to the regional Office of MoEF&CC regarding commencement of mining operations.	The mining activities are ongoing since more than 100 years.
ix	The project authorities must strictly adhere to the stipulation made by the State Pollution Control Board and the State Government.	Shall be complied
x	The project proponent shall abide by all the commitments and recommendations made in the EIA/EMP report, commitment made during public hearing and also that during their	It has been noted and shall be complied

Compliance status of Jamadoba Underground Coal Mine 0.34 MTPA in ML Area of 927.17 ha by M/s Tata Steel Ltd. At village Jorapokhar, Pattiya Dungri, Tehsil Jharia, District- Dhanbad, Jharkhand vide MoEFCC Letter no J-11015/91/2017-IA.II (M) dated July 11, 2022

	presentation to the Expert Appraisal Committee.	
xi	No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment, Forest and Climate Change.	It has been Agreed
xii	Concealing factual data or submission of false /fabricated data may result in revocation of this environmental clearance and attract action under this provision of Environment (Protection) Act, 1986.	It has been noted
xiii	The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.	It has been agreed
xiv	The Ministry reserve the right to stipulate additional condition if found necessary .The company in a time bound manner shall implement these conditions.	Agreed
xv	The Regional office of this Ministry shall monitor compliance of the stipulated conditions The project authorities should extend full cooperation to the officers of the Regional Office by furnishing the requisite data /information/monitoring reports.	Agreed
xvi	The above conditions shall be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1986, Hazardous and Other Waste (Managements and Trans- Boundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 along with their amendments and Rules and any other orders by the Hon'ble Supreme Court of India/ High Court and any other Court of Law relating to the subject matter.	It has been agreed
5	The Proponent shall abide by all the commitments and recommendation made in the EIA/EMP report and also that during presentation to the EAC. All the commitments made on the issues raised during public hearing shall also be implemented in letter and spirit.	All the commitment and recommendations made as per Public hearing are under process of completion.
6	The proponent shall obtain all necessary Clarence /approvals that may be required before the start of the project. The Ministry or any other competent authority may stipulate any further condition for environmental protection. Ministry or any other competent authority may stipulate any further condition for Environment protection.	It has been agreed

Compliance status of Jamadoba Underground Coal Mine 0.34 MTPA in ML Area of 927.17 ha by M/s Tata Steel Ltd. At village Jorapokhar, Pattiya Dungri, Tehsil Jharia, District- Dhanbad, Jharkhand vide MoEFCC Letter no J-11015/91/2017-IA.II (M) dated July 11, 2022

7	Any appeal against this environmental clearance shall lie with the Green Tribunal if Preferred, with in a period of 30 day as prescribed under section 16 of the National Green Tribunal Act, 2010.	Not required
8	The coal company\project proponent shall be liable to pay compensation against the illegal mining, if any, and raised by the respective state Government at any point of time in terms of the orders dated 2nd August, 2017 of Hon'ble Supreme Court in WP (Civil) No.-114/2014 in the matter of Common Cause Vs Union of India & others.	Agreed
9	The concerned State Government shall ensure no mining operations to commence till the entire compensation for illegal mining if any is paid by the project proponents through their respective Department Of Mining & Geology, in strict compliance of judgement of Hon'ble Supreme Court.	It has been noted
10	This environmental clearance shall not be operational till time the project proponent complies with the above said judgement of Hon'ble Supreme Court, as applicable, and other statutory requirements.	Agreed

ANNEXURE-I

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	12263

Glimpses of plantation activities for FY25:





Annexure- I Greenbelt Development Report

Green belt developed around JCPP is given in the pictures below. Plantation in this monsoon has been done in JCPP to enhance the green belt. The plantations are done in areas in front of MCC building, and near the boundary wall of JCPP to enhance the green cover around the operational areas of washery. Since the washery is in construction phase, three tier plantation has been done in some patches around the boundary wall of the washery premises. Once the washery starts to operate, further plantation will be taken up.



Picture: Existing Green Belt around JCPP

Photographs of some recent plantation activities in this monsoon season are shown below:



Picture: Plantation in area in front of MCC building(JCPP) during this monsoon season.



Picture: Plantation around some patches of the boundary wall of washery (JCPP) during this monsoon season.

Annexure- Greenbelt Development Report

Glimpses of already existing green belt and plantation activities done in this monsoon season in and around Digwadih colliery premises to enhance the green cover have been depicted in the pictures below:



Picture: Plantation done in this monsoon season in and around Digwadih Colliery premises



Picture: Developed Green belt in and around Digwadih Colliery premises



Picture: Developed Green belt in and around Digwadih Colliery premises

ANNEXURE-II

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report (Period- April'24 to September'24)

TATA STEEL LIMITED
Internal Communication Form
TATA STEEL LIMITED
JHARIA DIVISION

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

Ref: JMB/ENV/LAB/02/258/24
Date: 08/05/2024

Re: AIR QUALITY REPORT

We wish to inform you that Air Quality Monitoring was carried out in JAMADOBA GROUP in the month of APRIL'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	05.04.24	Clear	245.2	92.6	18.1	22.7

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	03.04.24	Clear	85.1	45.7	16.8	19.4
2	Digwadih 12 No. Colony	23°41'42" N/ 86°24'45.3" E	04.04.24	Clear	87.9	47.4	17.0	20.3
3	New Village Colony, Jamadoba	23°41'51" N/ 86°23'19" E	09.04.24	Clear	73.5	32.6	18.1	21.7
4	Tata Central Hospital	23°42'36" N/ 86°24'10.4"E	08.04.24	Clear	70.2	29.8	15.9	18.6

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

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

Ref: JMB /ENV /LAB /02 / 330 / 24

Date: 03/06 /2024

Re: AIR QUALITY REPORT

We wish to inform you that Air Quality Monitoring was carried out in **JAMADOBA GROUP** in the month of **MAY'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	10.05.24	Clear	237.9	89.3	17.8	19.4

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	16.05.24	Clear	78.4	37.2	19.3	21.5
2	Digwadih 12 No. Colony	23°41'42" N/ 86°24'45.3" E	13.05.24	Clear	80.6	40.1	18.2	22.1
3	New Village Colony, Jamadoba	23°41'51" N/ 86°23'19" E	14.05.24	Clear	70.1	30.3	15.9	17.8
4	Tata Central Hospital	23°42'36" N/ 86°24'10.4"E	15.05.24	Clear	72.9	32.6	14.7	17.2

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)

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- April'24 to September'24)

Annexure- II

TATA STEEL LIMITED
JHARIA DIVISION

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

Ref: JMB /ENV /LAB /02 / 397 / 24
Date: 03/07/2024

Re: AIR QUALITY REPORT

We wish to inform you that Air Quality Monitoring was carried out in **JAMADOBA GROUP** in the month of **JUNE'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	04.06.24	Clear	241.7	87.1	18.7	21.9

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	07.06.24	Clear	94.2	51.8	20.8	22.1
2	Digwadih 12 No. Colony	23°41'42" N/ 86°24'45.3" E	05.06.24	Clear	86.2	45.9	17.2	20.8
3	New Village Colony, Jamadoba	23°41'51" N/ 86°23'19" E	06.06.24	Clear	82.4	43.6	16.8	19.5
4	Tata Central Hospital	23°42'36" N/ 86°24'10.4"E	10.06.24	Clear	90.8	48.5	15.2	18.6

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)

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- April'24 to September'24)

Annexure- II

TATA STEEL LIMITED
JHARIA DIVISION

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

Ref: JMB /ENV /LAB /02 / **465** / 24

Date: **01/08** / 2024

Re: AIR QUALITY REPORT

We wish to inform you that Air Quality Monitoring was carried out in **JAMADOBA GROUP** in the month of **JULY'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	03.07.24	Cloudy	186.7	67.2	15.9	18.4

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	05.07.24	Clear	86.5	44.3	18.2	21.6
2	Digwadih 12 No. Colony	23°41'42" N/ 86°24'45.3" E	04.07.24	Cloudy	65.9	30.2	14.8	16.2
3	New Village Colony, Jamadoba	23°41'51" N/ 86°23'19" E	08.07.24	Cloudy	68.2	31.0	17.5	20.3
4	Tata Central Hospital	23°42'36" N/ 86°24'10.4"E	09.07.24	Clear	72.4	33.1	16.8	19.5

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)

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- April'24 to September'24)

Annexure- II

TATA STEEL LIMITED
JHARIA DIVISION

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

Ref: JMB /ENV /LAB /02 / 521 / 24
Date: 02/09 / 2024

Re: AIR QUALITY REPORT

We wish to inform you that Air Quality Monitoring was carried out in **JAMADOBA GROUP** in the month of **AUGUST'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	16.08.24	Clear	201.9	70.8	16.8	19.7

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	12.08.24	Clear	74.2	36.2	16.5	18.3
2	Digwadih 12 No. Colony	23°41'42" N/ 86°24'45.3" E	13.08.24	Cloudy	57.1	24.0	15.4	17.8
3	New Village Colony, Jamadoba	23°41'51" N/ 86°23'19" E	20.08.24	Cloudy	69.4	32.1	12.7	14.1
4	Tata Central Hospital	23°42'36" N/ 86°24'10.4"E	19.08.24	Cloudy	64.2	29.5	14.6	16.7

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)


Area Manager (Environment)

TATA STEEL LIMITED
JHARIA DIVISION

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

Ref: JMB /ENV /LAB /02 / 581 / 24
Date: 01 / 10 / 2024

Re: AIR QUALITY REPORT

We wish to inform you that Air Quality Monitoring was carried out in **JAMADOBA GROUP** in the month of **SEPTEMBER'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	05.09.24	Cloudy	195.6	68.4	15.7	17.2

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	06.09.24	Clear	90.6	52.7	17.4	20.1
2	Digwadih 12 No. Colony	23°41'42" N/ 86°24'45.3" E	03.09.24	Clear	72.6	38.1	18.7	21.0
3	New Village Colony, Jamadoba	23°41'51" N/ 86°23'19" E	04.09.24	Clear	70.4	35.2	16.9	19.5
4	Tata Central Hospital	23°42'36" N/ 86°24'10.4"E	07.09.24	Cloudy	65.4	28.9	14.8	16.2

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)

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- April'24 to September'24)

Annexure- II

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/ 228 /24

Dated: 02/05/2024

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 **APRIL'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	25.04.24	43.7	45.5	44.6	35.4	37.7	36.6
2	New Village Colony, Jamadoba	25.04.24	41.3	43.6	42.5	33.6	35.4	34.5
3	6&7 Pits Kalimandir Colony	25.04.24	43.2	45.4	44.3	35.5	37.8	36.7
4	Digwadih 10 No. Colony	25.04.24	44.5	46.7	45.6	36.2	38.5	37.4

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	25.04.24	57.4	60.7	59.1	49.3	51.5	50.4
2	2 Pit Top Kalimandir, Jamadoba	25.04.24	53.1	56.4	54.8	45.6	47.9	46.8
3	Weigh Bridge, Digwadih	25.04.24	48.6	51.3	50.0	40.4	42.7	41.6
4	Canteen Complex, Digwadih	25.04.24	49.2	50.6	49.9	41.7	43.5	42.6
5	Head Office Complex, Digwadih	25.04.24	48.6	50.4	49.5	40.2	42.6	41.4
6	Check Post Security Gate, 6&7 Pits	25.04.24	49.3	51.7	50.5	41.1	43.4	42.3
7	Canteen Complex, 6&7 Pits	25.04.24	48.5	49.2	48.9	40.3	41.5	40.9
8	Fan house- Nitrogen Plant, 6&7 Pits	25.04.24	72.3	73.5	72.9	64.2	65.4	64.8
9	Joota Gate, JCPP	25.04.24	67.7	70.9	69.3	59.5	62.2	60.9
10	Main Gate Stores, JCPP	25.04.24	54.2	57.5	55.9	46.5	48.7	47.6
11	Railway Siding Yard, JCPP	25.04.24	50.4	52.7	51.6	42.3	44.5	43.4

Analysis: All the values are within permissible limit.

This is for your information please.



Lab. Assistant (Environment)



Sr. 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/ 307 /24

Dated: 03/06/2024

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 **MAY'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	09.05.24	44.2	46.5	45.4	36.4	38.7	37.6
2	New Village Colony, Jamadoba	09.05.24	42.7	44.5	43.6	34.5	36.8	35.7
3	6&7 Pits Kalimandir Colony	09.05.24	44.5	46.7	45.6	36.7	38.5	37.6
4	Digwadih 10 No. Colony	09.05.24	42.3	44.8	43.6	34.2	36.5	35.4

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	09.05.24	56.6	59.3	58.0	48.4	51.1	49.8
2	2 Pit Top Kalimandir, Jamadoba	09.05.24	52.3	54.5	53.4	44.5	46.7	45.6
3	Weigh Bridge, Digwadih	09.05.24	48.2	50.5	49.4	40.3	42.5	41.4
4	Canteen Complex, Digwadih	09.05.24	48.5	50.7	49.6	40.7	42.9	41.8
5	Head Office Complex, Digwadih	09.05.24	46.1	48.3	47.2	38.3	40.6	39.5
6	Check Post Security Gate, 6&7 Pits	09.05.24	48.3	51.2	49.8	40.5	42.7	41.6
7	Canteen Complex, 6&7 Pits	09.05.24	47.2	48.6	47.9	39.4	41.5	40.5
8	Fan house- Nitrogen Plant, 6&7 Pits	09.05.24	72.2	73.6	72.9	64.4	65.5	65.0
9	Joota Gate, JCPP	09.05.24	68.4	71.7	70.1	60.2	63.4	61.8
10	Main Gate Stores, JCPP	09.05.24	53.5	56.8	55.2	45.7	48.5	47.1
11	Railway Siding Yard, JCPP	09.05.24	51.2	53.4	52.3	43.5	45.8	44.7

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/ 372/24

Dated: 01 / 07 / 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 **JUNE'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	28.06.24	42.7	44.5	43.6	34.5	36.3	35.4
2	New Village Colony, Jamadoba	28.06.24	41.5	43.8	42.7	33.2	35.4	34.3
3	6&7 Pits Kalimandir Colony	28.06.24	43.2	45.5	44.4	35.4	37.6	36.5
4	Digwadih 10 No. Colony	28.06.24	42.6	44.9	43.8	34.7	36.5	35.6

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	28.06.24	54.4	57.7	56.1	46.1	49.5	47.8
2	2 Pit Top Kalimandir, Jamadoba	28.06.24	52.7	55.5	54.1	44.3	47.6	46.0
3	Weigh Bridge, Digwadih	28.06.24	49.5	52.8	51.2	41.7	44.5	43.1
4	Canteen Complex, Digwadih	28.06.24	48.8	50.6	49.7	40.4	42.7	41.6
5	Head Office Complex, Digwadih	28.06.24	45.3	47.5	46.4	37.6	39.9	38.8
6	Check Post Security Gate, 6&7 Pits	28.06.24	49.5	52.7	51.1	41.2	44.7	43.0
7	Canteen Complex, 6&7 Pits	28.06.24	47.6	49.4	48.5	39.5	41.3	40.4
8	Fan house- Nitrogen Plant, 6&7 Pits	28.06.24	72.3	73.7	73.0	64.3	65.5	64.9
9	Joota Gate, JCPP	28.06.24	66.7	69.5	68.1	58.6	61.8	60.2
10	Main Gate Stores, JCPP	28.06.24	52.4	55.6	54.0	44.2	47.5	45.9
11	Railway Siding Yard, JCPP	28.06.24	51.5	53.8	52.7	43.7	45.4	44.6

Analysis: All the values are within permissible limit.

This is for your information please.


Lab. Assistant (Environment)

Copy to: Specialist (OH). TCH


Area 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/ 444 /24

Dated: 01/08/2024

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 **JULY'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	26.07.24	42.3	44.7	43.5	34.5	36.7	35.6
2	New Village Colony, Jamadoba	26.07.24	43.1	45.4	44.3	35.3	37.7	36.5
3	6&7 Pits Kalimandir Colony	26.07.24	42.5	44.8	43.7	34.7	36.5	35.6
4	Digwadih 10 No. Colony	26.07.24	41.8	43.3	42.6	33.4	35.6	34.5

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	26.07.24	52.8	55.6	54.2	44.6	46.5	45.6
2	2 Pit Top Kalimandir, Jamadoba	26.07.24	53.5	56.3	54.9	45.2	47.4	46.3
3	Weigh Bridge, Digwadih	26.07.24	48.4	50.7	49.6	40.6	42.9	41.8
4	Canteen Complex, Digwadih	26.07.24	46.6	48.4	47.5	38.4	40.7	39.6
5	Head Office Complex, Digwadih	26.07.24	46.3	49.7	48.0	38.1	40.3	39.2
6	Check Post Security Gate, 6&7 Pits	26.07.24	48.7	51.5	50.1	40.5	45.1	42.8
7	Canteen Complex, 6&7 Pits	26.07.24	46.5	48.6	47.6	38.3	40.5	39.4
8	Fan house- Nitrogen Plant, 6&7 Pits	26.07.24	72.2	73.5	72.9	64.4	65.6	65.0
9	Joota Gate, JCPP	26.07.24	64.7	67.3	66.0	56.2	59.5	57.9
10	Main Gate Stores, JCPP	26.07.24	55.1	58.4	56.8	47.4	49.9	48.7
11	Railway Siding Yard, JCPP	26.07.24	52.4	55.7	54.1	44.1	47.3	45.7

Analysis: All the values are within permissible limit.

This is for your information please.


Lab. Assistant (Environment)

Copy to: Specialist (OH). TCH


Area 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/ 507/24

Dated: 02/09/2024

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 **AUGUST'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	27.08.24	42.7	44.9	43.8	34.3	36.5	35.4
2	New Village Colony, Jamadoba	27.08.24	43.5	45.6	44.6	35.6	37.8	36.7
3	6&7 Pits Kalimandir Colony	27.08.24	43.2	45.5	44.4	35.4	37.6	36.5
4	Digwadih 10 No. Colony	27.08.24	42.4	44.7	43.6	34.5	36.8	35.7

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	27.08.24	52.4	55.7	54.1	44.6	47.8	46.2
2	2 Pit Top Kalimandir, Jamadoba	27.08.24	53.1	56.5	54.8	45.2	48.4	46.8
3	Weigh Bridge, Digwadih	27.08.24	49.3	51.7	50.5	40.5	42.9	41.7
4	Canteen Complex, Digwadih	27.08.24	46.7	48.9	47.8	38.4	40.7	39.6
5	Head Office Complex, Digwadih	27.08.24	47.5	50.3	48.9	39.7	42.6	41.2
6	Check Post Security Gate, 6&7 Pits	27.08.24	49.4	52.7	51.1	41.5	44.7	43.1
7	Canteen Complex, 6&7 Pits	27.08.24	46.3	48.5	47.4	38.1	40.4	39.3
8	Fan house- Nitrogen Plant, 6&7 Pits	27.08.24	72.3	73.6	73.0	64.4	65.8	65.1
9	Joota Gate, JCPP	27.08.24	61.5	64.2	62.9	53.2	56.5	54.9
10	Main Gate Stores, JCPP	27.08.24	53.3	56.6	55.0	45.6	48.7	47.2
11	Railway Siding Yard, JCPP	27.08.24	50.6	53.8	52.2	42.3	45.5	43.9

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/ 584/24

Dated: 01/10/2024

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 **SEPTEMBER'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	22.09.24	42.4	44.7	43.6	34.2	36.5	35.4
2	New Village Colony, Jamadoba	22.09.24	43.3	45.5	44.4	35.4	37.7	36.6
3	6&7 Pits Kalimandir Colony	22.09.24	43.7	45.9	44.8	35.6	37.9	36.8
4	Digwadih 10 No. Colony	22.09.24	42.8	44.6	43.7	34.5	36.8	35.7

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	22.09.24	52.7	55.9	54.3	44.5	47.8	46.2
2	2 Pit Top Kalimandir, Jamadoba	22.09.24	53.3	56.7	55.0	45.1	48.4	46.8
3	Weigh Bridge, Digwadih	22.09.24	49.5	51.9	50.7	41.4	43.6	42.5
4	Canteen Complex, Digwadih	22.09.24	46.6	48.7	47.7	38.3	40.5	39.4
5	Head Office Complex, Digwadih	22.09.24	47.3	50.6	49.0	39.5	42.7	41.1
6	Check Post Security Gate, 6&7 Pits	22.09.24	49.7	52.9	51.3	41.5	44.8	43.2
7	Canteen Complex, 6&7 Pits	22.09.24	46.1	48.4	47.3	38.4	40.6	39.5
8	Fan house- Nitrogen Plant, 6&7 Pits	22.09.24	72.4	73.7	73.1	64.3	65.7	65.0
9	Joota Gate, JCPP	22.09.24	60.1	63.4	61.8	52.6	55.7	54.2
10	Main Gate Stores, JCPP	22.09.24	52.7	55.6	54.2	44.4	47.3	45.9
11	Railway Siding Yard, JCPP	22.09.24	50.3	53.5	51.9	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



Area Manager (Environment)

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- April'24 to September'24)

Annexure- II

TATA STEEL LIMITED
JHARIA DIVISION

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

Ref. No. - JMB / ENV / LAB / 03 / 253 / 2024

Dated - 08/05/2024

Sub: ETP WATER ANALYSIS REPORT.

We wish to inform you that Trade Effluent Sampling was carried out in **JAMADOBA GROUP** in the month of **APRIL'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	25.04.24	12:50 PM	26	8.2	132	978	26.5	260	1.6
2	ETP, TCH- Outlet	25.04.24	12:55 PM	25	7.7	26	732	5.4	72	0.5
3	ETP, Garage- Inlet	25.04.24	01:50 PM	27	8.0	158	910	28.9	236	3.6
4	ETP, Garage- Outlet	25.04.24	01:55 PM	26	7.8	23	742	7.3	84	1.4
5	Final Settling Pond JCPP	25.04.24	10:05 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)



Area Manager (Environment)

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- April'24 to September'24)

Annexure- II

TATA STEEL LIMITED
JHARIA DIVISION

Sr. Manager, Jamadoba Colliery
Sr. Manager, Digwadih Colliery
Sr. Manager, 6&7 Pits Colliery

Ref. No. - JMB / ENV / LAB / 03 / -25 / 2024
Dated - 08/05/2024

Sub: MINE WATER ANALYSIS REPORT.

We wish to inform you that Trade Effluent Sampling was carried out in **JAMADOBA GROUP** in the month of **APRIL'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	25.04.24	09:35 AM	31	7.6	36	740	2.5	64	1.4
2	3 Pit Jamadoba Colliery	25.04.24	09:50 AM	No Discharge						
3	2 Incline Jamadoba Colliery	25.04.24	10:25 AM	No Discharge						
4	6 & 7 Pits Colliery	25.04.24	12:35 PM	32	7.5	14	784	2.1	74	0
5	Digwadih Colliery	25.04.24	11:20 AM	32	7.6	23	1024	2.6	54	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)


Area Manager (Environment)

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- April'24 to September'24)

Annexure- II

TATA STEEL LIMITED
JHARIA DIVISION

Sr. Manager Jamadoba Colliery
Head, Jamadoba Coal Preparation Plant
Sr. Manager Digwadih Colliery

Ref. No. - JMB / ENV / LAB / 03 / 252 / 2024

Dated - 08/05 / 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 **APRIL'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	25.04.24	01:30 PM	27	7.8	106	982	33.1	326	2.8
2	STP, Jmb. Canteen- Outlet	25.04.24	01:35 PM	26	7.4	24	722	6.2	74	0.7
3	STP, JCPP Canteen- Inlet	25.04.24	01:10 PM	27	7.9	122	879	32.9	284	2.3
4	STP, JCPP Canteen- Outlet	25.04.24	01:15 PM	26	7.2	34	687	6.9	54	0.4
5	STP, Railway Colony- Inlet	25.04.24	10:45 AM	27	8.1	144	1036	36.2	310	3.4
6	STP, Railway Colony-Outlet	25.04.24	10:50 AM	26	7.5	28	725	6.4	94	0.8
7	STP, Digwadih 12 No. Officer's colony-Inlet	25.04.24	11:40 AM	26	8.2	136	1024	30.5	320	2.8
8	STP, Digwadih 12 No. Officer's colony- Outlet	25.04.24	11:45 AM	25	7.4	37	684	5.7	86	1.2
9	STP, Digwadih 12 No. Supervisor flat - Inlet	25.04.24	12:05 PM	27	7.8	137	974	34.8	326	3.1
10	STP, Digwadih 12 No. Supervisor flat -Outlet	25.04.24	12:10 PM	26	7.6	18	736	5.2	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- April'24 to September'24)

Annexure- II

TATA STEEL LIMITED
JHARIA DIVISION

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

Ref. No. - JMB / ENV / LAB / 03 / 328 / 2024
Dated - 03/06/2024

Sub: ETP WATER ANALYSIS REPORT.

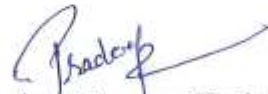
We wish to inform you that Trade Effluent Sampling was carried out in **JAMADOBA GROUP** in the month of **MAY'2024**. The results are as given below:

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	09.05.24	11:00 AM	27	8.5	98	798	23.5	210	1.2
2	ETP, TCH- Outlet	09.05.24	11:05 AM	26	8.3	46	716	6.9	66	0.3
3	ETP, Garage- Inlet	09.05.24	01:30 PM	26	8.4	106	890	33.1	310	4.2
4	ETP, Garage- Outlet	09.05.24	01:35 PM	25	8.0	49	814	7.8	112	1.8
5	Final Settling Pond JCPP	09.05.24	12:05 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- April'24 to September'24)

Annexure- II

TATA STEEL LIMITED
JHARIA DIVISION

Sr. Manager, Jamadoba Colliery
Sr. Manager, Digwadih Colliery
Sr. Manager, 6&7 Pits Colliery

Ref. No. - JMB / ENV / LAB / 03 / 326 / 2024
Dated - 03/06/2024

Sub: MINE WATER ANALYSIS REPORT.

We wish to inform you that Trade Effluent Sampling was carried out in JAMADOBA GROUP in the month of MAY'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	09.05.24	12:55 PM	No Discharge						
2	3 Pit Jamadoba Colliery	09.05.24	12:20 PM	31	7.8	36	862	2.1	66	0
3	2 Incline Jamadoba Colliery	09.05.24	11:50 AM	No Discharge						
4	6 & 7 Pits Colliery	09.05.24	10:45 AM	32	7.2	21	927	2.5	80	0.4
5	Digwadih Colliery	09.05.24	10:20 AM	30	8.0	17	958	2.4	58	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.

P. Mahato

Lab. Assistant (Environment)

P. Mahato

Area Manager (Environment)

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- April'24 to September'24)

Annexure- II

TATA STEEL LIMITED
JHARIA DIVISION

Sr. Manager Jamadoba Colliery
Head, Jamadoba Coal Preparation Plant
Sr. Manager Digwadih Colliery

Ref. No. - JMB / ENV / LAB / 03 / 327 / 2024

Dated - 03/06/2024

Sub: STP WATER ANALYSIS REPORT.

We wish to inform you that Trade Effluent Sampling was carried out in **JAMADOBA GROUP** in the month of **MAY'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	09.05.24	01:10 PM	26	7.5	84	893	31.9	316	2.5
2	STP, Jmb. Canteen- Outlet	09.05.24	01:15 PM	25	7.3	22	819	7.3	82	0.8
3	STP, JCPP Canteen- Inlet	09.05.24	12:35 PM	26	8.2	118	1058	33.4	290	2.7
4	STP, JCPP Canteen- Outlet	09.05.24	12:40 PM	25	7.8	19	922	5.2	72	0.9
5	STP, Railway Colony- Inlet	09.05.24	11:25 AM	27	8.3	129	1122	35.7	320	3.6
6	STP, Railway Colony-Outlet	09.05.24	11:30 AM	26	8.0	25	1048	7.8	73	1.0
7	STP, Digwadih 12 No. Officer's colony-Inlet	09.05.24	09:40 AM	27	8.4	158	987	34.9	317	3.2
8	STP, Digwadih 12 No. Officer's colony- Outlet	09.05.24	09:45 AM	26	7.9	24	747	6.8	64	1.6
9	STP, Digwadih 12 No. Supervisor flat - Inlet	09.05.24	10:00 AM	26	8.1	148	1428	35.2	348	3.9
10	STP, Digwadih 12 No. Supervisor flat -Outlet	09.05.24	10:05 AM	25	7.8	46	1216	8.4	110	2.1

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)

TATA STEEL LIMITED
JHARIA DIVISION

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

JAMADOBA GROUP

S.No	Date	Location	Time	Depth in meter	pH	Electrical Conductivity $\mu\text{S/m}$
1	10.05.24	Purnadih (Jorapokhar)	11:45 AM	6.38	7.3	1226
2	10.05.24	Bhowra 13 No	12:20 PM	3.85	7.1	1017
3	10.05.24	Mohalbani Basti	02:30 PM	8.24	7.2	1085
4	10.05.24	Digwadih 10 No F & J	01:10 PM	5.10	7.3	1560
5	10.05.24	Kalimela Shivmandir	11:00 AM	11.00	7.2	846
6	10.05.24	Kalimela Kalimandir	11:15 AM	11.15	7.0	1395
7	10.05.24	Lower Dungari	10:35 AM	10.35	7.1	840
8	10.05.24	Upper Dungari	10:10 AM	10.10	7.5	878
9	10.05.24	Pattia Basti	09:30 AM	9.30	7.3	987
10	10.05.24	Kenduadih Basti	09:50 AM	9.50	7.4	1028
11	10.05.24	Jorapokhar Kushtand	11:25 AM	11.25	7.6	1583
12	10.05.24	6&7 Pits (Ayodhya Nagri)	02:00 PM	2.00	7.2	984
13	10.05.24	Jorapokhar Basti Chhattan	01:30 PM	2.30	7.3	1412
14	10.05.24	Jorapokhar Babu Basa	12:05 PM	12.00	7.1	1240



Lab.Assistant (Environment)



Area Manager (Environment)

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- April'24 to September'24)

Annexure- II

TATA STEEL LIMITED
JHARIA DIVISION

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

Ref. No. - JMB / ENV / LAB / 03 / 393 / 2024

Dated - 03/07/2024

Sub: ETP WATER ANALYSIS REPORT.

We wish to inform you that Trade Effluent Sampling was carried out in **JAMADOBA GROUP** in the month of **JUNE'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	28.06.24	12:25 PM	27	8.1	126	983	26.5	246	1.5
2	ETP, TCH- Outlet	28.06.24	12:30 PM	26	7.8	42	859	4.6	68	0.6
3	ETP, Garage- Inlet	28.06.24	01:25 PM	26	8.3	164	996	30.7	324	4.6
4	ETP, Garage- Outlet	28.06.24	01:30 PM	25	7.6	38	768	7.4	102	1.6
5	Final Settling Pond JCPP	28.06.24	10:15 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)


Area Manager (Environment)

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- April'24 to September'24)

Annexure- II

TATA STEEL LIMITED
JHARIA DIVISION

Sr. Manager, Jamadoba Colliery
Sr. Manager, Digwadih Colliery
Sr. Manager, 6&7 Pits Colliery

Ref. No. - JMB / ENV / LAB / 03 / 391 / 2024
Dated - 03/07/2024

Sub: MINE WATER ANALYSIS REPORT.

We wish to inform you that Trade Effluent Sampling was carried out in **JAMADOBA GROUP** in the month of **JUNE'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	28.06.24	09:30 AM	No Discharge						
2	3 Pit Jamadoba Colliery	28.06.24	09:45 AM	31	7.6	29	784	2.3	72	0
3	2 Incline Jamadoba Colliery	28.06.24	10:05 AM	No Discharge						
4	6 & 7 Pits Colliery	28.06.24	12:10 PM	30	7.7	17	932	2.9	54	0
5	Digwadih Colliery	28.06.24	11:45 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)


Area Manager (Environment)

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- April'24 to September'24)

Annexure- II

TATA STEEL LIMITED
JHARIA DIVISION

Sr. Manager Jamadoba Colliery
Head, Jamadoba Coal Preparation Plant
Sr. Manager Digwadih Colliery

Ref. No. - JMB / ENV / LAB / 03 / 392 / 2024

Dated - 03/07/2024

Sub: STP WATER ANALYSIS REPORT.

We wish to inform you that Trade Effluent Sampling was carried out in JAMADOBA GROUP in the month of JUNE'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	28.06.24	01:10 PM	27	8.0	123	1028	34.8	320	2.9
2	STP, Jmb. Canteen- Outlet	28.06.24	01:15 PM	26	7.5	41	836	5.9	68	0.3
3	STP, JCPP Canteen- Inlet	28.06.24	12:50 PM	27	8.3	157	1027	32.1	260	3.1
4	STP, JCPP Canteen- Outlet	28.06.24	12:55 PM	26	8.0	35	832	4.8	84	0.5
5	STP, Railway Colony- Inlet	28.06.24	10:30 AM	27	8.4	164	1137	35.8	336	2.9
6	STP, Railway Colony-Outlet	28.06.24	10:35 AM	26	8.1	54	987	6.2	76	1.3
7	STP, Digwadih 12 No. Officer's colony-Inlet	28.06.24	11:05 AM	26	8.3	131	996	33.7	332	3.4
8	STP, Digwadih 12 No. Officer's colony- Outlet	28.06.24	11:10 AM	25	7.8	46	892	5.2	96	1.8
9	STP, Digwadih 12 No. Supervisor flat - Inlet	28.06.24	11:25 AM	27	8.2	146	1219	36.8	284	3.4
10	STP, Digwadih 12 No. Supervisor flat -Outlet	28.06.24	11:30 AM	26	7.9	52	1124	8.9	117	1.5

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- April'24 to September'24)

Annexure- II

TATA STEEL LIMITED
JHARIA DIVISION

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

Ref. No. - JMB / ENV / LAB / 03 / 455 / 2024
Dated - 01 / 08 / 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 JULY'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	26.07.24	12:20 PM	28	8.4	148	836	28.3	256	1.7
2	ETP, TCH- Outlet	26.07.24	12:25 PM	27	8.2	25	707	4.9	76	0.2
3	ETP, Garage- Inlet	26.07.24	01:20 PM	28	8.5	137	816	29.1	316	4.5
4	ETP, Garage- Outlet	26.07.24	01:25 PM	27	8.2	16	774	6.7	97	1.8
5	Final Settling Pond JCPP	26.07.24	10:05 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. Mahanta

Lab. Assistant (Environment)

f. Umesh
12.08.24

Area Manager (Environment)

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- April'24 to September'24)

Annexure- II

TATA STEEL LIMITED
JHARIA DIVISION

Sr. Manager, Jamadoba Colliery
Sr. Manager, Digwadih Colliery
Sr. Manager, 6&7 Pits Colliery

Ref. No. - JMB / ENV / LAB / 03 / 453 / 2024
Dated - 01 / 08 / 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 **JULY'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	26.07.24	09:20 AM	30	7.4	29	790	2.9	67	0.8
2	3 Pit Jamadoba Colliery	26.07.24	09:35 AM	30	7.5	28	816	2.6	58	0
3	2 Incline Jamadoba Colliery	26.07.24	09:50 AM	No Discharge						
4	6 & 7 Pits Colliery	26.07.24	12:05 PM	32	7.8	21	926	3.1	68	0
5	Digwadih Colliery	26.07.24	10:50 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)


Area Manager (Environment)

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- April'24 to September'24)

Annexure- II

TATA STEEL LIMITED
JHARIA DIVISION

Head, Jamadoba Coal Preparation Plant
Sr. Manager Jamadoba Colliery
Sr. Manager Digwadih Colliery

Ref. No. - JMB / ENV / LAB / 03 / 454 / 2024

Dated - 01 / 08 / 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 JULY'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	26.07.24	01:05 PM	28	7.8	117	936	35.1	332	2.4
2	STP, Jmb. Canteen- Outlet	26.07.24	01:10 PM	27	7.2	23	814	5.4	76	0.5
3	STP, JCPP Canteen- Inlet	26.07.24	12:45 PM	27	8.2	154	934	31.7	294	2.8
4	STP, JCPP Canteen- Outlet	26.07.24	12:50 PM	26	7.9	27	846	6.4	54	0.3
5	STP, Railway Colony- Inlet	26.07.24	10:20 AM	28	8.1	179	1145	34.9	342	2.1
6	STP, Railway Colony-Outlet	26.07.24	10:25 AM	27	7.8	22	958	5.8	84	1.5
7	STP, Digwadih 12 No. Officer's colony-Inlet	26.07.24	11:40 AM	27	8.0	191	1025	31.2	310	2.3
8	STP, Digwadih 12 No. Officer's colony- Outlet	26.07.24	11:45 AM	26	7.7	18	986	4.7	68	1.0
9	STP, Digwadih 12 No. Supervisor flat - Inlet	26.07.24	11:20 AM	27	8.3	119	1226	35.3	346	3.5
10	STP, Digwadih 12 No. Supervisor flat -Outlet	26.07.24	11:25 AM	26	7.8	63	919	7.1	99	1.6

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. Mahesh

Lab.Assistant (Environment)

f. Umesh
12.08.24

Area Manager (Environment)

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- April'24 to September'24)

Annexure- II

TATA STEEL LIMITED
JHARIA DIVISION

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

Ref. No. - JMB / ENV / LAB / 03 / 527 / 2024

Dated - 02/09 / 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 **AUGUST'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	27.08.24	10:45 AM	28	8.3	129	725	27.4	264	1.6
2	ETP, TCH- Outlet	27.08.24	10:50 AM	27	8.0	38	624	5.1	84	0.4
3	ETP, Garage- Inlet	27.08.24	01:20 PM	27	8.4	152	967	28.1	254	4.1
4	ETP, Garage- Outlet	27.08.24	01:25 PM	26	8.1	28	846	8.4	116	1.2
5	Final Settling Pond JCPP	27.08.24	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)



Area Manager (Environment)

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- April'24 to September'24)

Annexure- II

TATA STEEL LIMITED
JHARIA DIVISION

Sr. Manager, Jamadoba Colliery
Sr. Manager, Digwadih Colliery
Sr. Manager, 6&7 Pits Colliery

Ref. No. - JMB / ENV / LAB / 03 / 525 / 2024
Dated - 02/09/2024

Sub: MINE WATER ANALYSIS REPORT.

We wish to inform you that Trade Effluent Sampling was carried out in JAMADOBA GROUP in the month of AUGUST'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	27.08.24	09:20 AM	No Discharge						
2	3 Pit Jamadoba Colliery	27.08.24	09:35 AM	31	7.7	24	742	2.4	68	0
3	2 Incline Jamadoba Colliery	27.08.24	10:05 AM	No Discharge						
4	6 & 7 Pits Colliery	27.08.24	11:10 AM	30	7.5	32	872	2.7	72	0
5	Digwadih Colliery	27.08.24	12:15 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)

P. Mahato.

Area Manager (Environment)

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- April'24 to September'24)

Annexure- II

TATA STEEL LIMITED
JHARIA DIVISION

Head, Jamadoba Coal Preparation Plant
Sr. Manager Jamadoba Colliery
Sr. Manager Digwadih Colliery

Ref. No. - JMB / ENV / LAB / 03 / 526 / 2024
Dated - 02/09 / 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 **AUGUST'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	27.08.24	01:05 PM	27	7.6	110	879	32.9	290	2.8
2	STP, Jmb. Canteen- Outlet	27.08.24	01:10 PM	26	7.3	20	592	7.2	48	0.9
3	STP, JCPP Canteen- Inlet	27.08.24	12:40 PM	27	8.0	137	910	33.7	316	3.6
4	STP, JCPP Canteen- Outlet	27.08.24	12:45 PM	26	7.5	29	676	6.1	76	0.8
5	STP, Railway Colony- Inlet	27.08.24	10:25 AM	28	8.2	158	1039	36.1	315	2.3
6	STP, Railway Colony-Outlet	27.08.24	10:30 AM	26	7.9	34	932	7.5	69	1.0
7	STP, Digwadih 12 No. Officer's colony-Inlet	27.08.24	11:30 AM	27	7.9	117	1064	30.1	260	2.5
8	STP, Digwadih 12 No. Officer's colony- Outlet	27.08.24	11:35 AM	26	7.4	47	954	4.9	46	0.6
9	STP, Digwadih 12 No. Supervisor flat - Inlet	27.08.24	11:50 AM	28	7.8	168	987	34.6	327	2.9
10	STP, Digwadih 12 No. Supervisor flat -Outlet	27.08.24	11:55 AM	27	7.5	30	796	5.7	94	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)



Area Manager (Environment)

TATA STEEL LIMITED
JHARIA DIVISION

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

JAMADOBA GROUP

S.No	Date	Location	Time	Depth in meter	pH	Electrical Conductivity $\mu\text{S/m}$
1	27.08.24	Purnadih (Jorapokhar)	04:10 PM	3.92	7.2	1232
2	27.08.24	Bhowra 13 No	03:45 PM	1.04	7.0	1022
3	27.08.24	Mohalbani Basti	12:30 PM	1.16	7.4	1036
4	27.08.24	Digwadih 10 No F & J	02:35 PM	1.37	7.2	1816
5	27.08.24	Kalimela Shivmandir	06:15 PM	0.84	7.0	898
6	27.08.24	Kalimela Kalimandir	06:00 PM	2.04	7.2	1350
7	27.08.24	Lower Dungari	05:45 PM	1.82	7.5	610
8	27.08.24	Upper Dungari	05:25 PM	0.95	7.3	746
9	27.08.24	Pattia Basti	05:10 PM	2.98	7.2	872
10	27.08.24	Kenduadih Basti	04:50 PM	0.93	7.0	946
11	27.08.24	Jorapokhar Kushtand	03:20 PM	2.16	7.3	1530
12	27.08.24	6&7 Pits (Ayodhya Nagri)	02:15 PM	1.45	7.4	1161
13	27.08.24	Jorapokhar Basti Chhattand	02:55 PM	0.59	7.2	1397
14	27.08.24	Jorapokhar Babu Basa	04:25 PM	1.02	7.3	1020



Lab.Assistant (Environment)



Area Manager (Environment)

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- April'24 to September'24)

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 / 577 / 2024
Dated - 01 / 10 / 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 **SEPTEMBER'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	22.09.24	12:20 PM	27	8.2	168	736	29.8	284	1.2
2	ETP, TCH- Outlet	22.09.24	12:25 PM	26	7.9	25	632	5.3	72	0.5
3	ETP, Garage- Inlet	22.09.24	01:30 PM	27	8.3	143	935	30.2	310	4.2
4	ETP, Garage- Outlet	22.09.24	01:35 PM	26	8.0	23	834	7.6	106	1.4
5	Final Settling Pond JCPP	22.09.24	10:05 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)



Area Manager (Environment)

Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- April'24 to September'24)

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 / 575 / 2024
Dated - 01/10 / 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 **SEPTEMBER'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	22.09.24	09:35 AM	30	7.5	18	754	2.6	52	0
2	3 Pit Jamadoba Colliery	22.09.24	09:50 AM	32	7.6	22	810	2.8	76	0.6
3	2 Incline Jamadoba Colliery	22.09.24	10:25 AM	No Discharge						
4	6 & 7 Pits Colliery	22.09.24	12:05 PM	30	7.4	24	867	2.1	84	0.5
5	Digwadih Colliery	22.09.24	11:55 AM	30	7.9	20	1064	2.5	54	0.8

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- April'24 to September'24)

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 / 575 / 2024
Dated - 01/10/2024

Sub: MINE WATER ANALYSIS REPORT.

We wish to inform you that Trade Effluent Sampling was carried out in **JAMADOBA GROUP** in the month of **SEPTEMBER'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	22.09.24	09:35 AM	30	7.5	18	754	2.6	52	0
2	3 Pit Jamadoba Colliery	22.09.24	09:50 AM	32	7.6	22	810	2.8	76	0.6
3	2 Incline Jamadoba Colliery	22.09.24	10:25 AM	No Discharge						
4	6 & 7 Pits Colliery	22.09.24	12:05 PM	30	7.4	24	867	2.1	84	0.5
5	Digwadih Colliery	22.09.24	11:55 AM	30	7.9	20	1064	2.5	54	0.8

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)



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Mobile: 09471358492, 09431512608

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

Date: 16.05.2024

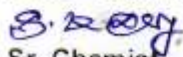
TEST REPORT OF AMBIENT AIR QUALITY

- Name of the industry : M/S TATA STEEL, JAMADOBA,
TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700092573/932 Dt. 20.07.2021
- Date of Sample Collection : 09.05.2024 to 10.05.2024
- Date of Testing : 11.05.2024 to 15.05.2024
- Test Procedure : As per IS-5182

TEST RESULTS

LOCATION – OFFICERS COLONY, 12 NO. DIGWADIH				
	Avg. Ambient Temperature	40°C	Avg. Humidity	28%
Sl No.	Particulars	Value	NAAQ - CPCB STANDARD	
1.	Particulate Matter (PM ₁₀), µg/m ³	75.86	100 µg/m ³	
2.	Particulate Matter (PM _{2.5}), µg/m ³	43.60	60 µg/m ³	
3.	SO ₂ , µg/m ³	17.38	80 µg/m ³	
4.	NO ₂ , µg/m ³	26.54	80 µg/m ³	
5.	Ozone, µg/m ³	17.66	180 µg/m ³	
6.	NH ₃ , µg/m ³	14.90	400 µg/m ³	
7.	CO, mg/m ³	0.60	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

Statements :

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- The test results reported in this report are valid at the time of and under the stated condition of measurement.
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Fax: 0326-2952377
Mobile: 09471358492, 09431512608

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

Date: 16.05.2024

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. : 4700092573/932 Dt. 20.07.2021
- Date of Sample Collection : 09.05.2024 to 10.05.2024
- Date of Testing : 11.05.2024 to 15.05.2024
- Test Procedure : As per IS-5182

TEST RESULTS

LOCATION – CENTRAL WORKSHOP AREA , JAMADOBA				
	Avg. Ambient Temperature	40°C	Avg. Humidity	28%
Sl No.	Particulars	Value	NAAQ - CPCB STANDARD	
1.	Particulate Matter (PM ₁₀), µg/m ³	88.46	100 µg/m ³	
2.	Particulate Matter (PM _{2.5}), µg/m ³	52.64	60 µg/m ³	
3.	SO ₂ , µg/m ³	22.82	80 µg/m ³	
4.	NO ₂ , µg/m ³	32.64	80 µg/m ³	
5.	Ozone, µg/m ³	17.48	180 µg/m ³	
6.	NH ₃ , µg/m ³	17.60	400 µg/m ³	
7.	CO, mg/m ³	0.93	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: 16.05.2024

TEST REPORT OF AMBIENT AIR QUALITY

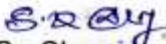
- Name of the industry : M/S TATA STEEL, JAMADOBA,
TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700092573/932 Dt. 20.07.2021
- Date of Sample Collection : 09.05.2024 To 10.05.2024
- Date of Testing : 11.05.2024 To 15.05.2024
- Test Procedure : As per IS-5182

TEST RESULTS

LOCATION – TATA CENTRAL HOSPITAL

SI No.	Avg. Ambient Temperature	40°C	Avg. Humidity	28%
	Particulars	Value	NAAQ - CPCB STANDARD	
1.	Particulate Matter (PM ₁₀), µg/m ³	70.08	100 µg/m ³	
2.	Particulate Matter (PM _{2.5}), µg/m ³	40.57	60 µg/m ³	
3.	SO ₂ , µg/m ³	16.18	80 µg/m ³	
4.	NO ₂ , µg/m ³	25.80	80 µg/m ³	
5.	Ozone, µg/m ³	16.32	180 µg/m ³	
6.	NH ₃ , µg/m ³	17.57	400 µg/m ³	
7.	CO, mg/m ³	0.88	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/1

Date: 16.05.2024

TEST REPORT OF AMBIENT AIR QUALITY

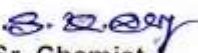
- Name of the industry : M/S TATA STEEL, JAMADOBA,
TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO.: : 4700092573/932 Dt. 20.07.2021
- Date of Sample Collection : 09.05.2024 To 10.05.2024
- Date of Testing : 11.05.2024 To 15.05.2024
- Test Procedure : As per IS-5182

TEST RESULTS

LOCATION - 6 & 7 PITS COLLIERY OFFICE

	Avg. Ambient Temperature	40°C	Avg. Humidity	28%
Sl No.	Particulars	Value	NAAQ - CPCB STANDARD	
1.	Particulate Matter (PM ₁₀), µg/m ³	89.38	100 µg/m ³	
2.	Particulate Matter (PM _{2.5}), µg/m ³	52.81	60 µg/m ³	
3.	SO ₂ , µg/m ³	23.15	80 µg/m ³	
4.	NO ₂ , µg/m ³	28.46	80 µg/m ³	
5.	Ozone, µg/m ³	17.83	180 µg/m ³	
6.	NH ₃ , µg/m ³	14.88	400 µg/m ³	
7.	CO, mg/m ³	0.82	4 mg/m ³	
8.	Pb, µg/m ³	BDL	1 µg/m ³	
9.	As, ng/m ³	BDL	6 ng/m ³	
10.	Ni, ng/m ³	BDL	20 ng/m ³	
11.	Benzene, µg/m ³	BDL	5 µg/m ³	
12.	Benzoapyrene ng/m ³	BDL	1 ng/m ³	

NOTE: BDL - Below Detection Limit


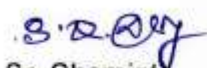



Sr. Chemist
Aditi R&D Services




Technical Manager
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/24-25/MINER./1		Date: 14.05.2024																									
<u>TEST REPORT OF MINERALOGICAL COMPOSITION</u> <u>OF PARTICULATE MATTER</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. : 4700092573/932 Dt. 20.07.2021Date of Sample Collection : 10.05.2024Date of Testing : 11.05.2024 To 13.05.2024																											
<u>TEST RESULTS</u>																											
<table border="1"><thead><tr><th rowspan="2">Sl No.</th><th rowspan="2">Particulars</th><th colspan="4">Mineralogical Composition (%)</th></tr><tr><th>SiO₂</th><th>FeO</th><th>Al₂O₃</th><th>CaO</th></tr></thead><tbody><tr><td>1.</td><td>Central Workshop Area, Jamadoba</td><td>1.88</td><td>0.10</td><td>1.36</td><td>2.5</td></tr><tr><td>2.</td><td>Officer's Colony, 12 No Digwadih</td><td>2.08</td><td>0.12</td><td>1.39</td><td>2.63</td></tr></tbody></table>		Sl No.	Particulars	Mineralogical Composition (%)				SiO ₂	FeO	Al ₂ O ₃	CaO	1.	Central Workshop Area, Jamadoba	1.88	0.10	1.36	2.5	2.	Officer's Colony, 12 No Digwadih	2.08	0.12	1.39	2.63				
Sl No.	Particulars			Mineralogical Composition (%)																							
		SiO ₂	FeO	Al ₂ O ₃	CaO																						
1.	Central Workshop Area, Jamadoba	1.88	0.10	1.36	2.5																						
2.	Officer's Colony, 12 No Digwadih	2.08	0.12	1.39	2.63																						
 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.																											



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

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

Date: 17.05.2024

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.: : 4700092573/932 Dt. 20.07.2021
- Sample Code : 1. Damodar River Up Stream
2. Damodar River Down Stream
- Date of Sample Collection: 10.05.2024
- Date of Testing : 11.05.2024 To 16.05.2024
- 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	7.8	8.0	6.5 -8.5	IS-3025 (P-11): 1983
2.	Total Dissolved Solids, mg/l	410	432	1500	IS-3025 (P-16): 1984
3.	Turbidity, NTU	2.0	2.4	-	IS-3025 (P-10):1984
4.	Dissolved Oxygen, mg/l	4.2	4.0	4.0 (Min)	IS-3025 (P-38):1989
5.	Bio chemical Oxygen Demand, mg/l	1.6	2.0	3.0	IS-3025 (P-44):1994
6.	Chloride as Cl, mg/l	36.8	38.8	600 (Max.)	IS-3025 (P-32):1988
7.	Fluoride as F, mg/l	0.59	0.62	1.5	IS-3025 (P-60):2008
8.	Sulphate as SO ₄ , mg/l	57.3	60.1	400	IS-3025 (P-24):1986

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



Technical Manager
Aditi R&D Services, Sindri

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TEST REPORT OF NOISE (AMBIENT) LEVEL MONITORING

Ref. No. & Date		NAME AND ADDRESS OF THE CLIENT							
ARDS/24-25/NOISE/1 Date:11.05.2024		M/S TATA STEEL, JAMADOBA,							
Date of Monitoring		TATA STEEL LIMITED, JAMADOBA GROUP PLANT,							
		DIST. - DHANBAD (JHARKHAND)							
09.05.2024 To 10.05.2024		Avg. Ambient Temperature (°C)		Average Humidity (%)		Weather Condition		Status of the plant	
Work Order 4700092573/932 Dt. 20.07.2021		40		28		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 Industrial Area	Night Time Industrial Area
LOCATION		MAX	MIN	AVG. dB(A) Leq	MAX	MIN	AVERAGE dB(A) Leq	Industrial Area	Industrial Area
JAMADOBA GROUP									
1.	Central Workshop Area	68.4	53.4	65.52	59.6	42.4	56.67	75	70
2.	6 & 7 Pits Colliery Office	67.6	51.2	64.69	56.6	40.2	53.69		
								Residential Area	Residential Area
3.	Officer Colony 12 No. Digwadih	54.2	46.8	51.92	46.2	42.4	44.7	65	55
								Silence Zone	Silence Zone
4.	Tata Central Hospital	49.4	44.2	47.54	38.4	30.6	36.06	50	40

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



Aditi R&D Services
Technical Manager
Aditi R&D Services, Sindri

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

Date: 16.05.2024

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.: : 4700092573/932 Dt. 20.07.2021
- Sample Code :
 - 2 Pit Jamadoba Colliery
 - 3 Pit Jamadoba Colliery
 - 6 & 7 Pits Colliery
 - Digwadih Colliery
- Date of Sample Collection: 09.05.2024 To 10.05.2024
- Date of Testing : 11.05.2024 To 15.05.2024
- 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,	8.2	7.8	8.3	8.0	6.5-8.5	IS-3025 (P-11): 1983
2.	Total Dissolved Solids, mg/l	865	860	980	907	-	IS-3025 (P-16): 1984
3.	Total Suspended Solids, mg/l	38	40	42	35	-	IS-3025 (P-17): 1984
4.	Bio chemical Oxygen Demand, mg/l	1.8	2.0	2.6	2.8	3	IS-3025 (P-44): 1994
5.	Chemical Oxygen Demand, mg/l	66	66	80	80	-	IS-3025 (P-58): 2006
6.	Oil & Grease, mg/l	B.D.L	B.D.L	B.D.L	B.D.L	-	IS-3025 (P-39): 2021


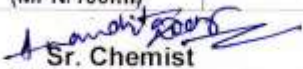


Anandit
Sr. Chemist
Aditi R&D Services


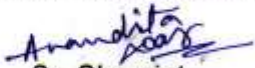




Barji
Technical Manager
Aditi R&D Services, Sindri

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Ref. No.: - ARDS/24-25/STP/1		Date: 16.05.2024						
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.:		: 4700092573/932 Dt. 20.07.2021						
• 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:		: 09.05.2024 To 10.05.2024						
• Date of Testing		: 10.05.2024 To 15.05.2024						
• Test		: pH, TDS, TSS, BOD, COD, OIL & GREASE, and Fecal Coliform.						
TEST RESULT								
Sl. No.	PARAMETERS OF TEST	VALUE					As per MoEF&CC Notification dated 13 th Oct. 2017 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,	8.5	8.3	7.9	7.4	8.0	6.5-9.0	IS-3025(P-11):1983
2.	Total Dissolved Solids, mg/l	1170	892	1415	1020	1105	-	IS-3025(P-16):1984
3.	Total Suspended Solids, mg/l	54	46	48	39	40	100	IS-3025(P-17):1984
4.	Bio chemical Oxygen Demand, mg/l	6.6	8.4	9.0	2.4	4.8	30	IS-3025(P-44):1994
5.	Chemical Oxygen Demand, mg/l	88	95	117	44	73	250	IS-3025(P-58):2006
6.	Oil & Grease, mg/l	3.6	2.8	9	0.4	B.D.L	-	IS-3025(P-39):2021
7.	Fecal Coliform (FC) (MPN/100ml)	759	654	600	636	542	<1000 MPN/100ml	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: 16.05.2024			
TEST REPORT OF EFFLUENT					
• Name of the industry		: M/S TATA STEEL, JAMADOBA, TATA STEEL LIMITED JAMADOBA GROUP PLANT, DIST. - DHANBAD (JHARKHAND)			
• Work Order Ref. NO.:		: 4700092573/932 Dt. 20.07.2021			
• Sample Code		: 1. E.T.P. Outlet T.C.H. 2. E.T.P. Outlet Garage			
• Date of Sample Collection:		: 09.05.2024 To 10.05.2024			
• Date of Testing		: 10.05.2024 To 15.05.2024			
• 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,	8.6	8.4	5.5-9.0	IS-3025 (P-11): 1983
2.	Total Dissolved Solids, mg/l	859	990	-	IS-3025 (P-16): 1984
3.	Total Suspended Solids, mg/l	43	48	100	IS-3025(P-17) : 1984
4.	Bio chemical Oxygen Demand, mg/l	3.0	7.8	30	IS-3025 (P-44):1994
5.	Chemical Oxygen Demand, mg/l	66	102	250	IS-3025 (P-58):2006
6.	Oil & Grease, mg/l	B.D.L	3.1	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: 16.05.2024

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.: : 4700092573/932 Dt. 20.07.2021
- Sample Code : 1. Canteen- Jamadoba Colliery
2. Canteen- Jamadoba Washery
3. Canteen- Digwadih Colliery
4. Canteen- 6&7 Pits Colliery
- Date of Sample Collection: 09.05.2024 To 10.05.2024
- Date of Testing : 10.05.2024 To 15.05.2024
- 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	Desirable	Permissible	
1.	Colour, (Hazen Unit)	1	1	1	1	5.00	15.0	IS 3025 (P-4):2021
2.	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	IS 3025 (P-5):2018
3.	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	IS 3025 (P-7):2017
4.	Turbidity, NTU	NIL	2.0	NIL	NIL	1.0	5.0	IS 3025 (P-10):1984
5.	pH	8.4	8.2	8.2	8.1	6.5-8.5	No. Relax.	IS-3025 (P-11):1983
6.	Total Hardness as CaCO ₃ , mg/l	308	300	304	220	200	600	IS 3025 (P-21):2009
7.	Chloride as Cl, mg/l	71.8	67.88	73.7	27.2	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	580	584	605	310	500	2000	IS 3025 (P-16):1984
10.	Calcium as CaCO ₃ , mg/l	67.2	60.8	72	44.8	75	200	IS 3025 (P-40):1991
11.	Copper as Cu, mg/l	B.D.L.	B.D.L.	B.D.L.	B.D.L.	0.05	1.5	IS 3025 (P-42):1992

Continued on Page 2



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- 2 -

Sl. No.	PARAMETERS OF TEST	VALUE				IS as per IS 10500:1991		Test Method
		Canteen-Jamadoba Colliery	Canteen Jamadoba Washery	Canteen Digwadiah 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	50.14	57.6	59.7	37.9	200	400	IS 3025 (P-24):1986
14.	Nitrate as NO ₃ , mg/l	4.6	6.2	4.2	3.7	45	No. Relax	IS 3025 (P-34):1988
15.	Fluoride as F, mg/l	0.40	0.32	0.28	0.35	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,	0.18	0.22	0.20	0.12	5	15	IS 3025 (P-42):1992
23.	Total Coliform, No./100ml	Absent	Absent	Absent	Absent	Absent	Absent	IS 3025 (P-49):1994
24.	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,	499.2	489.6	518.4	196.8	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

Anandita
Sr. Chemist
Aditi R&D Services

S. S. S.
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Aditi R&D Services, Sindri



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

Date: 17.05.2024

TEST REPORT OF GROUND WATER

- Name of the industry : M/S TATA STEEL, JAMADOBA,
TATA STEEL LIMITED
JAMADOBA GROUP PLANT,
DIST. - DHANBAD (JHARKHAND)
- Work Order Ref. NO. : 4700092573/932 Dt. 20.07.2021
- Sample Code :
 1. Purnadih (Jorapokhar)
 2. Digwadih 10 No F & J
 3. Kenduadih Basti
 4. Upper Dungari
 5. Kalimela Kalimandir
 6. 6&7 Pits (Ayodhya Nagri)
- Date of Sample Collection : 10.05.2024
- Date of Testing : 11.05.2024 To 16.05.2024
- 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,
Hexavalent Chromium, Mineral Oil, Alkalinity,
Aluminium & Boron.

TEST RESULT

Sl. No	PARAMETERS OF TEST	VALUE						IS as per IS 10500:1991		Test Method
		Purnadih (Jorapokhar)	Digwadih 10 No F&J	Kenduadih Basti	Upper Dungari	Kalimela Kalimandir	6&7 Pits (Ayodhya Nagri)	Desirable	Permissible	
1.	Colour, (Hazen Unit)	2	2	1	1	1	2	5	15	IS 3025 (P-4):2021
2.	Temperature °C	29	30	30	28	29	29	-	-	-
3.	Electrical Conductivity, µmhos/cm	1140	1107	780	880	950	860	-	-	-
4.	Total Dissolved Solids, mg/l	740	720	508	570	620	560	500	2000	IS 3025(P-16):1984
5.	pH	7.7	7.5	7.7	7.5	7.1	7.9	6.5-8.5	No Relax	IS-3025(P-11):1983
6.	Total Hardness as CaCO ₃ , mg/l	580	472	356	336	304	392	200	600	IS 3025(P-21):2009
7.	Calcium as Ca, mg/l	150.4	161.6	57.6	60.8	56	70.4	75	200	IS 3025(P-40):1991
8.	Magnesium as Mg, mg/l	48.96	16.30	50.88	44.2	39.4	51.8	30	100	IS 3025(P-46):1994
9.	Chloride as Cl, mg/l	133.8	139.60	64	67.88	147.4	62.1	250	1000	IS 3025(P-32):1988
10.	Fluoride as F, mg/l	0.49	0.30	0.56	0.62	0.60	0.45	1.0	1.5	IS 3025(P-60):2008

Continued on Page -2



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- 2 -

Sl. No	PARAMETERS OF TEST	VALUE						IS as per IS 10500:1991		Test Method
		Purnadih (Jorapokhar)	Digwadih 10 No F&J	Kenduadih Basti	Upper Dungari	Kalimela Kalimandir	6&7 Pits (Ayo dhya Nagri)	Desirable	Permissible	
11	Sulphate as SO ₄ , mg/l	52.8	63.6	65.2	62.8	59.98	49.98	200	400	IS 3025(P-24):1986
12	Nitrate as NO ₃ , mg/l	9.6	9.2	9.7	8.3	11.9	9.0	45	No. Relax	IS 3025(P-34):1988
13	Alkalinity as CaCO ₃ , mg/l	456	427.2	345.6	441.6	374.4	432	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	BD.L	BDL	0.01	No. Relax	IS 3025(P-47):1994
15	Zinc as Zn, mg/l	0.28	0.18	0.20	0.22	0.32	0.24	5	15	IS 3025(P-42):1992
16	Iron a Fe, mg/l	0.2	0.24	0.29	0.28	0.26	0.14	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	BDL	BDL	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	BDL	BDL	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	BDL	BDL	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	BDL	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





Anandita
Sr. Chemist
Aditi R&D Services








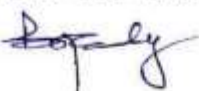


JATGE
Technical Manager
Aditi R&D Services, Sindri





Statements :


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Ref. No.: - ARDS/24-25/AAQ/1		Date: 14.08.2024			
<u>TEST REPORT OF AMBIENT AIR QUALITY</u>					
•	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	: 07/08/2024 To 08/08/2024			
•	Date of Testing	: 10/08/2024 To 13/08/2024			
•	Test Procedure	: As per IS-5182			
<u>TEST RESULTS</u>					
LOCATION – 6 & 7 PITS COLLIERY OFFICE					
	Avg. Ambient Temperature	32°C	Avg. Humidity	75%	
SI No.	Particulars	Value	NAAQ - CPCB STANDARD		
1.	Particulate Matter (PM ₁₀), µg/m ³	76.72	100 µg/m ³		
2.	Particulate Matter (PM _{2.5}), µg/m ³	44.61	60 µg/m ³		
3.	SO ₂ , µg/m ³	17.13	80 µg/m ³		
4.	NO ₂ , µg/m ³	25.66	80 µg/m ³		
5.	Ozone, µg/m ³	15.24	180 µg/m ³		
6.	NH ₃ , µg/m ³	14.10	400 µg/m ³		
7.	CO, mg/m ³	0.77	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: 14.08.2024			
<u>TEST REPORT OF AMBIENT AIR QUALITY</u>					
•	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	: 08.08.2024 to 09.08.2024			
•	Date of Testing	: 10.08.2024 to 13.08.2024			
•	Test Procedure	: As per IS-5182			
<u>TEST RESULTS</u>					
LOCATION – OFFICERS COLONY, 12 NO. DIGWADIH					
	Avg. Ambient Temperature	32°C	Avg. Humidity	75%	
SI No.	Particulars	Value	NAAQ - CPCB STANDARD		
1.	Particulate Matter (PM ₁₀), µg/m ³	70.35	100 µg/m ³		
2.	Particulate Matter (PM _{2.5}), µg/m ³	39.28	60 µg/m ³		
3.	SO ₂ , µg/m ³	18.14	80 µg/m ³		
4.	NO ₂ , µg/m ³	29.13	80 µg/m ³		
5.	Ozone, µg/m ³	16.65	180 µg/m ³		
6.	NH ₃ , µg/m ³	14.10	400 µg/m ³		
7.	CO, mg/m ³	0.40	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: 14.08.2024	
<u>TEST REPORT OF AMBIENT AIR QUALITY</u>					
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		: 08.08.2024 to 09.08.2024			
Date of Testing		: 10.08.2024 to 13.08.2024			
Test Procedure		: As per IS-5182			
<u>TEST RESULTS</u>					
LOCATION – CENTRAL WORKSHOP AREA , JAMADOBA					
Avg. Ambient Temperature		32°C	Avg. Humidity		75%
Sl No.	Particulars	Value	NAAQ - CPCB STANDARD		
1.	Particulate Matter (PM ₁₀), µg/m ³	76.48	100 µg/m ³		
2.	Particulate Matter (PM _{2.5}), µg/m ³	50.14	60 µg/m ³		
3.	SO ₂ , µg/m ³	14.90	80 µg/m ³		
4.	NO ₂ , µg/m ³	23.25	80 µg/m ³		
5.	Ozone, µg/m ³	16.38	180 µg/m ³		
6.	NH ₃ , µg/m ³	14.76	400 µg/m ³		
7.	CO, mg/m ³	0.81	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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		Testing Laboratory			
		NABL ACCREDITED			
		(A Constituent Board of Quality Council of India)			
		ISO/IEC 17025:2017, ISO 9001:2015, ISO (OHSAS) 45001:2018 Certified			
Ref. No.: - ARDS/24-25/ AAQ/4		Date: 14.08.2024			
<u>TEST REPORT OF AMBIENT AIR QUALITY</u>					
•	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	: 07.08.2024 To 08.08.2024			
•	Date of Testing	: 10.08.2024 To 13.08.2024			
•	Test Procedure	: As per IS-5182			
TEST RESULTS					
LOCATION – TATA CENTRAL HOSPITAL					
	Avg. Ambient Temperature	32°C	Avg. Humidity	75%	
SI No.	Particulars	Value	NAAQ - CPCB STANDARD		
1.	Particulate Matter (PM ₁₀), µg/m ³	64.06	100 µg/m ³		
2.	Particulate Matter (PM _{2.5}), µg/m ³	36.38	60 µg/m ³		
3.	SO ₂ , µg/m ³	15.92	80 µg/m ³		
4.	NO ₂ , µg/m ³	23.07	80 µg/m ³		
5.	Ozone, µg/m ³	14.36	180 µg/m ³		
6.	NH ₃ , µg/m ³	13.98	400 µg/m ³		
7.	CO, mg/m ³	0.76	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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	<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: aditirndservices.com Phone: 0326-2952377 (O) Mobile: 09471358492, 09431512608						
	<h3 style="margin:0;">TEST REPORT OF NOISE (AMBIENT) LEVEL MONITORING</h3>								
	Ref. No. & Date ARDS/24-25/NOISE/1 Date: 14.08.2024		NAME AND ADDRESS OF THE CLIENT M/S TATA STEEL, JAMADOBA, TATA STEEL LIMITED, JAMADOBA GROUP PLANT, DIST. - DHANBAD (JHARKHAND)						
Date of Monitoring 07.08.2024 To 09.08.2024		Avg. Ambient Temperature (°C) 32	Average Humidity (%) 75	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 Industrial Area	Night Time Industrial Area
LOCATION									
JAMADOBA GROUP									
1.	Central Workshop Area	70.4	60.8	67.84	58.4	47.3	55.71	75	70
2.	6 & 7 Pits Colliery Office	68.7	55.2	65.88	56.8	46.5	54.18		
								Residential Area	Residential Area
3.	Officer Colony 12 No. Digwadih	63.9	50.6	61.09	51.2	40.8	48.57	65	55
								Silence Zone	Silence Zone
4.	Tata Central Hospital	50.5	46.7	49.00	39.6	36.4	38.29	50	40



Sr. Chemist
Aditi R&D Services

















Technical Manager
Aditi R&D Services, Sindri





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Ref. No.: - ARDS/24-25/MINER./1		Date: 14.08.2024			
<u>TEST REPORT OF MINERALOGICAL COMPOSITION</u> <u>OF PARTICULATE MATTER</u>					
•	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	: 09.08.2024			
•	Date of Testing	: 12.08.2024 To 14.08.2024			
<u>TEST RESULTS</u>					
Sl No.	Particulars	Mineralogical Composition (%)			
		SiO ₂	FeO	Al ₂ O ₃	CaO
1.	6 & 7 pits colliery office	1.98	0.14	1.38	2.68
2.	Tata Central Hospital	2.16	0.18	1.34	2.84
 Sr. Chemist Aditi R&D Services				 Technical Manager Aditi R&D Services, Sindri	
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Ref. No.: - ARDS/24-25/SW/1		Date: 17.08.2024			
<u>TEST REPORT OF SURFACE WATER</u>					
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:		: 09.08.2024			
Date of Testing		: 10.08.2024 To 16.08.2024			
Test		: pH, TDS, Turbidity, DO, BOD, Cl, F, SO ₄			
<u>TEST RESULT</u>					
Sl. No.	PARAMETERS OF TEST	VALUE		Limit as per IS 2296 Class - C	Test Method
		Damodar River Up Stream	Damodar River Dn Stream		
1.	pH	7.6	7.6	6.5 -8.5	IS-3025 (P-11): 1983
2.	Total Dissolved Solids, mg/l	397	431	1500	IS-3025 (P-16): 1984
3.	Turbidity, NTU	5	5	-	IS-3025 (P-10):1984
4.	Dissolved Oxygen, mg/l	4.8	4.9	4.0 (Min)	IS-3025 (P-38):1989
5.	Bio chemical Oxygen Demand, mg/l	1.5	3.0	3.0	IS-3025 (P-44):1994
6.	Chloride as Cl, mg/l	26	22.0	600 (Max.)	IS-3025 (P-32):1988
7.	Fluoride as F, mg/l	0.5	0.5	1.5	IS-3025 (P-60):2008
8.	Sulphate as SO ₄ , mg/l	250	215	400	IS-3025 (P-24):1986
 Sr. Chemist Aditi R&D Services				 Technical Manager Aditi R&D Services, Sindri	
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Ref. No.: - ARDS/24-25/MWD/1				Date: 17.08.2024			
<u>TEST REPORT OF MINE WATER DISCHARGE</u>							
• 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:		07.08.2024 To 08.08.2024					
• Date of Testing :		10.08.2024 To 16.08.2024					
• Test :		pH, TDS, TSS, BOD, COD, OIL & GREASE.					
<u>TEST RESULT</u>							
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,	8.2	8.3	7.9	8.2	6.5-8.5	IS-3025 (P-11): 1983
2.	Total Dissolved Solids, mg/l	790	770	649	698	-	IS-3025 (P-16): 1984
3.	Total Suspended Solids, mg/l	30.0	28	24	26	-	IS-3025(P-17) : 1984
4.	Bio chemical Oxygen Demand, mg/l	2.3	3.0	2.8	3.0	3	IS-3025 (P-44):1994
5.	Chemical Oxygen Demand, mg/l	122	49	91	79	-	IS-3025 (P-58):2006
6.	Oil & Grease, mg/l	0.8	0.3	0.2	0.2	-	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: 17.08.2024						
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:		07.08.2024 To 09.08.2024						
• Date of Testing :		10.08.2024 To 16.08.2024						
• Test :		pH, TDS, TSS, BOD, COD, OIL & GREASE, and Fecal Coliform.						
TEST RESULT								
Sl. No.	PARAMETERS OF TEST	VALUE					As per MoEF&CC Notification dated 13 th Oct. 2017 for Sewage Treatment Plant	Test Method
		STP Outlet Railway Colony	STP Outlet Digwadih 12 No Officers Colony	STP Outlet Digwadih 12 No. Supervisor or flat	STP Outlet Jmb. Canteen	STP Outlet- JCPP Canteen		
1.	pH,	7.9	7.5	7.4	7.3	7.5	6.5-9.0	IS-3025(P-11):1983
2.	Total Dissolved Solids, mg/l	939.0	952	791	592	547	-	IS-3025(P-16):1984
3.	Total Suspended Solids, mg/l	40.0	28.0	30.0	35.0	38.0	100	IS-3025(P-17):1984
4.	Bio chemical Oxygen Demand, mg/l	9.0	4.2	3.5	8.0	7.0	30	IS-3025(P-44):1994
5.	Chemical Oxygen Demand, mg/l	54.7	36.5	24.3	48.6	42.6	250	IS-3025(P-58):2006
6.	Oil & Grease, mg/l	1.0	0.8	0.6	0.8	0.9	-	IS-3025(P-39):2021
7.	Fecal Coliform (FC) (MPN/100ml)	580	460	450	560	470	<1000 MPN/100ml	IS - 1622
 Sr. Chemist 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: aditirnds-services.com Phone: 0326-2952377 (O) Mobile: 09471358492, 09431512608	
Ref. No.: - ARDS/24-25/ETP/1				Date: 17.08.2024	
<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: 07.08.2024 To 08.08.2024Date of Testing : 10.08.2024 To 16.08.2024Test : pH, TDS, TSS, BOD, COD, OIL & GREASE.					
<u>TEST RESULT</u>					
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,	8.4	8.3	5.5-9.0	IS-3025 (P-11): 1983
2.	Total Dissolved Solids, mg/l	589.0	842.0	-	IS-3025 (P-16): 1984
3.	Total Suspended Solids, mg/l	22.0	30.0	100	IS-3025(P-17) : 1984
4.	Bio chemical Oxygen Demand, mg/l	3.0	18.0	30	IS-3025 (P-44):1994
5.	Chemical Oxygen Demand, mg/l	12.2	139.8	250	IS-3025 (P-58):2006
6.	Oil & Grease, mg/l	0.4	1.2	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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	<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: sindriadi@gmail.com Website: aditirndservices.com Phone: 0326-2952377 (O) Mobile: 09471358492, 09431512608</p>						
<p>Ref. No.: - ARDS/24-25/DW/1</p>		<p>Date: 17.08.2024</p>						
<h3><u>TEST REPORT OF DRINKING WATER</u></h3>								
<p>• Name of the industry : M/S TATA STEEL, JAMADOBA, TATA STEEL LIMITED JAMADOBA GROUP PLANT, DIST. - DHANBAD (JHARKHAND)</p> <p>• Work Order Ref. NO.: : 4700126557/932 Date:- 29/05/2024</p> <p>• Sample Code : 1. Canteen- Jamadoba Colliery 2. Canteen- Jamadoba Washery 3. Canteen- Digwadih Colliery 4. Canteen- 6&7 Pits Colliery</p> <p>• Date of Sample Collection: 07.08.2024 To 09.08.2024</p> <p>• Date of Testing : 10.08.2024 To 16.08.2024</p> <p>• 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.</p>								
<h3><u>TEST RESULT</u></h3>								
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	Desirable	Permissible	
1.	Colour, (Hazen Unit)	1	1	1	1	5.00	15.0	IS 3025 (P-4):2021
2.	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	IS 3025 (P-5):2018
3.	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	IS 3025 (P-7):2017
4.	Turbidity, NTU	1	1	1	1	1.0	5.0	IS 3025 (P-10):1984
5.	pH	7.7	7.6	7.6	7.5	6.5-8.5	No. Relax.	IS-3025 (P-11):1983
6.	Total Hardness as CaCO ₃ , mg/l	400	450	445	180	200	600	IS 3025 (P-21):2009
7.	Chloride as Cl, mg/l	82.5	74.8	85	25	250	1000	IS 3025 (P-32):1988
8.	Res. Free chlorine as Cl ₂ mg/l	N.T.	N.T.	N.T.	N.T.	0.20	1.0	IS 3025 (P-26):2021
9.	Total Dissolved Solids, mg/l	770	760	750	246	500	2000	IS 3025 (P-16):1984
10.	Calcium as CaCO ₃ , mg/l	80	105	85	55	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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Ambient Air Quality, Ambient Noise Quality, Effluent Water and Groundwater Quality Report
(Period- April'24 to September'24)


Annexure- II

	<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: aditirndservices.com Phone: 0326-2952377 (O) Mobile: 09471358492, 09431512608</p>
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- 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	Desira ble	Permis sible	
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	86.0	68.0	85.0	27.6	200	400	IS 3025 (P-24):1986
14.	Nitrate as NO ₃ , mg/l	5.2	5.8	5.4	4.6	45	No. Relax	IS 3025 (P-34):1988
15.	Fluoride as F, mg/l	0.6	0.6	0.3	0.4	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,	2.8	2.2	1.8	2.0	5	15	IS 3025 (P-42):1992
23.	Total Coliform, No./100ml	Absent	Absent	Absent	Absent	Absen t	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,	494.5	500.0	473	107.5	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: aditirndservices.com Phone: 0326-2952377 (O) Mobile: 09471358492, 09431512608						
	Ref. No.: - ARDS/23-24/GW/1		Date: 17.08.2024						
	<h3 style="margin:0;">TEST REPORT OF GROUND WATER</h3>								
• 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 : 08.08.2024 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, Chromium, Mineral Oil, Alkalinity, Aluminium & Boron.							
<h3 style="margin:0;">TEST RESULT</h3>									
Sl. No	PARAMETERS OF TEST	VALUE					IS as per IS 10500:1991		Test Method
		Jorapokhar Kustand	Bhowra 13 No.	Mohalbani Basti	Lower Dungari	Jamadoba 3 No.	Desirable	Permissible	
1.	Colour, (Hazen Unit)	2	4	4	3	2	5	15	IS 3025 (P-4):2021
2.	Temperature °C	27	27	27	27	27	-	-	-
3.	Electrical Conductivity, µmhos/cm	1530	1340	1000	570	960	-	-	-
4.	Total Dissolved Solids, mg/l	858	745	555	320	537	500	2000	IS 3025(P-16):1984
5.	pH	7.4	7.5	7.5	7.6	7.8	6.5-8.5	No Relax	IS-3025(P-11):1983
6.	Total Hardness as CaCO ₃ , mg/l	552	550	572	229	452	200	600	IS 3025(P-21):2009
7.	Calcium as Ca, mg/l	112	140	120	40	112	75	200	IS 3025(P-40):1991
8.	Magnesium as Mg, mg/l	67.9	50.0	68	32.1	43	30	100	IS 3025(P-46):1994
9.	Chloride as Cl, mg/l	150	120	287.4	38	86	250	1000	IS 3025(P-32):1988
10.	Fluoride as F, mg/l	0.8	0.8	0.8	0.4	0.3	1.0	1.5	IS 3025(P-60):2008
Continued on Page -2									
									
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- 2 -

Sl. No	PARAMETERS OF TEST	VALUE					IS as per IS 10500:1991		Test Method
		Jorapokhar Kustand	Bhowra 13 No.	Mohalban i Basti	Lower Dungari	Jamadoba 3 No.	Desir - able	Permis -sible	
11	Sulphate as SO ₄ , mg/l	85.0	125.0	180.0	65	60	200	400	IS 3025(P-24):1986
12	Nitrate as NO ₃ , mg/l	4.8	5.2	5.4	4.9	5.2	45	No. Relax	IS 3025(P-34):1988
13	Alkalinity as CaCO ₃ , mg/l,	182.75	331.75	548.3	139.75	190.4	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,	2.2	2.0	2.3	2.5	2.4	5	15	IS 3025(P-42):1992
16	Iron a Fe, mg/l	0.6	0.8	0.7	0.5	0.8	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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ENVIRONMENTAL POLICY

Tata Steel's environmental responsibilities are driven by our commitment to preserve the environment and are integral to the way we do business.

1. We are committed to deal proactively with Climate Change issue by efficient use of natural resources & energy; reducing and preventing pollution; promoting waste avoidance and recycling measures; and product stewardship.
 - We shall identify, assess and manage our environment impact.
 - We shall regularly monitor, review and report publicly our environmental performance.
 - We shall develop & rehabilitate abandoned sites through afforestation and landscaping and shall protect and preserve the biodiversity in the areas of our operations.
 - We shall enhance awareness, skill and competence of our employees and contractors so as to enable them to demonstrate their involvement, responsibility and accountability for sound environmental performance.
2. We are committed to continual improvement in our environmental performance.
 - We shall set objective-targets, develop, implement and maintain management standards and systems, and go beyond compliance of the relevant industry standards, legal and other requirements.
3. We will truly succeed when we sustain our environmental achievement and are valued by the communities in which we work.

Date : November 1, 2017

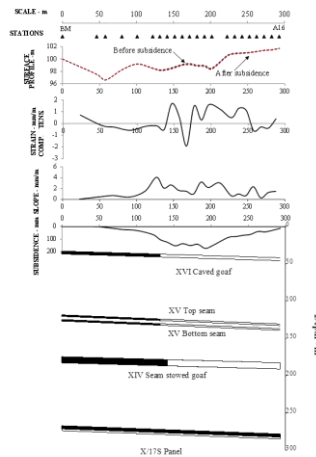


T V Narendran
CEO & Managing Director



रिपोर्ट / **REPORT**
ऑन / **ON**

झरिया कोलफील्ड की टाटा स्टील कोलियरियों में डिपिलरिंग पैनलों पर सबसिडेंस
मूवमेंट्स के कारण सतह आकृतियाँ और ढांचाओं का सुरक्षा मूल्यांकन
**SAFETY EVALUATION OF SURFACE FEATURES AND STRUCTURES
DUE TO SUBSIDENCE MOVEMENTS OVER DEPILLARING PANELS
AT TATA STEEL COLLIERIES OF JHARIA COALFIELD**



March, 2023

खान धंसान एवं सर्वेक्षण
सीएसआईआर-केंद्रीय खनन एवं ईंधन अनुसंधान संस्थान
(वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद)
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**MINE SUBSIDENCE AND SURVEYING
CSIR-CENTRAL INSTITUTE OF MINING & FUEL RESEARCH
(Council of Scientific & Industrial Research)
Barwa Road, Dhanbad - 826 015, Jharkhand**

झरिया कोलफील्ड की टाटा स्टील कोलियरियों में डिपिलरिंग पैनलों पर सबसिडेंस मूवमेंट्स के कारण सतह आकृतियाँ और ढांचाओं का सुरक्षा मूल्यांकन
SAFETY EVALUATION OF SURFACE FEATURES AND STRUCTURES DUE TO SUBSIDENCE MOVEMENTS OVER DEPILLARING PANELS AT TATA STEEL COLLIERIES OF JHARIA COALFIELD
(Period: March, 2021 to December, 2021)

Project No. SSP/690/2022-23

PROJECT PERSONNEL

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श्री संजीवन कुमार, तकनीकी सहायक/ Sri Sanjivan Kumar, Tech. Assistant
श्री जगदीपा उरांव, तकनीकी सहायक/ Sri Jagdeepa Oraon, Tech. Assistant
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श्री मनोज कुमार सिंह, वरिष्ठ तकनीशियन (1) / Sri Manoj Kumar Singh, Sr. Technician (1)

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परियोजना प्रस्तावकों के हस्ताक्षर/ Signature of Project Proponents

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(एस.के. मण्डल / S. K. Mandal)
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परियोजना समन्वयक एवं अनुसंधान समूह के प्रमुख
Project Coordinator & HORG

सीएसआईआरहस्ताक्षरकर्ता प्राधिकृत सीआईएमएफआर- / CSIR-CIMFR Authorised Signatories

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Pr. Scientist & HoS
परियोजना प्रबंधन एवं अनुवीक्षण
Project Planning and Monitoring

(जे.के. पांडे/ J. K. Pandey)
मुख्य वैज्ञानिक एवं समन्वयक
Chief Scientist & Coordinator
परियोजना प्रबंधन एवं उद्योग संपर्क
Project Planning & Industry Interface

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EXECUTIVE SUMMARY

Subsidence investigations were conducted over 5 stowed panels during March, 2021 and December, 2021 at Jamadoba 2&3 Pit, Sijua and Bhelatand collieries of Tata Steel in Jharia Coalfield for the safety evaluation of different surface features and structures. All the panels were extracted by Bord & Pillar method of mining with 70-80 percent of coal extraction in conjunction with hydraulic sand stowing. Depillaring operations were carried out at depths ranging from 137 m to 273.8 m. The width-depth ratio of the panels varied between 0.41 and 0.73, i.e., all the panels were under sub-critical width condition. All these panels were extracted under multi-seam mining condition with overlying old stowed and caved goaves. X/17S panel of Sijua colliery and XIV/4S panel of Bhelatand colliery were completed during the study period. The important surface features over most of the panels include plantations, barren land, cultivated land, road and village. The study conducted during the above period led to the following conclusion and recommendation:

1. Maximum subsidence movement was 2.56% of extraction thicknesses over the 17S panel of X seam at Sijua colliery amounting to 172 mm and the depillaring operation was completed.
2. Maximum slope, compressive and tensile strains observed over measured panels was 4.30 mm/m, 1.91 mm/m and 1.68 mm/m respectively.
3. Subsidence, slope and strains profiles were influenced by the overlying old goaves, position of goaf edges, inclination of the seam, topography of the surface profiles as well as left out stooks/ribs in the overlying seams worked by bord & pillar method of mining. Hence, the profiles were not symmetric.
4. Subsidence movements did not cause any adverse impact on surface features and structures.
5. It is recommended to erect subsidence monitoring stations at least one month before the commencement of depillaring over new panels. Layout of subsidence monitoring stations should be made as proposed.
6. It is also recommended to extend subsidence monitoring stations outside the panel boundary equal to panel depth for proper evaluation of extent of subsidence.
7. It is recommended to continue subsidence investigations for the safety evaluation of different surface features and structures lying over different on-going and future depillaring panels.

1.0 INTRODUCTION

Subsidence investigation is being carried out continuously since 1982, on yearly sponsorship at different collieries of Tata Steel (erstwhile TISCO) in Jharia Coalfield. The mine management of Tata Steel Jharia division requested Director, CSIR-Central Institute of Mining and Fuel Research (CIMFR), Dhanbad to conduct subsidence investigation over depillaring panels in the collieries of Jharia Coalfield for the period between March, 2021 and December, 2021. Subsidence investigations were conducted in three collieries, namely, Jamadoba 2&3 Pit, Sijua and Bhelatand of Tata Steel. Mining leasehold areas of these collieries have important surface features and structures like railway lines, quarters, hospital, roads, forest land, high tension line, nallah, agricultural land, water tank, buildings, etc. The main objectives of this study are to evaluate the stability and safety of different surface features and structures lying above the depillaring panels. It was proposed to conduct surface ground movement studies over 5 stowed panels from March, 2021 to December, 2021, located in the above-mentioned three collieries. The report covers outcome of subsidence investigations conducted over 5 panels at Tata Steel collieries in Jharia Coalfield during March, 2021 to December, 2021.

2.0 GEO-MINING DETAILS OF EXTRACTION

Jamadoba 2&3 Pit colliery is located in the eastern limb whereas Sijua and Bhelatand collieries are located in the western limb of Jharia Coalfield as depicted in Fig. 1. Geo-mining details of different panels are shown in Table 1. The width-depth ratio of the panels varied between 0.41 - 0.73, i.e., all the panels were under sub-critical width condition. The low value of width-depth ratios of the panels were maintained to minimize the magnitude of subsidence movements for the protection of important surface features and structures. All the stowed panels were under multi-seam working condition. Layouts of monitoring stations with overlying workings and surface features are shown in figures 2 through 6. Hindrances in the field restricted systematic erection of subsidence monitoring stations over and around the panels. Hence, at places monitoring stations were laid as per the site situation. Borehole sections of three collieries with lithology and strata thickness are shown in figures 7 to 9.

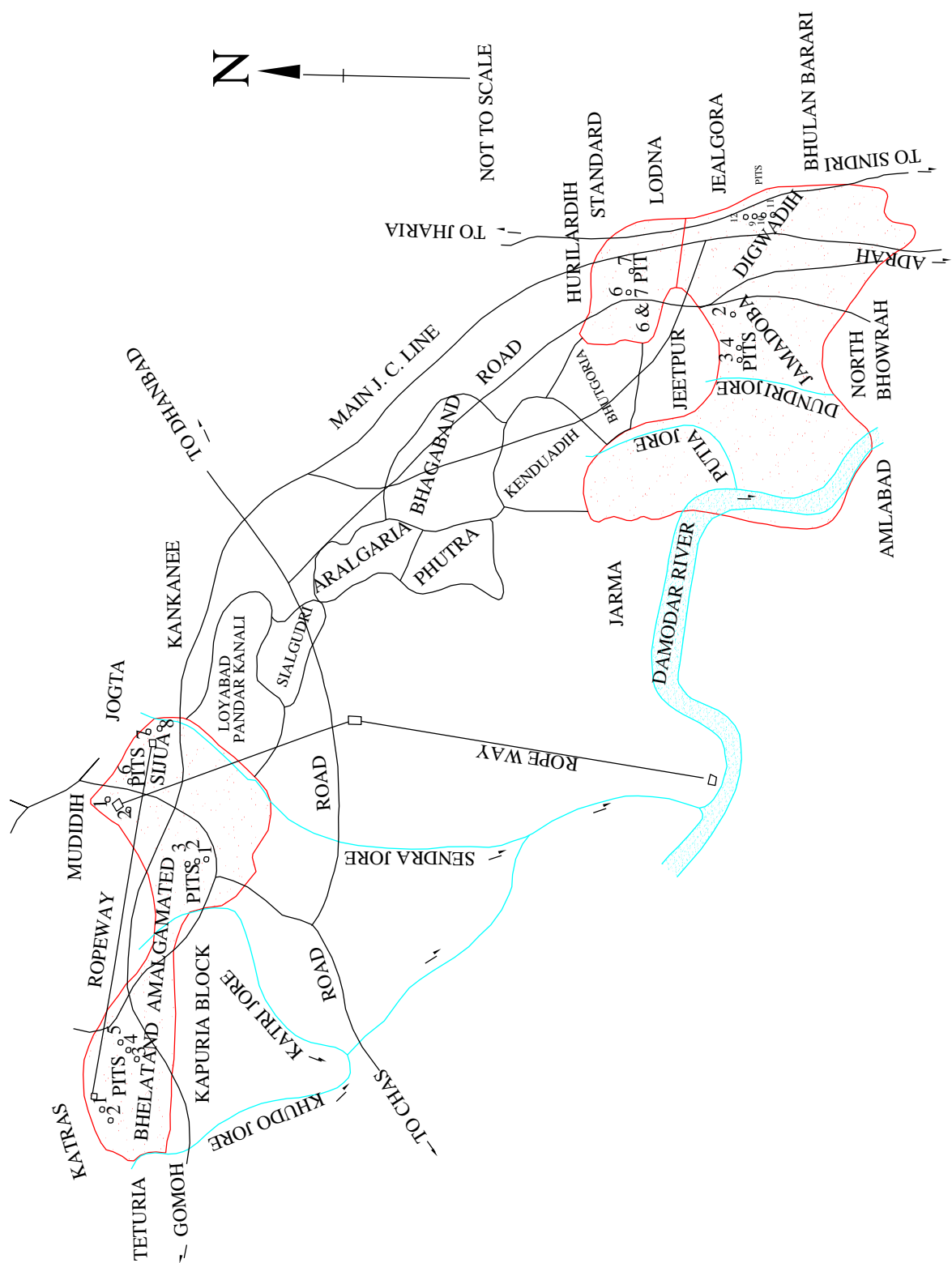


Fig. 1: Location of Tata Steel collieries in Jharia Coalfield

Table 1: Geo-mining details of extraction in different collieries of Tata Steel in Jharia Coalfield

Sl. No.	Colliery	Seam/dip of seam/panel	Extraction thickness (m)	Average depth of extraction (m)	Panel size (m x m)	Mining method / extraction percentage (%) / Overburden sandstone (%)	Extraction period	Overlying goaf	Surface properties
1	Jamadoba 2&3 Pit	XV/1 in 5/4S	3.00	137.00	245x100	B&P/70/60	02/2020 to cont.	Caved goaf in 16,15A, 15 Partly virgin and mostly standing on pillars	Barren land
2	Sijua	X/1 in 4.6/ 17S	6.71	290.11	150X280	B&P /75/65	03/2019 to 30/09/2021	16 seam, 15 (top and bottom) seams caved goaf and 14 seam stowed goaf	Plantation
3	Sijua	IX/1 in 5.07/1S (Ext.)	3.05	295.945	120X120	B&P/75/65	09/2020 to cont.	12 seam, 13 seam ,14 seam and 16 seam caved goaf	Barren land and plantation
4	Sijua	X/1 in 4.67/15S	6.71	310.850	150X300	B&P/80/65	20/02/2021 to cont.	14 seam, 15 seam (bottom), 15 seam (top) and 16 seam caved goaf	Barren land and cultivated land
5	Bhelatand	XIV(E)/1 in 5.40/4S	3.00	373.80	188X240	B&P/75/63	05/2019 to 01/08/2021	17 seam caved goaf, 16 seam standing on pillar, 15 seam partly caved and partly virgin	village and road

B&P = Bord & Pillar, S = Stowing

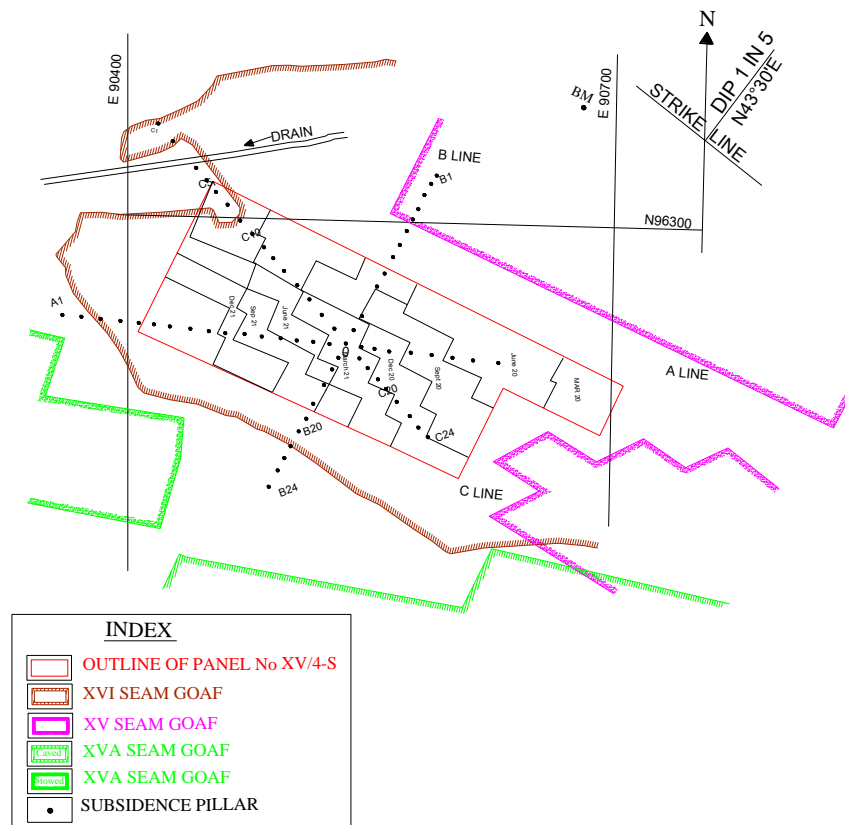


Fig. 2: Layout of monitoring stations over 4S panel of XV seam with overlying goaves at Jamadoba 2&3 Pit

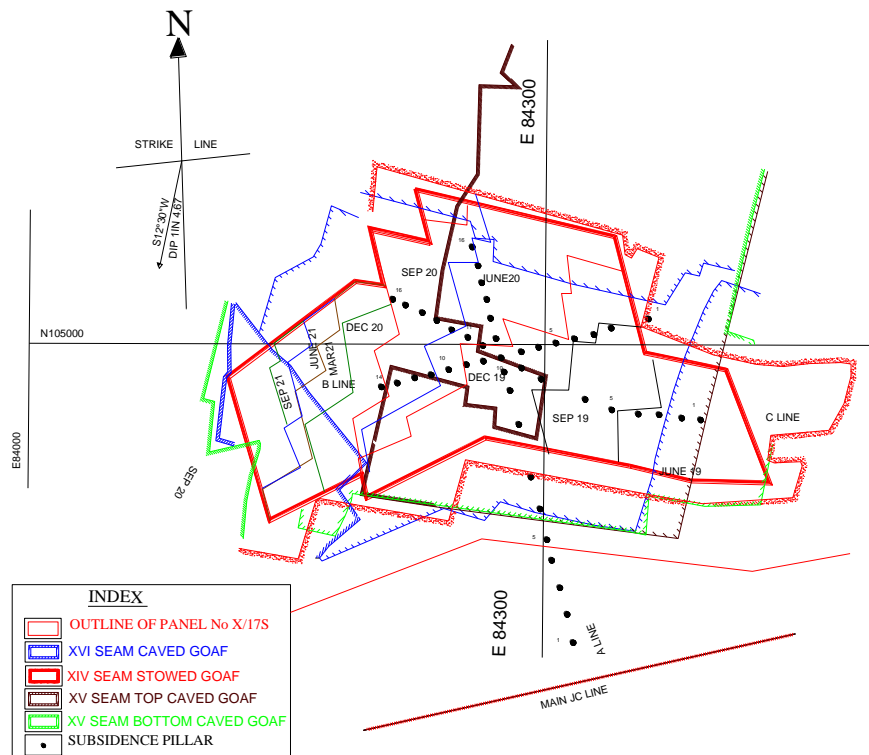


Fig. 3: Layout of monitoring stations over 17S panel of X seam with overlying goaves at Sijua colliery

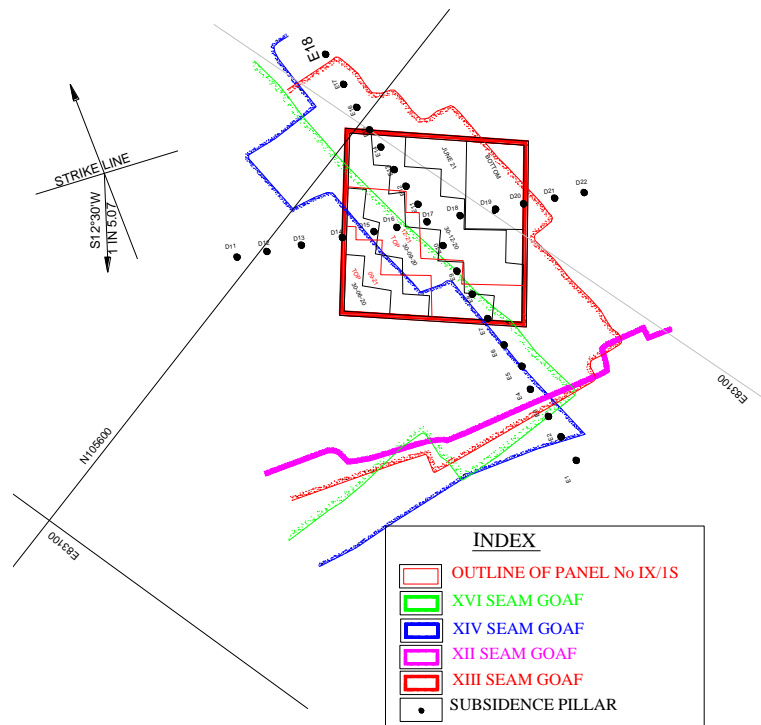


Fig. 4: Layout of monitoring stations over 1S panel of IX seam with overlying goaves at Sijua colliery

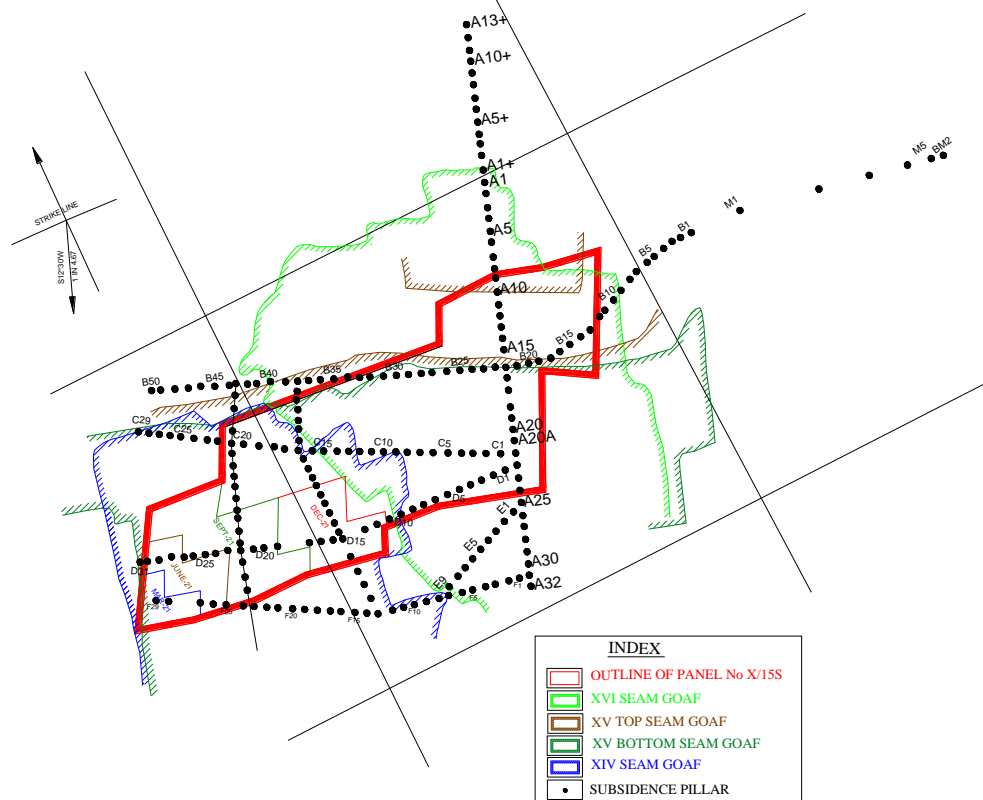


Fig. 5: Layout of monitoring stations over 15S panel of X seam with overlying goaves at Sijua colliery

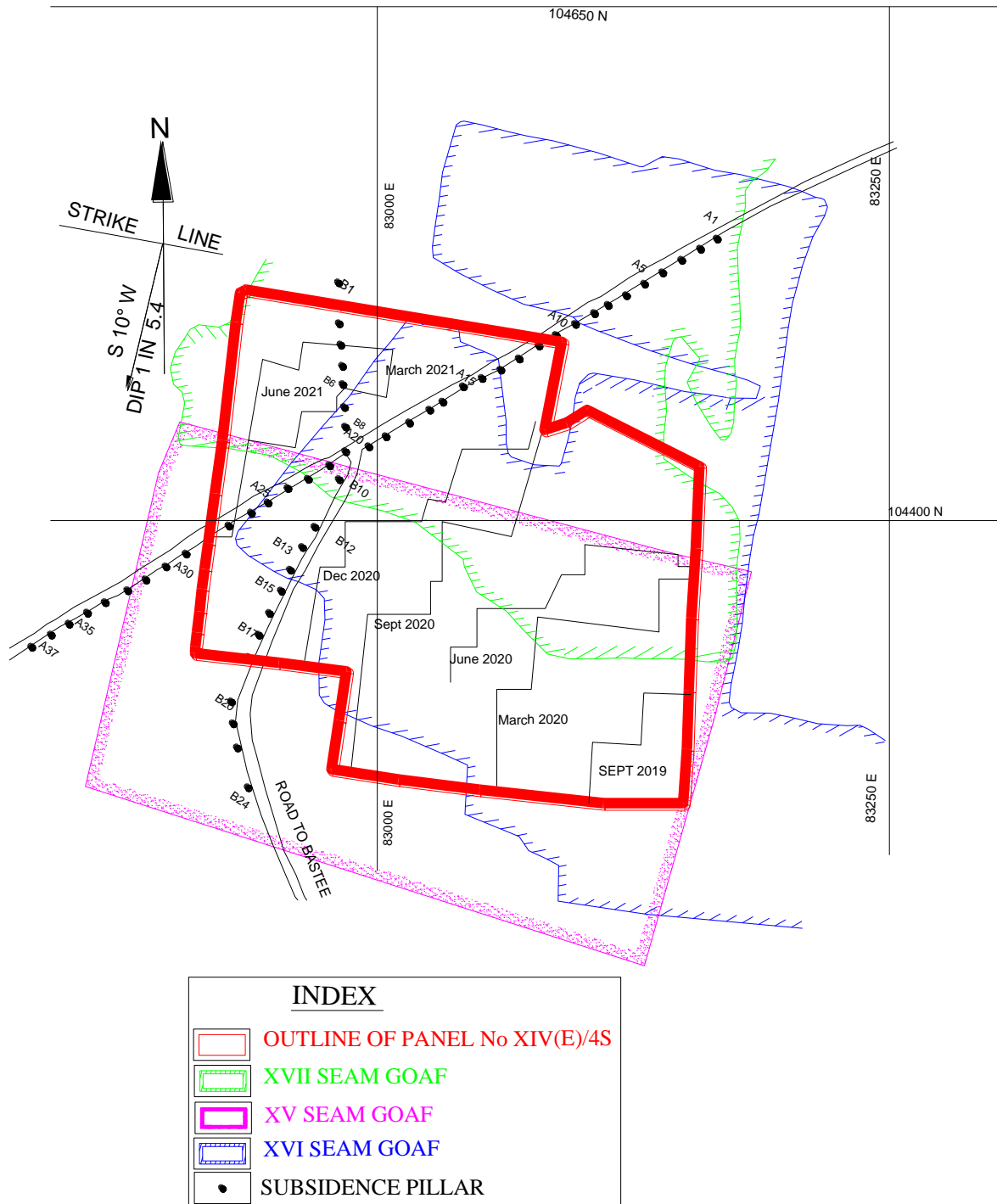


Fig. 6: Layout of monitoring stations over 4S panel of XIV seam with overlying goaves at Bhelatand colliery

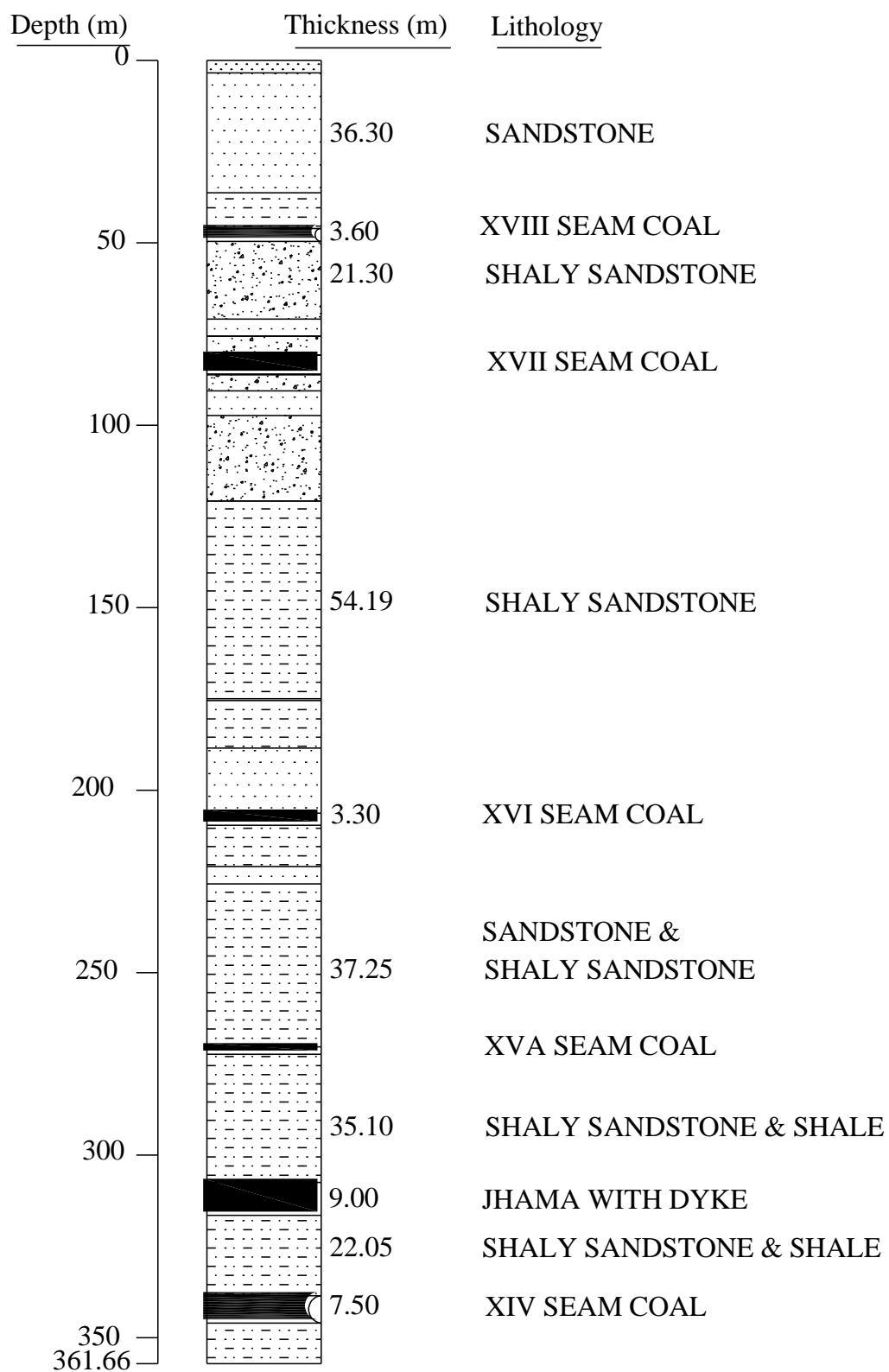


Fig. 7: Section of borehole no. J3 of Jamadoba 2&3 Pit

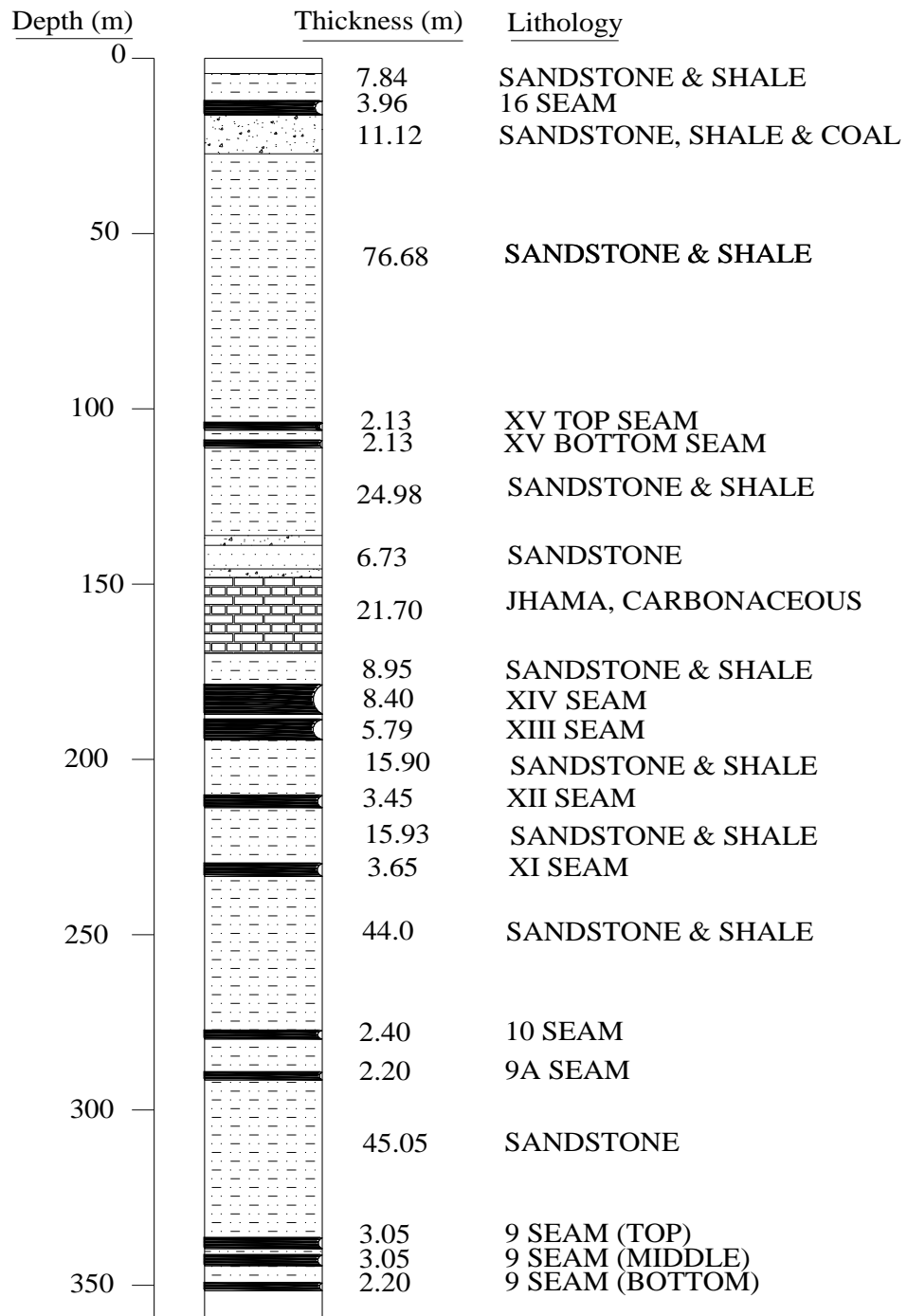


Fig. 8: Section of 2 Pit of Sijua colliery

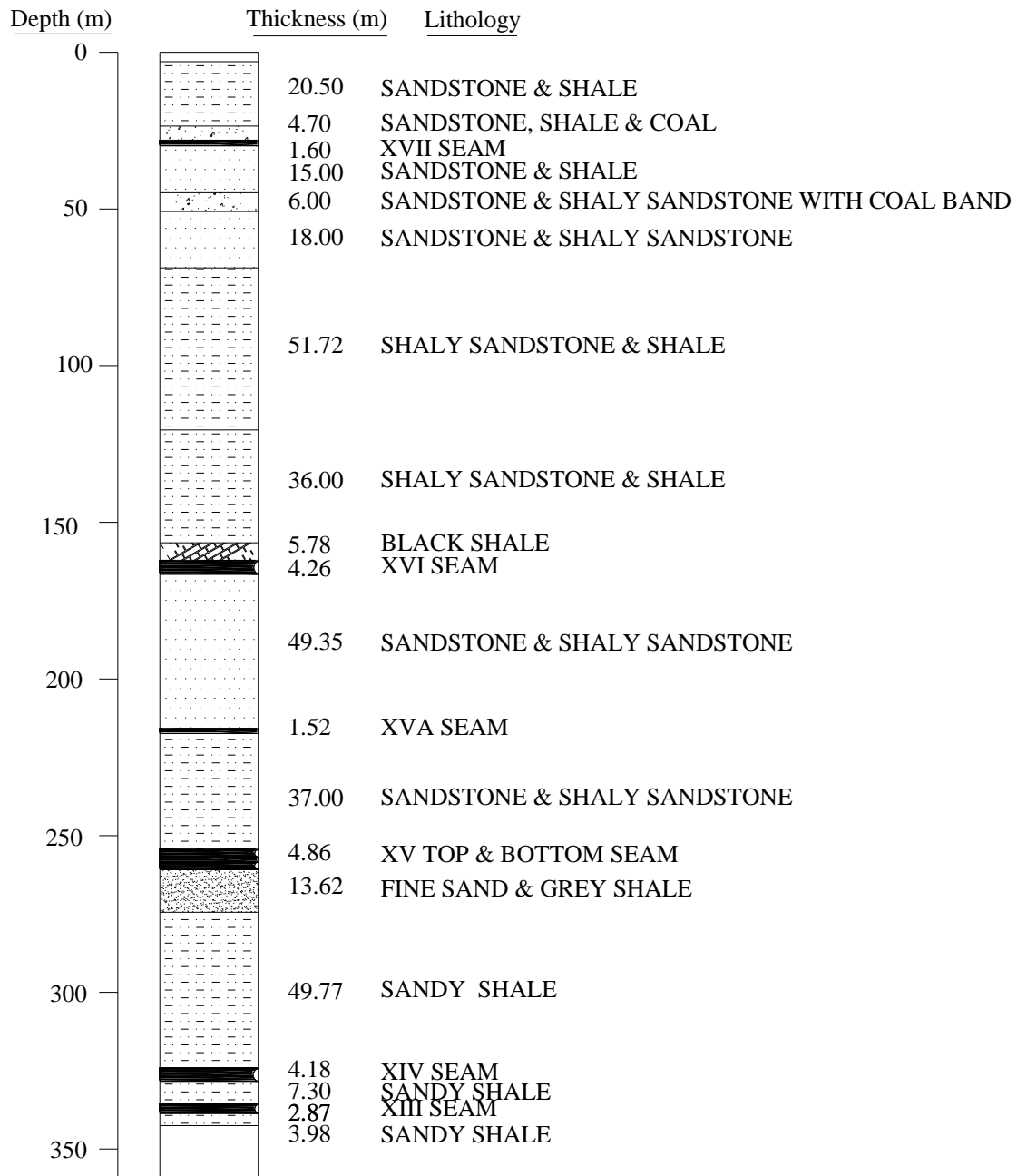


Fig. 9: Section of borehole no. B in Bhelatand colliery

The general lithologies of the overburden in all the three collieries comprise sandstone, shale, shaly sandstone, sandy shale, carbonaceous shale and coal seams. Sandstone and shale are the dominant rock types in the overburden. Percentage of sandstone lying over the working panels varied from 60 to 65%. The gradient of seam varied from 1 in 4.67 to 1 in 5.4. All the coal seams lie in Barakar formation of Lower Gondwana. Depillaring was

completed in XV/4S panel of Jamadoba 2&3 Pit and X/17S panel of Sijua colliery. Depillaring was in progress in the remaining three panels. Most of the panels lie below the barren land and plantation area (Table 1).

3.0 METHODOLOGY

Monitoring stations are fixed on the ground as per the designed layout at regular interval covering the entire area of interest. Subsidence measurement is carried out from a reference station/Bench Mark (B.M.) fixed beyond the influence of ground movement. Total Station is used to conduct subsidence investigations in all the panels.

Total Station, an outgrowth of theodolite, is used for measuring Reduced Level of subsidence monitoring stations and horizontal distance between the adjacent monitoring stations in the field (Fig. 10). This aids in computing subsidence (vertical displacement), strain (horizontal displacement) and slope of the subsidence. The key specification of Total Station is given in Table 2. Therefore, Missing Line Measurement (MLM) mode is adopted for subsidence investigation, as it calculates the horizontal distance, slope distance and difference in elevation between two target prisms as illustrated in Fig. 11.



Fig. 10: Total Station

Table 2: Specification of Total Station

Parameter	Specification
Make	Leica
Model	TS07
Measurement Range (1 prism)	3500 m
Linear accuracy	$\pm (1\text{mm} + 1.5 \text{ ppm} \times D)$
Linear Least count	1 mm
Angular accuracy	1"
Angular Least count	0.1"

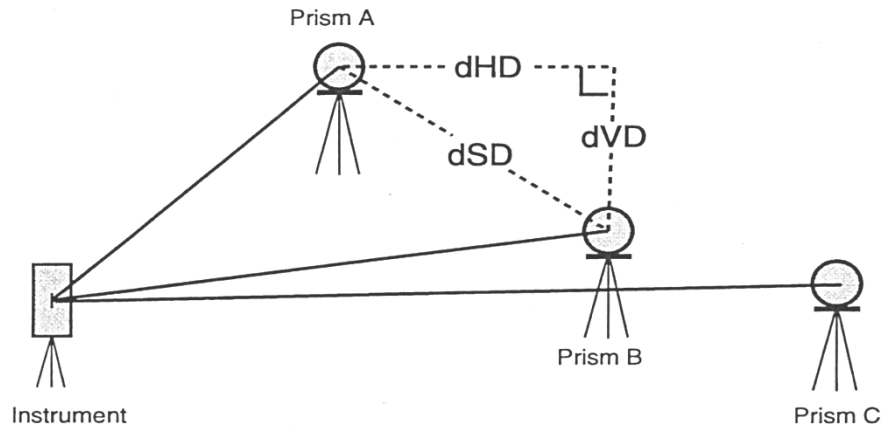


Fig. 11: Concept of Missing Line Measurement

4.0 RESULT OF SUBSIDENCE INVESTIGATIONS

Surface subsidence investigations were conducted over 5 stowed panels (1 panel at Jamadoba 2&3 Pit, 3 panels at Sijua colliery and 1 panel at Bhelatand colliery) of Tata Steel collieries in Jharia Coalfield. Depillaring in X/17S panel of Jamadoba 2&3 Pit and XIV/4S panel of Bhelatand colliery were completed in September, 2021 and August, 2021 respectively. Two readings were taken over the X/15S panel of Sijua colliery and the magnitude of subsidence was negligible till last measurement. Initial reading was taken over a new IX/3S panel of Sijua colliery. Hence, no subsidence profile was prepared for these two panels.

Total Station is proved to be useful in congested and highly undulating topographical areas for subsidence monitoring. Fixing of subsidence monitoring stations over few panels were not possible as per the desired layout owing to surface constraints like paddy field, built-up

areas, building etc. Table 3 shows the outcome of subsidence investigations conducted over 5 panels whereas figures 12 to 20 depict respective surface, strain, slope and subsidence profiles along different lines of monitoring stations erected over the studied panels. A brief description of the outcome of this study is illustrated below.

4.1 Non-Effective Width

One new panel was started during the study period at Sijua. Computation of non-effective width (NEW) of extraction, expressed in terms of average depth of extraction, was not possible due to improper layout of subsidence monitoring stations due to surface constraints.

4.2 Maximum Subsidence

Maximum subsidence movements over different stowed panels varied between 8 and 172 mm. The maximum subsidence over completed stowed panel was 2.56% of extraction height. The factors influencing the magnitude of subsidence movements include thickness of extraction, status of working over and around the panel, inclination of seam, type of goaf support, percentage of extraction, panel dimension etc.

4.3 Maximum Slope and Strains

Maximum slope, compressive and tensile strains measured over stowed panels were 4.30 mm/m, 1.91 mm/m and 1.68 mm/m respectively as depicted in Table 3.

4.4 Subsidence Characteristics

The characteristics of subsidence profiles observed along different lines of monitoring stations are as follows:

1. The shapes of the subsidence profiles were asymmetric in nature. This characteristic was primarily attributed due to the combined influence of irregular overlapping of overlying caved and stowed goaves, left out coal rib pillars in the seams of overlying panels, goaf edge effects and inclination of seams as well as varied panel geometry (Figs. 12 through 20). Maximum subsidence of 172 mm was observed over X/17S panel of Sijua colliery with a subsidence factor of 2.56. The width of the panel was 150 m with a width to depth ratio of 0.51 i.e. panel width was under sub-critical condition. However, some cumulative impact of overlying three caved panels in XVI, XV Top and XV Bottom seams and one stowed panel of XIV seam could have caused additional influence to subsidence.

2. Slope and strain profiles were also not regular. These were influenced by irregular overlying goaves, seam inclination, topography of ground surface and left out stooks/ribs in Bord & Pillar mining (Figs. 12 to 20).
3. No remarkable change was observed in ground slope and surface profiles due to underground mining with stowing as the magnitude of subsidence was low due to small width-depth ratios of the panels. All the panels were kept under sub-critical condition i.e. width-to-depth ratio of panels were from 0.41 to 0.73 resulting in generation of low strain and slope values.
4. Goaf treatment by method of stowing was adopted for all the panels with an objective to minimize ground deformation at the surface.

Table 3: Result of subsidence investigations at different collieries of Tata Steel in Jharia Coalfield

Sl. No.	Colliery/Panel	Width/depth ratio	Maximum subsidence (S)		Maximum slope (mm/m)	Maximum compressive strain (mm/m)	Maximum tensile strain (mm/m)	Remarks
			(mm)	(%)				
1	Jamadoba 2&3 XV/4S	0.73	90	3	2.26	1.48	1.34	Extraction in progress
2	Sijua X/17S	0.51	172	2.56	4.30	1.91	1.68	Extraction completed
3	Sijua IX/1S (Ext.)	0.41	36	1.18	1.02	0.78	0.96	Extraction in progress
4	Sijua X/15S	0.48	8	0.12	0.546	0.76	0.72	Extraction in progress
5	Bhelatand XIV(E)/4S	0.50	70	2.33	2.59	1.51	1.36	Extraction completed

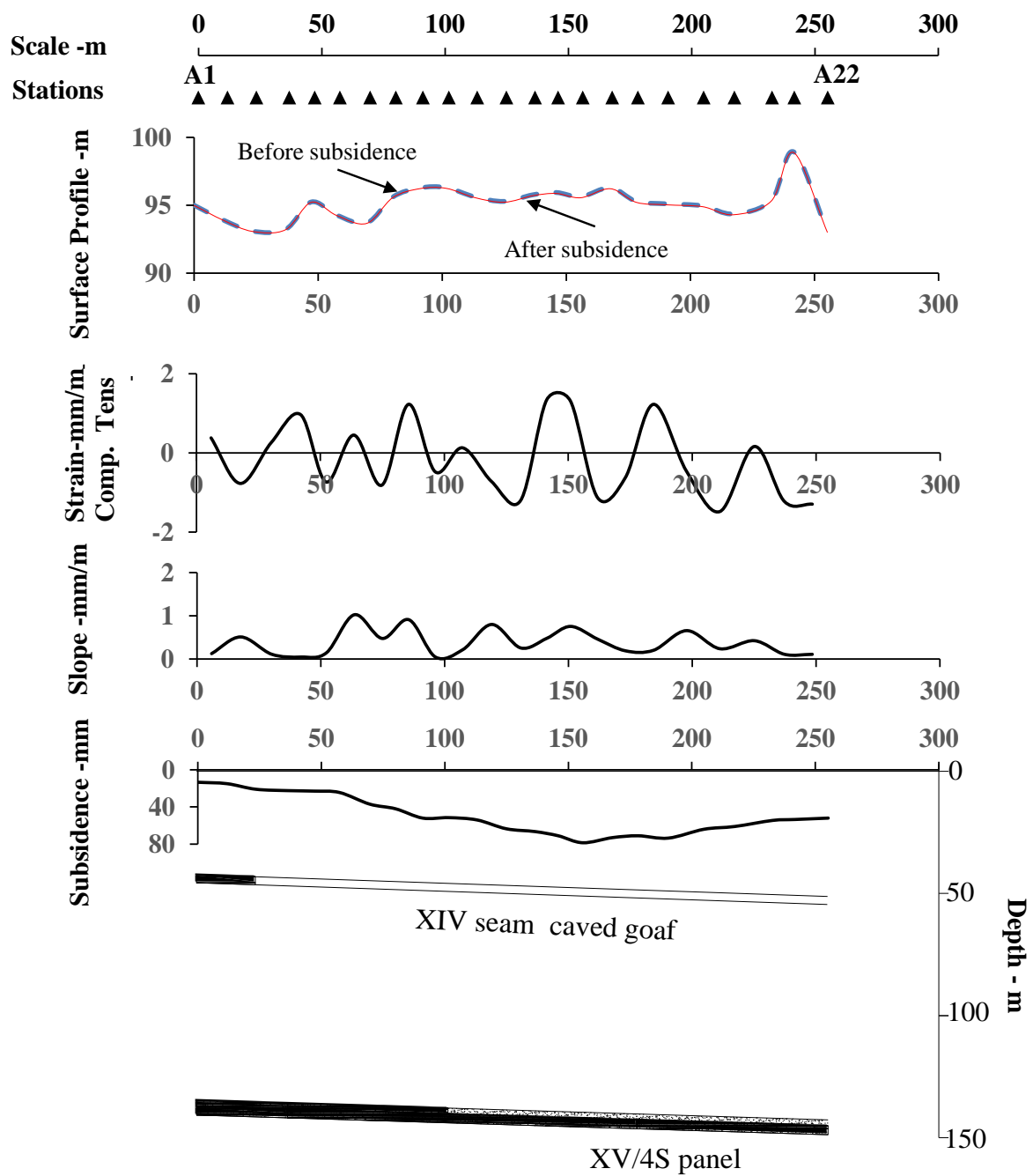


Fig. 12: Surface, strain, slope and subsidence profiles along A-line of monitoring stations over 4S panel in XV seam at Jamadoba 2&3 Pit colliery

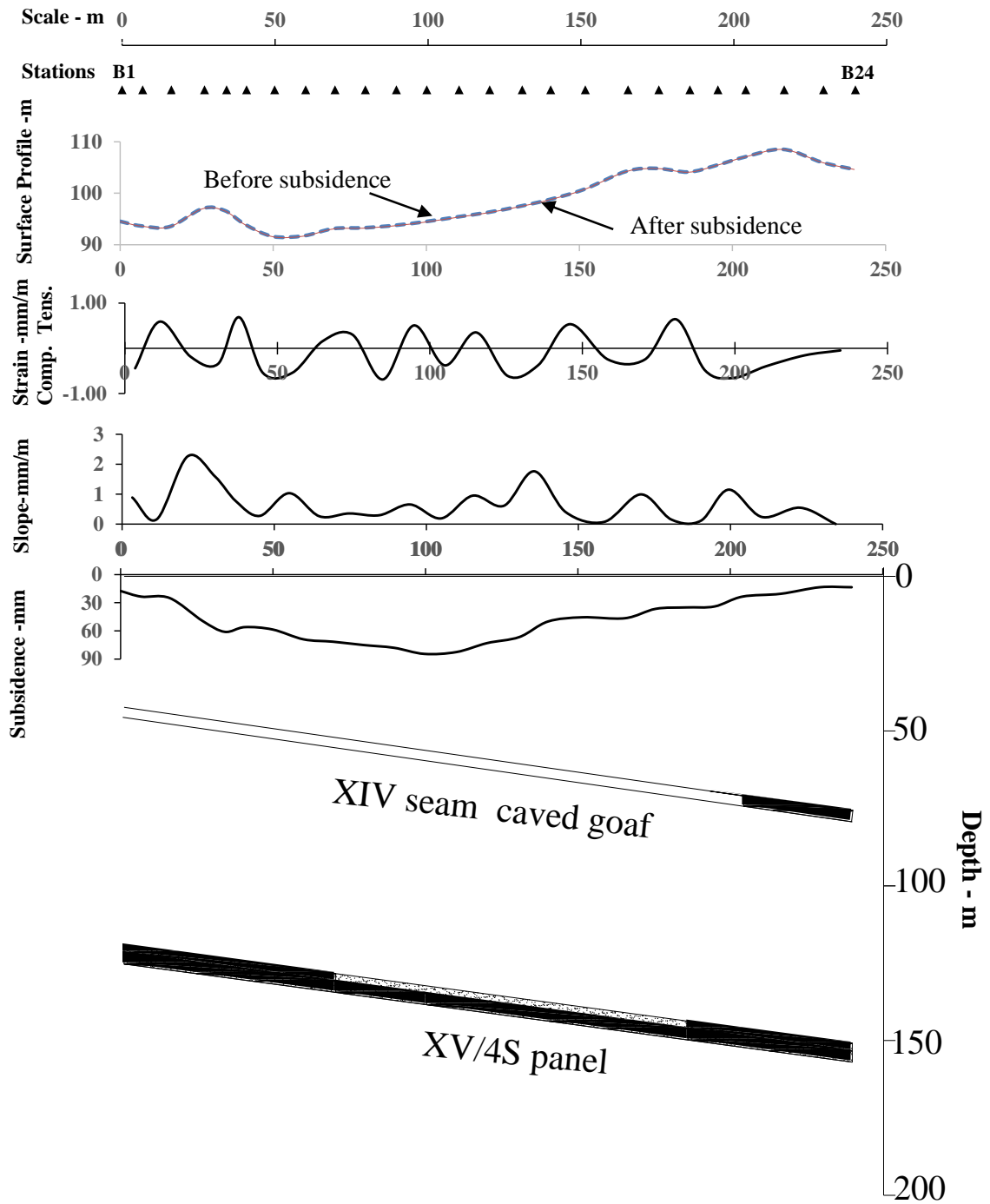


Fig. 13: Surface, strain, slope and subsidence profiles along B-line of monitoring stations over 4S panel in XV seam at Jamadoba 2&3 Pit colliery

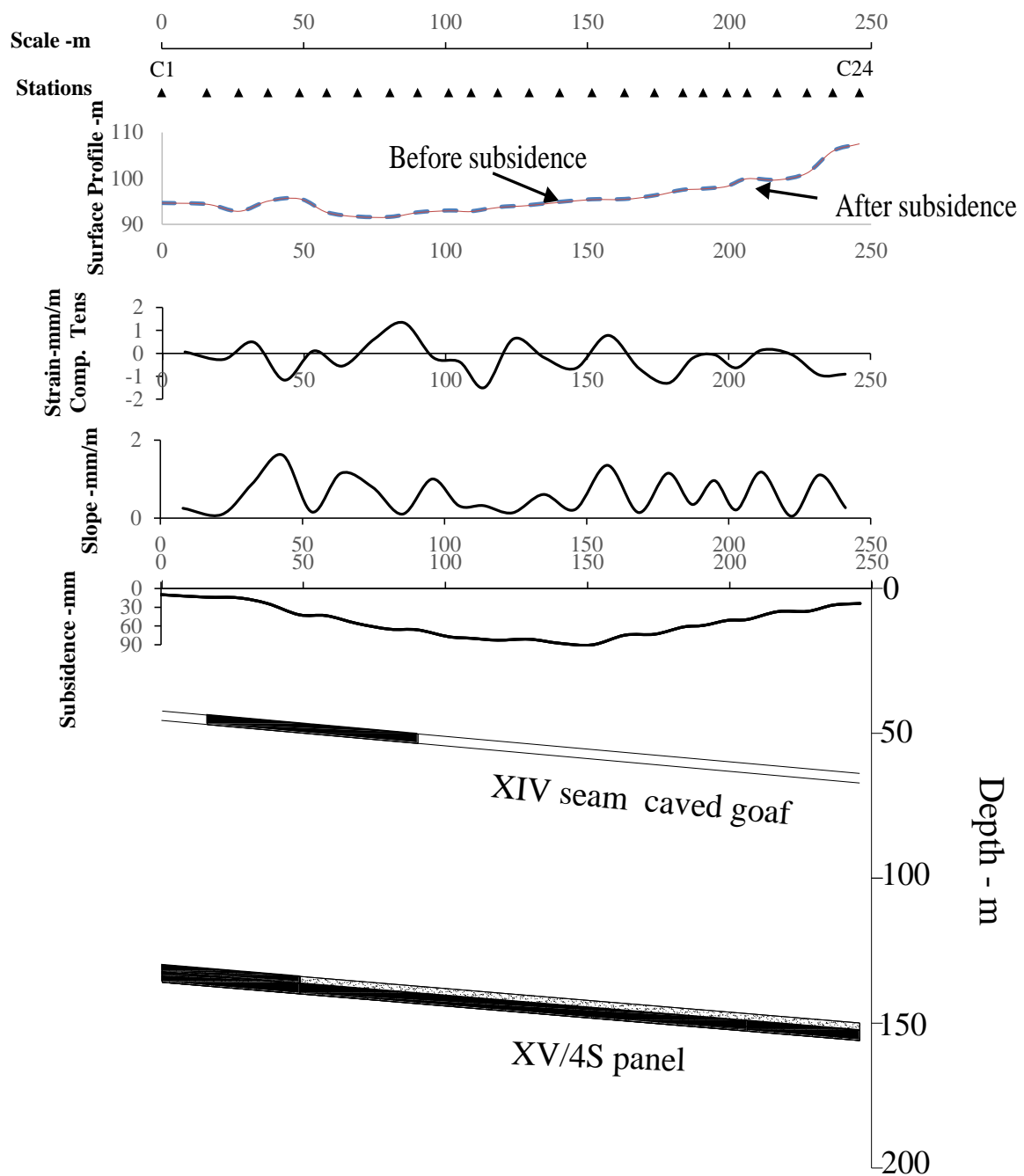


Fig. 14: Surface, strain, slope and subsidence profiles along C-line of monitoring stations over 4S panel in XV seam at Jamadoba 2&3 Pit colliery

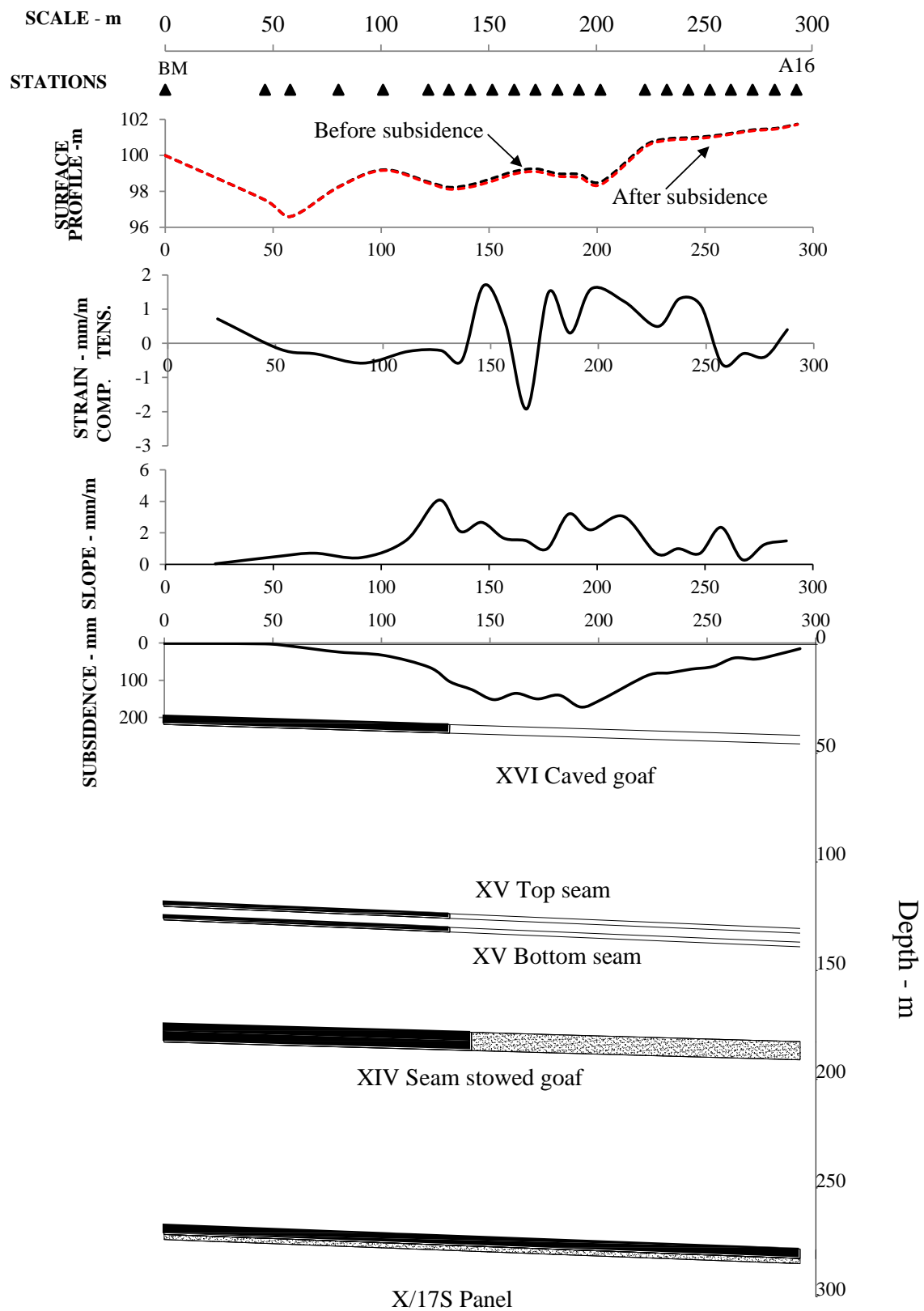


Fig. 15: Surface, strain, slope and subsidence profiles along A-line of monitoring stations over 17S panel in X seam at Sijua colliery

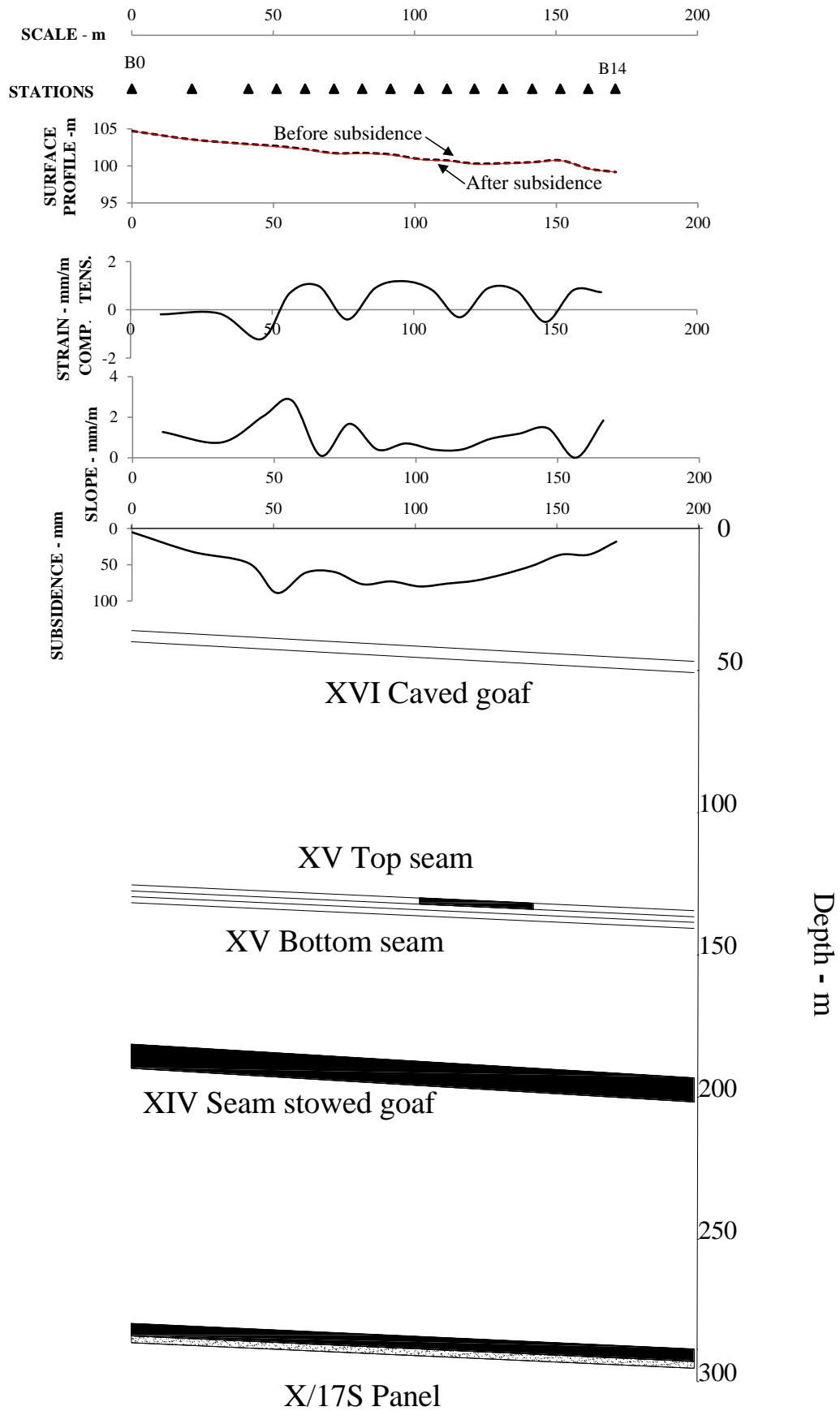


Fig. 16: Surface, strain, slope and subsidence profiles along B-line of monitoring stations over 17S panel in X seam at Sijua colliery

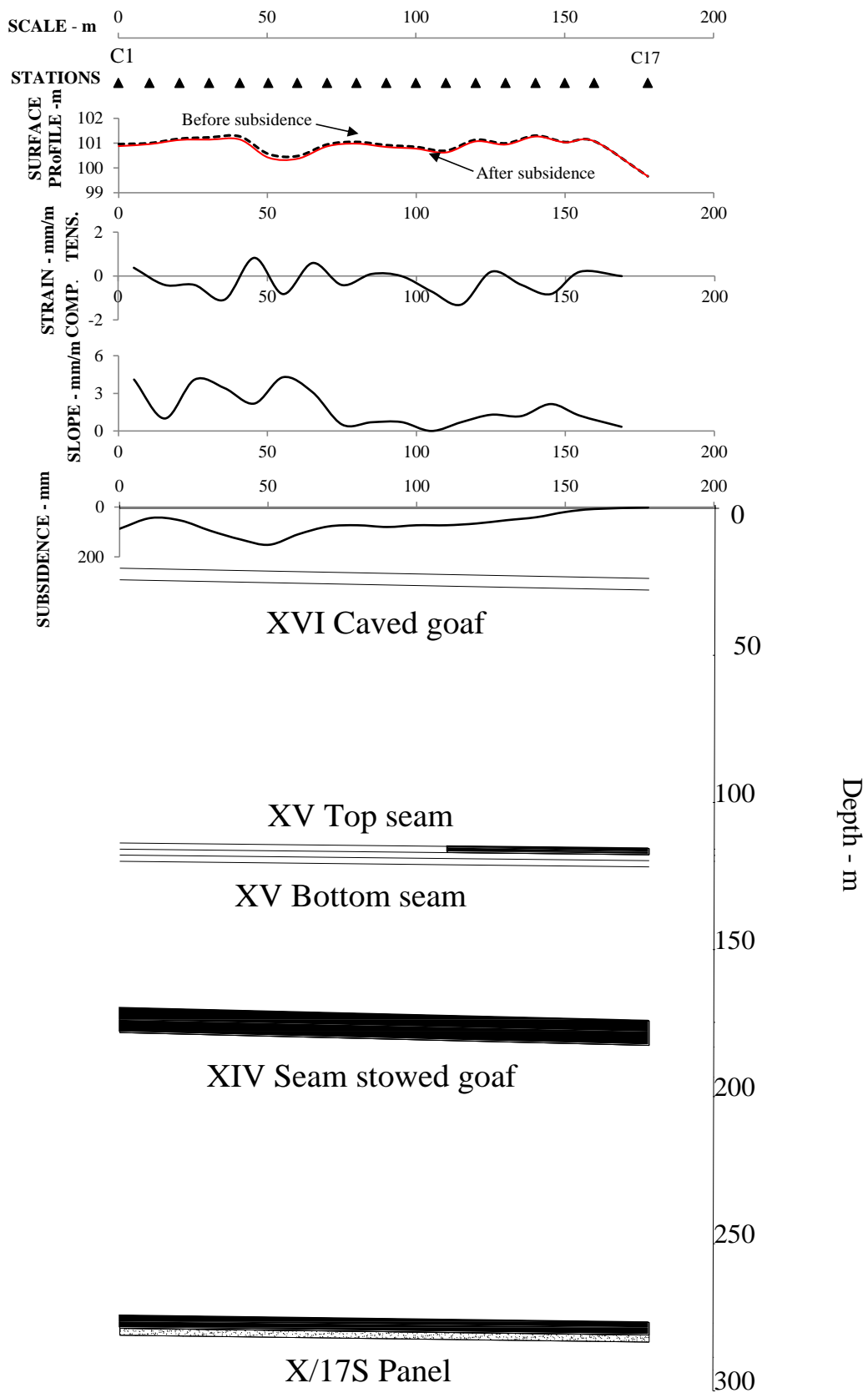


Fig. 17: Surface, strain, slope and subsidence profiles along C-line of monitoring stations over 17S panel in X seam at Sijua colliery

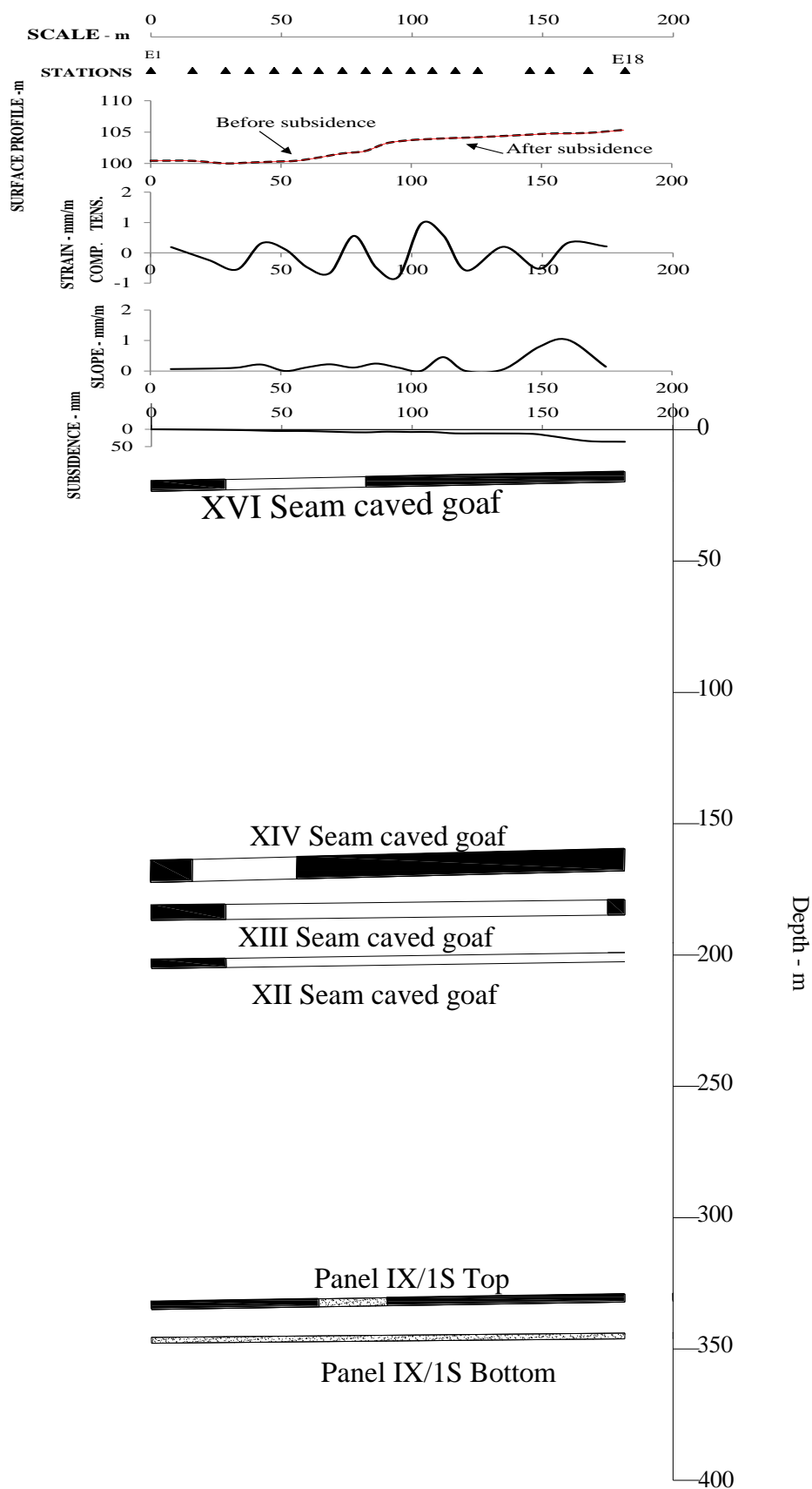


Fig. 18: Surface, strain, slope and subsidence profiles along E-line of monitoring stations over 1S (Ext.) panel in IX seam at Sijua colliery

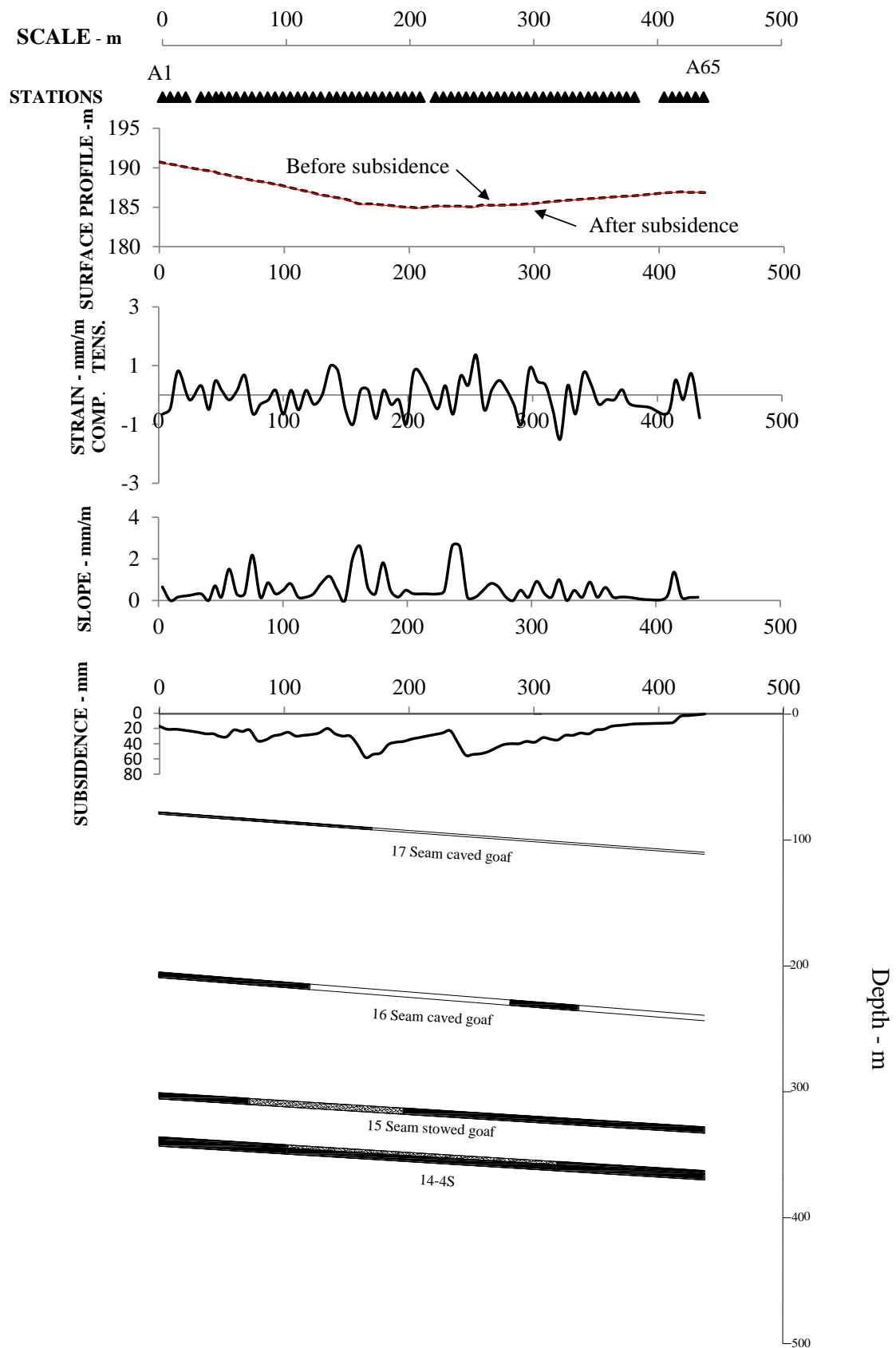


Fig. 19: Surface, strain, slope and subsidence profiles along A-line of monitoring stations over 4S panel in XIV(E) seam at Bhelatand colliery

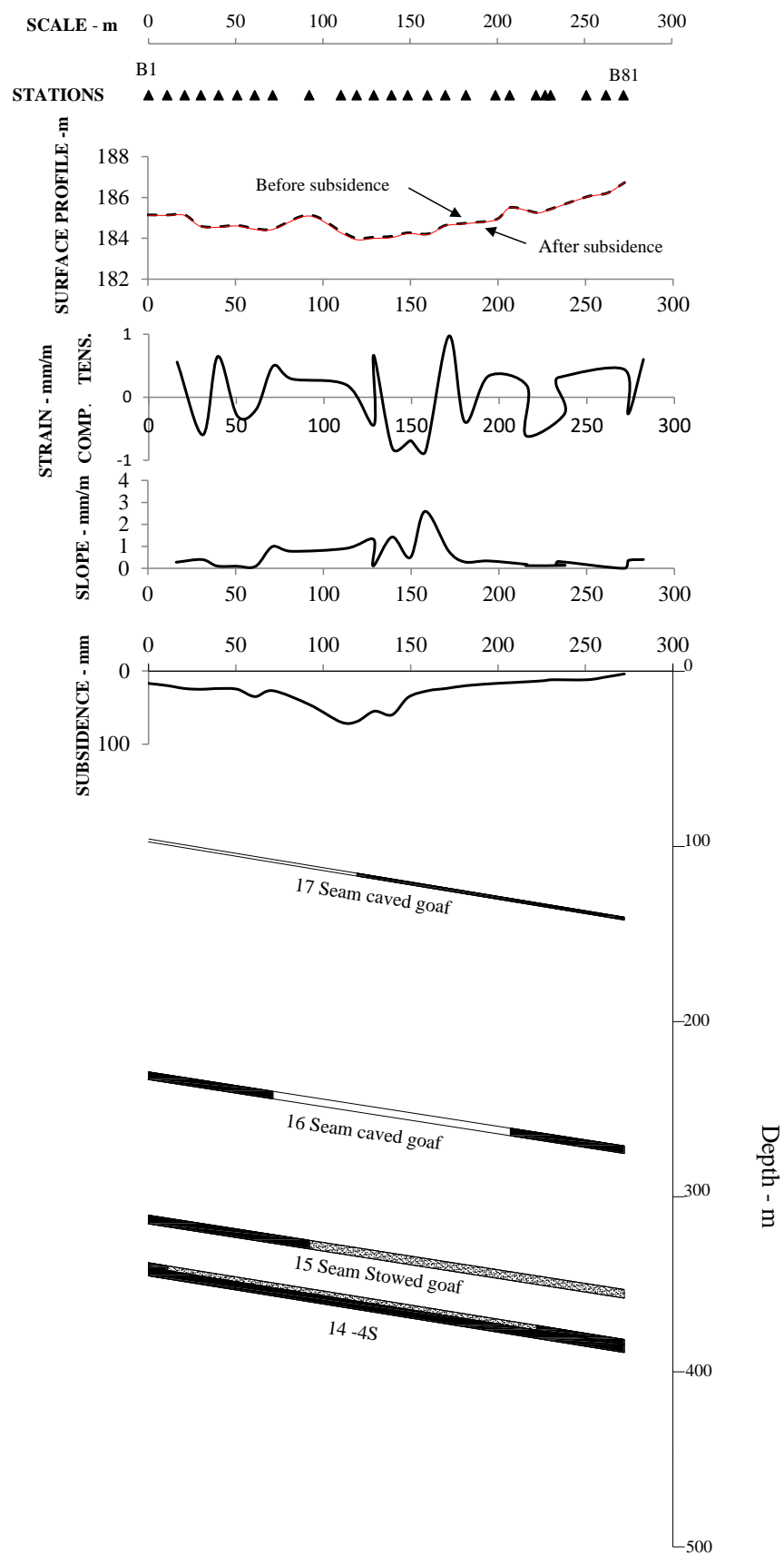


Fig. 20: Surface, strain, slope and subsidence profiles along B-line of monitoring stations over 4S panel in XIV(E) seam at Bhelatand colliery

Profile was not prepared for D-line of 1S (Ext.) panel of IX seam, Sijua, as most of the pillars were damaged. The subsidence, slope and strain measured over five panels with reference to the mining parameters i.e. depth and width-to-depth ratio are summarized in Fig. 21.

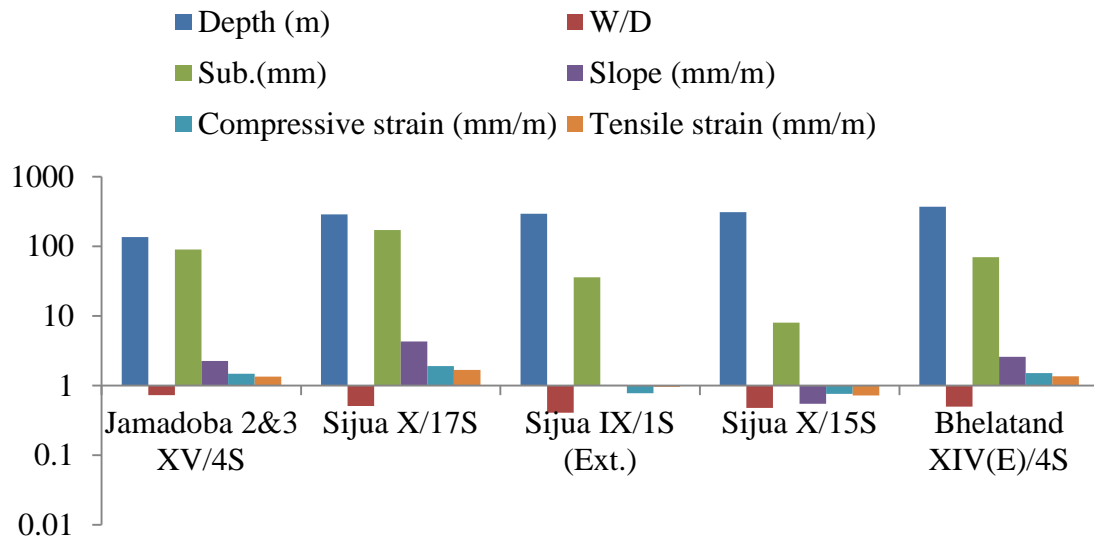


Fig. 21: Subsidence, slope and strain with respect to mining parameters

5.0 IMPACT OF SUBSIDENCE MOVEMENTS

Surface subsidence movements did not cause any adverse impact on surface features and structures as the magnitude of strains were within safe limit of 3 mm/m (Table 3). No surface cracks were noticed during the course of measurement. The overall surface topography was intact.

6.0 CONCLUSIONS

Subsidence investigations conducted over 5 stowed panels during March, 2021 to December, 2021 at Jamadoba 2&3 Pit, Sijua and Bhelatand collieries of the Tata Steel in Jharia Coalfield led to the following conclusions:

1. Maximum subsidence movement was 2.56% of extraction thicknesses over the 17S panel of X seam at Sijua colliery amounting to 172 mm and the depillaring operation was completed.
2. Maximum slope, compressive and tensile strains observed over measured panels was 4.30 mm/m, 1.91 mm/m and 1.68 mm/m respectively.
3. Subsidence, slope and strains profiles were influenced by the overlying old goaves, position of goaf edges, inclination of the seam, topography of the surface profiles as

well as left out stooks/ribs in the overlying seams worked by bord & pillar method of mining. Hence, the profiles were not symmetric.

4. Subsidence movements did not cause any adverse impact on surface features and structures.

7.0 RECOMMENDATIONS

The following recommendations are proposed for effective subsidence investigations over the Tata Steel collieries of Jharia Coalfield:

1. It is recommended to erect subsidence monitoring stations at least one month before the commencement of depillaring over new panels. Layout of subsidence monitoring stations should be made as proposed.
2. It is also recommended to extend subsidence monitoring stations outside the panel boundary equal to panel depth for proper evaluation of extent of subsidence.
3. It is recommended to continue subsidence investigations for the safety evaluation of different surface features and structures lying over different on-going and future depillaring panels.