OIC

TSM-CPP/MoEF&CC/TS-01/2025-02/188

May 19, 2025

The Director(s)
Ministry of Environment, Forest & Climate Change,
Integrated Regional Office,
A/3, Chandrasekharpur,
Bhubaneswar-751023

Subject: Submission of half yearly EC compliance reports for expansion of existing 300MW TPP by installation of 185MW coal based TPP at M/s. Tata Steel Limited-TSM-CPP(formerly known as Angul Energy Limited), Odisha for the period from October' 2024 to March' 2025.

Reference: EC vide letter No. J-13012/78/2011-IA-II(T); dated: 12.02.2015 & its amendment dated: 25.09.2020.

Dear Sir,

With reference to the captioned subject and cited reference, we are herewith submitting six monthly compliance reports for the conditions stipulated in the Environmental Clearance for expansion of existing (2x150) 300MW TPP by installation of 185MW coal based TPP at M/s. Tata Steel Limited – TSM-CPP (formerly known as Angul Energy Limited), Odisha for the period from October' 2024 to March' 2025 along with monitoring reports for your kind perusal.

The soft copies of the aforesaid compliance report are also being sent through mail to roez.bsr-mef@nic.in for your kind information and necessary record please. Also copy of EC compliance is being uploaded on MoEF&CC web site on portal http://environmentalclearance.nic.in.

Hope, the above are in line with the statutory requirements.

Thanking you

Yours faithfully,

For TSM-CPP

Rajesh Kumar Agarwal
(Factory Manager, TSM-CPP)

No.....Dt.....
RECEIVED
31 MAY 2025
S.P.C. BOARD
BHUBANESWAR

Encl: As above

Copy to: 1. The Zonal Officer, Central Pollution Control Board, Southern Conclave Block, 502, 5th & 6th Floors, 1582 Rajdanga Main Road, Kolkata – 700107.

SPECIFIC CONDITION

SL	STIPULATED CONDITIONS	COMPLIANCE STATUS
i	Vision document specifying prospective plan for the site shall be formulated and submitted to the RO of the Ministry within six months.	Vision, Mission and Environment Policy statements have submitted to the Regional Offices, MoEF&CC, BBSR along with the compliance report.
ii	Harnessing solar power within the premises of the plant particularly at available roof tops shall be carried out and status of implementation including actual generation of solar power shall be submitted along with half yearly monitoring report.	Feasibility study completed for installation of solar power plant.
iii	Sulphur and ash contents in the imported coal to be used in the project shall not exceed 0.3% and 6% respectively at any given time. In case of variation of coal quality at any point of time, fresh reference shall be made to the Ministry for suitable amendments to environment clearance condition wherever necessary.	Amendment in Environmental Clearance was obtained from MoEF&CC for change in coal source from imported to Indian coal on 25.09.2020. Presently domestic coal being used having sulphur content less than 0.5 %.
iv	A long term study of radioactivity and heavy metals contents in coal to be used shall be carried out through a reputed institute and results thereof analyzed every two years and reported along with monitoring reports. Thereafter mechanism for an in-built continuous monitoring for radioactivity and heavy metals in coal and fly ash (including bottom ash) shall be put in place.	Heavy metal contents in coal have been analyzed at CSIR-IMMT Bhubaneswar. Coal analysis report is attached as **Annexure-I** for reference.
v	A stack of 220 m height shall be provided with continuous online monitoring equipments for SO_x, NO_x, PM_{10} and $PM_{2.5}$. Exit velocity of flue gases shall not be less than 22 m/sec. Mercury emissions from stack shall also be monitored on periodic basis.	• A stack with a height of 220 meters has been constructed, equipped with continuous online monitoring systems for sulfur oxides (SOx), nitrogen oxides (NOx), and particulate matter (PM10 and PM2.5). The exit velocity of the flue gases is maintained at no less than 22 meters per second. • An online mercury analyzer has been installed at one stack attached to 165 MW to monitor Mercury content in Flue gas.

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		Manual monitoring of mercury emissions is also conducted periodically, with the analysis report attached as Manual monitoring of mercury emissions is also conducted periodically, with the analysis report for the period from Oct'24 to Mar'25 is attached as **Annexure – II**.
vi	High efficiency ESPs shall be installed to ensure that particulate emission does not exceed 50 mg/Nm3. Adequate dust extraction system such as cyclones/bag filters and water spraying system in dusty areas such as in coal handling and ash handling points, transfer areas and other vulnerable dusty areas shall be provided.	• Electrostatic Precipitators (ESPs) have been installed for each boiler to ensure emissions are below 50 mg/Nm³. • Dust extraction systems and dust suppression measures are actively implemented at ash silos and coal handling areas. • Wheel washing systems is in operation to prevent fugitive dust emissions during the movement of fly ash vehicles.
vii	Adequate dust extraction system such as cyclones / bag filters and water spraying system in dusty areas such as in coal handling and ash handling points, transfer areas and other vulnerable dusty areas shall be provided.	• Dust Extraction Systems: Installation of a dust extraction system at both the Intermediate and Main ash silos. • Dust Suppression Systems: Implementation of an effective dry fog dust suppression system and the installation of rain guns at junction houses across the entire coal handling route.
viii	COC of at least 5.0 shall be adopted	• The plant is being operated with COC more than 5.
ix	Monitoring of surface water quantity and quality shall also be regularly conducted, and records maintained. The monitoring data shall be submitted to the Ministry regularly. Further, monitoring points shall be located between the plant and drainage in the direction of the flow of ground water and records maintained. Monitoring for heavy metals in ground water shall also be undertaken and results/findings submitted along with half yearly monitoring report.	• Monitoring of influent, effluent, surface, and ground water quality is regularly conducted in our in-house NABL accredited environment laboratory at TSM, as well as through a third-party NABL accredited laboratory. • The summarized data of water quality analysis for the period from Oct'24 to Mar'25 is enclosed as **Annexure - III**.
x	A well-designed rainwater harvesting system shall be put in place within six months, which shall comprise of rainwater collection from the built up and open area in the plant premises and detailed records	Adequate number of rainwater harvesting ponds have been constructed to collect surface runoff water which is being used for plant applications.

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	kept of the quantity of water harvested every year and its use.	
xi	No water bodies including natural drainage system in the area shall be disturbed due to activities associated with the setting up / operation of the power plant.	No natural water bodies/drainage system was disturbed due to setting up this project.
xii	Hydrogeology of the area shall be reviewed annually from an institute/organization of repute to assess impact of surface water and ground regime (especially around ash dyke). In case any deterioration is observed, specific mitigation measures shall be undertaken and report/data of water quality monitored regularly and maintained shall be submitted to the Regional Office of the Ministry.	There is no deterioration of groundwater level, and the quality has been observed from the last hydrogeology study. Hydrogeology studies are being carried out on a quarterly basis internally and thorough CSIR-IMMT. Last six-month ground water quality and water level report is attached as **Annexure-IV.**
xiii	Wastewater generated from the plant shall be treated before discharge to comply limits prescribed by the SPCB/CPCB.	Wastewater generated from the plant is treated in ETP#1, and the treated water is reused for DRI shell cooling, dust suppression, and green area development.
xiv	Additional soil for leveling of the proposed site shall be generated within the site (to the extent possible) so that natural drainage system of the area is protected and improved.	No additional soil required for leveling the site as project activity has been completed.
xv	Prior approval of the Ministry shall be obtained for Mine Void and abandoned stone quarry filling of fly ash based on the outcome of the pilot study for which permission was accorded to the existing units by the Ministry on 05.09.2013 subject to Hon'ble NGT's Order.	• Presently fly ash is not used for coal mine void filling. • Fly ash is also being supplied to ○ Nearby fly ash brick manufacturing units, free of cost at door delivery model, for maximum utilization of ash. ○ Cement plants through bulker. ○ Construction of national highways (NH-55 & NH 149). • Balance ash if any is being utilized in reclamation of low-lying areas & abandoned stone quarries as per guidelines of CPCB/ OSPCB after grant of necessary consents. • Details of Fly Ash Generation and Utilization report is attached as **Annexure - IX**
xvi	Fly ash shall be collected in dry form and storage facility (silos) shall be provided.	• Ash is being collected in dry form in the ash silo.

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	Unutilized fly ash shall be disposed off in the ash pond in the form of slurry. Mercury and other heavy metals (As, Cr, Pb etc) will be monitored in the bottom ash as also in the effluents emanating from the existing ash pond. No ash shall be disposed off in low lying areas.	• Four silos with a capacity of 1,000 MT each and two intermediate silos with a capacity of 250 MT each have been installed. • Ash utilization is being ensured as per fly ash notification of MoEF&CC, Govt. of India. • Leachate characteristics of ash are carried out at regular intervals. The latest analysis report is enclosed as **Annexure -V**.
xvii	Fugitive emission of fly ash (dry or wet) shall be controlled such that no agricultural or non-agricultural land is affected. Damage to any land shall be mitigated and suitable compensation provided in consultation with the local panchayat.	Fly ash is being stored in ash silo and supplied to actual user by maintaining minimum 15 % moisture content. Fly Ash is transported using covered trucks/ bulker/ to avoid any fugitive emission due to transportation.
xviii	Ash pond shall be lined up with HDPE/LDPE lining or any other suitable material impermeable media such that no leachate takes place at any point of time. Adequate safety measures shall also be implemented to protect the ash dyke from getting breached.	An interim ash pond is currently functioning to store fly ash for emergency scenarios. To prevent leaching, the pond has been lined with bentonite material. Additionally, adequate safety measures are already in place to protect the ash dyke from breaches.
xix	Green belt consisting of three tires of plantation of native species around plant and at least 50 m width shall be raised. Wherever 50 m width is not feasible a 20 m width shall be raised, and adequate justification shall be submitted to the Ministry. Tree density shall not be less than 2500 trees per ha with survival rate not less than 80%. Only native species shall be planted and the green belt development shall be expedited.	• Wherever feasible, greenery has been developed in and around the plant premises using mainly native plant species. The survival rate of plant species is about 80%. • Plantation of saplings is done regularly based on availability of vacant areas.
xx	CSR schemes identified based on Public Hearing issues and need based assessment shall be implemented in consultation with the village panchayat and the District administration starting from the development of the project itself. As part of CSR, prior identification of local employable youth and eventual employment in the project after imparting relevant training shall be also undertaken. Company shall provide separate budget for	• The peripheral development is being carried out based on socio-economic survey of the area on need based assessment. • Various socio-economic development programs covering education (Green school project in collaboration with TERI) Roads in the nearby villages, safe drinking water, sanitation, sports and health care etc. are undertaken in nearby villages as per the suggestions made in public hearing. The

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	community development activities and income generating program.	above includes social engineering as well as infrastructure projects.
xxi	As committed, a minimum amount of Rs. 40.00 crore shall be earmarked for CSR activities for next five years. For proper and periodic monitoring of CSR activities, a CSR committee or a social audit committee or a suitable credible external agency shall be appointed. CSR activities shall also be evaluated by an independent external agency. This evaluation shall be both concurrent and final.	• Various CSR activities have been undertaken since the inception of the plant by providing facilities of sanitation, drinking water, education, health care, road and communication etc. Following the acquisition of the industry by Tata Steel Limited, there has been a significant increase in both the variety and expenditure related to CSR activities. • Breakdown of CSR initiatives for the FY'25 is enclosed as **Annexure-VI**.
xxii	For proper and periodic monitoring of CSR activities, a CSR committee or a social audit committee or a suitable credible external agency shall be appointed. CSR activities shall also be evaluated by an independent external agency. This evaluation shall be both concurrent and final.	• As per the revised companies Act, 2013 and its amendment, CSR committee has been formed. Evaluation of each specific CSR intervention/activities is monitored & evaluated by the CSR Committee. • The peripheral development is being carried out based on socio economic survey and need based assessment. Based on this, we have provided the facilities for sanitation, drinking water, education, health care, road and communication facilities etc. to the surrounding villages.
xxiii	An Environmental Cell comprising of at least one expert in environment science/ engineering, ecology, occupational health and social science, shall be created preferably at the project site itself and shall be headed by an officer of appropriate superiority and qualification. It shall be ensured that the Head of the Cell shall directly report to the Head of the Plant who would be accountable for implementation of environmental regulations and social impact improvement / mitigation measures.	• The Environment Management Department has been established to ensure effective implementation of environmental safeguards and control measures for pollution. It is led by qualified and experienced officers who are dedicated to adhering to the stipulated regulations. Key details regarding these measures have already been submitted to the Ministry of Environment, Forest and Climate Change (MoEF&CC). • The chief of the Environment department functionally reports to the Head of Plant who is accountable for implementation of environmental regulations and social impact improvement / mitigation measures.

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A	**General Conditions:**	
i	Space for FGD shall be provided for future installation as may be required.	• CFBC (Circulating Fluidized Bed Combustion) coal-fired boiler has been installed, and to control SO_2 emissions, lime is being fed along with the coal. Adequate space has been provided for the installation of a lime injection system, and a lime sizing plant is currently under construction to supply sized lime for the effective reduction of SO_2 emissions.
ii	The treated effluents conforming to the prescribed standards only shall be re-circulated and re-used within the plant. Arrangements shall be made that effluents and storm water do not get mixed	• Wastewater is treated in ETP-1 and the treated effluents conforming to the prescribed limits are recycled and reused in dust suppression and green area irrigation. • Rainwater collected from the plant area is being channelized through drains into a series of storage ponds (3 Nos. of lagoons are in operation).
iii	A sewage treatment plant shall be provided (as applicable) and the treated sewage shall be used for raising greenbelt /plantation.	A Sewage treatment plant of capacity 3000 KLD is in operation to treat domestic sewage, and treated water is being reused for ash conditioning.
iv	Adequate safety measures shall be provided in the plant area to check/minimize spontaneous fire in coal yard especially during summer season. Copy of these measures with full details along with location on plant layout shall be submitted to the Ministry as well as to the Regional Office of the Ministry.	• 19 numbers of fire hydrants have been provided in the coal yard-1, 2 and coal shed to check / minimize spontaneous fire. • 09 numbers of gun sprinklers have also been installed in the yards to keep the surface moist. • The coal piles are leveled by scraping and compacted by rolling. • In coal silos / bins, First in First out (FIFO) principle is applied to avoid spontaneous burning. • Fire tenders are ready to put into service in case of emergency.
v	Storage facility for auxiliary liquid fuel such as LDO/HFO/LSHS shall be made in the plant area in consultation with the Department of Explosives, Nagpur. Sulphur content in the liquid fuel will not exceed 0.5%. Disaster Management Plan shall be prepared to meet any eventuality in case of	• LDO/HSD is stored in the plant area where the risk is minimum. There is a dyke around the storage tanks to contain LDO/HSD in case of any leakage. • Onsite emergency plan has prepared to meet any eventuality in case of an accident taking place.

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	an accident taking place due to storage of oil.	• As per specification of the supplier, the sulfur content in the fuel is less than 0.5 % by mass.
vi	First aid and sanitation arrangements shall be made for the drivers and other contract workers during construction phase.	• Adequate First aid and sanitation arrangements were made during the construction phase of the plant. • Similar facilities are being maintained during operational phase for the workers and employees.
vii	Noise level emanating from turbines shall be so controlled such that the noise in the work zone shall be limited to 85 dB(A) from the source. For people working in the high noised areas, requisite PPEs like ear plugs/ear muffs etc shall be provided. Workers engaged in noisy areas such as turbine area, air compressors etc shall be periodically examined to maintain audiometric records and for treatment for any hearing loss including shifting to non-noisy/less noisy areas.	• Enclosures and silencers have been provided for primary air and secondary air fans of all four boilers. • Necessary PPEs are being provided to all the workers working in noise prone areas and periodic examination is being conducted for the workers engaged in noise prone areas. • Noise monitoring is carried out regularly at six locations in the work zone areas. • The summary of noise monitoring report for the period from Oct'24 to Mar'25 is enclosed as **Annexure – VII.**
viii	Regular monitoring of ambient air ground level concentration of SO_2, NO_x, $PM_{2.5}$, PM_{10} and Hg shall be carried out in the impact zone and records maintained. If at any stage levels are found to exceed the prescribe limits, necessary control measures shall be provided immediately. The locations of the monitoring stations and frequency of monitoring shall be decided in consultation with SPCB. Periodic reports shall be submitted to the regional office of the Ministry. The data shall also be put on the website of the Company.	• 5 Nos. of ambient air quality monitoring stations have set up in nearby villages for measuring the monthly ground level concentrations of PM_{10}, SO_2 and NOx in consultation with SPCB, Odisha. • The summary of ambient air quality monitoring report for the period from Oct'24 to Mar'25 is enclosed as Annexure **– VIII**.
ix	Utilization of 100 % fly ash generated shall be made from 4th year of operation. Status of implementation shall be reported to the Regional Office of the Ministry from time to time.	• Presently 100 % utilization of fly ash is being achieved by supplying cement manufacturing units and supplying to bricks manufacturing units on a transport subsidy basis. Balance ash if any is being used in filling abandoned stone quarries, low lying areas,

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		• The annual implementation report on fly ash generation and utilization is being submitted regularly to the Regional Office of the Ministry and SPCB Odisha. The last report was submitted vide letter no. TSM-CPP/SPCB/TS-06/2025-01/186 dated 29.04.2025 and the copy is enclosed as **Annexure-IX.**
x	Provision shall be made for the housing of contractor workers (as applicable) within the site with all necessary infrastructure facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc.	Adequate arrangements for housing of construction workers were made during the construction phase of the plant.
xi	The project proponent shall advertise in at least two local newspapers widely circulated in the region around the project, one of which shall be in the vernacular language of the locality concerned within seven days from the date of this clearance letter, informing that the project has been accorded environment clearance and copies of the clearance letters are available with the SPCB/Committee and may also be seen at website of the Ministry of Environment and Forests at http://envfor.nic.in	• Advertisements were circulated in The Telegraph (English daily) dated 15.02.2015 and the Samaya (Oriya daily) dated 15.02.2015. • A copy of the same was submitted to MoEF&CC vide letter no. BSL/MoEF/BS-02/2015-09 dated 21.02.2015.
xii	A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parishad / Municipal Corporation, Urban Local Body and the local NGO, if any, from whom suggestions/representations, if any, were received while processing the proposal. The clearance letter shall also be put on the web site of the Company by the Proponent.	Copy of the environment clearance was submitted to the concerned village panchayat, Zila Parishad, District Industry Centre etc.
xiii	The proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of measured data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the MoEF, the respective zonal office of CPCB and the SPCB. The criteria	• Status of compliance with the stipulated environment clearance conditions are uploaded and sent to the MoEF&CC, CPCB and SPCB. • Results of online air quality monitoring are being displayed near the main gate.

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	pollutant levels namely SPM, RSPM (PM_{10} and $PM_{2.5}$) SO_2, NO_x (ambient as well as stack emission) shall be displayed at a convenient location near the main gate of the Company in the public domain.	
xiv	The environment statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned SPCB as prescribed under the Environment (Protection) Rules 1986, as amended subsequently, shall also be put on the website of the Company along with the status of compliance of environment clearance conditions and shall also be sent to the respective Regional Office of the Ministry by e-mail.	• The environment statement for each financial year ending 31st March in Form-V is submitted regularly to the Regional Office of MoEF&CC, CPCB and SPCB, Odisha. • The last Environment Statement was submitted in Form – V vide letter no. TSM-CPP/SPCB/TS-03/2024-13/160 dated 27.09.2024.
xv	The project proponent shall submit six monthly reports on the status of the implementation of the stipulated environmental safeguards to the Ministry of environment and Forests, its Regional Office, CPCB and SPCB. The project proponent shall upload the status of compliance of the environmental clearance conditions on their website and update the same periodically and simultaneously send the same by e-mail to the Regional office of MoEF.	• Six monthly reports on the status of the implementation of the stipulated environmental safeguards are being submitted to the MoEF&CC, Regional Office, CPCB and SPCB, Odisha. • Last compliance report has been submitted vide letter no. TSM-CPP/MoEF&CC/TS-01/2024-04/167 dated 27.11.2024
xvi	Regional office of the MoEF will monitor the implementation of the stipulated conditions. A complete set of documents including Environment Impact Assessment report and Environment Management Plan along with the additional information submitted from time to time shall be forwarded to the Regional Office for their use during monitoring. Project proponent will upload the compliance status in their website and update the same from time to time at least six monthly basis. Criteria pollutants levels including NOx (from stack and ambient air) shall be displayed at the main gate of the power plant.	• All the required documents have already been submitted to the Regional Office and will be made available during inspection. • Compliance status is uploaded on the website and updated every six months.

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xvii	Separate funds shall be allocated for implementation of environmental protection measures along with item-wise break-up. These shall be included as part of the project cost. The funds earmarked for the environment protection measures shall not be diverted for other purposes and year-wise expenditure should be reported to the Ministry.	• Funds earmarked for pollution control measures are not diverted for any other activity. • Year-wise expenditure is submitted along with the annual environmental statement to the Ministry.
xviii	The project authorities shall inform the Regional Office as well as the Ministry regarding the date of financial closure and final approval of the project by the project authorities and the dates of land development work and commissioning of plant.	165 MW TG was commissioned on 23rd September 2015.
xix	Full cooperation shall be extended to the Scientists / Officers from the Ministry / Regional Office / CPCB / SPCB who would be monitoring the compliance on environmental status.	Full cooperation is being extended to the Scientists/Officers from the Ministry / Regional Office / CPCB / SPCB who would be monitoring the compliance on environmental status.
Amendment Environment clearance of 185 MW power plant File no.: J-13012/78/2011-IA.II(T) dated 25.09.2020		
SN	**Additional Condition**	**Compliance**
i	Increase in ash generation due to change in coal source from imported to domestic coal shall be utilised 100% as per the targets provided in the Fly ash Notification. Ash generation, utilisation, disposal along with the target achieved (percentage utilisation) annually shall be submitted in the compliance report. Mercury in the coal to be analysed and submitted.	• 100% fly ash utilization is ensured as per fly ash notification of MoEF&CC, Govt. of India. • Annual implementation report w.r.t. fly ash generation and utilization are being submitted periodically. The last report was submitted vide letter no. TSM-CPP/SPCB/TS-06/2025-01/186 dated 29.04.2025 and acknowledgement copy is enclosed as **Annexure-IX**. Trace element analysis of coal sample is enclosed as **Annexure-I.**
ii	The ash pond of 5 acres of ash pond was already constructed for disposing unutilised ash. No additional land is permitted for ash pond owing to increase in ash generation. PP should take proper implementation measures for control of fugitive dust during storage, handling, and transport flyash.	• Fly ash has been stored in ash silo and is being supplied to actual users through covered trucks/bulker/rake to avoid any fugitive emission due to transportation. • Fly ash is being supplied to ○ Nearby fly ash brick manufacturing units, free of cost on door delivery

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		model, for maximum utilization of ash. ○ Cement plants through rake & bulker. ○ Construction of national highways. ○ Balance ash if any is being used for reclamation of low-lying areas & abandoned stone quarries as per guidelines of CPCB/OSPCB after grant of necessary Consents. An interim ash pond is currently in operation to Store and manage ash in case of emergencies to ensure proper handling until final disposal can be arranged.
iii	The emissions from the flue gases and chimney shall meet the standard of PM: 50 mg/Nm3, SO2: 600 mg/Nm3, NOx: 300 mg/Nm3, Hg: 0.03 mg/Nm3 as per the Ministry's Notification dated 07.12.2015. Emission reporting shall be submitted in the compliance report.	• Emissions from flue gases and the chimney are well within the norms as per the Ministry's Notification dated 07.12.2015, except for SO2 emissions. CFBC coal-fired boilers have been commissioned to control NOx emissions. progress. Lime is being fed along with coal to reduce SO2 emissions. A separate bunker for mixing fluxes (lime along with coal) has been provided to control SO2 emissions. To further improve the lime conveying and dosing system and enhance desulphurization ability, a separate lime injection system is currently being commissioned. • An online mercury analyzer has been installed at CEMS-3, attached to Boiler No. 5 and 6. • A report on NOx and SO2 emissions is enclosed as **Annexure-X**.
iv	The coal transportation shall be carried out by rail as far as possible. In case, the rail/conveyor belt infrastructure is not available, road transportation may be done with tarpaulin covered trucks. The coal transportation and the ash content in the coal are governed by the Ministry's Notification dated 21.05.2020.	Coal transportation is being carried out by both rail and road with covered rakes and trucks.

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सीएसआईआर - खनिज एवं पदार्थ प्रौद्योगिकी संस्थान
(वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद)
भुवनेश्वर-751013, ओडिशा, भारत
CSIR - INSTITUTE OF MINERALS & MATERIALS TECHNOLOGY
Council of Scientific & Industrial Research
Bhubaneswar - 751013, Odisha, INDIA

TEST REPORT

Ref. No. JD/MMC/05/25 **Date: 16.05.2025**

Name & Address of the Party:	Tata Steel Ltd. At-Narendrapur, P.O.-Kusupanga Via-Meramandali, Dist-Dhenkanal Pin-759121, Odisha.
Your Ref. No.:	Work Order No.: 3000156889/A06, Date: 26.10.2023
Sample Details:	1. Indian Coal (01 No.) 2. Imported Coal (01 No.) 3. Iron Ore (01 No.) 4. Lime stone (01 No.)
Date of Receiving:	12.02.2025
Date(s) of Conducting Test:	03.03.2025
Date of Completion of Test:	28.04.2025

Method Adopted:

1. Proximate analysis of coal samples by classical methods.
2. Major and trace element analysis of Coal, Iron ore, lime stone and Dolomite samples through wet chemical route by gravimetric, AAS and ICP-OES techniques.
3. Coal samples were leached with distilled water at a solid: liquid ratio of 1:20 for Fluoride analysis using ISE.

Detail Report: Following data tables are enclosed:

Table-1. Proximate analysis of coal samples.
Table-2. Chemical composition analysis of coal samples.
Table-3. Trace element analysis of coal samples.
Table-4. Chemical composition analysis of Iron ore, Lime stone and Dolomite samples.
Table-5. Trace element analysis of Iron ore, Lime stone and Dolomite samples.

16/05/2025
(J. Das)
Pr. Technical Officer
MMC Dept.

16/05/25
(Dr. B. Nayak)
Chief Scientist
PL & Head, MMCD

N.B.: The samples are not drawn by CSIR-IMMT. Liability, if any, for the institute arising in connection with the testing shall be subject to ceiling of amount received by the institute from the client. The report should not be interpreted in part.

सीएसआईआर - खनिज एवं पदार्थ प्रौद्योगिकी संस्थान
(वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद)
भुवनेश्वर-751013, ओडिशा, भारत
CSIR - INSTITUTE OF MINERALS & MATERIALS TECHNOLOGY
Council of Scientific & Industrial Research
Bhubaneswar - 751013, Odisha, INDIA

TEST REPORT

Ref. No. JD/MMC/05/25 **Date: 16.05.2025**

Table-1. Proximate analysis of coal samples.

Sample ID	Moisture (%)	Volatile Matter (%)	Ash (%)	Fixed Carbon (%)
Indian coal	1.97	25.46	45.16	27.41
Imported coal	2.30	24.06	11.48	62.16

Table-2. Chemical composition analysis of coal samples.

Sl. No.	Component	Concentration in Test Samples, %	
		Indian Coal	Imported Coal
1	SiO_2	24.56	5.24
2	Al_2O_3	14.49	3.46
3	Fe_2O_3	1.24	0.31
4	TiO_2	0.93	0.18
5	MnO	0.008	0.01
6	CaO	0.24	0.61
7	MgO	0.06	0.07
8	Na_2O	0.88	0.4
9	K_2O	0.63	0.14
10	P_2O_5	0.10	0.10
11	S/SO_3	0.48/1.2	0.72/1.8
12	LOI	54.24	87.16

16/05/25

(Dr. B. Nayak)
Chief Scientist
PL & Head, MMCD

16/05/2025

(J. Das)
Pr. Technical Officer
MMC Dept.

सीएसआईआर - खनिज एवं पदार्थ प्रौद्योगिकी संस्थान
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Bhubaneswar - 751013, Odisha, INDIA

TEST REPORT

Ref. No. JD/MMC/05/25 **Date: 16.05.2025**

Table-3. Trace element analysis of coal samples

Sl. No.	Parameters	Trace element concentrations in test samples		
		Unit	Indian coal	Imported coal
1	Pb	mg/kg	22.95	2.94
2	Cd	mg/kg	BDL	BDL
3	Cu	mg/kg	49.0	16.7
4	Ni	mg/kg	52.83	23.87
5	Co	mg/kg	12.23	5.06
6	Cr	mg/kg	57.52	21.49
7	Zn	mg/kg	83.6	19.07
8	Ag	mg/kg	1.23	0.48
9	Sb	mg/kg	6.45	1.67
10	Mo	mg/kg	2.92	0.31
11	V	mg/kg	56.55	19.82
12	Se	mg/kg	1.77	0.28
13	Ba	mg/kg	180.74	23.5
14	As	mg/kg	139.5	37.2
15	Hg	mg/kg	0.91	0.62
16	B	%	0.35	0.13
17	F^- in water leaching (1:20) solutions.	mg/L	0.38	0.13

16/05/25

(Dr. B. Nayak)
Chief Scientist
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16/05/2025

(J. Das)
Pr. Technical Officer
MMC Dept.

सीएसआईआर - खनिज एवं पदार्थ प्रौद्योगिकी संस्थान
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सीएसआईआर CSIR भारत का नवाचार इंजन The Innovation Engine of India

TEST REPORT

Ref. No. JD/MMC/05/25 **Date: 16.05.2025**

Table-4. Chemical composition analysis of Iron ore and Lime stone samples.

Sl. No.	Component	Concentration in Test Samples, %	
		Iron Ore	Lime Stone
1	SiO_2	1.08	3.36
2	Al_2O_3	5.07	0.98
3	Fe_2O_3	86.14	0.14
4	TiO_2	0.43	0.03
5	MnO	0.016	0.023
6	CaO	0.09	43.35
7	MgO	0.01	9.54
8	Na_2O	1.26	0.86
9	K_2O	0.12	0.27
10	P_2O_5	0.25	0.012
11	S/SO_3	0.052/0.13	0.064/0.16
12	LOI	4.35	40.15

16/05/2025
(J. Das)
Pr. Technical Officer
MMC Dept.

16/05/25
(Dr. B. Nayak)
Chief Scientist
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सीएसआईआर - खनिज एवं पदार्थ प्रौद्योगिकी संस्थान
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Bhubaneswar - 751013, Odisha, INDIA

TEST REPORT

Ref. No. JD/MMC/05/25 **Date: 16.05.2025**

Table-5. Trace element analysis of Iron ore and Lime stone samples.

Sl. No.	Parameters	Trace element concentrations in test samples		
		Unit	Iron Ore	Lime Stone
1	Pb	mg/kg	0.26	0.05
2	Cd	mg/kg	BDL	BDL
3	Cu	mg/kg	13.54	4.97
4	Ni	mg/kg	1.15	6.62
5	Co	mg/kg	5.75	4.07
6	Cr	mg/kg	93.1	12.25
7	Zn	mg/kg	31.94	15.76
8	Ag	mg/kg	0.42	0.80
9	Sb	mg/kg	0.18	0.07
10	Mo	mg/kg	BDL	BDL
11	V	mg/kg	69.5	3.83
12	Se	mg/kg	BDL	0.12
13	Ba	mg/kg	70.26	16.48
14	As	mg/kg	0.76	23.6
15	Hg	mg/kg	0.53	0.38
16	B	%	0.67	0.51

16/05/2025

(J. Das)
Pr. Technical Officer
MMC Dept.

16/05/25

(Dr. B. Nayak)
Chief Scientist
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Mitra S.K.Private Limited

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Email: mumbailab@mitrask.com
Web : www.mitrask.com

TEST REPORT

Name & Address of the Customer:
Tata Steel Ltd.
NH-55, Narendrapur, Meramandli,
Dhenkanal,Odisha-759129, India

Report No. :C/2025/202
Date :02.05.25
Sample No. :MSK/BBSR/2025/302

We hereby certify that the following sample drawn by us from the customer has been analyzed with the following results:

1	Group	: Atmospheric Pollution
2	Description of sample *(As declared by customer)*	: Stack Emission
3	Sample Mark *(if any, given by the customer)*	: Stack Emission
4	Date of sampling	: 16.04.25 at 12:25 pm to 12:50 pm
5	Place of sampling	: TSM CPP Boiler-2
6	Environmental conditions during sampling	: Cold Chain Maintained
7	Sampling Drawn By	: Mr. Chinmaya Biswal
8	Sampling Plan & Procedures used	: USEPA
9	Location of performance of laboratory activities	: Laboratory Permanent Facility
10	Additions to, Deviation from the method (if any)	: No

A: GENERAL INFORMATION ABOUT STACK:		
1	Stack connected to	TSM CPP Boiler-2
2	Emission due to	Process Emission
3	Material of construction of Stack	MS
4	Shape of Stack	Rectangular
5	Whether Stack is provided with permanent platform	Yes
6	Capacity	NA
B: PHYSICAL CHARACTERISTICS OF STACK:		
1	Height of Stack from ground level	120 m
2	Diameter of Stack at sampling point	2.5 m x 2.5 m
3	Height of the sampling point from ground level	10 m
4	Area of Stack	6.28 m2
C: ANALYSIS/CHARACTERSTIC OF STACK:		
1	Fuel used : NA	2. Fuel consumption: NA

ANALYSIS RESULT

D: RESULTS FOR SAMPLING & ANALYSIS OF GASEOUS EMISSION:	Unit	Result	Method
Mercury	mg/Nm3	BDL(DL:0.008)	USEPA Part-29

Reviewed By:

Signature : Ananta Ku Rath
Name : Mr. Ananta Kumar Rath
Designation : Operation Manager

Authorized Signatory
For **Mitra S.K. Private Limited**

Signature Ananta Ku Rath
Name : Mr. Ananta Kumar Rath
Designation : Operation Manager

Mitra S.K.Private Limited

Building No.D5, Unit No- 230, Bhumi World Industrial Park,
Mumbai, Nashik Highway, Pimplas Village, Bhiwandi, Near Kalyan
Bhiwandi Bypass,Tal - Bhiwandi
Dist. Thane- 421302.
Tel. : 0252 2672352.
Email: mumbailab@mitrask.com
Web : www.mitrask.com

TEST REPORT

Name & Address of the Customer:
Tata Steel Ltd.
NH-55, Narendrapur, Meramandli,
Dhenkanal,Odisha-759129, India

Report No. :C/2025/203
Date :02.05.25
Sample No. :MSK/BBSR/2025/303

We hereby certify that the following sample drawn by us from the customer has been analyzed with the following results:

1	Group	: Atmospheric Pollution
2	Description of sample *(As declared by customer)*	: Stack Emission
3	Sample Mark *(if any, given by the customer)*	: Stack Emission
4	Date of sampling	: 16.04.25 at 04:10 pm to 04:35 pm
5	Place of sampling	: TSM CPP Boiler-4
6	Environmental conditions during sampling	: Cold Chain Maintained
7	Sampling Drawn By	: Mr. Chinmaya Biswal
8	Sampling Plan & Procedures used	: USEPA
9	Location of performance of laboratory activities	: Laboratory Permanent Facility
10	Additions to, Deviation from the method (if any)	: No

A: GENERAL INFORMATION ABOUT STACK:		
1	Stack connected to	TSM CPP Boiler-4
2	Emission due to	Process Emission
3	Material of construction of Stack	MS
4	Shape of Stack	Rectangular
5	Whether Stack is provided with permanent platform	Yes
6	Capacity	NA
B: PHYSICAL CHARACTERISTICS OF STACK:		
1	Height of Stack from ground level	120 m
2	Diameter of Stack at sampling point	2.5 m x 2.5 m
3	Height of the sampling point from ground level	10 m
4	Area of Stack	6.28 m2
C: ANALYSIS/CHARACTERSTIC OF STACK:		
1	Fuel used : NA	2. Fuel consumption: NA

ANALYSIS RESULT

D: RESULTS FOR SAMPLING & ANALYSIS OF GASEOUS EMISSION:	Unit	Result	Method
Mercury	mg/Nm3	BDL(DL:0.008)	USEPA Part-29

Reviewed By:

Signature : Ananta Ku Rath

Name : Mr. Ananta Kumar Rath
Designation : Operation Manager

Authorized Signatory
For **Mitra S.K. Private Limited**

Signature Ananta Ku Rath

Name : Mr. Ananta Kumar Rath
Designation : Operation Manager

Annexure-III

Summary of Surface Water Quality Analysis

(Period: From October 2024 to March 2025)

S. N	Parameter	Unit	Kishinda Nala		Lingara Nala		Brahamani River	
			U/S	D/S	U/S	D/S	U/S	D/S
1	pH Value	-	7.24-8.35	7.72-8.35	7.75-8.61	7.64-8.56	7.08-8.27	7.24-8.14
2	Colour	Hazen	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)
3	Temperature	Deg C	25-25.2	25-25.2	25-25.2	25-25.2	25-25.2	25-25.2
4	Total Suspended Solids	mg/l	18-31.2	2.6-28.3	3.2-14	4.1-13.1	3-20.2	8-20.3
5	Arsenic as As	mg/l	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
6	BOD, 3days at 27°C	mg/l	2.1-2.5	3.2-4.6	2.6-5.3	3.2-4.6	3.2-8.3	2.4-5.8
7	Boron as B	mg/l	BDL(DL:0.25)	BDL(DL:0.25)	BDL(DL:0.25)	BDL(DL:0.25)	BDL(DL:0.25)	BDL(DL:0.25)
8	Cadmium as Cd	mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)
9	Calcium as Ca	mg/l	18.1-36	16.5-42	22.1-42.4	16.8-43	8-22	8-22
10	Chlorides as Cl	mg/l	8.6-45.26	9.7-45.26	11.1-116.9	13.2-116.9	4.8-21	11.31-19
11	COD	mg/l	7.9-8	12-19.6	3.4-7.6	7.8-9.8	3.2-8.3	9.8-14
12	Copper (as Cu)	mg/l	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)
13	Cyanide as CN	mg/l	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)
14	Fluoride as F-	mg/l	0.82-4.2	1.2-6	0.13-1.2	0.17-2.6	0.16-4.5	0.11-2.9

S. N	Parameter	Unit	Kishinda Nala		Lingara Nala		Brahamani River	
			U/S	D/S	U/S	D/S	U/S	D/S
15	Hexa Chromium as Cr +6	mg/l	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)
16	Iron as Fe	mg/l	1.84-5.4	0.14-1.8	0.27-0.8	0.16-0.17	0.21-1.9	0.18-2.1
17	Lead (as Pb)	mg/l	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
18	Manganese (as Mn)	mg/l	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)
19	Mercury (as Hg)	mg/l	BDL(DL:0.0002)	BDL(DL:0.0002)	BDL(DL:0.0002)	BDL(DL:0.0002)	BDL(DL:0.0002)	BDL(DL:0.0002)
20	Nickel (as Ni)	mg/l	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)
21	O&G	mg/l	BDL(DL:1.4)	BDL(DL:1.4)	BDL(DL:1.4)	BDL(DL:1.4)	BDL(DL:1.4)	BDL(DL:1.4)
22	Phenolic Comp	mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)
23	Phosphate as P	mg/l	0.32-0.34	0.26-0.28	0.16-0.21	0.19-0.23	0.12-0.28	0.24-0.32
24	RFC	mg/l	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)
25	Selenium (as Se)	mg/l	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
26	TKN	mg/l	BDL(DL:0.3)	BDL(DL:0.3)	BDL(DL:0.3)	BDL(DL:0.3)	BDL(DL:0.3)	BDL(DL:0.3)
27	Zinc (as Zn)	mg/l	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)	BDL(DL:0.02)

Ground Water Quality Analysis Report of surrounding villages

February 2025

	Location		Kharagprasad	Charadagadia	Sibpur	Kochilamada	Galapada	Motonga	Narendrapur	Khaliberena	Kharagprasad
S.N.	**Parameters**	**unit**	**GW-01**	**GW-02**	**GW-03**	**GW-04**	**GW-05**	**GW-06**	**GW-07**	**GW-08**	**GW-9**
1	**pH**	**-**	8.12	8.04	7.55	8.08	8.01	7.69	8.21	8.03	8.01
2	**Odour**	**-**	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	**Colour**	**mg/l**	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)
4	**Turbidity**	**N.T. U**	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)
5	**Total Dissolved Solids (as TDS)**	**mg/l**	848	841	888	860	876	946	792	780	758
6	**Aluminium as Al**	**mg/l**	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
7	**Anionic Surface-Active Agents as (MBAS)**	**mg/l**	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
8	**Boron as B**	**mg/l**	BDL(DL:0.5)	BDL(DL:0.5)	BDL(DL:0.5)	BDL(DL:0.5)	BDL(DL:0.5)	BDL(DL:0.5)	BDL(DL:0.5)	BDL(DL:0.5)	BDL(DL:0.5)
9	**Calcium as Ca**	**mg/l**	114	108	114	130	100	130	123	106	139
10	**Chloride as Cl**	**mg/l**	57	37	24	93	143	56	89	143	96
11	**Copper as Cu**	**mg/l**	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
12	**Fluoride as F**	**mg/l**	1.7	1.9	2.6	3.1	3.8	4.2	1.3	1.4	1.9
13	**Residual Free**	**mg/l**	BDL(DL:0.1)	BDL(DL:0.1)	BDL(D	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)

	Location		Kharagprasad	Charadagadia	Sibpur	Kochilamada	Galapada	Motonga	Narendrapur	Khaliberena	Kharagprasad
S.N.	**Parameters**	**unit**	**GW-01**	**GW-02**	**GW-03**	**GW-04**	**GW-05**	**GW-06**	**GW-07**	**GW-08**	**GW-9**
	Chlorine				L:0.1)						
14	**Iron as Fe**	**mg/l**	BDL(DL:0.5)	BDL(DL:0.5)	BDL(DL:0.5)	BDL(DL:0.5)	BDL(DL:0.05)	BDL(DL:0.5)	BDL(DL:0.5)	BDL(DL:0.5)	BDL(DL:0.5)
15	**Magnesium as Mg**	**mg/l**	28	29	25	25	29	40	29	22	14
16	**Manganese as Mn**	**mg/l**	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
17	**Mineral Oil**	**mg/l**	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)
18	**Nitrate as NO3**	**mg/l**	BDL(DL:0.2)	2.4	3.2	17.4	7.3	5.6	33.2	19	27.6
19	**Phenolic Compounds as C6H5OH**	**mg/l**	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)
20	**Selenium as Se**	**mg/l**	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)
21	**Sulphate as SO4**	**mg/l**	87	133	89	121	143	112	158	143	126
22	**Total Alkalinity as CaCO3**	**mg/l**	435	431	420	416	451	500	467	420	482
23	**Total Hardness as CaCO3**	**mg/l**	402	392	388	428	370	492	430	356	406
24	**Zinc as Zn**	**mg/l**	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	1.06	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
25	**Cadmium as Cd**	**mg/l**	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
26	**Cyanide as CN**	**mg/l**	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)
27	**Lead as Pb**	**mg/l**	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)

	Location		Kharagprasad	Charadagadia	Sibpur	Kochilamada	Galapada	Motonga	Narendrapur	Khaliberena	Kharagprasad
S.N.	**Parameters**	**unit**	**GW-01**	**GW-02**	**GW-03**	**GW-04**	**GW-05**	**GW-06**	**GW-07**	**GW-08**	**GW-9**
					)						
28	**Mercury as Hg**	**mg/l**	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)	BDL (DL:0.001)
29	**Nickel (as Ni)**	**mg/l**	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)	BDL(DL:0.05)
30	**Total Arsenic (as As)**	**mg/l**	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)	BDL (DL:0.005)
31	**E. coli**	**/100ml**	Not Detected	Detected	Not Detected	Not Detected	Not Detected	Detected	Not Detected	Not Detected	Not Detected

Note: BDL: Below Detectable Limit; DL: Detectable Limit, U/S: Upstream D/S: Downstream

Source: Monitoring/ Analysis report of S.K. Mitra Private Limited and Environment Laboratory of TSM.

(AMBIENT AIR QUALITY REPORT)

(Period: From January 2024 to March 2025)

S. No	Location	PM 10 in µg/m3	PM2.5 in µg/m3
1	Motanga	71.98 -79.34	36.54 -40.08
2	Galpada	70.32 -76.24	33.42 -36.94
3	Nalachandrapur (Nalatangra)	68.22 -74	31.6-36.19
4	Narandrapur	68.91 -76.04	33.44 -37.65
5	Mangalpur	72.64 -76	35.4 8-37.85
6	Khaliberana	72-75.38	33.9-38.05
7	Kochilamara	70.04 -82.59	32.34 -42.56
8	Itapa	69.5-75.82	32.04 -37.56

---------- End of Report ----------

CSIR-INSTITUTE OF MINERALS & MATERIALS TECHNOLOGY.

(A Govt. of India Autonomous Body)

Environmental Chemical Laboratory

Bhubaneswar,Odisha

(An NABL Accredited Laboratory)

NABL
TC-12319

TEST REPORT

Issued to: Tata Steel Limited, Meramandali **Date : 16.12.2024**

Test Report No.11/2024-001

Sample Condition: In Plastic Jar

Sample quantity: 2 Litre

Sampling Method: APHA1060B

Source of Sample :Kisinda UP & Down stream **Sample Collected on: 14.11.2024**

Letter Reference : **Sample Analysed on: 15.11.2024**

Sl No	Characteristics	Test Method As Per APHA	Kisinda UP-stream	Kisinda down stream	Standard as per Class C-IS 2296/CPCB/SPCB
1	pH Value	APHA 4500H+ B	8.33	8.03	6.0-9.0
2	Colour	APHA 2120 B, C	15	20	300 (max)
3	Electrical Conductivity, µs/cm	APHA 2510 B	711	1004	--
4	Total Dissolved Solids, mg/l	APHA 2540 C	448.0	692.0	1500 (max)
5	Dissolved Oxygen, mg/l	APHA 2540 C	9.0	8.8	4 (min)
6	BOD (3) days at 27°C	APHA 5210 B	5.4	3.4	3 (max)
7	Chloride , mg/l	APHA 4500Cl- B	35.0	126.0	600 (max)
8	Fluoride as F , mg/l	APHA 4500F- C	5.2	3.5	1.5 (max)
9	Sulphates (SO_4) , mg/l	APHA 4500 SO42- E	41.01	111.96	400 (max)
10	Nitrate as NO_3, mg/l	APH4500 NO3- E	10.2	17.7	50 (max)
11	Hexa Chromium as Cr^{+6}, mg/l	APHA 3500Cr B	<0.01	<0.01	0.05
12	Cyanide as CN , mg/l	APHA 4500 CN- C,D	<0.03	<0.03	0.05 (max)
13	Copper as Cu , mg/l	APHA 3111 B,C	0.074	0.107	1.5 (max)
14	Iron as Fe , mg/l	APHA 3500Fe, B	0.078	0.211	0.5 (max)
15	Cadmium as Cd , mg/l	APHA 3111 B,C	<0.003	<0.003	0.01 (max)

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06/05/2025

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Bhubaneswar-751013, Odisha, INDIA

TEST REPORT

16	Selenium as Se, mg/l	APHA 3114 B	<0.01	<0.01	0.05 (max)
17	Arsenic as As, mg/l	APHA 3114 B	0.008	0.011	0.2 (max)
18	Lead as Pb(max), mg/l	APHA 3111 B,C	<0.01	<0.01	0.1 (max)
19	Zinc as Zn(max), mg/l	APHA 3111 B,C	0.108	0.010	15 (max)
20	Sodium Absorption Ratio	By Calculation	10.28	10.81	--
21	Total Coliform	APHA 9221 B	348	>542	5000
22	Fecal Coliform	APHA 9221 B	33	120	300
23	Manganese as Mn, mg/l		0.017	<0.01	0.1
24	Sodium as Na, mg/l		62.36	72.05	
25	Potassium as K, mg/l		2.11	5.89	
26	Nickel as Ni, mg/l		0.014	0.018	0.02
27	Chemical Oxygen Demand, mg/l		40.0	36.0	
28	Free Ammonia , mg/l		<0.01	<0.01	0.5
29	Boron as B, mg/l		0.012	0.018	0.5

Authorized Signatory

06/05/2025

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NABL

TC-12319

TEST REPORT

Issued to: Tata Steel Limited, Meramandali **Date : 16.12.2024**

Test Report No.11/2024-002

Sample Condition: In Plastic Jar

Sample quantity: 2 Litre

Sampling Method: APHA1060B

Source of Sample :Lingra UP & Down stream **Sample Collected on: 14.11.2024**

Letter Reference : **Sample Analysed on: 15.11.2024**

Sl No	Characteristics	Test Method As Per APHA	Lingra UP-stream	Lingra down stream	Standard as per Class C-IS 2296/CPCB/SPCB
1	pH Value	APHA 4500H+ B	8.36	7.91	6.0-9.0
2	Colour	APHA 2120 B, C	20	25	300 (max)
3	Electrical Conductivity, µs/cm	APHA 2510 B	499	598	--
4	Total Dissolved Solids, mg/l	APHA 2540 C	309.0	360.0	1500 (max)
5	Dissolved Oxygen, mg/l	APHA 2540 C	9.9	8.6	4 (min)
6	BOD (3) days at 27°C	APHA 5210 B	6.9	3.0	3 (max)
7	Chloride , mg/l	APHA 4500Cl- B	25.0	41.0	600 (max)
8	Fluoride as F , mg/l	APHA 4500F- C	0.70	1.50	1.5 (max)
9	Sulphates (SO_4) , mg/l	APHA 4500 SO42- E	10.54	27.42	400 (max)
10	Nitrate as NO_3, mg/l	APH4500 NO3- E	6.28	17.0	50 (max)
11	Hexa Chromium as Cr^{+6}, mg/l	APHA 3500Cr B	<0.01	<0.01	0.05
12	Cyanide as CN , mg/l	APHA 4500 CN-C,D	<0.03	<0.03	0.05 (max)
13	Copper as Cu , mg/l	APHA 3111 B,C	0.065	0.147	1.5 (max)
14	Iron as Fe , mg/l	APHA 3500Fe, B	0.078	0.412	0.5 (max)
15	Cadmium as Cd , mg/l	APHA 3111 B,C	<0.003	<0.003	0.01 (max)

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06/05/2025

TEST REPORT

16	Selenium as Se, mg/l	APHA 3114 B	<0.01	<0.01	0.05 (max)
17	Arsenic as As, mg/l	APHA 3114 B	0.005	0.007	0.2 (max)
18	Lead as Pb(max), mg/l	APHA 3111 B,C	<0.01	<0.01	0.1 (max)
19	Zinc as Zn(max), mg/l	APHA 3111 B,C	0.005	0.032	15 (max)
20	Sodium Absorption Ratio	By Calculation	7.05	7.40	--
21	Total Coliform (CFU/ml)	APHA 9221 B	542	348	5000
22	Fecal Coliform (CFU/ml)	APHA 9221 B	32	120	300
23	Manganese as Mn, mg/l		<0.005	<0.005	0.1
24	Sodium as Na, mg/l		37.31	39.95	
25	Potassium as K, mg/l		1.94	4.52	
26	Nickel as Ni, mg/l		0.015	0.016	0.02
27	Chemical Oxygen Demand, mg/l		24.0	28.0	
28	Free Ammonia , mg/l		<0.01	<0.01	0.5
29	Boron as B, mg/l		0.014	0.019	0.5

Authorized Signatory

04/05/2025

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CSIR-INSTITUTE OF MINERALS & MATERIALS TECHNOLOGY.

(A Govt. of India Autonomous Body)

Environmental Chemical Laboratory

Bhubaneswar, Odisha

TEST REPORT

NABL TC-12319

Issued to : TATA STEEL LIMITED, MERAMANDALI	**Date : 16.12.2024**
Test report No – 11/2024-003	
Source of Sample : Ganthigadia	**Sample receiving Date : 14.11.2024**
Type of Sample : Well water	**Sample Analysis Date : 15.11.2024**

Sl No	Characteristics	Test Method (P)of IS:3025	Requirements as per IS 10500:2012(Latest Version)		Test Result
			Acceptable limit	Permissible Limit	
1.	Turbidity, NTU	Part 10	1	5	1.64
2.	pH@Temp° C	Part 11	6.5-8.5	No relaxation	7.43@25.0° C
3.	Total Dissolved Solids mg/L	Part 16	500	2000	841.0
4.	Total Hardness (as $CaCO_3$),mg/L	Part 21	200	600	572.0
5.	Calcium as Ca, mg/L	Part 40	75	200	63.33
6.	Magnesium as Mg, mg/L	Part 46	30	100	100.60
7.	Alkalinity as $CaCO_3$, mg/L	Part 23	200	600	470.0
8.	Chloride as Cl, mg/L	Part 32	250	1000	64.0
9.	Sulfate as SO_4, mg/L	Part 24	200	400	119.26
10.	Fluoride as F, mg/L	Part 60	1.0	1.5	1.00
11.	Iron as Fe, mg/L	Part 53	0.3	No relaxation	0.137
12.	Copper as Cu, mg/L	Part 42	0.05	1.5	0.007
13.	Manganese as Mn, mg/L	APHA(PART 3111B)	0.1	0.3	<0.005
14.	Zinc as Zn, mg/L	Part 49	5.0	15.0	0.139
15.	Lead as Pb, mg/L	Part 47	0.01	No relaxation	<0.010
16.	Cadmium as Cd, mg/L	Part 41	0.003	No relaxation	<0.003
17.	Chromium as Cr, mg/L	Part 52	0.05	No relaxation	0.008
18.	Nickel as Ni, mg/l	Part 54	0.02	No relaxation	0.015

Authorized Signatory

16.12.2024

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NOTES :

1. The sample is drawn by EC Laboratory & result relates to the sample tested.
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4. Latest version of test methods used as per latest specification.
5. It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned in "acceptable limit" render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicate under "permissible limit" in the absence of alternative sources, above which the source will have to be rejected.

Non NABL Test report – P.T.O

'End of Test Report'

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CSIR-INSTITUTE OF MINERALS & MATERIALS TECHNOLOGY.

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Environmental Chemical Laboratory
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TEST REPORT

Issued to : TATA STEEL LIMITED, MERAMANDALI	**Date : 16.12.2024**
Test report No – 11/2024-003	
Source of Sample : Ganthigadia	**Sample receiving Date : 14.11.2024**
Type of Sample : Well water	**Sample Analysis Date : 15.11.2024**

Sl No	Characteristics	Test Method (P)of IS:3025	Requirements as per IS 10500:2012(Latest Version)		Test Result
			Acceptable limit	Permissible Limit	
19.	Color, Hazen Units	Part 4	5	15	< 5
20.	Odour	Part 5	Agreeable	Agreeable	Agreeable
21.	Conductivity, µs/cm	Part 14	--	--	1185
22.	Total Suspended Solid, mg/l	Part 17	--	--	4.1
23.	Nitrite as NO_2, mg/l	Part 34	--	--	0.215
24.	Nitrate as NO_3, mg/l	Part 34	45	No relaxation	34.3
25.	Sodium as Na, mg/l	Part 45	--	--	34.18
26.	Potassium as K, mg/l	Part 45	--	--	3.01
27.	Residual Free Chlorine, mg/l	Part 26	0.2	1.0	<0.1
28.	Arsenic as As, mg/l	Part 37	0.01	No relaxation	<0.010
29.	Dissolved Oxygen, mg/l	Part 38	--	--	2.6
30.	Biological Oxygen Demand, mg/l	Part 44	--	--	1.6
31.	Total Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	>542
32.	Fecal Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	79

Authorized Signatory

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07/05/2025

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'End of Test Report'

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Environmental Chemical Laboratory

Bhubaneswar, Odisha

TEST REPORT

NABL TC-12319

Issued to : TATA STEEL LIMITED, MERAMANDALI	**Date : 16.12.2024**
Test report No – 11/2024-004	
Source of Sample : Khaliberena	**Sample receiving Date : 14.11.2024**
Type of Sample : Well water	**Sample Analysis Date : 15.11.2024**

Sl No	Characteristics	Test Method (P)of IS:3025	Requirements as per IS 10500:2012(Latest Version)		Test Result
			Acceptable limit	Permissible Limit	
1.	Turbidity, NTU	Part 10	1	5	0.41
2.	pH@Temp° C	Part 11	6.5-8.5	No relaxation	7.61@25.0 °C
3.	Total Dissolved Solids mg/L	Part 16	500	2000	484.0
4.	Total Hardness (as $CaCO_3$),mg/L	Part 21	200	600	296.0
5.	Calcium as Ca, mg/L	Part 40	75	200	56.91
6.	Magnesium as Mg, mg/L	Part 46	30	100	37.42
7.	Alkalinity as $CaCO_3$, mg/L	Part 23	200	600	342.0
8.	Chloride as Cl, mg/L	Part 32	250	1000	18.0
9.	Sulfate as SO_4, mg/L	Part 24	200	400	49.82
10.	Fluoride as F, mg/L	Part 60	1.0	1.5	0.71
11.	Iron as Fe, mg/L	Part 53	0.3	No relaxation	0.176
12.	Copper as Cu, mg/L	Part 42	0.05	1.5	0.046
13.	Manganese as Mn, mg/L	APHA(PART 3111B)	0.1	0.3	0.002
14.	Zinc as Zn, mg/L	Part 49	5.0	15.0	0.095
15.	Lead as Pb, mg/L	Part 47	0.01	No relaxation	<0.010
16.	Cadmium as Cd, mg/L	Part 41	0.003	No relaxation	0.003
17.	Chromium as Cr, mg/L	Part 52	0.05	No relaxation	0.011
18.	Nickel as Ni, mg/l	Part 54	0.02	No relaxation	0.008

Authorized Signatory

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Non NABL Test report – P.T.O

'End of Test Report'

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TEST REPORT

Issued to : TATA STEEL LIMITED, MERAMANDALI	**Date : 16.12.2024**
Test report No – 11/2024-004	
Source of Sample : Khaliberena	**Sample receiving Date : 14.11.2024**
Type of Sample : Well water	**Sample Analysis Date : 15.11.2024**

Sl No	Characteristics	Test Method (P)of IS:3025	Requirements as per IS 10500:2012(Latest Version)		Test Result
			Acceptable limit	Permissible Limit	
19.	Color, Hazen Units	Part 4	5	15	< 5
20.	Odour	Part 5	Agreeable	Agreeable	Agreeable
21.	Conductivity, µs/cm	Part 14	--	--	716
22.	Total Suspended Solid, mg/l	Part 17	--	--	2.9
23.	Nitrite as NO_2, mg/l	Part 34	--	--	0.081
24.	Nitrate as NO_3, mg/l	Part 34	45	No relaxation	14.3
25.	Sodium as Na, mg/l	Part 45	--	--	33.08
26.	Potassium as K, mg/l	Part 45	--	--	1.11
27.	Residual Free Chlorine, mg/l	Part 26	0.2	1.0	<0.1
28.	Arsenic as As, mg/l	Part 37	0.01	No relaxation	<0.010
29.	Dissolved Oxygen, mg/l	Part 38	--	--	6.4
30.	Biological Oxygen Demand, mg/l	Part 44	--	--	4.6
31.	Total Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	221
32.	Fecal Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	17

Authorized Signatory

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16/05/25

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'End of Test Report'

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TEST REPORT

NABL
TC-12319

Issued to : TATA STEEL LIMITED, MERAMANDALI	**Date : 16.12.2024**
Test report No – 11/2024-005	
Source of Sample : SARAPA	**Sample receiving Date : 14.11.2024**
Type of Sample : Well water	**Sample Analysis Date : 15.11.2024**

Sl No	Characteristics	Test Method (P)of IS:3025	Requirements as per IS 10500:2012(Latest Version)		Test Result
			Acceptable limit	Permissible Limit	
1.	Turbidity, NTU	Part 10	1	5	9.23
2.	pH@Temp° C	Part 11	6.5-8.5	No relaxation	7.83@25.0° C
3.	Total Dissolved Solids mg/L	Part 16	500	2000	461.0
4.	Total Hardness (as $CaCO_3$),mg/L	Part 21	200	600	284.0
5.	Calcium as Ca, mg/L	Part 40	75	200	78.56
6.	Magnesium as Mg, mg/L	Part 46	30	100	21.38
7.	Alkalinity as $CaCO_3$, mg/L	Part 23	200	600	212.0
8.	Chloride as Cl, mg/L	Part 32	250	1000	65.0
9.	Sulfate as SO_4, mg/L	Part 24	200	400	52.08
10.	Fluoride as F, mg/L	Part 60	1.0	1.5	0.54
11.	Iron as Fe, mg/L	Part 53	0.3	No relaxation	0.152
12.	Copper as Cu, mg/L	Part 42	0.05	1.5	0.042
13.	Manganese as Mn, mg/L	APHA(PART 3111B)	0.1	0.3	<0.005
14.	Zinc as Zn, mg/L	Part 49	5.0	15.0	0.177
15.	Lead as Pb, mg/L	Part 47	0.01	No relaxation	<0.010
16.	Cadmium as Cd, mg/L	Part 41	0.003	No relaxation	<0.003
17.	Chromium as Cr, mg/L	Part 52	0.05	No relaxation	0.012
18.	Nickel as Ni, mg/l	Part 54	0.02	No relaxation	0.007

Authorized Signatory

06/05/25

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Non NABL Test report – P.T.O

'End of Test Report'

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TEST REPORT

Issued to : TATA STEEL LIMITED, MERAMANDALI	**Date : 16.12.2024**
Test report No – 11/2024-005	
Source of Sample : SARAPA	**Sample receiving Date : 14.11.2024**
Type of Sample : Well water	**Sample Analysis Date : 15.11.2024**

Sl No	Characteristics	Test Method (P)of IS:3025	Requirements as per IS 10500:2012(Latest Version)		Test Result
			Acceptable limit	Permissible Limit	
19.	Color, Hazen Units	Part 4	5	15	< 5
20.	Odour	Part 5	Agreeable	Agreeable	Agreeable
21.	Conductivity, µs/cm	Part 14	--	--	688
22.	Total Suspended Solid, mg/l	Part 17	--	--	14.2
23.	Nitrite as NO_2, mg/l	Part 34	--	--	0.122
24.	Nitrate as NO_3, mg/l	Part 34	45	No relaxation	13.1
25.	Sodium as Na, mg/l	Part 45	--	--	27.83
26.	Potassium as K, mg/l	Part 45	--	--	2.13
27.	Residual Free Chlorine, mg/l	Part 26	0.2	1.0	<0.1
28.	Arsenic as As, mg/l	Part 37	0.01	No relaxation	<0.010
29.	Dissolved Oxygen, mg/l	Part 38	--	--	4.6
30.	Biological Oxygen Demand, mg/l	Part 44	--	--	1.0
31.	Total Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	11
32.	Fecal Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	2

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TEST REPORT

NABL TC-12319

Issued to : TATA STEEL LIMITED, MERAMANDALI	**Date : 16.12.2024**
Test report No – 11/2024-006	
Source of Sample : SIBAPUR	**Sample receiving Date : 14.11.2024**
Type of Sample : Well water	**Sample Analysis Date : 15.11.2024**

Sl No	Characteristics	Test Method (P)of IS:3025	Requirements as per IS 10500:2012(Latest Version)		Test Result
			Acceptable limit	Permissible Limit	
1.	Turbidity, NTU	Part 10	1	5	1.39
2.	pH@Temp° C	Part 11	6.5-8.5	No relaxation	7.61@25.0 °C
3.	Total Dissolved Solids mg/L	Part 16	500	2000	366.0
4.	Total Hardness (as $CaCO_3$),mg/L	Part 21	200	600	230.0
5.	Calcium as Ca, mg/L	Part 40	75	200	55.31
6.	Magnesium as Mg, mg/L	Part 46	30	100	22.36
7.	Alkalinity as $CaCO_3$, mg/L	Part 23	200	600	196.0
8.	Chloride as Cl, mg/L	Part 32	250	1000	33.0
9.	Sulfate as SO_4, mg/L	Part 24	200	400	37.24
10.	Fluoride as F, mg/L	Part 60	1.0	1.5	0.59
11.	Iron as Fe, mg/L	Part 53	0.3	No relaxation	0.162
12.	Copper as Cu, mg/L	Part 42	0.05	1.5	0.036
13.	Manganese as Mn, mg/L	APHA(PART 3111B)	0.1	0.3	0.044
14.	Zinc as Zn, mg/L	Part 49	5.0	15.0	0.016
15.	Lead as Pb, mg/L	Part 47	0.01	No relaxation	<0.010
16.	Cadmium as Cd, mg/L	Part 41	0.003	No relaxation	<0.003
17.	Chromium as Cr, mg/L	Part 52	0.05	No relaxation	0.018
18.	Nickel as Ni, mg/l	Part 54	0.02	No relaxation	0.014

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Non NABL Test report – P.T.O

'End of Test Report'

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TEST REPORT

Issued to : TATA STEEL LIMITED, MERAMANDALI	**Date : 16.12.2024**
Test report No – 11/2024-006	
Source of Sample : SIBAPUR	**Sample receiving Date : 14.11.2024**
Type of Sample : Well water	**Sample Analysis Date : 15.11.2024**

Sl No	Characteristics	Test Method (P)of IS:3025	Requirements as per IS 10500:2012(Latest Version)		Test Result
			Acceptable limit	Permissible Limit	
19.	Color, Hazen Units	Part 4	5	15	< 5
20.	Odour	Part 5	Agreeable	Agreeable	Agreeable
21.	Conductivity, µs/cm	Part 14	--	--	561
22.	Total Suspended Solid, mg/l	Part 17	--	--	2.8
23.	Nitrite as NO_2, mg/l	Part 34	--	--	0.049
24.	Nitrate as NO_3, mg/l	Part 34	45	No relaxation	6.12
25.	Sodium as Na, mg/l	Part 45	--	--	13.8
26.	Potassium as K, mg/l	Part 45	--	--	16.58
27.	Residual Free Chlorine, mg/l	Part 26	0.2	1.0	<0.1
28.	Arsenic as As, mg/l	Part 37	0.01	No relaxation	<0.010
29.	Dissolved Oxygen, mg/l	Part 38	--	--	2.4
30.	Biological Oxygen Demand, mg/l	Part 44	--	--	1.5
31.	Total Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	542
32.	Fecal Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	21

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TEST REPORT

NABL TC-12319

Issued to : TATA STEEL LIMITED, MERAMANDALI	**Date : 16.12.2024**
Test report No – 11/2024-007	
Source of Sample : Charadagadia	**Sample receiving Date : 14.11.2024**
Type of Sample : well water	**Sample Analysis Date : 15.11.2024**

Sl No	Characteristics	Test Method (P)of IS:3025	Requirements as per IS 10500:2012(Latest Version)		Test Result
			Acceptable limit	Permissible Limit	
1.	Turbidity, NTU	Part 10	1	5	2.28
2.	pH@Temp° C	Part 11	6.5-8.5	No relaxation	7.25@25.0° C
3.	Total Dissolved Solids mg/L	Part 16	500	2000	1392.0
4.	Total Hardness (as $CaCO_3$),mg/L	Part 21	200	600	686.0
5.	Calcium as Ca, mg/L	Part 40	75	200	75.35
6.	Magnesium as Mg, mg/L	Part 46	30	100	121.01
7.	Alkalinity as $CaCO_3$, mg/L	Part 23	200	600	504.0
8.	Chloride as Cl, mg/L	Part 32	250	1000	181.0
9.	Sulfate as SO_4, mg/L	Part 24	200	400	147.19
10.	Fluoride as F, mg/L	Part 60	1.0	1.5	1.10
11.	Iron as Fe, mg/L	Part 53	0.3	No relaxation	0.181
12.	Copper as Cu, mg/L	Part 42	0.05	1.5	0.040
13.	Manganese as Mn, mg/L	APHA(PART 3111B)	0.1	0.3	0.016
14.	Zinc as Zn, mg/L	Part 49	5.0	15.0	0.186
15.	Lead as Pb, mg/L	Part 47	0.01	No relaxation	<0.010
16.	Cadmium as Cd, mg/L	Part 41	0.003	No relaxation	0.002
17.	Chromium as Cr, mg/L	Part 52	0.05	No relaxation	0.036
18.	Nickel as Ni, mg/l	Part 54	0.02	No relaxation	0.017

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06/05/25

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Non NABL Test report – P.T.O

'End of Test Report'

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TEST REPORT

Issued to : TATA STEEL LIMITED, MERAMANDALI	**Date : 16.12.2024**
Test report No – 11/2024-007	
Source of Sample : Charadagadia	**Sample receiving Date : 14.11.2024**
Type of Sample : well water	**Sample Analysis Date : 15.11.2024**

Sl No	Characteristics	Test Method (P)of IS:3025	Requirements as per IS 10500:2012(Latest Version)		Test Result
			Acceptable limit	Permissible Limit	
19.	Color, Hazen Units	Part 4	5	15	< 5
20.	Odour	Part 5	Agreeable	Agreeable	Agreeable
21.	Conductivity, µs/cm	Part 14	--	--	1973
22.	Total Suspended Solid, mg/l	Part 17	--	--	4.8
23.	Nitrite as NO_2, mg/l	Part 34	--	--	0.527
24.	Nitrate as NO_3, mg/l	Part 34	45	No relaxation	184.0
25.	Sodium as Na, mg/l	Part 45	--	--	159.6
26.	Potassium as K, mg/l	Part 45	--	--	4.84
27.	Residual Free Chlorine, mg/l	Part 26	0.2	1.0	<0.1
28.	Arsenic as As, mg/l	Part 37	0.01	No relaxation	<0.010
29.	Dissolved Oxygen, mg/l	Part 38	--	--	2.6
30.	Biological Oxygen Demand, mg/l	Part 44	--	--	1.6
31.	Total Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	278
32.	Fecal Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	120

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TEST REPORT

NABL TC-12319

Issued to : TATA STEEL LIMITED, MERAMANDALI	**Date : 16.12.2024**
Test report No – 11/2024-008	
Source of Sample : KOCHILAMARA	**Sample receiving Date : 14.11.2024**
Type of Sample : Well water	**Sample Analysis Date : 15.11.2024**

Sl No	Characteristics	Test Method (P)of IS:3025	Requirements as per IS 10500:2012(Latest Version)		Test Result
			Acceptable limit	Permissible Limit	
1.	Turbidity, NTU	Part 10	1	5	0.46
2.	pH@Temp° C	Part 11	6.5-8.5	No relaxation	7.49@25.0° C
3.	Total Dissolved Solids mg/L	Part 16	500	2000	738.0
4.	Total Hardness (as $CaCO_3$),mg/L	Part 21	200	600	376.0
5.	Calcium as Ca, mg/L	Part 40	75	200	46.49
6.	Magnesium as Mg, mg/L	Part 46	30	100	63.18
7.	Alkalinity as $CaCO_3$, mg/L	Part 23	200	600	454.0
8.	Chloride as Cl, mg/L	Part 32	250	1000	63.0
9.	Sulfate as SO_4, mg/L	Part 24	200	400	83.03
10.	Fluoride as F, mg/L	Part 60	1.0	1.5	1.00
11.	Iron as Fe, mg/L	Part 53	0.3	No relaxation	0.216
12.	Copper as Cu, mg/L	Part 42	0.05	1.5	0.034
13.	Manganese as Mn, mg/L	APHA(PART 3111B)	0.1	0.3	<0.005
14.	Zinc as Zn, mg/L	Part 49	5.0	15.0	0.052
15.	Lead as Pb, mg/L	Part 47	0.01	No relaxation	<0.010
16.	Cadmium as Cd, mg/L	Part 41	0.003	No relaxation	0.003
17.	Chromium as Cr, mg/L	Part 52	0.05	No relaxation	0.015
18.	Nickel as Ni, mg/l	Part 54	0.02	No relaxation	0.008

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06/03/25

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Non NABL Test report – P.T.O

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TEST REPORT

Issued to : TATA STEEL LIMITED, MERAMANDALI	**Date : 16.12.2024**
Test report No – 11/2024-008	
Source of Sample : KOCHILAMARA	**Sample receiving Date : 14.11.2024**
Type of Sample : Well water	**Sample Analysis Date : 15.11.2024**

Sl No	Characteristics	Test Method (P)of IS:3025	Requirements as per IS 10500:2012(Latest Version)		Test Result
			Acceptable limit	Permissible Limit	
19.	Color, Hazen Units	Part 4	5	15	< 5
20.	Odour	Part 5	Agreeable	Agreeable	Agreeable
21.	Conductivity, µs/cm	Part 14	--	--	1181
22.	Total Suspended Solid, mg/l	Part 17	--	--	1.9
23.	Nitrite as NO_2, mg/l	Part 34	--	--	0.264
24.	Nitrate as NO_3, mg/l	Part 34	45	No relaxation	61.0
25.	Sodium as Na, mg/l	Part 45	--	--	95.32
26.	Potassium as K, mg/l	Part 45	--	--	1.53
27.	Residual Free Chlorine, mg/l	Part 26	0.2	1.0	<0.1
28.	Arsenic as As, mg/l	Part 37	0.01	No relaxation	<0.010
29.	Dissolved Oxygen, mg/l	Part 38	--	--	3.2
30.	Biological Oxygen Demand, mg/l	Part 44	--	--	1.6
31.	Total Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	542
32.	Fecal Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	14

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TEST REPORT

NABL TC-12319

Issued to : TATA STEEL LIMITED, MERAMANDALI	**Date : 16.12.2024**
Test report No – 11/2024-009	
Source of Sample : KHARAGPRASAD	**Sample receiving Date : 14.11.2024**
Type of Sample : Well water	**Sample Analysis Date : 15.11.2024**

Sl No	Characteristics	Test Method (P)of IS:3025	Requirements as per IS 10500:2012(Latest Version)		Test Result
			Acceptable limit	Permissible Limit	
1.	Turbidity, NTU	Part 10	1	5	1.21
2.	pH@Temp° C	Part 11	6.5-8.5	No relaxation	6.88@25.0° C
3.	Total Dissolved Solids mg/L	Part 16	500	2000	303.0
4.	Total Hardness (as $CaCO_3$),mg/L	Part 21	200	600	166.0
5.	Calcium as Ca, mg/L	Part 40	75	200	35.27
6.	Magnesium as Mg, mg/L	Part 46	30	100	18.95
7.	Alkalinity as $CaCO_3$, mg/L	Part 23	200	600	124.0
8.	Chloride as Cl, mg/L	Part 32	250	1000	21.0
9.	Sulfate as SO_4, mg/L	Part 24	200	400	36.73
10.	Fluoride as F, mg/L	Part 60	1.0	1.5	0.18
11.	Iron as Fe, mg/L	Part 53	0.3	No relaxation	0.270
12.	Copper as Cu, mg/L	Part 42	0.05	1.5	0.013
13.	Manganese as Mn, mg/L	APHA(PART 3111B)	0.1	0.3	0.017
14.	Zinc as Zn, mg/L	Part 49	5.0	15.0	0.097
15.	Lead as Pb, mg/L	Part 47	0.01	No relaxation	<0.010
16.	Cadmium as Cd, mg/L	Part 41	0.003	No relaxation	<0.003
17.	Chromium as Cr, mg/L	Part 52	0.05	No relaxation	0.027
18.	Nickel as Ni, mg/l	Part 54	0.02	No relaxation	0.008

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Non NABL Test report – P.T.O

'End of Test Report'

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TEST REPORT

Issued to : TATA STEEL LIMITED, MERAMANDALI	**Date : 16.12.2024**
Test report No – 11/2024-009	
Source of Sample : KHARAGPRASAD	**Sample receiving Date : 14.11.2024**
Type of Sample : Well water	**Sample Analysis Date : 15.11.2024**

Sl No	Characteristics	Test Method (P)of IS:3025	Requirements as per IS 10500:2012(Latest Version)		Test Result
			Acceptable limit	Permissible Limit	
19.	Color, Hazen Units	Part 4	5	15	< 5
20.	Odour	Part 5	Agreeable	Agreeable	Agreeable
21.	Conductivity, µs/cm	Part 14	--	--	413
22.	Total Suspended Solid, mg/l	Part 17	--	--	3.7
23.	Nitrite as NO_2, mg/l	Part 34	--	--	0.127
24.	Nitrate as NO_3, mg/l	Part 34	45	No relaxation	19.2
25.	Sodium as Na, mg/l	Part 45	--	--	14.85
26.	Potassium as K, mg/l	Part 45	--	--	12.27
27.	Residual Free Chlorine, mg/l	Part 26	0.2	1.0	<0.1
28.	Arsenic as As, mg/l	Part 37	0.01	No relaxation	<0.010
29.	Dissolved Oxygen, mg/l	Part 38	--	--	1.4
30.	Biological Oxygen Demand, mg/l	Part 44	--	--	1.0
31.	Total Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	>542
32.	Fecal Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	33

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06/01/25

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TEST REPORT

NABL TC-12319

Issued to : TATA STEEL LIMITED, MERAMANDALI	**Date : 16.12.2024**
Test report No – 11/2024-010	
Source of Sample : MOTANGA	**Sample receiving Date : 14.11.2024**
Type of Sample : Well water	**Sample Analysis Date : 15.11.2024**

Sl No	Characteristics	Test Method (P)of IS:3025	Requirements as per IS 10500:2012(Latest Version)		Test Result
			Acceptable limit	Permissible Limit	
1.	Turbidity, NTU	Part 10	1	5	1.15
2.	pH@Temp° C	Part 11	6.5-8.5	No relaxation	7.56@25.0
3.	Total Dissolved Solids mg/L	Part 16	500	2000	810.0
4.	Total Hardness (as $CaCO_3$),mg/L	Part 21	200	600	422.0
5.	Calcium as Ca, mg/L	Part 40	75	200	92.18
6.	Magnesium as Mg, mg/L	Part 46	30	100	46.66
7.	Alkalinity as $CaCO_3$, mg/L	Part 23	200	600	364.0
8.	Chloride as Cl, mg/L	Part 32	250	1000	80.0
9.	Sulfate as SO_4, mg/L	Part 24	200	400	137.12
10.	Fluoride as F, mg/L	Part 60	1.0	1.5	1.00
11.	Iron as Fe, mg/L	Part 53	0.3	No relaxation	0.112
12.	Copper as Cu, mg/L	Part 42	0.05	1.5	0.009
13.	Manganese as Mn, mg/L	APHA(PART 3111B)	0.1	0.3	0.002
14.	Zinc as Zn, mg/L	Part 49	5.0	15.0	0.115
15.	Lead as Pb, mg/L	Part 47	0.01	No relaxation	<0.010
16.	Cadmium as Cd, mg/L	Part 41	0.003	No relaxation	<0.003
17.	Chromium as Cr, mg/L	Part 52	0.05	No relaxation	0.019
18.	Nickel as Ni, mg/l	Part 54	0.02	No relaxation	0.009

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Non NABL Test report – P.T.O

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TEST REPORT

Issued to : TATA STEEL LIMITED, MERAMANDALI	**Date : 16.12.2024**
Test report No – 11/2024-010	
Source of Sample : MOTANGA	**Sample receiving Date : 14.11.2024**
Type of Sample : Well water	**Sample Analysis Date : 15.11.2024**

Sl No	Characteristics	Test Method (P)of IS:3025	Requirements as per IS 10500:2012(Latest Version)		Test Result
			Acceptable limit	Permissible Limit	
19.	Color, Hazen Units	Part 4	5	15	< 5
20.	Odour	Part 5	Agreeable	Agreeable	Agreeable
21.	Conductivity, µs/cm	Part 14	--	--	1156
22.	Total Suspended Solid, mg/l	Part 17	--	--	2.6
23.	Nitrite as NO_2, mg/l	Part 34	--	--	0.085
24.	Nitrate as NO_3, mg/l	Part 34	45	No relaxation	16.7
25.	Sodium as Na, mg/l	Part 45	--	--	77.02
26.	Potassium as K, mg/l	Part 45	--	--	1.22
27.	Residual Free Chlorine, mg/l	Part 26	0.2	1.0	<0.1
28.	Arsenic as As, mg/l	Part 37	0.01	No relaxation	<0.010
29.	Dissolved Oxygen, mg/l	Part 38	--	--	7.4
30.	Biological Oxygen Demand, mg/l	Part 44	--	--	2.4
31.	Total Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	33
32.	Fecal Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	2

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TEST REPORT

NABL
TC-12319

Issued to : TATA STEEL LIMITED, MERAMANDALI	**Date : 16.12.2024**
Test report No – 11/2024-011	
Source of Sample : GALPADA	**Sample receiving Date : 14.11.2024**
Type of Sample : Well water	**Sample Analysis Date : 15.11.2024**

Sl No	Characteristics	Test Method (P)of IS:3025	Requirements as per IS 10500:2012(Latest Version)		Test Result
			Acceptable limit	Permissible Limit	
1.	Turbidity, NTU	Part 10	1	5	0.42
2.	pH@Temp° C	Part 11	6.5-8.5	No relaxation	7.09@ 25.0
3.	Total Dissolved Solids mg/L	Part 16	500	2000	283.0
4.	Total Hardness (as $CaCO_3$),mg/L	Part 21	200	600	138.0
5.	Calcium as Ca, mg/L	Part 40	75	200	36.07
6.	Magnesium as Mg, mg/L	Part 46	30	100	11.66
7.	Alkalinity as $CaCO_3$, mg/L	Part 23	200	600	142.0
8.	Chloride as Cl, mg/L	Part 32	250	1000	14.0
9.	Sulfate as SO_4, mg/L	Part 24	200	400	19.40
10.	Fluoride as F, mg/L	Part 60	1.0	1.5	0.28
11.	Iron as Fe, mg/L	Part 53	0.3	No relaxation	0.216
12.	Copper as Cu, mg/L	Part 42	0.05	1.5	0.011
13.	Manganese as Mn, mg/L	APHA(PART 3111B)	0.1	0.3	<0.005
14.	Zinc as Zn, mg/L	Part 49	5.0	15.0	0.051
15.	Lead as Pb, mg/L	Part 47	0.01	No relaxation	<0.010
16.	Cadmium as Cd, mg/L	Part 41	0.003	No relaxation	<0.003
17.	Chromium as Cr, mg/L	Part 52	0.05	No relaxation	0.031
18.	Nickel as Ni, mg/l	Part 54	0.02	No relaxation	0.012

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06/01/25

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Non NABL Test report – P.T.O

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TEST REPORT

Issued to : TATA STEEL LIMITED, MERAMANDALI	**Date : 16.12.2024**
Test report No – 11/2024-011	
Source of Sample : GALPADA	**Sample receiving Date : 14.11.2024**
Type of Sample : Well water	**Sample Analysis Date : 15.11.2024**

Sl No	Characteristics	Test Method (P)of IS:3025	Requirements as per IS 10500:2012(Latest Version)		Test Result
			Acceptable limit	Permissible Limit	
19.	Color, Hazen Units	Part 4	5	15	< 5
20.	Odour	Part 5	Agreeable	Agreeable	Agreeable
21.	Conductivity, µs/cm	Part 14	--	--	350
22.	Total Suspended Solid, mg/l	Part 17	--	--	1.5
23.	Nitrite as NO_2, mg/l	Part 34	--	--	0.075
24.	Nitrate as NO_3, mg/l	Part 34	45	No relaxation	12.8
25.	Sodium as Na, mg/l	Part 45	--	--	10.80
26.	Potassium as K, mg/l	Part 45	--	--	0.46
27.	Residual Free Chlorine, mg/l	Part 26	0.2	1.0	<0.1
28.	Arsenic as As, mg/l	Part 37	0.01	No relaxation	<0.010
29.	Dissolved Oxygen, mg/l	Part 38	--	--	2.8
30.	Biological Oxygen Demand, mg/l	Part 44	--	--	1.6
31.	Total Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	348
32.	Fecal Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	11

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16/12/24

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TEST REPORT

NABL
TC-12319

Issued to : TATA STEEL LIMITED, MERAMANDALI	**Date : 16.12.2024**
Test report No – 11/2024-012	
Source of Sample : ETAPA	**Sample receiving Date : 14.11.2024**
Type of Sample : Well water	**Sample Analysis Date : 15.11.2024**

Sl No	Characteristics	Test Method (P)of IS:3025	Requirements as per IS 10500:2012(Latest Version)		Test Result
			Acceptable limit	Permissible Limit	
1.	Turbidity, NTU	Part 10	1	5	11.24
2.	pH@Temp° C	Part 11	6.5-8.5	No relaxation	7.28@ 25.0
3.	Total Dissolved Solids mg/L	Part 16	500	2000	676.0
4.	Total Hardness (as $CaCO_3$),mg/L	Part 21	200	600	312.0
5.	Calcium as Ca, mg/L	Part 40	75	200	44.09
6.	Magnesium as Mg, mg/L	Part 46	30	100	49.09
7.	Alkalinity as $CaCO_3$, mg/L	Part 23	200	600	408.0
8.	Chloride as Cl, mg/L	Part 32	250	1000	83.0
9.	Sulfate as SO_4, mg/L	Part 24	200	400	51.58
10.	Fluoride as F, mg/L	Part 60	1.0	1.5	0.93
11.	Iron as Fe, mg/L	Part 53	0.3	No relaxation	0.073
12.	Copper as Cu, mg/L	Part 42	0.05	1.5	0.013
13.	Manganese as Mn, mg/L	APHA(PART 3111B)	0.1	0.3	0.081
14.	Zinc as Zn, mg/L	Part 49	5.0	15.0	0.011
15.	Lead as Pb, mg/L	Part 47	0.01	No relaxation	<0.010
16.	Cadmium as Cd, mg/L	Part 41	0.003	No relaxation	<0.003
17.	Chromium as Cr, mg/L	Part 52	0.05	No relaxation	0.007
18.	Nickel as Ni, mg/l	Part 54	0.02	No relaxation	0.010

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TEST REPORT

Issued to : TATA STEEL LIMITED, MERAMANDALI	**Date : 16.12.2024**
Test report No – 11/2024-012	
Source of Sample : ETAPA	**Sample receiving Date : 14.11.2024**
Type of Sample : Well water	**Sample Analysis Date : 15.11.2024**

Sl No	Characteristics	Test Method (P)of IS:3025	Requirements as per IS 10500:2012(Latest Version)		Test Result
			Acceptable limit	Permissible Limit	
19.	Color, Hazen Units	Part 4	5	15	< 5
20.	Odour	Part 5	Agreeable	Agreeable	Agreeable
21.	Conductivity, µs/cm	Part 14	--	--	1120
22.	Total Suspended Solid, mg/l	Part 17	--	--	15.6
23.	Nitrite as NO_2, mg/l	Part 34	--	--	0.112
24.	Nitrate as NO_3, mg/l	Part 34	45	No relaxation	17.2
25.	Sodium as Na, mg/l	Part 45	--	--	111.3
26.	Potassium as K, mg/l	Part 45	--	--	15.42
27.	Residual Free Chlorine, mg/l	Part 26	0.2	1.0	<0.1
28.	Arsenic as As, mg/l	Part 37	0.01	No relaxation	<0.010
29.	Dissolved Oxygen, mg/l	Part 38	--	--	2.5
30.	Biological Oxygen Demand, mg/l	Part 44	--	--	2.1
31.	Total Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	221
32.	Fecal Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	79

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TEST REPORT

NABL
TC-12319

Issued to : TATA STEEL LIMITED, MERAMANDALI	**Date : 16.12.2024**
Test report No – 11/2024-013	
Source of Sample : NARENDRAPUR	**Sample receiving Date : 14.11.2024**
Type of Sample : Well water	**Sample Analysis Date : 15.11.2024**

Sl No	Characteristics	Test Method (P)of IS:3025	Requirements as per IS 10500:2012(Latest Version)		Test Result
			Acceptable limit	Permissible Limit	
1.	Turbidity, NTU	Part 10	1	5	0.67
2.	pH@Temp° C	Part 11	6.5-8.5	No relaxation	7.41@25.0
3.	Total Dissolved Solids mg/L	Part 16	500	2000	539.0
4.	Total Hardness (as $CaCO_3$),mg/L	Part 21	200	600	322.0
5.	Calcium as Ca, mg/L	Part 40	75	200	55.31
6.	Magnesium as Mg, mg/L	Part 46	30	100	44.71
7.	Alkalinity as $CaCO_3$, mg/L	Part 23	200	600	286.0
8.	Chloride as Cl, mg/L	Part 32	250	1000	44.0
9.	Sulfate as SO_4, mg/L	Part 24	200	400	46.80
10.	Fluoride as F, mg/L	Part 60	1.0	1.5	0.82
11.	Iron as Fe, mg/L	Part 53	0.3	No relaxation	0.245
12.	Copper as Cu, mg/L	Part 42	0.05	1.5	0.011
13.	Manganese as Mn, mg/L	APHA(PART 3111B)	0.1	0.3	<0.005
14.	Zinc as Zn, mg/L	Part 49	5.0	15.0	0.059
15.	Lead as Pb, mg/L	Part 47	0.01	No relaxation	<0.010
16.	Cadmium as Cd, mg/L	Part 41	0.003	No relaxation	0.003
17.	Chromium as Cr, mg/L	Part 52	0.05	No relaxation	0.038
18.	Nickel as Ni, mg/l	Part 54	0.02	No relaxation	0.007

Authorized Signatory

Dr. Arakshita Majhi
(For Environmental Chemical Lab) (ISO17025:2017, NABL Lab)
Environmental & Sustainability Dept.
CSIR-Institute of Minerals & Materials Technology
Bhubaneswar-751013, Odisha, INDIA

Dr. Arakshita Majhi
Senior Principal Scientist
Phone : 0674-2379236,
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NOTES :

1. The sample is drawn by EC Laboratory & result relates to the sample tested.
2. This certificate shall not be reproduced wholly or in part without prior written consent of the laboratory.
3. This certificate shall not be used in any advertising media or as evidence in the court of Law without prior written consent of laboratory.
4. Latest version of test methods used as per latest specification.
5. It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned in "acceptable limit" render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicate under "permissible limit" in the absence of alternative sources, above which the source will have to be rejected.

Non NABL Test report – P.T.O

'End of Test Report'

Laboratory: Acharya Vihar, Bhubaneswar, Odisha-751013. Tel: 0674-2379236, Mobile: 9760387460.
E-mail: dir@immt.res.in.

CSIR-INSTITUTE OF MINERALS & MATERIALS TECHNOLOGY.

(A Govt. of India Autonomous Body)
Environmental Chemical Laboratory
Bhubaneswar, Odisha

TEST REPORT

Issued to : TATA STEEL LIMITED, MERAMANDALI	**Date : 16.12.2024**
Test report No – 11/2024-013	
Source of Sample : NARENDRAPUR	**Sample receiving Date : 14.11.2024**
Type of Sample : Well water	**Sample Analysis Date : 15.11.2024**

Sl No	Characteristics	Test Method (P)of IS:3025	Requirements as per IS 10500:2012(Latest Version)		Test Result
			Acceptable limit	Permissible Limit	
19.	Color, Hazen Units	Part 4	5	15	< 5
20.	Odour	Part 5	Agreeable	Agreeable	Agreeable
21.	Conductivity, µs/cm	Part 14	--	--	821
22.	Total Suspended Solid, mg/l	Part 17	--	--	2.4
23.	Nitrite as NO_2, mg/l	Part 34	--	--	0.218
24.	Nitrate as NO_3, mg/l	Part 34	45	No relaxation	39.6
25.	Sodium as Na, mg/l	Part 45	--	--	50.54
26.	Potassium as K, mg/l	Part 45	--	--	5.89
27.	Residual Free Chlorine, mg/l	Part 26	0.2	1.0	<0.1
28.	Arsenic as As, mg/l	Part 37	0.01	No relaxation	<0.010
29.	Dissolved Oxygen, mg/l	Part 38	--	--	1.2
30.	Biological Oxygen Demand, mg/l	Part 44	--	--	0.6
31.	Total Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	542
32.	Fecal Coliform by MPN	IS 1622 RA 2019	Shall not be detectable in 100ml sample	No relaxation	21

Authorized Signatory

Dr. Arakshita Majhi
Senior Principal Scientist
(Environmental Chemical Lab) (ISO17025:2017, NABL Lab)
Environmental & Sustainability Dept.
CSIR-Institute of Minerals & Materials Technology
Bhubaneswar-751013, Odisha, INDIA

Dr. Arakshita Majhi
Senior Principal Scientist
Phone : 0674-2379236,
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NOTES :

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5. It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned in "acceptable limit" render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicate under "permissible limit" in the absence of alternative sources, above which the source will have to be rejected.

'End of Test Report'

Laboratory: Acharya Vihar, Bhubaneswar, Odisha-751013. Tel: 0674-2379236, Mobile: 9760387460.
E-mail: dir@immt.res.in.

Visiontek Consultancy Services Pvt. Ltd.

(Committed For Better Environment)

ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 (OH&S), ISO/IEC 17025:2017 Certified

Ref. no: Envlab/24-25/TR-12306 **Date: 18.11.2024**

ASH ANALYSIS REPORT

1. Name of the Indus : **M/s TATA Steel Limited Meramandali, Dhenkanal**
2. Sampling Location : **S-1**: Fly Ash collected from BFPP-1
   : **S-2:** Bed Ash collected from BFPP-1
   :S-3: Fly ash collected from AEL-165
   :S-4: Bed ash collected from ASL-165
3. Date of Sampling : 11.11.2024
4. Date of Analysis : 12.11.2024 to 18.11.2024
5. Sample Collected by : VCSPL Representative

Sl. No.	Name of the Parameters	Unit	Govt. of India, MoEF & CC Schedule-II based on leachable concentration limits (TCLP) orSoluble Threshold limit Concentration (STLC), Class A2016	Analysis Results			
				S-1	S-2	S-3	S-4
01	Arsenic as As	mg/l	5.0 mg/l	0.004	0.002	0.003	0.002
02	Barium as Ba	mg/l	100.0 mg/l	BDL	BDL	BDL	BDL
03	Cadmium as cd	mg/l	1.0 mg/l	BDL	BDL	BDL	BDL
04	Chromium as Cr	mg/l	5.0 mg/l	BDL	BDL	BDL	BDL
05	Lead as Pb	mg/l	5.0 mg/l	BDL	BDL	BDL	BDL
06	Mercury as Hg	mg/l	0.2 mg/l	BDL	BDL	BDL	BDL
07	Selenium as Se	mg/l	1.0 mg/l	0.003	0.003	0.003	0.003
08	Iron as Fe	mg/l	--	0.81	0.41	0.69	0.36
09	Nickel as Ni	mg/l	20.0 mg/l	0.22	0.16	0.24	0.17
10	Zinc as Zn	mg/l	250.0 mg/l	0.48	0.35	0.49	0.33
11	Manganese as Mn	mg/l	10.0 mg/l	0.41	0.28	0.50	0.32
12	Cobalt as Co	mg/l	80.0 mg/l	BDL	BDL	BDL	BDL
13	Copper as Cu	mg/l	25.0 mg/l	0.37	0.28	0.39	0.26
14	Vanadium as V	mg/l	24.0 mg/l	BDL	BDL	BDL	BDL
15	Aluminium as Al	mg/l	--	4.7	4.3	5.3	4.8
16	Fluoride as F	mg/l	180.0 mg/l	1.79	1.31	1.89	1.36

Reviewed By: **Approved By**

Annexure-VI

CSR Expenditure and Activities

(Around Tata Steel Ltd, Meramandali & TSM-CPP(AEL))

Period: From April'24 to Mar'25

PROGRAM HEAD	Expenditure in Lakh	MAJOR INTERVENTIONS/REMARKS
HEALTH	153.85	Public Health Unit; Rishta; Project Drishti, Poshan NCD, VBD
Agriculture	126.51	Agricultural activity
Environment	3.03	Plantation
Empowerment	7.2	GCE
DRINKING WATER	166.38	Installation of tubewells; supply of drinking water
Ethnicity	14.1	Cultural events
EDUCATION	828.61	School infrastructure; Education signature project, Green school project, Pre-matric coaching
SPORTS	24.26	
Skill Development	7.2	
Miscellaneous	253.85	
TOTAL	**1895.77**	

Annexure-VII

Environment Laboratory
TATA Steel Meramandali, Odisha

Ref.No.EMD/LAB/2024/0002

S.No	Name of the unit	Location	Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25
			Leq					
2	110 MW Compressor House AEL	Near Entrance Point	84.1	84.5	83.2	83.6	83.7	81.7
		Near Compressor	93	91.5	91.6	91.4	90.6	87.5
		Inside Operator office	77.9	71.6	74.8	76	75	73.3
	150 MW Ash Conveying Compressor House AEL	Near Entrance Point	85.2	84.9	85.1	83.1	85.6	84.7
		Near Compressor	93.4	94.1	92.1	86.8	90	90.3
		Inside Operator office	79.2	78.3	80	80	75.6	79.8
3	165 MW Compressor House AEL	Near Entrance Point	81.6	83	80.5	82.5	80	81.4
		Near Compressor	92.4	92.7	90.1	90.8	88.2	89.7
		Inside Operator office	79	77.6	78.5	70.8	73.2	70.6
4	300 MW Power Plant AEL	**CFBC Boiler-1**						
		Near ID Fan-1	SD	SD	SD	SD	SD	SD
		Near ID Fan-2	SD	SD	SD	SD	SD	SD
		Near S A Fan	SD	SD	SD	SD	SD	SD
		Near P.A. Fan	SD	SD	SD	SD	SD	SD
		Near Boiler -1 Area	SD	SD	SD	SD	SD	SD
		CFBC- Boiler-2						
		Near ID Fan-1	85.7	85.4	85.8	SD	85.9	85.8
		Near ID Fan-2	86.2	85.9	86	SD	85.7	85.7
		Near S A Fan	91.8	91.2	92.2	SD	91.5	90.2
		Near P.A. Fan	92.1	91.9	92.6	SD	91.6	90.4
		Near Boiler -2 Area	84.5	84.6	84.8	SD	84.8	84.8
		CFBC- Boiler-3						
		Near ID Fan-1	86.1	85.7	85.6	85.5	85.1	85.1
		Near ID Fan-2	87	86.5	86.7	86.1	85.4	85.5
		Near S A Fan	92.4	92.6	92.7	91.2	91.7	91
		Near P.A. Fan	92.7	91	93.2	91.8	91.8	90.8
		Near Boiler -3 Area	85.1	85.4	85.3	85.4	85.2	85.4
		CFBC- Boiler-4						
		Near ID Fan-1	SD	SD	85.1	85.8	84.8	84.8
		Near ID Fan-2	SD	SD	85.5	85.4	85.4	85.4
		Near S A Fan	SD	SD	91.2	91.3	90	91.2
		Near P.A. Fan	SD	SD	92.2	91.1	90.3	91.5
		Near Boiler -4	SD	SD	85.2	84.7	85	84.9
5	185 MW Power Plant AEL	**CFBC- Boiler-5**						
		Near ID Fan-1	SD	SD	SD	SD	SD	SD
		Near ID Fan-2	SD	SD	SD	SD	SD	SD
		Near S A Fan	SD	SD	SD	SD	SD	SD
		Near P.A. Fan	SD	SD	SD	SD	SD	SD
		Near Boiler -5	SD	SD	SD	SD	SD	SD
		CFBC- Boiler-6						
		Near ID Fan-1	81.1	81.1	80.2	80.5	80	80.5
		Near ID Fan-2	81.3	80.8	80.5	80.8	80.3	81.2
		Near S A Fan	91.1	90.2	91.2	91.4	92	92.1
		Near P.A. Fan	91.4	91.1	91.5	92	91.8	91.5
		Near Boiler -6	84.8	84.8	85.1	84.8	85.3	85
		Near Silo Area	83.5	82.8	83.5	82.4	82.3	82.7
		Near 150 MW TG	89.2	89.2	89.2	89.2	89.1	89.3
		Near 165 MW TG	90.4	89.4	88.4	88.9	88.4	88.8
		Control Room Office	62.4	61.2	64	68.3	62.5	70.4

SUMMARY OF AMBIENT AIR QUALITY
MONTHLY AVERAGE VALUES

Month	Locations of Monitoring	Monthly Average				
		Unit in µg/m^3				Unit in mg/m^3
	Pollutant	PM_{10}	$PM_{2.5}$	SO_2	NO_X	CO
	Standard	100	60	80	80	2
Oct'24	CAAQMS-1	114.61	22.72	17.51	24.66	0.66
	CAAQMS-2	115.40	41.32	23.12	11.31	0.73
	CAAQMS-3	105.46	41.13	6.39	18.68	0.73
	CAAQMS-4	67.27	33.57	8.10	25.70	0.25
	CAAQMS-5	92.97	34.30	8.32	20.93	0.96
	CAAQMS-6	106.28	34.50	14.75	18.66	1.00
	CAAQMS-7	93.08	47.40	50.66	15.56	0.74
Nov'24	CAAQMS-1	144.77	41.61	15.28	24.96	0.70
	CAAQMS-2	156.66	70.39	23.08	9.64	0.71
	CAAQMS-3	135.67	66.24	6.46	18.04	0.79
	CAAQMS-4	112.29	72.17	5.49	29.34	0.21
	CAAQMS-5	147.43	64.61	8.11	19.90	0.52
	CAAQMS-6	176.41	55.09	14.58	18.78	0.84
	CAAQMS-7	216.03	95.54	24.14	18.51	1.10
Dec'24	CAAQMS-1	160.55	46.26	15.12	24.75	0.73
	CAAQMS-2	216.80	94.39	23.07	9.61	0.92
	CAAQMS-3	163.75	76.05	5.65	19.37	1.27
	CAAQMS-4	126.61	84.24	5.24	33.54	0.61
	CAAQMS-5	148.71	66.81	9.14	26.89	0.53
	CAAQMS-6	149.22	53.69	14.59	24.62	0.52
	CAAQMS-7	186.13	91.94	10.11	20.38	1.15
Jan'25	CAAQMS-1	184.69	52.22	18.52	17.25	0.41
	CAAQMS-2	243.09	113.05	23.08	5.47	0.72
	CAAQMS-3	191.31	96.96	5.42	17.68	1.14
	CAAQMS-4	113.65	71.37	5.95	31.58	0.47
	CAAQMS-5	150.84	57.52	14.81	10.84	0.62
	CAAQMS-6	174.27	46.45	15.26	18.28	0.43
	CAAQMS-7	246.13	126.09	10.54	14.65	1.15

Month	Locations of Monitoring	Monthly Average				
		Unit in $\mu g/m^3$				Unit in mg/m^3
	Pollutant	PM_{10}	$PM_{2.5}$	SO_2	NO_X	CO
	Standard	100	60	80	80	2
Feb'25	CAAQMS-1	180.65	55.67	22.90	9.66	0.82
	CAAQMS-2	220.07	101.39	23.17	9.72	0.43
	CAAQMS-3	193.09	77.35	9.42	16.17	1.20
	CAAQMS-4	132.01	59.52	5.69	24.10	0.69
	CAAQMS-5	140.82	52.02	18.79	13.42	0.90
	CAAQMS-6	154.70	44.05	15.46	15.72	0.49
	CAAQMS-7	206.59	102.64	8.13	18.40	0.99
March'25	CAAQMS-1	167.68	67.94	39.69	6.23	0.71
	CAAQMS-2	233.49	94.75	23.15	4.61	0.76
	CAAQMS-3	175.38	67.95	10.18	19.16	1.26
	CAAQMS-4	117.66	51.89	6.70	23.87	0.59
	CAAQMS-5	150.84	57.52	14.81	10.84	0.62
	CAAQMS-6	134.42	63.79	19.60	14.77	0.52
	CAAQMS-7	187.26	86.61	14.75	18.41	0.97

All values are in $\mu g/m^3$ except CO values are in mg/m^3. All Values are derived from 24 hourly average data except CO values which are derived from 8 hourly average data.

CAAQMS 1: Near Township; CAAQMS 2: Near Utility Department; CAAQMS 3: Near CRM; CAAQMS 4: Near Water Complex; CAAQMS 5: Near Coke Oven 2; CAAQMS 6: Near Wagon Tippler; CAAQMS 7: Near Material Gate, UM: Under Maintenance.

TSM-CPP/SPCB/TS-06/2025-01/186
April 25, 2025

The Member Secretary
State Pollution Control Board, Odisha
PariveshBhawan, A/118,
Nilakantha Nagar, Unit-VIII,
Bhubaneswar-751 012

Subject: Submission of ash 'Annual Implementation Report' for the financial year 2024-25

Dear Sir,
With reference to the captioned subject and Fly ash notification dtd. September 14, 1999 and its amendment, we are submitting hereby the ash 'Annual implementation report' for the period from 1st April' 2024 to 31st March' 2025 of M/s. TSM-CPP located at Ganthigadia, Dist. Angul, Odisha.

Particulars	Generation (MT)	Disposal/Utilization (MT)	Disposal/Utilization (%)
Fly Ash	729696	729696	100%
Bottom Ash	103217	103217	100%
Total Quantity	832913	832913	100%

Mode of Ash Disposal/Utilization	Quantity (MT)
Brick Manufacturing	187005
Cement Plant	374956
Quarry Filling	9343
NH/ Road Making	244901
Low Lying Area Filling & internal utilisation	16708
Total Utilization/ Disposal Quantity	**832913**

Hope, the information furnished above is in line with the statutory requirement.

Thanking you

Yours faithfully,

For TSM-CPP

Rajesh Kumar Agrawal
(Factory Manager)

RECEIVED
Dt. 9 MAY 2025
S.P.C. BOARD
BHUBANESWAR

Received
No. 28
Dt. 29/4/2025
REGIONAL OFFICE ORISSA POLLUTION CONTROL BOARD ANGUL

Copy to:
1. Deputy Director General Forest(C) IRO, MoEF&CC, Eastern Zone, Bhubaneswar.
2. The Divisional Head, CPCB, Eastern Region, Kolkata.
3. The Regional Officer, State Pollution Control Board, Odisha, Angul.
4. Central Electricity Authority (CEA), New Delhi.

Annexure-X

SUMMARY OF GASEOUS EMISSION

Period: From October 2024 to March 2025

AEL, CEMS- 1 (Boiler 1 & 2)				AEL, CEMS- 2 (Boiler 3 & 4)			AEL, CEMS- 3 (Boiler 5 & 6)		
Month	PM in mg/m^3	SO2 in mg/m^3	NOx in mg/m^3	PM in mg/m^3	SO2 in mg/m^3	NOx in mg/m^3	PM in mg/m^3	SO2 in mg/m^3	NOx in mg/m^3
October, 24	17.84	985.3	116.1	25.00	1132.8	95.5	27.56	999.2	140.9
November, 24	21.61	1253.3	115.3	25.24	1191.2	89.7	30.61	1044.6	157.7
December, 24	21.92	1118.2	173.5	30.10	1265.2	70.9	30.81	960.2	118.7
January, 25	22.37	771.4	130.9	29.76	1278.8	79.6	31.35	948.4	116.4
February, 25	20.50	766.3	72.7	29.64	1188.7	88.5	32.30	904.9	110.0
March, 25	29.2	865.0	81.1	32.3	1231.7	36.8	30.3	869.1	118.4