



एन टी पी सी लिमिटेड  
(भारत सरकार का उद्यम)  
**NTPC Limited**  
(A Govt. of India Enterprise)

तालचेर थर्मल / Talcher Thermal

Ref: 037/TTPP/EMG/25-26

Date: 12.05.2026

To,  
Additional Principal Chief Conservator of Forest (C),  
Ministry of Environment, Forest and Climate Change,  
Regional Office (EZ), A/3, Chandrasekharpur,  
Bhubaneswar – 751023  
Tel. No. 0674-2301213, 2302432  
Fax No. 0674-2302432  
Email – roez.bsr-mef@nic.in

Sub: Submission of Half Yearly Compliance Report of Environmental Clearance for Talcher Thermal Power Project Stage-III (2 x 660 MW)

Dear Sir,

Please find enclosed herewith Half Yearly Compliance Report of Environmental Clearance conditions given vide MoEF&CC letter no. J-13012/31/2009-IA.II(T) dated 12.09.2018 and Environmental Clearance amendment conditions given vide MoEF&CC letter no. J-13012/31/2009- IA.II (T) dated 16.03.2022 regarding Talcher Thermal Power Project Stage-III (2 x 660 MW) near Talcher Town, Tehsil Talcher Sadar, Angul District, Odisha, for compliance period October 2025 to March 2026.

Thanking you.

Yours faithfully

12/5/2026  
Anjan Kumar Sahoo

Encl: As above

CC: 1. Central Pollution Control Board, Kasba New Market, Sector 4 E, East Kolkata Twp, Kolkata, West Bengal-700107

2. The Member Secretary, SPCB Odisha Paribesh Bhawan, A/118, Nilakantha Nagar, Unit-VIII, Bhubaneswar-751012

तालचेर थर्मल पावर स्टेशन, पत्रालय : तालचेर थर्मल, जिला : अंगुल (ओडीसा) – 759101, दूरभाष : 06760-249101 (कार्यालय), फैक्स : 06760-249053  
Talcher Thermal Power Station, P.O. : Talcher Thermal, Dist. : Angul (Orissa) - 759101, Phone : 06760-249101 (O), Fax : 06760-249053  
पंजीकृत कार्यालय : एन टी पी सी भवन, स्कोप कॉम्प्लेक्स, 7 इन्स्टीट्यूशनल एरिया, लोधी रोड, नई दिल्ली – 110 003  
Registered Office : NTPC Bhawan, Scope Complex, 7 Institutional Area, Lodhi Road, New Delhi - 110 003, वेबसाइट / website : www.ntpc.co.in

हिन्दी में काम करना आसान है – शुरु तो कीजिये।

AGM (EMG)  
Anjan Kumar Sahoo / अंजन कुमार सहाय  
AGM (EMG) / NTPC LTD.  
Talcher Thermal Power Project  
एन टी पी सी लिमिटेड / तालचेर थर्मल पावर प्रोजेक्ट

**Half-Yearly Compliance Status Report to the EC Conditions for**  
**2x660 MW (Stage-III) Talcher Thermal Power Project at Talcher in Odisha by**  
**M/s NTPC Ltd.**  
**(Period Oct'2025 to Mar'2026)**

EC Ref. No. No. J-13012/31/2009-IA.II(T) Dated: 12.09.2018

EC Amendment Ref. No. F.No. J-13012/31/2009-IA.II (T) Dated: 16.03.2022

EC Amendment Ref. No. F.No. J-13012/31/2009-IA.II (T) Dated: 24.02.2026

S.No.	EC Conditions	Status
<b>A</b>	<b>SPECIFIC CONDITIONS</b>	
(i)	Ash ponds near Village Jhadiamba (133.848 acres) and Village Santhapada (156.538 acres) shall not be taken up as the ash is proposed to dispose it in the abandoned mine voids	Ash Dyke Construction works have been short closed and hence condition has been complied. Ash will be utilized in various ash utilization avenues and disposed in abandoned mine voids.
(ii)	The Ash content and Sulphur contents in the Coal shall not exceed 34% and 0.55%, respectively. In case of change in coal characteristics', a fresh reference is to be made to Ministry for reviewing the incremental impact, if any and adequacy of the conditions	The said stipulation will be complied during operation phase of the project.
(iii)	The capital CSR/CER budget shall be in line with Ministry's OM dated 1.5.2018 or Rs.19.5 crores whichever is higher. The amount shall be implemented during project construction in the surrounding villages.	The said stipulation is being complied. CSR/CER details with implementation status is attached (Anx-1). About 11.63 Cr Actual expenses incurred for activities under Education, Health, Drinking water, Water Conservation, Sanitation, Roads, Infrastructure, Women empowerment, Livelihood & Capacity building and promotions of rural sports & cultural activities heads.
(iv)	As the coal source is to be determined, the details regarding characteristics of coal along with transport mode shall be submitted to Ministry. Coal transportation shall be done by rail and conveyor system only.	The said stipulation will be complied during operation phase of the project. Coal transported will be done by rail mode only.
(v)	The ash which is sent to South Balanda mines shall be mixed with 8% lime before disposing into the mines.	The condition deleted in EC Amendment Ref. No. F.No. J13012/31/2009-IA.II(T) Dated: 16.03.2022.
(vi)	The new emission standards notified vide Ministry's S.O.3305(E) dated 7.12.2015 shall be achieved for existing units as per the extended timelines given by CPCB. Further, the proposed units shall achieve new emissions standards from the date of commissioning of the plant.	Operations of existing units have been discontinued w.e.f 31.03.2021. The new emissions standards of proposed units will be complied from the date of commissioning of the plant.

(vii)	Considering the proposed project is located in the Talcher Critically Polluted Area, the stack height of 275 m shall be erected to achieve maximum dispersion	Complied, 275 m height stack is under construction.
(viii)	The ash pond near Village Santhapada shall not be used as it is near to Brahmani River and high chances of breaching and contaminating the water body.	Ash Dyke Construction works have been short closed and hence condition has been complied. Ash will be utilized in various ash utilization avenues and disposed in abandoned mine voids.
(ix)	As per the Revised Tariff Policy notified by Ministry of Power vide dated 28.01.2016, project proponent shall explore the use of treated sewage water from the Sewage Treatment Plant of Municipality/ local bodies/ similar organization located within 50 km radius of the proposed power project to minimize the water drawl from River Brahmani/other surface water bodies	Shall be explored with local bodies within 50 km.
(x)	Compliance of EC conditions, E(P) Act, 1986, Rules and Mo EF&CC(W.S) Notifications issued time to time shall be achieved by a qualified environment officer to be nominated by the Project Head of the Company who shall be responsible for implementation and necessary compliance	An Environment Management Group (EMG) headed by AGM(EMG) is already functional at the Talcher Thermal PowerStation. AGM (EMG) will be responsible for implementing and monitoring the stipulations. EMG will have sufficient trained manpower for environmental monitoring and other environmental related activities to ensure compliance with statutory requirements. It will interact regularly with the State Pollution Control Board.
(xi)	Thermal Power Plant shall achieve specific water consumption, zero liquid discharge and emission standards as per Mo EF&CC Notification S.O. 3305(E) dated 7.12.2015 or subsequent notifications issued time to time.	The said stipulation considered during design of the project as mentioned EIA. The same will be complied during operation phase of plant.
(xii)	MoEF&CC Notification G.S.R 02(E) dated 2.1.2014 regarding use of raw or blended or beneficiated or washed coal with ash content not exceeding 34% shall be complied with, as applicable.	The said stipulation will be complied during operation phase of the project.
(xiii)	MoEF&CC Notifications on fly ash utilization S.O. 763(E) dated 14.09.1999, S.O. 979(E) dated 27.08.2003, S.O. 2804(E) dated 3.11.2009, S.O. 254(E) dated 25.01.2016 and subsequent amendments issued from time to time shall be complied with.	All MoEF&CC Notifications on Fly ash utilization will be complied during operation phase of the project.
(xiv)	Construction and inert waste generated during phasing out of existing plants shall be disposed as per Construction and Demolition Waste Management Rules, 2016	Operations of existing units have been discontinued wef 31.03.2021. Demolition of existing units is in progress. The applicable rules are being complied.
(xv)	Vision document specifying prospective plan for the site shall be formulated and	Talcher TPS has already submitted a project vision document to the Regional Office of MoEF&CC at Bhubaneswar.

	submitted to the Regional Office of the Ministry within six months.	
(xvi)	Harnessing solar power within the premises of the plant particularly at available roof tops and floating solar plants on raw water reservoir shall be carried out and status of implementation including actual generation of solar power shall be submitted along with half yearly monitoring report	Solar plant of 150KW has been installed & running successfully. In St-III another solar plant of capacity 1400KW is envisaged in the EPC package.
(xvii)	Online continuous monitoring system for stack emission, ambient air and effluent shall be installed.	Condition will be complied during the operation phase.
(xviii)	High Efficiency Electrostatic Precipitators (ESPs) shall be installed to ensure that particulate emission does not exceed 30 mg/Nm <sup>3</sup> or as would be notified by the Ministry, whichever is stringent. Adequate dust extraction system such as cyclones/bag filters and water spray system in dusty areas such as in coal handling and ash handling points, transfer areas and other vulnerable dusty areas shall be provided along with an environment friendly sludge disposal system.	The High Efficiency Electrostatic Precipitators (ESP) will be designed in order to comply with the direction. Besides, dust extraction systems and suitable water spray systems are included in the design of the plant to suppress/avoid dust emissions from the coal and ash handling areas.
(xix)	Adequate dust extraction system such as cyclones/ bag filters and water spray system in dusty areas such as in coal handling and ash handling points, transfer areas and other vulnerable dusty areas shall be provided.	Adequate nos. of dust suppression and dust extraction systems will be provided in coal handling area including coal stock yard area, ash handling area and other vulnerable dusty area for control of fugitive dust emissions.
(xx)	Monitoring of surface water quantity and quality shall also be regularly conducted and records maintained. The monitored data shall be submitted to the Ministry regularly. Further, monitoring points shall be located between the plant and drainage in the direction of 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 Surface and ground water quality is being carried out as per Stipulations and half yearly reports is attached (Anx-2). Heavy metal monitoring in ground water is being undertaken and results are included in the above report.
(xxi)	A well designed rain water 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 record kept of the quantity of water harvested every year and its use.	Rainwater harvesting system will be put in place before commissioning of plant and records shall be maintained.
(xxii)	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	The said stipulation will be complied both during the construction as well as operation phase of the project.

(xxiii)	Additional soil for levelling of the proposed site shall be generated within the sites (to the extent possible) so that natural drainage system of the area is protected and improved.	All additional soil levelling of the project site will be done from within the sites only with all necessary precautions to protect natural drainage system of the area.
(xxiv)	Fly ash shall be collected in dry form and storage facility (silos) shall be provided. Mercury and other heavy metals (As, Hg, Cr, Pb etc.) shall be monitored in the bottom ash. No ash shall be disposed off in low lying area.	An ash management & disposal scheme will be implemented consisting of dry ash extraction system (DAES) for dry collection of fly ash with storage facility (silos), supply of ash to ash end users for utilization and promoting ash utilization to maximum extent and safe disposal of unused ash in slurry form to the abandoned mine void area. The plant shall also have ash water re-circulation system for bringing back decanted water from abandoned mine voids for reuse inside plant for ash slurry making. Periodic monitoring for mercury & heavy metals in the bottom ash will be done during the operation phase of the extension project.
(xxv)	No mine void filling will be undertaken as an option for ash utilization without adequate lining of mine with suitable media such that no leachate shall take place at any point of time. In case, the option of mine void filling is to be adopted, prior detailed study of soil characteristics of the mine area shall be undertaken from an institute of repute and adequate clay lining shall be ascertained by the State Pollution Control Board and implementation done in close coordination with the State Pollution Control Board	The condition deleted in EC Amendment Ref. No. F.No. J13012/31/2009-IA.II (T) Dated: 16.03.2022
(xxvi)	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.	Fugitive emission of fly ash & dust will be controlled with the aid of suitable pollution control devices such as dust extraction system and dust suppression system, etc. Extensive plantation will be undertaken in all available spaces including coal handling, ash handling areas etc.
(xxvii)	Green Belt consisting of three tiers of plantations of native species all 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 per ha with survival rate not less than 80%. <b>This condition has been modified as per EC amendment dated 24.02.2026 as "PP shall complete tree plantation in 33% of total land area. Greenbelt in 142.72 Ha at the 33%</b>	More than 2,11,330 trees of different species were already planted by Talcher project in and around its existing area. Plantation would be developed in the available and feasible areas of Main plant, cooling towers, new admin building, around stockpile of the coal and other material, roadsides, internal roads. Extensive afforestation will be undertaken at all available spaces in and around project, after construction is complete. Greenbelt plantation shall be done as per greenbelt action plan submitted.

	of total land area 432.49 Ha is proposed. This includes 14.44 Ha inside main plant and balance 128.28 Ha at the unused ash dyke land.	
(xxviii)	The project proponent shall formulate a well laid Corporate Environment Policy and identify and designate responsible officers at all levels of its hierarchy for ensuring adherence to the policy and compliance with the conditions stipulated in this clearance letter and other applicable environmental laws and regulations.	Corporate Environment Policy is already existing and the same will be adhered to so as to comply with the conditions stipulated in this clearance letter and other applicable environmental laws and regulations as submitted earlier.
(xxix)	CER schemes identified based on need-based assessment shall be implemented in consultation with the village Panchayat and the District Administration starting from the development of project itself. As part of CER 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 community development activities and income generating programs.	CER/CSR schemes are being implemented as per guidelines. NTPC is providing employment to local employable persons through various contractors. Separate budget has been earmarked for implementing CER/CD activities for the project and shall be utilized in accordance with the said stipulations. NTPC is already providing solar lights & toilets in villages, providing education in schools inside TTPS premises to children from villages in the periphery & organized medical camp for local population.
(xxx)	CER activities will be carried out as per OM No. 22-65/2017-IA.II dated 01.05.2018 or as proposed by the PP in reference to Public Hearing or as earmarked in the EIA/EMP report along with the detailed scheduled of implementation with appropriate budgeting	The said stipulation is being complied. CSR/CER details with implementation status is attached (Anx-1).
(xxxi)	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.	In-built mechanism will be adopted for the monitoring of CSR schemes through any Government institute or agency of repute in the region.
<b>B</b>	<b>GENERAL CONDITIONS</b>	
(i)	The treated effluents conforming to the prescribed standards only shall be recirculated and reused within the plant. Arrangements shall be made that effluents and storm water do not get mixed	The concept of Zero Liquid Discharge (ZLD) shall be adopted through reuse of plant effluents. An independent plant effluent drainage system will be constructed to ensure that plant effluents do not mix with storm water drainage.
(ii)	A sewage treatment plant shall be provided (as applicable) and the treated sewage shall be used for raising greenbelt/plantation	All domestic sewage emanating from plant and township will be treated in a sewage treatment plant. The treated sewage conforming to prescribed standards shall be utilized for plantation & raising greenbelt to the extent possible.

(iii)	Storage facilities for auxiliary liquid fuel such as LDO/HFO/LSHS shall be made in the plant area in consultation with 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 an accident taking place due to storage of oil	Storage facilities for auxiliary liquid fuel LDO/HFO are designed conforming to the safety standards and where risk is minimal. A detailed Disaster Management Plan & Risk assessment including fire and explosion issues will be prepared and finalized in consultation with Department of Explosives, Nagpur and regular mock drills shall be conducted as per plan in order to address any eventuality in case of an accident.
(iv)	First Aid and sanitation arrangements shall be made for the drivers and other contract workers during construction phase	All arrangements related to first aid, health & safety and sanitation for workers/drivers during construction phase of the project have been kept under the scope of EPC contractor. However, NTPC ensures effective compliance of the said stipulations.
(v)	Noise levels emanating from turbines shall be so controlled such that the noise in the work zone shall be limited to 85 dB(A) from source. For people working in the high noise area, requisite personal protective equipment like earplugs/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 record and for treatment for any hearing loss including shifting to nonnoisy/less noisy areas.	Design specification for the equipment has been made to comply with the stipulation. Personal protective equipment has been arranged through contractors during construction phase. Periodic examination of workers during operation phase shall be done as stipulated. The workers of generator hall and other high noise area will be provided with appropriate ear protection devices.
(vi)	Regular monitoring of ambient air ground level concentration of SO <sub>2</sub> , NO <sub>x</sub> , PM <sub>2.5</sub> & PM <sub>10</sub> and Hg shall be carried out in the impact zone and records maintained. If at any stage these levels are found to exceed the prescribed limits, necessary control measures shall be provided immediately. The location 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 this Ministry. The data shall also be put on the website of the company.	Ambient Air Quality is being monitored by third Party Agency as per guidelines of CPCB/SPCB & reports are being sent to appropriate authorities at regular intervals. (Anx-3)
(vii)	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	Ash Utilization shall be implemented in compliance to fly ash gazette notification by MoEF&CC dt 14.09.1999 and its subsequent amendments and status of ash utilization plan implementation shall be intimated to the RO of Ministry, of MoEF&CC at Bhubaneswar after operation of project.
(viii)	Provision shall be made for the housing of construction labour (as applicable) within the site with all necessary infrastructure and	A labour colony with necessary infrastructure facilities such as housing, sanitation, mobile toilet, fuel, medical facilities, safety, drinking

	facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, creche etc. The housing may be in the form of temporary structures to be removed after the completion of the project	water supply, etc. will be provided for construction labour through EPC contractor. NTPC will ensure effective compliance of the said stipulation by contractors.
(ix)	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 environmental clearance and copies of clearance letter are available with the Delhi Pollution Control Committee and may also be seen at the Website of MoEF&CC at <a href="http://envfor.nic.in">http://envfor.nic.in</a> .	The information of Environment Clearance was widely circulated in the region in two newspapers, i.e. in English Newspaper –The New Indian Express, and in vernacular language newspaper, i.e. in Sambad, on 19.09.2018.
(x)	A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parishad I 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 website of the Company by the proponent	Copy of Clearance letter has been submitted to Panchayat, Zila Parishad and NGO. The Environmental Clearance was also uploaded in NTPC website.
(xi)	The proponent shall upload the status of compliance of the stipulated environmental clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of MOEF, the respective Zonal Office of CPCB and the SPCB. The criteria pollutant levels namely; SPM, RSPM (PM2.5 & PM10), SO2, NOx (ambient levels as well as stack emissions) shall be displayed at a convenient location near the main gate of the company in the public domain	The HYC status of the stipulated Environmental Clearance conditions is being uploaded on the NTPC website of the company. The display of ambient air quality in terms of PM10, PM2.5, SO2 and NOx for expansion project will be displayed at a convenient location near the main gate as mentioned in CPA action plan during operation of plant.
(xii)	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 State Pollution Control Board 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 environmental clearance conditions and shall also be sent to the respective Regional Offices of the Ministry by e-mail	The environment statement for each financial year ending 31st March in Form – V will be submitted to the Odisha State Pollution Control Board, once the plant becomes operational and will be upload on NTPC website.

(xiii)	The project proponent shall submit six monthly reports on the status of the implementation of the stipulated environmental safeguards to Mo EF&CC, its Regional Office, Central Pollution Control Board and State Pollution Control Board. 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, MoEF&CC.	Six monthly EC compliance report for the period Oct 2025 to Mar 2026 is submitted herewith.
(xiv)	The progress of the project shall be submitted to CEA on six monthly basis.	Same is being Complied.
(xv)	Regional Office of the Mo EF&CC will monitor the implementation of the stipulated conditions. A complete set of documents including Environmental 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 up-load the compliance status in their website and up-date the same from time to time at least six-monthly basis. Criteria pollutants levels including NO <sub>x</sub> (from stack & ambient air) shall be displayed at the main gate of the power plant.	Shall be complied.
(xvi)	Separate funds shall be allocated for implementation of environmental protection measures along with item-wise break-up. This cost 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	Separate funds for Environment Protection measures are allocated in project cost. Funds earmarked towards Env. Protection measures will not be diverted for any other purpose.
(xvii)	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 concerned authorities and the dates of start of land development work and commissioning of plant.	Shall be complied.
(xviii)	Full cooperation shall be extended to the Scientists/Officers from the Ministry/ Regional Office of the Ministry / CPCB/ SPCB who would be monitoring the compliance of environmental status	Full cooperation shall be extended to the Scientists / officers from the Ministry / Regional Office of the Ministry / CPCB / SPCB during monitoring of the project.

C	An as built or as completed report on EMP to be submitted stating the scope/extent of work envisaged in the EIA along with estimated cost vis-à-vis the actual completed works and cost incurred. A certificate/completion certificate accordingly, shall have to be submitted before Commissioning of the TPP.	Shall be complied before Commissioning of the plant.
33.	The ministry reserves the right to revoke the clearance if conditions stipulated are not implemented to the satisfaction. The Ministry may also impose additional environmental conditions or modify the existing ones, if necessary.	Noted.
34.	The environmental clearance accorded shall be valid for a period of 7 years from the date of issue of this letter to start operations by the power plant.	Noted.
35.	Concealing factual data or submission of false /fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environmental (Protection) Act, 1986.	Noted.
36.	In case of any deviation or alteration in the project proposed including coal transportation system from those submitted to this Ministry for clearance, a fresh reference should be made to the Ministry to assess the adequacy of the conditions (s) imposed and to add additional environmental protection measures required, if any.	Noted.
37.	The above stipulations would be enforced among others under the water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and Control of Pollution) Act, 1981, the Environmental (Protection) Act, 1986 and rules there under, Hazardous Wastes (Management, Handling & Transboundary Movement) Rules, 2008 and its amendments, the Public. Liability Insurance Act, 1991 and its amendments.	Noted.
38.	Any appeal against this environmental clearance shall lie with the National Green Tribunal, if preferred, within 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.	Noted.
(A)	<b>Environmental Management</b>	
(i)	Coal transportation shall be done by rail only and closed conveyor system only. In any	The said stipulation will be complied during operation phase

	event, coal shall not be transported by road. Further, PP shall follow the provisions of the Ministry's Notification S.O (E) 1561 dated 21st May, 2020.	
(ii)	PP shall complete 33% tree plantation in the periphery of the project are with Miyawaki technique within strict timelines. <b>This condition has been modified as per EC amendment dated 24.02.2026</b> as "PP shall complete tree plantation in 33% of total land area. Greenbelt in 142.72 Ha at the 33% of total land area 432.49 Ha is proposed. This includes 14.44 Ha inside main plant and balance 128.28 Ha at the unused ash dyke land.	More than 2,11,330 trees of different species were already planted by Talcher project in and around its existing area. Plantation would be developed in the available and feasible areas of Main plant, cooling towers, new admin building, around stockpile of the coal and other material, roadsides, internal roads. Extensive afforestation will be undertaken at all available spaces in and around project, after construction is complete. Greenbelt plantation shall be done as per greenbelt action plan submitted.
(B)	<b>Miscellaneous</b>	
(iii)	PP shall install solar power within premise of the plant at available roof tops and floating solar plants on raw water reservoir within certain timeline and status report shall be submitted to Ministry's IRO with its six-monthly monitoring report.	Solar plant of 150KW has been installed & running successfully. In St-III another solar plant of capacity 1400KW is envisaged in the EPC package. The scheme for harnessing solar power from floating solar plants within the premises of the upcoming plant will be implemented and report will be submitted along with half yearly monitoring report.
(iv)	Other conditions of the EC letter dated 12th September, 2018 shall remain unchanged.	Noted.
(v)	PP shall follow Ministry's guidelines vide OM dated 28th August, 2019 for ash filling in mine voids and monitor the heavy metal in Groundwater and Surface water quarterly. PP shall also check pH of supernatant water in mine void and if required mixing of lime with ash may be done.	Monitoring of Surface and ground water quality will be carried out regularly as per Stipulations and reports will be submitted during operation stage of expansion project.

# Annexure-I

Community Development Approved		Budget vis-à-vis Expenditure		
S. No.	Thematic Head	Approved Amount (in Cr. Rs.)	Tentative/Approved Amount (in Rs.)	Notesheet Ref. No.
1	BIG TICKET PROJECT Project (Rejuvenation of Nandira Nallah)	9.50		Rejuvenation and peripheral development of Nandira Nallah from Kali Bazar Chhak to East Coast Railway Line Near NTPC TTPS
			2,023,171.82	Bantol School renovation
			8,138,223.00	Upgradation of Anganwari centers to Smart Anganwari Centers in the peripheral villages of NTPC Talcher Thermal
			2,400,000.00	Approval regarding placement of funds towards relocation of Aanganwari Centre
			2,674,984.33	1. Renovation work of Ahimanyupur Project Primary School 2. Renovation work of Teheranpur Project Primary School
			235,768.00	Distribution of water bottles to students studying in Govt. Schools in the peripheral and RoU Villages of NTPC Talcher Thermal
			1,481,400.00	Distribution of school bags to students studying in Govt. schools in the peripheral villages of NTPC Talcher Thermal
			59,000.00	Approval for making necessary arrangements for handing over of Upgraded Anganwadi Centres under CD activities
			<b>17,012,547.15</b>	
			17,917,563.36	Hiring of MMU & MCH Services for NTPC TTPS for a period of 04 years with a provision for extension for 01 year
			1,147,970.00	Procurement of Medicines for MMU & MCH services of NTPC Talcher Thermal for a period of 01 Year under CD activity
			1,975,088.00	Expenses incurred for treatment of patients in Ashalok Hospital under CD 2023-24
			1,032,470.00	Expenses incurred for treatment of patients in Ashalok Hospital under CD 2024-25 (From April till August 2024)
			689,236.00	Expenses incurred for treatment of patients in Ashalok Hospital under CD 2024-25 (From September till November 2024)
			707,694.00	Expenses incurred for treatment of patients in Ashalok Hospital under CD 2024-25 (From December 2024 till February 2025)
			227,910.00	Expenses incurred for treatment of patients in Ashalok Hospital under CD 2024-25 (March 2025)
			719,403.00	Expenses incurred for treatment of patients in Ashalok Hospital under CD 2025-26 (April-June 2025)
			330,590.00	Expenses incurred for treatment of patients in Ashalok Hospital under CD 2025-26 (July 2025)
			346,439.00	Expenses incurred for treatment of patients in Ashalok Hospital under CD 2025-26 (August 2025)
			216,380.00	Expenses incurred for treatment of patients in Ashalok Hospital under CD 2025-26 (December 2025)
			256,911.00	Expenses incurred for treatment of patients in Ashalok Hospital under CD 2025-26 (January 2026)
			262,936.00	Expenses incurred for treatment of patients in Ashalok Hospital under CD 2025-26 (February 2026)
			145,465.00	Expenses incurred for treatment of patients in Ashalok Hospital under CD 2025-26 (March 2026)
			840,000.00	1. Mega Health Camp at 03 GP's for the year 2023-24 2. 02 nos. health camps were arranged in Asha Mission-Talcher & Blind School-Balram Prasad
			1,110,000.00	Organizing Mega Health Camps at 05 Gram Panchayats in the Project Affected Villages of NTPC Talcher Thermal for the FY 2024-25
			36,876.00	Medicines for organizing Mega Health Camps at 05 Gram Panchayats in the Project Affected Villages of NTPC Talcher Thermal for the FY 2024-25
			65,320.00	Organising Medical Check up for rural women in observance of International womens day
			4,000,000.00	Distribution of Aids and Assistive devices to Divyangjans and Sr. Citizens of peripheral villages of NTPC Talcher Thermal under Community Development
			22,500.00	Approval for providing refreshment during distribution of Aids Assistive Devices through ALIMCO in RoU villages of NTPC Talcher Thermal
			31,100.00	Providing assistance to Sub Collector for celebrating World AIDS Day
			394,779.00	Supply of Sanitary Napkin Vending Machine, Incinerator and Sanitary Napkins for nearby schools/colleges of NTPC Talcher Thermal
			929,460.84	Purchase of open air gym equipments for peripheral villages under CD initiatives of NTPC Talcher Thermal
			820,000.00	Purchase of 2000 nos. of blankets for peripheral area under CD Budget
			32,400.00	Approval for procurement of Glucometer Strips for MMU MCH Services of NTPC TTPS from GEM Portal.
			48,000.00	Approval for procurement of EzeCheck non-invasive HB screening device for MMMU MCH Services of NTPC TTPS from GEM Portal.
			<b>34,306,491.20</b>	
			2,760,531.87	Development work of pond at Shiv mandir complex village Jagannathpur, Jagannathpur GP
			255,408.46	DIG office plantation
			7,263,373.97	1. Renovation of pond at Jagannathpur village (Nua-bandha) 2. Balance Development of Pond - Jagannathpur Village Shiv Mandir
			414,067.78	Installation of 14 water purifiers at various location
			<b>10,693,382.08</b>	
			116,800.00	Street play for creating awareness w.r.t Dengue, Malaria, Jaundice etc. in 4 Panchayats
			63,000.00	Bleaching powder distribution on all 4 GP's 2023
			63,000.00	Bleaching powder distribution on all 4 GP's 2024
			65,100.00	Bleaching powder distribution on all 4 GP's 2025
			1,603,356.39	Sweeping and cleaning of weekly market area near to TTPS Plant.
			2,000,000.00	Providing assistance to Odisha Police in organising All India Police Hockey Championship-2025 (Initiated for re-appropriation by ED-CSR)
			<b>3,911,256.39</b>	
			81,000,000.00	Kali Mandir-Bantol Road
			6,544,630.00	Relocation of bi-weekly Haat
			663,479.45	Renovation of Santhapada Cremation ground
			607,268.24	Repairing of Kukudola Village internal road
			1,627,786.66	Renovation of community centre at Santhapada
			336,001.48	Renovation of Jagannathpur Panchayat Office
			2,597,998.08	Const. of Structural shed for Kalyan Mandap at Jagannathpur Village
			2,000,000.00	Deposit of Rs. 20 lacs to BDO Talcher for installation of CCTV along the Jagannathpur Bypass Road
			113,254.00	Construction of concrete pathway to Maa Budhapata Pitha temple in Santhapada village
			3,380,400.00	Supply, erection and commissioning of 4 no. of 30 m high-mast light 4 GP's

6	INTERNAL ROADS & OTHER VILLAGE INFRASTRUCTURE	32.35	72,336.00	Approval for providing electrical connection to Hi-Mast Lights provided by NTPC Talcher Thermal through Ms. TPCODL (Santhapada & Bantol)			
			73,908.00	Approval for providing electrical connection to Hi-Mast Light at Jagannathpur GP provided by NTPC Talcher Thermal through Ms. TPCODL			
			97,436.00	Approval for providing electrical connection to Hi-Mast Light at Gurujanguli GP provided by NTPC Talcher Thermal through Ms TPCODL			
			3,881,691.76	Different CSR-Community Development works at Jagannathpur GP under NTPC/TTPP			
			3,047,996.32	Construction of CC road from NH-149 (Balhar Chowk) to 400 mtr towards Bangu Village (Indira Gandhi road)			
			10,976,670.89	Technical and Administrative approval for Execution of Civil works at Various Anganwadis & Schools of Bantol GP near NTPC Talcher Thermal			
			7,389,651.83	Execution of Civil and Electrical Works in the villages of Bantol Gram Panchayat near NTPC Talcher Thermal			
			706,878.50	Construction of Cement Concrete road at Santhapada Village under CD works of NTPC/TTPP			
			6,512,576.62	Execution of Works at various Schools of Gurujanguli GP at NTPC Talcher Thermal			
			30,717,212.81	Different CD Works at Santhapada GP under NTPC-TTPP			
			9,837,867.73	Different CSR-CD works at Samal Under NTPC TTPP			
			15,981,600.00	Supply of Integrated Solar Street Lights in Peripheral Villages of NTPC Talcher (600 Nos.)			
			971,400.00	Installation & Commissioning of Integrated Solar Street Lights in Peripheral Villages of NTPC Talcher			
			763,200.00	AMC of Integrated Solar Street Lights in Peripheral Villages of NTPC Talcher			
			1,214,539.64	Construction of Sri Chaitanya Thakur Mandapam at Jagannathpur, Talcher			
			5,767,745.41	Approval for taking up various community development works in Bhogabereni GP			
			3,326,994.20	Approval for development works at Nuapada village of Santhapada GP under CD			
			12,901,035.93	Road construction from Anand Bazar Chowk to Santhapada Ghai under community development activities of Talcher Thermal.			
			195,711.50	CD work activity in Gurujang Village-Digging of Trench around plantation			
			5,213,162.66	CD Works in Tippo Village (Samal Panchayat)			
			7,611,584.00	Supply installation and commissioning of 120 kWp solar Plant at Black Diamond Library, Angul under CD initiative			
			2,254,361.21	CD Works-Belpada Village			
			7,163,083.98	CD WORKS-EKAGHARIA VILLAGE			
			4,998,928.05	CD works at Tippo Under NTPC TTPP (Phase-II works in Tippo)			
			2,968,615.91	Execution of different CSR-CD works in Bikisar Area			
			27,279,801.31	Construction of Police Outpost near Kali Mandir bypass road at TTPP area.			
			122,100.00	Approval for procurement of 02 Nos. Air Conditioners and 10 Nos. Office Chairs to Tahasil Office Banarpal			
						<b>270,918,908.17</b>	
			7	WOMEN EMPOWERMENT	1.60	230,000.00	Beautician Training
						280,032.00	Sewing Training
128,510.00	Training to SHG's of peripheral villages w.r.t millets processing, preservation and marketing for enhanced economic opportunity						
37,055.00	Approval for organising refresher advance sewing training for self help group women of Bantol panchayat						
294,625.00	Tailoring training for Self help groups in nearby villages						
			146,000.00	Approval regarding celebration of International Women's Day at NTPC Talcher Thermal			
			<b>1,116,222.00</b>				
8	LIVELIHOOD AND CAPACITY BUILDING	1.00	262,314.00	Approval for providing paper plate and cup making machine to SHGs of peripheral villages to promote livelihood opportunities			
			1,017,050.00	Livelihood enhancement through apiary in the peripheral villages of NTPC Talcher Thermal			
			351,337.00	In-principle approval for Livelihood Training Programme on Sewing Stitching for women of Brajnathpur GP (RoU Village)			
			<b>1,630,701.00</b>				
			472,100.00	1. Volleyball Tournament 2. District Badminton Association			
			1,000,000.00	Financial support of Rs. 10 lacs to District Administration-Angul in commemoration of 30 years of Angul Dist			
			1,000,000.00	Financial support of Rs. 10 lacs to District Administration-Angul for organising 12th Cultural Extravaganza Zilla Mahotsava			
			1,000,000.00	Financial support of Rs. 10 lacs to District Administration-Angul for organising 13th Cultural Extravaganza Zilla Mahotsava			
			30,000.00	Rath yatra Bhajan Sandhya Samiti			
			63,490.00	Approval for providing support to Angul District United Badminton Association			
			30,000.00	Financial Support to District Administration for celebration of Independence Day 2023			
			125,000.00	Purchase of 5000 nos. National Flag for distribution to the communities as part of "Har Ghar Tiranga" Campaign of GoI (Independence Day 2023)			
			100,000.00	Procurement of National Flags for "Har Ghar Tiranga Campaign" for the year 2024			
			100,000.00	Procurement of National Flags for "Har Ghar Tiranga Campaign" for the year 2025			
			125,675.00	Expenses for refreshments in Aganwari and govt. schools on the occasion of Republic day 2024			
			150,000.00	Expenses for refreshments in Aganwari and govt. schools on the occasion of Independence day 2024			
			93,127.00	Expenses for refreshments in Aganwari and govt. schools on the occasion of Independence day 2023			
			124,019.00	Expenses for refreshments in Aganwari and govt. schools on the occasion of Republic day 2025			
			129,400.00	Expenses for refreshments in Aganwari and govt. schools on the occasion of Independence day 2023			
			41,360.60	Drawing & rangoli activities for children and women to promote cultural cohesion			
			37,370.00	Annual sports meet at Santhapada GP			
			227,000.00	Cultural Event at Gurujanguli GP			
			131,927.00	Volleyball Tournament at Sathapada GP			
			71,000.00	Assistance in celebrating Rajo Festivals 2024 in 04 GPs			
			289,074.00	Long term volleyball coaching for rural youths 2024 (Ref:TTPS/R & R/2024-25/TTPP-CD/144927)			
			655,279.00	Providing shooting equipments shooter from Talcher, Dist: Angul (Odisha)			
			665,850.00	Providing assistance to young shooter from Talcher Angul.			
			150,000.00	Extending support for holding block level NUA-O Sports Competition			
			293,427.53	Financial Assistance to International Mountaineer Ms. Bibharani Priyadarshani			
			377,900.00	Volleyball Tournament and Coaching for 04 GPs			
			9,450.00	Providing assistance to Area Khabar on the occasion for organizing Mega Blood Donation Camp at Talcher			
			60,000.00	Approval for providing tentage items at Village Santhapada on the occasion of Gram Pratishtha Diwas			

9	PROMOTION OF RURAL SPORTS AND CULTURAL ACTIVITIES	2.20	67,656.96	Providing assistance to Saraswati Sishu Vidya Mandir Samal in organising Annual Function-2025			
			50,000.00	Providing assistance to villagers of Bantol GP on the occasion of Dholpurnima Mahotsava 2025			
			65,590.00	Providing assistance to villagers of Bantol GP on the occasion of Dholpurnima Mahotsava 2024			
			138,082.70	Welfare measures during General Election 2024			
			242,940.00	Approval for providing assistance in organizing Tennis Cricket Tournament at Bantol Panchayat			
			11,000.00	Providing assistance to Abhimanyupur Project School Talcher for annual sports event			
			14,152.00	Providing assistance to Diamond Club for organizing Blood Donation Camp at Village Santhapada			
			461,799.00	Approval for organising 20th Talcher Pustak Mela to be held from 23.01.2023 to 30.01.2023 at Prajamandal Bhawan, Talcher			
			586,165.00	Approval for organising 21th Talcher Pustak Mela to be held from 23.01.2024 to 30.01.2024 at Prajamandal Bhawan, Talcher			
			500,000.00	Approval for organizing 22nd Talcher Pustak Mela to be held from 23.01.2025 to 30.01.2025 at Deulabera Durga Mandap Premises Talcher			
			500,000.00	Approval for organizing 23rd Talcher Pustak Mela to be held from 23.01.2026 to 30.01.2026 at Deulabera Durga Mandap Premises Talcher			
			41,000.00	Providing support to Angul District United Badminton Association			
			79,679.00	Providing assistance to villagers for celebrating Rajo festival 2025			
			150,000.00	Extend financial support to village committee Bhaktipal for organizing Cultural program during Rath Yatra 2025			
			150,000.00	Extend financial support to Talcher committee for organizing Cultural program during Rath Yatra 2025			
			32,500.00	Provided assistance to Diamond Club Santhapada for organising annual function			
			10,000.00	Financial support to Sub-collector Talcher for observance of Independence Day 2025			
			50,000.00	Conducting street play in gram panchayats in view of awareness of EK PED MAA KE NAAM 2.0 Plantation program in Talcher Block			
			66,954.43	Providing sound system to Radha Krusna Jew Bije Sangathan of Lulai Talasahi			
			67,656.96	Providing assistance to Saraswati Sishu Vidya Mandir Samal in organising Annual Function-2026			
			50,000.00	Providing assistance to villagers of Bilinda for organising Annual function-2026			
			40,000.00	Providing assistance to villagers of Gurujang for organising cultural function-2026			
			202,500.00	Approval for providing assistance to organize Volleyball Tournament at Bantol Gram Panchayat			
			203,000.00	Approval for providing assistance to Village committee Bhaktipal (Samal) for Chaiti Parba April 2026			
			1,500,000.00	Approval for financial support of Rs. 15 lacs to District Administration Angul for organising 13th Zilla Mahotsava			
			80,000.00	Approval for providing tentage items at Village Santhapada on the occasion of Om Sai Palinki Yatra 2026			
			50,000.00	Providing assistance to villagers of Bantol GP on the occasion of Dholpurnima Mahotsava 2026			
			61,400.00	Approval regarding conduct of Street Play on AIDS Awareness Program in Peripheral Villages of NTPC Talcher Thermal			
			15,000.00	Providing assistance to villagers of Bikisar on the occasion of Dholpurnima Mahotsava 2026			
						<b>13,039,525.18</b>	
				<b>TOTAL</b>	<b>65.00</b>	<b>352,629,033.17</b>	

Annexure-II

*INTRIM REPORT-IV (POST-MONSOON 2025)*

**HYDRO GEOLOGICAL STUDY FOR TALCHER THERMAL  
POWER PROJECT, STAGE-III (2X660MW)**



**Submitted to  
NATIONAL THERMAL POWER CORPORATION  
TTPP TALCHER (ANGUL)**



**By  
GEO SCIENCE CONSULTANCY SERVICES, ROORKEE  
(CGWA ACCREDITED & ISO 9001:2015)  
SALEMPUR RAJUPTAN, ROORKEE – 247667 (UTTARAKHAND)  
DECEMBER - 2025**

## **CONTENTS**

<b>1</b>	<b>INTRODUCTION.....</b>	<b>1</b>
1.1	GENERAL .....	1
1.2	OBJECTIVES .....	2
1.2.1	Surface Water Hydrology .....	2
1.2.2	Ground Water Hydrology .....	3
1.3	SCOPE OF WORK.....	4
1.3.1	Literature Review .....	4
1.3.2	Field Studies.....	4
1.4	GEOGRAPHICAL EXTENT OF STUDY AREA .....	5
<b>2</b>	<b>DESCRIPTION OF STUDY AREA .....</b>	<b>7</b>
2.1	ANGUL DISTRICT .....	7
2.2	STUDY AREA .....	9
2.3	PHYSIOGRAPHY .....	9
2.4	CLIMATE AND RAINFALL.....	12
2.5	GENERAL GEOLOGY.....	13
2.6	HYDROLOGY AND DRAINAGE SYSTEM.....	15
2.7	HYDROGEOLOGY AND GROUNDWATER.....	16
2.8	SOIL TYPE AND LAND USE LAND COVER.....	18
<b>3</b>	<b>METHODOLOGY .....</b>	<b>20</b>
3.1	COLLECTION OF WATER SAMPLES .....	20
3.2	CHEMICALS AND REAGENTS .....	24
3.3	ANALYTICAL METHODOLOGY FOR WATER SAMPLE .....	24
<b>4</b>	<b>WATER QUALITY CHARACTERISTICS.....</b>	<b>26</b>
4.1	PHYSICAL AND CHEMICAL PARAMETERS.....	27
4.1.1	pH.....	30
4.1.2	Electrical Conductivity (EC) .....	30
4.1.3	Temperature.....	31
4.1.4	Dissolved Oxygen .....	32
4.1.5	Total Dissolved Solids.....	33
4.1.6	Total Suspended Solids .....	34
4.1.7	Saturation percentage .....	35
4.1.8	Alkalinity.....	36

4.1.9	Hardness.....	37
4.1.10	Biochemical Oxygen Demand (BOD).....	38
4.1.11	Chemical Oxygen Demand (COD).....	39
4.1.12	Fluoride.....	40
4.1.13	Silica.....	41
4.1.14	Oil and Grease.....	42
4.1.15	Phenolic Compounds.....	43
4.2	MAJOR IONS.....	44
4.2.1	Major Anions ( $\text{HCO}_3^-$ , $\text{Cl}^-$ , $\text{SO}_4^{2-}$ , $\text{NO}_3^-$ ).....	47
4.2.2	Major Cations ( $\text{Ca}^{2+}$ , $\text{Mg}^{2+}$ , $\text{Na}^+$ , $\text{K}^+$ ).....	51
4.3	BACTERIOLOGICAL PARAMETERS.....	55
4.4	HEAVY METALS.....	57
<b>5</b>	<b>SUMMARY.....</b>	<b>78</b>

## **LIST OF FIGURES**

Figure 2.1: Location Map of Talcher TTPS, Angul, (Odisha).....	7
Figure 2.2: Vicinity map of TTPS.....	8
Figure 2.3: Digital elevation model of the buffer zone of TTPS Stage III.....	12
Figure 2.4: Geological map of the buffer zone of the proposed TTPS Stage-III. ....	14
Figure 2.5: Drainage network of TTPS Area.....	16
Figure 2.6: Water table seasonal fluctuation during pre and post monsoon.....	18
Figure 2.7: Land Use Land Cover (2024) Map of Study Area.....	19
Figure 3.1: Map of Surface water sampling locations. ....	22
Figure 3.2: Map of Groundwater sampling locations. ....	23
Figure 3.3: Measurement of ions in the collected water samples using Ion Chromatography (IC) .....	25
Figure 4.1: pH of SW and GW (Post-monsoon 2025).....	30
Figure 4.2: Electrical Conductivity (EC) of SW and GW (Post-monsoon 2025).....	31
Figure 4.3: Temperature variation in surface water (Post-monsoon 2025) .....	32
Figure 4.4: DO variation in surface water (Post-monsoon 2025) .....	33
Figure 4.5: TDS variation in the surface water & groundwater (Post-monsoon 2025).....	34
Figure 4.6: Total Suspended Solids in Surface water (Post-monsoon 2025) .....	35
Figure 4.7: Saturation percentage in Surface water (Post-monsoon 2025) .....	36
Figure 4.8: Alkalinity in Surface water and Groundwater (Post-monsoon 2025) .....	37
Figure 4.9: Total Hardness in Surface water and Groundwater (Post-monsoon).....	38
Figure 4.10: Variation of BOD in SW and GW during post-monsoon 2025. ....	39
Figure 4.11: Variation of COD in SW and GW during post-monsoon 2025. ....	40
Figure 4.12: Fluoride in SW and GW (Post-monsoon 2025). ....	41
Figure 4.13: Silica in SW and GW (Post-monsoon 2025). ....	42
Figure 4.14: Oil and Grease in SW and GW (Post-monsoon 2025). ....	43
Figure 4.15: Anion distribution in SW and GW during Post-monsoon 2025.....	47
Figure 4.16: Bicarbonates in SW and GW during post-monsoon 2025. ....	48
Figure 4.17: Chloride in SW and GW during post-monsoon 2025.....	49
Figure 4.18: Sulphate in SW and GW during post-monsoon 2025.....	49
Figure 4.19: Nitrate in SW and GW during post-monsoon 2025. ....	51
Figure 4.20: Cation distribution in GW and SW during Post-monsoon 2025. ....	51
Figure 4.21: Calcium in SW and GW during Post-monsoon 2025.....	52
Figure 4.22: Magnesium in SW and GW during Post-monsoon 2025.....	53

Figure 4.23: Sodium in SW and GW during Post-monsoon 2025.....	54
Figure 4.24: Potassium in SW and GW during Post-monsoon 2025.....	55
Figure 4.25: Total Coliform and Fecal Coliform (E. Coli) in SW and GW (Post-monsoon 2025). 56	
Figure 4.26: Arsenic concentration in Surface water and Ground water (Post-monsoon, 2025)60	
Figure 4.27: Mercury (Hg) in SW and GW (Post-monsoon 2025). ....	61
Figure 4.28: Lead (Pb) in SW and GW (Post-monsoon 2025). ....	62
Figure 4.29: Cadmium (Cd) in SW and GW (Post-monsoon 2025). ....	63
Figure 4.30: Total Chromium (Cr) and Chromium hexavalent (Cr <sup>6+</sup> ) in SW and GW (Post- monsoon 2025).....	64
Figure 4.31: Copper (Cu) in SW and GW (Post-monsoon 2025). ....	65
Figure 4.32: Zinc (Zn) in SW and GW (Post-monsoon 2025). ....	66
Figure 4.33: Selenium (Se) in SW and GW (Post-monsoon 2025). ....	67
Figure 4.34: Iron (Fe) in SW and GW (Post-monsoon 2025). ....	68
Figure 4.35: Lithium (Li) in SW and GW (Post-monsoon 2025). ....	69
Figure 4.36: Boron (B) in SW and GW (Post-monsoon 2025). ....	70
Figure 4.37: Aluminum (Al) in SW and GW (Post-monsoon 2025). ....	71
Figure 4.38: Manganese (Mn) in SW and GW (Post-monsoon 2025). ....	72
Figure 4.39: Nickel (Ni) in SW and GW (Post-monsoon 2025). ....	73
Figure 4.40: Strontium (Sr) in SW and GW (Post-monsoon 2025). ....	74
Figure 4.41: Barium (Ba) in SW and GW (Post-monsoon 2025). ....	76
Figure 4.42: Molybdenum (Mo) in SW and GW (Post-monsoon 2025). ....	77

## **LIST OF TABLES**

Table 2.1: Climatological Data of IMD Station, Angul (1971-23) .....	13
Table 2.2: Local geology of the area (CMPDI Report, 2003) .....	14
Table 2.3: Depth to groundwater levels during pre and post-monsoon 2025.....	17
Table 3.1: Details of samples collected for water quality analysis. ....	20
Table 3.2: Analytical methods and equipment used in the study .....	24
Table 4.1: Physicochemical quality of Surface Water sources within buffer area (post- monsoon, 2025) .....	28
Table 4.2: Physicochemical quality of Groundwater sources within buffer area (Post- monsoon, 2025) .....	29
Table 4.3: Classification of water based on Total Dissolved Solids (Post-monsoon 2025).....	34
Table 4.4: Hardness Classification of water (Pre monsoon 2025) .....	38
Table 4.5: Major ions in Surface water sources in buffer area (Post-monsoon, 2025). ....	45
Table 4.6: Major ions in ground water sources in the buffer area (Post-monsoon, 2025).....	46
Table 4.7: Heavy metals in SW sources in the buffer area (Post-monsoon, 2025).....	58
Table 4.8: Heavy Metals in GW sources in the buffer area (Post-monsoon, 2025) .....	59



## **1 INTRODUCTION**

### **1.1 GENERAL**

NTPC Limited, which was set up in November 1975 with the objective of planning, promoting and organizing integrated development of thermal power in India, has been playing a key role in the power sector of the country. As on 31 December 2025, total installed capacity of the company is 76,708.18 MW (including JVs). Its own stations include 26 coal- based, 7 gas based, 1 Hydro, 1 Wind, 18 Solar and 1 Small hydro plant and under JV, NTPC has 9 coal based, 4 gas based, 8 hydro based and 4 renewable energy projects (one small hydro, two wind-powered, and one Solar PV)

Talcher Thermal Power Station (TTPS) is situated near Talcher town in Angul district of Odisha, has existing capacity of 460 MW [Stage-I (4x60 MW) + Stage-II (2x110 MW)]. The project was implemented by erstwhile Orissa State Electricity Board (OSEB) and was subsequently taken over by NTPC on 03.06.1995 and its units have not been operation since 31.03.2021. Therefore, NTPC is establishing 2x660 MW (Stage-III, Expansion) Coal based Ultra Super Critical Talcher Thermal Power Project over an area of 446 Acres, within the existing premises of TTPS. The water requirement of the power plant is proposed to be met from the submergence of Samal Barrage on Brahmani River. The coal requirement for TTPS shall be met by MCL mines.

The Ministry of Environment, Forests and Climate Change (MoEF&CC) had accorded Environment Clearance (EC) for 2X660 MW (Stage-III, Expansion) Coal based Ultra Super Critical Talcher Thermal Power Project, vide letter no. J-13012/31/2009-IAII(T), Dated 12.09.2018 and amendments on 16.03.2022.

SPCB Odisha, issued Consent to established (CTE) on 28.03.2023. To fulfill the requirements of CET's condition as well as NTPC's concern towards conservation of surface and ground water resources for the benefit of the project as well as for general population, a detailed Hydro-geological Study is proposed to be undertaken. The study would include geological and hydrological framework of area, groundwater condition including groundwater quality.

In compliances to the order dated 12.02.2020 of Honorable NGT Principal Bench New Delhi in OA Nos. 117, 499 and 102 of 2014; published “Updated list of abandoned mines identified for ash filling” on 18.02.2022. The ash generated from the Talcher Stage-III is proposed to be disposed of in the Mine Voids of Jagannath Mines. Jagannath Mine is located about 14 km away from the plant.

MOEF & CC through its Office Memorandum dated 28.08.2019 has stipulated guidelines for disposal of fly ash utilization in low-lying areas and mine voids, mentioning to maintain a clearance of a safe distance of 500m from river and water bodies to prevent failure of the embankment and fly ash flowing to nearby water bodies. Surface runoff and supernatant water, in any case shall not be let into the surrounding areas. Collection can be done by providing adequate drains around the mine. The water requirements of the power plant are proposed to be met from the submergence of Samal Barrage on the Brahmani River about 14 km from the proposed plant.

Keeping in view the above, a consultancy “**Hydro Geological Study for “Talcher Thermal Power Project, Stage-III (2X660 MW)”**” has been to **M/s. Geoscience Consultancy Services (GCS)** -a CGWA accredited institute, vide PO No. 5500044200-004-1019 Dated 27.02.2025.

## **1.2 OBJECTIVES**

The main objective envisaged for the present consultancy is to study the Hydro-geological Status of the Project area and mine voids area of TTPS Stage-III and the impact of ash disposal on surface water and ground water regime (especially around Mine Voids). The specific objectives of the study are as follows:

### **1.2.1 Surface Water Hydrology**

- a) Any change in the drainage pattern of the study area with respect to previous years.
- b) Status of identified surface water bodies, if any (including degenerated water bodies) within the study area (12 km radius from the plant boundary), their exploitation and potential for development of degenerated water bodies.

Recommendations by consultant to improve the condition of degenerated water bodies by NTPC.

- c) To study the surface water quantity & quality at identified location and current sources of contamination, if any.
- d) Status of rainwater harvesting at NTPC premises and Status of watershed management at study area.
- e) Recommendation/suggestions to NTPC for taking site specific mitigation measures

### **1.2.2 Ground Water Hydrology**

- a) Define the present hydro-geological scenario of the study area through water table contour map & ground water flow direction map.
- b) Assessment of groundwater depletion if any.
- c) Estimation of annual recharge and utilization of ground water during operation of TTPS.
- d) Status of Implementation of NTPC Rainwater harvesting Policy.
- e) Enumerate any increase/decrease in the potential for rainwater harvesting and suggestions for augmenting ground water recharge
- f) To study groundwater quality at identified locations and current sources of contamination, if any.
- g) Data collection from existing monitoring network for annual review and monitoring of ground water levels and quality. In case a monitoring network is not available, work of the same needs to be executed by the agency.
- h) Coordinates of tube wells of Plant & Township area & their locations shall be provided on Geo reference maps
- i) Recommendation/suggestions to NTPC for taking site specific mitigation measures. However, the consultant is free to recommend any additional

observation/finding apart from reviewing the hydrogeological condition with respect to previous study.

### **1.3 SCOPE OF WORK**

#### **1.3.1 Literature Review**

A detailed literature review for the documents/ reports has been already available for the study area with various agencies such as Geological Survey of India, State Department of Geology and Mining, Central and State Water Boards, State Water Resources/ Irrigation departments, Central Water Commission, India Meteorological Department, etc. The consultant will review the earlier reports/ data related to the study with all possible help from NTPC. Based on the review of the literature available, a detailed plan for the study covering all the objectives will be prepared.

#### **1.3.2 Field Studies**

The field studies will cover the following aspects:

1. The latest satellite imageries from IRS/NRSC will be used for geological mapping and to ascertain areas covered by water bodies. Any reduction/increment in area covered by water body in study area will be given.
2. Drainage patterns and surface water bodies to be identified. The satellite imageries will be used for mapping LULC and water bodies.
3. Well logging for water level measurements as well as water quality monitoring to determine hydraulic gradients and groundwater flow characteristics using flow net analysis for Post-monsoon and Post-Monsoon Seasons.
4. As there are no temporal changes on the aquifer characteristic therefore as per TOR during the tenure of the study one-time Pumping tests on

existing/new wells at 3 locations will be carried out in order to estimate the hydraulic characteristics of the aquifer in the study area.

5. Infiltration studies for determining rate of infiltration using double ring infiltrometers at 5 locations in and around the mine void– post-monsoon and post-monsoon seasons will be carried out.
6. Monitoring the surface and groundwater quality at 24 locations within the 12 Km radius from NTPC plant, with respect to parameters like pH, TSS, DO, BOD, COD, dissolved phosphate, nitrate and ammonia, Major ions (Na, K, Ca, Mg, HCO<sub>3</sub>, Cl, SO<sub>4</sub> and F<sup>-</sup>), Silica, oil & grease, Phenolic compound, Bacteriological, total coliform and Heavy metals (Cd, Zn, Hg, As, Cr, Pb, Cu, Se, Fe, B, Al, Mn, Co, Ni, Ag, Ba, Rh) during post-monsoon and post-monsoon seasons.
7. Potential for rainwater harvesting will be investigated by studying the physiography of the area and identification of zones required for runoff generation, water harvesting, and recharge.

#### **1.4 GEOGRAPHICAL EXTENT OF STUDY AREA**

The proposed Plant site is located at a Latitude of 20°54'02"N to 20°55'05"N and Longitude of 85°12'10" E to 85°13'00"E near Talcher Town, Angul district of Odisha. The site is about 4 km from Talcher Town and about 25 km from district headquarters Angul.

The geographical extent of the study area shall consist of an area within 12 km from the periphery of the project components (Main Plant and Township Area). In addition, the source of water and location of intake point, type of intake structures (weir, intake well, intake channel etc.) shall also be covered for the study, even if located beyond 12 km. Further, any significant surface or ground water body located within 10-25 km. which is likely to influence the project/ get influenced from the project shall also be covered. The ash generated from the Talcher Stage-III is proposed to be disposed of in the Mine Voids of Jagannath

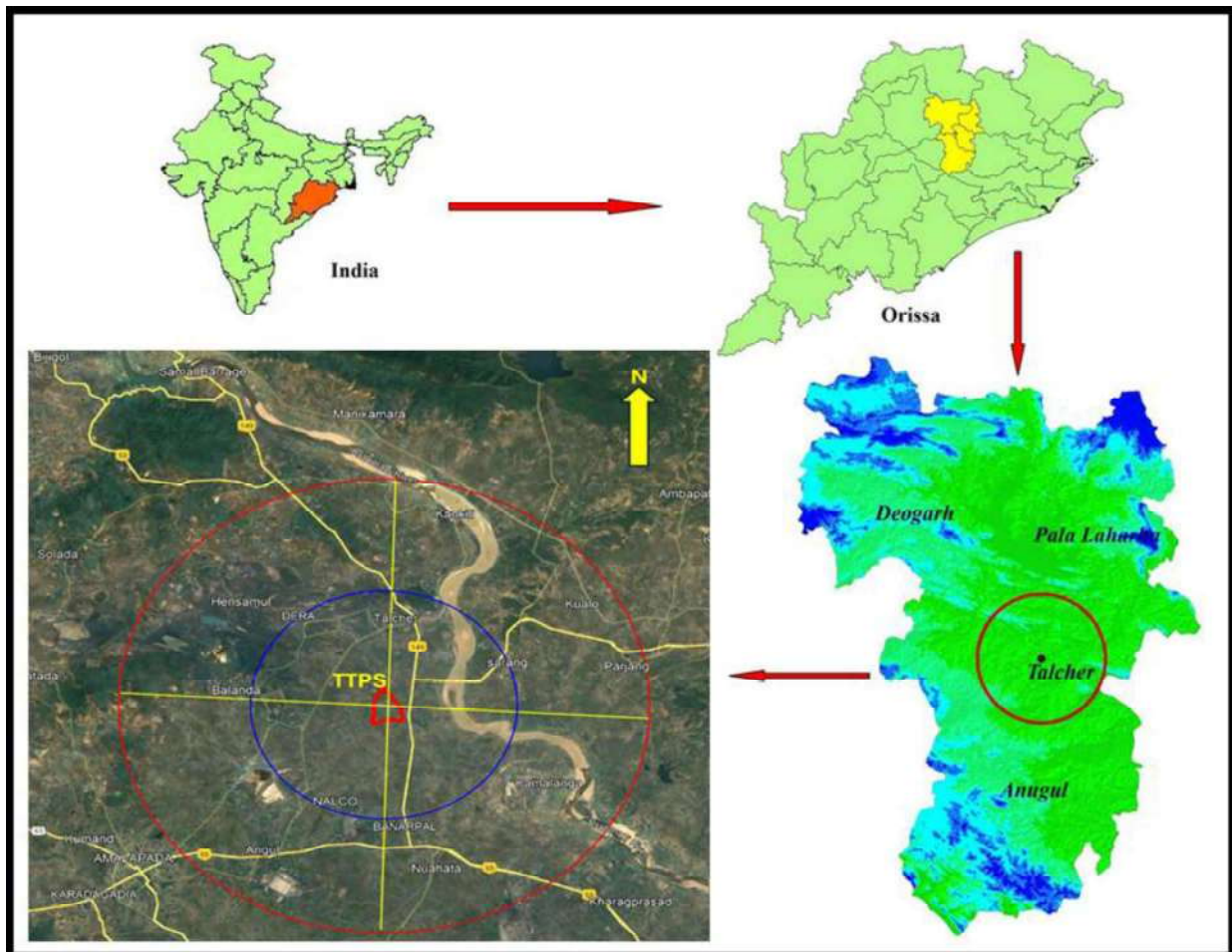


*Hydro Geological Study for Talcher Thermal Power Project, Stage-III  
(2X660MW), Talcher, Angul (Odisha)*

Mines. Jagannath Mine is located about 14 km away from the plant. Jagannath mine voids shall be covered in the study.

## 2 DESCRIPTION OF STUDY AREA

The study area is located at Talcher in Angul district of Odisha. The study area of proposed project boundary (Ash Dyke/Pond) with a buffer radius of 12 km of proposed Ash Dyke for NTPC Ltd. Talcher, lies on survey of India Topo Sheets No. F45, M16 and F45, N4, is given in **Figure 2.1**.



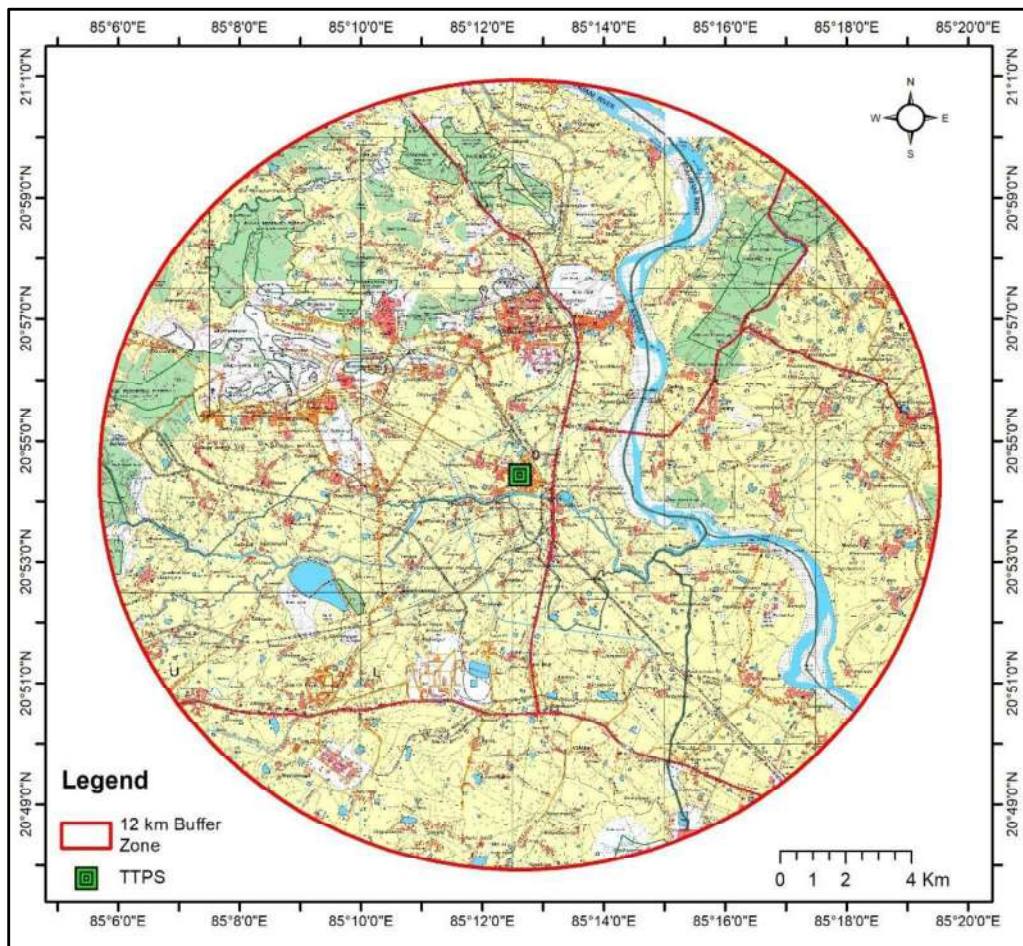
**Figure 2.1: Location Map of Talcher TTPS, Angul, (Odisha).**

### 2.1 Angul District

The district lies between 20°31' N and 21°40' North latitudes and 84°15' E and 85°23' East longitudes. The total geographical area of the district is 6232 km<sup>2</sup>. From the point of view of area, it stands 11<sup>th</sup> out of the 30 districts of Orissa. Angul, the district headquarters is about 150 km from the State capital Bhubaneswar. Angul is bounded

by Dhenkanal and Cuttack district in east, Deogarh, Kendujhar and Sundargarh district in north, Sambalpur and Sonepur in west and Boudh and Nayagarh in the south side. Angul is an industrial district having major industries, such as, Steel Plant, Fertilizer Plant, Cement factory, Ferro Vanadium Plant, Machine building factory, Glass and China clay factory and Spinning mills etc. The district is abundant with natural resources. Brahmani, Nadira, Tikira, Sankh, Koel and Ib are the major rivers flowing through this district.

The TTPS, NTPC Talcher (2\*660 MW) is located in Talcher town, which is well connected by road with Angul district headquarters. The vicinity map of the Talcher TTPS is given in **Figure 2.2**.



**Figure 2.2: Vicinity map of TTPS**

The site is located north of National Highway (NH-200). The nearest railway stations are Talcher (27 km) and Angul (60 km), and the nearest airports are Raipur (300 km) and Bhubaneswar (136 km.) The company has a township for its employees. The beneficiary states from the power generation are Odisha, Bihar, Sikkim, Damodar Valley Corporation, West Bengal, Jharkhand and southern states. Coal for the power plant is sourced from the Talcher Coal Field and water from Samal Barrage Reservoir in Brahmani River.

## **2.2 Study area**

The site is about 4 km from Talcher Town and about 25 km from district headquarters Angul. The nearest railway station, Talcher' is on the Talcher-Cuttack section of North-Eastern Railway (renamed East Coast Railway) at about 2 km. However, a small railway station named 'Talcher Thermal' is located near the project boundary. The area is accessible by NH-23 (renamed NH-149) at about 1 km. The nearest commercial airport is at Bhubaneswar at an aerial distance of nearly 90 km and about 150 km by road. The co-ordinates of the study area, including 12 km buffer zone from the periphery of the project's components (Ash Pond Area), are: 85°06'00"E to 85°19'00"E longitude and from 20°48'00"N to 21°01'00"N latitude. In addition, the source of water and location of intake point, type of intake structure (barrage, dam, intake well, intake channel etc.) are also covered for the study, even if located beyond 12 km.

A map (buffer zone) of 12 km radius is drawn taking the proposed sites as a center. No national park, wildlife sanctuary, biosphere reserve, notified wetland, defense installation, is present within the buffer zone of the proposed site. Also, no Reserve or Protected Forest is present within the 12 km area of the proposed site.

## **2.3 Physiography**

The study area constitutes the northern part of Angul district. The area is mainly drained by the Brahmani River. The area constitutes various physiographic features such as alluvial plain, mountain ranges, flood plains and

water bodies. The elevation of the area above mean sea level (amsl) ranges from 18 m to 191 m and the slope is towards the south-east direction.

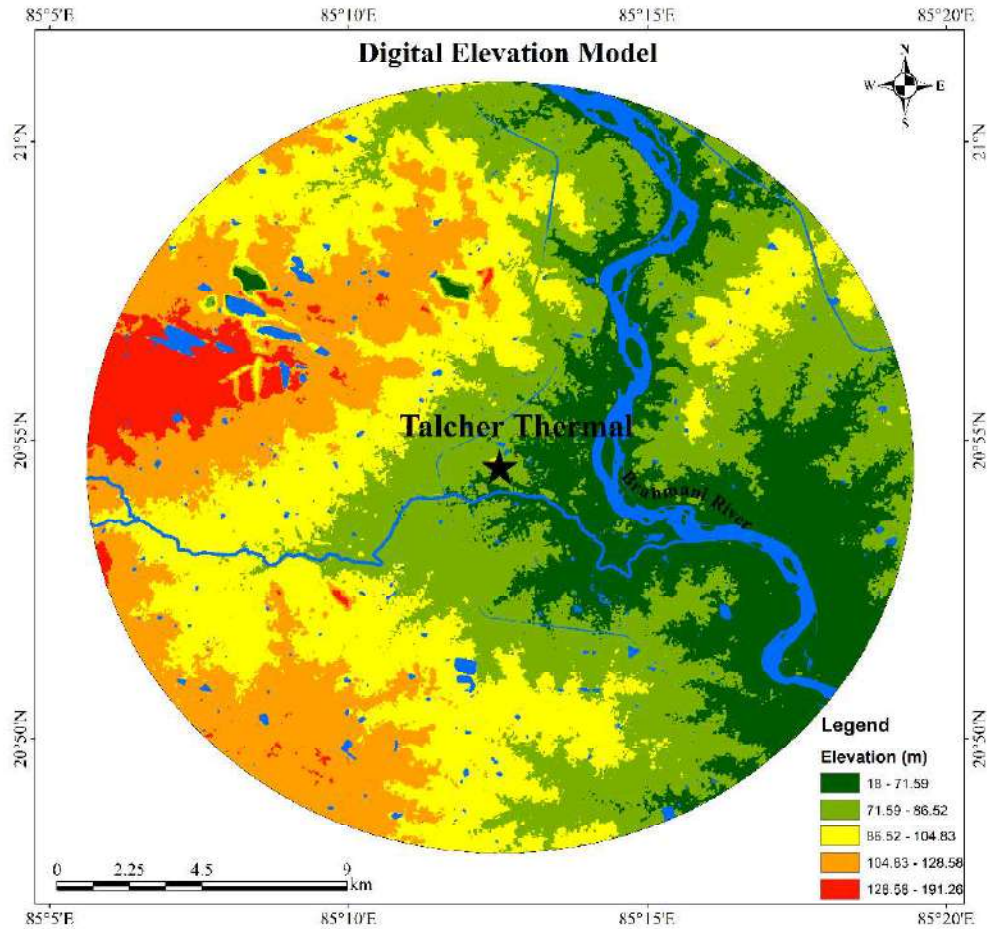
The remote sensing technique has been used to delineate the geomorphological set-up of the study area. Remote Sensing (RS) data are essential input for the appraisal of natural environments as it provides valuable information for the interpretation of the landscape. This technology has already been demonstrated to provide information on natural resources such as land use land cover, soil, vegetation and crop patterns on a periodic basis. Geographic Information System (GIS) is the latest tool available to capturing, storing, querying, analyzing, and displaying geospatial data. Thus, it plays an important role in evolving alternate scenarios for natural resources management. Combination of RS and GIS provide multi-dimensional information for mapping of an area.

The scope of work in the present study includes rectification and georeferencing of satellite images pertaining to years 2006, preparation of maps for the area including land use land cover, major streams and tributaries etc. using satellite imageries and topographic maps, marking the location of water resources projects, their area of influence and other features in the study area. The Angul district is represented by hills and table land, the entire district of Angul can be divided into three distinct Physiographic regions namely Northern Mountainous Region, Southern and Southwestern Mountainous Region and Central undulating plains. The northern part of the district is characterized by dense forest of Pallahara subdivision and WNW-ESE trending hills immediately north of the Talchir coal, the area is drained by river Brahmani. The southern hilly region forms the watershed between the river Brahmani and Mahanadi River. The central part of the district in which the TTPS Talcher project area is located is characterized by Undulating plain, though the remaining, including the study area (Proposed Ash Pond) is characterized by considerably flat country.

The topographic maps F45 and M16 (1:50,000 scale) were used as base map. It was converted to digital mode using scanning. The topographic map was georeferenced with longitude and latitudes using the Arc-GIS software and spatial analyst tools and demarcated the boundary of study area.

Landsat ETM+ images have been used for the study. Landsat ETM+ data was downloaded for the year 2006 to study land use and land cover patterns. The Enhanced Thematic Mapper Plus (ETM+) instrument is a fixed “whiskbroom”, eight-band, multispectral scanning radiometer capable of providing high-resolution imaging information of the Earth’s surface. It detects spectrally filtered radiation in VNIR, SWIR, LWIR and panchromatic bands from the sun/lit Earth in a 183 km wide swath when orbiting at an altitude of 705 km. The primary new features on Landsat 7 are a panchromatic band with 15 m spatial resolution, an on-board full aperture solar calibrator, 5% absolute radiometric calibration and a thermal IR channel with a four-fold improvement in spatial resolution over TM. The Enhanced Thematic Mapper Plus (ETM+) satellite data from 19 November 2006 was downloaded from Global Land Cover Facility (GLCF).

DEM of the study area has been generated using ASTER data. ASTER (Advanced Space borne Thermal Emission and Reflection Radiometer sensor) is an imaging instrument that is flying on the TERRA satellite launched in December 1999 as part of NASA's Earth Observing System (EOS). ASTER provides images with high resolution. There are 14 spectral bands all together spanning the visible and infrared spectra. Since sensor operates in visible and NIR bands, cloud cover poses problems in view of the earth and availability of the data. Because of its off-nadir sensor pointing capability, ASTER can collect the stereo pairs necessary to generate high resolution DEM (using bands 3N and 3B). The ASTER onboard the Terra satellite has produced 30 m resolution elevation data. There is a fairly complete coverage of the world at this high resolution and data are free. Japan’s Ministry of Economy, Trade and industry (METI) and NASA announced the release of the ASTER Global Digital Elevation Model (GDEM) in June 2009. The GDEM was created by stereo-correlating the 1.3 million scenes from ASTER VNIR archive, covering the Earth’s land surface between 83N and 83S latitudes. The GDEM is produced with 30m postings and is formatted in 1 x 1 degree tiles as Geo-TIFF files. The GDEM is referenced to the WGS84/EGM96 geoid. The GDEM’s pre-production accuracy estimates were 20 meters at 95% confidence for vertical data, and 30 meters at 95% confidence for horizontal data. The digital elevation model of the study area is shown in **Figure 2.3**.



**Figure 2.3: Digital elevation model of the buffer zone of TTPS Stage III.**

The district Angul showing maximum elevation over 520 m above mean sea level is observed in south-western sector in Pathargarh reserve forest and Kalapat reserve forest, however the land elevation in the study area varies from 18 to 191 m above mean sea level.

## 2.4 Climate and Rainfall

The district enjoys a sub-tropical climate, characterized by hot and dry summer, cold winter and erratic rainfall in monsoon. As per the district meteorological observatory data may be taken as representative of the meteorological condition of the whole district. The hot season commences at the beginning of March. May is the hottest month with a mean daily maximum temperature at 44°C. With the onset of monsoon,

early in June day temperature drops appreciably. After the withdrawal of monsoon by the 1<sup>st</sup> week of October both day and night temperature began to diminish steadily. December is usually the coldest month of the year with a mean daily minimum temperature of 11°C. In association with the passage of western disturbances across north India during winter months' short spells of cold occur and the minimum temperature drops down to 10°C. The lowest minimum temperature was 5.2°C in Angul and the neighborhood is the hottest part of the district and has lower rainfall.

The average annual rainfall of the district is 1421 mm. However, there is a great variation of rainfall from year to year. The rainfall in the district during the last 10 years varied between 896 mm & 1744 mm. There are 70 rainy days on an average in a year, but it varies from 66 at Athamallik to 80 at Pallahara. The distribution of rainfall is also quite erratic, causing widespread drought year after year. The air is generally dry except during the monsoon period. The humidity over the area remains more or less uniform over the year, varying from 67% to 83% in the morning hours and from 40% to 81 % during evening hours.

**Table 2.1: Climatological Data of IMD Station, Angul (1971-23)**

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Record high °C	36.2	38.2	42.0	46.8	50.9	46.4	44.0	38.2	38.7	36.4	32.0	30.3	50.9
Average high °C	27.9	30.9	35.5	38.9	39.8	36.2	32.1	31.4	32.1	32.3	30.0	27.7	32.9
Average low °C	15.6	18.2	21.0	24.4	26.0	25.9	24.4	23.9	24.1	20.7	18.2	15.1	21.5
Record low °C	5.2	7.2	13.4	19.8	23.2	21.4	20.4	18.3	17.9	14.1	11.2	7.7	5.2
<b>Average Rainfall mm</b>	9.0	20.9	25.0	36.9	75.6	210	260	325	206	101	26.7	3.1	1,421.0

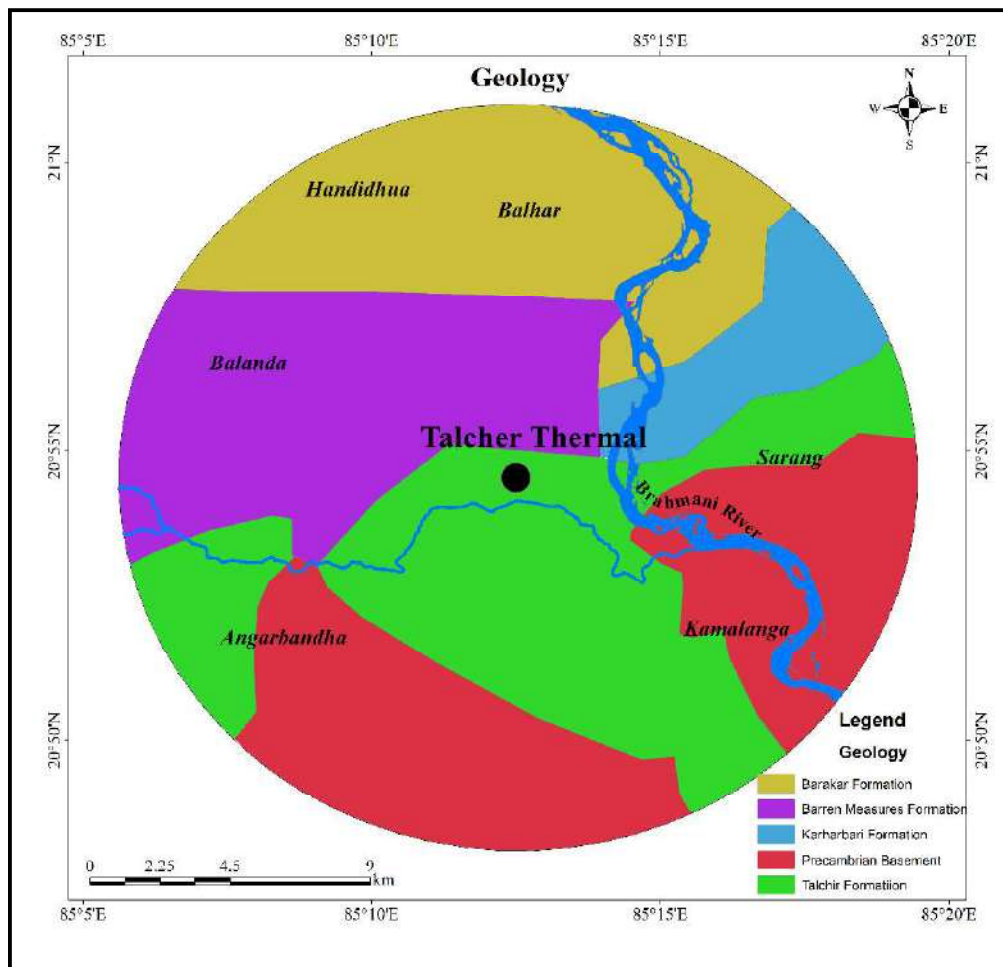
Source: India Meteorological Department

## 2.5 General Geology

The Angul district represents a diverse geological sequence and characterised by varied landforms. The important litho-stratigraphic units of the area are rocks of Eastern Ghats of Pre Cambrian age, Iron-ore super group, Gondwana Super group, Laterites to alluvial deposits of Quaternary age (**Table 2.2**).

**Table 2.2: Local geology of the area (CMPDI Report, 2003)**

Age	Formation	Lithology	Thickness
Quaternary	Recent	Soil and sub-soil	0.86 m
Lower Permian	Baraker	Sandstone	6.1 m - 15.25 m
		Seam II	7.38 m - 48.92 m
		Pebbly sandstone	60 m (approx.)
Lower Permian	Karharbari	Sandstone	60 m -75 m
		Seam I	0.61 m - 18.16 m
		Sandstone	About 135m
Upper carboniferous to Lower Permian	Talchir	Sandstone and Shale	-



**Figure 2.4: Geological map of the buffer zone of the proposed TTPS Stage-III.**

The Gondwana rocks are exposed in the central part of the district covering parts of Talchir, Talcher, Chendipada and Kishorenagar blocks. The existing and proposed ash pond of the TTPP are located on the weathered and soil covered Archean schist/gneiss and Gondwana sedimentary rock between two hill ranges, formed by Brahmini and Nadira Rivers (**Figure 2.4**).

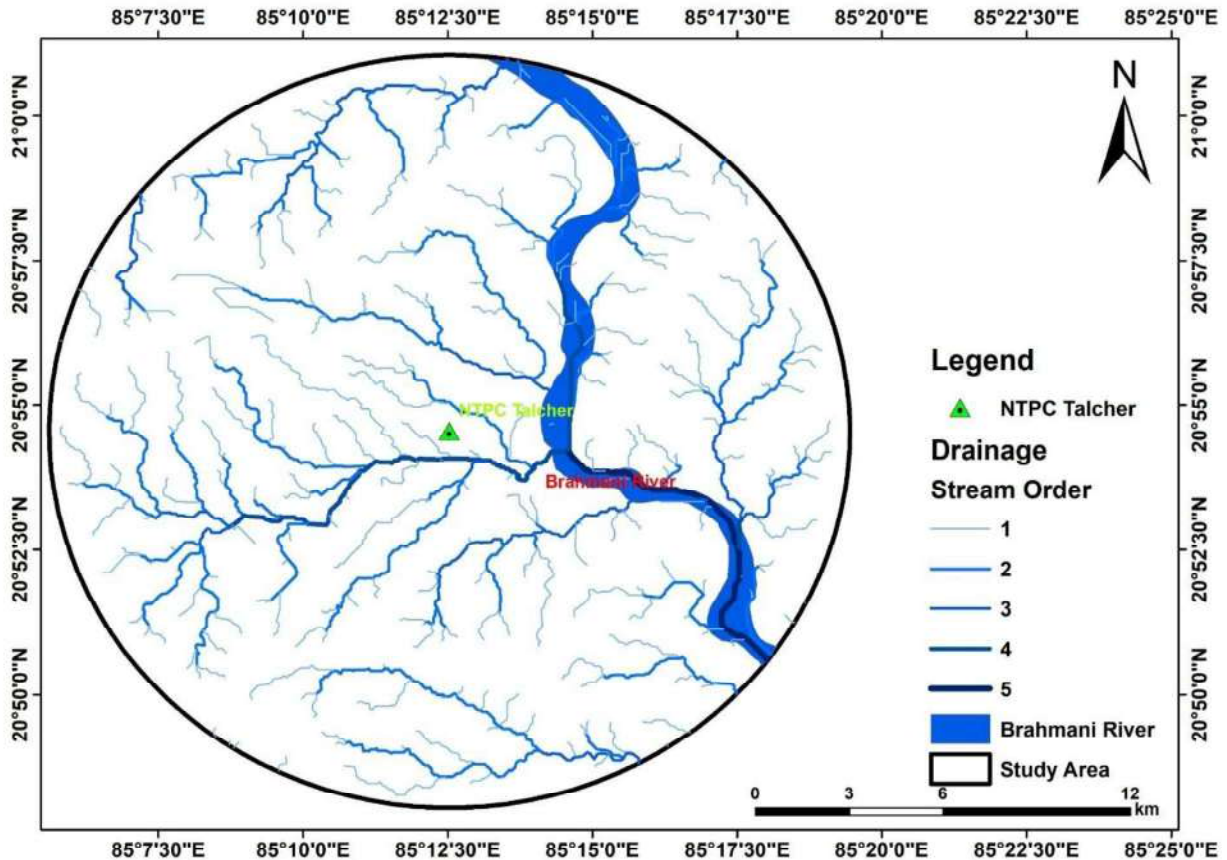
The main rock types of the Archean in this area are granitic gneiss and schist. The area is underlain by Pre-Cambrian crystalline rocks. The major litho-units are formed by highly weathered mica-schists, coarse to fine grained granite, and gneiss, quartzite, amphibolite and pegmatite and do not occur on the mappable scale. Large track of the region is covered by soil/alluvial with poor exposure of the Archean rocks.

## **2.6 Hydrology and drainage system**

A major part of the Angul district lies between two major river systems of Orissa State i.e. River Brahmani flows in the northeast and river Mahanadi which forms the south-southwestern boundary of the district. The altitude and physiographic set of the area divides the entire district into two distinct catchments, the streams joining the river Mahanadi flows in south-west direction whereas the streams joining the river Brahmani from the central plains flows in north – east direction.

The study area (Proposed Mine Void) forms a part of Nadira Nadi which is a major tributary of Brahmani River basin. Tikira river and Olhani rivers forms the small watershed in the west (upstream side) while at downstream side Tikira rivers meets with Brahmani rivers near Godhsheela. The Tikira River flows in the southwestern corner of the proposed ash pond area having NW-SE trend. In general, the major streams show approximately right-angle pattern while joining with the river Brahmani, the meanders indicating differential weathering phenomenon. The drainage pattern is mostly dendritic and occasionally parallel in hills.

A drainage map has been prepared using the ASTER DEM. The drainages in topographic maps, from 1965 to 1975, were in general matching those prepared using ASTER DEM data (**Figure 2.5**).



**Figure 2.5: Drainage network of TTPS Area.**

## 2.7 Hydrogeology and Groundwater

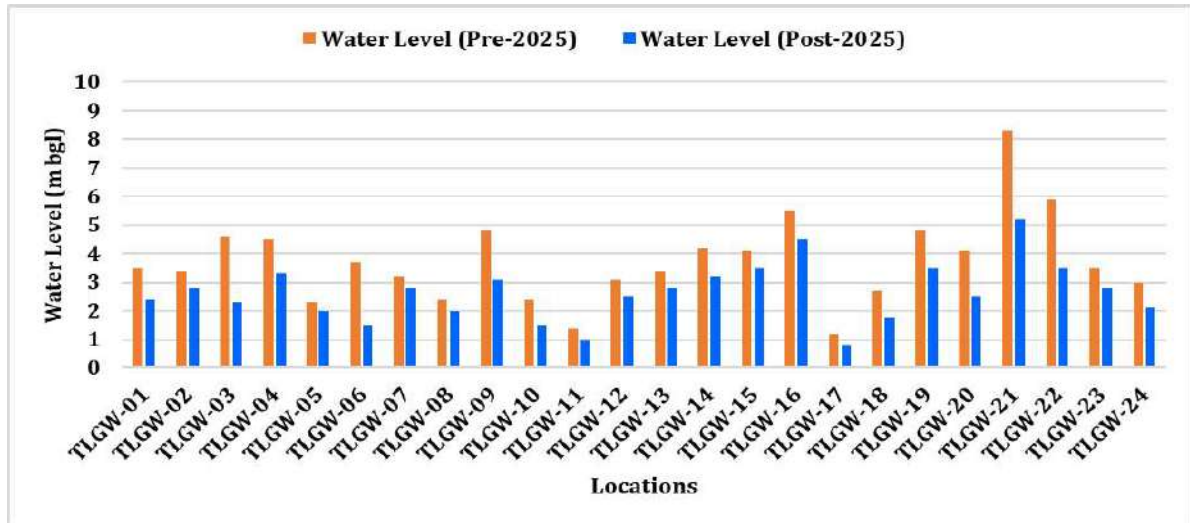
The area falls in the Brahmani basin. The principal ground water reservoir in the area is consolidated crystalline rock of Precambrian age and semi consolidated Gondwana formations comprising of mainly sandstone and shale. The weathered and fractured sandstone forms a good aquifer. Groundwater occurs under water table conditions in the weathered mantle, recent alluvium and the laterites and under semi-confined to confined conditions in the fracture zone. The groundwater abstraction sources are mainly the open wells and India Mark-II hand pumps which are used to meet the domestic and drinking water requirements in the study area. The groundwater abstraction for agricultural requirement is almost insignificant

Depth to water levels in 24 dug wells or hand pumps around the existing TTPS were monitored during post-monsoon (**Table 2.3**).

**Table 2.3: Depth to groundwater levels during pre and post-monsoon 2025**

S. No.	Location	Latitude	Longitude	Depth to Water Level (m bgl)	
		(°N)	(°E)	Pre	Post
1	Kulei	20.99274	85.26740	3.5	2.4
2	Pitri High School	20.94606	85.27661	3.4	2.8
3	Parjang Aaganbai (opp. police station)	20.92168	85.31660	4.6	2.3
4	Lodhani	20.87667	85.31889	4.5	3.3
5	Sishu mandir Mangalpur	20.84440	85.28361	2.3	2.0
6	Gov High School Nauhata	20.83139	85.22444	3.7	1.5
7	Primary school Dishahi	20.81083	85.18639	3.2	2.8
8	On Angul Road	20.84270	85.13139	2.4	2.0
9	Suksingha on road	20.87870	85.10956	4.8	3.1
10	Badasinghada	20.92150	85.13310	2.4	1.5
11	Dera	20.94942	85.16986	1.4	1.0
12	Goverdhan Pardhan House	21.01080	85.17783	3.1	2.5
13	Sarang High School (On highway)	20.92074	85.25406	3.4	2.8
14	Kanakdurga	20.91957	85.23122	4.2	3.2
15	Nityanada Ashram opposite police station	20.94852	85.23066	4.1	3.5
16	Jagannath temple NTPC	20.90132	85.20413	5.5	4.5
17	Primary School Chainapal	20.8819	85.21821	1.2	0.8
18	Pandarbhariana (Outside Primary school)	20.87379	85.24705	2.7	1.8
19	Kendupatana	20.86199	85.16920	4.8	3.5
20	On Road (Twin wells)	20.88998	85.17227	4.1	2.5
21	Shiv mandir dug well FCI Township	20.90269	85.15910	8.3	5.2
22	Home well	20.92278	85.18510	5.9	3.5
23	Ghantapada	20.92957	85.16376	3.5	2.8
24	Balunga	20.96877	85.19800	3	2.1

The water level was observed deepest (8.3 mbgl) in TLGW-21, the Shiv mandir dug well near FCI township area. In the study area, depth to water table varies from 1.2m (TLGW-17, Primary School Chainapal) to 8.5m (TLGW-21, FCI township) during the post-monsoon 2025. Based on the water level measurement, depth to water table map for post-monsoon is shown in **Figure 2.6**.



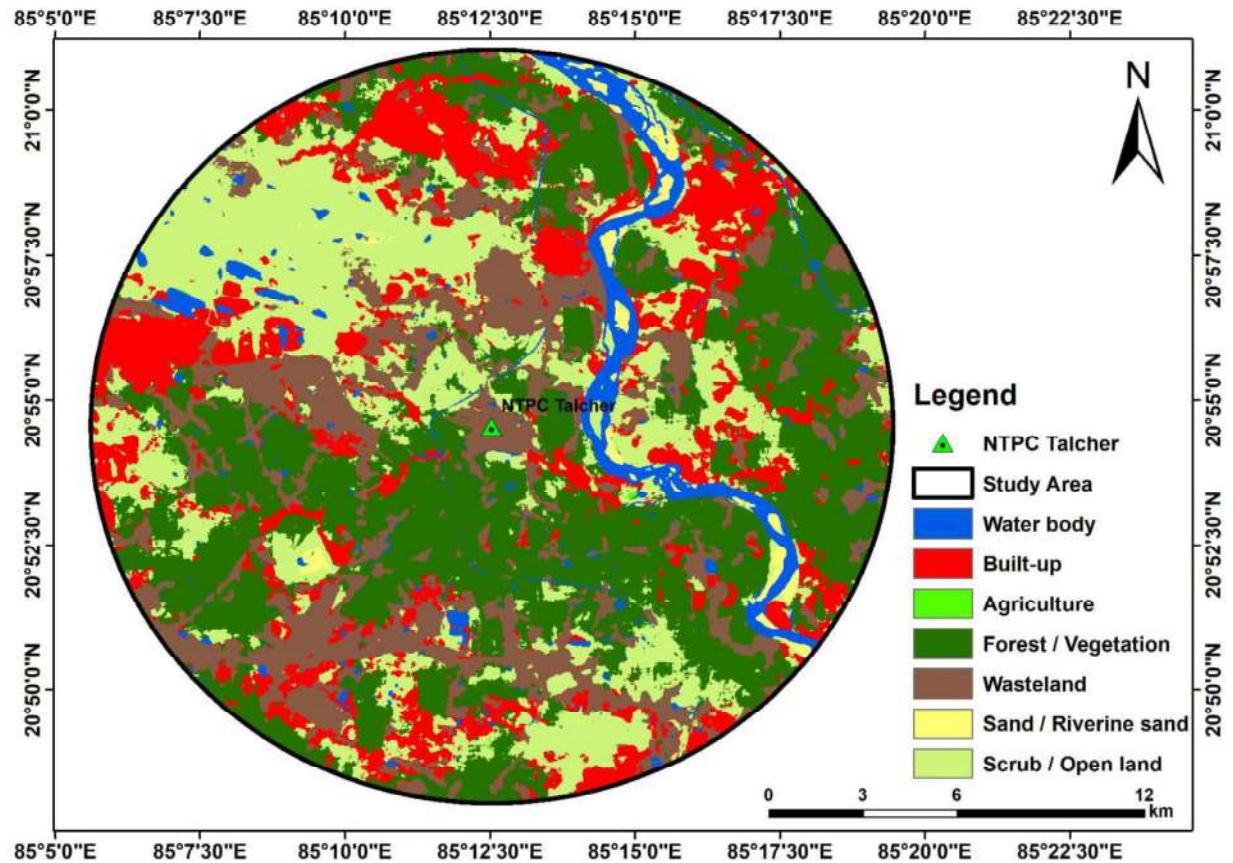
**Figure 2.6: Water table seasonal fluctuation during pre and post monsoon**

## 2.8 Soil Type and Land Use Land Cover

As per the agro-climatic classification, the soil characteristics of the district show wide variation. The district falls under the broader category of tropical wet and dry climate and locally it has been put under Arid Central Table Land. There are mainly three types of soil found in the district viz. Alfisols, Ultisols and Vertisols. Alfisols which include red sandy soils, red loamy soils and mixed red and black soils, the red sandy/loamy soils cover major part of the district including the study area. Soil plays very important role in overall availability of surface water as well as recharge to ground water.

The Alfisol or red soils (neutral to slightly acidic to slightly alkaline in nature; pH varies from 6.08 to 7.6) are light textured, usually devoid of lime kankar and free of carbonates. This soil type predominantly occupies high and medium land throughout the Angul district. Sandy clay is common, and these soils are suitable for cultivation of paddy and other crops. Ultisols are also found in the study area which consists of lateritic soils, red and yellow soils and are rich in clay content. These soils are mildly acidic in nature and deficient in nitrogen, phosphorous, potassium and organic matters. Nearly 43.6% of the district area is occupied by reserve forest. Paddy is the major crop

of Kharif season, during Rabi season mainly vegetables and oil seeds are grown. **(Figure 2.7.)**



**Figure 2.7: Land Use Land Cover (2024) Map of Study Area**

### 3 METHODOLOGY

#### 3.1 Collection of water samples

To understand the impact of ash pond on ground water quality, post-monsoon water samples from and around the proposed ash pond of TTPS Talcher, were collected during the field visit conducted between 07.04.2025 to 14.04.2025. The water samples were collected from surface (pond/River) as well as ground (hand pump and dug well) water sources. A total of 48 samples were collected for physicochemical and trace metal analysis in polyethylene bottles along with their GPS coordinates. Out of these total collected water samples, 24 were from groundwater sources and 24 were from surface water sources. The hand pumps were continuously pumped for at least 15 minutes prior to the sampling, to ensure the groundwater to be sampled was representative of groundwater aquifer. All the groundwater samples were collected from the sources which are being used extensively. A total number of four samples were taken from each site, two for chemical analysis (toxic or non-toxic heavy metals, cation and anion), one for bacteriological analysis and one for oil and grease analysis.

The sampling locations are selected in all directions from the ash pond area to find out the impact of ash pond on subsurface water quality. The details of water samples collected for analysis of various parameters are provided in **Table 3.1**.

**Table 3.1: Details of samples collected for water quality analysis.**

S. No.	Code	Source	Location	Latitude (°N)	Longitude (°E)
<b>Surface Water Stations</b>					
1	TLSW-01	Canal	Kulei	20.9949	85.2712
2	TLSW-02	Pond	Pitri	20.9494	85.2729
3	TLSW-03	Pond	Parjang	20.9245	85.3160
4	TLSW-04	Canal	Lodhani	20.8789	85.3203
5	TLSW-05	Canal	Mangalpur	20.8383	85.2669
6	TLSW-06	Pond	Park And Pond	20.8042	85.2083
7	TLSW-07	Pond	NALCO Pond	20.8446	85.1897
8	TLSW-08	Mine void	Mine Void 7	20.9534	85.1335
9	TLSW-09	Pond	Kurudol	20.8757	85.1394

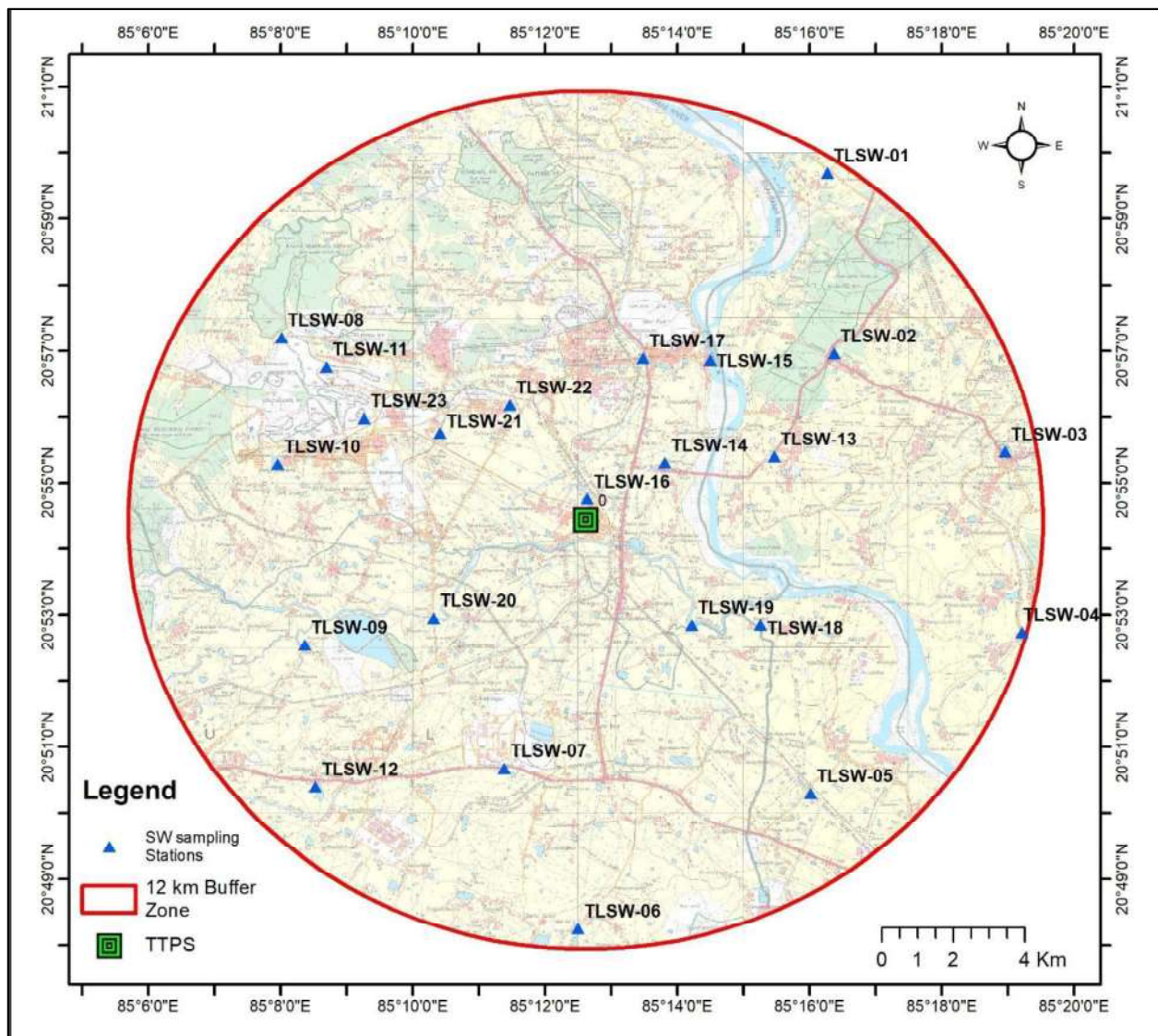


*Hydro Geological Study for Talcher Thermal Power Project, Stage-III  
(2X660MW), Talcher, Angul (Odisha)*

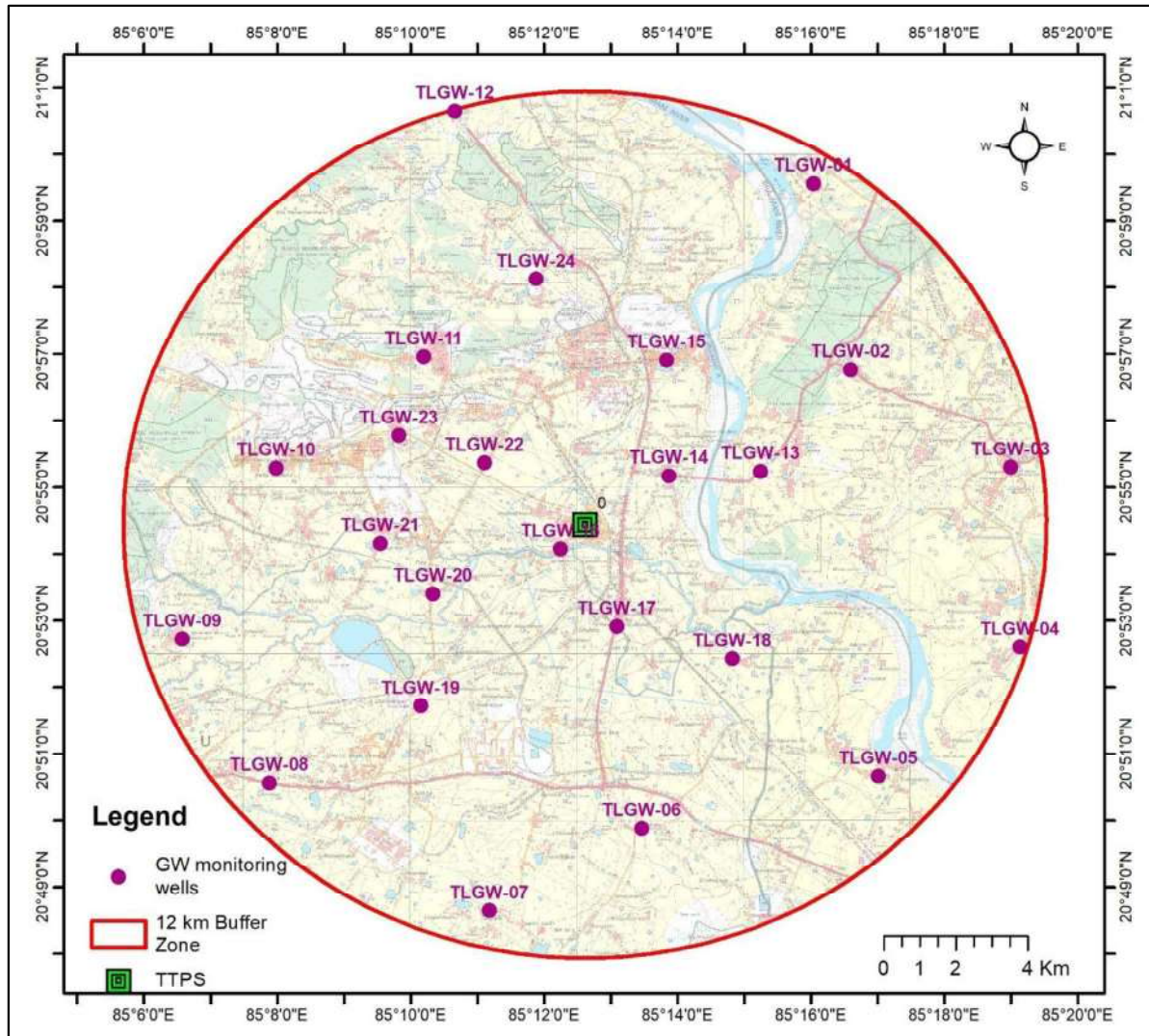
<b>S. No.</b>	<b>Code</b>	<b>Source</b>	<b>Location</b>	<b>Latitude (°N)</b>	<b>Longitude (°E)</b>
10	TLSW-10	Pond	Badasinghada	20.9214	85.1326
11	TLSW-11	Mine void	Mine Void 4	20.9460	85.1448
12	TLSW-12	Pond	Behind Cineplex Angul	20.8400	85.1421
13	TLSW-13	Pond	Sarang	20.9233	85.2578
14	TLSW-14	Pond	Santhapada	20.9218	85.2302
15	TLSW-15	River	Brahamani River	20.9477	85.2416
16	TLSW-16	Pond	NTPC Pond	20.9126	85.2106
17	TLSW-17	Canal	Talchir Town Market	20.9482	85.2247
18	TLSW-18	Pond	Durgapur	20.8809	85.2543
19	TLSW-19	River	Downstream Nandira River	20.8807	85.2370
20	TLSW-20	River	Upstream Nandira River	20.8824	85.1719
21	TLSW-21	Pond	Nr. Baghamara High School	20.9293	85.1735
22	TLSW-22	Pond	Ghantapadu	20.9364	85.1911
23	TLSW-23	Pond	Mine Void	20.9329	85.1544
24	TLSW-24	River / Canal	Brahmani River (Samal Barrage)	21.0715	85.1326
<b>Groundwater Stations</b>					
1	TLGW-01	Dug Well	Kulei	20.9927	85.2674
2	TLGW-02	Hand Pump	Pitiri High school	20.9461	85.2766
3	TLGW-03	Dug Well	Parjang Aaganbai (Opp. PS)	20.9217	85.3166
4	TLGW-04	Hand Pump	Lodhani	20.8767	85.3189
5	TLGW-05	Hand Pump	Sishu mandir Mangalpur	20.8444	85.2836
6	TLGW-06	Hand Pump	Gov High School Nauhata	20.8314	85.2244
7	TLGW-07	Hand Pump	Primary school Dishahi	20.8108	85.1864
8	TLGW-08	Hand Pump	On Angul Road	20.8427	85.1314
9	TLGW-09	Dug Well	Suksingha on road	20.8787	85.1096
10	TLGW-10	Hand Pump	Badasinghada	20.9215	85.1331
11	TLGW-11	Dug Well	Dera	20.9494	85.1699
12	TLGW-12	Dug Well	Govardhan Pradhan House	21.0108	85.1778
13	TLGW-13	Hand Pump	Nr. Sarang High school	20.9207	85.2541
14	TLGW-14	Hand Pump	Kanak Durga	20.9196	85.2312
15	TLGW-15	Dug Well	Nityananda Ashram (Opp PS)	20.9485	85.2307
16	TLGW-16	Hand Pump	Jagannath temple NTPC	20.9013	85.2041
17	TLGW-17	Hand Pump	School on road	20.8819	85.2182
18	TLGW-18	Hand Pump	Outside Primary school	20.8738	85.2471
19	TLGW-19	Hand Pump	Kendupatana	20.8620	85.1692
20	TLGW-20	Dug Well	On Road (Twin wells)	20.8900	85.1723

S. No.	Code	Source	Location	Latitude (°N)	Longitude (°E)
21	TLGW-21	Dug Well	Shiv Mandir dug well	20.9027	85.1591
22	TLGW-22	Dug Well	Home well	20.9228	85.1851
23	TLGW-23	Hand Pump	Ghantapada	20.9296	85.1638
24	TLGW-24	Dug Well	On Road, BALUNGA	20.9688	85.1980

The maps showing the surface water and groundwater sampling locations are shown **Figure 3.1 and Figure 3.2.**



**Figure 3.1: Map of Surface water sampling locations.**



**Figure 3.2: Map of Groundwater sampling locations.**

To avoid any precipitation of trace elements, the samples collected for trace metals were acidified using  $\text{HNO}_3$  to  $\text{pH} \approx 2$  in the field whereas unfiltered samples were collected for analysis of anions (APHA, 2012).

Water samples were collected in a wide mouth amber color bottle for oil and grease analysis. Approximately one litre of representative sample was collected in a glass bottle following conventional sampling practice, except that the bottles were not pre-rinsed with sample before collection.

The samples brought to the laboratory for detailed physicochemical, trace metal, and oil and grease analysis. The Physico-chemical, trace metals, analysis were performed following APHA's Standard Methods for the Examination of Water and Wastewater (APHA, 2012).

### 3.2 Chemicals and Reagents

All chemicals used for analysis were of analytical reagent grade (Merck-BDH). Standard solutions of metals ions were procured from Merck, Germany. De-ionized water was used throughout the analysis work. All glassware and other containers used for trace metal analysis were thoroughly cleaned by soaking in detergent followed by soaking in 10% nitric acid for 48 hours and finally rinsed with de-ionized water several times prior to use. All glassware and reagents used for analysis were cleaned before use. It is also important that all glassware surfaces were rinsed with n-hexane to affect a quantitative transfer of the constituents (oil and grease) in the sample prior to start analysis.

### 3.3 Analytical Methodology for Water Sample

The samples were analysed as per Standard Methods for the Examination of Water and Wastewater (APHA, 2012; Jain and Bhatia, 1988). The details of analytical methods and equipment used in the study are given in **Table 3.2**. Ionic balance was calculated and the error in the ionic balance for majority of the samples was within 10%.

**Table 3.2: Analytical methods and equipment used in the study**

S. No.	Parameter	Unit	Method	Equipment
1.	pH		Electrometric	pH Meter
2.	Electrical Conductivity	μS/cm	Electrometric	Conductivity Meter
3.	Temperature	°C		Digital Thermometer
4.	Total Dissolved Solids	mg/l	Gravimetric	Conductivity Meter
5.	Total Suspended Solids	mg/l	Gravimetric	
6.	Dissolved oxygen	mg/l	Titration	
7.	BOD	mg/l	Titration	
8.	COD	mg/l	Titration	
9.	Alkalinity	mg/l	Titration by H <sub>2</sub> SO <sub>4</sub>	-
10.	Hardness	mg/l		-

S. No.	Parameter	Unit	Method	Equipment
11.	Chloride	mg/l	Conductivity Method	Ion Chromatograph
12.	Bi-Carbonate	mg/l		Ion Chromatograph
13.	Sulphate	mg/l		Ion Chromatograph
14.	Nitrate	mg/l		Ion Chromatograph
15.	Sodium	mg/l		Ion Chromatograph
16.	Potassium	mg/l		Ion Chromatograph
17.	Calcium	mg/l		Ion Chromatograph
18.	Magnesium	mg/l		Ion Chromatograph
19.	Fluoride	mg/l		Ion Chromatograph
20.	Silica	mg/l		UV Spectrophotometer
21.	Oil and grease	mg/l	Hexane Extractable Gravimetric Method	
22.	Phenolic Compounds	mg/l		
23.	Bacteriological	MPN/100 ml	Membrane filtration	Bacteriological Incubator
24.	Heavy Metals	ppm		ICP-MS



**Figure 3.3: Measurement of ions in the collected water samples using Ion Chromatography (IC)**

#### **4 WATER QUALITY CHARACTERISTICS**

The quality of water depends on many individual hydrological, physical, chemical and biological factors. Generally, higher proportions of dissolved constituents are found in groundwater than in surface water because of greater interaction of groundwater with various materials in geologic strata. The water used for drinking purposes should be free from any toxic elements, living and non-living organisms and excessive amounts of minerals that may be hazardous to health. Some of the heavy metals are extremely essential to humans, for example, Cobalt, Copper, etc., but large quantities of them may cause physiological disorders. The contamination of groundwater by heavy metals has assumed great significance during recent years due to their toxicity and accumulative behavior. These elements, contrary to most pollutants, are not biodegradable and undergo a global eco-biological cycle in which natural waters are the main pathways. The determination of the concentration levels of heavy metals in these waters, as well as the elucidation of the chemical forms in which they appear is a prime target in environmental research today.

The quality of water is also influenced by anthropogenic factors. For example, overexploitation of groundwater in coastal regions may result in sea water ingress and consequent increase in salinity of groundwater and excessive use of fertilizers and pesticides in agriculture and improper disposal of urban/industrial waste can cause contamination of groundwater resources. Groundwater contains a wide variety of dissolved inorganic chemical constituents in various concentrations, resulting from chemical and biochemical interactions between water and geological materials. Inorganic contaminants including salinity, chloride, fluoride, nitrate, iron and arsenic are important in determining the suitability of groundwater for drinking purposes.

The surface water and groundwater samples collected during post-monsoon season were analysed for various physicochemical parameters, bacteriological parameters and heavy metals. In-situ parameters (i.e. pH, EC, TDS, DO, Bacteriological) were measured in the field, wherever for the others analysis samples were brought to the institute laboratory at Department of Earth Science, IIT Roorkee. The water quality

data was analysed with reference to BIS and WHO standards. The results of analysis of post-monsoon sampling of different water quality parameters are discussed below:

#### **4.1 Physical and Chemical Parameters**

It is essential and important to test the water before it is used for drinking, domestic, agricultural or industrial purposes. Water must be tested with different physio-chemical parameters. Selection of parameters for testing water solely depends upon what purpose it is going to be used and the extent of quality and purity needed. Water does content different types of floating, dissolved, suspended and microbiological as well as bacteriological impurities. Some physical tests are performed for testing its physical appearance such as temperature, color, pH, turbidity (TSS), TDS etc., while chemical parameters are analysed for its BOD, COD, dissolved oxygen, alkalinity, hardness and other characters.

Results of physicochemical analysis for **post-monsoon 2025** are given in **Table 4.1 and 4.2** of surface water and groundwater respectively.

**Table 4.1:** Physicochemical quality of Surface Water sources within buffer area (post-monsoon, 2025)

Sample No.	Source	Temp (°C)	pH	EC µS/cm	TDS	TSS	DO	BOD	COD	Alkalinity (mg/l)	Tot Hard (mg/l)	F	Silica	Oil & Grease	Phenolic Comp.
TLWSW-1	Canal	29.2	7.86	120	77	2.2	6.5	2	5	83.6	94	0	10	0	BDL
TLWSW-2	Pond	28.5	7.42	160	58	2.4	5.4	1	3	110.4	120	0.2	11	0	BDL
TLWSW-3	Pond	28.23	7.6	450	291.66	1.5	6.3	2	6	128	184	0	8	0	BDL
TLWSW-4	Canal	30.6	7.99	220	270	1.5	4.7	2	5	76	91	0.35	10	0	BDL
TLWSW-5	Canal	29.36	7.79	140	68.6	1.7	3.9	3	11	32	32	0.2	14	0	BDL
TLWSW-6	Pond	27.5	7.68	340	101.6	3.2	5.5	3	18	125.2	149	0.5	12	0	BDL
TLWSW-7	Pond	28.5	7.5	360	343	1.6	5.6	5	5	116	189	0.55	14	0.5	BDL
TLWSW-8	Mine void	30.7	7.45	570	338	3.3	6.5	3	7	28	163	0.4	20	0	BDL
TLWSW-9	Pond	25.6	7.17	730	316.3	2.6	4.6	2	12	212	228	0.4	10	0	BDL
TLWSW-10	Pond	27.5	7.4	490	337	3	5.6	4	10	103.2	132	0.5	16	0	BDL
TLWSW-11	Mine void	25.6	7.58	650	268	3.3	7.8	6	15	64	200	1	8	0	BDL
TLWSW-12	Pond	30.5	7.93	670	399.7	1.8	5.3	5	14	236	281	1.35	10	0	BDL
TLWSW-13	Pond	29.8	7.03	165	71.33	3.1	5.3	3	9	289.2	300	0.7	19	0	BDL
TLWSW-14	Pond	29.8	7.24	200	72.6	4.3	4.9	2	11	72	75	0.2	18	0.5	BDL
TLWSW-15	River D/s	29.8	7.65	130	50.6	2	6.9	2	5	73.6	86	0.9	15	0	BDL
TLWSW-16	Pond	29.1	8.05	130	87.6	2.4	6.8	1	8	68.4	72	0.6	9	0	BDL
TLWSW-17	Canal	26.15	7.66	120	59.3	3.5	7.1	3	10	78.8	80	0.7	16	0	BDL
TLWSW-18	Pond	26.1	7.84	105	44.4	0.8	5.7	4	20	94.0	88	0.2	10	0	BDL
TLWSW-19	River D/s	28.8	8.12	530	199	1.7	6.5	3	15	152	199	0.5	5	0	BDL
TLWSW-20	River U/S	26.9	7.92	610	163.3	1.9	6.6	3	25	160	208	0.4	11	0	BDL
TLWSW-21	Pond	29	7.95	220	188.3	2.5	4.5	2	13	72.5	96	0.5	19	0.5	BDL
TLWSW-22	Pond	30.2	7.6	290	206	1.7	6.8	3	22	116.4	144	1.1	15	0.5	BDL
TLWSW-23	Pond	28.3	7.18	550	313.6	2.8	6.4	5	18	68	137	0.7	9	0	BDL
TLWSW-24	River U/S	29.3	7.82	150	66.3	1.6	4.5	3	20	140	162	0.2	20	0	BDL
Acceptable Limit			6.5-8.5		500	NS	NS	NS	NS	200	200	1	NS	0.5	0.001
Permissible Limit			NR		1000	NS	NS	NS	NS	600	600	1.5	NS	NR	0.002
Detection Limit					3	0.02		0.02	3	10	10	0.02		0.5	0.00001

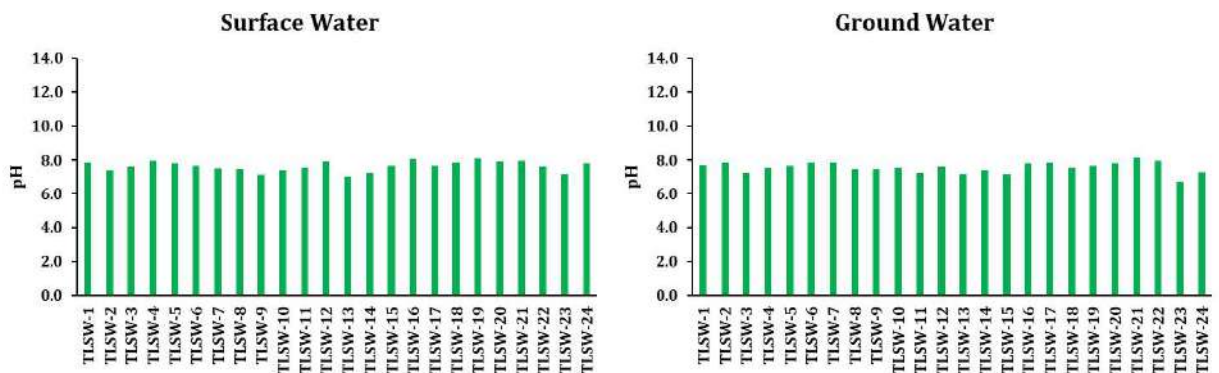
**Table 4-2: Physicochemical quality of Groundwater sources within buffer area (Post-monsoon, 2025)**

Sample No.	Source	pH	EC µS/cm	TDS	TSS	BOD	COD	Alkalinity	TotHard (mg/l)	F- (mg/l)	Silica	Oil & Grease	Phenolic Compound
TLGW-1	DW	7.7	310	202	2	2	8	92	104	0.40	4	BDL	BDL
TLGW-2	HP	7.85	930	465	1	0	0	356	388.4	0.50	10	BDL	BDL
TLGW-3	DW	7.25	610	366	2	2	10	94.4	156	0.60	12	BDL	BDL
TLGW-4	HP	7.58	860	447	1	0	2	70.4	105.6	0.00	8	BDL	BDL
TLGW-5	HP	7.64	730	445	1	0	4	139.2	224	0.45	15	BDL	BDL
TLGW-6	HP	7.86	720	432	1	0	5	274.4	396	0.60	10	BDL	BDL
TLGW-7	HP	7.87	960	624	2	0	0	244	336	0.40	14	1.2	BDL
TLGW-8	HP	7.43	870	479	3	0	2	384	512.8	0.30	20	BDL	BDL
TLGW-9	DW	7.44	940	611	2.5	4	12	296	427.2	0.10	14	BDL	BDL
TLGW-10	HP	7.57	260	169	4	0	2	324	453.6	0.00	12	0.5	BDL
TLGW-11	DW	7.26	480	312	3	1	4	144	221.6	0.00	8	BDL	BDL
TLGW-12	DW	7.6	320	208	2	2	1	291.2	327.2	0.00	9	BDL	BDL
TLGW-13	HP	7.2	1184	770	4	0	2	180	96	0.20	12	BDL	BDL
TLGW-14	HP	7.4	423	275	0.5	0	0	124	68	0.30	13	BDL	BDL
TLGW-15	DW	7.18	680	442	2	3	10.5	156	140	0.05	17	BDL	BDL
TLGW-16	HP	7.83	740	407	1	0	0	232.8	250	0.60	9	BDL	BDL
TLGW-17	HP	7.85	620	403	2	0	1	157.2	176	0.50	11	BDL	BDL
TLGW-18	HP	7.58	970	582	2.5	0	2	204	288	0.60	7	BDL	BDL
TLGW-19	HP	7.66	970	534	2	0	2	246.8	380	0.40	10	BDL	BDL
TLGW-20	DW	7.8	620	403	3	3	8.8	274	336	0.30	13	BDL	BDL
TLGW-21	DW	8.15	170	88	2.5	1	2	105.6	128	0.00	20	BDL	BDL
TLGW-22	DW	7.99	500	325	2	2	6.5	236	300	0.70	15	0.5	BDL
TLGW-23	HP	6.72	280	182	1	0	0	96	160.8	0.35	5	BDL	BDL
TLGW-24	DW	7.28	580	377	2	2	5.6	200	254.8	0.10	10	BDL	BDL
Acceptable Limit		6.5-8.5		500	200		NS	NS	200	1		NS	
Permissible Limit		NR		1000	600		NS	NS	600	1.5		NS	
Detection Limit				3	10		3	0.02	10	0.02			

#### 4.1.1 pH

pH is defined as  $\log[H^+]$  and is measured as intensity of acidity or alkalinity on a scale ranging from 0-14. In natural water, pH is governed by the equilibrium between carbon dioxide, bicarbonate and carbonates ions and in general, ranges between pH 4.5 to 8.5. Although pH has no direct impact on the health of consumers, yet it is one of the most important operational water quality parameters. BIS (2012) have prescribed pH value in the range of 6.5 to 8.5 for water used for drinking purpose.

The pH of the analysed surface water samples in the study area ranges from 7.03 to 8.12, with an average value of 7.64, whereas the groundwater samples showed pH values between 6.72 and 8.15, with an average of 7.57 during the post-monsoon season of 2025. **(Figure 4.1).**

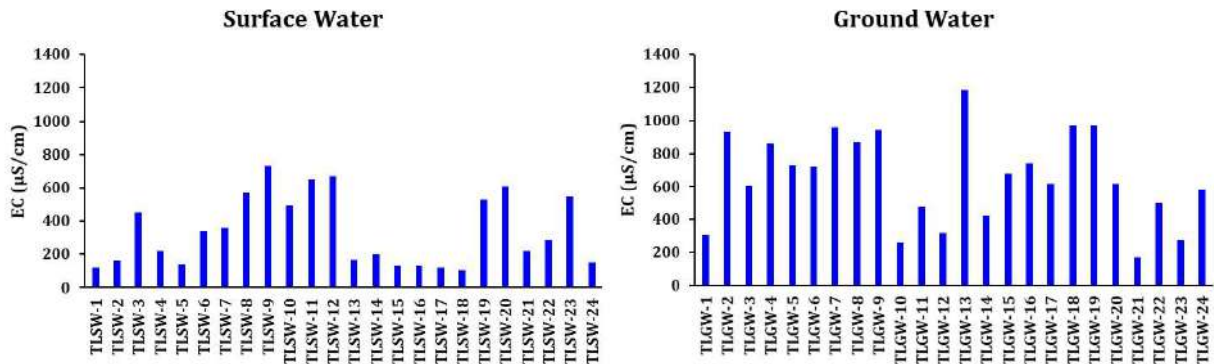


**Figure 4.1: pH of SW and GW (Post-monsoon 2025).**

All these water samples contained pH well within the desirable limits prescribed by BIS (2012) and WHO (2011) for various uses of water including drinking and other domestic supplies.

#### 4.1.2 Electrical Conductivity (EC)

Electrical conductivity (EC) is a measure of the ability of an aqueous solution to carry an electric current. This ability depends on the presence of ions; on their total concentration, mobility, and valence; and on the temperature of measurement. The electrical conductivity and dissolved salt concentrations are directly related to the concentration of ionized substance in water and may also be related to problems of excessive hardness and-or other mineral contamination.



**Figure 4.2: Electrical Conductivity (EC) of SW and GW (Post-monsoon 2025).**

The electrical conductivity during post-monsoon varied between 105  $\mu\text{S}/\text{cm}$  to 730  $\mu\text{S}/\text{cm}$  with an average of 337.50  $\mu\text{S}/\text{cm}$  in surface water and between 170 to 1184  $\mu\text{S}/\text{cm}$  with an average of 655.3  $\mu\text{S}/\text{cm}$  in ground water during post-monsoon 2025 season. (**Figure 4.2**).

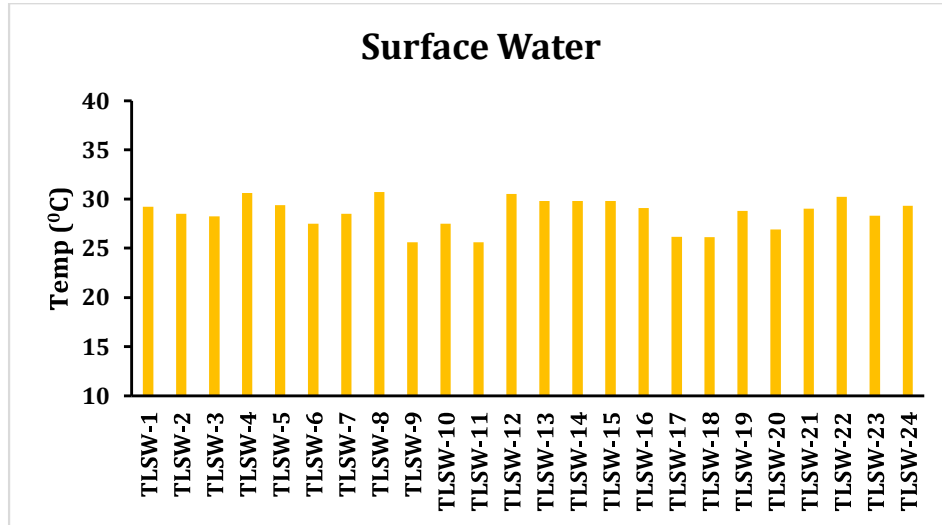
In the study area, groundwater shows overall higher EC than surface water samples. The waters are still suitable for drinking and for irrigation uses. The spatial differences between the EC values are due to wide variation in the activities and processes prevailing in the study area.

#### 4.1.3 Temperature

Temperature exerts a major influence on biological activity and growth. Temperature governs the kinds of organisms that can live in rivers and lakes. Fish, insects, zooplankton, phytoplankton, and other aquatic species all have a preferred temperature range. As temperatures get too far above or below this preferred range, the number of individuals of the species decreases until finally there are none.

Temperature is also important because of its influence on water chemistry. Warm stream water can affect the aquatic life in the stream. Warm water holds less dissolved oxygen than cool water, and may not contain enough dissolved oxygen for the survival of different species of aquatic life. Some compounds are also more toxic to aquatic life at higher temperatures. Temperature in surface water during post-monsoon 2025 varies in a narrow range of 25.6°C to 30.7°C with an average of 28.7°C (**Figure 4.3**). Water in

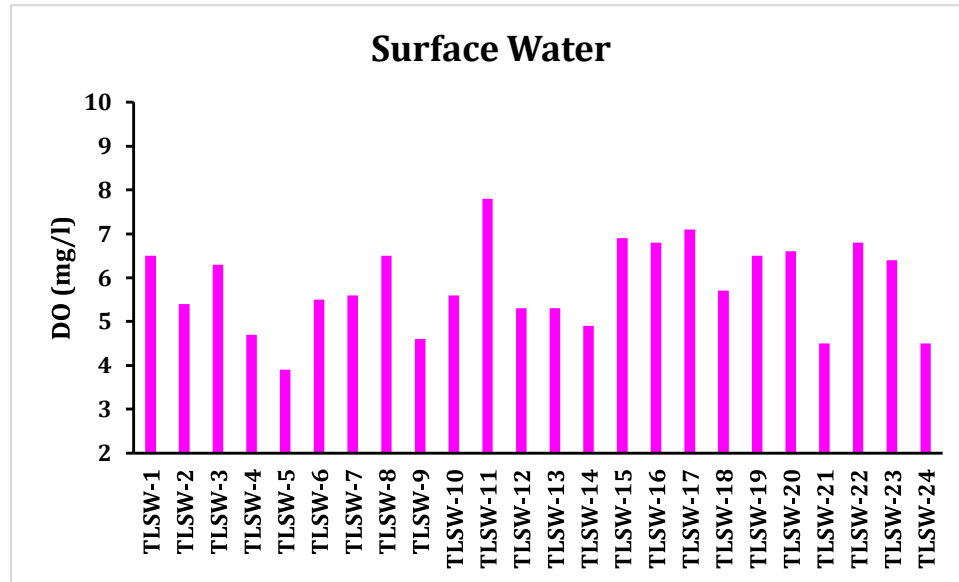
ponds is more than that of the river/canal. There is no BIS standard for temperature for water.



**Figure 4.3: Temperature variation in surface water (Post-monsoon 2025)**

#### 4.1.4 Dissolved Oxygen

Dissolved oxygen (DO) is the amount of oxygen that is present in water. Water bodies receive oxygen from the atmosphere and from aquatic plants. Running water, such as that of a swift moving stream, dissolves more oxygen than the still water of a pond or lake. It is an important indicator of the qualitative health of any surface water body. The higher the dissolved oxygen, the better the quality of water. Generally, water at lower temperatures has higher DO while warmer and polluted waters have lower DO. Healthy water should generally have dissolved oxygen concentrations above 6.5-8 mg/l.



**Figure 4.4: DO variation in surface water (Post-monsoon 2025)**

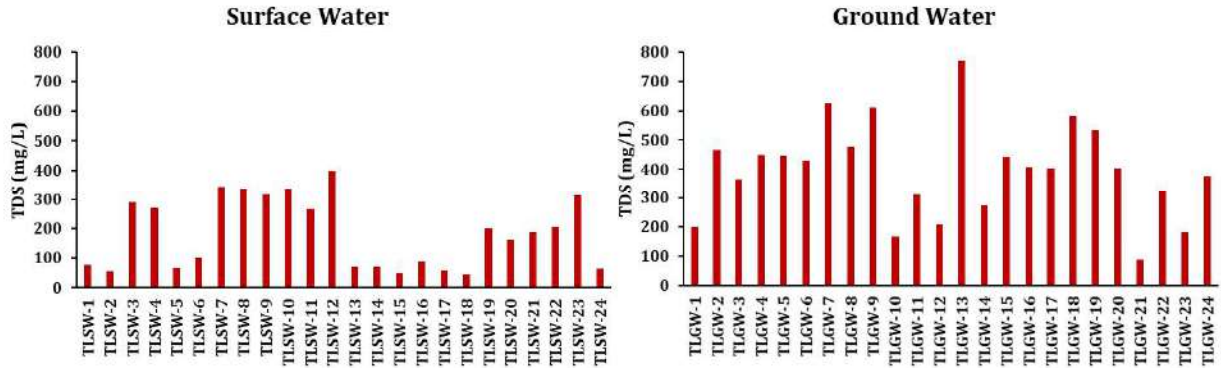
DO in surface water during post-monsoon 2025 varies in a range of 3.90 to 7.80 mg/l with an average of 5.82 mg/l. (**Figure 4.4**). DO of water in ponds is less than that of the river/canal. There is no BIS standard for dissolved oxygen for water.

#### 4.1.5 Total Dissolved Solids

Total Dissolved Solid (TDS) in water includes all dissolved material in solution, whether ionized or not. TDS is numerical sum of all mineral constituents dissolved in water and is expressed in mg/l. TDS in drinking-water originates from natural sources, sewage, urban runoff and industrial wastewater. Concentrations of TDS in water vary considerably in different geological regions owing to differences in the solubility of minerals. The palatability of water with a total dissolved solids (TDS) level of less than about 600 mg/l is generally considered to be good; drinking-water becomes significantly and increasingly unpalatable at TDS levels greater than about 1000 mg/l. No health-based guideline value for TDS has been proposed (WHO, 2011). BIS (2012) have prescribed 500 mg/l as the acceptable limit and 2000 mg/l as permissible limit in absence of alternate source for drinking and other domestic usage.

During the post-monsoon season 2025, the TDS values in surface water of the study area ranged from 44.40 to 399.67 mg/L, with an average of 182.97 mg/L, whereas

groundwater TDS varied from 88.4 to 769.6 mg/L, with an average of 398 mg/L. **(Figure 4.5).**



**Figure 4.5: TDS variation in the surface water & groundwater (Post-monsoon 2025).**

Based on TDS content, water can be classified into four categories as fresh, brackish, saline and brine water (**Table 4.3**). TDS of the 100% of analysed water samples fall in the category of fresh water during post-monsoon season.

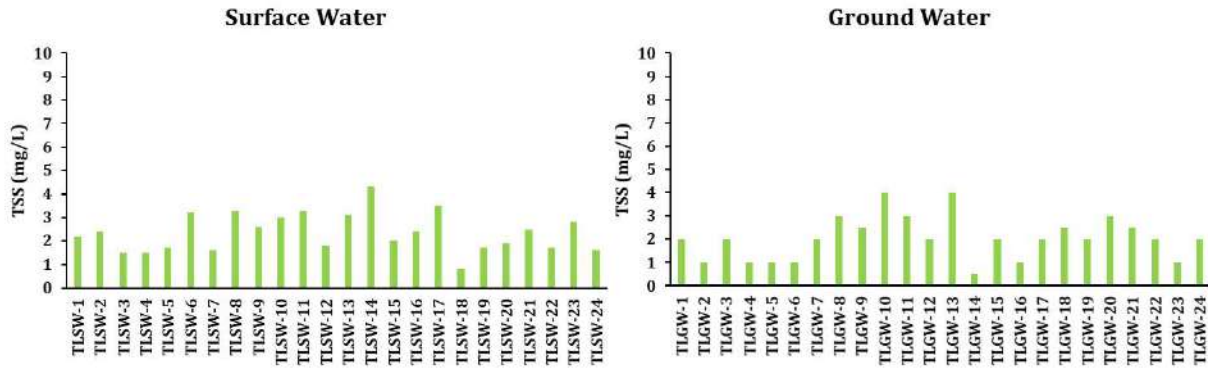
**Table 4.3: Classification of water based on Total Dissolved Solids (Post-monsoon 2025)**

TDS (mg/l)	Water Quality	% Samples
0 – 1,000	Fresh Water	100%
1,000 – 10,000	Brackish Water	Nil
10,000 – 100,000	Saline Water	Nil
>100,000	Brine	Nil

#### 4.1.6 Total Suspended Solids

Total Suspended Solids (TSS) refers to solid particles or matter present in water that are large enough to be retained by a filter. These particles can range in size from fine clay and silt to larger organic and inorganic materials. Elevated TSS levels can cause water to appear cloudy or turbid and may have adverse effects on aquatic ecosystems and human health.

No health-based guideline value for TSS has been proposed by BIS (2012) and (WHO, 2011).



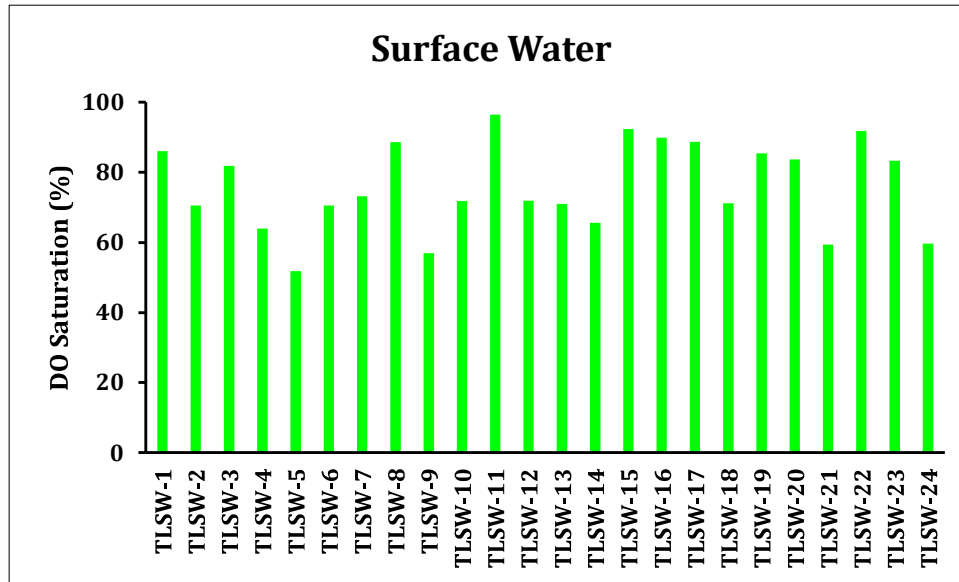
**Figure 4.6: Total Suspended Solids in Surface water (Post-monsoon 2025)**

During the post-monsoon season, the TSS in surface water of the study area ranged from 0.80 to 4.30 mg/L, with an average of 2.35 mg/L, whereas groundwater TSS values ranged from 0.5 to 4.0 mg/L, with an average of 2 mg/L. (**Figure 4.6**). TSS in groundwater is only seen in dug wells.

#### 4.1.7 Saturation percentage

Saturation percentage in dissolved oxygen analysis refers to the state of water when it has reached its maximum capacity to dissolve oxygen at a particular temperature and pressure. Saturation is expressed in percentage, where 100% saturation means that the water has dissolved the maximum amount of oxygen that can be held at a given temperature and pressure. Saturation levels can vary depending on several factors like temperature, atmospheric pressure, and salinity. Low saturation percentage may have adverse effects on aquatic ecosystems and human health.

During the post-monsoon season, the saturation percentage in surface water ranged from 51.81 to 96.50, with an average value of 76.08. It is noted that saturation percentage was measured only for surface water samples. Saturation percentage in surface water is shown in **Figure 4.7**.

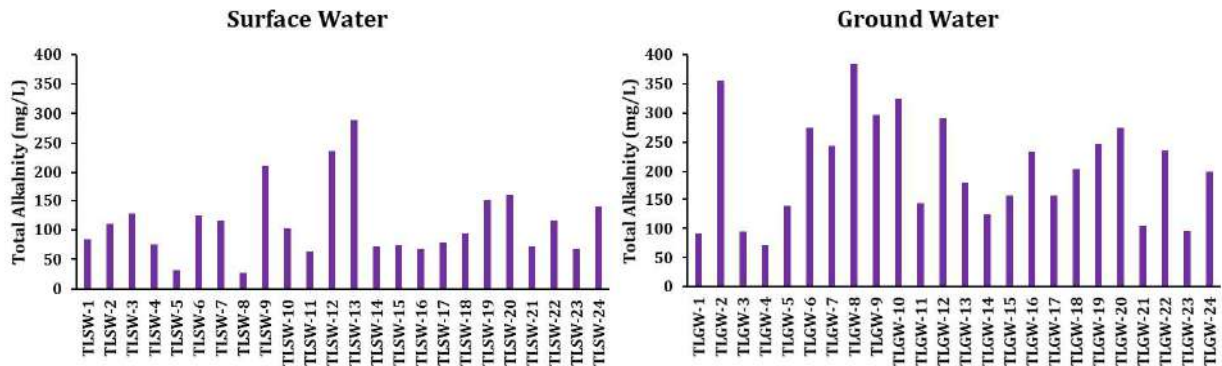


**Figure 4.7: Saturation percentage in Surface water (Post-monsoon 2025)**

#### 4.1.8 Alkalinity

Alkalinity is a measure of the ability of water to neutralize acids. It is expressed in terms of  $\text{CaCO}_3$  equivalent of the hydrogen ions neutralized. Alkalinity of water is mainly due to the presence of bicarbonates, carbonates, hydroxides of sodium, potassium, calcium and magnesium. Highly alkaline waters are usually unpalatable and impart a bitter taste to water.

Measuring alkalinity is important in determining water sources' ability to neutralize acidic pollution from rainfall or wastewater. There can be long-term changes in the alkalinity of streams and rivers in response to human disturbances. Alkalinity is related to the pH of a solution (its basicity) but measures a different property. Roughly, the pH of a solution is a measure of how "strong" the bases are in a solution, whereas the alkalinity measures the "amount" of chemical bases.



**Figure 4.8: Alkalinity in Surface water and Groundwater (Post-monsoon 2025)**

During the post-monsoon season (2025), the alkalinity of surface water samples in the TTPS area ranged from 28.0 to 289.20 mg/L, with an average of 112.47 mg/L. Groundwater alkalinity varied between 70.4 and 384.0 mg/L, with an average value of 205.1 mg/L. (**Figure 4.8**).

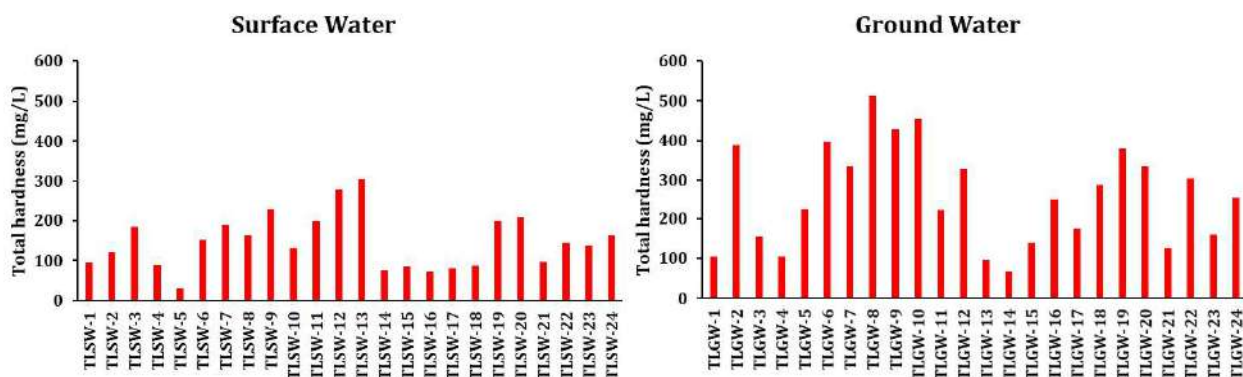
Alkalinity in both surface water and ground water is within the permissible limit prescribed by BIS for drinking water.

#### 4.1.9 Hardness

Total Hardness in water is caused by a variety of dissolved polyvalent metallic ions, predominantly calcium and magnesium cations. It is usually expressed as milligrams of calcium carbonate per liter. The degree of hardness of drinking water is important for aesthetic acceptability by consumers.

Drinking-water can be a contributor to calcium and magnesium intake and could be important for those who are marginal for calcium and magnesium. Consumers are likely to notice changes in hardness. The taste threshold for the calcium ion is in the range of 100–300 mg/l, depending on the associated anion, and the taste threshold for magnesium is probably lower than that for calcium. In some instances, consumers tolerate water hardness more than 500 mg/l. BIS (2012) has prescribed 200 mg/l as acceptable limit and 600 mg/l as permissible limit in absence of alternate source for

drinking and other domestic usage. No health-based guideline value is proposed for hardness in drinking-water (WHO, 2011).



**Figure 4.9: Total Hardness in Surface water and Groundwater (Post-monsoon)**

During the post-monsoon season, the total hardness (TH) of surface water ranged from 31.60 to 300.00 mg/L, with an average of 146.25 mg/L. Groundwater samples showed a total hardness range of 68.0 to 512.8 mg/L, with an average value of 259.8 mg/L. (**Figure 4.9**).

Hardness is classified in four categories as soft water, hard water, moderately hard water and very hard water (**Table 4.4**). Total hardness in the ground water and

**Table 4.4: Hardness Classification of water (Pre monsoon 2025)**

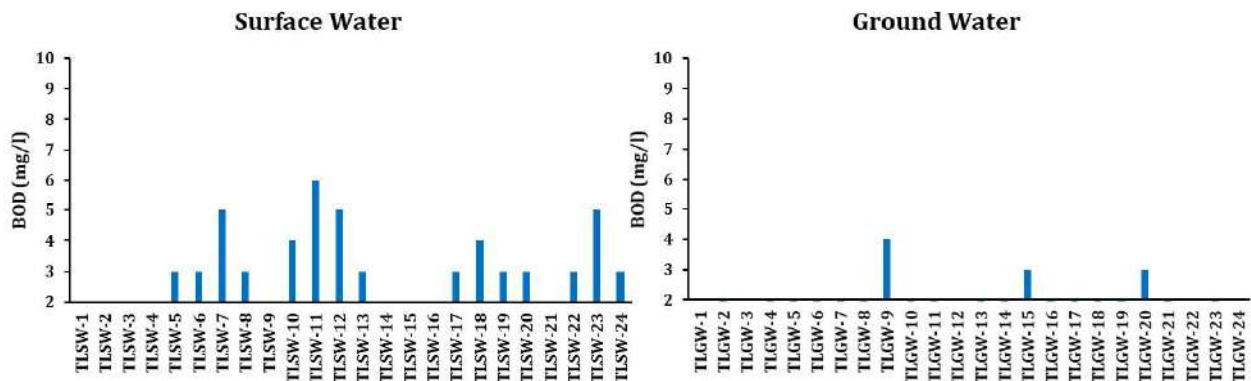
Hardness (mg/l)	Water Class	Surface water (% Samples)	Groundwater (% Samples)
0-75	Soft	12.5	4.2
75-150	Moderately hard	45.8	20.8
150-300	Hard	41.7	37.5
>300	Very hard	0.0	41.7

surface water is within the BIS permissible limit. As per **Table 4.4**, 33.3% of the analyzed surface samples fall under hard water category, whereas none of the groundwater sample is in hard and very hard water category.

#### 4.1.10 Biochemical Oxygen Demand (BOD)

The demand of oxygen from water to break down organic and inorganic waste

and sewage is known as biochemical oxygen demand (BOD). The more the oxygen taken out from water, the less the content of dissolved oxygen, thus increasing the pollution in the river with a high BOD load. The amount of dissolved oxygen needed by bacteria to decompose the waste determines the quality of wastewater. The problem arises when demand for dissolved oxygen exceeds available supply. Thus, BOD is a measure of oxygen required to sustain organisms like aerobes, protozoa etc. The BOD values in surface water samples from ponds and rivers in the study area ranged from 1.0 to 6.0 mg/L, with an average of 3.0 mg/L. In contrast, the BOD values in groundwater samples varied from 0.0 to 4.0 mg/L, with an average of 0.9 mg/L in hand pumps and bore wells. BOD values in surface water and groundwater samples are shown in **Figure 4.10**.



**Figure 4.10: Variation of BOD in SW and GW during post-monsoon 2025.**

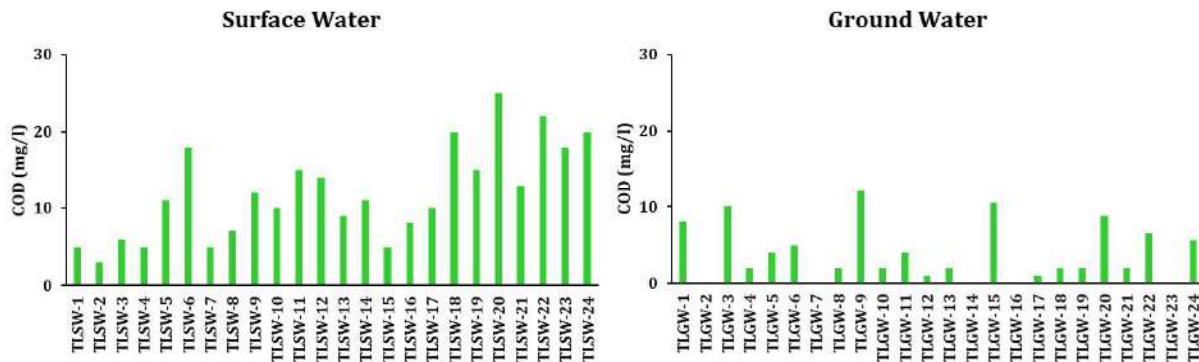
#### 4.1.11 Chemical Oxygen Demand (COD)

Chemical Oxygen Demand (COD) is a measurement of the oxygen requirement equivalent of organic matter that is susceptible to oxidation with the help of a strong chemical oxidant. It is an important, rapidly measured parameter as a means of measuring organic strength for streams and polluted water bodies.

Chemical Oxygen Demand (COD) is a measurement of the oxygen requirement equivalent of organic matter that is susceptible to oxidation with the help of a strong chemical oxidant. It is an important, rapidly measured parameter as a means of measuring organic strength for streams and polluted water bodies. The COD values in surface water samples ranged from 3.0 to 25.0 mg/L, with an average of 11.96 mg/L. In groundwater samples, COD varied from 0 to 12.0 mg/L, with an average value of 3.8

mg/L in hand pumps and bore wells.

Variation of COD in surface water and groundwater is shown in **Figure 4.11**.



**Figure 4.11: Variation of COD in SW and GW during post-monsoon 2025.**

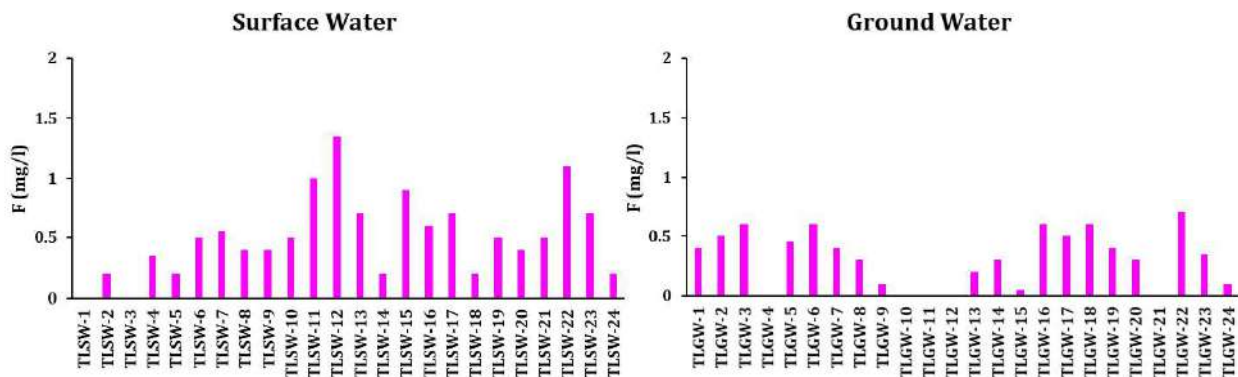
#### 4.1.12 Fluoride

Fluorine is a common element, but it does not occur in the elemental state in nature because of its high reactivity. Fluorine is the most electronegative and reactive of all elements that occur naturally within many rock types.

Fluoride is found in all natural waters at some concentration. Seawater typically contains about 1 mg/l while rivers and lakes generally exhibit concentrations of less than 0.5 mg/l. In groundwater, however, low or high concentrations of fluoride can occur, depending on the nature of the rocks and the occurrence of fluoride-bearing minerals. Fluoride occurs as fluor spar (fluorite), rock phosphate, phosphorite minerals etc. in nature. Among the factors, which control the concentration of fluoride includes climate of the area and the presence of accessory minerals in the rock mineral assemblage through which the groundwater is circulating. Concentrations in water are limited by fluorite solubility. It is the absence of calcium in solution which allows higher concentrations to be stable. High fluoride concentrations may therefore be expected in groundwater from calcium-poor aquifers and in areas where fluoride-bearing minerals are common. Fluoride in drinking water has a narrow range between beneficial and detrimental health effects. Fluoride intake to humans is necessary if it does not exceed the limits. The WHO (2011) and BIS (2012) estimate the maximum allowable limit for

fluoride uptake to humans in drinking water as 1.5 mg/l. Excess fluoride intake causes different types of fluorosis, primarily dental and skeletal fluorosis.

During the post-monsoon monitoring period, fluoride concentrations in surface water ranged from 0.0 to 1.4 mg/L, with an average of 0.5 mg/L, whereas groundwater fluoride levels varied between 0 and 0.7 mg/L, with an average value of 0.3 mg/L. (**Figure 4.12**).



**Figure 4.12: Fluoride in SW and GW (Post-monsoon 2025).**

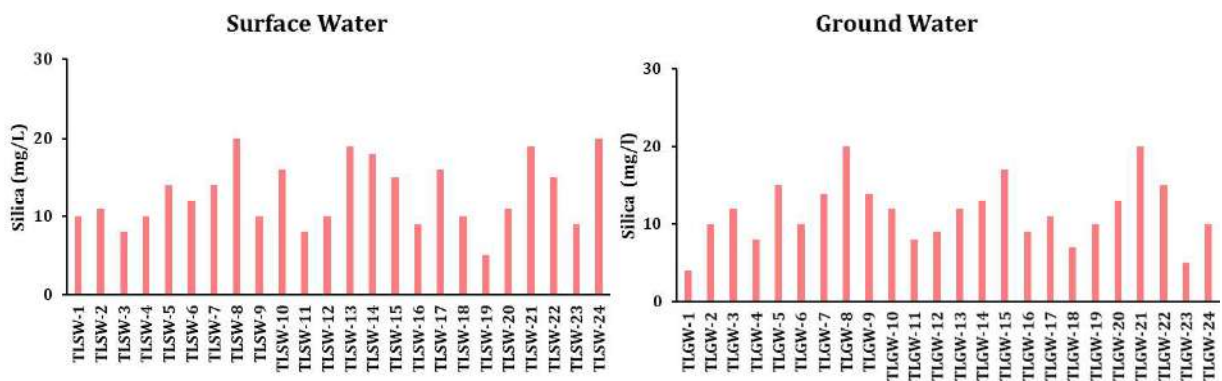
Concentration of fluoride is within the prescribed permissible limit (1.5 mg/l) in drinking water requirement during post-monsoon season.

#### **4.1.13 Silica**

Silica (silicon dioxide) is a compound of silicon and oxygen ( $\text{SiO}_2$ ). It is a hard, glassy mineral substance that occurs in a variety of forms such as sand, quartz, sandstone, and granite. It is also found in the skeletal parts of various animals and plants. Silicon is the 7<sup>th</sup> most abundant element in the universe and the second most abundant element on earth after oxygen which explains why most water supplies will contain some traces of silica. All natural water supplies contain some dissolved “silica” and most will also contain suspended or colloidal silica. In solution it can exist as silicic acid or silicate ion, depending upon the pH value. Silica can also be found in certain foods including cucumbers, oats, brown rice, wheat, strawberries, onions, avocados, and root vegetables.

Silica can cause water to appear cloudy or leave white, chalky deposits on glassware, showerheads, and sinks. These residues are harmless but can be unsightly and inconvenient to clean. High silica levels in water can cause scaling on industrial equipment, pipes, and appliances. This is a particular concern for businesses using boilers or cooling systems, where silica deposits can reduce efficiency and increase maintenance costs.

The dissolved silica concentrations in waters samples collected during post-monsoon from study area (TTPS) are tabulated in **Table 4.1 and Table 4.2** for surface water and groundwater respectively. Variation of silica in surface water and groundwater are shown in **Figure 4.13**.



**Figure 4.13: Silica in SW and GW (Post-monsoon 2025).**

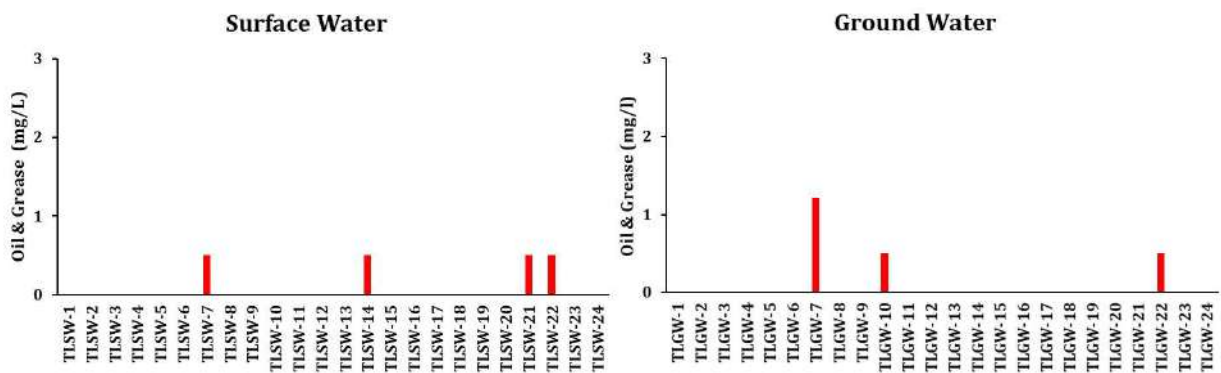
During the post-monsoon season, silica concentrations in surface water samples of the study area ranged from 5.0 to 20.0 mg/L, with an average of 12.88 mg/L, while groundwater samples showed silica levels between 4.0 and 20.0 mg/L, with an average of 11.6 mg/L respectively during post-monsoon season. Though BIS & WHO has not set any guidelines for silica in drinking water standards, high concentration of silica forms hard scale in pipes and boilers and may form deposits on blades of steam turbines.

#### **4.1.14 Oil and Grease**

Oil and grease include fats, oils, waxes, and other related constituents found in water, generally wastewater. If these compounds are not removed before discharge of treated wastewater, oil and grease can interfere with biological life in surface waters and

create unsightly films. Fats and oils contribute to domestic wastewater in butter, lard, margarine, and vegetable fats and oils. Fats are also commonly found in meats, in the germinal area of cereals, in seeds, in nuts, and in certain fruits. The low solubility of fats and oils reduces their rate of microbial degradation. Kerosene, lubricating, and road oils are derived from petroleum and coal tar and contain essentially carbon and hydrogen. These oils can reach sewers in considerable volume from shops, garages, and streets. The mineral oils coat surfaces to a greater extent than fats, oils, and soaps, and the particles interfere with biological action and cause maintenance problems.

All the 48 samples of surface and groundwater were examined for oil and grease in the area including ground water and pond/river water during post-monsoon season of 2025 (**Figure 4.14**).



**Figure 4.14: Oil and Grease in SW and GW (Post-monsoon 2025).**

In the post-monsoon surface water samples, oil and grease were detected in 50% of the samples 0.5 mg/L in four samples and the remaining samples were below the detection limit (BDL). In groundwater samples, oil and grease concentrations were below the detection limit (BDL) in all analyzed samples.

#### **4.1.15 Phenolic Compounds**

Phenol, a pervasive and persistent organic pollutant, threatens natural ecosystems and human health. Phenol is non-biodegradable, efficiently absorbed through the skin, and highly toxic and mutagenic at higher concentrations. Phenolic compounds cover a vast array of substances. At lower concentrations, phenol is used

as a disinfectant. Most monohydric and dihydric phenols easily succumb to oxidation and microbial breakdown, depending on the habitat.

Phenol and its derivatives are classified as potent water contaminants that cause foul odors and water taste. The effluents from the paint, pesticide, pharmaceutical, chemical, petroleum, and petrochemical sectors are the leading causes of phenol contamination in the aquatic environment. The chlorination used for water disinfectants produces chlorinated phenols that are more toxic than the parent material. The European Union (EU) and the United States Environmental Protection Agency (USEPA) have designated phenol and its derivatives as pollutants of primary concern. Since these compounds are known to be hazardous and to have negative short- and long-term impacts on both humans and animals, this enlistment is necessary. According to BIS, the phenol in drinking water should not be higher than 0.002 mg/l.

Phenolic compounds exist in water bodies due to the discharge of polluted wastewater from industrial, agricultural and domestic activities into water bodies. They also occur because of natural phenomena. These compounds are known to be toxic and inflict both severe and long-lasting effects on both humans and animals. They act as carcinogens and cause damage to the red blood cells and the liver, even at low concentrations. Interaction of these compounds with microorganisms, inorganic and other organic compounds in water can produce substituted compounds or other moieties, which may be as toxic as the original phenolic compounds.

*Phenols or Phenolic compounds have not been detected in surface water or groundwater during post-monsoon 2025.*

## **4.2 Major Ions**

Major ions are the positive and negatively charged ions present in water. These are the constituents that contribute to the amount of total and dissolved solids and specific conductance in waters.

Concentration of various ions in surface water and groundwater are given in **Table 4.5** and **Table 4.6** respectively.

**Table 4.5: Major ions in Surface water sources in buffer area (Post-monsoon, 2025).**

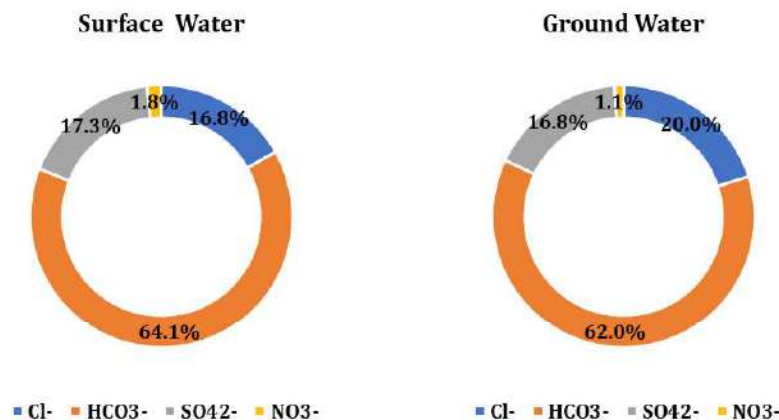
Sample ID	Source	HCO <sup>3-</sup>	Cl <sup>-</sup>	SO <sub>4</sub> <sup>2-</sup>	NO <sub>3</sub> <sup>-</sup>	Ca <sup>2+</sup>	Mg <sup>2+</sup>	Na <sup>+</sup>	K <sup>+</sup>
		(mg/L)							
TLSW-1	Canal	46.2	18.6	4.8	1.0	13.7	7.0	5.6	1.9
TLSW-2	Pond	64.7	17.5	7.0	1.1	13.5	6.2	8.4	2.5
TLSW-3	Pond	156.2	56.0	27.6	2.6	33.7	24.4	45.4	2.1
TLSW-4	Canal	92.7	28.0	13.3	1.1	9.8	16.1	15.8	1.9
TLSW-5	Canal	42.0	20.6	5.7	1.0	14.5	5.0	7.2	2.1
TLSW-6	Pond	152.7	24.0	16.5	1.7	16.8	26.7	25.9	4.8
TLSW-7	Pond	121.5	20.0	46.6	3.1	31.7	12.8	21.8	5.7
TLSW-8	Mine void	110.2	40.0	68.8	2.9	39.2	15.9	32.0	9.7
TLSW-9	Pond	158.6	40.5	24.0	13.0	26.4	17.0	31.0	5.3
TLSW-10	Pond	125.9	48.0	38.7	3.6	26.3	16.1	42.4	6.7
TLSW-11	Mine void	78.1	22.8	132.6	0.7	33.4	18.5	14.4	8.0
TLSW-12	Pond	167.9	46.0	43.2	1.6	42.9	16.2	19.8	4.5
TLSW-13	Pond	152.8	32.5	36.0	4.1	20.6	24.8	10.7	12.2
TLSW-14	Pond	87.8	39.6	7.0	1.9	14.7	15.6	7.1	5.2
TLSW-15	River D/s	89.8	30.3	10.0	1.4	8.2	18.4	6.5	2.5
TLSW-16	Pond	83.4	20.2	9.0	0.7	10.7	15.3	5.7	2.3
TLSW-17	Canal	96.1	19.6	6.7	1.3	4.0	17.0	6.1	2.0
TLSW-18	Pond	115.0	25.0	14.0	1.0	12.5	14.0	18.0	1.6
TLSW-19	River D/s	185.4	32.0	58.3	9.8	26.6	32.2	43.3	7.8
TLSW-20	River U/S	195.2	52.0	44.1	19.5	41.7	25.3	55.8	9.1
TLSW-21	Pond	85.9	24.0	10.6	0.5	14.6	4.0	20.0	1.5
TLSW-22	Pond	142.0	32.4	23.6	2.0	15.4	25.7	23.0	7.8
TLSW-23	Pond	83.0	26.0	94.5	0.9	10.1	27.2	16.0	9.6
TLSW-24	River U/s	170.8	18.8	13.14	1	4.33	36.84	6.81	2.47
<b>Acceptable Limit</b>		<b>250</b>	<b>NS</b>	<b>200</b>	<b>45</b>	<b>75</b>	<b>30</b>	<b>NS</b>	<b>NS</b>
<b>Permissible Limit</b>		<b>1000</b>	<b>NS</b>	<b>400</b>	<b>NR</b>	<b>200</b>	<b>100</b>	<b>NS</b>	<b>NS</b>
<b>Detection Limit</b>		<b>10</b>	<b>10</b>	<b>0.02</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	

**Table 4.6: Major ions in ground water sources in the buffer area (Post-monsoon, 2025).**

S. No.	Sample ID	Source	HCO <sub>3</sub> <sup>-</sup>	Cl <sup>-</sup>	SO <sub>4</sub> <sup>2-</sup>	NO <sub>3</sub> <sup>-</sup>	Ca <sup>2+</sup>	Mg <sup>2+</sup>	Na <sup>+</sup>	K <sup>+</sup>
			(mg/L)							
1	TLGW-1	DW	112.2	46.4	35.5	0.7	36.6	10.3	29.7	6.9
2	TLGW-2	HP	164.3	110.5	28.0	0.4	55.7	18.8	68.1	1.3
3	TLGW-3	DW	115.2	65.2	46.2	1.9	46.5	9.7	50.4	4.8
4	TLGW-4	HP	185.9	84.0	31.0	1.1	55.9	16.0	60.4	5.2
5	TLGW-5	HP	169.8	32.0	44.6	1.3	48.8	4.9	57.3	10.1
6	TLGW-6	HP	334.8	128.0	39.1	7.3	50.2	27.6	105.9	12.6
7	TLGW-7	HP	237.7	52.0	69.9	3.9	54.5	18.6	73.7	4.6
8	TLGW-8	HP	268.5	132.0	84.0	9.9	59.8	20.4	96.6	5.5
9	TLGW-9	DW	261.1	92.6	100.4	0.9	65.1	28.0	104.5	10.6
10	TLGW-10	HP	195.3	28.0	84.5	1.7	23.3	18.8	52.4	5.1
11	TLGW-11	DW	175.7	42.5	59.9	13.3	28.1	24.7	49.8	12.6
12	TLGW-12	DW	155.3	44.0	35.3	1.9	44.9	12.3	32.5	3.0
13	TLGW-13	HP	220.4	66.4	74.5	0.3	40.4	20.0	47.3	10.8
14	TLGW-14	HP	151.3	40.8	29.1	0.5	21.6	10.3	53.5	1.7
15	TLGW-15	DW	190.3	52.0	51.8	1.3	41.4	15.0	46.0	5.8
16	TLGW-16	HP	145.0	68.1	30.6	2.5	20.9	13.5	70.1	7.3
17	TLGW-17	HP	191.8	42.0	52.4	4.5	42.6	29.1	45.6	6.5
18	TLGW-18	HP	248.9	98.4	95.7	14.6	33.0	23.6	117.5	6.4
19	TLGW-19	HP	301.1	80.0	87.5	5.3	69.1	38.6	62.3	8.2
20	TLGW-20	DW	234.3	86.4	82.7	2.9	33.4	31.1	70.6	9.0
21	TLGW-21	DW	168.8	24.5	20.6	1.3	24.8	21.2	27.1	2.5
22	TLGW-22	DW	187.9	20.8	43.2	1.2	30.7	17.4	21.7	4.3
23	TLGW-23	HP	117.1	38.9	20.3	0.7	21.5	12.6	35.0	7.5
24	TLGW-24	DW	124.0	28.2	16.9	1.9	20.9	4.3	35.0	3.8
<b>Acceptable Limit</b>		<b>IS 10500- 2012</b>	<b>250</b>	<b>NS</b>	<b>200</b>	<b>45</b>	<b>75</b>	<b>30</b>	<b>NS</b>	<b>NS</b>
<b>Permissible Limit</b>			<b>1000</b>	<b>NS</b>	<b>400</b>	<b>NR</b>	<b>200</b>	<b>100</b>	<b>NS</b>	<b>NS</b>
<b>Detection Limit</b>			<b>10</b>	<b>10</b>		<b>0.02</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>

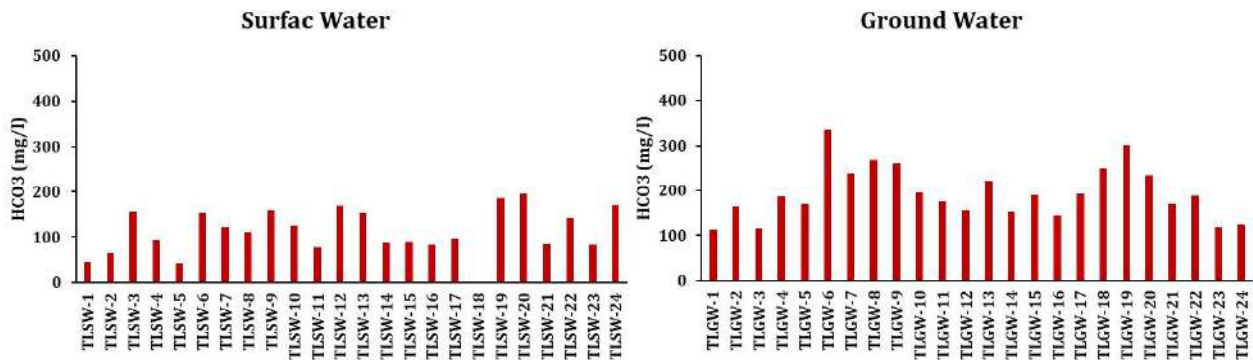
#### 4.2.1 Major Anions ( $\text{HCO}_3^-$ , $\text{Cl}^-$ , $\text{SO}_4^{2-}$ , $\text{NO}_3^-$ )

The major cations include  $\text{HCO}_3^-$ ,  $\text{Cl}^-$ ,  $\text{SO}_4^{2-}$  and  $\text{NO}_3^-$ . The anion chemistry of the analysed samples shows that  $\text{HCO}_3^-$ ,  $\text{Cl}^-$ , and  $\text{SO}_4^{2-}$  are the dominant anions in water samples during post-monsoon. In ground water, the anions follow the abundance order of  $\text{HCO}_3^- > \text{Cl}^- > \text{SO}_4^{2-} > \text{NO}_3^-$ , whereas in the surface water samples the abundance order is  $\text{HCO}_3^- > \text{SO}_4^{2-} > \text{Cl}^- > \text{NO}_3^-$  in the study area (**Figure 4.15**).



**Figure 4.15: Anion distribution in SW and GW during Post-monsoon 2025.**

**Bicarbonate:** The bicarbonates & carbonate are derived mainly from the soil zone  $\text{CO}_2$  and at the time of weathering of parent minerals. The soil zone in the subsurface environment contains elevated  $\text{CO}_2$  pressure (produce as result of decay of organic matter and root respiration), which in turn combines with rainwater to form bicarbonate. Bicarbonate may also be derived from the dissolution of carbonates and/or silicate minerals by the carbonic acid. Bicarbonates contribute to alkalinity (acid neutralizing capacity), and BIS (2012) has prescribed 200 mg/l as acceptable limit and 600 mg/l as permissible limit in absence of alternate source for drinking and other domestic usage.

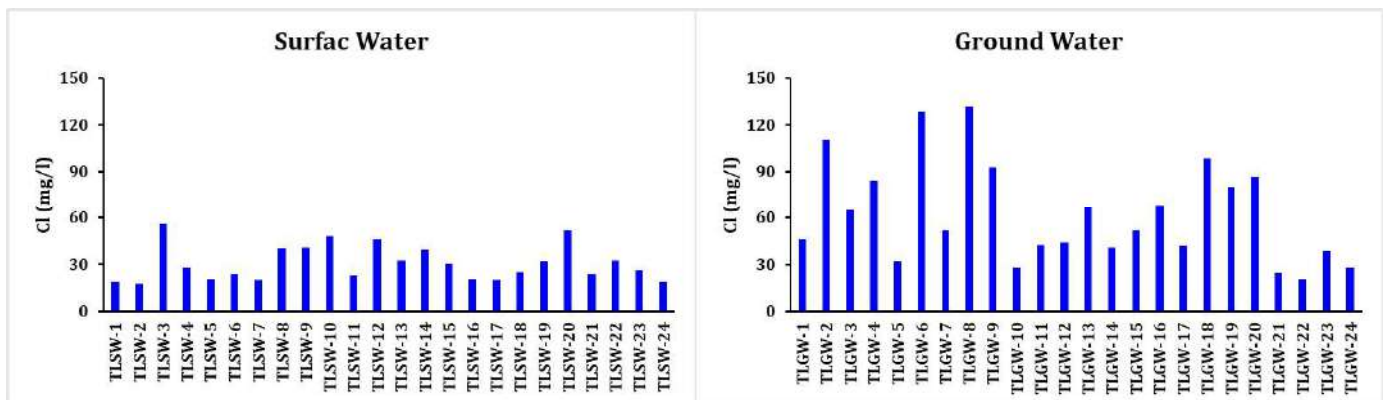


**Figure 4.16: Bicarbonates in SW and GW during post-monsoon 2025.**

During the post-monsoon season, HCO<sub>3</sub><sup>-</sup> concentrations in surface water ranged from 42.04 to 195.20 mg/L, with an average of 116.84 mg/L, while groundwater concentrations varied between 112.2 and 334.8 mg/L, with an average of 194.0 mg/L. (Figure 4.16).

**Chloride (Cl<sup>-</sup>):** All natural waters contain some dissolved solids (salinity) from contact with soils, rocks, and other natural materials. Too much, though, and dissolved solids can impair water use. Unpleasant taste, high water-treatment costs, mineral accumulation in plumbing, staining, corrosion, and restricted use for irrigation are among the problems associated with elevated concentrations of dissolved solids.

BIS (2012) has prescribed chloride (Cl<sup>-</sup>) concentration of 250 mg/l as acceptable limit and 1000 mg/l as permissible limit in absence of alternate source for drinking and other domestic usage.

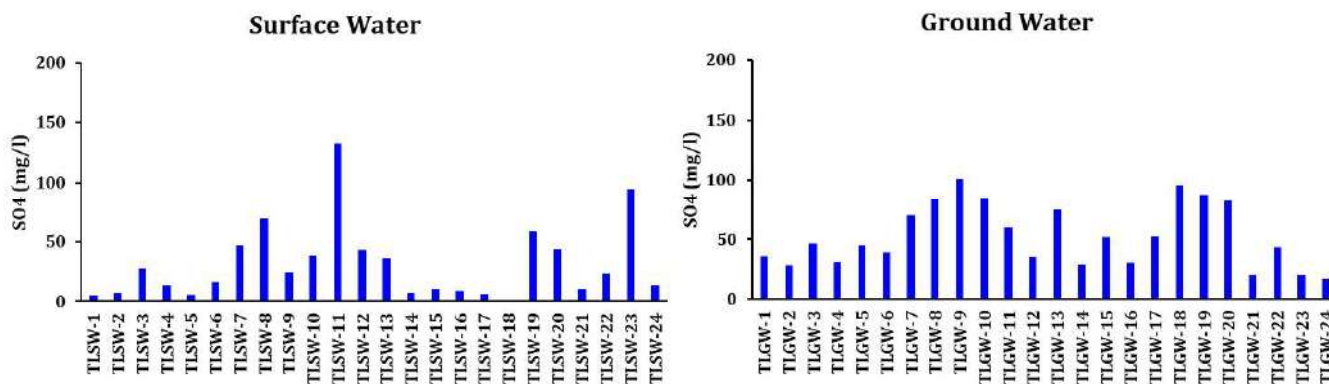


**Figure 4.17: Chloride in SW and GW during post-monsoon 2025.**

During the post-monsoon season, chloride ( $\text{Cl}^-$ ) concentrations in surface water ranged from 17.5 to 56.0 mg/L, with an average of 30.6 mg/L, whereas groundwater chloride levels varied from 20.8 to 132.0 mg/L, with an average of 62.7 mg/L. (**Figure 4.17**).

Chloride concentrations in all the analysed samples were within the acceptable limit prescribed by BIS. No health-based guideline value is proposed for chloride in drinking-water.

**Sulphate ( $\text{SO}_4^{2-}$ ):** Sulphate in drinking-water can cause noticeable taste, and very high levels might cause a laxative effect in unaccustomed consumers. Taste impairment varies with the nature of the associated cation; taste thresholds have been found to range from 250 mg/l for sodium sulfate to 1000 mg/l for calcium sulfate. High sulfate levels in drinking water results in gastro-intestinal disorders, and hence, it is recommended that health authorities be notified of sources of drinking water that contain sulfate concentrations more than 500 mg/l (WHO, 2011). BIS (2012) has prescribed 200 mg/l as acceptable limit and 400 mg/l as permissible limit for sulfate in absence of alternate source for drinking and other domestic usage.

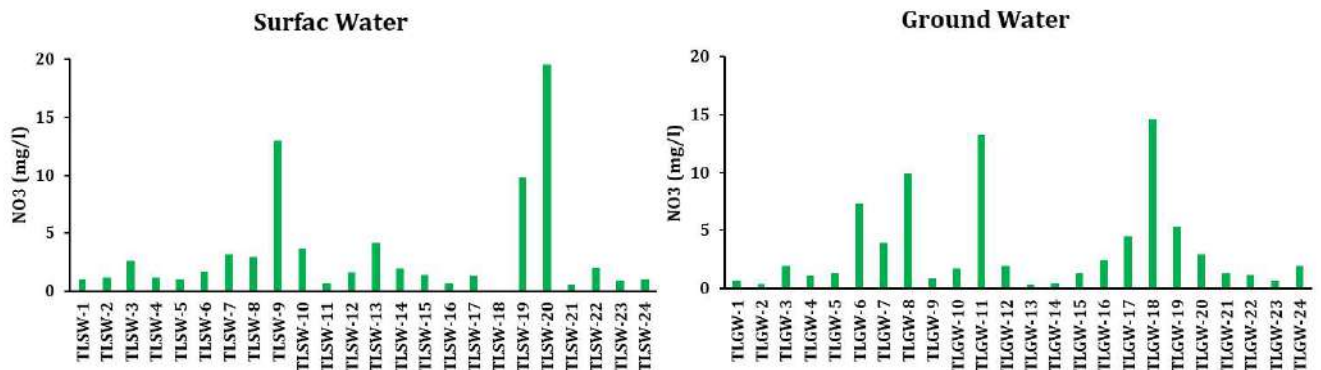


**Figure 4.18: Sulphate in SW and GW during post-monsoon 2025.**

During the post-monsoon season,  $\text{SO}_4^{2-}$  concentration in surface water varies from 4.78 to 132.60 mg/l with an average of 31.49 mg/l, whereas in groundwater the concentration of  $\text{SO}_4^{2-}$  varies between 16.9 to 100.4 mg/l with an average of 52.6 mg/L.

(Figure 4.18). The ranges of  $\text{SO}_4^{2-}$  concentration in both the surface water and groundwater indicated that Sulphate concentration is within the stipulated permissible limit prescribed by BIS (2012).

**Nitrate ( $\text{NO}_3^-$ ):** Nitrate is highly soluble in water. Nitrate ( $\text{NO}_3^-$ ) is found naturally in the environment and is an important plant nutrient. It is present at varying concentrations in all plants and is a part of the nitrogen cycle. Nitrate can reach both surface water and groundwater because of agricultural activity (including excess application of inorganic nitrogenous fertilizers and manures), from wastewater disposal and from oxidation of nitrogenous waste products in human and animal excreta, including septic tanks. Surface water nitrate concentrations can change rapidly owing to the surface runoff of fertilizer, uptake by phytoplankton and denitrification by bacteria, but groundwater concentrations generally show relatively slow changes. Some groundwater may also have nitrate contamination because of leaching from natural vegetation. The anthropogenic sources of nitrogen include (i) point source including industrial effluents, sewage, refuse dumps etc. discharged directly into the surface water, (ii) diffuse source including runoff and leaching from rural and urban land and (iii) precipitation. The presence of nitrate in drinking water is a potential health hazard when present in large quantities. Nitrites are formed by reduction of nitrate in the human body, which combines with haemoglobin in the blood to form methemoglobin that leads to methaemoglobinaemia (blue baby syndrome) in infants. The combination of nitrates with amines, amides, or other nitrogenous compounds through the action of bacteria in the digestive tract results in the formation of nitrosamines, which are potentially carcinogenic.



**Figure 4.19: Nitrate in SW and GW during post-monsoon 2025.**

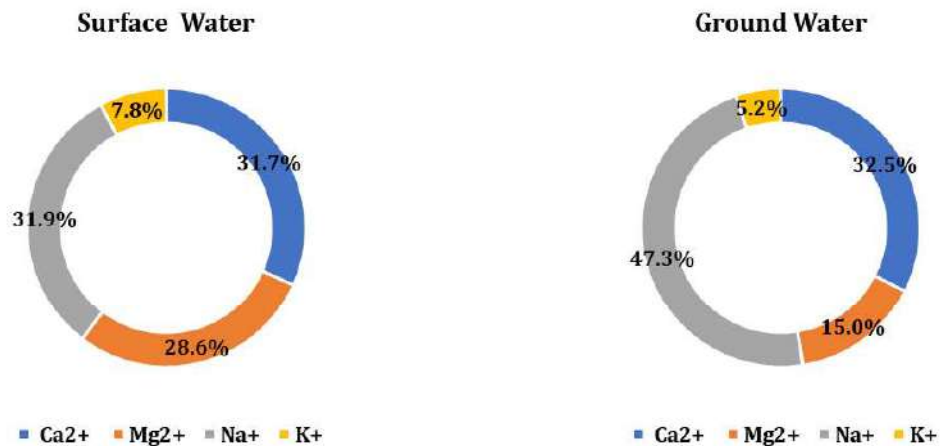
According to the Indian Standard for drinking water (IS 10500:2012), the maximum allowable nitrate concentration in drinking water is 45 mg/l as  $\text{NO}_3$ .

During the post-monsoon season,  $\text{NO}_3^-$  concentrations in surface water of the study area ranged from 0.5 to 19.50 mg/L, with an average of 3.23 mg/L, while groundwater  $\text{NO}_3^-$  levels varied from 0.0 to 14.6 mg/L, with an average of 3.4 mg/L. (**Figure 4.19**).

Nitrate concentrations in the study area are well within the acceptable limit (45.0 mg/l) in all the analysed water samples.

#### 4.2.2 Major Cations ( $\text{Ca}^{2+}$ , $\text{Mg}^{2+}$ , $\text{Na}^+$ , $\text{K}^+$ )

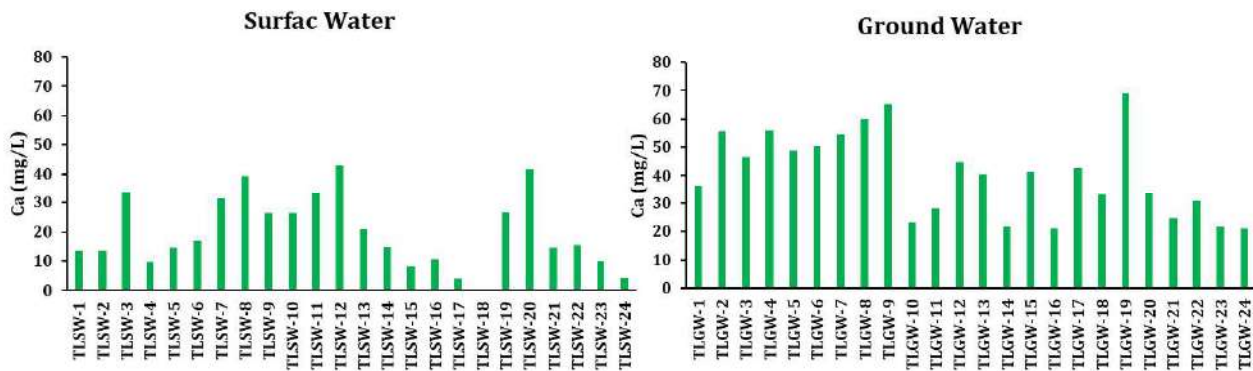
The major cations include  $\text{Ca}^{2+}$ ,  $\text{Mg}^{2+}$ ,  $\text{Na}^+$  and  $\text{K}^+$ . Generally,  $\text{Ca}^{2+}$  and  $\text{Na}^+$  are the major cations, and both constitute more than 70.0% of the total cations in the analysed groundwater and surface water of the buffer area of TTPS. **Figure 4.20** shows that the groundwater is dominated by  $\text{Ca}^{2+}$ ,  $\text{Mg}^{2+}$ ,  $\text{Na}^+$ , and  $\text{K}^+$  during post-monsoon sampling period. The dominance of these ions in surface water is in the order  $\text{Ca}^{2+} > \text{Na}^+ > \text{Mg}^{2+} > \text{K}^+$ , while in ground water cations dominate in the order of  $\text{Na}^+ > \text{Ca}^{2+} > \text{Mg}^{2+} > \text{K}^+$ .



**Figure 4.20: Cation distribution in GW and SW during Post-monsoon 2025.**

**Calcium (Ca<sup>2+</sup>):** Calcium ions are among the most encountered substances in water. Calcium in water arises mostly from the dissolution of Ca bearing minerals of the aquifer formation and often it is the most abundant cation in water. Weathering and dissolution of calcium carbonate (limestone and dolomite) and calc-silicate minerals (amphiboles, pyroxenes, olivine, biotite etc.) are the most common sources of calcium in the aquatic system. The calcium in hard water results in teaming up with excess bile and its resident fats to lather up the soap like insoluble substance, which is emitted from the body during bowel movements.

BIS (2012) have prescribed 75 mg/l as an acceptable limit and 200 mg/l as permissible limit for calcium in absence of alternate source for drinking and other domestic usage.



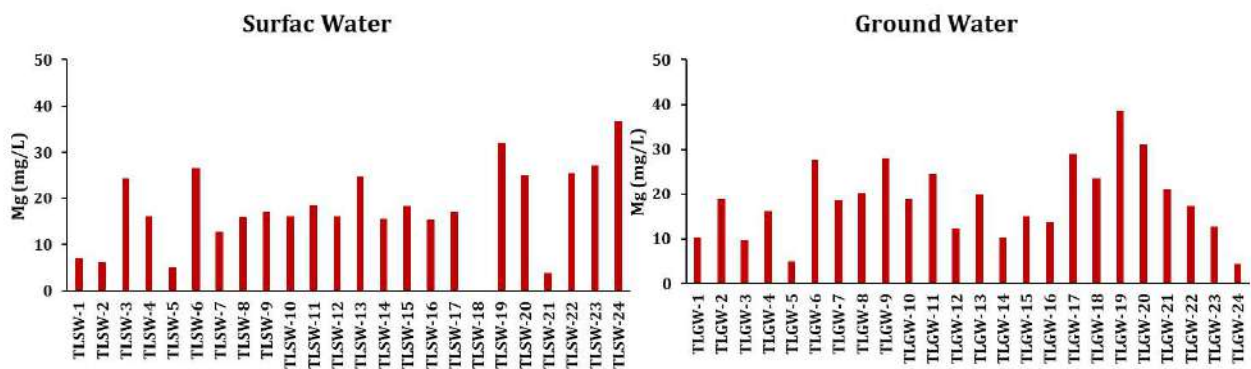
**Figure 4.21: Calcium in SW and GW during Post-monsoon 2025.**

During the post-monsoon monitoring period, calcium concentrations in surface water ranged from 4.01 to 42.93 mg/L, with an average of 20.22 mg/L, whereas groundwater calcium levels varied from 20.9 to 69.1 mg/L, with an average of 40.4 mg/L. (**Figure 4.21**). None of the samples exceeded the desirable limits, and all values remained within the permissible limits for drinking water, indicating that the water is safe for various uses.

**Magnesium (Mg<sup>2+</sup>):** Magnesium is abundant in earth crust and is a common constituent of natural water. Olivine, clay minerals, dolomite, pyroxenes are the common source minerals for magnesium in the waters. The carbonate, chlorides, hydroxides, oxides and sulphate of the magnesium are used in the production of magnesium metal, refractories,

fertilizers, ceramics, and explosives and medicines. Magnesium compounds are more soluble than their counterparts. Magnesium precipitates in its hydroxide at  $\text{pH} > 10$ .

Natural sources contribute more magnesium to the environment than all anthropogenic sources. The principal source of magnesium in natural water is ferromagnesian mineral in igneous rock and magnesium carbonate in sedimentary rock. The sulphate and chloride of magnesium are very soluble. The presence of calcium and magnesium make the water hard. BIS (2012) have prescribed 30 mg/l as acceptable limit and 100 mg/l as permissible limit for magnesium in absence of alternate source for drinking and other domestic usage.

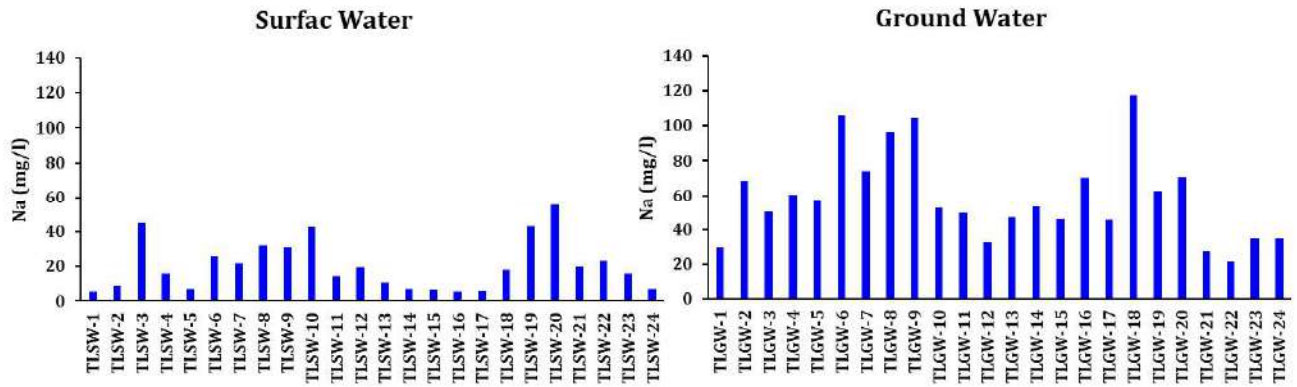


**Figure 4.22: Magnesium in SW and GW during Post-monsoon 2025.**

In the post-monsoon season, magnesium concentrations in surface water ranged from 4.00 to 36.84 mg/L, with an average of 18.25 mg/L, while groundwater magnesium levels varied from 4.3 to 38.6 mg/L, with an average of 18.6 mg/L. (**Figure 4.22**). During post-monsoon season, concentration of magnesium in surface water and groundwater, few samples exceeded the acceptable limit (30 mg/l) while none of the samples exceeded the permissible limit for drinking water.

**Sodium (Na):** The sodium (Na) in the aquatic system is derived from the atmospheric deposition, evaporate dissolution and silicate weathering. The evaporate encrustations of sodium-potassium salts may also be developed due to cyclic wetting and drying periods leading to the formation of alkaline-saline soils, which may also serve as a source of sodium and potassium. The weathering of Na and K silicate minerals like

albite, anorthite, orthoclase and microcline are the major source of the Na and K in the aquatic system.

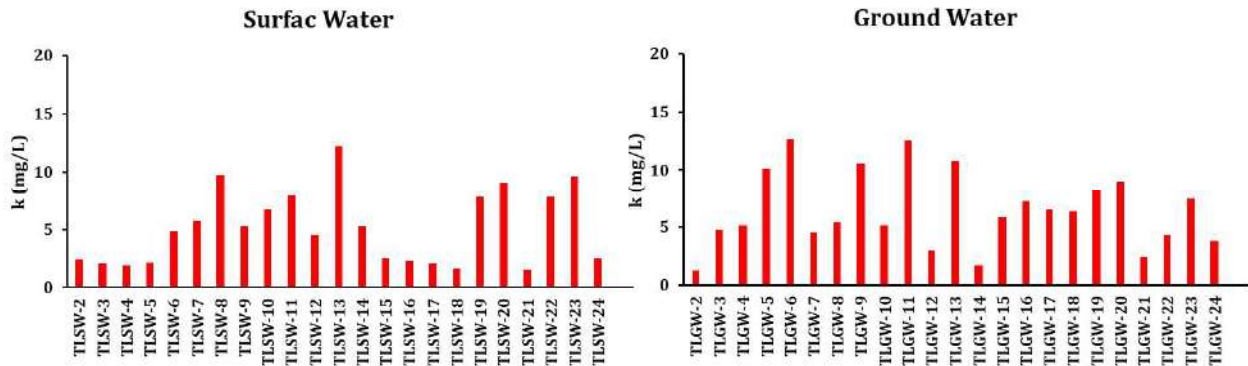


**Figure 4.23: Sodium in SW and GW during Post-monsoon 2025.**

During the post-monsoon season of 2025, sodium concentrations in surface water ranged from 5.63 to 55.78 mg/L, with an average of 19.30 mg/L, whereas groundwater sodium levels varied between 21.7 and 117.5 mg/L, with an average of 58.9 mg/L. (**Figure 4.23**).

No health-based guidelines are given by BIS for drinking water for sodium. WHO (2011) has defined taste threshold for sodium in water depends on the associated anion and the temperature of the solution. At room temperature, the threshold values are about 20 mg/l for sodium carbonate, 150 mg/l for sodium chloride, 190 mg/l for sodium nitrate, 220 mg/l for sodium sulfate, and 420 mg/l for sodium bicarbonate. Based on taste threshold, the recommended concentration of sodium in the water should be less than 200 mg/l. The values at all locations are within the stipulated standards recommended by BIS/ WHO.

**Potassium (K<sup>+</sup>):** Although potassium is nearly as abundant as sodium in igneous rocks and metamorphic rocks, its concentration in groundwater is one-tenth or even one-hundredth that of sodium. Parity in concentration of sodium and potassium is found only in waters with low mineral contents. The factors responsible for the scarcity of potassium in groundwater are the resistance of potassium minerals to weathering and fixation of potassium in clay minerals formed due to weathering.



**Figure 4.24: Potassium in SW and GW during Post-monsoon 2025.**

During the post-monsoon season,  $K^+$  concentrations in surface water ranged from 1.5 to 12.18 mg/L, with an average of 4.71 mg/L, while groundwater  $K^+$  levels varied between 1.3 and 12.6 mg/L, with an average of 6.5 mg/L. The BIS & WHO has not included K in drinking water standards. The main sources of potassium in ground water include rainwater, weathering of potash, silicate minerals, use of potash fertilizers and use of surface water for irrigation. (**Figure 4.24**).

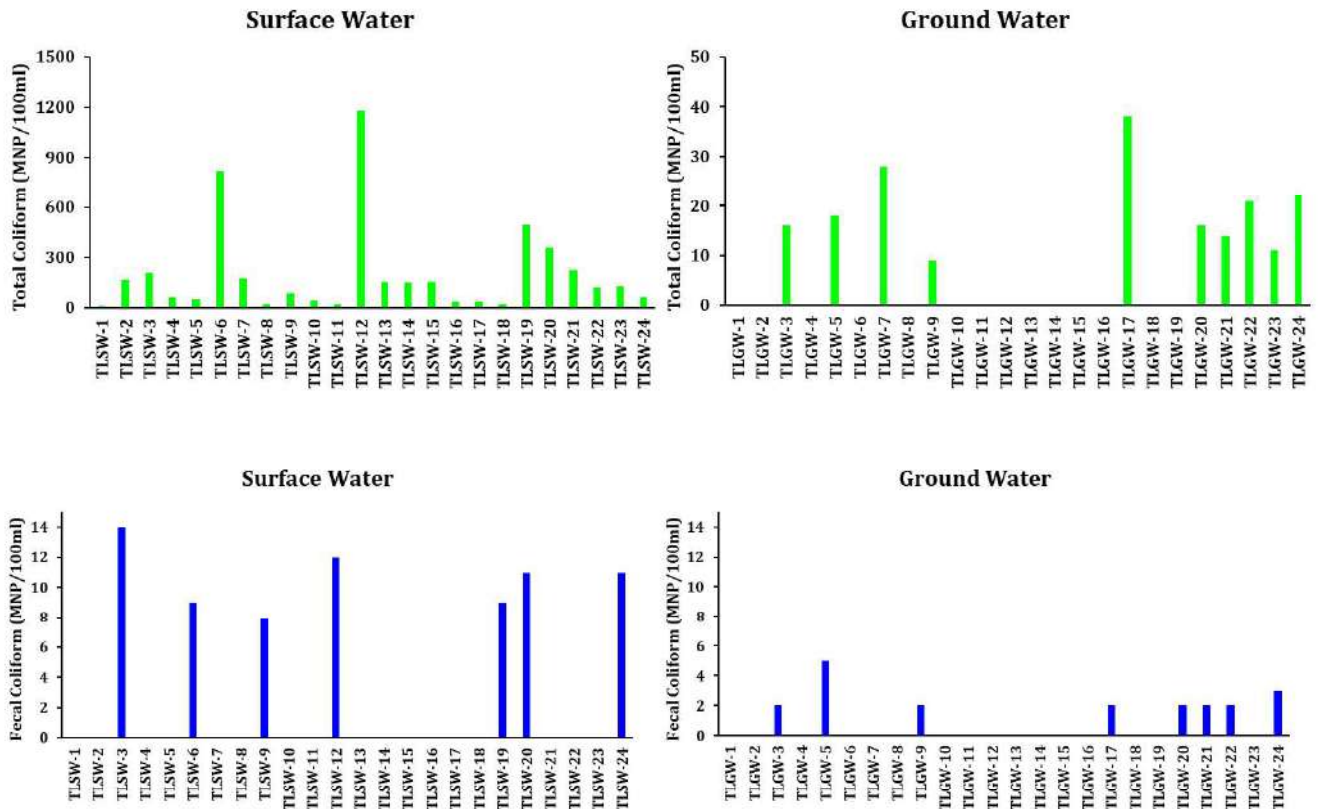
### 4.3 Bacteriological Parameters

Bacteriological quality is one of the important parameters of water potability. It is measured by the presence of a pollution indicator of organisms, in particular, total germs and fecal coliforms (*Escherichia coli*). Total germs represent the density of the bacterial population in drinking water. This measure allows a global assessment of the pernicious nature of water, without determining the sources of contamination (Levallois 2003). *E. coli* is one of the most determined bacteria that indicates fecal contamination (Edberg et al. 2000). Total coliform and *E. coli* are used as indicators to measure pollution level and water quality.

Water quality through the presence of pathogenic enteric microorganisms may affect human health. Coliform bacteria, *Escherichia coli* and coliphages are normally used as indicators of water quality. However, the presence of above-mentioned indicators does not always suggest the presence of human enteric viruses. It is important to study human enteric viruses in water. Human enteric viruses can tolerate

fluctuating environmental conditions and survive in the environment for long periods of time becoming causal agents of diarrheal diseases.

BIS (2012) has prescribed permissible limit for total coliform as 500 MPN / 100 ml, whereas, for E. Coli should not be present in drinking water.



**Figure 4.25: Total Coliform and Fecal Coliform (E. Coli) in SW and GW (Post-monsoon 2025).**

During post-monsoon season, in most of the surface water sources, Total coliforms have been observed, whereas E. coli have been detected only in four samples. In groundwater samples, Total coliform and E. coli are present in a few samples (**Figure 4.25**).

#### **4.4 Heavy Metals**

Heavy metals in ground water have considerable significance due to their toxicity and adsorption behavior. Heavy metals are not biodegradable and enter the food chain through several pathways causing progressive toxicity due to the accumulation in human and animal organs during their life span on long term exposure to contaminated environments.

Despite the presence of trace concentrations of Cr, Mn, Co, Cu and Zn in the aquatic environment, which is essential to several life processes, high concentrations of these metals become toxic. The major sources of heavy metals in ground and surface water include weathering of rock minerals and waste effluents on land and runoff water. Many cement and sponge iron plants, coal based thermal power plants have been set up at Talcher, Talcher and Banaharpali. Captive thermal power plants have also been set up by NALCO, RSP, ICCL, JINDAL etc. and many more are in the pipeline.

The concentration of trace metals in surface water and groundwater of the study area for post-monsoon 2025 are given in **Table 4.7** and **Table 4.8** respectively. The toxic effects of these elements and the extent of their contamination are discussed in the following sections.

**Table 4.7: Heavy metals in SW sources in the buffer area (Post-monsoon, 2025).**

Sample ID	Source	As	Hg	Pb	Cd	Cr	Cr <sup>6+</sup>	Cu	Zn	Se	Fe	Li	B	Al	Mn	Co	Ni	Sr	Ag	Ba	Rh	Mo	
		ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	
TLSW-1	Canal	0.0003	BDL	BDL	BDL	BDL	0.0001	0.000	BDL	0.001	BDL	0.005	0.04	0.003	0.0001	BDL	0.0002	0.0022	BDL	0.0267	BDL	BDL	
TLSW-2	Pond	0.0010	BDL	BDL	BDL	BDL	0.0002	0.001	BDL	0.001	0.001	BDL	BDL	BDL	0.0014	BDL	0.0003	0.0033	BDL	0.0563	BDL	BDL	
TLSW-3	Pond	0.0024	BDL	0.0002	BDL	BDL	0.0004	0.001	0.006	0.004	0.190	BDL	BDL	BDL	2.2082	BDL	0.0010	0.0018	BDL	0.0389	BDL	BDL	
TLSW-4	Canal	0.0011	BDL	0.0004	0.0000	BDL	0.0008	0.001	0.004	0.004	0.407	BDL	BDL	BDL	0.1170	BDL	0.0008	0.0026	BDL	0.0420	BDL	BDL	
TLSW-5	Canal	0.0009	BDL	0.0006	0.0000	BDL	0.0009	0.001	0.004	0.003	0.440	BDL	BDL	0.0091	0.0847	BDL	0.0008	BDL	BDL	0.0313	BDL	BDL	
TLSW-6	Pond	0.0036	BDL	0.0012	0.0000	BDL	0.0005	0.001	0.005	0.003	0.154	BDL	BDL	BDL	0.1519	BDL	0.0007	BDL	BDL	0.0563	BDL	BDL	
TLSW-7	Pond	0.0023	BDL	0.0005	0.0000	BDL	0.0007	0.002	0.004	0.004	0.409	BDL	BDL	0.0081	0.2051	BDL	0.0015	0.0020	BDL	0.0336	BDL	BDL	
TLSW-8	Mine void	0.0101	0.0003	0.0023	0.0001	BDL	0.0006	0.002	0.010	0.003	0.295	BDL	0.05	0.00335	0.5860	BDL	0.0181	0.0042	BDL	0.0472	BDL	0.1106	
TLSW-9	Pond	0.0028	0.0001	0.0017	0.0000	BDL	0.0008	0.001	0.006	0.003	0.134	0.002	BDL	BDL	0.1613	BDL	0.0007	0.0031	BDL	0.0278	BDL	0.0630	
TLSW-10	Pond	0.0023	BDL	0.0006	0.0000	BDL	0.0006	0.001	0.004	0.004	0.162	0.006	BDL	0.00105	0.1978	BDL	0.0010	0.0015	BDL	0.0314	BDL	0.0123	
TLSW-11	Mine void	0.0008	0.0019	0.0003	0.0000	BDL	0.0002	0.000	0.003	0.005	0.064	BDL	0.01	BDL	0.0842	BDL	0.0022	0.0020	BDL	0.0440	BDL	0.1145	
TLSW-12	Pond	0.0009	BDL	BDL	BDL	BDL	0.0001	0.000	BDL	0.002	BDL	BDL	BDL	0.00185	0.0003	BDL	0.0004	0.0023	BDL	0.0571	BDL	0.0521	
TLSW-13	Pond	0.0026	BDL	0.0143	0.0001	BDL	0.0041	0.003	0.004	0.004	2.634	0.008	0.07	BDL	0.2410	BDL	0.0023	0.0045	BDL	0.0523	BDL	BDL	
TLSW-14	Pond	0.0020	BDL	0.0007	0.0001	BDL	0.0004	0.001	0.005	0.003	0.223	BDL	BDL	BDL	0.1861	BDL	0.0010	0.0010	BDL	0.0295	BDL	BDL	
TLSW-15	River	0.0007	BDL	0.0011	0.0000	BDL	0.0008	0.001	0.007	0.003	0.276	BDL	BDL	0.005	0.0843	BDL	0.0011	0.0050	BDL	0.0295	BDL	0.0380	
TLSW-16	NTPC Pond	0.0000	0.0000	0.0000	0.0000	BDL	0.0000	0.000	0.000	0.000	0.000	BDL	BDL	0.00635	0.0000	BDL	0.0000	BDL	BDL	0.0000	BDL	BDL	
TLSW-17	Canal	0.0006	BDL	0.0004	0.0000	BDL	0.0009	0.001	0.004	0.003	0.312	BDL	BDL	BDL	0.0572	BDL	0.0009	0.0032	BDL	0.0291	BDL	BDL	
TLSW-18	Pond	0.0000	0.0000	0.0000	0.0000	BDL	0.0000	0.000	0.000	0.000	0.000	BDL	BDL	0.006	0.0000	BDL	0.0000	0.0048	BDL	0.0000	BDL	BDL	
TLSW-19	River D/N	0.0025	BDL	0.0006	0.0000	BDL	0.0006	0.001	0.005	0.011	0.201	BDL	0.01	0.01	0.1399	BDL	0.0014	0.0050	BDL	0.0555	BDL	0.0380	
TLSW-20	River U/S	0.0018	0.0014	0.0009	0.0000	BDL	0.0015	0.001	0.009	0.005	0.638	0.001	0.01	0.006	0.2062	BDL	0.0020	0.0060	BDL	0.0404	BDL	0.0287	
TLSW-21	Pond	0.0000	0.0000	0.0000	0.0000	BDL	0.0000	0.000	0.000	0.000	0.000	BDL	BDL	0.0043	0.0000	BDL	0.0000	0.0030	BDL	0.0000	BDL	BDL	
TLSW-22	Pond	0.0021	BDL	0.0042	0.0000	BDL	0.0003	0.001	0.008	0.003	0.121	BDL	BDL	0.0103	0.1316	BDL	0.0008	0.0048	BDL	0.0406	BDL	BDL	
TLSW-23	Pond	0.0003	BDL	0.0004	0.0000	BDL	0.0002	0.000	0.006	0.003	0.119	BDL	BDL	BDL	0.3413	BDL	0.0113	BDL	BDL	0.0309	BDL	BDL	
TLSW-24	River	0.0000	0.0000	0.0000	0.0000	BDL	0.0000	0.000	0.000	0.000	0.000	BDL	0.01	BDL	0.0000	BDL	0.0000	BDL	BDL	0.0000	BDL	BDL	
Acceptable Limit		0.010	0.001	0.010	0.003	0.050	NS	0.050	5.00	0.010	0.30	NS	0.50	0.03	0.10	0.02	0.02	0.03	0.10	0.70	NS	NS	
Permissible Limit		0.050	NR	NR	NR	NR	NS	1.500	15.00	NR	NR	NS	1.00	0.20	0.30	NR	NR	0.00	NR	NR	NR	NS	
Detection Limit		0.0005	0.0000	0.0001	0.0001	0.0010	0.0001	0.0001	0.0010	0.0001	0.0020	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

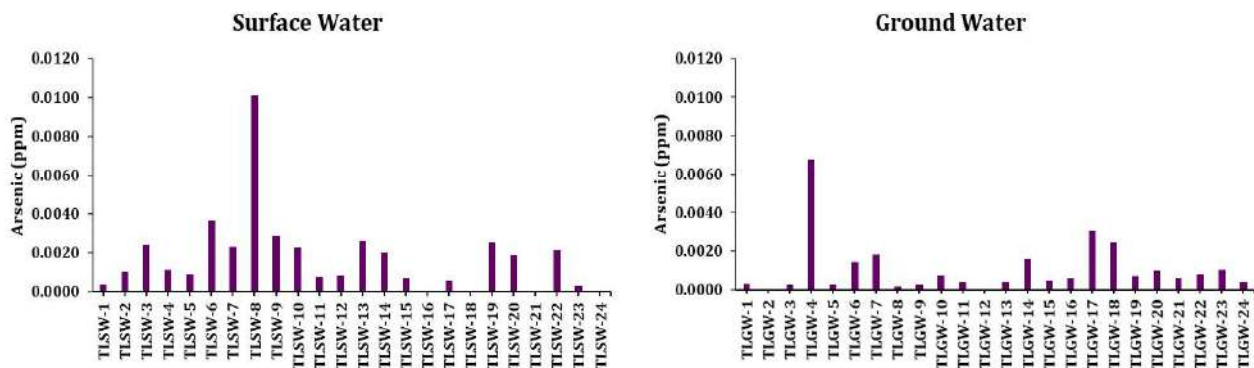
**Table 4.8: Heavy Metals in GW sources in the buffer area (Post-monsoon, 2025)**

S.No.	Sample ID	Source	As	Hg	Pb	Cd	Cr	Cr <sup>6+</sup>	Cu	Zn	Se	Fe	Li	B	Al	Mn	Co	Ni	Sr	Ag	Ba	Rh	Mo	
			ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	
1	TLGW-1	DW	0.0003	0.0012	0.0007	BDL	BDL	0.0004	0.001	0.006	0.001	0.08	BDL	0.02	0.008	0.06	BDL	0.001	0.04	BDL	0.05	BDL	0.024	
2	TLGW-2	HP	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.119	0.001	BDL	BDL	0.02	0.005	0.02	BDL	BDL	0.50	BDL	0.06	BDL	BDL	
3	TLGW-3	DW	0.0002	0.0006	0.0052	0.0029	BDL	0.0039	0.004	3.227	0.001	2.91	BDL	0.01	0.004	0.79	BDL	0.003	0.03	BDL	0.06	BDL	BDL	
4	TLGW-4	HP	0.0068	0.0004	0.0100	0.0003	BDL	0.0092	0.009	0.274	0.003	5.27	BDL	0.01	BDL	0.20	BDL	0.007	0.44	BDL	0.04	BDL	BDL	
5	TLGW-5	HP	0.0003	0.0001	0.0023	0.0001	BDL	0.0004	0.001	0.473	0.002	0.12	0.002	0.04	BDL	0.09	BDL	BDL	0.06	BDL	0.05	BDL	BDL	
6	TLGW-6	HP	0.0014	0.0004	0.0004	BDL	BDL	0.0003	0.001	0.004	0.002	0.03	BDL	0.02	BDL	0.05	BDL	BDL	0.34	BDL	0.03	BDL	BDL	
7	TLGW-7	HP	0.0018	BDL	0.0022	BDL	BDL	0.0005	0.003	0.069	0.002	0.50	BDL	0.02	BDL	0.05	BDL	BDL	0.54	BDL	0.03	BDL	BDL	
8	TLGW-8	HP	0.0002	0.0003	0.0022	0.0001	BDL	0.0003	0.026	1.671	0.002	0.91	BDL	0.04	0.009	0.43	BDL	0.001	0.42	BDL	0.02	BDL	BDL	
9	TLGW-9	DW	0.0002	BDL	0.0023	0.0006	BDL	0.0005	0.041	0.847	0.002	0.51	BDL	0.07	0.0135	0.09	BDL	0.001	BDL	BDL	0.02	BDL	BDL	
10	TLGW-10	HP	0.0008	0.0004	0.0012	BDL	BDL	0.0009	0.008	0.009	0.003	0.55	BDL	0.08	0.0015	1.11	BDL	0.002	BDL	BDL	0.02	BDL	BDL	
11	TLGW-11	DW	0.0004	0.0003	0.0005	BDL	BDL	0.0006	0.001	0.012	0.003	0.08	BDL	0.04	BDL	0.06	BDL	0.001	BDL	BDL	0.03	BDL	BDL	
12	TLGW-12	DW	BDL	0.0001	BDL	BDL	BDL	BDL	0.001	0.622	0.001	BDL	BDL	0.01	0.018	BDL	BDL	0.001	BDL	BDL	0.16	BDL	BDL	
13	TLGW-13	HP	0.0004	BDL	0.0014	0.0003	BDL	0.0018	0.008	0.219	0.003	1.78	BDL	0.05	0.005	1.61	BDL	0.004	0.66	BDL	0.04	BDL	0.008	
14	TLGW-14	HP	0.0016	BDL	0.0374	0.0001	BDL	0.0043	0.032	1.298	0.003	9.44	BDL	0.07	0.013	0.32	BDL	0.002	0.16	BDL	0.03	BDL	BDL	
15	TLGW-15	DW	0.0005	0.0002	0.0022	0.0001	BDL	0.0011	0.001	0.023	0.004	0.16	BDL	0.20	0.006	0.04	BDL	0.025	BDL	BDL	0.05	BDL	0.002	
16	TLGW-16	HP	0.0006	0.0002	0.0053	0.0002	BDL	0.0025	0.023	1.127	0.005	2.75	BDL	0.04	BDL	0.25	BDL	0.002	0.43	BDL	0.04	BDL	BDL	
17	TLGW-17	HP	0.0030	BDL	0.0029	BDL	BDL	0.0011	0.005	0.132	0.005	1.44	BDL	0.02	BDL	0.10	BDL	0.001	BDL	BDL	0.06	BDL	BDL	
18	TLGW-18	HP	0.0025	BDL	0.0010	BDL	BDL	0.0004	0.004	0.026	0.006	0.22	0.001	0.02	BDL	0.19	BDL	0.001	0.17	BDL	0.04	BDL	BDL	
19	TLGW-19	HP	0.0007	BDL	0.0022	0.0001	BDL	0.0006	0.003	0.010	0.006	0.12	BDL	0.04	BDL	0.06	BDL	0.001	BDL	BDL	0.04	BDL	BDL	
20	TLGW-20	DW	0.0010	0.0009	0.0005	BDL	BDL	0.0004	0.001	0.008	0.004	0.07	BDL	BDL	0.004	0.13	BDL	0.001	0.80	BDL	0.05	BDL	BDL	
21	TLGW-21	DW	0.0006	BDL	0.0006	BDL	BDL	0.0009	0.001	0.022	0.004	0.14	BDL	0.02	0.008	0.06	BDL	BDL	BDL	BDL	0.04	BDL	BDL	
22	TLGW-22	DW	0.0008	BDL	0.0017	BDL	BDL	0.0010	0.004	0.011	0.003	0.28	0.002	BDL	0.006	0.08	BDL	0.001	0.31	BDL	0.05	BDL	BDL	
23	TLGW-23	HP	0.0010	0.0001	0.0025	0.0001	BDL	0.0013	0.012	0.021	0.004	0.17	BDL	0.02	0.014	0.29	BDL	0.005	BDL	BDL	0.03	BDL	BDL	
24	TLGW-24	DW	0.0004	BDL	0.0006	BDL	BDL	0.0004	0.001	0.004	0.003	0.05	BDL	BDL	BDL	0.09	BDL	0.001	BDL	BDL	0.06	BDL	BDL	
Acceptable Limit			0.01	0.001	0.010	0.003	0.05	NS	0.05	5.0	0.01	0.30	NS	0.50	0.03	0.10	0.02	0.02	0.03	0.10	0.70	NS	NS	
Permissible Limit			0.05	NR	NR	NR	NR	NS	1.50	15.0	NR	NR	NS	1.00	0.20	0.30	NR	NR	0.00	NR	NR	NR	NS	
Detection Limit			0.0005	0.0000	0.0001	0.0001	0.0010	0.0001	0.0001	0.0010	0.0001	0.0020	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

**Arsenic (As):** Arsenic is usually present in natural waters at concentrations of less than 1–2 µg/l. However, in waters, particularly ground waters, where there are sulfide mineral deposits and sedimentary deposits deriving from volcanic rocks, the concentrations can be significantly elevated. Arsenic has not been demonstrated to be essential in humans.

The acute toxicity of arsenic compounds in humans is predominantly a function of their rate of removal from the body. Arsine is the most toxic form, followed by the arsenites, the arsenates and organic arsenic compounds. Signs of chronic arsenicism, including dermal lesions such as hyper-pigmentation and hypopigmentation, peripheral neuropathy, skin cancer, bladder and lung cancers and peripheral vascular disease, have been observed in populations ingesting arsenic-contaminated drinking-water.

The Bureau of Indian Standards has recommended 0.010 mg/l as the As desirable limit and 0.050 mg/l as the permissible limit for drinking water (BIS, 2012).



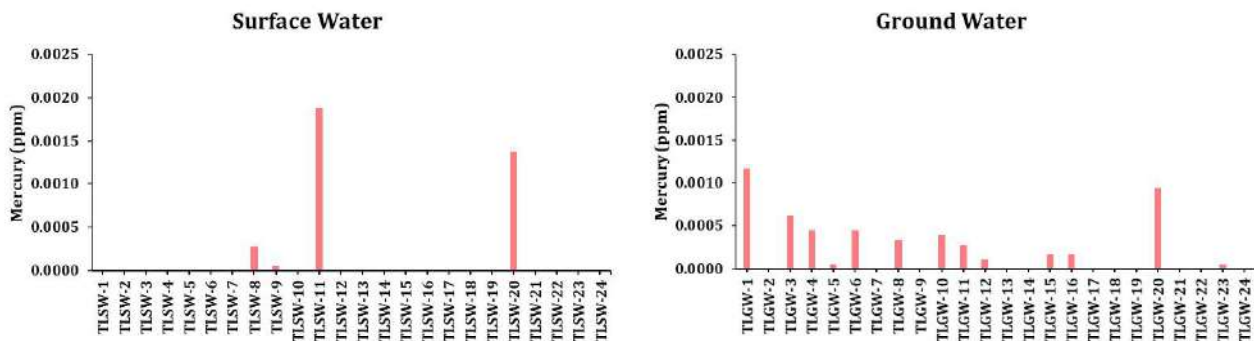
**Figure 4.26: Arsenic concentration in Surface water and Ground water (Post-monsoon, 2025)**

During the post-monsoon season, arsenic concentrations in surface water ranged from BDL to 0.010 mg/L, with an average of 0.002 mg/L, while groundwater arsenic levels varied from BDL to 0.001 mg/L, with an average of 0.0004 mg/L. (**Figure 4.26**).

**Mercury (Hg):** Mercury is a shiny, silver-white metal found in small amounts in the earth’s crust. At room temperature, metallic mercury is an odorless liquid that can slowly evaporate into the air. It can combine with other elements to form inorganic and

organic compounds. Mercury is a persistent, bio accumulative, toxic pollutant. When released into the environment, it accumulates in water laid sediments where it converts into toxic methylmercury and enters the food chain. Mercury contamination is a significant public health and environmental problem because methylmercury easily enters the bloodstream and affects the brain.

Mercury concentrations tend to be higher in larger, older fish and in fish from tea-colored and relatively acidic waters. Mercury is introduced into the environment in three ways. First, mercury is emitted into the air naturally from volcanoes, the weathering of rocks, forest fires, and soils. Second, mercury is emitted into the air from the burning of fossil fuels and municipal or medical waste. Also, mercury can be re-introduced into the environment through natural processes such as evaporation of ocean water.

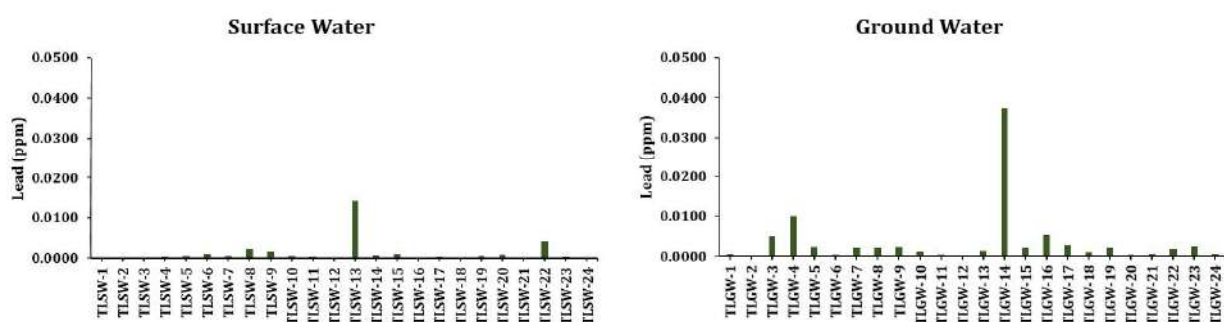


**Figure 4.27: Mercury (Hg) in SW and GW (Post-monsoon 2025).**

The Bureau of Indian Standards has recommended 0.001 mg/l as the acceptable limit for mercury in drinking water (BIS, 2012).

During the post-monsoon 2025, mercury (Hg) concentrations in The concentration of Mercury (Hg) in surface water ranged from 0.0000 to 0.0019 mg/L with an average of 0.0004 mg/L, while in groundwater it varied from 0.0001 to 0.0012 mg/L with an average of ~0.0004 mg/L. Relatively higher values were recorded at TLSW-11 (Mine Void) and TLGW-1 (DW). Overall, mercury concentrations are low with isolated elevated values. (**Figure 4.27**).

**Lead (Pb):** Lead is the most common of the trace metals and is mined widely throughout the world. It is used principally in the production of lead-acid batteries, solder and alloys. The lead compounds (tetraethyl and tetramethyl) are also used extensively as antiknock and lubricating agents in petrol, although their use for these purposes in many countries has largely been phased out. Lead is rarely present in drinking water because of its dissolution from natural sources; rather, its presence is primarily from corrosive water effects on household plumbing systems containing lead in pipes, solder, fittings or the service connections. Exposure to lead is associated with a wide range of effects, including various neuro developmental effects, mortality (mainly due to cardiovascular diseases), impaired renal function, hypertension, impaired fertility and adverse pregnancy outcomes.



**Figure 4.28: Lead (Pb) in SW and GW (Post-monsoon 2025).**

The Bureau of Indian Standards has recommended 0.01 mg/l as the acceptable limit for mercury in drinking water (BIS, 2012).

During the post-monsoon season, lead concentrations in all surface water vary from BDL to 0.014 ppm (0.001 ppm) and in groundwater samples vary from BDL to 0.037 (avg; 0.004 ppm). (**Figure 4.28**).

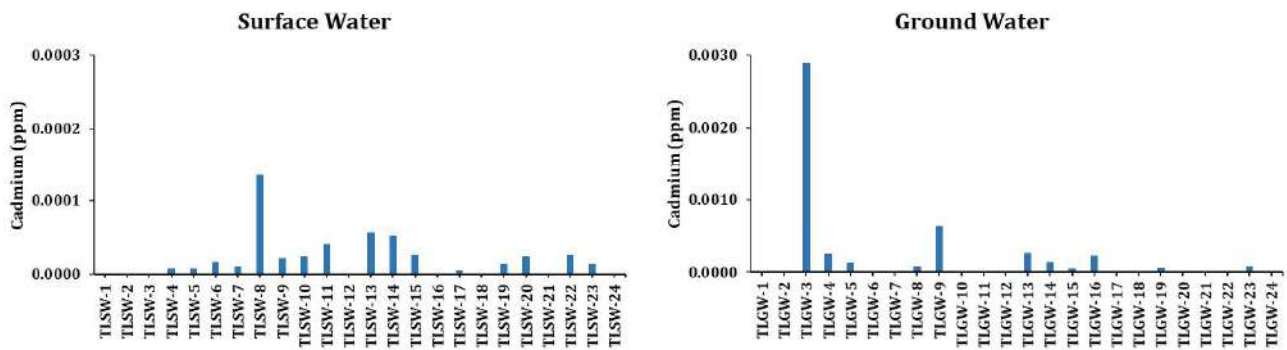
**Cadmium (Cd):** Cadmium is mainly found in the earth's crust. It always occurs in combination with zinc. Cadmium also consists in the industries as an inevitable by-product of zinc, lead and copper extraction. After being applied it enters the environment mainly through the ground, because it is found in manures and pesticides.

Naturally a very large amount of cadmium is released into the environment, about 25,000 tons a year. About half of the cadmium is released into rivers through the

weathering of rocks and some cadmium is released into air through forest fires and volcanoes. The rest of the cadmium is released through human activities, such as manufacturing.

Health effects that can be caused by cadmium are Diarrhea, stomach pains and severe vomiting, Bone fracture, Reproductive failure and possibly even infertility, Damage to the central nervous system, Damage to the immune system, and psychological disorders.

The Bureau of Indian Standards has recommended 0.003 mg/l as the acceptable limit for cadmium in drinking water (BIS, 2012).



**Figure 4.29: Cadmium (Cd) in SW and GW (Post-monsoon 2025).**

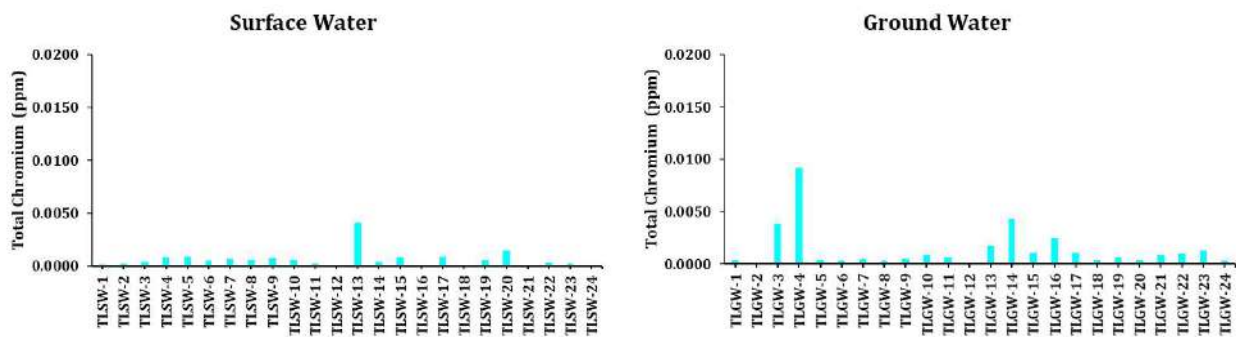
During the post-monsoon season, concentration of Cadmium (Cd) in surface water ranged from 0.0000 to 0.0001 mg/L with an average close to zero, while in groundwater it ranged from 0.0001 to 0.0029 mg/L with an average of ~0.0004 mg/L. Maximum value was recorded at TLGW-3 (DW) (0.0029 mg/L), which is within the acceptable limit. Overall, cadmium levels are very low in the study area. (**Figure 4.29**).

Concentration of cadmium in surface water and groundwater during post-monsoon is in general less than BIS-2012 permissible limit (0.003 mg/l) as prescribed for drinking water. None of the surface water sample and ground water analysed samples exceeded the acceptable limit.

**Chromium (Cr) & Chromium hexavalent (Cr<sup>6+</sup>):** In water, chromium occurs in two oxidation states, Cr<sup>3+</sup> and Cr<sup>6+</sup>. Cr<sup>3+</sup> is an essential human dietary element and is found in many vegetables, fruits, meats, grains, and yeast, while Cr<sup>6+</sup> occurs naturally in the

environment from the erosion of natural chromium deposits. It can also be produced by industrial processes. There are demonstrated instances of chromium being released to the environment by leakage, poor storage, or inadequate industrial waste disposal practices.

The Bureau of Indian Standards has recommended 0.05 mg/l as the acceptable limit for chromium in drinking water (BIS, 2012). No standard has been recommended by BIS/WHO for Cr<sup>6+</sup>, but National Health and Medical Research Council (NHMRC) and National Resource Management Ministerial Council (NRMMC) of Australia has recommended 0.05 mg/l as the permissible limit for Cr<sup>6+</sup> in drinking water.

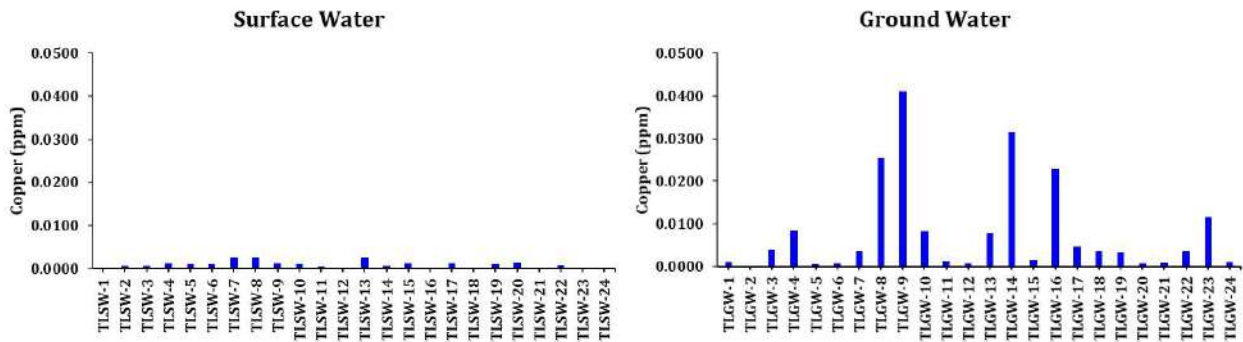


**Figure 4.30: Total Chromium (Cr) and Chromium hexavalent (Cr<sup>6+</sup>) in SW and GW (Post-monsoon 2025).**

During the post-monsoon season, the concentration of Cr<sup>6+</sup> in surface water samples was below the detection limit (BDL) (**Figure 4.30**). The concentration of Total Chromium (Cr) in surface water ranged from 0.0000 to 0.0041 mg/L with an average of 0.0006 mg/L, while in groundwater it ranged from 0.0003 to 0.0092 mg/L with an average of ~0.0015 mg/L. Higher values were recorded at TLGW-4 (HP). Overall, chromium concentrations are low across most sampling locations.

**Copper (Cu):** Copper is both an essential nutrient and a drinking-water contaminant. It is used to make pipes, valves and fittings and is present in alloys and coatings. Beyond 0.05 mg/l the water imparts astringent taste and cause discoloration and corrosion of pipes, fittings and utensils. Recent studies have delineated the threshold for the effects of copper in drinking-water on the gastrointestinal tract, but there is still some uncertainty regarding the long-term effects of copper on sensitive populations, such as

carriers of the gene for Wilson disease and other metabolic disorders of copper homeostasis.



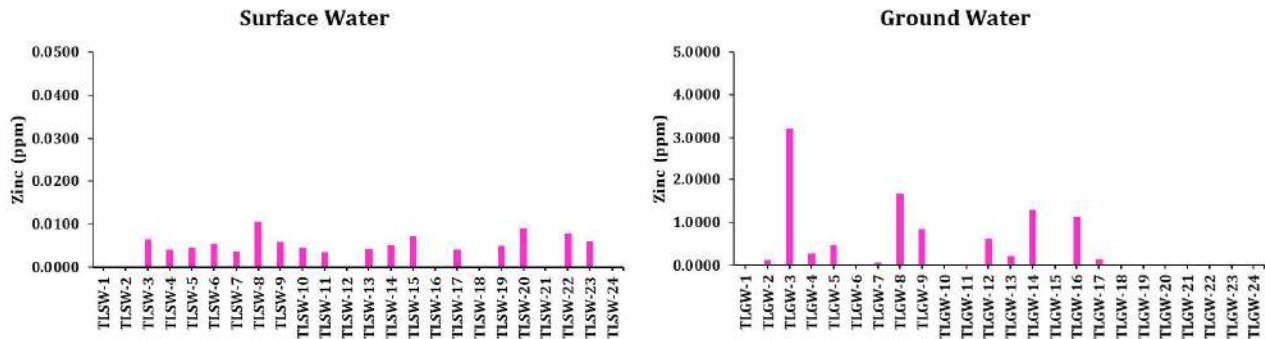
**Figure 4.31: Copper (Cu) in SW and GW (Post-monsoon 2025).**

The Bureau of Indian Standards has recommended 0.05 mg/l as the acceptable limit and 1.50 mg/l as the permissible limit for copper in drinking water (BIS, 2012).

The concentration of Copper (Cu) in surface water ranged from 0.0000 to 0.0025 mg/L with an average of 0.0009 mg/L, while in groundwater it ranged from 0.0005 to 0.041 mg/L with an average of ~0.0082 mg/L. Overall, Cu levels remain generally low, all the samples fell in the within the permissible limit of 1.5 mg/l for drinking water. **(Figure 4.31).**

**Zinc (Zn):** Zinc is an essential trace element found in virtually all food and potable water in the form of salts or organic complexes. The solubility of zinc in water is a function of pH and total inorganic carbon concentrations; the solubility of basic zinc carbonate decreases with increase in pH and concentrations of carbonate species. In general, concentration of zinc in surface water and groundwater normally do not exceed 0.01 and 0.05 mg/l, respectively.

The Bureau of Indian Standards has recommended 5.0 mg/l as the desirable and 15.0 mg/l as the maximum permissible limit for drinking water (BIS, 2012).



**Figure 4.32: Zinc (Zn) in SW and GW (Post-monsoon 2025).**

The concentration of Zinc (Zn) in surface water ranged from 0.0000 to 0.003 mg/L with an average of 0.001 mg/L, while in groundwater it ranged from 0.0037 to 3.2266 mg/L with an average of ~0.426 mg/L. Overall, zinc concentrations show moderate variation but remain generally within typical natural ranges. (**Figure 4.32**).

It is evident from the results that zinc concentration was well within the acceptable limit for all the samples.

**Selenium (Se):** Selenium is among the rarer elements on the surface of this planet and is rarer than silver. Selenium is present in the atmosphere as methyl derivatives. Uncombined selenium is occasionally found and there are around 40 known selenium-containing minerals, some of which can have as much as 30% selenium - but all are rare and generally they occur together with sulfides of metals such as copper, zinc and lead.

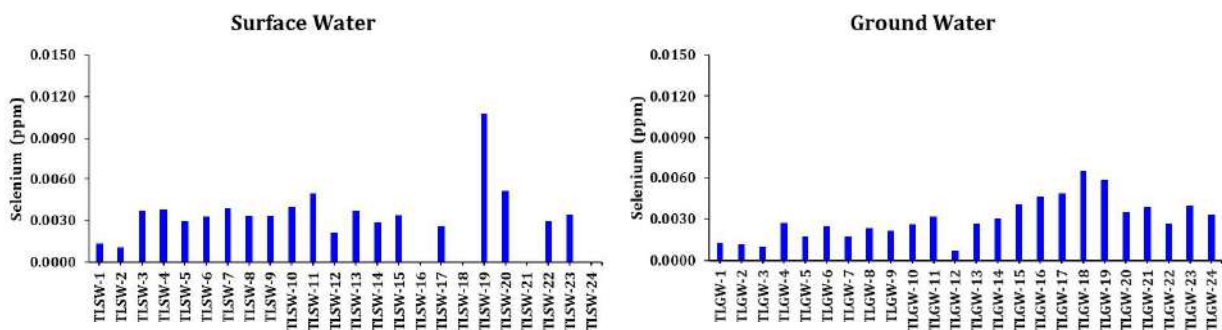
Selenium occurs naturally in the environment. It is released through both natural processes and human activities. Well fertilized agricultural soil generally has about 400 mg/ton since the element is naturally present in phosphate fertilizers and is often added as a trace nutrient. In its natural form as an element selenium cannot be created or destroyed, but selenium does have the ability to change form.

Selenium levels in soils and waters increase, because selenium settles from air and selenium from waste also tends to end up in the soils of disposal sites. When selenium in the soil does not react with oxygen it remains immobile. Selenium that is immobile and will not dissolve in water is less of a risk for organisms. The oxygen levels

in the soil and the acidity of the soil will increase mobile forms of selenium. Higher oxygen levels and increased acidity of soils are usually caused by human activities, such as industrial and agricultural processes.

Humans may be exposed to selenium in several different ways. Selenium exposure takes place either through food or water, or when we encounter soil or air that contains high concentrations of selenium. This is not very surprising, because selenium occurs naturally in the environment extensively and it is very widespread. The health effects of various forms of selenium can vary from brittle hair and deformed nails to rashes, heat, swelling of the skin and severe pains. When selenium ends up in the eyes people experience burning, irritation and tearing.

The Bureau of Indian Standards has recommended 0.01 mg/l as the acceptable limit and there is no relaxation as the maximum permissible limit for drinking water (BIS, 2012).



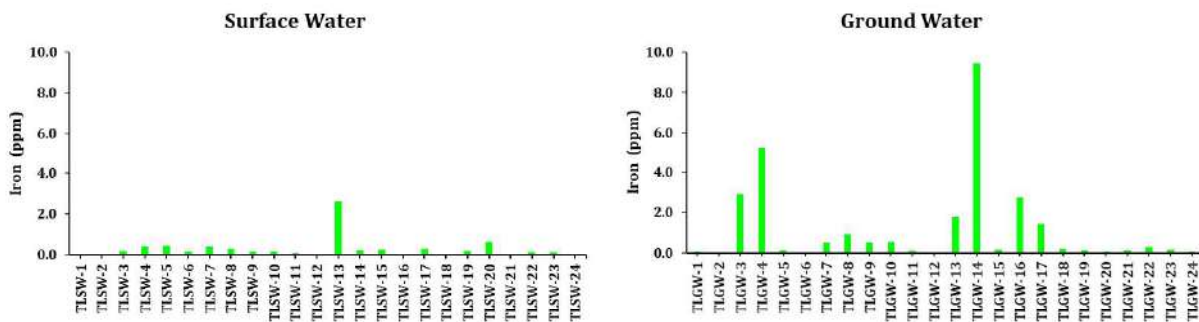
**Figure 4.33: Selenium (Se) in SW and GW (Post-monsoon 2025).**

During the post-monsoon monitoring period, the concentration of Selenium (Se) in surface water ranged from 0.0000 to 0.011 mg/L with an average of 0.003 mg/L, while in groundwater it ranged from 0.001 to 0.006 mg/L with an average of ~0.003 mg/L. Higher values were observed at TLSW-8 (Mine Void). Overall, selenium concentrations are generally low. (**Figure 4.33**).

**Iron (Fe):** Iron in trace amounts is essential for nutrition. High concentrations of iron generally cause inky flavor, bitter and astringent taste to water. Well water containing soluble iron remains clear while pumped out, but exposure to air causes precipitation

of iron due to oxidation, with a consequence of rusty color and turbidity. The objection to iron in the distribution system is not due to health reasons but to staining of laundry and plumbing fixtures and appearance. Taste and odor problems may be caused by filamentous organisms that prey on iron compounds, originating from another consumer's objection (red water). The presence of iron bacteria may clog well screens or develop in the distribution system, particularly when sulfate compounds in addition to iron may be subjected to chemical reduction.

The Bureau of Indian Standards has recommended 1.0 mg/l as the as the revised acceptable limit for iron, however no relaxation is given for permissible limit for iron in drinking water (BIS, 2019).



**Figure 4.34: Iron (Fe) in SW and GW (Post-monsoon 2025).**

During the post-monsoon season, iron (Fe) concentrations in surface water ranged from 0.0000 to 2.6337 mg/L with an average of 0.308 mg/L, while in groundwater it ranged from 0.0309 to 9.4434 mg/L with an average of ~1.254 mg/L. Higher concentrations were observed at TLSW-13 (Pond) and TLGW-14 (HP). Overall, Fe levels show considerable variation, indicating localized geogenic influence. (**Figure 4.34**).

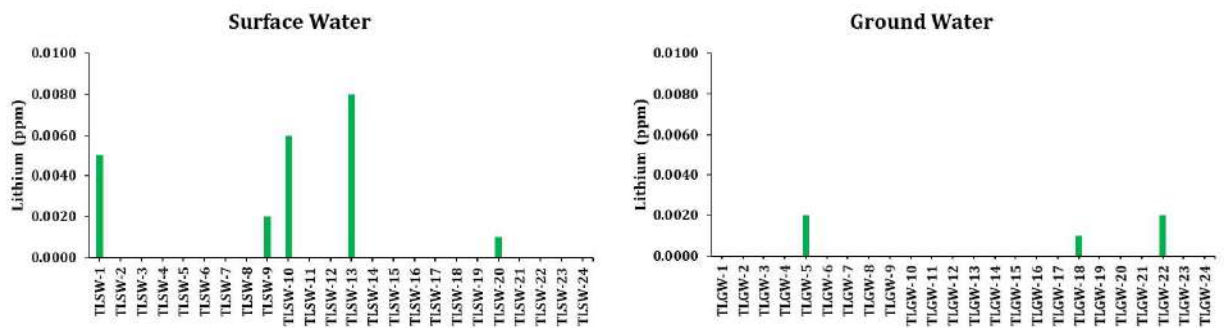
It is evident from the results that none of the ground water samples and surface water samples exceeded the maximum acceptable limit (1.0 mg/l) of iron, whereas about 65% of surface water samples also crossed the permissible limit.

**Lithium (Li):** Lithium is the lightest solid metal, soft, silvery-white, with a low melting point and is highly reactive. Like all alkali metals, lithium reacts easily in water and

does not occur freely in nature due to its activity, Lithium is a moderately abundant element and its present in the Earth’s crust in 65 ppm (parts per million).

Lithium hydroxide represents a potentially significant hazard because it is extremely corrosive.

The Bureau of Indian Standards has not recommended any acceptable or permissible limit of lithium in drinking water.



**Figure 4.35: Lithium (Li) in SW and GW (Post-monsoon 2025).**

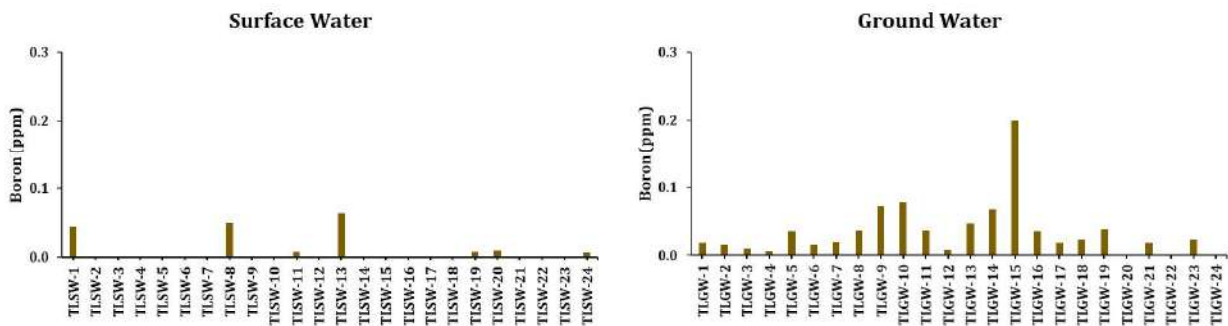
During the post-monsoon season, lithium concentrations in surface water ranged from 0.001 to 0.008 mg/L with an average of 0.0044 mg/L, while in groundwater it ranged from 0.001 to 0.002 mg/L with an average of ~0.0017 mg/L. Overall, lithium concentrations are low across the study area. (**Figure 4.35**).

**Boron (B):** Boron (B) is a naturally occurring dark brown/black substance found throughout the environment. It only occurs in combined form, usually as borax, colemanite, boronatrocalcite and boracite. The highest concentrations of boron are found in sediments and sedimentary rock, particularly clay rich marine sediments. The high boron concentration in seawater. Boron is released into the environment very slowly and at low concentrations by natural weathering processes. Anthropogenic sources of boron in the environment include sewage sludge and effluents, coal combustion, glass, cleaning compounds and agrochemicals.

Because boron naturally occurs in the environment, boron residue finds its way into waterbodies. Generally, environmental concentrations found in surface water are below levels identified as toxic to aquatic organisms.

High levels of boron exposure have been associated with skin inflammation and peeling, irritability, tremors, convulsions, weakness, headaches, depression, diarrhea, and vomiting and boron may interfere with the function of the kidneys. An acute overdose in infants has caused diarrhea, vomiting, signs of irritability, erythema (skin inflammation) in the diaper area, a mild red rash on the face and neck, a pus-like discharge or mild congestion of the eye, and possibly convulsive seizures. In adults, an acute overdose causes nausea, vomiting, redness of the skin, difficulty swallowing due to ulcers in the throat, and a non-bloody diarrhea.

The Bureau of Indian Standards has recommended 0.5 mg/l as the desirable and 1.0 mg/l as the maximum permissible limit for boron for drinking water (BIS, 2012).



**Figure 4.36: Boron (B) in SW and GW (Post-monsoon 2025).**

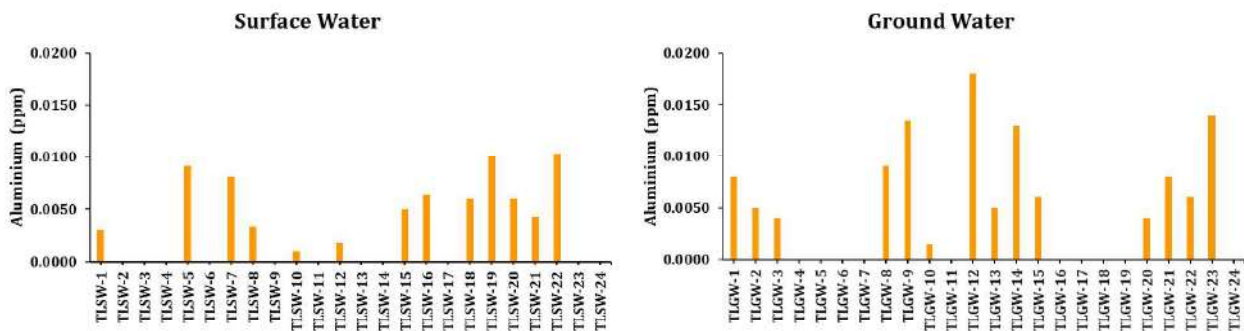
During the post-monsoon season, boron (B) concentrations in surface water ranged from 0.010 to 0.070 mg/L with an average of 0.029 mg/L, while in groundwater it ranged from 0.010 to 0.200 mg/L with an average of ~0.041 mg/L. Maximum value were observed at TLGW-15 (DW) which is 0.200 mg/L remains below the acceptable limit (0.5 mg/L), indicating low boron levels. Overall, boron concentrations remain relatively low. (**Figure 4.36**).

In the study area, all the analysed samples fall well within the permissible limit of 1.5 mg/l, as recommended by BIS.

**Aluminum (Al):** Aluminum is the most abundant metallic element and constitutes about 8% of Earth’s crust. High residual concentrations may ensure undesirable color and turbidity. There is little indication that orally ingested aluminum is acutely toxic to

humans despite the widespread occurrence of the element in foods, drinking-water and many antacid preparations. It has been hypothesized that aluminum exposure is a risk factor for the development or acceleration of onset of Alzheimer disease in humans.

The Bureau of Indian Standards has recommended 0.030 mg/l as the acceptable limit and 0.20 mg/l as the permissible limit for drinking water (BIS, 2012).



**Figure 4.37: Aluminum (Al) in SW and GW (Post-monsoon 2025).**

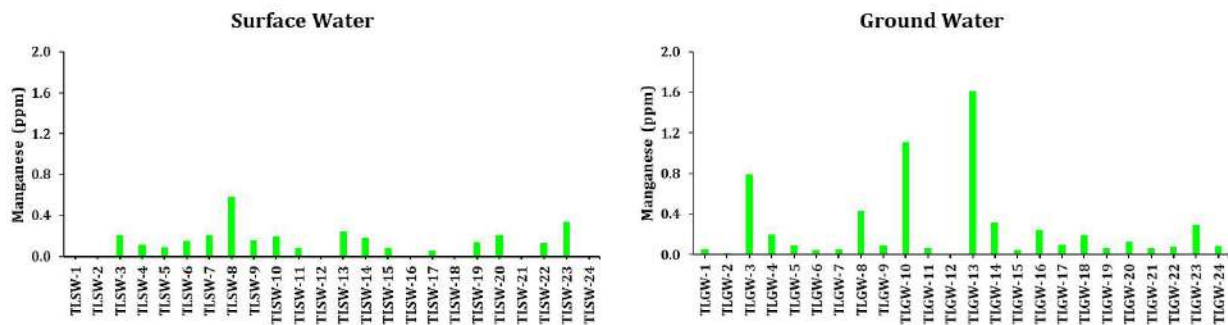
During the post-monsoon season, aluminum concentrations in surface water ranged from 0.0011 to 0.0103 mg/L with an average of 0.0057 mg/L, while in groundwater it ranged from 0.0015 to 0.018 mg/L with an average of ~0.0082 mg/L. Overall, aluminium levels are low across most locations. (**Figure 4.37**).

It is evident from the results that among the analysed surface water samples 8% samples exceeded the permissible limit and 4% groundwater samples exceeded the permissible limit for drinking purposes.

**Manganese (Mn):** Manganese is one of the most abundant metals in Earth’s crust, usually occurring with iron. It is used principally in the manufacture of iron and steel alloys, as an oxidant for cleaning, bleaching and disinfection (as potassium permanganate) and as an ingredient in various products. More recently, it has been used in an organic compound, methyl-cyclo-pentadienyl manganese tri-carbonyl, or MMT, as an octane enhancer in petrol. Manganese naturally occurs in many surface water and groundwater sources, particularly in anaerobic or low oxidation conditions. At levels exceeding 0.1 mg/l, manganese in water supplies causes an undesirable taste in beverages and stains sanitary ware and laundry. The presence of manganese in

drinking water may lead to the accumulation of deposits in the distribution system. Manganese will often form a coating on pipes, which may slough off as a black precipitate.

The Bureau of Indian Standards has recommended 0.1 mg/l as acceptable and 0.3 mg/l as the maximum permissible limit for Mn in drinking water (BIS, 2012).



**Figure 4.38: Manganese (Mn) in SW and GW (Post-monsoon 2025).**

During the post-monsoon season, manganese concentrations in surface water ranged from 0.0000 to 0.586 mg/L with an average of 0.133 mg/L, while in groundwater it ranged from 0.0152 to 1.6148 mg/L with an average of ~0.268 mg/L. Higher values were recorded at TLSW-23 (Pond) and TLGW-13 (HP). Overall, Mn shows significant spatial variation likely due to geogenic conditions. (**Figure 4.38**).

The results indicate that none of the surface water samples and groundwater samples of the study area exceed the maximum permissible limit of 0.3 mg/l.

**Cobalt (Co):** Cobalt is of relatively low abundance in the Earth's crust and in natural waters, from which it is precipitated as the highly insoluble cobalt sulfide CoS. Although the average level of cobalt in soils is 8 ppm, there are soils with as little as 0.1 ppm and others with as much as 70 ppm. In the marine environment cobalt is needed by blue-green algae (cyanobacteria) and other nitrogen fixing organisms. Humans add cobalt by releasing small amounts into the atmosphere from coal combustion and mining, processing cobalt-containing ores and the production and use of cobalt chemicals.

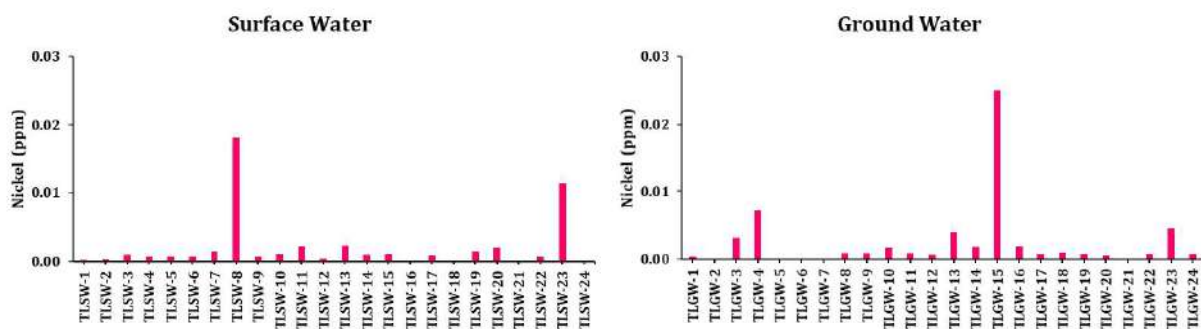
As cobalt is widely dispersed in the environment humans may be exposed to it by breathing air, drinking water and eating food that contains cobalt. Skin contacts with soil or water that contains cobalt may also enhance exposure.

There does not exist any limit for cobalt in the water as well as wastewater by the national and international regulatory bodies.

During the post-monsoon season, cobalt concentrations in all surface water and groundwater samples were below the detection limit (BDL).

**Nickel (Ni):** Nickel is released to the environment from the burning of fossil fuels and waste discharge from electroplating industries. In general concentration of nickel in water resources is generally below 0.02 mg/l, however, where there is heavy pollution, nickel in groundwater is mobilized. Also, where non-resistant material in wells that comes into contact with nickel or chromium-plated taps, the nickel contribution from water may be significant. Inhalation of nickel compounds is carcinogenic to humans, however, no evidence of a carcinogenic risk from oral exposure is reported.

The Bureau of Indian Standards has recommended 0.02 mg/l as the acceptable limit and there is no relaxation for permissible limit for drinking water (BIS, 2012).



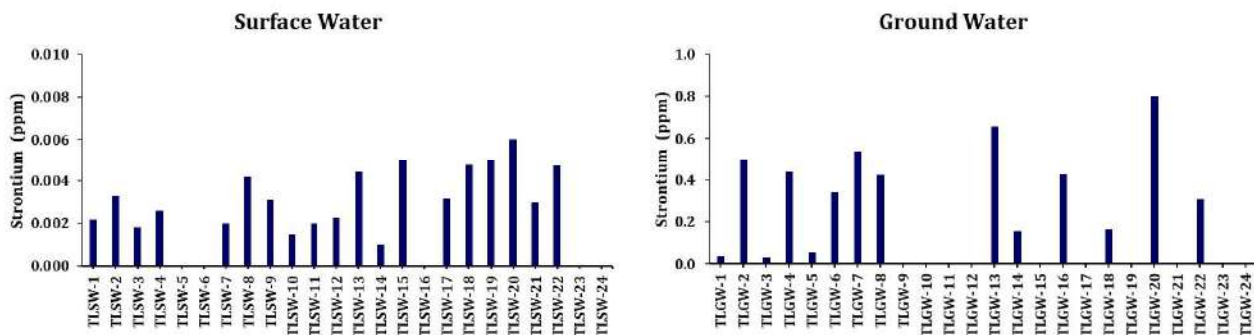
**Figure 4.39: Nickel (Ni) in SW and GW (Post-monsoon 2025).**

During the post-monsoon season, nickel concentrations in surface water ranged from 0.0000 to 0.0181 mg/L with an average of 0.0020 mg/L, while in groundwater it ranged from 0.0005 to 0.025 mg/L with an average of ~0.0031 mg/L. Higher concentrations were observed at TLGW-15 (DW). Overall, Ni levels are generally low. (Figure 4.39).

**Strontium (Sr):** Strontium is a soft, silver-yellow, alkaline-earth metal. Strontium commonly occurs in nature, forming about 0.034% of all igneous rock and in the form of the sulfate mineral celestite (SrSO<sub>4</sub>) and the carbonate strontianite (SrCO<sub>3</sub>). Strontium compounds that are water-insoluble can become water-soluble, because of chemical reactions. The water-soluble compounds are a greater threat to human health than the water-insoluble ones. Therefore, water-soluble forms of strontium can pollute drinking water. Fortunately, the concentrations in drinking water are usually quite low. When strontium uptake is extremely high, it can cause disruption of bone development. But this effect can only occur when strontium uptake is in the thousands of ppm range. Strontium levels in food and drinking water are not high enough to be able to cause these effects. Strontium can end up in water through soil and through weathering of rocks. Only a small part of the strontium in water comes from dust particles from the air. Most of the strontium in water is dissolved, but some of it is suspended, causing muddy water at some locations.

The Bureau of Indian Standards has recommended 0.03 mg/l as the permissible limit for drinking water (BIS, 2012).

During the post-monsoon season, strontium concentrations in surface water ranged from 0.001 to 0.006 mg/L with an average of 0.0033 mg/L, while in groundwater it ranged from 0.03 to 0.80 mg/L with an average of ~0.349 mg/L. Higher values were observed at TLGW-20 (DW). Overall, Sr. concentrations show moderate variability. **(Figure 4.40).**



**Figure 4.40: Strontium (Sr) in SW and GW (Post-monsoon 2025).**

**Silver (Ag):** Silver is a naturally occurring, rare and precious metal found in minerals and is released into soil and water through the weathering of rocks and mining activities. Silver also enters the environment by manufacturing and using Ag compounds in electroplating and photography, catalysts, medical devices, and batteries. In soil and natural waters, most Ag is sorbed to soil particles and sediments and precipitated as oxides, carbonates, sulfides, chlorides and hydroxides.

Silver, one of the most toxic forms of heavy metals, has been assigned to the highest toxicity class of contaminants, along with cadmium, mercury, chromium, and copper. Silver is considered toxic to soil microorganisms and avian and mammalian species. Its adverse impacts include reduced growth and reproduction and increased mortality. Silver oxide is harmful to swallowing, because it irritates the eyes, respiratory tract and skin. Silver nitrate is much more harmful, because it is a strong oxidant. It causes corrosion and at oral uptake it leads to vomiting, dizziness and diarrhea. At silver salt uptake the body may protect itself by converting them into insoluble silver chlorides.

BIS (2012) has prescribed an acceptable limit of 0.1 mg/l for drinking water.

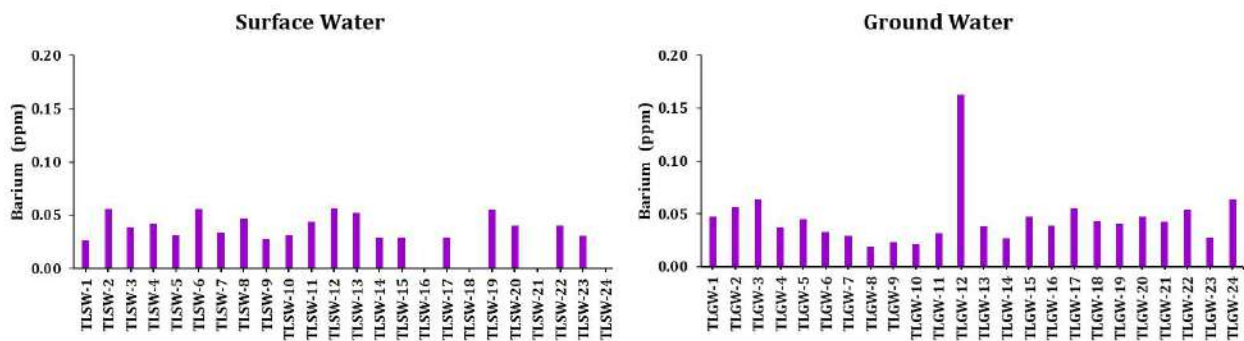
*Silver has not been detected in any of the surface water or groundwater samples in the area.*

**Barium (Ba):** Barium is a silvery-white metal that can be found in the environment, where it exists naturally. It occurs combined with other chemicals, such as sulfur, carbon or oxygen. Barium is abundant in the Earth's crust, being the 14<sup>th</sup> most abundant element. High amounts of barium may only be found in soil and in food, such as nuts, seaweed, fish and certain plants.

Because of the extensive use of barium in the industries human activities add greatly to the release of barium in the environment. As a result, barium concentrations in air, water and soil may be higher than naturally occurring concentrations on many locations. Barium enters the air during mining processes, refining processes, and during the production of barium compounds. It can also enter the air during coal and oil combustion.

The health effects of barium depend upon the water-solubility of the compounds. Barium compounds that dissolve in water can be harmful to human health. The uptake of very large amounts of barium that are water-soluble may cause paralyses and, in some cases, even death. Small amounts of water-soluble barium may cause a person to experience breathing difficulties, increased blood pressure, heart rhythm changes, stomach irritation, muscle weakness, changes in nerve reflexes, swelling of brains and liver, kidney and heart damage.

The Bureau of Indian Standards has recommended 0.7 mg/l as the acceptable limit for Barium in drinking water (BIS, 2012).



**Figure 4.41: Barium (Ba) in SW and GW (Post-monsoon 2025).**

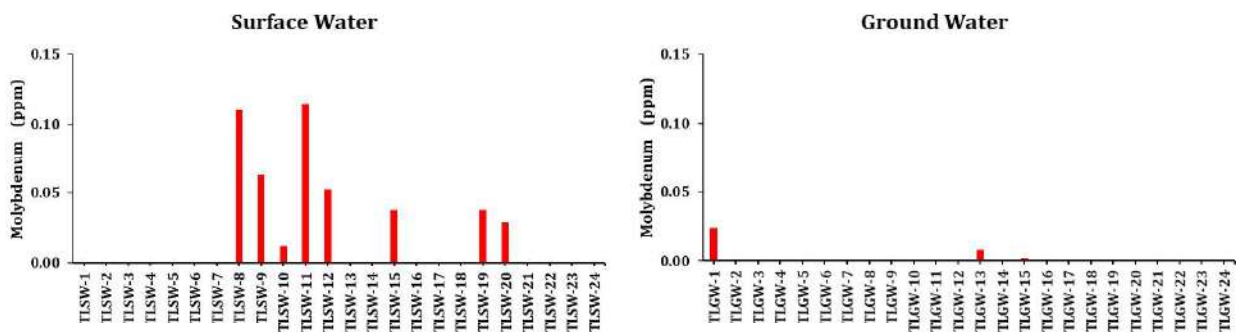
During the post-monsoon season, concentration of Barium (Ba) in surface water ranged from 0.0000 to 0.0571 mg/L with an average of 0.033 mg/L, while in groundwater it ranged from 0.0188 to 0.1632 mg/L with an average of ~0.046 mg/L. Overall, Ba concentrations are generally low in the study area. (Figure 4.41).

**Rhodium (Rh):** Rhodium is a very rare, silvery-white, hard, corrosion-resistant transition metal. It is a noble metal and a member of the platinum group. It has only one naturally occurring isotope, which is  $^{103}\text{Rh}$ . Naturally occurring rhodium is usually found as a free metal or as a chemical compound in minerals such as bowieite and rhodplumsite.

Being a noble metal, pure rhodium is inert and harmless in elemental form. However, chemical complexes of rhodium can be reactive. Like the other noble metals, rhodium has not been found to serve any biological function.

*Rhodium has not been detected in any water sample in the area.*

**Molybdenum (Mo):** Molybdenum is a hard, silvery-grey transition metal known for its high melting point and excellent resistance to corrosion. It commonly occurs in nature in the form of minerals such as molybdenite ( $\text{MoS}_2$ ) and wulfenite ( $\text{PbMoO}_4$ ). Molybdenum has several naturally occurring isotopes and is widely distributed in soils, rocks, and water in trace amounts. Unlike many other heavy metals, molybdenum is considered an essential trace element for living organisms, as it plays a key role in certain enzymes involved in nitrogen metabolism. However, excessive concentrations of molybdenum may lead to adverse health effects, although such occurrences are relatively rare in natural water systems.



**Figure 4.42: Molybdenum (Mo) in SW and GW (Post-monsoon 2025).**

During the post-monsoon season, the concentration of Molybdenum (Mo) in surface water ranged from 0.0123 to 0.1145 mg/L with an average of 0.057 mg/L, while in groundwater it ranged from 0.002 to 0.024 mg/L with an average of ~0.011 mg/L. Higher values were observed at TLSW-11 (Mine Void). Overall, Mo levels are low with localized variation. (**Figure 4.42**).

## 5 SUMMARY

The report presents a comprehensive assessment of water quality characteristics of both surface water and groundwater in the study area during the post-monsoon season of 2025. Water quality is influenced by a combination of physical, chemical, biological, and anthropogenic factors. Groundwater typically contains higher concentrations of dissolved constituents compared to surface water due to prolonged interaction with geological formations. The study evaluates water suitability for drinking and other uses based on standards prescribed by BIS and WHO.

A wide range of physicochemical parameters were analyzed, including pH, electrical conductivity (EC), total dissolved solids (TDS), total suspended solids (TSS), dissolved oxygen (DO), biochemical oxygen demand (BOD), chemical oxygen demand (COD), alkalinity, hardness, fluoride, silica, and major ions. The pH values of both surface and groundwater samples fall within the acceptable range (6.5–8.5), indicating neutral to slightly alkaline conditions suitable for drinking. Electrical conductivity and TDS values are generally higher in groundwater, reflecting greater mineralization, but remain within permissible limits.

Dissolved oxygen levels in surface water indicate moderate water quality, with slightly lower values observed in stagnant sources like ponds compared to flowing water bodies such as rivers and canals. BOD and COD values suggest the presence of moderate organic pollution, particularly in surface water sources, though not at critically high levels. TDS classification shows that all water samples fall under the “freshwater” category, indicating good palatability and suitability for consumption.

Alkalinity and total hardness values are within permissible limits, although groundwater tends to be harder than surface water due to the presence of calcium and magnesium ions. Fluoride concentration remains well within safe limits, reducing the risk of fluorosis. Similarly, concentrations of major anions such as chloride, sulphate, and nitrate are within acceptable limits, indicating minimal impact from agricultural runoff or wastewater contamination. Silica is present in moderate amounts, which may cause scaling but does not pose direct health risks.

The analysis of major cations and anions reveals that bicarbonate is the dominant ion in both surface and groundwater, followed by chloride and sulphate. Calcium and sodium are the predominant cations. These ion distributions are primarily controlled by geological processes such as weathering of rocks and mineral dissolution.

Oil and grease were mostly below detection limits, except in a few surface water samples. Phenolic compounds were not detected in any samples, suggesting absence of industrial contamination. Heavy metals, although discussed as potential contaminants, were not found at harmful levels in the analyzed samples.

However, bacteriological analysis reveals the presence of total coliforms in most surface water samples and in some groundwater samples, with *E. coli* detected in a few cases. This indicates fecal contamination and potential health risks, emphasizing the need for proper treatment before consumption.

In conclusion, the overall water quality in the study area is largely within acceptable limits for drinking and domestic purposes. Nevertheless, localized microbial contamination and moderate organic pollution highlight the importance of regular monitoring and appropriate water treatment measures to ensure safe usage.



# Vardan Envirolab LLP

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (HR)  
ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number:	VEL/AP/01-09	Report No.:	VEL/AP/2510000001-0009
Name & Address of the Project:	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sampling Location:	Main Plant Area (ADC Office)	Party Reference No.:	5500044394-037-1019
Sample Description:	Ambient Air Quality Monitoring	Reporting Date:	05/11/2025
Sampling & Analysis Protocol:	IS 5182 & STP	Parameter Required:	As per Work Order
		Sample Collected By:	Vardan EnviroLab Representative

S. No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	429 A 24	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	157 I 2020	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	440 I 24	11.08.2026

PARAMETERS	Concentration of Pollutant											
	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>x</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	O <sub>3</sub> µg/m <sup>3</sup>	NH <sub>3</sub> µg/m <sup>3</sup>	Lead µg/m <sup>3</sup>	Nickel ng/m <sup>3</sup>	Arsenic ng/m <sup>3</sup>	Benzene µg/m <sup>3</sup>	B(a)P ng/m <sup>3</sup>
@ NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1
Date of Monitoring	03/10/2025	59.33	30.27	17.49	19.41	0.54	20.65	BLQ	BLQ	BLQ	BLQ	BLQ
	06/10/2025	54.72	28.51	16.42	18.63	0.76	22.57	BLQ	BLQ	BLQ	BLQ	BLQ
	08/10/2025	60.35	31.69	20.75	17.53	0.61	23.25	BLQ	BLQ	BLQ	BLQ	BLQ
	14/10/2025	57.42	29.51	18.62	18.76	0.69	26.75	BLQ	BLQ	BLQ	BLQ	BLQ
	16/10/2025	61.86	34.76	17.57	20.14	0.58	25.18	BLQ	BLQ	BLQ	BLQ	BLQ
	21/10/2025	60.15	33.78	21.42	21.47	0.81	24.32	BLQ	BLQ	BLQ	BLQ	BLQ
	23/10/2025	58.76	27.19	18.31	16.39	0.55	23.63	BLQ	BLQ	BLQ	BLQ	BLQ
	27/10/2025	55.79	26.46	16.67	15.79	0.67	28.79	BLQ	BLQ	BLQ	BLQ	BLQ
	30/10/2025	62.38	36.53	22.64	21.36	0.67	24.91	BLQ	BLQ	BLQ	BLQ	BLQ
Maximum	62.38	36.53	22.64	21.47	0.81	28.79	--	--	--	--	--	--
Minimum	54.72	26.46	16.42	15.79	0.54	20.65	--	--	--	--	--	--
Average	58.97	30.97	18.87	18.83	0.65	24.45	--	--	--	--	--	--
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	VEL/E NV/ST P/110 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004

Note- #STP-Standard Testing Procedure, BLQ- Below Limit of Quantification, LOQ- Limit of Quantification.

@NAAQS- National Ambient Air Quality Standards.

\*\*\*End of Report\*\*\*



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## Test Report

Sample Number: VEL/AP/10-18      Report No.: VEL/AP/2510000010-0018  
 Name & Address of the Project: M/s Talcher Super Thermal Power Station  
 P.O.- Talcher Thermal, Angul, Angul, Odisha-759101      Format No.: 7.8 F-03  
 Party Reference No.: 5500044394-037-1019  
 Reporting Date: 05/11/2025  
 Sampling Location: Safety Park (CHP Area)      Parameter Required: As per Work Order  
 Sample Description: Ambient Air Quality      Sample Collected By: Vardan EnviroLab Representative  
 Sampling & Analysis Protocol: IS 5182 & STP

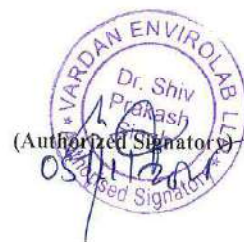
S.No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	46 G 22	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	486 A 2024	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	447 A 22	11.08.2026

PARAMETERS	Concentration of Pollutant											
	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>x</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	O <sub>3</sub> µg/m <sup>3</sup>	NH <sub>3</sub> µg/m <sup>3</sup>	Lead µg/m <sup>3</sup>	Nickel ng/m <sup>3</sup>	Arsenic ng/m <sup>3</sup>	Benzene µg/m <sup>3</sup>	B(a)P ng/m <sup>3</sup>
@NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1
Date of Monitoring	03/10/2025	56.24	28.34	17.54	17.15	0.77	21.30	BLQ	BLQ	BLQ	BLQ	BLQ
	06/10/2025	58.43	29.42	16.21	18.43	0.69	23.47	BLQ	BLQ	BLQ	BLQ	BLQ
	08/10/2025	51.28	23.52	18.49	16.85	0.68	24.52	BLQ	BLQ	BLQ	BLQ	BLQ
	14/10/2025	53.61	25.15	19.48	13.61	0.57	25.65	BLQ	BLQ	BLQ	BLQ	BLQ
	16/10/2025	57.36	26.76	17.52	15.42	0.79	21.46	BLQ	BLQ	BLQ	BLQ	BLQ
	21/10/2025	54.21	28.63	20.69	19.78	0.75	26.75	BLQ	BLQ	BLQ	BLQ	BLQ
	23/10/2025	52.67	22.75	18.76	16.19	0.62	24.75	BLQ	BLQ	BLQ	BLQ	BLQ
	27/10/2025	60.19	30.67	21.30	21.87	0.58	28.89	BLQ	BLQ	BLQ	BLQ	BLQ
	30/10/2025	56.12	27.40	17.26	18.36	0.74	23.25	BLQ	BLQ	BLQ	BLQ	BLQ
Maximum	60.19	30.67	21.30	21.87	0.79	28.89	--	--	--	--	--	--
Minimum	51.28	22.75	16.21	13.61	0.57	21.30	--	--	--	--	--	--
Average	55.56	26.96	18.58	17.51	0.68	24.44	--	--	--	--	--	--
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	VEL/E NV/ST P/110 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004

Note- #STP-Standard Testing Procedure, BLQ -Below Limit of Quantification, LOQ -Limit of Quantification.

\*NAAQS- National Ambient Air Quality Standards.

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# Vardan Envirolab LLP

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (HR)  
ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number: VEL/AP/19-27 Report No.: VEL/AP/2510000019-0027  
 Name & Address of the Project: M/s 1027, Talcher Super Thermal Power Station Format No.: 7.8 F-03  
 P.O.- Talcher Thermal, Angul, Angul, Odisha-759101 Party Reference No.: 5500044394-037-1019  
 Reporting Date: 05/11/2025  
 Sampling Location: PT Plant (Central Store Area) Parameter Required: As per Work Order  
 Sample Description: Ambient Air Quality Monitoring Sample Collected By: Vardan Envirolab Representative  
 Sampling & Analysis Protocol: IS 5182 & STP

S. No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	428 A 24	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	485 A 2024	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	120 I 22	11.08.2026

PARAMETERS	Concentration of Pollutant											
	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	O <sub>3</sub>	NH <sub>3</sub>	Lead	Nickel	Arsenic	Benzene	B(a)P
	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	mg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ng/m <sup>3</sup>	ng/m <sup>3</sup>	µg/m <sup>3</sup>	ng/m <sup>3</sup>
@NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1
Date of Monitoring	03/10/2025	61.25	34.55	22.54	19.25	0.84	22.41	BLQ	BLQ	BLQ	BLQ	BLQ
	06/10/2025	58.43	29.87	20.17	22.43	0.69	23.47	BLQ	BLQ	BLQ	BLQ	BLQ
	08/10/2025	60.74	32.96	23.41	23.15	0.64	25.76	BLQ	BLQ	BLQ	BLQ	BLQ
	14/10/2025	63.15	35.41	17.86	21.27	0.70	26.15	BLQ	BLQ	BLQ	BLQ	BLQ
	16/10/2025	59.42	28.30	16.27	20.19	0.68	23.64	BLQ	BLQ	BLQ	BLQ	BLQ
	21/10/2025	64.97	37.71	21.42	22.80	0.77	27.83	BLQ	BLQ	BLQ	BLQ	BLQ
	23/10/2025	62.47	34.05	22.15	19.76	0.61	26.36	BLQ	BLQ	BLQ	BLQ	BLQ
	27/10/2025	68.76	36.97	25.36	24.36	0.67	28.71	BLQ	BLQ	BLQ	BLQ	BLQ
	30/10/2025	61.78	30.86	20.64	21.74	0.59	25.30	BLQ	BLQ	BLQ	BLQ	BLQ
Maximum	68.76	37.71	25.36	24.36	0.84	28.71	--	--	--	--	--	--
Minimum	58.43	28.30	16.27	19.25	0.59	22.41	--	--	--	--	--	--
Average	62.33	33.40	21.09	21.66	0.68	25.51	--	--	--	--	--	--
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	VEL/E NV/ST P/110 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004

Note- #STP-Standard Testing Procedure, BLQ- Below Limit of Quantification, LOQ- Limit of Quantification.

@NAAQS- National Ambient Air Quality Standards.

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## Test Report

Sample Number: VEL/AP/28-36 Report No.: VEL/AP/251000028-0036  
 Name & Address of the Project: M/s 1027, Talcher Super Thermal Power Station Format No.: 7.8 F-03  
 P.O.- Talcher Thermal, Angul, Angul, Odisha-759101 Party Reference No.: 5500044394-037-1019  
 Reporting Date: 05/11/2025  
 Sampling Location: Township (Field Hostel) Parameter Required: As per Work Order  
 Sample Description: Ambient Air Quality Monitoring Sample Collected By: Vardan EnviroLab Representative  
 Sampling & Analysis Protocol: IS 5182 & STP

S. No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	312 L 22	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	330 L 22	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	333 I 22	11.08.2026

PARAMETERS	Concentration of Pollutant											
	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	O <sub>3</sub>	NH <sub>3</sub>	Lead	Nickel	Arsenic	Benzene	B(a)P
	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	mg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ng/m <sup>3</sup>	ng/m <sup>3</sup>	µg/m <sup>3</sup>	ng/m <sup>3</sup>
@NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1
Date of Monitoring	03/10/2025	56.16	28.71	20.13	16.51	0.57	21.33	BLQ	BLQ	BLQ	BLQ	BLQ
	06/10/2025	58.71	24.42	19.46	18.32	0.61	25.41	BLQ	BLQ	BLQ	BLQ	BLQ
	08/10/2025	54.52	27.51	18.24	15.12	0.64	20.67	BLQ	BLQ	BLQ	BLQ	BLQ
	14/10/2025	60.36	31.24	21.51	17.76	0.73	22.42	BLQ	BLQ	BLQ	BLQ	BLQ
	16/10/2025	57.12	29.62	19.68	19.30	0.66	24.16	BLQ	BLQ	BLQ	BLQ	BLQ
	21/10/2025	56.76	26.78	23.30	20.98	0.58	23.28	BLQ	BLQ	BLQ	BLQ	BLQ
	23/10/2025	55.21	23.51	17.34	17.09	0.57	25.61	BLQ	BLQ	BLQ	BLQ	BLQ
	27/10/2025	61.89	24.12	22.57	21.32	0.69	25.78	BLQ	BLQ	BLQ	BLQ	BLQ
30/10/2025	57.02	27.41	18.12	19.27	0.72	23.22	BLQ	BLQ	BLQ	BLQ	BLQ	
Maximum	61.89	31.24	23.30	21.32	0.73	25.78	--	--	--	--	--	--
Minimum	54.52	23.51	17.34	15.12	0.57	20.67	--	--	--	--	--	--
Average	57.52	27.03	20.03	18.40	0.64	23.54	--	--	--	--	--	--
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	VEL/EN V/STP/11 0 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004

Note- #STP-Standard Testing Procedure, BLQ- Below Limit of Quantification, LOQ- Limit of Quantification.

@NAAQS- National Ambient Air Quality Standards.

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## Test Report

Sample Number:	VEL/AP/37-45	Report No.:	VEL/AP/2510000037-0045
Name & Address of the Project:	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	5500044394-037-1019
Sampling & Analysis Protocol:	IS 9989 & CPCB Guidelines	Reporting Date:	05/11/2025
		Parameter Required:	As per Work Order
		Sample Collected By:	Vardan Envirolab Representative

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- Main Plant Area (ADC Plant)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
03/10/2025	57.5	53.1	53.2	62.41	53.24	dB(A)
06/10/2025	60.7	52.3	54.1	58.63	50.21	dB(A)
08/10/2025	63.6	55.7	50.5	52.62	53.69	dB(A)
14/10/2025	62.5	50.5	52.1	53.87	49.37	dB(A)
16/10/2025	64.9	57.2	55.2	55.33	51.25	dB(A)
21/10/2025	66.2	53.1	56.7	50.79	48.64	dB(A)
23/10/2025	65.1	56.7	58.3	54.71	52.84	dB(A)
27/10/2025	58.0	55.4	54.1	58.27	51.36	dB(A)
30/10/2025	61.2	57.1	52.7	52.28	50.39	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq</sub>	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
- Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.
- \*dB(A) L<sub>Eq</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Note:- \*A "decibel" is a unit in which noise is measured.

\*\*\*End of Report\*\*\*



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## Test Report

Sample Number:	VEL/AP/46-54	Report No.:	VEL/AP/2510000046-0054
Name & Address of the Project:	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	5500044394-037-1019
Sampling & Analysis Protocol:	IS 9989 & CPCB Guidelines	Reporting Date:	05/11/2025
		Parameter Required:	As per Work Order
		Sample Collected By:	Vardan EnviroLab Representative

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- Safety Park (CHP Area)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
03/10/2025	51.3	47.5	49.2	49.24	42.34	dB(A)
06/10/2025	48.1	43.4	48.4	46.31	45.21	dB(A)
08/10/2025	55.4	42.5	47.2	45.58	43.96	dB(A)
14/10/2025	49.2	44.9	51.0	47.94	40.51	dB(A)
16/10/2025	47.6	46.4	49.5	46.35	43.46	dB(A)
21/10/2025	52.1	45.3	43.4	43.20	42.27	dB(A)
23/10/2025	56.1	42.4	47.5	45.79	40.36	dB(A)
27/10/2025	53.2	42.8	44.2	48.61	41.02	dB(A)
30/10/2025	48.2	43.6	46.3	52.27	48.36	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq</sub>	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
- Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.
- \*dB(A) L<sub>Eq</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Note:- \*A "decibel" is a unit in which noise is measured.



\*\*\*End of Report\*\*\*



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## Test Report

Sample Number:	VEL/AP/55-63	Report No.:	VEL/AP/2510000055-0063
Name & Address of the Project:	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	5500044394-037-1019
Sampling & Analysis Protocol:	IS 9989 & CPCB Guidelines	Reporting Date:	05/11/2025
		Parameter Required:	As per Work Order
		Sample Collected By:	Vardan EnviroLab Representative

### AMBIENT NOISE QUALITY MONITORING RESULTS

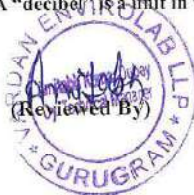
Sampling Location- PT Plant (Central Store Area)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
03/10/2025	60.1	54.2	54.2	59.62	52.46	dB(A)
06/10/2025	64.2	52.7	56.4	51.23	49.25	dB(A)
08/10/2025	63.8	56.1	53.7	52.73	48.74	dB(A)
14/10/2025	68.2	55.3	50.7	56.27	47.86	dB(A)
16/10/2025	65.7	56.7	51.8	58.74	50.03	dB(A)
21/10/2025	60.6	59.1	53.7	57.36	46.48	dB(A)
23/10/2025	65.9	55.7	52.7	53.21	45.64	dB(A)
27/10/2025	63.7	53.2	51.9	54.94	44.76	dB(A)
30/10/2025	67.4	57.8	54.8	63.75	51.37	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq</sub>	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
- Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.
- \*dB(A) L<sub>Eq</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Note:- \*A "decibel" is a unit in which noise is measured.



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## Test Report

Sample Number:	VEL/AP/64-72	Report No.:	VEL/AP/2510000064-0072
Name & Address of the Project:	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	5500044394-037-1019
Sampling & Analysis Protocol:	IS 9989 & CPCB Guidelines	Reporting Date:	05/11/2025
		Parameter Required:	As per Work Order
		Sample Collected By:	Vardan Envirolab Representative

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- Township (Field Hostel)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
03/10/2025	52.5	45.1	59.4	54.51	44.69	dB(A)
06/10/2025	58.3	47.5	55.6	52.42	42.27	dB(A)
08/10/2025	57.2	46.4	53.7	53.13	41.18	dB(A)
14/10/2025	56.5	43.5	50.4	50.38	43.94	dB(A)
16/10/2025	59.4	50.2	58.5	51.42	40.75	dB(A)
21/10/2025	50.3	51.4	53.6	53.97	41.38	dB(A)
23/10/2025	58.1	48.3	56.8	54.03	39.79	dB(A)
27/10/2025	51.4	50.6	52.2	51.75	43.87	dB(A)
30/10/2025	59.2	48.7	51.7	49.24	38.46	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq</sub>	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
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- Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.
- \*dB(A) L<sub>Eq</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Note:- \*A "decibel" is a unit in which noise is measured.

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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (HR)  
ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number:	VEL/AP/01-08	Report No.:	VEL/AP/2511000001-0008
Name & Address of the Project:	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sampling Location:	Main Plant Area (ADC Office)	Party Reference No.:	5500044394-037-1019
Sample Description:	Ambient Air Quality Monitoring	Reporting Date:	05/12/2025
Sampling & Analysis Protocol:	IS 5182 & STP	Parameter Required:	As per Work Order
		Sample Collected By:	Vardan Envirolab Representative

S. No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	429 A 24	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	157 I 2020	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	440 I 24	11.08.2026

PARAMETERS	Concentration of Pollutant												
	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>x</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	O <sub>3</sub> µg/m <sup>3</sup>	NH <sub>3</sub> µg/m <sup>3</sup>	Lead µg/m <sup>3</sup>	Nickel ng/m <sup>3</sup>	Arsenic ng/m <sup>3</sup>	Benzene µg/m <sup>3</sup>	B(a)P ng/m <sup>3</sup>	
@NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1	
Date of Monitoring	03/11/2025	64.15	32.21	18.76	18.61	0.73	22.52	BLQ	BLQ	BLQ	BLQ	BLQ	
	06/11/2025	58.42	29.36	17.21	19.58	0.62	21.64	BLQ	BLQ	BLQ	BLQ	BLQ	
	10/11/2025	63.86	33.58	21.25	20.64	0.70	24.68	BLQ	BLQ	BLQ	BLQ	BLQ	
	13/11/2025	59.67	28.76	19.94	17.16	0.73	25.49	BLQ	BLQ	BLQ	BLQ	BLQ	
	18/11/2025	60.56	35.15	18.48	21.25	0.62	23.83	BLQ	BLQ	BLQ	BLQ	BLQ	
	20/11/2025	61.32	32.94	20.61	22.41	0.72	24.94	BLQ	BLQ	BLQ	BLQ	BLQ	
	24/11/2025	57.49	26.48	17.02	18.24	0.69	20.18	BLQ	BLQ	BLQ	BLQ	BLQ	
	27/11/2025	65.37	36.16	23.36	23.53	0.78	27.57	BLQ	BLQ	BLQ	BLQ	BLQ	
	Maximum	65.37	36.16	23.36	23.53	0.78	27.57	--	--	--	--	--	--
	Minimum	57.49	26.48	17.02	17.16	0.62	20.18	--	--	--	--	--	--
Average	61.35	31.83	19.57	20.17	0.69	23.85	--	--	--	--	--	--	
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5	
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	VEL/E NV/ST P/110 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004		

Note- #STP-Standard Testing Procedure, BLQ- Below Limit of Quantification, LOQ- Limit of Quantification.  
@NAAQS- National Ambient Air Quality Standards.



\*\*\*End of Report\*\*\*



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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (HR)  
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## Test Report

Sample Number: VEL/AP/09-16 Report No.: VEL/AP/2511000009-0016  
 Name & Address of the Project: M/s Talcher Super Thermal Power Station  
 P.O.- Talcher Thermal, Angul, Angul, Odisha-759101  
 Format No.: 7.8 F-03  
 Party Reference No.: 5500044394-037-1019  
 Reporting Date: 05/12/2025  
 Sampling Location: Safety Park (CHP Area) Parameter Required: As per Work Order  
 Sample Description: Ambient Air Quality Monitoring Sample Collected By: Vardan EnviroLab Representative  
 Sampling & Analysis Protocol: IS 5182 & STP

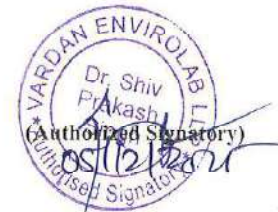
S.No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	46 G 22	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	486 A 2024	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	447 A 22	11.08.2026

PARAMETERS	Concentration of Pollutant											
	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>x</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	O <sub>3</sub> µg/m <sup>3</sup>	NH <sub>3</sub> µg/m <sup>3</sup>	Lead µg/m <sup>3</sup>	Nickel ng/m <sup>3</sup>	Arsenic ng/m <sup>3</sup>	Benzene µg/m <sup>3</sup>	B(a)P ng/m <sup>3</sup>
@NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1
Date of Monitoring	03/11/2025	57.61	27.61	18.47	19.82	0.64	20.46	BLQ	BLQ	BLQ	BLQ	BLQ
	06/11/2025	60.27	30.57	17.61	20.64	0.75	25.82	BLQ	BLQ	BLQ	BLQ	BLQ
	10/11/2025	54.31	26.34	19.42	17.25	0.73	26.42	BLQ	BLQ	BLQ	BLQ	BLQ
	13/11/2025	55.98	28.61	16.25	15.53	0.61	24.05	BLQ	BLQ	BLQ	BLQ	BLQ
	18/11/2025	58.74	29.49	17.32	16.91	0.75	23.38	BLQ	BLQ	BLQ	BLQ	BLQ
	20/11/2025	56.49	25.31	21.72	18.52	0.68	27.94	BLQ	BLQ	BLQ	BLQ	BLQ
	24/11/2025	57.20	24.97	20.19	17.49	0.70	22.17	BLQ	BLQ	BLQ	BLQ	BLQ
	27/11/2025	61.39	32.10	22.43	23.28	0.66	29.63	BLQ	BLQ	BLQ	BLQ	BLQ
Maximum	61.39	32.10	22.43	23.28	0.75	29.63	--	--	--	--	--	--
Minimum	54.31	24.97	16.25	15.53	0.61	20.46	--	--	--	--	--	--
Average	57.74	28.12	19.17	18.68	0.69	24.98	--	--	--	--	--	--
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	VEL/E NV/ST P/110 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004

Note- #STP-Standard Testing Procedure, BLQ -Below Limit of Quantification, LOQ -Limit of Quantification.

@NAAQS- National Ambient Air Quality Standards.

\*\*\*End of Report\*\*\*



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ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number: VEL/AP/17-24 Report No.: VEL/AP/2511000017-0024  
 Name & Address of the Project: M/s 1027, Talcher Super Thermal Power Station  
 Format No.: 7.8 F-03  
 Party Reference No.: 5500044394-037-1019  
 P.O.- Talcher Thermal, Angul, Angul, Odisha-759101 Reporting Date: 05/12/2025  
 Sampling Location: PT Plant (Central Store Area) Parameter Required: As per Work Order  
 Sample Description: Ambient Air Quality Monitoring Sample Collected By: Vardan Envirolab Representative  
 Sampling & Analysis Protocol: IS 5182 & STP

S. No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	428 A 24	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	485 A 2024	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	120 I 22	11.08.2026

PARAMETERS	Concentration of Pollutant											
	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>x</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	O <sub>3</sub> µg/m <sup>3</sup>	NH <sub>3</sub> µg/m <sup>3</sup>	Lead µg/m <sup>3</sup>	Nickel ng/m <sup>3</sup>	Arsenic ng/m <sup>3</sup>	Benzene µg/m <sup>3</sup>	B(a)P ng/m <sup>3</sup>
@NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1
Date of Monitoring	03/11/2025	64.12	35.13	23.64	18.75	0.79	24.16	BLQ	BLQ	BLQ	BLQ	BLQ
	06/11/2025	60.27	31.20	21.42	23.16	0.53	22.28	BLQ	BLQ	BLQ	BLQ	BLQ
	10/11/2025	61.50	34.25	24.25	24.52	0.77	23.61	BLQ	BLQ	BLQ	BLQ	BLQ
	13/11/2025	66.49	33.43	19.42	25.15	0.69	24.58	BLQ	BLQ	BLQ	BLQ	BLQ
	18/11/2025	62.35	36.61	18.13	19.23	0.75	25.35	BLQ	BLQ	BLQ	BLQ	BLQ
	20/11/2025	68.76	34.28	22.97	24.60	0.73	26.79	BLQ	BLQ	BLQ	BLQ	BLQ
	24/11/2025	63.05	35.19	20.52	21.52	0.58	28.30	BLQ	BLQ	BLQ	BLQ	BLQ
	27/11/2025	71.48	38.21	27.39	23.47	0.78	29.83	BLQ	BLQ	BLQ	BLQ	BLQ
Maximum	71.48	38.21	27.39	25.15	0.79	29.83	--	--	--	--	--	--
Minimum	60.27	31.20	18.13	18.75	0.53	22.28	--	--	--	--	--	--
Average	64.75	34.78	22.21	22.55	0.70	25.61	--	--	--	--	--	--
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	VEL/E NV/ST P/110 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004

Note- #STP-Standard Testing Procedure, BLQ- Below Limit of Quantification, LOQ- Limit of Quantification.

@NAAQS- National Ambient Air Quality Standards.

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ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number: VEL/AP/25-32  
 Name & Address of the Project: M/s 1027, Talcher Super Thermal Power Station  
 P.O.- Talcher Thermal, Angul, Angul, Odisha-759101  
 Sampling Location: Township (Field Hostel)  
 Sample Description: Ambient Air Quality Monitoring  
 Sampling & Analysis Protocol: IS 5182 & STP

Report No.: VEL/AP/2511000025-0032  
 Format No.: 7.8 F-03  
 Party Reference No.: 5500044394-037-1019  
 Reporting Date: 05/12/2025

Parameter Required: As per Work Order  
 Sample Collected By: Vardan EnviroLab Representative

S. No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	312 L 22	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	330 L 22	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	333 I 22	11.08.2026

PARAMETERS	Concentration of Pollutant											
	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	O <sub>3</sub>	NH <sub>3</sub>	Lead	Nickel	Arsenic	Benzene	B(a)P
	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	mg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ng/m <sup>3</sup>	ng/m <sup>3</sup>	µg/m <sup>3</sup>	ng/m <sup>3</sup>
@NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1
Date of Monitoring	03/11/2025	57.42	27.51	21.64	17.94	0.61	22.64	BLQ	BLQ	BLQ	BLQ	BLQ
	06/11/2025	59.64	23.62	20.27	19.58	0.57	24.98	BLQ	BLQ	BLQ	BLQ	BLQ
	10/11/2025	55.31	28.79	19.51	16.25	0.69	21.30	BLQ	BLQ	BLQ	BLQ	BLQ
	13/11/2025	61.25	32.34	23.36	18.47	0.66	23.67	BLQ	BLQ	BLQ	BLQ	BLQ
	18/11/2025	58.61	31.01	18.47	20.39	0.73	25.97	BLQ	BLQ	BLQ	BLQ	BLQ
	20/11/2025	57.52	26.53	25.53	21.81	0.75	24.52	BLQ	BLQ	BLQ	BLQ	BLQ
	24/11/2025	57.14	24.94	17.05	19.61	0.62	26.35	BLQ	BLQ	BLQ	BLQ	BLQ
	27/11/2025	60.93	30.36	22.81	22.79	0.78	27.98	BLQ	BLQ	BLQ	BLQ	BLQ
Maximum	61.25	32.34	25.53	22.79	0.78	27.98	--	--	--	--	--	--
Minimum	55.31	23.62	17.05	16.25	0.57	21.30	--	--	--	--	--	--
Average	58.47	28.13	21.08	19.60	0.67	24.67	--	--	--	--	--	--
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	VEL/EN V/STP/11 0 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004

Note- #STP-Standard Testing Procedure, BLQ- Below Limit of Quantification, LOQ- Limit of Quantification.

@NAAQS- National Ambient Air Quality Standards.

\*\*\*End of Report\*\*\*



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# Vardan Envirolab LLP

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (HR)  
ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number:	VEL/AP/33-40	Report No.:	VEL/AP/2511000033-0040
Name & Address of the Project:	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	5500044394-037-1019
Sampling & Analysis Protocol:	IS 9989 & CPCB Guidelines	Reporting Date:	05/12/2025
		Parameter Required:	As per Work Order
		Sample Collected By:	Vardan EnviroLab Representative

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- Main Plant Area (ADC Plant)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
03/11/2025	59.1	55.2	54.4	64.36	54.61	dB(A)
06/11/2025	62.4	53.4	55.2	60.42	52.24	dB(A)
10/11/2025	64.2	56.2	51.6	56.52	51.78	dB(A)
13/11/2025	61.6	52.1	53.5	51.34	48.43	dB(A)
18/11/2025	66.8	58.3	56.7	57.16	50.20	dB(A)
20/11/2025	63.4	54.4	57.2	53.42	51.76	dB(A)
24/11/2025	67.8	57.5	59.2	59.36	53.79	dB(A)
27/11/2025	60.2	56.9	53.0	60.18	52.14	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq</sub> .	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
- Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.
- \*dB(A) L<sub>Eq</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Note:- \*A "decibel" is a unit in which noise is measured.

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## Test Report

Sample Number: VEL/AP/41-48  
Name & Address of the Project: M/s Talcher Super Thermal Power Station  
P.O.- Talcher Thermal, Angul, Angul, Odisha-759101

Report No.: VEL/AP/2511000041-0048  
Format No.: 7.8 F-03  
Party Reference No.: 5500044394-037-1019  
Reporting Date: 05/12/2025  
Parameter Required: As per Work Order  
Sample Collected By: Vardan EnviroLab Representative

Sample Description: Ambient Noise Level Monitoring  
Sampling & Analysis Protocol: IS 9989 & CPCB Guidelines

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- Safety Park (CHP Area)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
03/11/2025	53.1	48.4	47.5	51.23	43.61	dB(A)
06/11/2025	49.5	45.5	49.2	49.24	42.70	dB(A)
10/11/2025	54.5	43.6	48.4	46.37	44.61	dB(A)
13/11/2025	48.6	42.4	50.5	50.79	42.35	dB(A)
18/11/2025	49.1	47.5	51.6	48.98	40.66	dB(A)
20/11/2025	55.2	48.6	42.3	46.32	43.97	dB(A)
24/11/2025	57.4	43.9	44.1	47.28	41.53	dB(A)
27/11/2025	58.9	44.7	45.8	51.53	44.30	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq</sub>	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
- Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.
- \*dB(A) L<sub>Eq</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Note:- \*A "decibel" is a unit in which noise is measured.



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## Test Report

Sample Number:	VEL/AP/49-56	Report No.:	VEL/AP/2511000049-0056
Name & Address of the Project:	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
		Party Reference No.:	5500044394-037-1019
		Reporting Date:	05/12/2025
Sample Description:	Ambient Noise Level Monitoring	Parameter Required:	As per Work Order
Sampling & Analysis Protocol:	IS 9989 & CPCB Guidelines	Sample Collected By:	Vardan EnviroLab Representative

### AMBIENT NOISE QUALITY MONITORING RESULTS

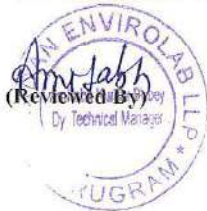
Sampling Location- PT Plant (Central Store Area)						
Sampling Date	$L_d$	$L_n$	$L_{dn}$	$L_{eq}$ (Day Time)	$L_{eq}$ (Night Time)	Unit
03/11/2025	64.3	53.5	56.1	60.42	53.61	dB(A)
06/11/2025	60.5	51.4	57.5	55.86	51.24	dB(A)
10/11/2025	62.6	57.6	54.5	53.68	50.58	dB(A)
13/11/2025	67.1	56.5	52.4	59.16	49.76	dB(A)
18/11/2025	66.8	57.2	53.0	61.24	51.13	dB(A)
20/11/2025	63.2	58.2	54.5	62.94	50.86	dB(A)
24/11/2025	66.8	56.9	51.4	54.81	48.35	dB(A)
27/11/2025	64.2	54.7	53.8	56.96	47.64	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) $L_{Eq}$	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
- Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.
- \*dB(A)  $L_{Eq}$  denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Note:- \*A "decibel" is a unit in which noise is measured.



\*\*\*End of Report\*\*\*



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## Test Report

Sample Number:	VEL/AP/57-64	Report No.:	VEL/AP/2511000056-0064
Name & Address of the Project:	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	5500044394-037-1019
Sampling & Analysis Protocol:	IS 9989 & CPCB Guidelines	Reporting Date:	05/12/2025
		Parameter Required:	As per Work Order
		Sample Collected By:	Vardan EnviroLab Representative

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- Township (Field Hostel)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
03/11/2025	51.8	46.4	58.1	51.36	43.16	dB(A)
06/11/2025	57.5	48.2	57.5	53.64	41.98	dB(A)
10/11/2025	56.3	49.3	54.6	54.94	43.33	dB(A)
13/11/2025	54.2	44.2	52.3	52.68	44.25	dB(A)
18/11/2025	56.1	52.4	57.3	53.97	42.46	dB(A)
20/11/2025	52.7	53.4	52.5	52.56	43.75	dB(A)
24/11/2025	59.2	45.6	57.2	52.41	41.58	dB(A)
27/11/2025	56.4	51.7	51.0	50.36	44.32	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq</sub>	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
- Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.
- \*dB(A) L<sub>Eq</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Note:- \*A "decibel" is a unit in which noise is measured.

\*\*\*End of Report\*\*\*



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## Test Report

Sample Number:	VEL/AP/01-09	Report No.:	VEL/AP/2512000001-0009
Name & Address of the Project:	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sampling Location:	Main Plant Area (ADC Office)	Party Reference No.:	5500044394-037-1019
Sample Description:	Ambient Air Quality Monitoring	Reporting Date:	05/01/2026
Sampling & Analysis Protocol:	IS 5182 & STP	Parameter Required:	As Per Work Order
		Sample Collected By:	Vardan EnviroLab Representative

S. No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	429 A 24	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	157 I 2020	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	440 I 24	11.08.2026

PARAMETERS	Concentration of Pollutant											
	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>x</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	O <sub>3</sub> µg/m <sup>3</sup>	NH <sub>3</sub> µg/m <sup>3</sup>	Lead µg/m <sup>3</sup>	Nickel ng/m <sup>3</sup>	Arsenic ng/m <sup>3</sup>	Benzene µg/m <sup>3</sup>	B(a)P ng/m <sup>3</sup>
@NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1
Date of Monitoring	01/12/2025	63.16	37.52	17.42	22.41	0.75	22.49	BLQ	BLQ	BLQ	BLQ	BLQ
	04/12/2025	60.79	32.42	20.15	19.35	0.68	23.67	BLQ	BLQ	BLQ	BLQ	BLQ
	08/12/2025	64.51	33.16	21.34	20.79	0.70	24.50	BLQ	BLQ	BLQ	BLQ	BLQ
	12/12/2025	61.26	30.69	19.32	21.05	0.62	21.24	BLQ	BLQ	BLQ	BLQ	BLQ
	15/12/2025	61.97	35.22	22.73	23.62	0.77	25.75	BLQ	BLQ	BLQ	BLQ	BLQ
	18/12/2025	58.75	27.71	18.25	22.75	0.53	24.12	BLQ	BLQ	BLQ	BLQ	BLQ
	22/12/2025	65.36	38.82	23.16	24.49	0.64	25.07	BLQ	BLQ	BLQ	BLQ	BLQ
	26/12/2025	66.27	34.76	26.27	26.27	0.56	28.03	BLQ	BLQ	BLQ	BLQ	BLQ
	29/12/2025	68.42	36.15	25.76	23.41	0.61	24.47	BLQ	BLQ	BLQ	BLQ	BLQ
Maximum	68.42	38.82	26.27	26.27	0.77	28.03	--	--	--	--	--	--
Minimum	58.75	27.71	17.42	19.35	0.53	21.24	--	--	--	--	--	--
Average	63.38	34.05	21.60	22.68	0.65	24.37	--	--	--	--	--	--
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	VEL/E NV/ST P/110 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004

Note- #STP-Standard Testing Procedure, BLQ- Below Limit of Quantification, LOQ- Limit of Quantification.

@NAAQS- National Ambient Air Quality Standards.



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ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number: VEL/AP/10-18 Report No.: VEL/AP/2512000010-0018  
 Name & Address of the Project: M/s Talcher Super Thermal Power Station  
 P.O.- Talcher Thermal, Angul, Angul, Odisha-759101  
 Format No.: 7.8 F-03  
 Party Reference No.: 5500044394-037-1019  
 Reporting Date: 05/01/2026  
 Sampling Location: Safety Park (CHP Area) Parameter Required: As Per Work Order  
 Sample Description: Ambient Air Quality Monitoring Sample Collected By: Vardan EnviroLab Representative  
 Sampling & Analysis Protocol: IS 5182 & STP

S.No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	46 G 22	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	486 A 2024	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	447 A 22	11.08.2026

PARAMETERS	Concentration of Pollutant												
	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>x</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	O <sub>3</sub> µg/m <sup>3</sup>	NH <sub>3</sub> µg/m <sup>3</sup>	Lead µg/m <sup>3</sup>	Nickel ng/m <sup>3</sup>	Arsenic ng/m <sup>3</sup>	Benzene µg/m <sup>3</sup>	B(a)P ng/m <sup>3</sup>	
@NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1	
Date of Monitoring	01/12/2025	62.24	25.14	19.25	20.15	0.70	21.27	BLQ	BLQ	BLQ	BLQ	BLQ	
	04/12/2025	63.12	32.18	18.16	22.61	0.56	24.62	BLQ	BLQ	BLQ	BLQ	BLQ	
	08/12/2025	56.94	28.43	17.35	18.34	0.61	27.71	BLQ	BLQ	BLQ	BLQ	BLQ	
	12/12/2025	57.42	29.18	20.18	17.81	0.76	22.26	BLQ	BLQ	BLQ	BLQ	BLQ	
	15/12/2025	56.15	27.46	16.27	15.42	0.64	24.91	BLQ	BLQ	BLQ	BLQ	BLQ	
	18/12/2025	60.34	30.75	25.16	21.24	0.73	29.78	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
	22/12/2025	59.57	26.60	23.76	19.76	0.69	23.55	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
	26/12/2025	64.19	31.42	24.32	25.17	0.52	28.16	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
	29/12/2025	61.27	30.67	22.82	28.42	0.70	26.43	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Maximum	64.19	32.18	25.16	28.42	0.76	29.78	--	--	--	--	--	--	
Minimum	56.15	25.14	16.27	15.42	0.52	21.27	--	--	--	--	--	--	
Average	60.13	29.09	20.80	20.99	0.65	25.41	--	--	--	--	--	--	
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5	
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	VEL/E NV/ST P/110 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004	

Note- #STP-Standard Testing Procedure, BLQ -Below Limit of Quantification, LOQ -Limit of Quantification.

\*NAAQS- National Ambient Air Quality Standards.

\*\*\*End of Report\*\*\*



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# Vardan Envirolab LLP

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (HR)  
ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number: VEL/AP/19-27 Report No.: VEL/AP/2512000019-0027  
 Name & Address of the Project: M/s 1027, Talcher Super Thermal Power Station  
 Format No.: 7.8 F-03  
 Party Reference No.: 5500044394-037-1019  
 P.O.- Talcher Thermal, Angul, Angul, Odisha-759101 Reporting Date: 05/01/2026  
 Sampling Location: PT Plant (Central Store Area) Parameter Required: As Per Work Order  
 Sample Description: Ambient Air Quality Monitoring Sample Collected By: Vardan Envirolab Representative  
 Sampling & Analysis Protocol: IS 5182 & STP

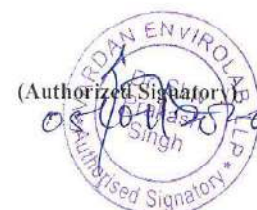
S. No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	428 A 24	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	485 A 2024	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	120 I 22	11.08.2026

PARAMETERS	Concentration of Pollutant											
	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>x</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	O <sub>3</sub> µg/m <sup>3</sup>	NH <sub>3</sub> µg/m <sup>3</sup>	Lead µg/m <sup>3</sup>	Nickel ng/m <sup>3</sup>	Arsenic ng/m <sup>3</sup>	Benzene µg/m <sup>3</sup>	B(a)P ng/m <sup>3</sup>
@NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1
Date of Monitoring	01/12/2025	61.58	33.42	24.15	19.29	0.59	25.43	BLQ	BLQ	BLQ	BLQ	BLQ
	04/12/2025	62.34	30.51	20.61	22.54	0.68	21.74	BLQ	BLQ	BLQ	BLQ	BLQ
	08/12/2025	64.16	35.54	25.73	23.75	0.60	26.35	BLQ	BLQ	BLQ	BLQ	BLQ
	12/12/2025	67.12	36.79	21.50	26.31	0.72	22.91	BLQ	BLQ	BLQ	BLQ	BLQ
	15/12/2025	60.24	32.80	19.64	20.19	0.67	24.23	BLQ	BLQ	BLQ	BLQ	BLQ
	18/12/2025	67.61	35.24	21.78	25.72	0.69	27.68	BLQ	BLQ	BLQ	BLQ	BLQ
	22/12/2025	64.42	36.11	22.46	22.64	0.71	26.73	BLQ	BLQ	BLQ	BLQ	BLQ
	26/12/2025	70.19	39.27	28.74	24.27	0.66	30.12	BLQ	BLQ	BLQ	BLQ	BLQ
29/12/2025	68.49	37.41	25.12	25.43	0.73	29.55	BLQ	BLQ	BLQ	BLQ	BLQ	
Maximum	70.19	39.27	28.74	26.31	0.73	30.12	--	--	--	--	--	--
Minimum	60.24	30.51	19.64	19.29	0.59	21.74	--	--	--	--	--	--
Average	65.12	35.23	23.30	23.34	0.67	26.08	--	--	--	--	--	--
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	VEL/E NV/ST P/110 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004

Note- #STP-Standard Testing Procedure, BLQ- Below Limit of Quantification, LOQ- Limit of Quantification.

@NAAQS- National Ambient Air Quality Standards.

\*\*\*End of Report\*\*\*



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# Vardan Envirolab LLP

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (HR)  
ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number: VEL/AP/28-36  
Name & Address of the Project: M/s 1027, Talcher Super Thermal Power Station  
P.O.- Talcher Thermal, Angul, Angul, Odisha-759101  
Township (Field Hostel)  
Sample Description: Ambient Air Quality Monitoring  
Sampling & Analysis Protocol: IS 5182 & STP

Report No.: VEL/AP/2512000028-0036  
Format No.: 7.8 F-03  
Party Reference No.: 5500044394-037-1019  
Reporting Date: 05/01/2026

Parameter Required: As Per Work Order  
Sample Collected By: Vardan Envirolab Representative

S. No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	312 L 22	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	330 L 22	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	333 I 22	11.08.2026

PARAMETERS	Concentration of Pollutant											
	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	O <sub>3</sub>	NH <sub>3</sub>	Lead	Nickel	Arsenic	Benzene	B(a)P
	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	mg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ng/m <sup>3</sup>	ng/m <sup>3</sup>	µg/m <sup>3</sup>	ng/m <sup>3</sup>
@NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1
Date of Monitoring	01/12/2025	55.43	26.13	20.79	18.74	0.57	23.51	BLQ	BLQ	BLQ	BLQ	BLQ
	04/12/2025	60.24	24.21	22.61	20.60	0.61	25.32	BLQ	BLQ	BLQ	BLQ	BLQ
	08/12/2025	58.41	29.42	18.72	19.64	0.74	20.73	BLQ	BLQ	BLQ	BLQ	BLQ
	12/12/2025	62.46	30.81	24.51	21.39	0.72	24.96	BLQ	BLQ	BLQ	BLQ	BLQ
	15/12/2025	63.18	32.64	19.27	22.05	0.67	22.81	BLQ	BLQ	BLQ	BLQ	BLQ
	18/12/2025	56.13	28.53	26.61	19.97	0.61	25.94	BLQ	BLQ	BLQ	BLQ	BLQ
	22/12/2025	62.76	27.76	20.76	23.42	0.59	21.69	BLQ	BLQ	BLQ	BLQ	BLQ
	26/12/2025	63.61	31.40	23.67	24.79	0.74	28.34	BLQ	BLQ	BLQ	BLQ	BLQ
	29/12/2025	59.31	32.67	25.98	23.46	0.69	25.21	BLQ	BLQ	BLQ	BLQ	BLQ
Maximum	63.61	32.67	26.61	24.79	0.74	28.34	--	--	--	--	--	--
Minimum	55.43	24.21	18.72	18.74	0.57	20.73	--	--	--	--	--	--
Average	60.17	29.28	22.54	21.56	0.66	24.27	--	--	--	--	--	--
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	VEL/EN V/STP/11 0 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004

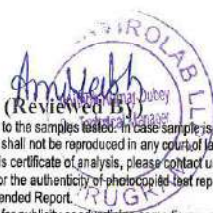
Note- #STP-Standard Testing Procedure, BLQ- Below Limit of Quantification, LOQ- Limit of Quantification.

@NAAQS- National Ambient Air Quality Standards.

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# Vardan EnviroLab LLP

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (HR)  
ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number:	VEL/AP/37-45	Report No.:	VEL/AP/2512000037-0045
Name & Address of the Project:	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	5500044394-037-1019
Sampling & Analysis Protocol:	IS 9989 & CPCB Guidelines	Reporting Date:	05/01/2026
		Parameter Required:	As Per Work Order
		Sample Collected By:	Vardan EnviroLab Representative

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- Main Plant Area (ADC Plant)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
01/12/2025	61.2	58.4	53.2	63.75	51.75	dB(A)
04/12/2025	63.5	52.2	54.4	62.61	53.51	dB(A)
08/12/2025	62.3	57.4	50.8	59.42	53.42	dB(A)
12/12/2025	60.7	53.1	55.1	50.82	47.31	dB(A)
15/12/2025	65.7	56.2	57.2	56.24	52.79	dB(A)
18/12/2025	62.1	57.2	58.7	60.18	54.27	dB(A)
22/12/2025	66.5	56.9	57.9	63.69	56.49	dB(A)
26/12/2025	63.4	55.8	52.2	61.52	55.30	dB(A)
29/12/2025	63.1	57.1	51.4	63.76	57.15	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq</sub>	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
- Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.
- \*dB(A) L<sub>Eq</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Note:- \*A "decibel" is a unit in which noise is measured.

\*\*\*End of Report\*\*\*



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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (HR)  
ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number:	VEL/AP/46-54	Report No.:	VEL/AP/2512000046-0054
Name & Address of the Project:	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	5500044394-037-1019
Sampling & Analysis Protocol:	IS 9989 & CPCB Guidelines	Reporting Date:	05/01/2026
		Parameter Required:	As Per Work Order
		Sample Collected By:	Vardan EnviroLab Representative

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- Safety Park (CHP Area)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
01/12/2025	54.2	49.2	48.1	53.41	41.52	dB(A)
04/12/2025	50.1	47.4	47.3	50.32	43.67	dB(A)
08/12/2025	53.6	46.2	49.2	49.25	43.19	dB(A)
12/12/2025	49.2	44.6	51.4	52.61	40.42	dB(A)
15/12/2025	48.2	49.3	53.1	47.76	41.79	dB(A)
18/12/2025	57.4	46.5	46.4	48.28	42.19	dB(A)
22/12/2025	56.3	44.2	46.4	49.49	39.26	dB(A)
26/12/2025	59.7	47.1	48.2	54.28	43.67	dB(A)
29/12/2025	53.4	46.4	49.7	53.15	42.94	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq</sub>	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
- Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.
- \*dB(A) L<sub>Eq</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Note:- \*A "decibel" is a unit in which noise is measured.

\*\*\*End of Report\*\*\*



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## Test Report

Sample Number:	VEL/AP/55-63	Report No.:	VEL/AP/2512000055-0063
Name & Address of the Project:	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	5500044394-037-1019
Sampling & Analysis Protocol:	IS 9989 & CPCB Guidelines	Reporting Date:	05/01/2026
		Parameter Required:	As Per Work Order
		Sample Collected By:	Vardan EnviroLab Representative

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- PT Plant (Central Store Area)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
01/12/2025	67.2	56.4	57.2	63.51	52.40	dB(A)
04/12/2025	62.4	54.2	59.5	58.67	50.13	dB(A)
08/12/2025	63.5	56.7	56.7	54.25	48.35	dB(A)
12/12/2025	66.4	52.4	53.5	60.98	52.62	dB(A)
15/12/2025	67.8	59.3	52.4	62.35	53.42	dB(A)
18/12/2025	64.0	51.8	56.1	63.82	54.39	dB(A)
22/12/2025	68.1	55.5	53.6	57.32	49.84	dB(A)
26/12/2025	67.7	53.8	54.7	55.78	46.34	dB(A)
29/12/2025	65.2	56.1	52.4	58.71	51.27	dB(A)

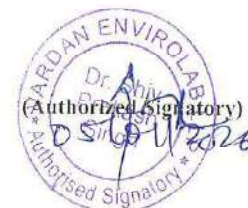
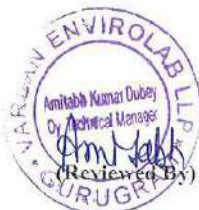
### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq</sub>	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
- Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.
- \*dB(A) L<sub>Eq</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Note:- \*A "decibel" is a unit in which noise is measured.

\*\*\*End of Report\*\*\*



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## Test Report

Sample Number:	VEL/AP/64-72	Report No.:	VEL/AP/2512000064-0072
Name & Address of the Project:	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	5500044394-037-1019
Sampling & Analysis Protocol:	IS 9989 & CPCB Guidelines	Reporting Date:	05/01/2026
		Parameter Required:	As Per Work Order
		Sample Collected By:	Vardan EnviroLab Representative

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- Township (Field Hostel)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
01/12/2025	53.2	49.1	54.2	52.42	44.22	dB(A)
04/12/2025	56.1	50.2	58.1	54.96	40.18	dB(A)
08/12/2025	57.2	48.4	56.2	53.28	43.52	dB(A)
12/12/2025	55.4	46.3	53.4	51.54	41.49	dB(A)
15/12/2025	57.6	53.5	59.2	54.27	39.42	dB(A)
18/12/2025	53.9	54.2	53.4	53.94	37.78	dB(A)
22/12/2025	58.1	48.7	56.3	50.85	42.34	dB(A)
26/12/2025	57.8	50.2	53.2	53.24	43.61	dB(A)
29/12/2025	55.3	51.7	52.9	51.40	41.27	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq.</sub>	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
- Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.
- \*dB(A) L<sub>Eq.</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Note:- \*A "decibel" is a unit in which noise is measured.

\*\*\*End of Report\*\*\*



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# **ENVIRONMENTAL MONITORING REPORT**

**(January 2026)**



**Submitted To:**

**M/s Talcher Super Thermal Power Station  
P.O.- Talcher Thermal, Angul, Angul,  
Odisha-759101**

**Study Conducted By:**



**M/s Vardan EnviroLab LLP  
Plot No. 82 A, Sector-5, IMT Manesar, Gurugram,  
Haryana - 122051**

**E-mail: [projects.env@vardan.co.in](mailto:projects.env@vardan.co.in)**

**(Recognized By NABL & MOEF&CC, Government of India)**

## INDEX

<b>S.NO.</b>	<b>Enviromental Monitoring Details</b>	<b>Pages</b>
1.	Test Reports of Ambient Air Quality Monitoring	4
2.	Test Reports of Ambient Noise Quality Monitoring	4

**TEST REPORTS**  
**OF**  
**AMBIENT AIR**  
**QUALITY**  
**MONITORING**



# Vardan Envirolab LLP

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (HR)  
ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number: VEL/AP/01-09      Report No.: VEL/AP/2601000001-0009  
 Name & Address of the Project: M/s Talcher Super Thermal Power Station      Format No.: 7.8 F-03  
 P.O.- Talcher Thermal, Angul, Angul, Odisha-759101      Party Reference No.: 5500044394-037-1019  
 Reporting Date: 05/02/2026  
 Sampling Location: Main Plant Area (ADC Office)      Parameter Required: As Per Work Order  
 Sample Description: Ambient Air Quality Monitoring      Sample Collected By: Vardan EnviroLab Representative  
 Sampling & Analysis Protocol: IS 5182 & STP

S. No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	429 A 24	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	157 I 2020	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	440 I 24	11.08.2026

PARAMETERS	Concentration of Pollutant											
	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>x</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	O <sub>3</sub> µg/m <sup>3</sup>	NH <sub>3</sub> µg/m <sup>3</sup>	Lead µg/m <sup>3</sup>	Nickel ng/m <sup>3</sup>	Arsenic ng/m <sup>3</sup>	Benzene µg/m <sup>3</sup>	B(a)P ng/m <sup>3</sup>
@NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1
Date of Monitoring	02/01/2026	65.52	38.24	18.93	20.67	0.69	23.72	BLQ	BLQ	BLQ	BLQ	BLQ
	05/01/2026	64.25	35.76	21.20	18.75	0.73	24.13	BLQ	BLQ	BLQ	BLQ	BLQ
	08/01/2026	63.36	34.53	20.42	21.53	0.66	25.53	BLQ	BLQ	BLQ	BLQ	BLQ
	13/01/2026	60.76	32.19	17.91	22.38	0.74	20.65	BLQ	BLQ	BLQ	BLQ	BLQ
	16/01/2026	65.85	36.37	23.46	24.16	0.81	24.94	BLQ	BLQ	BLQ	BLQ	BLQ
	19/01/2026	61.27	30.16	19.17	23.85	0.62	23.58	BLQ	BLQ	BLQ	BLQ	BLQ
	22/01/2026	62.86	36.24	24.81	25.69	0.71	24.18	BLQ	BLQ	BLQ	BLQ	BLQ
	27/01/2026	68.96	35.49	25.35	21.27	0.67	25.37	BLQ	BLQ	BLQ	BLQ	BLQ
	30/01/2026	72.05	40.22	27.49	26.35	0.75	29.38	BLQ	BLQ	BLQ	BLQ	BLQ
	Maximum	72.05	40.22	27.49	26.35	0.81	29.38	--	--	--	--	--
Minimum	60.76	30.16	17.91	18.75	0.62	20.65	--	--	--	--	--	
Average	64.98	35.46	22.08	22.73	0.70	24.60	--	--	--	--	--	
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	VEL/E NV/ST P/110 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004

Note:- #STP-Standard Testing Procedure, BLQ- Below Limit of Quantification, LOQ- Limit of Quantification.  
 @NAAQS- National Ambient Air Quality Standards.

\*\*\*End of Report\*\*\*



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# Vardan Envirolab LLP

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (HR)  
ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number: VEL/AP/10-18  
 Name & Address of the Project: M/s Talcher Super Thermal Power Station, P.O.- Talcher Thermal, Angul, Angul, Odisha-759101  
 Report No.: VEL/AP/2601000010-0018  
 Format No.: 7.8 F-03  
 Party Reference No.: 5500044394-037-1019  
 Reporting Date: 05/02/2026  
 Sampling Location: Safety Park (CHP Area)  
 Sample Description: Ambient Air Quality Monitoring  
 Parameter Required: As Per Work Order  
 Sample Collected By: Vardan EnviroLab Representative  
 Sampling & Analysis Protocol: IS 5182 & STP

S.No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	46 G 22	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	486 A 2024	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	447 A 22	11.08.2026

PARAMETERS	Concentration of Pollutant											
	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>x</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	O <sub>3</sub> µg/m <sup>3</sup>	NH <sub>3</sub> µg/m <sup>3</sup>	Lead µg/m <sup>3</sup>	Nickel ng/m <sup>3</sup>	Arsenic ng/m <sup>3</sup>	Benzene µg/m <sup>3</sup>	B(a)P ng/m <sup>3</sup>
@NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1
Date of Monitoring	02/01/2026	60.41	28.31	20.86	22.83	0.65	22.52	BLQ	BLQ	BLQ	BLQ	BLQ
	05/01/2026	65.24	33.42	19.50	21.27	0.61	23.43	BLQ	BLQ	BLQ	BLQ	BLQ
	08/01/2026	58.43	26.53	18.26	15.63	0.73	26.42	BLQ	BLQ	BLQ	BLQ	BLQ
	13/01/2026	61.37	28.42	22.31	18.46	0.61	25.51	BLQ	BLQ	BLQ	BLQ	BLQ
	16/01/2026	59.62	25.96	20.81	16.20	0.78	27.89	BLQ	BLQ	BLQ	BLQ	BLQ
	19/01/2026	64.26	32.28	21.35	22.98	0.64	28.37	BLQ	BLQ	BLQ	BLQ	BLQ
	22/01/2026	55.82	29.43	22.92	23.42	0.71	25.15	BLQ	BLQ	BLQ	BLQ	BLQ
	27/01/2026	68.34	30.18	25.38	26.33	0.68	29.76	BLQ	BLQ	BLQ	BLQ	BLQ
	30/01/2026	63.24	33.43	24.53	29.36	0.79	25.82	BLQ	BLQ	BLQ	BLQ	BLQ
Maximum	68.34	33.43	25.38	29.36	0.79	29.76	--	--	--	--	--	--
Minimum	55.82	25.96	18.26	15.63	0.61	22.52	--	--	--	--	--	--
Average	61.85	29.77	21.76	21.83	0.69	26.09	--	--	--	--	--	--
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	VEL/E NV/ST P/110 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004

Note: #STP-Standard Testing Procedure, BLQ -Below Limit of Quantification, LOQ -Limit of Quantification.

\* NAAQS- National Ambient Air Quality Standards.

\*\*\*End of Report\*\*\*



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# Vardan Envirolab LLP

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (HR)  
ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number: VEL/AP/19-27  
 Name & Address of the Project: M/s 1027, Talcher Super Thermal Power Station  
 P.O.- Talcher Thermal, Angul, Angul, Odisha-759101  
 Sampling Location: PT Plant (Central Store Area)  
 Sample Description: Ambient Air Quality Monitoring  
 Sampling & Analysis Protocol: IS 5182 & STP

Report No.: VEL/AP/2601000019-0027  
 Format No.: 7.8 F-03  
 Party Reference No.: 5500044394-037-1019  
 Reporting Date: 05/02/2026

Parameter Required: As Per Work Order  
 Sample Collected By: Vardan Envirolab Representative

S. No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	428 A 24	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	485 A 2024	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	120 I 22	11.08.2026

PARAMETERS	Concentration of Pollutant											
	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>x</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	O <sub>3</sub> µg/m <sup>3</sup>	NH <sub>3</sub> µg/m <sup>3</sup>	Lead µg/m <sup>3</sup>	Nickel ng/m <sup>3</sup>	Arsenic ng/m <sup>3</sup>	Benzene µg/m <sup>3</sup>	B(a)P ng/m <sup>3</sup>
<sup>ii</sup> NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1
Date of Monitoring	02/01/2026	65.13	34.28	23.42	18.65	0.74	24.34	BLQ	BLQ	BLQ	BLQ	BLQ
	05/01/2026	64.42	32.14	22.61	23.77	0.61	20.52	BLQ	BLQ	BLQ	BLQ	BLQ
	08/01/2026	66.43	36.27	24.19	22.19	0.73	25.43	BLQ	BLQ	BLQ	BLQ	BLQ
	13/01/2026	61.52	33.05	26.68	25.65	0.62	23.62	BLQ	BLQ	BLQ	BLQ	BLQ
	16/01/2026	63.93	35.76	21.67	23.79	0.79	26.18	BLQ	BLQ	BLQ	BLQ	BLQ
	19/01/2026	68.27	36.82	23.58	25.98	0.75	24.79	BLQ	BLQ	BLQ	BLQ	BLQ
	22/01/2026	66.15	37.19	24.13	22.38	0.64	28.53	BLQ	BLQ	BLQ	BLQ	BLQ
	27/01/2026	69.76	34.48	25.34	26.19	0.70	31.46	BLQ	BLQ	BLQ	BLQ	BLQ
	30/01/2026	73.28	40.35	29.12	27.71	0.69	27.67	BLQ	BLQ	BLQ	BLQ	BLQ
	Maximum	73.28	40.35	29.12	27.71	0.79	31.46	--	--	--	--	--
Minimum	61.52	32.14	20.68	18.65	0.61	20.52	--	--	--	--	--	
Average	66.54	35.59	23.86	24.03	0.69	25.83	--	--	--	--	--	
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 3182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	VEL/E NV/ST P/110 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004

Note: #STP-Standard Testing Procedure, BLQ- Below Limit of Quantification, LOQ- Limit of Quantification.

<sup>ii</sup>NAAQS- National Ambient Air Quality Standards.

\*\*\*End of Report\*\*\*



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# Vardan Envirolab LLP

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (HR)  
ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number: VEL/AP/28-36  
 Name & Address of the Project: M/s 1027, Talcher Super Thermal Power Station  
 P.O.- Talcher Thermal, Angul, Angul, Odisha-759101  
 Sampling Location: Township (Field Hostel)  
 Sample Description: Ambient Air Quality Monitoring  
 Sampling & Analysis Protocol: IS 5182 & STP

Report No.: VEL/AP/2601000028-0036  
 Format No.: 7.8 F-03  
 Party Reference No.: 5500044394-037-1019  
 Reporting Date: 05/02/2026

Parameter Required: As Per Work Order  
 Sample Collected By: Vardan EnviroLab Representative

S. No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	312 L 22	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	330 L 22	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	333 I 22	11.08.2026

PARAMETERS	Concentration of Pollutant											
	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	O <sub>3</sub>	NH <sub>3</sub>	Lead	Nickel	Arsenic	Benzene	B(a)P
	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	mg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ng/m <sup>3</sup>	ng/m <sup>3</sup>	µg/m <sup>3</sup>	ng/m <sup>3</sup>
NAAQ Standard	100	60	80	30	4	180	400	1	20	6	5	1
Date of Monitoring	02/01/2026	59.15	25.62	21.38	19.52	0.60	22.83	BLQ	BLQ	BLQ	BLQ	BLQ
05/01/2026	61.82	26.34	23.54	21.42	0.72	26.62	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
08/01/2026	57.68	28.75	19.69	22.35	0.82	21.88	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
13/01/2026	64.27	31.25	20.35	20.96	0.66	23.21	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
16/01/2026	60.35	30.08	21.82	23.72	0.56	20.76	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
19/01/2026	58.24	25.65	27.18	18.13	0.59	24.83	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
22/01/2026	61.52	28.53	22.53	22.67	0.70	22.97	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
27/01/2026	64.32	33.64	24.35	26.89	0.68	27.15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
30/01/2026	56.23	29.83	26.14	24.76	0.73	23.68	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Maximum	64.32	33.64	27.18	26.89	0.82	27.15	--	--	--	--	--	--
Minimum	56.23	25.62	19.69	18.13	0.56	20.76	--	--	--	--	--	--
Average	60.39	28.85	22.99	22.26	0.67	23.77	--	--	--	--	--	--
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-19) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	VEL/EN V/STP/11 0 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004

Note: -STP-Standard Testing procedure, BLQ- Below Limit of Quantification, LOQ- Limit of Quantification.  
 NAQS- National Ambient Air Quality Standards.

\*\*\*End of Report\*\*\*

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TEST REPORTS  
OF  
AMBIENT NOISE  
QUALITY  
MONITORING



## Test Report

Sample Number:	VEL/AP/37-45	Report No.:	VEL/AP/2601000037-0045
Name & Address of the Project:	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	5500044394-037-1019
Sampling & Analysis Protocol:	IS 9989 & CPCB Guidelines	Reporting Date:	05/02/2026
		Parameter Required:	As Per Work Order
		Sample Collected By:	Vardan Envirolab Representative

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- Main Plant Area (ADC Plant)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
02/01/2026	64.3	57.3	54.5	64.25	53.79	dB(A)
05/01/2026	61.0	51.5	53.2	63.53	52.13	dB(A)
08/01/2026	63.5	56.2	52.1	58.16	54.33	dB(A)
13/01/2026	61.5	54.3	53.5	52.72	46.28	dB(A)
16/01/2026	66.8	58.4	56.4	59.36	50.79	dB(A)
19/01/2026	64.7	59.5	59.8	62.14	53.38	dB(A)
22/01/2026	63.2	57.3	60.1	64.98	55.19	dB(A)
27/01/2026	65.6	58.2	53.4	60.27	52.40	dB(A)
30/01/2026	62.5	56.0	52.5	61.15	56.92	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq</sub>	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
- Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.
- \*dB(A) L<sub>Eq</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relative to human hearing.

Note:- \*A "decibel" is a unit in which noise is measured.

\*\*\*End of Report\*\*\*



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## Test Report

Sample Number:	VEL/AP/46-54	Report No.:	VEL/AP/2601000046-0054
Name & Address of the Project:	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	5500044394-037-1019
Sampling & Analysis Protocol:	IS 9989 & CPCB Guidelines	Reporting Date:	05/02/2026
		Parameter Required:	As Per Work Order
		Sample Collected By:	Vardan Envirolab Representative

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- Safety Park (CHP Area)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
02/01/2026	56.1	48.1	49.2	54.20	43.24	dB(A)
05/01/2026	53.4	46.5	48.4	52.12	44.16	dB(A)
08/01/2026	57.5	47.5	47.5	48.37	40.34	dB(A)
13/01/2026	50.1	43.6	50.4	53.16	42.27	dB(A)
16/01/2026	49.9	42.5	54.2	50.12	43.69	dB(A)
19/01/2026	55.3	43.7	47.5	49.91	44.73	dB(A)
22/01/2026	53.6	46.8	47.2	47.62	40.17	dB(A)
27/01/2026	58.9	45.2	49.3	53.08	42.28	dB(A)
30/01/2026	56.1	43.7	48.2	52.72	41.96	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq</sub>	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
- Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.
- \*dB(A) L<sub>Eq</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Note:- \*A "decibel" is a unit in which noise is measured.

\*\*\*End of Report\*\*\*



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## Test Report

Sample Number:	VEL/AP/55-63	Report No.:	VEL/AP/2601000055-0063
Name & Address of the Project:	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	5500044394-037-1019
Sampling & Analysis Protocol:	IS 9989 & CPCB Guidelines	Reporting Date:	05/02/2026
		Parameter Required:	As Per Work Order
		Sample Collected By:	Vardan Envirolab Representative

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- PT Plant (Central Store Area)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
02/01/2026	70.6	55.3	59.1	64.36	54.43	dB(A)
05/01/2026	66.2	52.1	57.1	65.42	52.61	dB(A)
08/01/2026	64.8	59.2	58.2	63.62	50.15	dB(A)
13/01/2026	67.5	54.2	54.3	61.27	53.24	dB(A)
16/01/2026	63.1	58.7	51.2	64.43	56.37	dB(A)
19/01/2026	66.9	53.6	58.6	60.26	59.43	dB(A)
22/01/2026	69.4	50.7	52.7	68.13	52.08	dB(A)
27/01/2026	68.2	54.5	53.2	57.47	54.78	dB(A)
30/01/2026	62.1	58.2	51.7	61.35	53.64	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq</sub>	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
- Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.
- \*dB(A) L<sub>Eq</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Note: \*A "decibel" is a unit in which noise is measured.

\*\*\*End of Report\*\*\*



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## Test Report

Sample Number:	VEL/AP/64-72	Report No.:	VEL/AP/2601000064-0072
Name & Address of the Project:	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	5500044394-037-1019
Sampling & Analysis Protocol:	IS 9989 & CPCB Guidelines	Reporting Date:	05/02/2026
		Parameter Required:	As Per Work Order
		Sample Collected By:	Vardan Envirolab Representative

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- Township (Field Hostel)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
02/01/2026	52.0	51.8	56.3	53.17	43.79	dB(A)
05/01/2026	53.5	52.6	59.4	50.42	42.53	dB(A)
08/01/2026	56.4	49.2	57.3	54.15	41.28	dB(A)
13/01/2026	53.8	48.4	54.5	53.52	44.96	dB(A)
16/01/2026	56.7	50.7	58.7	52.43	40.02	dB(A)
19/01/2026	54.2	56.1	56.8	49.75	38.56	dB(A)
22/01/2026	59.0	51.2	55.1	51.38	43.35	dB(A)
27/01/2026	56.7	52.7	50.4	52.93	40.79	dB(A)
30/01/2026	58.1	53.8	53.5	50.79	42.63	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq</sub>	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

1. Day Time shall mean from 06.00 A.M. to 10.00 P.M.  
2. Night Time shall mean from 10.00 P.M. to 06.00 A.M.  
3. Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.  
4. Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.  
5. \*dB(A) L<sub>Eq</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Note: \*A "decibel" is a unit in which noise is measured.

\*\*\*End of Report\*\*\*



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**END OF THE  
REPORT**



## Test Report

Sample Number:	VEL/AP/01-09	Report No.:	VEL/AP/2510000001-0009
Name & Address of the Project:	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sampling Location:	Main Plant Area (ADC Office)	Party Reference No.:	5500044394-037-1019
Sample Description:	Ambient Air Quality Monitoring	Reporting Date:	05/11/2025
Sampling & Analysis Protocol:	IS 5182 & STP	Parameter Required:	As per Work Order
		Sample Collected By:	Vardan EnviroLab Representative

S. No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	429 A 24	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	157 I 2020	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	440 I 24	11.08.2026

PARAMETERS	Concentration of Pollutant											
	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>x</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	O <sub>3</sub> µg/m <sup>3</sup>	NH <sub>3</sub> µg/m <sup>3</sup>	Lead µg/m <sup>3</sup>	Nickel ng/m <sup>3</sup>	Arsenic ng/m <sup>3</sup>	Benzene µg/m <sup>3</sup>	B(a)P ng/m <sup>3</sup>
@NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1
Date of Monitoring	03/10/2025	59.33	30.27	17.49	19.41	0.54	20.65	BLQ	BLQ	BLQ	BLQ	BLQ
	06/10/2025	54.72	28.51	16.42	18.63	0.76	22.57	BLQ	BLQ	BLQ	BLQ	BLQ
	08/10/2025	60.35	31.69	20.75	17.53	0.61	23.25	BLQ	BLQ	BLQ	BLQ	BLQ
	14/10/2025	57.42	29.51	18.62	18.76	0.69	26.75	BLQ	BLQ	BLQ	BLQ	BLQ
	16/10/2025	61.86	34.76	17.57	20.14	0.58	25.18	BLQ	BLQ	BLQ	BLQ	BLQ
	21/10/2025	60.15	33.78	21.42	21.47	0.81	24.32	BLQ	BLQ	BLQ	BLQ	BLQ
	23/10/2025	58.76	27.19	18.31	16.39	0.55	23.63	BLQ	BLQ	BLQ	BLQ	BLQ
	27/10/2025	55.79	26.46	16.67	15.79	0.67	28.79	BLQ	BLQ	BLQ	BLQ	BLQ
30/10/2025	62.38	36.53	22.64	21.36	0.67	24.91	BLQ	BLQ	BLQ	BLQ	BLQ	
Maximum	62.38	36.53	22.64	21.47	0.81	28.79	--	--	--	--	--	--
Minimum	54.72	26.46	16.42	15.79	0.54	20.65	--	--	--	--	--	--
Average	58.97	30.97	18.87	18.83	0.65	24.45	--	--	--	--	--	--
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	VEL/E NV/ST P/110 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004

Note- #STP-Standard Testing Procedure, BLQ- Below Limit of Quantification, LOQ- Limit of Quantification.

@NAAQS- National Ambient Air Quality Standards.



\*\*\*End of Report\*\*\*



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# Vardan Envirolab LLP

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (HR)  
ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number:	VEL/AP/10-18	Report No.:	VEL/AP/2510000010-0018
Name & Address of the Project:	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sampling Location:	Safety Park (CHP Area)	Party Reference No.:	5500044394-037-1019
Sample Description:	Ambient Air Quality Monitoring	Reporting Date:	05/11/2025
Sampling & Analysis Protocol:	IS 5182 & STP	Parameter Required:	As per Work Order
		Sample Collected By:	Vardan Envirolab Representative

S.No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	46 G 22	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	486 A 2024	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	447 A 22	11.08.2026

PARAMETERS	Concentration of Pollutant												
	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>x</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	O <sub>3</sub> µg/m <sup>3</sup>	NH <sub>3</sub> µg/m <sup>3</sup>	Lead µg/m <sup>3</sup>	Nickel ng/m <sup>3</sup>	Arsenic ng/m <sup>3</sup>	Benzene µg/m <sup>3</sup>	B(a)P ng/m <sup>3</sup>	
@NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1	
Date of Monitoring	03/10/2025	56.24	28.34	17.54	17.15	0.77	21.30	BLQ	BLQ	BLQ	BLQ	BLQ	
	06/10/2025	58.43	29.42	16.21	18.43	0.69	23.47	BLQ	BLQ	BLQ	BLQ	BLQ	
	08/10/2025	51.28	23.52	18.49	16.85	0.68	24.52	BLQ	BLQ	BLQ	BLQ	BLQ	
	14/10/2025	53.61	25.15	19.48	13.61	0.57	25.65	BLQ	BLQ	BLQ	BLQ	BLQ	
	16/10/2025	57.36	26.76	17.52	15.42	0.79	21.46	BLQ	BLQ	BLQ	BLQ	BLQ	
	21/10/2025	54.21	28.63	20.69	19.78	0.75	26.75	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
	23/10/2025	52.67	22.75	18.76	16.19	0.62	24.75	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
	27/10/2025	60.19	30.67	21.30	21.87	0.58	28.89	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
	30/10/2025	56.12	27.40	17.26	18.36	0.74	23.25	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Maximum	60.19	30.67	21.30	21.87	0.79	28.89	--	--	--	--	--	--	
Minimum	51.28	22.75	16.21	13.61	0.57	21.30	--	--	--	--	--	--	
Average	55.56	26.96	18.58	17.51	0.68	24.44	--	--	--	--	--	--	
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5	
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	VEL/E NV/ST P/110 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004	

Note: #STP-Standard Testing Procedure, BLQ -Below Limit of Quantification, LOQ -Limit of Quantification.

@NAAQS- National Ambient Air Quality Standards.

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ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number:	VEL/AP/19-27	Report No.:	VEL/AP/2510000019-0027
Name & Address of the Project:	M/s 1027, Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sampling Location:	PT Plant (Central Store Area)	Party Reference No.:	5500044394-037-1019
Sample Description:	Ambient Air Quality Monitoring	Reporting Date:	05/11/2025
Sampling & Analysis Protocol:	IS 5182 & STP	Parameter Required:	As per Work Order
		Sample Collected By:	Vardan EnviroLab Representative

S. No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	428 A 24	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	485 A 2024	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	120 I 22	11.08.2026

PARAMETERS	Concentration of Pollutant											
	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>x</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	O <sub>3</sub> µg/m <sup>3</sup>	NH <sub>3</sub> µg/m <sup>3</sup>	Lead µg/m <sup>3</sup>	Nickel ng/m <sup>3</sup>	Arsenic ng/m <sup>3</sup>	Benzene µg/m <sup>3</sup>	B(a)P ng/m <sup>3</sup>
@NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1
Date of Monitoring	03/10/2025	61.25	34.55	22.54	19.25	0.84	22.41	BLQ	BLQ	BLQ	BLQ	BLQ
	06/10/2025	58.43	29.87	20.17	22.43	0.69	23.47	BLQ	BLQ	BLQ	BLQ	BLQ
	08/10/2025	60.74	32.96	23.41	23.15	0.64	25.76	BLQ	BLQ	BLQ	BLQ	BLQ
	14/10/2025	63.15	35.41	17.86	21.27	0.70	26.15	BLQ	BLQ	BLQ	BLQ	BLQ
	16/10/2025	59.42	28.30	16.27	20.19	0.68	23.64	BLQ	BLQ	BLQ	BLQ	BLQ
	21/10/2025	64.97	37.71	21.42	22.80	0.77	27.83	BLQ	BLQ	BLQ	BLQ	BLQ
	23/10/2025	62.47	34.05	22.15	19.76	0.61	26.36	BLQ	BLQ	BLQ	BLQ	BLQ
	27/10/2025	68.76	36.97	25.36	24.36	0.67	28.71	BLQ	BLQ	BLQ	BLQ	BLQ
	30/10/2025	61.78	30.86	20.64	21.74	0.59	25.30	BLQ	BLQ	BLQ	BLQ	BLQ
Maximum	68.76	37.71	25.36	24.36	0.84	28.71	--	--	--	--	--	--
Minimum	58.43	28.30	16.27	19.25	0.59	22.41	--	--	--	--	--	--
Average	62.33	33.40	21.09	21.66	0.68	25.51	--	--	--	--	--	--
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	VEL/E NV/ST P/110 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004

Note: #STP-Standard Testing Procedure, BLQ- Below Limit of Quantification, LOQ- Limit of Quantification.

@NAAQS- National Ambient Air Quality Standards.

\*\*\*End of Report\*\*\*



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# Vardan Envirolab LLP

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (HR)  
ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number:	VEL/AP/28-36	Report No.:	VEL/AP/251000028-0036
Name & Address of the Project:	M/s 1027, Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sampling Location:	Township (Field Hostel)	Party Reference No.:	5500044394-037-1019
Sample Description:	Ambient Air Quality Monitoring	Reporting Date:	05/11/2025
Sampling & Analysis Protocol:	IS 5182 & STP	Parameter Required:	As per Work Order
		Sample Collected By:	Vardan Envirolab Representative

S. No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	312 L 22	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	330 L 22	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	333 I 22	11.08.2026

PARAMETERS	Concentration of Pollutant												
	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	O <sub>3</sub>	NH <sub>3</sub>	Lead	Nickel	Arsenic	Benzene	B(a)P	
	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	mg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ng/m <sup>3</sup>	ng/m <sup>3</sup>	µg/m <sup>3</sup>	ng/m <sup>3</sup>	
@NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1	
Date of Monitoring	03/10/2025	56.16	28.71	20.13	16.51	0.57	21.33	BLQ	BLQ	BLQ	BLQ	BLQ	
	06/10/2025	58.71	24.42	19.46	18.32	0.61	25.41	BLQ	BLQ	BLQ	BLQ	BLQ	
	08/10/2025	54.52	27.51	18.24	15.12	0.64	20.67	BLQ	BLQ	BLQ	BLQ	BLQ	
	14/10/2025	60.36	31.24	21.51	17.76	0.73	22.42	BLQ	BLQ	BLQ	BLQ	BLQ	
	16/10/2025	57.12	29.62	19.68	19.30	0.66	24.16	BLQ	BLQ	BLQ	BLQ	BLQ	
	21/10/2025	56.76	26.78	23.30	20.98	0.58	23.28	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
	23/10/2025	55.21	23.51	17.34	17.09	0.57	25.61	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
	27/10/2025	61.89	24.12	22.57	21.32	0.69	25.78	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
	30/10/2025	57.02	27.41	18.12	19.27	0.72	23.22	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Maximum	61.89	31.24	23.30	21.32	0.73	25.78	--	--	--	--	--	--	
Minimum	54.52	23.51	17.34	15.12	0.57	20.67	--	--	--	--	--	--	
Average	57.52	27.03	20.03	18.40	0.64	23.54	--	--	--	--	--	--	
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5	
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	VEL/EN V/STP/11 0 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004	

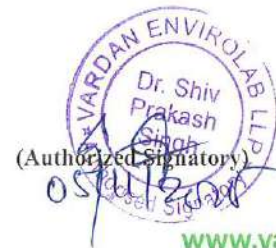
Note- #STP-Standard Testing Procedure, BLQ- Below Limit of Quantification, LOQ- Limit of Quantification.

@NAAQS- National Ambient Air Quality Standards.

\*\*\*End of Report\*\*\*

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## Test Report

Sample Number: VEL/AP/37-45 Report No.: VEL/AP/2510000037-0045  
 Name & Address of the Project: M/s Talcher Super Thermal Power Station  
 P.O.- Talcher Thermal, Angul, Angul, Odisha-759101  
 Format No.: 7.8 F-03  
 Party Reference No.: 5500044394-037-1019  
 Reporting Date: 05/11/2025  
 Parameter Required: As per Work Order  
 Sample Collected By: Vardan EnviroLab Representative

Sample Description: Ambient Noise Level Monitoring  
 Sampling & Analysis Protocol: IS 9989 & CPCB Guidelines

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- Main Plant Area (ADC Plant)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
03/10/2025	57.5	53.1	53.2	62.41	53.24	dB(A)
06/10/2025	60.7	52.3	54.1	58.63	50.21	dB(A)
08/10/2025	63.6	55.7	50.5	52.62	53.69	dB(A)
14/10/2025	62.5	50.5	52.1	53.87	49.37	dB(A)
16/10/2025	64.9	57.2	55.2	55.33	51.25	dB(A)
21/10/2025	66.2	53.1	56.7	50.79	48.64	dB(A)
23/10/2025	65.1	56.7	58.3	54.71	52.84	dB(A)
27/10/2025	58.0	55.4	54.1	58.27	51.36	dB(A)
30/10/2025	61.2	57.1	52.7	52.28	50.39	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq</sub>	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
- Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.
- \*dB(A) L<sub>Eq</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Note:- \*A "decibel" is a unit in which noise is measured.

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## Test Report

Sample Number:	VEL/AP/46-54	Report No.:	VEL/AP/2510000046-0054
Name & Address of the Project:	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	5500044394-037-1019
Sampling & Analysis Protocol:	IS 9989 & CPCB Guidelines	Reporting Date:	05/11/2025
		Parameter Required:	As per Work Order
		Sample Collected By:	Vardan EnviroLab Representative

### AMBIENT NOISE QUALITY MONITORING RESULTS

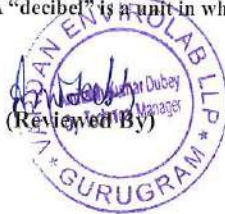
Sampling Location- Safety Park (CHP Area)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
03/10/2025	51.3	47.5	49.2	49.24	42.34	dB(A)
06/10/2025	48.1	43.4	48.4	46.31	45.21	dB(A)
08/10/2025	55.4	42.5	47.2	45.58	43.96	dB(A)
14/10/2025	49.2	44.9	51.0	47.94	40.51	dB(A)
16/10/2025	47.6	46.4	49.5	46.35	43.46	dB(A)
21/10/2025	52.1	45.3	43.4	43.20	42.27	dB(A)
23/10/2025	56.1	42.4	47.5	45.79	40.36	dB(A)
27/10/2025	53.2	42.8	44.2	48.61	41.02	dB(A)
30/10/2025	48.2	43.6	46.3	52.27	48.36	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq</sub> .	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
- Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.
- \*dB(A) L<sub>Eq</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Note:- \*A "decibel" is a unit in which noise is measured.



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## Test Report

Sample Number: VEL/AP/55-63      Report No.: VEL/AP/2510000055-0063  
 Name & Address of the Project: M/s Talcher Super Thermal Power Station  
 P.O.- Talcher Thermal, Angul, Angul, Odisha-759101      Format No.: 7.8 F-03  
 Party Reference No.: 5500044394-037-1019  
 Reporting Date: 05/11/2025  
 Parameter Required: As per Work Order  
 Sample Collected By: Vardan EnviroLab Representative

Sample Description: Ambient Noise Level Monitoring  
 Sampling & Analysis Protocol: IS 9989 & CPCB Guidelines

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- PT Plant (Central Store Area)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
03/10/2025	60.1	54.2	54.2	59.62	52.46	dB(A)
06/10/2025	64.2	52.7	56.4	51.23	49.25	dB(A)
08/10/2025	63.8	56.1	53.7	52.73	48.74	dB(A)
14/10/2025	68.2	55.3	50.7	56.27	47.86	dB(A)
16/10/2025	65.7	56.7	51.8	58.74	50.03	dB(A)
21/10/2025	60.6	59.1	53.7	57.36	46.48	dB(A)
23/10/2025	65.9	55.7	52.7	53.21	45.64	dB(A)
27/10/2025	63.7	53.2	51.9	54.94	44.76	dB(A)
30/10/2025	67.4	57.8	54.8	63.75	51.37	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq</sub>	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
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- \*dB(A) L<sub>Eq</sub> denotes the time weighted average of the level of sound in decibels on scale A which is reliable to human hearing.

Note:- \*A "decibel" is a unit in which noise is measured.



\*\*\*End of Report\*\*\*



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## Test Report

Sample Number: VEL/AP/64-72      Report No.: VEL/AP/2510000064-0072  
 Name & Address of the Project: M/s Talcher Super Thermal Power Station  
 P.O.- Talcher Thermal, Angul, Angul, Odisha-759101      Format No.: 7.8 F-03  
 Party Reference No.: 5500044394-037-1019  
 Reporting Date: 05/11/2025  
 Parameter Required: As per Work Order  
 Sample Collected By: Vardan EnviroLab Representative

Sample Description: Ambient Noise Level Monitoring  
 Sampling & Analysis Protocol: IS 9989 & CPCB Guidelines

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- Township (Field Hostel)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
03/10/2025	52.5	45.1	59.4	54.51	44.69	dB(A)
06/10/2025	58.3	47.5	55.6	52.42	42.27	dB(A)
08/10/2025	57.2	46.4	53.7	53.13	41.18	dB(A)
14/10/2025	56.5	43.5	50.4	50.38	43.94	dB(A)
16/10/2025	59.4	50.2	58.5	51.42	40.75	dB(A)
21/10/2025	50.3	51.4	53.6	53.97	41.38	dB(A)
23/10/2025	58.1	48.3	56.8	54.03	39.79	dB(A)
27/10/2025	51.4	50.6	52.2	51.75	43.87	dB(A)
30/10/2025	59.2	48.7	51.7	49.24	38.46	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq</sub>	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
- Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.
- \*dB(A) L<sub>Eq</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Note:- \*A "decibel" is a unit in which noise is measured.

\*\*\*End of Report\*\*\*



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ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number: VEL/AP/01-08  
 Name & Address of the Project: M/s Talcher Super Thermal Power Station  
 P.O.- Talcher Thermal, Angul, Angul, Odisha-759101  
 Sampling Location: Main Plant Area (ADC Office)  
 Sample Description: Ambient Air Quality Monitoring  
 Sampling & Analysis Protocol: IS 5182 & STP

Report No.: VEL/AP/2511000001-0008  
 Format No.: 7.8 F-03  
 Party Reference No.: 5500044394-037-1019  
 Reporting Date: 05/12/2025

Parameter Required: As per Work Order  
 Sample Collected By: Vardan EnviroLab Representative

S. No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	429 A 24	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	157 I 2020	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	440 I 24	11.08.2026

PARAMETERS	Concentration of Pollutant											
	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>x</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	O <sub>3</sub> µg/m <sup>3</sup>	NH <sub>3</sub> µg/m <sup>3</sup>	Lead µg/m <sup>3</sup>	Nickel ng/m <sup>3</sup>	Arsenic ng/m <sup>3</sup>	Benzene µg/m <sup>3</sup>	B(a)P ng/m <sup>3</sup>
@NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1
Date of Monitoring	03/11/2025	64.15	32.21	18.76	18.61	0.73	22.52	BLQ	BLQ	BLQ	BLQ	BLQ
	06/11/2025	58.42	29.36	17.21	19.58	0.62	21.64	BLQ	BLQ	BLQ	BLQ	BLQ
	10/11/2025	63.86	33.58	21.25	20.64	0.70	24.68	BLQ	BLQ	BLQ	BLQ	BLQ
	13/11/2025	59.67	28.76	19.94	17.16	0.73	25.49	BLQ	BLQ	BLQ	BLQ	BLQ
	18/11/2025	60.56	35.15	18.48	21.25	0.62	23.83	BLQ	BLQ	BLQ	BLQ	BLQ
	20/11/2025	61.32	32.94	20.61	22.41	0.72	24.94	BLQ	BLQ	BLQ	BLQ	BLQ
	24/11/2025	57.49	26.48	17.02	18.24	0.69	20.18	BLQ	BLQ	BLQ	BLQ	BLQ
	27/11/2025	65.37	36.16	23.36	23.53	0.78	27.57	BLQ	BLQ	BLQ	BLQ	BLQ
Maximum	65.37	36.16	23.36	23.53	0.78	27.57	--	--	--	--	--	--
Minimum	57.49	26.48	17.02	17.16	0.62	20.18	--	--	--	--	--	--
Average	61.35	31.83	19.57	20.17	0.69	23.85	--	--	--	--	--	--
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	VEL/E NV/ST P/110 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004

Note- #STP-Standard Testing Procedure, BLQ- Below Limit of Quantification, LOQ- Limit of Quantification.  
 @NAAQS- National Ambient Air Quality Standards.



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# Vardan Envirolab LLP

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (HR)  
ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number:	VEL/AP/09-16	Report No.:	VEL/AP/2511000009-0016
Name & Address of the Project:	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sampling Location:	Safety Park (CHP Area)	Party Reference No.:	5500044394-037-1019
Sample Description:	Ambient Air Quality Monitoring	Reporting Date:	05/12/2025
Sampling & Analysis Protocol:	IS 5182 & STP	Parameter Required:	As per Work Order
		Sample Collected By:	Vardan EnviroLab Representative

S.No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	46 G 22	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	486 A 2024	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	447 A 22	11.08.2026

PARAMETERS	Concentration of Pollutant											
	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>x</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	O <sub>3</sub> µg/m <sup>3</sup>	NH <sub>3</sub> µg/m <sup>3</sup>	Lead µg/m <sup>3</sup>	Nickel ng/m <sup>3</sup>	Arsenic ng/m <sup>3</sup>	Benzene µg/m <sup>3</sup>	B(a)P ng/m <sup>3</sup>
@NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1
Date of Monitoring	03/11/2025	57.61	27.61	18.47	19.82	0.64	20.46	BLQ	BLQ	BLQ	BLQ	BLQ
	06/11/2025	60.27	30.57	17.61	20.64	0.75	25.82	BLQ	BLQ	BLQ	BLQ	BLQ
	10/11/2025	54.31	26.34	19.42	17.25	0.73	26.42	BLQ	BLQ	BLQ	BLQ	BLQ
	13/11/2025	55.98	28.61	16.25	15.53	0.61	24.05	BLQ	BLQ	BLQ	BLQ	BLQ
	18/11/2025	58.74	29.49	17.32	16.91	0.75	23.38	BLQ	BLQ	BLQ	BLQ	BLQ
	20/11/2025	56.49	25.31	21.72	18.52	0.68	27.94	BLQ	BLQ	BLQ	BLQ	BLQ
	24/11/2025	57.20	24.97	20.19	17.49	0.70	22.17	BLQ	BLQ	BLQ	BLQ	BLQ
	27/11/2025	61.39	32.10	22.43	23.28	0.66	29.63	BLQ	BLQ	BLQ	BLQ	BLQ
Maximum	61.39	32.10	22.43	23.28	0.75	29.63	--	--	--	--	--	--
Minimum	54.31	24.97	16.25	15.53	0.61	20.46	--	--	--	--	--	--
Average	57.74	28.12	19.17	18.68	0.69	24.98	--	--	--	--	--	--
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	VEL/E NV/ST P/110 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004

Note- #STP-Standard Testing Procedure, BLQ -Below Limit of Quantification, LOQ -Limit of Quantification.

@NAAQS- National Ambient Air Quality Standards.

\*\*\*End of Report\*\*\*



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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (HR)  
ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number:	VEL/AP/17-24	Report No.:	VEL/AP/2511000017-0024
Name & Address of the Project:	M/s 1027, Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sampling Location:	PT Plant (Central Store Area)	Party Reference No.:	5500044394-037-1019
Sample Description:	Ambient Air Quality Monitoring	Reporting Date:	05/12/2025
Sampling & Analysis Protocol:	IS 5182 & STP	Parameter Required:	As per Work Order
		Sample Collected By:	Vardan Envirolab Representative

S. No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	428 A 24	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	485 A 2024	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	120 I 22	11.08.2026

PARAMETERS	Concentration of Pollutant											
	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>x</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	O <sub>3</sub> µg/m <sup>3</sup>	NH <sub>3</sub> µg/m <sup>3</sup>	Lead µg/m <sup>3</sup>	Nickel ng/m <sup>3</sup>	Arsenic ng/m <sup>3</sup>	Benzene µg/m <sup>3</sup>	B(a)P ng/m <sup>3</sup>
@NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1
Date of Monitoring	03/11/2025	64.12	35.13	23.64	18.75	0.79	24.16	BLQ	BLQ	BLQ	BLQ	BLQ
	06/11/2025	60.27	31.20	21.42	23.16	0.53	22.28	BLQ	BLQ	BLQ	BLQ	BLQ
	10/11/2025	61.50	34.25	24.25	24.52	0.77	23.61	BLQ	BLQ	BLQ	BLQ	BLQ
	13/11/2025	66.49	33.43	19.42	25.15	0.69	24.58	BLQ	BLQ	BLQ	BLQ	BLQ
	18/11/2025	62.35	36.61	18.13	19.23	0.75	25.35	BLQ	BLQ	BLQ	BLQ	BLQ
	20/11/2025	68.76	34.28	22.97	24.60	0.73	26.79	BLQ	BLQ	BLQ	BLQ	BLQ
	24/11/2025	63.05	35.19	20.52	21.52	0.58	28.30	BLQ	BLQ	BLQ	BLQ	BLQ
	27/11/2025	71.48	38.21	27.39	23.47	0.78	29.83	BLQ	BLQ	BLQ	BLQ	BLQ
Maximum	71.48	38.21	27.39	25.15	0.79	29.83	--	--	--	--	--	--
Minimum	60.27	31.20	18.13	18.75	0.53	22.28	--	--	--	--	--	--
Average	64.75	34.78	22.21	22.55	0.70	25.61	--	--	--	--	--	--
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	VEL/E NV/ST P/110 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004

Note- #STP-Standard Testing Procedure, BLQ- Below Limit of Quantification, LOQ- Limit of Quantification.

@NAAQS- National Ambient Air Quality Standards.

\*\*\*End of Report\*\*\*



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## Test Report

Sample Number: VEL/AP/25-32  
 Name & Address of the Project: M/s 1027, Talcher Super Thermal Power Station  
 P.O.- Talcher Thermal, Angul, Angul, Odisha-759101  
 Sampling Location: Township (Field Hostel)  
 Sample Description: Ambient Air Quality Monitoring  
 Sampling & Analysis Protocol: IS 5182 & STP

Report No.: VEL/AP/2511000025-0032  
 Format No.: 7.8 F-03  
 Party Reference No.: 5500044394-037-1019  
 Reporting Date: 05/12/2025

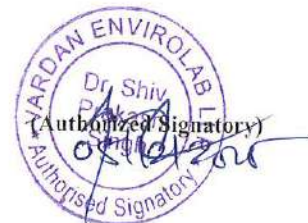
Parameter Required: As per Work Order  
 Sample Collected By: Vardan EnviroLab Representative

S. No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	312 L 22	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	330 L 22	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	333 I 22	11.08.2026

PARAMETERS	Concentration of Pollutant											
	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>x</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	O <sub>3</sub> µg/m <sup>3</sup>	NH <sub>3</sub> µg/m <sup>3</sup>	Lead µg/m <sup>3</sup>	Nickel ng/m <sup>3</sup>	Arsenic ng/m <sup>3</sup>	Benzene µg/m <sup>3</sup>	B(a)P ng/m <sup>3</sup>
@NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1
Date of Monitoring	03/11/2025	57.42	27.51	21.64	17.94	0.61	22.64	BLQ	BLQ	BLQ	BLQ	BLQ
	06/11/2025	59.64	23.62	20.27	19.58	0.57	24.98	BLQ	BLQ	BLQ	BLQ	BLQ
	10/11/2025	55.31	28.79	19.51	16.25	0.69	21.30	BLQ	BLQ	BLQ	BLQ	BLQ
	13/11/2025	61.25	32.34	23.36	18.47	0.66	23.67	BLQ	BLQ	BLQ	BLQ	BLQ
	18/11/2025	58.61	31.01	18.47	20.39	0.73	25.97	BLQ	BLQ	BLQ	BLQ	BLQ
	20/11/2025	57.52	26.53	25.53	21.81	0.75	24.52	BLQ	BLQ	BLQ	BLQ	BLQ
	24/11/2025	57.14	24.94	17.05	19.61	0.62	26.35	BLQ	BLQ	BLQ	BLQ	BLQ
	27/11/2025	60.93	30.36	22.81	22.79	0.78	27.98	BLQ	BLQ	BLQ	BLQ	BLQ
Maximum	61.25	32.34	25.53	22.79	0.78	27.98	--	--	--	--	--	--
Minimum	55.31	23.62	17.05	16.25	0.57	21.30	--	--	--	--	--	--
Average	58.47	28.13	21.08	19.60	0.67	24.67	--	--	--	--	--	--
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	VEL/EN V/STP/11 0 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004

Note- #STP-Standard Testing Procedure, BLQ- Below Limit of Quantification, LOQ- Limit of Quantification.  
 @NAAQS- National Ambient Air Quality Standards.

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## Test Report

Sample Number:	VEL/AP/33-40	Report No.:	VEL/AP/2511000033-0040
Name & Address of the Project:	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	5500044394-037-1019
Sampling & Analysis Protocol:	IS 9989 & CPCB Guidelines	Reporting Date:	05/12/2025
		Parameter Required:	As per Work Order
		Sample Collected By:	Vardan EnviroLab Representative

### AMBIENT NOISE QUALITY MONITORING RESULTS

#### Sampling Location- Main Plant Area (ADC Plant)

Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
03/11/2025	59.1	55.2	54.4	64.36	54.61	dB(A)
06/11/2025	62.4	53.4	55.2	60.42	52.24	dB(A)
10/11/2025	64.2	56.2	51.6	56.52	51.78	dB(A)
13/11/2025	61.6	52.1	53.5	51.34	48.43	dB(A)
18/11/2025	66.8	58.3	56.7	57.16	50.20	dB(A)
20/11/2025	63.4	54.4	57.2	53.42	51.76	dB(A)
24/11/2025	67.8	57.5	59.2	59.36	53.79	dB(A)
27/11/2025	60.2	56.9	53.0	60.18	52.14	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq</sub> .	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
- Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.
- \*dB(A) L<sub>Eq</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Note:- \*A "decibel" is a unit in which noise is measured.

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## Test Report

Sample Number:	VEL/AP/41-48	Report No.:	VEL/AP/2511000041-0048
Name & Address of the Project:	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	5500044394-037-1019
Sampling & Analysis Protocol:	IS 9989 & CPCB Guidelines	Reporting Date:	05/12/2025
		Parameter Required:	As per Work Order
		Sample Collected By:	Vardan EnviroLab Representative

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- Safety Park (CHP Area)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
03/11/2025	53.1	48.4	47.5	51.23	43.61	dB(A)
06/11/2025	49.5	45.5	49.2	49.24	42.70	dB(A)
10/11/2025	54.5	43.6	48.4	46.37	44.61	dB(A)
13/11/2025	48.6	42.4	50.5	50.79	42.35	dB(A)
18/11/2025	49.1	47.5	51.6	48.98	40.66	dB(A)
20/11/2025	55.2	48.6	42.3	46.32	43.97	dB(A)
24/11/2025	57.4	43.9	44.1	47.28	41.53	dB(A)
27/11/2025	58.9	44.7	45.8	51.53	44.30	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq</sub>	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
- Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.
- \*dB(A) L<sub>Eq</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Note:- \*A "decibel" is a unit in which noise is measured.



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## Test Report

Sample Number:	VEL/AP/49-56	Report No.:	VEL/AP/2511000049-0056
Name & Address of the Project:	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	5500044394-037-1019
Sampling & Analysis Protocol:	IS 9989 & CPCB Guidelines	Reporting Date:	05/12/2025
		Parameter Required:	As per Work Order
		Sample Collected By:	Vardan EnviroLab Representative

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- PT Plant (Central Store Area)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
03/11/2025	64.3	53.5	56.1	60.42	53.61	dB(A)
06/11/2025	60.5	51.4	57.5	55.86	51.24	dB(A)
10/11/2025	62.6	57.6	54.5	53.68	50.58	dB(A)
13/11/2025	67.1	56.5	52.4	59.16	49.76	dB(A)
18/11/2025	66.8	57.2	53.0	61.24	51.13	dB(A)
20/11/2025	63.2	58.2	54.5	62.94	50.86	dB(A)
24/11/2025	66.8	56.9	51.4	54.81	48.35	dB(A)
27/11/2025	64.2	54.7	53.8	56.96	47.64	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

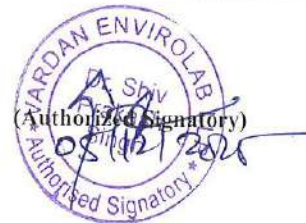
Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq</sub>	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
- Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.
- \*dB(A) L<sub>Eq</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Note:- \*A "decibel" is a unit in which noise is measured.



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# Vardan EnviroLab LLP

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (HR)  
ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number:	VEL/AP/57-64	Report No.:	VEL/AP/2511000056-0064
Name & Address of the Project:	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	5500044394-037-1019
Sampling & Analysis Protocol:	IS 9989 & CPCB Guidelines	Reporting Date:	05/12/2025
		Parameter Required:	As per Work Order
		Sample Collected By:	Vardan EnviroLab Representative

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- Township (Field Hostel)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
03/11/2025	51.8	46.4	58.1	51.36	43.16	dB(A)
06/11/2025	57.5	48.2	57.5	53.64	41.98	dB(A)
10/11/2025	56.3	49.3	54.6	54.94	43.33	dB(A)
13/11/2025	54.2	44.2	52.3	52.68	44.25	dB(A)
18/11/2025	56.1	52.4	57.3	53.97	42.46	dB(A)
20/11/2025	52.7	53.4	52.5	52.56	43.75	dB(A)
24/11/2025	59.2	45.6	57.2	52.41	41.58	dB(A)
27/11/2025	56.4	51.7	51.0	50.36	44.32	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq</sub> .	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
- Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.
- \*dB(A) L<sub>Eq</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Note:- \*A "decibel" is a unit in which noise is measured.

\*\*\*End of Report\*\*\*



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ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number:	VEL/AP/01-09	Report No.:	VEL/AP/2512000001-0009
Name & Address of the Project:	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sampling Location:	Main Plant Area (ADC Office)	Party Reference No.:	5500044394-037-1019
Sample Description:	Ambient Air Quality Monitoring	Reporting Date:	05/01/2026
Sampling & Analysis Protocol:	IS 5182 & STP	Parameter Required:	As Per Work Order
		Sample Collected By:	Vardan Envirolab Representative

S. No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	429 A 24	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	157 I 2020	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	440 I 24	11.08.2026

PARAMETERS	Concentration of Pollutant											
	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	O <sub>3</sub>	NH <sub>3</sub>	Lead	Nickel	Arsenic	Benzene	B(a)P
	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	mg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ng/m <sup>3</sup>	ng/m <sup>3</sup>	µg/m <sup>3</sup>	ng/m <sup>3</sup>
@NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1
Date of Monitoring	01/12/2025	63.16	37.52	17.42	22.41	0.75	22.49	BLQ	BLQ	BLQ	BLQ	BLQ
	04/12/2025	60.79	32.42	20.15	19.35	0.68	23.67	BLQ	BLQ	BLQ	BLQ	BLQ
	08/12/2025	64.51	33.16	21.34	20.79	0.70	24.50	BLQ	BLQ	BLQ	BLQ	BLQ
	12/12/2025	61.26	30.69	19.32	21.05	0.62	21.24	BLQ	BLQ	BLQ	BLQ	BLQ
	15/12/2025	61.97	35.22	22.73	23.62	0.77	25.75	BLQ	BLQ	BLQ	BLQ	BLQ
	18/12/2025	58.75	27.71	18.25	22.75	0.53	24.12	BLQ	BLQ	BLQ	BLQ	BLQ
	22/12/2025	65.36	38.82	23.16	24.49	0.64	25.07	BLQ	BLQ	BLQ	BLQ	BLQ
	26/12/2025	66.27	34.76	26.27	26.27	0.56	28.03	BLQ	BLQ	BLQ	BLQ	BLQ
	29/12/2025	68.42	36.15	25.76	23.41	0.61	24.47	BLQ	BLQ	BLQ	BLQ	BLQ
Maximum	68.42	38.82	26.27	26.27	0.77	28.03	--	--	--	--	--	--
Minimum	58.75	27.71	17.42	19.35	0.53	21.24	--	--	--	--	--	--
Average	63.38	34.05	21.60	22.68	0.65	24.37	--	--	--	--	--	--
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	VEL/E NV/ST P/110 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004

Note- #STP-Standard Testing Procedure, BLQ- Below Limit of Quantification, LOQ- Limit of Quantification.

@NAAQS- National Ambient Air Quality Standards.



\*\*\*End of Report\*\*\*



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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (HR)  
ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number: VEL/AP/10-18 Report No.: VEL/AP/2512000010-0018  
 Name & Address of the Project: M/s Talcher Super Thermal Power Station  
 P.O.- Talcher Thermal, Angul, Angul, Odisha-759101  
 Format No.: 7.8 F-03  
 Party Reference No.: 5500044394-037-1019  
 Reporting Date: 05/01/2026  
 Sampling Location: Safety Park (CHP Area) Parameter Required: As Per Work Order  
 Sample Description: Ambient Air Quality Monitoring Sample Collected By: Vardan EnviroLab Representative  
 Sampling & Analysis Protocol: IS 5182 & STP

S.No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	46 G 22	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	486 A 2024	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	447 A 22	11.08.2026

PARAMETERS	Concentration of Pollutant												
	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>x</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	O <sub>3</sub> µg/m <sup>3</sup>	NH <sub>3</sub> µg/m <sup>3</sup>	Lead µg/m <sup>3</sup>	Nickel ng/m <sup>3</sup>	Arsenic ng/m <sup>3</sup>	Benzene µg/m <sup>3</sup>	B(a)P ng/m <sup>3</sup>	
@NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1	
Date of Monitoring	01/12/2025	62.24	25.14	19.25	20.15	0.70	21.27	BLQ	BLQ	BLQ	BLQ	BLQ	
	04/12/2025	63.12	32.18	18.16	22.61	0.56	24.62	BLQ	BLQ	BLQ	BLQ	BLQ	
	08/12/2025	56.94	28.43	17.35	18.34	0.61	27.71	BLQ	BLQ	BLQ	BLQ	BLQ	
	12/12/2025	57.42	29.18	20.18	17.81	0.76	22.26	BLQ	BLQ	BLQ	BLQ	BLQ	
	15/12/2025	56.15	27.46	16.27	15.42	0.64	24.91	BLQ	BLQ	BLQ	BLQ	BLQ	
	18/12/2025	60.34	30.75	25.16	21.24	0.73	29.78	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
	22/12/2025	59.57	26.60	23.76	19.76	0.69	23.55	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
	26/12/2025	64.19	31.42	24.32	25.17	0.52	28.16	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
	29/12/2025	61.27	30.67	22.82	28.42	0.70	26.43	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Maximum	64.19	32.18	25.16	28.42	0.76	29.78	--	--	--	--	--	--	
Minimum	56.15	25.14	16.27	15.42	0.52	21.27	--	--	--	--	--	--	
Average	60.13	29.09	20.80	20.99	0.65	25.41	--	--	--	--	--	--	
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5	
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	VEL/E NV/ST P/110 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004	

Note- #STP-Standard Testing Procedure, BLQ -Below Limit of Quantification, LOQ -Limit of Quantification.

@NAAQS- National Ambient Air Quality Standards.

\*\*\*End of Report\*\*\*



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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (HR)  
ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number: VEL/AP/19-27 Report No.: VEL/AP/2512000019-0027  
 Name & Address of the Project: M/s 1027, Talcher Super Thermal Power Station  
 Format No.: 7.8 F-03  
 Party Reference No.: 5500044394-037-1019  
 P.O.- Talcher Thermal, Angul, Angul, Odisha-759101 Reporting Date: 05/01/2026  
 Sampling Location: PT Plant (Central Store Area) Parameter Required: As Per Work Order  
 Sample Description: Ambient Air Quality Monitoring Sample Collected By: Vardan EnviroLab Representative  
 Sampling & Analysis Protocol: IS 5182 & STP

S. No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	428 A 24	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	485 A 2024	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	120 I 22	11.08.2026

PARAMETERS	Concentration of Pollutant											
	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>x</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	O <sub>3</sub> µg/m <sup>3</sup>	NH <sub>3</sub> µg/m <sup>3</sup>	Lead µg/m <sup>3</sup>	Nickel ng/m <sup>3</sup>	Arsenic ng/m <sup>3</sup>	Benzene µg/m <sup>3</sup>	B(a)P ng/m <sup>3</sup>
@NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1
Date of Monitoring	01/12/2025	61.58	33.42	24.15	19.29	0.59	25.43	BLQ	BLQ	BLQ	BLQ	BLQ
	04/12/2025	62.34	30.51	20.61	22.54	0.68	21.74	BLQ	BLQ	BLQ	BLQ	BLQ
	08/12/2025	64.16	35.54	25.73	23.75	0.60	26.35	BLQ	BLQ	BLQ	BLQ	BLQ
	12/12/2025	67.12	36.79	21.50	26.31	0.72	22.91	BLQ	BLQ	BLQ	BLQ	BLQ
	15/12/2025	60.24	32.80	19.64	20.19	0.67	24.23	BLQ	BLQ	BLQ	BLQ	BLQ
	18/12/2025	67.61	35.24	21.78	25.72	0.69	27.68	BLQ	BLQ	BLQ	BLQ	BLQ
	22/12/2025	64.42	36.11	22.46	22.64	0.71	26.73	BLQ	BLQ	BLQ	BLQ	BLQ
	26/12/2025	70.19	39.27	28.74	24.27	0.66	30.12	BLQ	BLQ	BLQ	BLQ	BLQ
	29/12/2025	68.49	37.41	25.12	25.43	0.73	29.55	BLQ	BLQ	BLQ	BLQ	BLQ
Maximum	70.19	39.27	28.74	26.31	0.73	30.12	--	--	--	--	--	--
Minimum	60.24	30.51	19.64	19.29	0.59	21.74	--	--	--	--	--	--
Average	65.12	35.23	23.30	23.34	0.67	26.08	--	--	--	--	--	--
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	VEL/E NV/ST P/110 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004

Note- #STP-Standard Testing Procedure, BLQ- Below Limit of Quantification, LOQ- Limit of Quantification.

@NAAQS- National Ambient Air Quality Standards.



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ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number: VEL/AP/28-36 Report No.: VEL/AP/2512000028-0036  
 Name & Address of the Project: M/s 1027, Talcher Super Thermal Power Station  
 P.O.- Talcher Thermal, Angul, Angul, Odisha-759101  
 Format No.: 7.8 F-03  
 Party Reference No.: 5500044394-037-1019  
 Reporting Date: 05/01/2026  
 Sampling Location: Township (Field Hostel) Parameter Required: As Per Work Order  
 Sample Description: Ambient Air Quality Monitoring Sample Collected By: Vardan EnviroLab Representative  
 Sampling & Analysis Protocol: IS 5182 & STP

S. No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	312 L 22	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	330 L 22	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	333 I 22	11.08.2026

PARAMETERS	Concentration of Pollutant											
	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	O <sub>3</sub>	NH <sub>3</sub>	Lead	Nickel	Arsenic	Benzene	B(a)P
	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	mg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ng/m <sup>3</sup>	ng/m <sup>3</sup>	µg/m <sup>3</sup>	ng/m <sup>3</sup>
@NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1
Date of Monitoring	01/12/2025	55.43	26.13	20.79	18.74	0.57	23.51	BLQ	BLQ	BLQ	BLQ	BLQ
	04/12/2025	60.24	24.21	22.61	20.60	0.61	25.32	BLQ	BLQ	BLQ	BLQ	BLQ
	08/12/2025	58.41	29.42	18.72	19.64	0.74	20.73	BLQ	BLQ	BLQ	BLQ	BLQ
	12/12/2025	62.46	30.81	24.51	21.39	0.72	24.96	BLQ	BLQ	BLQ	BLQ	BLQ
	15/12/2025	63.18	32.64	19.27	22.05	0.67	22.81	BLQ	BLQ	BLQ	BLQ	BLQ
	18/12/2025	56.13	28.53	26.61	19.97	0.61	25.94	BLQ	BLQ	BLQ	BLQ	BLQ
	22/12/2025	62.76	27.76	20.76	23.42	0.59	21.69	BLQ	BLQ	BLQ	BLQ	BLQ
	26/12/2025	63.61	31.40	23.67	24.79	0.74	28.34	BLQ	BLQ	BLQ	BLQ	BLQ
29/12/2025	59.31	32.67	25.98	23.46	0.69	25.21	BLQ	BLQ	BLQ	BLQ	BLQ	
Maximum	63.61	32.67	26.61	24.79	0.74	28.34	--	--	--	--	--	--
Minimum	55.43	24.21	18.72	18.74	0.57	20.73	--	--	--	--	--	--
Average	60.17	29.28	22.54	21.56	0.66	24.27	--	--	--	--	--	--
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	VEL/EN V/STP/11 0 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004

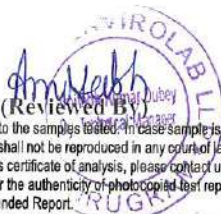
Note: #STP-Standard Testing Procedure, BLQ- Below Limit of Quantification, LOQ- Limit of Quantification.

@NAAQS- National Ambient Air Quality Standards.

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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (HR)  
ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number:	VEL/AP/37-45	Report No.:	VEL/AP/2512000037-0045
Name & Address of the Project:	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	5500044394-037-1019
Sampling & Analysis Protocol:	IS 9989 & CPCB Guidelines	Reporting Date:	05/01/2026
		Parameter Required:	As Per Work Order
		Sample Collected By:	Vardan EnviroLab Representative

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- Main Plant Area (ADC Plant)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
01/12/2025	61.2	58.4	53.2	63.75	51.75	dB(A)
04/12/2025	63.5	52.2	54.4	62.61	53.51	dB(A)
08/12/2025	62.3	57.4	50.8	59.42	53.42	dB(A)
12/12/2025	60.7	53.1	55.1	50.82	47.31	dB(A)
15/12/2025	65.7	56.2	57.2	56.24	52.79	dB(A)
18/12/2025	62.1	57.2	58.7	60.18	54.27	dB(A)
22/12/2025	66.5	56.9	57.9	63.69	56.49	dB(A)
26/12/2025	63.4	55.8	52.2	61.52	55.30	dB(A)
29/12/2025	63.1	57.1	51.4	63.76	57.15	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq</sub>	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
- Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.
- \*dB(A) L<sub>Eq</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Note:- \*A "decibel" is a unit in which noise is measured.

\*\*\*End of Report\*\*\*



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## Test Report

Sample Number:	VEL/AP/46-54	Report No.:	VEL/AP/2512000046-0054
Name & Address of the Project:	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	5500044394-037-1019
Sampling & Analysis Protocol:	IS 9989 & CPCB Guidelines	Reporting Date:	05/01/2026
		Parameter Required:	As Per Work Order
		Sample Collected By:	Vardan EnviroLab Representative

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- Safety Park (CHP Area)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
01/12/2025	54.2	49.2	48.1	53.41	41.52	dB(A)
04/12/2025	50.1	47.4	47.3	50.32	43.67	dB(A)
08/12/2025	53.6	46.2	49.2	49.25	43.19	dB(A)
12/12/2025	49.2	44.6	51.4	52.61	40.42	dB(A)
15/12/2025	48.2	49.3	53.1	47.76	41.79	dB(A)
18/12/2025	57.4	46.5	46.4	48.28	42.19	dB(A)
22/12/2025	56.3	44.2	46.4	49.49	39.26	dB(A)
26/12/2025	59.7	47.1	48.2	54.28	43.67	dB(A)
29/12/2025	53.4	46.4	49.7	53.15	42.94	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq</sub>	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
- Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.
- \*dB(A) L<sub>Eq</sub> denotes the time weighted average of the level of sound in decibels on scale A which is reliable to human hearing.

Note:- \*A "decibel" is a unit in which noise is measured.

\*\*\*End of Report\*\*\*



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# Vardan Envirolab LLP

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (HR)  
ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number:	VEL/AP/55-63	Report No.:	VEL/AP/2512000055-0063
Name & Address of the Project:	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	5500044394-037-1019
Sampling & Analysis Protocol:	IS 9989 & CPCB Guidelines	Reporting Date:	05/01/2026
		Parameter Required:	As Per Work Order
		Sample Collected By:	Vardan EnviroLab Representative

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- PT Plant (Central Store Area)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
01/12/2025	67.2	56.4	57.2	63.51	52.40	dB(A)
04/12/2025	62.4	54.2	59.5	58.67	50.13	dB(A)
08/12/2025	63.5	56.7	56.7	54.25	48.35	dB(A)
12/12/2025	66.4	52.4	53.5	60.98	52.62	dB(A)
15/12/2025	67.8	59.3	52.4	62.35	53.42	dB(A)
18/12/2025	64.0	51.8	56.1	63.82	54.39	dB(A)
22/12/2025	68.1	55.5	53.6	57.32	49.84	dB(A)
26/12/2025	67.7	53.8	54.7	55.78	46.34	dB(A)
29/12/2025	65.2	56.1	52.4	58.71	51.27	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq.</sub>	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
- Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.
- \*dB(A) L<sub>Eq.</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Note:- \*A "decibel" is a unit in which noise is measured.

\*\*\*End of Report\*\*\*



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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (HR)  
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## Test Report

Sample Number:	VEL/AP/64-72	Report No.:	VEL/AP/2512000064-0072
Name & Address of the Project:	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	5500044394-037-1019
Sampling & Analysis Protocol:	IS 9989 & CPCB Guidelines	Reporting Date:	05/01/2026
		Parameter Required:	As Per Work Order
		Sample Collected By:	Vardan EnviroLab Representative

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- Township (Field Hostel)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
01/12/2025	53.2	49.1	54.2	52.42	44.22	dB(A)
04/12/2025	56.1	50.2	58.1	54.96	40.18	dB(A)
08/12/2025	57.2	48.4	56.2	53.28	43.52	dB(A)
12/12/2025	55.4	46.3	53.4	51.54	41.49	dB(A)
15/12/2025	57.6	53.5	59.2	54.27	39.42	dB(A)
18/12/2025	53.9	54.2	53.4	53.94	37.78	dB(A)
22/12/2025	58.1	48.7	56.3	50.85	42.34	dB(A)
26/12/2025	57.8	50.2	53.2	53.24	43.61	dB(A)
29/12/2025	55.3	51.7	52.9	51.40	41.27	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq.</sub>	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
- Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.
- \*dB(A) L<sub>Eq.</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Note:- \*A "decibel" is a unit in which noise is measured.

\*\*\*End of Report\*\*\*



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# **ENVIRONMENTAL MONITORING REPORT**

**(January 2026)**



**Submitted To:**

**M/s Talcher Super Thermal Power Station  
P.O.- Talcher Thermal, Angul, Angul,  
Odisha-759101**

**Study Conducted By:**



**M/s Vardan EnviroLab LLP  
Plot No. 82 A, Sector-5, IMT Manesar, Gurugram,  
Haryana - 122051  
E-mail: [projects.env@vardan.co.in](mailto:projects.env@vardan.co.in)**

**(Recognized By NABL & MOEF&CC, Government of India)**

## INDEX

<b>S.NO.</b>	<b>Enviromental Monitoring Details</b>	<b>Pages</b>
1.	Test Reports of Ambient Air Quality Monitoring	4
2.	Test Reports of Ambient Noise Quality Monitoring	4

**TEST REPORTS**  
**OF**  
**AMBIENT AIR**  
**QUALITY**  
**MONITORING**



# Vardan Envirolab LLP

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (HR)  
ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number: VEL/AP/01-09 Report No.: VEL/AP/2601000001-0009  
 Name & Address of the Project: M/s Talcher Super Thermal Power Station  
 P.O.- Talcher Thermal, Angul, Angul, Odisha-759101  
 Format No.: 7.8 F-03  
 Party Reference No.: 5500044394-037-1019  
 Reporting Date: 05/02/2026  
 Sampling Location: Main Plant Area (ADC Office) Parameter Required: As Per Work Order  
 Sample Description: Ambient Air Quality Monitoring Sample Collected By: Vardan Envirolab Representative  
 Sampling & Analysis Protocol: IS 5182 & STP

S. No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	429 A 24	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	157 I 2020	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	440 I 24	11.08.2026

PARAMETERS	Concentration of Pollutant											
	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	O <sub>3</sub>	NH <sub>3</sub>	Lead	Nickel	Arsenic	Benzene	B(a)P
	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	mg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ng/m <sup>3</sup>	ng/m <sup>3</sup>	µg/m <sup>3</sup>	ng/m <sup>3</sup>
@NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1
Date of Monitoring	02/01/2026	65.52	38.24	18.93	20.67	0.69	23.72	BLQ	BLQ	BLQ	BLQ	BLQ
	05/01/2026	64.25	35.76	21.20	18.75	0.73	24.13	BLQ	BLQ	BLQ	BLQ	BLQ
	08/01/2026	63.36	34.53	20.42	21.53	0.66	25.53	BLQ	BLQ	BLQ	BLQ	BLQ
	13/01/2026	60.76	32.19	17.91	22.38	0.74	20.65	BLQ	BLQ	BLQ	BLQ	BLQ
	16/01/2026	65.85	36.37	23.46	24.16	0.81	24.94	BLQ	BLQ	BLQ	BLQ	BLQ
	19/01/2026	61.27	30.16	19.17	23.85	0.62	23.58	BLQ	BLQ	BLQ	BLQ	BLQ
	22/01/2026	62.86	36.24	24.81	25.69	0.71	24.18	BLQ	BLQ	BLQ	BLQ	BLQ
	27/01/2026	68.96	35.49	25.35	21.27	0.67	25.37	BLQ	BLQ	BLQ	BLQ	BLQ
	30/01/2026	72.05	40.22	27.49	26.35	0.75	29.38	BLQ	BLQ	BLQ	BLQ	BLQ
Maximum	72.05	40.22	27.49	26.35	0.81	29.38	--	--	--	--	--	--
Minimum	60.76	30.16	17.91	18.75	0.62	20.65	--	--	--	--	--	--
Average	64.98	35.46	22.08	22.73	0.70	24.60	--	--	--	--	--	--
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	VEL/E NV/ST P/110 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004

Note- #STP-Standard Testing Procedure, BLQ- Below Limit of Quantification, LOQ- Limit of Quantification.

@NAAQS- National Ambient Air Quality Standards.



\*\*\*End of Report\*\*\*



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## Test Report

Sample Number: VEL/AP/10-18 Report No.: VEL/AP/2601000010-0018  
 Name & Address of the Project: M/s Talcher Super Thermal Power Station  
 P.O.- Talcher Thermal, Angul, Angul, Odisha-759101  
 Safety Park (CHP Area) Ambient Air Quality Monitoring  
 IS 5182 & STP  
 Report No.: VEL/AP/2601000010-0018  
 Format No.: 7.8 F-03  
 Party Reference No.: 5500044394-037-1019  
 Reporting Date: 05/02/2026  
 Parameter Required: As Per Work Order  
 Sample Collected By: Vardan EnviroLab Representative

S.No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	46 G 22	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	486 A 2024	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	447 A 22	11.08.2026

PARAMETERS	Concentration of Pollutant											
	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>x</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	O <sub>3</sub> µg/m <sup>3</sup>	NH <sub>3</sub> µg/m <sup>3</sup>	Lead µg/m <sup>3</sup>	Nickel ng/m <sup>3</sup>	Arsenic ng/m <sup>3</sup>	Benzene µg/m <sup>3</sup>	B(a)P ng/m <sup>3</sup>
“NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1
Date of Monitoring	02/01/2026	60.41	28.31	20.86	22.83	0.65	22.52	BLQ	BLQ	BLQ	BLQ	BLQ
	05/01/2026	65.24	33.42	19.50	21.27	0.61	23.43	BLQ	BLQ	BLQ	BLQ	BLQ
	08/01/2026	58.43	26.53	18.26	15.63	0.73	26.42	BLQ	BLQ	BLQ	BLQ	BLQ
	13/01/2026	61.37	28.42	22.31	18.46	0.61	25.51	BLQ	BLQ	BLQ	BLQ	BLQ
	16/01/2026	59.62	25.96	20.81	16.20	0.78	27.89	BLQ	BLQ	BLQ	BLQ	BLQ
	19/01/2026	64.26	32.28	21.35	22.98	0.64	28.37	BLQ	BLQ	BLQ	BLQ	BLQ
	22/01/2026	55.82	29.43	22.92	23.42	0.71	25.15	BLQ	BLQ	BLQ	BLQ	BLQ
	27/01/2026	68.34	30.18	25.38	26.33	0.68	29.76	BLQ	BLQ	BLQ	BLQ	BLQ
	30/01/2026	63.24	33.43	24.53	29.36	0.79	25.82	BLQ	BLQ	BLQ	BLQ	BLQ
Maximum	68.34	33.43	25.38	29.36	0.79	29.76	--	--	--	--	--	--
Minimum	55.82	25.96	18.26	15.63	0.61	22.52	--	--	--	--	--	--
Average	61.85	29.77	21.76	21.83	0.69	26.09	--	--	--	--	--	--
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	VEL/E NV/ST P/110 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004

Note: #STP-Standard Testing Procedure. BLQ -Below Limit of Quantification, LOQ -Limit of Quantification.

\* NAAQS- National Ambient Air Quality Standards.

\*\*\*End of Report\*\*\*



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ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number: VEL/AP/19-27 Report No.: VEL/AP/2601000019-0027  
 Name & Address of the Project: M/s 1027, Talcher Super Thermal Power Station  
 P.O.- Talcher Thermal, Angul, Angul, Odisha-759101  
 Format No.: 7.8 F-03  
 Party Reference No.: 5500044394-037-1019  
 Reporting Date: 05/02/2026  
 Sampling Location: PT Plant (Central Store Area) Parameter Required: As Per Work Order  
 Sample Description: Ambient Air Quality Monitoring Sample Collected By: Vardan EnviroLab Representative  
 Sampling & Analysis Protocol: IS 5182 & STP

S. No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	428 A 24	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	485 A 2024	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	120 I 22	11.08.2026

PARAMETERS	Concentration of Pollutant												
	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>x</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	O <sub>3</sub> µg/m <sup>3</sup>	NH <sub>3</sub> µg/m <sup>3</sup>	Lead µg/m <sup>3</sup>	Nickel ng/m <sup>3</sup>	Arsenic ng/m <sup>3</sup>	Benzene µg/m <sup>3</sup>	B(a)P ng/m <sup>3</sup>	
@ NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1	
Date of Monitoring	02/01/2026	65.13	34.28	23.42	18.65	0.74	24.34	BLQ	BLQ	BLQ	BLQ	BLQ	
	05/01/2026	64.42	32.14	22.61	23.77	0.61	20.52	BLQ	BLQ	BLQ	BLQ	BLQ	
	08/01/2026	66.43	36.27	24.19	22.19	0.73	25.43	BLQ	BLQ	BLQ	BLQ	BLQ	
	13/01/2026	61.52	33.05	20.68	25.65	0.62	23.62	BLQ	BLQ	BLQ	BLQ	BLQ	
	16/01/2026	63.93	35.76	21.67	23.79	0.79	26.18	BLQ	BLQ	BLQ	BLQ	BLQ	
	19/01/2026	68.27	36.82	23.58	25.98	0.75	24.79	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
	22/01/2026	66.15	37.19	24.13	22.38	0.64	28.53	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
	27/01/2026	69.76	34.48	25.34	26.19	0.70	31.46	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
	30/01/2026	73.28	40.35	29.12	27.71	0.69	27.67	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Maximum	73.28	40.35	29.12	27.71	0.79	31.46	--	--	--	--	--	--	
Minimum	61.52	32.14	20.68	18.65	0.61	20.52	--	--	--	--	--	--	
Average	66.54	35.59	23.86	24.03	0.69	25.83	--	--	--	--	--	--	
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5	
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	VEL/E NV/ST P/110 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004	

Note: #STP-Standard Testing Procedure, BLQ- Below Limit of Quantification, LOQ- Limit of Quantification.

\* NAAQS- National Ambient Air Quality Standards.

\*\*\*End of Report\*\*\*



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Customer Care: 8010127843, Ph: 0124-4343750, 9810355569, 9953147268 | E-mail: environment@vardan.co.in, bd@vardan.co.in



# Vardan Envirolab LLP



Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (HR)  
ISO 9001 | ISO 14001 | ISO 45001

## Test Report

Sample Number: VEL/AP/28-36 Report No.: VEL/AP/2601000028-0036  
 Name & Address of the Project: M/s 1027, Talcher Super Thermal Power Station  
 P.O.- Talcher Thermal, Angul, Angul, Odisha-759101  
 Format No.: 7.8 F-03  
 Party Reference No.: 5500044394-037-1019  
 Reporting Date: 05/02/2026  
 Sampling Location: Township (Field Hostel) Parameter Required: As Per Work Order  
 Sample Description: Ambient Air Quality Monitoring Sample Collected By: Vardan Envirolab Representative  
 Sampling & Analysis Protocol: IS 5182 & STP

S. No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	312 L 22	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	330 L 22	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	333 I 22	11.08.2026

PARAMETERS	Concentration of Pollutant											
	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	O <sub>3</sub>	NH <sub>3</sub>	Lead	Nickel	Arsenic	Benzene	B(a)P
	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	mg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ng/m <sup>3</sup>	ng/m <sup>3</sup>	µg/m <sup>3</sup>	ng/m <sup>3</sup>
<sup>1</sup> NAAQ Standard	100	60	80	30	4	180	400	1	20	6	5	1
Date of Monitoring	02/01/2026	59.15	25.62	21.38	19.52	0.60	22.83	BLQ	BLQ	BLQ	BLQ	BLQ
	05/01/2026	61.82	26.34	23.54	21.42	0.72	26.62	BLQ	BLQ	BLQ	BLQ	BLQ
	08/01/2026	57.68	28.75	19.69	22.35	0.82	21.88	BLQ	BLQ	BLQ	BLQ	BLQ
	13/01/2026	64.27	31.25	20.35	20.96	0.66	23.21	BLQ	BLQ	BLQ	BLQ	BLQ
	16/01/2026	60.35	30.08	21.82	23.72	0.56	20.76	BLQ	BLQ	BLQ	BLQ	BLQ
	19/01/2026	58.24	25.65	27.18	18.13	0.59	24.83	BLQ	BLQ	BLQ	BLQ	BLQ
	22/01/2026	61.52	28.53	22.53	22.67	0.70	22.97	BLQ	BLQ	BLQ	BLQ	BLQ
	27/01/2026	64.32	33.64	24.35	26.89	0.68	27.15	BLQ	BLQ	BLQ	BLQ	BLQ
	30/01/2026	56.23	29.83	26.14	24.76	0.73	23.68	BLQ	BLQ	BLQ	BLQ	BLQ
Maximum	64.32	33.64	27.18	26.89	0.82	27.15	--	--	--	--	--	--
Minimum	56.23	25.62	19.69	18.15	0.56	20.76	--	--	--	--	--	--
Average	60.39	28.85	22.99	22.26	0.67	23.77	--	--	--	--	--	--
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1990	IS 5182 (P-9) 1974	IS 5182 (P-25) 2004	IS 5182 (P-22) 2004	VEL/EN V/STP/11 0 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004	

Note: #STP-Standard Testing procedure, BLQ- Below Limit of Quantification, LOQ- Limit of Quantification.

<sup>1</sup>NAAQ- National Ambient Air Quality Standards.

\*\*\*End of Report\*\*\*



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TEST REPORTS  
OF  
AMBIENT NOISE  
QUALITY  
MONITORING



## Test Report

**Sample Number:** VEL/AP/37-45 **Report No.:** VEL/AP/2601000037-0045  
**Name & Address of the Project:** M/s Talcher Super Thermal Power Station  
P.O.- Talcher Thermal, Angul, Angul, Odisha-759101 **Format No.:** 7.8 F-03  
**Party Reference No.:** 5500044394-037-1019  
**Reporting Date:** 05/02/2026  
**Parameter Required:** As Per Work Order  
**Sample Collected By:** Vardan Envirolab Representative

**Sample Description:** Ambient Noise Level Monitoring  
**Sampling & Analysis Protocol:** IS 9989 & CPCB Guidelines

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- Main Plant Area (ADC Plant)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
02/01/2026	64.3	57.3	54.5	64.25	53.79	dB(A)
05/01/2026	61.0	51.5	53.2	63.53	52.13	dB(A)
08/01/2026	63.5	56.2	52.1	58.16	54.33	dB(A)
13/01/2026	61.6	54.3	53.5	52.72	46.28	dB(A)
16/01/2026	66.8	58.4	56.4	59.36	50.79	dB(A)
19/01/2026	64.7	59.5	59.8	62.14	53.38	dB(A)
22/01/2026	63.2	57.3	60.1	54.98	55.19	dB(A)
27/01/2026	65.6	58.2	53.4	60.27	52.40	dB(A)
30/01/2026	62.5	56.0	52.5	61.15	56.92	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq</sub>	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
- Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.
- \*dB(A) L<sub>Eq</sub> denotes the time weighted average of the level of sound in decibels on scale A which is referable to human hearing.

Note: \*A "decibel" is a unit in which noise is measured.

\*\*\*End of Report\*\*\*



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# Vardan Envirolab LLP

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (HR)  
ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number:	VEL/AP/46-54	Report No.:	VEL/AP/2601000046-0054
Name & Address of the Project:	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	5500044394-037-1019
Sampling & Analysis Protocol:	IS 9989 & CPCB Guidelines	Reporting Date:	05/02/2026
		Parameter Required:	As Per Work Order
		Sample Collected By:	Vardan Envirolab Representative

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- Safety Park (CHP Area)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
02/01/2026	56.1	48.1	49.2	54.20	43.24	dB(A)
05/01/2026	53.4	46.5	48.4	52.12	44.16	dB(A)
08/01/2026	57.5	47.5	47.5	48.37	40.34	dB(A)
13/01/2026	50.1	43.6	50.4	53.16	42.27	dB(A)
16/01/2026	49.9	42.5	54.2	50.12	43.69	dB(A)
19/01/2026	55.3	43.7	47.5	49.91	44.73	dB(A)
22/01/2026	53.6	46.8	47.2	47.62	40.17	dB(A)
27/01/2026	58.9	45.2	49.3	53.08	42.28	dB(A)
30/01/2026	56.1	43.7	48.2	52.72	41.96	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq</sub>	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
- Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.
- \*dB(A) L<sub>Eq</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Note:- \*A "decibel" is a unit in which noise is measured.

\*\*\*End of Report\*\*\*



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## Test Report

<b>Sample Number:</b>	VEL/AP/55-63	<b>Report No.:</b>	VEL/AP/2601000055-0063
<b>Name &amp; Address of the Project:</b>	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	<b>Format No.:</b>	7.8 F-03
<b>Sample Description:</b>	Ambient Noise Level Monitoring	<b>Party Reference No.:</b>	5500044394-037-1019
<b>Sampling &amp; Analysis Protocol:</b>	IS 9989 & CPCB Guidelines	<b>Reporting Date:</b>	05/02/2026
		<b>Parameter Required:</b>	As Per Work Order
		<b>Sample Collected By:</b>	Vardan Envirolab Representative

### AMBIENT NOISE QUALITY MONITORING RESULTS

#### Sampling Location- PT Plant (Central Store Area)

Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
02/01/2026	70.6	55.3	59.1	64.36	54.43	dB(A)
05/01/2026	66.2	52.1	57.1	65.42	52.61	dB(A)
08/01/2026	64.8	59.2	58.2	63.62	50.15	dB(A)
13/01/2026	67.5	54.2	54.3	61.27	53.24	dB(A)
16/01/2026	63.1	58.7	51.2	64.43	56.37	dB(A)
19/01/2026	66.9	53.6	58.6	60.26	59.43	dB(A)
22/01/2026	69.4	50.7	52.7	68.13	52.08	dB(A)
27/01/2026	68.2	54.5	53.2	57.47	54.78	dB(A)
30/01/2026	62.1	58.2	51.7	61.35	53.64	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq</sub>	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
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- \*dB(A) L<sub>Eq</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relateable to human hearing.

Note:- \*A "decibel" is a unit in which noise is measured.

\*\*\*End of Report\*\*\*



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## Test Report

Sample Number:	VEL/AP/64-72	Report No.:	VEL/AP/2601000064-0072
Name & Address of the Project:	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sample Description:	Ambient Noise Level Monitoring	Party Reference No.:	5500044394-037-1019
Sampling & Analysis Protocol:	IS 9989 & CPCB Guidelines	Reporting Date:	05/02/2026
		Parameter Required:	As Per Work Order
		Sample Collected By:	Vardan Envirolab Representative

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- Township (Field Hostel)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
02/01/2026	52.0	51.8	56.3	53.17	43.79	dB(A)
05/01/2026	53.5	52.6	59.4	50.42	42.53	dB(A)
08/01/2026	56.4	49.2	57.3	54.15	41.28	dB(A)
13/01/2026	53.8	48.4	54.5	53.52	44.96	dB(A)
16/01/2026	56.7	50.7	58.7	52.43	40.02	dB(A)
19/01/2026	54.2	56.1	56.8	49.75	38.56	dB(A)
22/01/2026	59.0	51.2	55.1	51.38	43.35	dB(A)
27/01/2026	56.7	52.7	50.4	52.93	40.79	dB(A)
30/01/2026	58.1	53.8	53.5	50.79	42.63	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq</sub>	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
- Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.
- \*dB(A) L<sub>Eq</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Note: \*A "decibel" is a unit in which noise is measured.

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**END OF THE  
REPORT**



# Vardan Envirolab LLP

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (HR)  
ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number: VEL/AP/01-08 Report No.: VEL/AP/2602000001-0008  
 Name & Address of the Project: M/s Talcher Super Thermal Power Station  
 P.O.- Talcher Thermal, Angul, Angul, Odisha-759101  
 Format No.: 7.8 F-03  
 Party Reference No.: 5500044394-037-1019  
 Reporting Date: 03/03/2026  
 Sampling Location: Main Plant Area (ADC Office) Parameter Required: As Per Work Order  
 Sample Description: Ambient Air Quality Monitoring Sample Collected By: Vardan Envirolab Representative  
 Sampling & Analysis Protocol: IS 5182 & STP

S. No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	429 A 24	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	157 I 2020	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	440 I 24	11.08.2026

PARAMETERS	Concentration of Pollutant											
	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>x</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	O <sub>3</sub> µg/m <sup>3</sup>	NH <sub>3</sub> µg/m <sup>3</sup>	Lead µg/m <sup>3</sup>	Nickel ng/m <sup>3</sup>	Arsenic ng/m <sup>3</sup>	Benzene µg/m <sup>3</sup>	B(a)P ng/m <sup>3</sup>
@NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1
Date of Monitoring												
02/02/2026	52.37	29.46	17.51	21.34	0.74	20.53	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
05/02/2026	51.18	27.53	19.42	19.15	0.66	21.24	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
09/02/2026	59.35	30.34	18.35	20.64	0.54	24.35	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
13/02/2026	53.85	28.51	20.85	18.73	0.69	19.76	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
16/02/2026	58.67	26.63	21.46	22.53	0.76	20.15	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
19/02/2026	60.08	31.27	23.67	23.96	0.59	21.43	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
24/02/2026	57.37	25.76	16.27	17.56	0.67	18.67	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
26/02/2026	55.14	30.76	18.75	16.89	0.71	22.96	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Maximum	60.08	31.27	23.67	23.96	0.76	24.35	--	--	--	--	--	--
Minimum	51.18	25.76	16.27	16.89	0.54	18.67	--	--	--	--	--	--
Average	56.00	28.78	19.53	20.10	0.67	21.13	--	--	--	--	--	--
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	VEL/E NV/ST P/110 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004

Note- #STP-Standard Testing Procedure, BLQ- Below Limit of Quantification, LOQ- Limit of Quantification.

@NAAQS- National Ambient Air Quality Standards.

\*\*\*End of Report\*\*\*



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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (HR)  
ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number: VEL/AP/09-16 Report No.: VEL/AP/2602000009-0016  
 Name & Address of the Project: M/s Talcher Super Thermal Power Station Safety Park (CHP Area), P.O.- Talcher Thermal, Angul, Angul, Odisha-759101 Format No.: 7.8 F-03  
 Party Reference No.: 5500044394-037-1019 Reporting Date: 03/03/2026  
 Sampling Location: Safety Park (CHP Area) Parameter Required: As Per Work Order  
 Sample Description: Ambient Air Quality Monitoring Sample Collected By: Vardan EnviroLab Representative  
 Sampling & Analysis Protocol: IS 5182 & STP

S.No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	46 G 22	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	486 A 2024	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	447 A 22	11.08.2026

PARAMETERS	Concentration of Pollutant											
	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>x</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	O <sub>3</sub> µg/m <sup>3</sup>	NH <sub>3</sub> µg/m <sup>3</sup>	Lead µg/m <sup>3</sup>	Nickel ng/m <sup>3</sup>	Arsenic ng/m <sup>3</sup>	Benzene µg/m <sup>3</sup>	B(a)P ng/m <sup>3</sup>
@NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1
Date of Monitoring	02/02/2026	53.16	29.42	18.31	21.56	0.75	20.57	BLQ	BLQ	BLQ	BLQ	BLQ
	05/02/2026	57.96	31.67	17.42	20.27	0.58	21.62	BLQ	BLQ	BLQ	BLQ	BLQ
	09/02/2026	61.24	30.27	19.25	18.42	0.69	22.31	BLQ	BLQ	BLQ	BLQ	BLQ
	13/02/2026	60.79	29.61	20.63	17.65	0.53	24.23	BLQ	BLQ	BLQ	BLQ	BLQ
	16/02/2026	58.74	26.43	21.27	19.74	0.61	25.75	BLQ	BLQ	BLQ	BLQ	BLQ
	19/02/2026	54.69	28.76	18.43	23.25	0.78	23.79	BLQ	BLQ	BLQ	BLQ	BLQ
	24/02/2026	59.38	25.57	16.25	20.17	0.66	20.28	BLQ	BLQ	BLQ	BLQ	BLQ
	26/02/2026	62.63	32.72	22.36	22.58	0.59	26.72	BLQ	BLQ	BLQ	BLQ	BLQ
Maximum	62.63	32.72	22.36	23.25	0.78	26.72	--	--	--	--	--	--
Minimum	53.16	25.57	16.25	17.65	0.53	20.28	--	--	--	--	--	--
Average	58.57	29.30	19.24	20.45	0.64	23.15	--	--	--	--	--	--
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	VEL/E NV/ST P/110 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004

Note- #STP-Standard Testing Procedure, BLQ -Below Limit of Quantification, LOQ -Limit of Quantification.

@NAAQS- National Ambient Air Quality Standards.

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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (HR)  
ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number:	VEL/AP/17-24	Report No.:	VEL/AP/2602000017-0024
Name & Address of the Project:	M/s 1027, Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	Format No.:	7.8 F-03
Sampling Location:	PT Plant (Central Store Area)	Party Reference No.:	5500044394-037-1019
Sample Description:	Ambient Air Quality Monitoring	Reporting Date:	03/03/2026
Sampling & Analysis Protocol:	IS 5182 & STP	Parameter Required:	As Per Work Order
		Sample Collected By:	Vardan EnviroLab Representative

S. No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	428 A 24	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	485 A 2024	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	120 I 22	11.08.2026

PARAMETERS	Concentration of Pollutant											
	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>x</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	O <sub>3</sub> µg/m <sup>3</sup>	NH <sub>3</sub> µg/m <sup>3</sup>	Lead µg/m <sup>3</sup>	Nickel ng/m <sup>3</sup>	Arsenic ng/m <sup>3</sup>	Benzene µg/m <sup>3</sup>	B(a)P ng/m <sup>3</sup>
@NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1
Date of Monitoring	02/02/2026	61.24	32.61	22.18	19.24	0.66	23.51	BLQ	BLQ	BLQ	BLQ	BLQ
	05/02/2026	60.42	30.25	21.76	22.51	0.75	21.27	BLQ	BLQ	BLQ	BLQ	BLQ
	09/02/2026	63.76	34.78	23.36	20.33	0.68	24.85	BLQ	BLQ	BLQ	BLQ	BLQ
	13/02/2026	58.48	29.43	19.23	23.41	0.74	20.87	BLQ	BLQ	BLQ	BLQ	BLQ
	16/02/2026	62.45	32.78	20.75	18.67	0.56	23.59	BLQ	BLQ	BLQ	BLQ	BLQ
	19/02/2026	66.38	35.29	24.67	24.82	0.59	22.63	BLQ	BLQ	BLQ	BLQ	BLQ
	24/02/2026	61.84	30.77	22.48	21.53	0.79	26.87	BLQ	BLQ	BLQ	BLQ	BLQ
	26/02/2026	65.09	33.75	22.89	25.78	0.69	29.76	BLQ	BLQ	BLQ	BLQ	BLQ
Maximum	66.38	35.29	24.67	25.78	0.79	29.76	--	--	--	--	--	--
Minimum	58.48	29.43	19.23	18.67	0.56	20.87	--	--	--	--	--	--
Average	62.45	32.45	22.16	22.03	0.68	24.16	--	--	--	--	--	--
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	VEL/E NV/ST P/110 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004

Note- #STP-Standard Testing Procedure, BLQ- Below Limit of Quantification, LOQ- Limit of Quantification.

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Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (HR)  
ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number: VEL/AP/25-32  
 Name & Address of the Project: M/s 1027, Talcher Super Thermal Power Station  
 P.O.- Talcher Thermal, Angul, Angul, Odisha-759101  
 Sampling Location: Township (Field Hostel)  
 Sample Description: Ambient Air Quality Monitoring  
 Sampling & Analysis Protocol: IS 5182 & STP

Report No.: VEL/AP/2602000025-0032  
 Format No.: 7.8 F-03  
 Party Reference No.: 5500044394-037-1019  
 Reporting Date: 03/03/2026

Parameter Required: As Per Work Order  
 Sample Collected By: Vardan EnviroLab Representative

S. No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	312 L 22	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	330 L 22	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	333 I 22	11.08.2026

PARAMETERS	Concentration of Pollutant											
	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	O <sub>3</sub>	NH <sub>3</sub>	Lead	Nickel	Arsenic	Benzene	B(a)P
	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	mg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ng/m <sup>3</sup>	ng/m <sup>3</sup>	µg/m <sup>3</sup>	ng/m <sup>3</sup>
@NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1
Date of Monitoring	02/02/2026	57.24	28.61	20.97	18.42	0.71	21.35	BLQ	BLQ	BLQ	BLQ	BLQ
	05/02/2026	60.51	27.75	22.16	20.16	0.69	24.52	BLQ	BLQ	BLQ	BLQ	BLQ
	09/02/2026	56.62	29.51	18.34	23.68	0.68	20.34	BLQ	BLQ	BLQ	BLQ	BLQ
	13/02/2026	61.46	30.31	21.63	21.52	0.73	22.36	BLQ	BLQ	BLQ	BLQ	BLQ
	16/02/2026	62.17	32.64	23.94	22.13	0.61	23.72	BLQ	BLQ	BLQ	BLQ	BLQ
	19/02/2026	60.34	26.53	26.02	19.35	0.73	21.65	BLQ	BLQ	BLQ	BLQ	BLQ
	24/02/2026	59.76	28.53	19.36	22.46	0.62	24.43	BLQ	BLQ	BLQ	BLQ	BLQ
	26/02/2026	63.67	31.47	25.74	21.79	0.72	26.77	BLQ	BLQ	BLQ	BLQ	BLQ
Maximum	63.67	32.64	26.02	23.68	0.73	26.77	--	--	--	--	--	--
Minimum	56.62	26.53	18.34	18.42	0.61	20.34	--	--	--	--	--	--
Average	60.22	29.41	22.27	21.18	0.68	23.14	--	--	--	--	--	--
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	VEL/EN V/STP/11 0 Issue No.-01	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004

Note- #STP-Standard Testing Procedure, BLQ- Below Limit of Quantification, LOQ- Limit of Quantification.

@NAAQS- National Ambient Air Quality Standards.

\*\*\*End of Report\*\*\*

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ISO 9001 | ISO 14001 | ISO 45001



## Test Report

Sample Number: VEL/AP/65-66 Report No.: VEL/AP/2602000065-0066  
 Name & Address of the Project: M/s Talcher Super Thermal Power Station  
 P.O.- Talcher Thermal, Angul, Odisha-759101 Format No.: 7.8 F-03  
 Party Reference No.: 5500044394-037-1019 Reporting Date: 03/03/2026  
 Sampling Location: Near Anand Bazar Market Area Parameter Required: As Per Work Order  
 Sample Description: Ambient Air Quality Monitoring Sample Collected By: Vardan EnviroLab Representative  
 Sampling & Analysis Protocol: IS 5182 & STP

S. No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Indoor Air Quality Monitor	Skyking	VT-91NI	N/A	04.12.2026

PARAMETERS	Concentration of Pollutant			
	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>x</sub> µg/m <sup>3</sup>
@NAAQ Standard	100	60	80	80
10/02/2026	60.82	32.15	19.41	22.15
23/02/2026	57.43	30.76	21.34	20.37
Maximum	60.82	32.15	21.34	22.15
Minimum	57.43	30.76	19.41	20.37
Average	59.12	31.45	20.37	21.26
LOQ	5	5	5	6
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006

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## Test Report

**Sample Number:** VEL/AP/67-68  
**Name & Address of the Project:** M/s Talcher Super Thermal Power Station  
P.O.- Talcher Thermal, Angul, Odisha-759101  
**Sampling Location:** Near Shani Mandir Area  
**Sample Description:** Ambient Air Quality Monitoring  
**Sampling & Analysis Protocol:** IS 5182 & STP

**Report No.:** VEL/AP/2602000067-0068  
**Format No.:** 7.8 F-03  
**Party Reference No.:** 5500044394-037-1019  
**Reporting Date:** 03/03/2026

**Parameter Required:** As Per Work Order  
**Sample Collected By:** Vardan EnviroLab Representative

S. No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Indoor Air Quality Monitor	Skyking	VT-91NI	N/A	04.12.2026

PARAMETERS	Concentration of Pollutant			
	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>x</sub> µg/m <sup>3</sup>
<sup>@</sup> NAAQ Standard	100	60	80	80
10/02/2026	50.18	24.76	16.48	18.65
23/02/2026	53.64	26.24	17.74	17.43
Maximum	53.64	26.24	17.74	18.65
Minimum	50.18	24.76	16.48	17.43
Average	51.91	25.50	17.11	18.04
LOQ	5	5	5	6
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006

<sup>@</sup>NAAQS- National Ambient Air Quality Standards.

\*\*\*End of Report\*\*\*



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## Test Report

**Sample Number:** VEL/AP/69-70  
**Name & Address of the Project:** M/s Talcher Super Thermal Power Station  
P.O.- Talcher Thermal, Angul, Odisha-759101  
**Sampling Location:** Near Makeup Water Pump House, Near Samal Barrage  
**Sample Description:** Ambient Air Quality Monitoring  
**Sampling & Analysis Protocol:** IS 5182 & STP

**Report No.:** VEL/AP/2602000069-0070  
**Format No.:** 7.8 F-03  
**Party Reference No.:** 5500044394-037-1019  
**Reporting Date:** 03/03/2026

**Parameter Required:** As Per Work Order  
**Sample Collected By:** Vardan EnviroLab Representative

S. No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Indoor Air Quality Monitor	Skyking	VT-91NI	N/A	04.12.2026

PARAMETERS	Concentration of Pollutant			
	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>x</sub> µg/m <sup>3</sup>
@NAAQ Standard	100	60	80	80
10/02/2026	57.31	35.49	20.34	22.16
23/02/2026	63.44	32.76	18.79	21.37
Maximum	63.44	35.49	20.34	22.16
Minimum	57.31	32.76	18.79	21.37
Average	60.37	34.12	19.56	21.76
LOQ	5	5	5	6
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006

@NAAQS- National Ambient Air Quality Standards.

\*\*\*End of Report\*\*\*



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## Test Report

<b>Sample Number:</b>	VEL/AP/33-40	<b>Report No.:</b>	VEL/AP/2602000033-0040
<b>Name &amp; Address of the Project:</b>	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	5500044394-037-1019
		<b>Reporting Date:</b>	03/03/2026
<b>Sample Description:</b>	Ambient Noise Level Monitoring	<b>Parameter Required:</b>	As Per Work Order
<b>Sampling &amp; Analysis Protocol:</b>	IS 9989 & CPCB Guidelines	<b>Sample Collected By:</b>	Vardan Envirolab Representative

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- Main Plant Area (ADC Plant)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
02/02/2026	61.2	56.2	52.1	68.42	54.68	dB(A)
05/02/2026	63.3	50.4	54.3	65.62	53.43	dB(A)
09/02/2026	64.4	53.8	53.5	61.35	56.14	dB(A)
13/02/2026	60.7	52.6	51.2	56.73	49.78	dB(A)
16/02/2026	63.5	57.5	57.7	62.47	51.12	dB(A)
19/02/2026	62.7	56.6	55.3	65.38	54.49	dB(A)
24/02/2026	65.6	59.0	59.2	60.76	53.02	dB(A)
26/02/2026	61.8	56.2	54.0	63.09	55.82	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq</sub>	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
- Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.
- \*dB(A) L<sub>Eq</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Note:- \*A "decibel" is a unit in which noise is measured.

\*\*\*End of Report\*\*\*



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## Test Report

<b>Sample Number:</b>	VEL/AP/41-48	<b>Report No.:</b>	VEL/AP/2602000041-0048
<b>Name &amp; Address of the Project:</b>	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	<b>Format No.:</b>	7.8 F-03
<b>Sample Description:</b>	Ambient Noise Level Monitoring	<b>Party Reference No.:</b>	5500044394-037-1019
<b>Sampling &amp; Analysis Protocol:</b>	IS 9989 & CPCB Guidelines	<b>Reporting Date:</b>	03/03/2026
		<b>Parameter Required:</b>	As Per Work Order
		<b>Sample Collected By:</b>	Vardan EnviroLab Representative

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- Safety Park (CHP Area)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
02/02/2026	53.5	49.2	48.1	53.16	42.51	dB(A)
05/02/2026	55.1	47.4	49.2	50.21	43.34	dB(A)
09/02/2026	58.2	46.3	46.2	49.31	41.79	dB(A)
13/02/2026	52.4	42.4	52.7	52.84	44.42	dB(A)
16/02/2026	50.5	44.9	51.3	54.98	40.05	dB(A)
19/02/2026	56.8	45.1	48.6	47.05	39.76	dB(A)
24/02/2026	54.7	48.2	45.0	51.76	41.31	dB(A)
26/02/2026	56.8	46.7	48.4	48.24	43.46	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq</sub>	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
- Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.
- \*dB(A) L<sub>Eq</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

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## Test Report

**Sample Number:** VEL/AP/49-56  
**Name & Address of the Project:** M/s Talcher Super Thermal Power Station  
P.O.- Talcher Thermal, Angul, Angul,  
Odisha-759101

**Report No.:** VEL/AP/2602000049-0056  
**Format No.:** 7.8 F-03  
**Party Reference No.:** 5500044394-037-1019  
**Reporting Date:** 03/03/2026  
**Parameter Required:** As Per Work Order  
**Sample Collected By:** Vardan Envirolab Representative

**Sample Description:** Ambient Noise Level Monitoring  
**Sampling & Analysis Protocol:** IS 9989 & CPCB Guidelines

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- PT Plant (Central Store Area)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
02/02/2026	73.0	53.0	57.2	69.14	58.32	dB(A)
05/02/2026	68.6	56.4	58.4	66.17	56.41	dB(A)
09/02/2026	65.1	58.5	56.5	68.71	52.36	dB(A)
13/02/2026	66.2	56.4	53.4	60.24	54.79	dB(A)
16/02/2026	64.4	55.2	50.5	66.46	58.64	dB(A)
19/02/2026	69.7	59.3	57.9	71.08	61.27	dB(A)
24/02/2026	70.5	51.8	50.4	64.67	55.65	dB(A)
26/02/2026	64.1	57.2	51.6	62.84	57.27	dB(A)

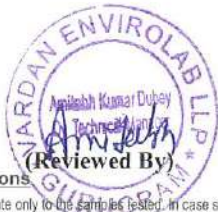
### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq</sub>	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

1. Day Time shall mean from 06.00 A.M. to 10.00 P.M.  
2. Night Time shall mean from 10.00 P.M. to 06.00 A.M.  
3. Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.  
4. Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.  
5. \*dB(A) L<sub>Eq</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Note:- \*A "decibel" is a unit in which noise is measured.

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# Vardan Envirolab LLP

Laboratory: Plot No. 82A, Sector - 5, IMT Manesar, Gurugram - 122051 (HR)  
ISO 9001 | ISO 14001 | ISO 45001



## Test Report

<b>Sample Number:</b>	VEL/AP/57-64	<b>Report No.:</b>	VEL/AP/2602000057-0064
<b>Name &amp; Address of the Project:</b>	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Angul, Odisha-759101	<b>Format No.:</b>	7.8 F-03
<b>Sample Description:</b>	Ambient Noise Level Monitoring	<b>Party Reference No.:</b>	5500044394-037-1019
<b>Sampling &amp; Analysis Protocol:</b>	IS 9989 & CPCB Guidelines	<b>Reporting Date:</b>	03/03/2026
		<b>Parameter Required:</b>	As Per Work Order
		<b>Sample Collected By:</b>	Vardan Envirolab Representative

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- Township (Field Hostel)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
02/02/2026	56.9	52.1	57.2	54.62	41.52	dB(A)
05/02/2026	54.2	53.4	58.2	52.27	43.26	dB(A)
09/02/2026	53.5	50.3	56.4	53.50	40.67	dB(A)
13/02/2026	56.3	49.9	59.2	50.18	42.85	dB(A)
16/02/2026	57.8	51.4	54.4	51.76	39.53	dB(A)
19/02/2026	52.5	53.5	57.5	48.05	44.38	dB(A)
24/02/2026	58.3	50.7	56.5	47.79	40.65	dB(A)
26/02/2026	57.1	54.5	53.1	50.86	37.15	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq</sub>	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
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## Test Report

<b>Sample Number:</b>	VEL/AP/71-72	<b>Report No.:</b>	VEL/AP/2602000071-0072
<b>Name &amp; Address of the Project:</b>	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Odisha-759101	<b>Format No.:</b>	7.8 F-03
		<b>Party Reference No.:</b>	5500044394-037-1019
		<b>Reporting Date:</b>	03/03/2026
<b>Sample Description:</b>	Ambient Noise Level Monitoring	<b>Parameter Required:</b>	As Per Work Order
<b>Sampling &amp; Analysis Protocol:</b>	IS 9989 & CPCB Guidelines	<b>Sample Collected By:</b>	Vardan EnviroLab Representative

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- Near Anand Bazar Market Area						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
10/02/2026	63.5	55.1	53.7	63.96	52.12	dB(A)
23/02/2026	60.4	56.2	56.4	60.15	51.42	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>eq</sub> .	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
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- \*dB(A) L<sub>eq</sub>. denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Note:- \*A "decibel" is a unit in which noise is measured.

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## Test Report

**Sample Number:** VEL/AP/73-74      **Report No.:** VEL/AP/2602000073-0074  
**Name & Address of the Project:** M/s Talcher Super Thermal Power Station  
P.O.- Talcher Thermal, Angul, Odisha-759101      **Format No.:** 7.8 F-03  
**Sample Description:** Ambient Noise Level Monitoring      **Party Reference No.:** 5500044394-037-1019  
**Sampling & Analysis Protocol:** IS 9989 & CPCB Guidelines      **Reporting Date:** 03/03/2026  
**Sample Collected By:** Vardan EnviroLab Representative      **Parameter Required:** As Per Work Order

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- Near Shani Mandir Area						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
10/02/2026	56.0	53.0	50.6	48.15	38.52	dB(A)
23/02/2026	54.6	51.4	52.7	46.73	35.51	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>eq</sub>	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
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- \*dB(A) L<sub>eq</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

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## Test Report

<b>Sample Number:</b>	VEL/AP/75-76	<b>Report No.:</b>	VEL/AP/2602000075-0076
<b>Name &amp; Address of the Project:</b>	M/s Talcher Super Thermal Power Station P.O.- Talcher Thermal, Angul, Odisha-759101	<b>Format No.:</b>	7.8 F-03
<b>Sample Description:</b>	Ambient Noise Level Monitoring	<b>Party Reference No.:</b>	5500044394-037-1019
<b>Sampling &amp; Analysis Protocol:</b>	IS 9989 & CPCB Guidelines	<b>Reporting Date:</b>	03/03/2026
		<b>Parameter Required:</b>	As Per Work Order
		<b>Sample Collected By:</b>	Vardan Envirolab Representative

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- Near Makeup Water Pump House, Near Samal Barrage						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
10/02/2026	64.8	59.2	55.4	61.86	50.38	dB(A)
23/02/2026	66.4	56.1	57.9	59.67	49.36	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>eq</sub>	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
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## Test Report

**Sample Number:** SKS/A/01-09  
**Name & Address of the Project:** M/s Talcher Super Thermal Power Station  
 P.O.- Talcher Thermal, Angul, Angul, Odisha-759101  
**Sampling Location:** Main Plant Area (ADC Office)  
**Sample Description:** Ambient Air Quality Monitoring  
**Sampling & Analysis Protocol:** IS 5182 & STP

**Report No.:** SKS/A/2603000001-0009  
**Format No.:** 7.8 F-03  
**Party Reference No.:** 5500044394-037-1019  
**Reporting Date:** 06/04/2026

**Parameter Required:** As Per Work Order  
**Sample Collected By:** Mr. Abhishek

S. No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	429 A 24	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	157 I 2020	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	440 I 24	11.08.2026

PARAMETERS	Concentration of Pollutant											
	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>x</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	O <sub>3</sub> µg/m <sup>3</sup>	NH <sub>3</sub> µg/m <sup>3</sup>	Lead µg/m <sup>3</sup>	Nickel ng/m <sup>3</sup>	Arsenic ng/m <sup>3</sup>	Benzene µg/m <sup>3</sup>	B(a)P ng/m <sup>3</sup>
@NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1
Date of Monitoring	02/03/2026	54.68	28.12	16.41	20.15	0.68	22.46	BLQ	BLQ	BLQ	BLQ	BLQ
	05/03/2026	53.46	29.24	18.42	18.49	0.75	20.15	BLQ	BLQ	BLQ	BLQ	BLQ
	09/03/2026	61.75	32.29	20.16	22.45	0.69	23.76	BLQ	BLQ	BLQ	BLQ	BLQ
	12/03/2026	50.15	27.92	17.62	19.23	0.71	18.95	BLQ	BLQ	BLQ	BLQ	BLQ
	16/03/2026	55.69	25.33	22.32	21.42	0.66	21.42	BLQ	BLQ	BLQ	BLQ	BLQ
	19/03/2026	62.25	34.48	24.54	25.15	0.78	20.36	BLQ	BLQ	BLQ	BLQ	BLQ
	23/03/2026	59.35	26.87	19.85	19.53	0.54	19.78	BLQ	BLQ	BLQ	BLQ	BLQ
	26/03/2026	52.79	29.38	17.53	18.78	0.67	24.52	BLQ	BLQ	BLQ	BLQ	BLQ
	30/03/2026	56.15	35.64	21.27	23.46	0.72	25.18	BLQ	BLQ	BLQ	BLQ	BLQ
Maximum	62.25	35.64	24.54	25.15	0.78	25.18	--	--	--	--	--	--
Minimum	50.15	25.33	16.41	18.49	0.54	18.95	--	--	--	--	--	--
Average	56.25	29.91	19.79	20.96	0.69	21.84	--	--	--	--	--	--
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	SKS/STP/11 Issue No.-01, 01/07/2022	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004

Note- #STP-Standard Testing Procedure, BLQ- Below Limit of Quantification, LOQ- Limit of Quantification.

@NAAQS- National Ambient Air Quality Standards.



\*\*\*End of Report\*\*\*





## Test Report

Sample Number: SKS/A/10-18  
 Name & Address of the Project: M/s Talcher Super Thermal Power Station, P.O.- Talcher Thermal, Angul, Angul, Odisha-759101  
 Sampling Location: Safety Park (CHP Area)  
 Sample Description: Ambient Air Quality Monitoring  
 Sampling & Analysis Protocol: IS 5182 & STP

Report No.: SKS/A/2603000010-0018  
 Format No.: 7.8 F-03  
 Party Reference No.: 5500044394-037-1019  
 Reporting Date: 06/04/2026

Parameter Required: As Per Work Order  
 Sample Collected By: Mr. Abhishek

S.No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	46 G 22	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	486 A 2024	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	447 A 22	11.08.2026

PARAMETERS	Concentration of Pollutant												
	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>x</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	O <sub>3</sub> µg/m <sup>3</sup>	NH <sub>3</sub> µg/m <sup>3</sup>	Lead µg/m <sup>3</sup>	Nickel ng/m <sup>3</sup>	Arsenic ng/m <sup>3</sup>	Benzene µg/m <sup>3</sup>	B(a)P ng/m <sup>3</sup>	
@NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1	
Date of Monitoring	02/03/2026	56.97	28.31	19.52	19.25	0.59	22.14	BLQ	BLQ	BLQ	BLQ	BLQ	
	05/03/2026	58.41	30.56	18.24	22.51	0.68	20.53	BLQ	BLQ	BLQ	BLQ	BLQ	
	09/03/2026	64.32	33.92	21.82	24.52	0.74	23.67	BLQ	BLQ	BLQ	BLQ	BLQ	
	12/03/2026	63.12	31.24	23.53	21.42	0.61	25.85	BLQ	BLQ	BLQ	BLQ	BLQ	
	16/03/2026	57.38	25.15	17.22	18.98	0.68	21.92	BLQ	BLQ	BLQ	BLQ	BLQ	
	19/03/2026	55.41	29.45	16.35	16.76	0.58	22.70	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
	23/03/2026	62.77	30.79	19.46	22.43	0.71	24.68	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
	26/03/2026	65.46	33.36	23.27	25.79	0.75	27.37	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
	30/03/2026	61.79	32.14	20.89	21.53	0.66	25.57	BLQ	BLQ	BLQ	BLQ	BLQ	BLQ
Maximum	65.46	33.92	23.53	25.79	0.75	27.37	--	--	--	--	--	--	
Minimum	55.41	25.15	16.35	16.76	0.58	20.53	--	--	--	--	--	--	
Average	60.62	30.54	20.03	21.46	0.67	23.82	--	--	--	--	--	--	
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5	
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	SKS/STP/11 Issue No.-01, 01/07/2022	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004	

Note- #STP-Standard Testing Procedure, BLQ -Below Limit of Quantification, LOQ -Limit of Quantification.

@NAAQS- National Ambient Air Quality Standards.

\*\*\*End of Report\*\*\*





## Test Report

Sample Number: SKS/A/19-27 Report No.: SKS/A/2603000019-0027  
 Name & Address of the Project: M/s 1027, Talcher Super Thermal Power Station Format No.: 7.8 F-03  
 P.O.- Talcher Thermal, Angul, Angul, Odisha-759101 Party Reference No.: 5500044394-037-1019  
 Reporting Date: 06/04/2026  
 Sampling Location: PT Plant (Central Store Area) Parameter Required: As Per Work Order  
 Sample Description: Ambient Air Quality Monitoring Sample Collected By: Mr. Abhishek  
 Sampling & Analysis Protocol: IS 5182 & STP

S. No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	428 A 24	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	485 A 2024	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	120 I 22	11.08.2026

PARAMETERS	Concentration of Pollutant											
	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>x</sub> µg/m <sup>3</sup>	CO mg/m <sup>3</sup>	O <sub>3</sub> µg/m <sup>3</sup>	NH <sub>3</sub> µg/m <sup>3</sup>	Lead µg/m <sup>3</sup>	Nickel ng/m <sup>3</sup>	Arsenic ng/m <sup>3</sup>	Benzene µg/m <sup>3</sup>	B(a)P ng/m <sup>3</sup>
@NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1
Date of Monitoring	02/03/2026	64.86	34.78	24.25	20.14	0.70	24.83	BLQ	BLQ	BLQ	BLQ	BLQ
	05/03/2026	62.72	32.53	23.65	25.72	0.61	20.54	BLQ	BLQ	BLQ	BLQ	BLQ
	09/03/2026	65.14	36.24	21.26	22.15	0.54	23.15	BLQ	BLQ	BLQ	BLQ	BLQ
	12/03/2026	57.65	28.69	18.48	24.56	0.65	18.72	BLQ	BLQ	BLQ	BLQ	BLQ
	16/03/2026	66.32	35.47	22.45	25.28	0.73	25.15	BLQ	BLQ	BLQ	BLQ	BLQ
	19/03/2026	68.51	38.65	27.32	29.76	0.81	28.75	BLQ	BLQ	BLQ	BLQ	BLQ
	23/03/2026	58.98	29.28	20.81	19.15	0.66	20.06	BLQ	BLQ	BLQ	BLQ	BLQ
	26/03/2026	61.24	30.43	25.61	24.33	0.71	23.49	BLQ	BLQ	BLQ	BLQ	BLQ
	30/03/2026	63.85	33.16	28.75	23.94	0.67	21.28	BLQ	BLQ	BLQ	BLQ	BLQ
	Maximum	68.51	38.65	28.75	29.76	0.81	28.75	--	--	--	--	--
Minimum	57.65	28.69	18.48	19.15	0.54	18.72	--	--	--	--	--	--
Average	63.25	33.24	23.62	23.89	0.67	22.88	--	--	--	--	--	--
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	SKS/STP/11 Issue No.-01, 01/07/2022	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004

Note- #STP-Standard Testing Procedure, BLQ- Below Limit of Quantification, LOQ- Limit of Quantification.

@NAAQS- National Ambient Air Quality Standards.

\*\*\*End of Report\*\*\*





## Test Report

Sample Number: SKS/A/28-36  
 Name & Address of the Project: M/s 1027, Talcher Super Thermal Power Station  
 P.O.- Talcher Thermal, Angul, Angul, Odisha-759101  
 Sampling Location: Township (Field Hostel)  
 Sample Description: Ambient Air Quality Monitoring  
 Sampling & Analysis Protocol: IS 5182 & STP

Report No.: SKS/A/2603000028-0036  
 Format No.: 7.8 F-03  
 Party Reference No.: 5500044394-037-1019  
 Reporting Date: 06/04/2026  
 Parameter Required: As Per Work Order  
 Sample Collected By: Mr. Abhishek

S. No.	Equipments Name	Make	Model No.	Serial No.	Validity of Calibration
1.	Respirable Dust Sampler	Enviro Instruments	EI 142	312 L 22	11.08.2026
2.	Gaseous Sampling Attachment	Enviro Instruments	EI 061	330 L 22	11.08.2026
3.	Fine Particulate Sampler	Enviro Instruments	EI 133	333 I 22	11.08.2026

PARAMETERS	Concentration of Pollutant											
	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	O <sub>3</sub>	NH <sub>3</sub>	Lead	Nickel	Arsenic	Benzene	B(a)P
	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	mg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	ng/m <sup>3</sup>	ng/m <sup>3</sup>	µg/m <sup>3</sup>	ng/m <sup>3</sup>
@ NAAQ Standard	100	60	80	80	4	180	400	1	20	6	5	1
Date of Monitoring	02/03/2026	56.74	27.51	22.98	19.82	0.66	23.17	BLQ	BLQ	BLQ	BLQ	BLQ
	05/03/2026	62.16	32.43	21.57	22.47	0.54	22.45	BLQ	BLQ	BLQ	BLQ	BLQ
	09/03/2026	59.24	28.54	19.35	20.13	0.71	20.16	BLQ	BLQ	BLQ	BLQ	BLQ
	12/03/2026	60.13	33.29	20.52	25.46	0.56	24.47	BLQ	BLQ	BLQ	BLQ	BLQ
	16/03/2026	64.85	35.78	25.66	27.85	0.69	25.86	BLQ	BLQ	BLQ	BLQ	BLQ
	19/03/2026	63.43	29.61	24.69	21.34	0.67	23.26	BLQ	BLQ	BLQ	BLQ	BLQ
	23/03/2026	58.78	25.42	18.79	20.68	0.75	27.85	BLQ	BLQ	BLQ	BLQ	BLQ
	26/03/2026	61.96	30.53	23.32	18.43	0.68	26.14	BLQ	BLQ	BLQ	BLQ	BLQ
30/03/2026	57.49	29.27	19.67	21.35	0.74	24.73	BLQ	BLQ	BLQ	BLQ	BLQ	
Maximum	64.85	35.78	25.66	27.85	0.75	27.85	--	--	--	--	--	--
Minimum	56.74	25.42	18.79	18.43	0.54	20.16	--	--	--	--	--	--
Average	60.53	30.26	21.83	21.94	0.66	24.23	--	--	--	--	--	--
LOQ	5	5	5	6	0.5	2	20	0.1	5	0.1	0.5	0.5
Test Method	IS 5182 (P-23) 2006	IS 5182 (P-24) 2019	IS 5182 (P-2) 2001	IS 5182 (P-6) 2006	IS 5182 (P-10) 1999	IS 5182 (P-9) 1974	IS 5182 (P-25) 2018	IS 5182 (P-22) 2004	IS 5182 (P-22) 2004	SKS/STP/11 Issue No.-01, 01/07/2022	IS 5182 (P-11) 2004	IS 5182 (P-12) 2004

Note- #STP-Standard Testing Procedure, BLQ- Below Limit of Quantification, LOQ- Limit of Quantification.

@NAAQS- National Ambient Air Quality Standards.

\*\*\*End of Report\*\*\*





## Test Report

Sample Number:  
Name & Address of the  
Project:

SKS/N/37-45  
M/s Talcher Super Thermal Power Station  
P.O.- Talcher Thermal, Angul, Angul,  
Odisha-759101

Report No.: SKS/N/2603000037-0045  
Format No.: 7.8 F-03  
Party Reference No.: 5500044394-037-1019  
Reporting Date: 06/04/2026  
Parameter Required: As Per Work Order  
Sample Collected By: Mr. Abhishek

Sample Description:  
Sampling & Analysis  
Protocol:

Ambient Noise Level Monitoring  
IS 9989 & CPCB Guidelines

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- Main Plant Area (ADC Plant)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
02/03/2026	65.1	54.3	55.2	69.27	56.42	dB(A)
05/03/2026	61.4	52.5	56.4	64.43	55.26	dB(A)
09/03/2026	63.2	55.4	57.2	63.24	59.68	dB(A)
12/03/2026	62.5	53.8	52.3	61.48	52.79	dB(A)
16/03/2026	64.0	56.1	56.1	66.28	53.63	dB(A)
19/03/2026	63.5	59.7	54.0	69.76	56.15	dB(A)
23/03/2026	67.6	58.1	58.1	64.39	57.86	dB(A)
26/03/2026	65.1	57.3	56.3	65.12	53.25	dB(A)
30/03/2026	63.5	54.5	54.3	67.58	59.46	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq</sub> .	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
- Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.
- \*dB(A) L<sub>Eq</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Note:- \*A "decibel" is a unit in which noise is measured.

\*\*\*End of Report\*\*\*





## Test Report

Sample Number: SKS/N/46-54  
 Name & Address of the Project: M/s Talcher Super Thermal Power Station  
 P.O.- Talcher Thermal, Angul, Angul, Odisha-759101

Report No.: SKS/N/2603000046-0054  
 Format No.: 7.8 F-03  
 Party Reference No.: 5500044394-037-1019  
 Reporting Date: 06/04/2026  
 Parameter Required: As Per Work Order  
 Sample Collected By: Mr. Abhishek

Sample Description: Ambient Noise Level Monitoring  
 Sampling & Analysis Protocol: IS 9989 & CPCB Guidelines

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- Safety Park (CHP Area)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
02/03/2026	54.2	48.1	49.3	52.44	40.26	dB(A)
05/03/2026	56.5	46.3	47.1	53.24	42.84	dB(A)
09/03/2026	59.4	45.2	45.4	48.78	43.36	dB(A)
12/03/2026	50.3	43.5	50.8	50.25	41.98	dB(A)
16/03/2026	51.2	46.0	53.4	51.36	42.79	dB(A)
19/03/2026	57.5	43.2	49.7	49.85	38.57	dB(A)
23/03/2026	53.8	49.8	46.5	54.66	40.22	dB(A)
26/03/2026	55.3	47.2	49.1	45.86	37.64	dB(A)
30/03/2026	57.3	49.4	48.4	50.41	39.27	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq</sub> .	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
- Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.
- \*dB(A) L<sub>Eq</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Note:- \*A "decibel" is a unit in which noise is measured.

\*\*\*End of Report\*\*\*

  
 (Reviewed By)  
 Technical Manager

  
 (Authorized Signatory)



## Test Report

Sample Number: SKS/N/55-63 Report No.: SKS/N/2603000055-0063  
 Name & Address of the Project: M/s Talcher Super Thermal Power Station  
 P.O.- Talcher Thermal, Angul, Angul, Odisha-759101  
 Format No.: 7.8 F-03  
 Party Reference No.: 5500044394-037-1019  
 Reporting Date: 06/04/2026  
 Parameter Required: As Per Work Order  
 Sample Collected By: Mr. Abhishek

Sample Description: Ambient Noise Level Monitoring  
 Sampling & Analysis Protocol: IS 9989 & CPCB Guidelines

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- PT Plant (Central Store Area)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
02/03/2026	70.4	54.2	56.1	64.35	59.23	dB(A)
05/03/2026	69.5	59.3	55.8	67.32	58.61	dB(A)
09/03/2026	68.3	57.1	54.0	69.12	50.33	dB(A)
12/03/2026	65.4	58.5	52.3	62.16	56.42	dB(A)
16/03/2026	62.6	54.3	53.4	67.25	59.72	dB(A)
19/03/2026	66.8	57.2	56.3	70.98	64.05	dB(A)
23/03/2026	71.0	58.4	52.8	66.38	58.76	dB(A)
26/03/2026	66.2	56.3	50.4	61.67	55.69	dB(A)
30/03/2026	67.4	59.7	52.1	63.45	57.16	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq.</sub>	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

- Day Time shall mean from 06.00 A.M. to 10.00 P.M.
- Night Time shall mean from 10.00 P.M. to 06.00 A.M.
- Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
- Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.
- \*dB(A) L<sub>Eq.</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Note:- \*A "decibel" is a unit in which noise is measured.

\*\*\*End of Report\*\*\*





## Test Report

Sample Number: SKS/N/64-72  
Name & Address of the Project: M/s Talcher Super Thermal Power Station  
P.O.- Talcher Thermal, Angul, Angul, Odisha-759101  
Report No.: SKS/N/2603000064-0072  
Format No.: 7.8 F-03  
Party Reference No.: 5500044394-037-1019  
Reporting Date: 06/04/2026  
Parameter Required: As Per Work Order  
Sample Collected By: Mr. Abhishek

Sample Description: Ambient Noise Level Monitoring  
Sampling & Analysis Protocol: IS 9989 & CPCB Guidelines

### AMBIENT NOISE QUALITY MONITORING RESULTS

Sampling Location- Township (Field Hostel)						
Sampling Date	L <sub>d</sub>	L <sub>n</sub>	L <sub>dn</sub>	L <sub>eq</sub> (Day Time)	L <sub>eq</sub> (Night Time)	Unit
02/03/2026	54.7	50.1	56.1	52.23	40.75	dB(A)
05/03/2026	55.3	54.2	57.5	50.15	44.52	dB(A)
09/03/2026	57.2	51.6	54.3	54.75	41.25	dB(A)
12/03/2026	53.1	48.4	58.6	49.33	43.67	dB(A)
16/03/2026	56.2	53.2	53.8	52.67	40.85	dB(A)
19/03/2026	54.8	56.0	56.1	51.98	39.49	dB(A)
23/03/2026	59.7	51.5	54.2	48.22	38.76	dB(A)
26/03/2026	52.0	49.3	55.3	53.36	42.57	dB(A)
30/03/2026	56.4	52.6	57.2	54.15	43.86	dB(A)

### Ambient Noise Quality Standards as per Noise Pollution (Regulation and Control) Rules, 2000

Area Code	Category of Area/Zone	Limits in dB (A*) L <sub>Eq</sub>	
		Day Time	Night Time
(A)	Industrial Area	75.00	70.00
(B)	Commercial Area	65.00	55.00
(C)	Residential Area	55.00	45.00
(D)	Silence Zone	50.00	40.00

1. Day Time shall mean from 06.00 A.M. to 10.00 P.M.
2. Night Time shall mean from 10.00 P.M. to 06.00 A.M.
3. Silence Zone is an area comprising not less than 100 metres around Hospitals, Educational Institutions, Courts, Religious Places or any other Area which is declared as such by the Competent Authority.
4. Mixed categories of areas may be declared as one of the four above mentioned categories by the Competent Authority.
5. \*dB(A) L<sub>Eq</sub> denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Note:- \*A "decibel" is a unit in which noise is measured.

\*\*\*End of Report\*\*\*



(Reviewed By)



(Authorized Signatory)