



**The Additional PCCF (C)**  
**MoEF & CC, Govt. of India**  
**Bungalow No. A-2, Shyamali Colony**  
**Ranchi-834002, Jharkhand**  
**Tel: 0651-2410007, 2410002, Email: [ro.ranchi-mef@gov.in](mailto:ro.ranchi-mef@gov.in)**

MD/ENV/ 57 /101/2021  
Date: 27.05.2021

Ref: Environmental Clearance letter no. J-11015/104/2011.IA.II (M) dated: 10.06.2013.

**Sub: Half-yearly compliance status report of Environmental Clearance conditions for the period October'20 - March'21 in respect of Noamundi Iron Mine, M/s Tata Steel Ltd.**

Dear Sir,

Kindly find attached herewith submitting the six monthly compliance report as on date in respect of the stipulated Environmental Clearance conditions of Noamundi Iron Mine, Tata Steel Ltd. for the period from **October'2020 - March'2021** as per EIA Notification, 2006. Also for the same period vide office memorandum no. Z-11013/57/2014-IA.II (M), dated 29.10.2014, is attached herewith as Annexure -1. The same has been mailed to your good office on email: [ro.ranchi-mef@gov.in](mailto:ro.ranchi-mef@gov.in) for your ready reference.

We trust that the measures taken towards environmental safeguards comply with the stipulated environmental conditions. We look forward to your further guidance which shall certainly help us in our endeavor for further improve upon our Environmental Management practices.

Thanking you,

Yours faithfully,  
f: M/s Tata Steel Limited

**Chief (Mine Planning & Projects), OMQ**

Encl. : As above

Copy to : The Chairman, Central Pollution Control Board, Southern Conclave, Block 502, 5<sup>th</sup> & 6<sup>th</sup> Floors, 1582 Rajdanga Main Road, Kolkata - 700107 (W. B.)  
: The Member Secretary, State Pollution Control Board, T.A. Division (Ground Floor), H.E.C. Dhurwa, Ranchi - 834004 (Jharkhand)  
: The Regional Officer, JSPCB, MB/12, New Housing Colony, Adityapur, Jamshedpur – 831013 (Jharkhand)

**TATA STEEL LIMITED**

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**Compliance**  
**to**  
**Environmental Clearance Conditions**  
**of**  
**Noamundi Iron Mine**  
**M/s. Tata Steel Limited**

**For the period: October 2020 - March 2021**

**(EC Letter No. J-11015/104/2011-IA.II (M) 10/06/2013)**

**27<sup>th</sup> May, 2020**

# ENVIRONMENTAL CLEARANCE OF NOAMUNDI IRON MINE OF TATA STEEL LIMITED

(October 2020 to March 2021)


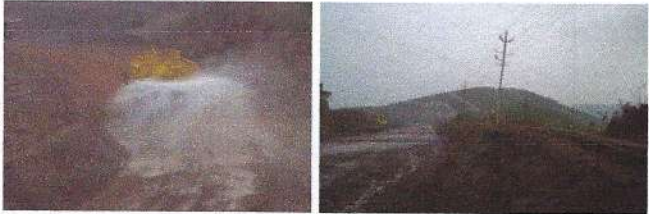

**(MoEF & CC Letter No. J-11015/104/2011-IA.II (M), DATED: 10/06/2013)  
FOR PRODUCTION OF 10 MTPA (ROM) &  
BENEFICIATION OF 18 MTPA (THROUGHPUT) OF IRON ORE**

Sl. No.	EC Conditions	Compliance
<i>Specific Conditions</i>		
1.	No mining activities will be allowed in forest area for which the Forest Clearance is not available.	Complied with.  Noamundi Iron Mine of TATA Steel has restricted its operations in diverted forest and non-forest area as per approvals obtained. The mine has 1160.06 ha lease area, out of which 762.42 ha is a forest land & rest is non-forest. Out of 762.42 ha, forest land diverted for mining is 370.92 ha vide letter no. 8-279, 1985 FC (Pt) dated 4 <sup>th</sup> Sept., 2014 & for rest 383.37 ha including safety zone of 8.14 ha, forest diversion proposal has already been applied & at advanced stage of clearance.
2.	The project proponent will seek and obtain approval under the FC Act, 1980 for diversion of the entire forest land located within the mining lease within a period of two years from 01.02.2013 i.e. the date of issue of guidelines by FC vide there letter F. No. 11-362/ 2012-FC, failing which the mining lease area will be reduced to the non-forest area plus the forest area for which the project proponent has been able to obtain the FC at the end of this time period. In the case of reduction in mine lease area, the project proponent will need to get a revised mining plan approved from the competent authority for reduced area and enter into a new mining lease as per reduced lease area. The EC will be construed to be available for the mining lease area as per the revised mining lease deed.	Complied.  New Guidelines for Forest Diversion Proposal by FC vide letter F. No. 11-599/2014-FC dated: 01.04.2015 has been issued by MoEF&CC regarding this matter which suppressed the previous guidelines issued vide letter F. No. 11-362/2012-FC dated: 01.02.2013. None of the forest land has been reduced. The mine has already obtained Forest Clearance for 370.92 ha and for balance forest land 383.37 ha forest diversion already applied and is well advance stage before MoEF&CC Govt of India of clearance as per law. The mine has also paid till date Rs. 59,21,75,354.5 as NPV over total forest land of 762.42 ha. Noamundi mine has valid lease as per the amendment of MMDR Act on 2015 till 31.03.2030 and has approved mine plan till 31.03.2022 vide no. RAN/WSP/Fe/MP-06/2019-20, dated 13.08.2019 by Indian Bureau of Mines, Govt. of India.
3.	Environmental clearance is subject to obtaining clearance under the Wildlife (Protection) Act, 1972 from the Competent authority, as may be applicable to this project.	Not applicable.  As no specific clearance under the Wildlife (Protection) Act, 1972 is required for the project. However, we have submitted details of Protection




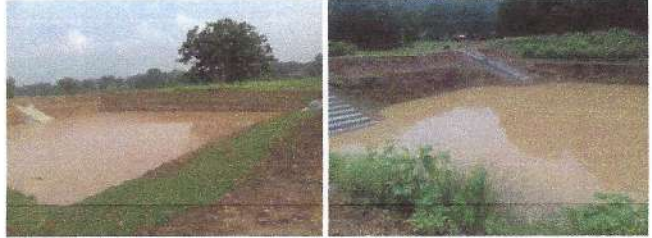
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Sl. No.	EC Conditions	Compliance
<i>Specific Conditions</i>		
		& Conservation of Wildlife measures to MoEF&CC good office vide our letter No. MD/ENV/204/101/15 dated: 20.04.2015.
4.	Prior environmental clearance from the Standing Committee of the National Board for Wildlife shall be obtained if applicable, due to location of the mine within the core zone of Singhbhum Elephant Reserve, before starting any activity relating to the project at site. All the conditions stipulated by the Standing Committee shall be effectively implemented in the project. It shall be noted that this clearance does not necessarily imply that wildlife clearance shall be granted to the project and that your proposal for wildlife clearance shall be considered by the competent authorities on its merit and decision taken. The investment made in the project, if any based on environmental clearance granted to the project, in anticipation of the clearance from wildlife clearance shall be entirely at the cost and risk of the project proponent and ministry of Environment & Forests shall not be responsible in this regard in any manner.	Not applicable. Prior Environmental Clearance is not required from the Standing Committee of the National Board for Wildlife as per letter no. Vanya Prani-19/2012/1310, dated. 19.03.2013 of State Govt. of Jharkhand.
5.	The project proponent shall obtain Consent to Establish and Consent to Operate from the State Pollution Control Board, Jharkhand and effectively implement all the conditions stipulated therein.	Complied with. Consent to Establish has been obtained from the Jharkhand State Pollution Control Board vide letter no. PC/NOC/JSR/26/12/B-1848, dated: 09.06.2015. Consent to Operate has also been obtained from State Pollution Control Board, Jharkhand vide letter No. JSPCB/HO/RNC/CTO-8511802/2020/1942, dated: 16.12.2020, which is valid till 31.12.2025. All the conditions are being effectively implemented & complied.
6.	Environmental Clearance is subject to final order of the Hon'ble Supreme Court of India in the matter of Goa Foundation Vs. Union of India in Writ Petition (Civil) No. 460 of 2004, as may be applicable to this project.	Noted down. However, there is no National Park, Sanctuaries, Elephant corridor and tiger reserves within 10 Km radius of the core zone.
7.	As part of Ambient Air Quality Monitoring during operational phase of the project, the air samples shall also be analysed for their mineralogical composition and records maintained.	Complied with. As a part of regular Ambient Air Quality Monitoring, mineralogical composition of air samples are also being analysed and submitted to regulatory agency. All the records are adequately maintained. The mineralogical composition report of ambient air is enclosed herewith as


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Sl. No.	EC Conditions	Compliance
<i>Specific Conditions</i>		
8.	The beneficiated ore shall be transported to railway sidings only through closed conveyor.	<p>(annexure-1).</p> <p>Complied with.</p> <p>The beneficiated ore from processing plant to railway sidings being transported through covered conveyors only.</p>  <p><i>Closed conveyor used in mineral transport</i></p>
9.	Effective safeguard measures such as conditioning of ore with water, regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of particulate matter such as around crushing and screening plant, loading and unloading point and transfer points. It should be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard	<p>Being complied with.</p> <p>The effective safeguard measures such as conditioning of ore before transportation by wet process is regularly being done. Fixed and mobile water sprinklers are installed and used in the area. Regular water sprinkling is also being done on the haul roads. Mist sprays are also installed in the area along in high dust generated areas. Fog based dust separators also installed and used.</p>  <p><i>Mobile &amp; Fixed water sprinklers in Noamundi mines</i></p> <p>Two water tankers of 50KL with spray mist are also installed in mines for effective dust control.</p> <p>Apart from above, the area is adequately covered with mass plantation. Thus dust generation has been controlled.</p>  <p><i>Mist type dust suppression measures</i></p> <p>As per last site visit of MoEF&amp;CC officials and kind instruction a new fixed water sprinkler suggested to install adjacent to the roads near hopper and crusher area which dust prone due to frequent dumper movement. At two new location in area fixed water sprinkling system were</p>



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Sl. No.	EC Conditions	Compliance
<b>Specific Conditions</b>		
		<p>installed.</p>  <p><i>Newly installed fixed water sprinkler at near hopper area.</i></p>
10.	<p>The project authority shall implement suitable conservation measures to augment ground water resources in the area in consultation with the Regional Director, Central Ground Water Board.</p>	<p>The rainwater collected in the mine pits and allowed to be collected in the lowest level sumps to augment the ground water resources gradually. Rain water harvesting (RWH) ponds and ground water recharge structures have been constructed and approved by the Ground Water Directorate, Jharkhand, Ranchi.</p>  <p><i>RWH structure for ground water augmentation in the area</i></p> <p>The unit has rainwater harvesting approval from Hon. Director, Ground Water Directorate, Water Resources Dept. Jharkhand vide letter no. GWD 317/Ranchi, dated 14<sup>th</sup> Jun, 2012. At Noamundi area the various RWH structures in the form of Check Dams, Saucer ponds, Gabion Structures, Trenches and contour are made based on recommendation in available area.</p>  <p><i>RWH structure for ground water augmentation in the area</i></p> <p>To augment the ground water about 06 new additional ponds are constructed in year 2019-20 around Noamundi mine lease at Leping, Mahudi, Jampani &amp; Sarbil villages.</p>  <p><i>Newly constructed ponds in surrounding villages (2019-20)</i></p>
11.	<p>Regular monitoring of ground water level and quality shall be carried out in and around the</p>	<p>Complied with.</p>

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Sl. No.	EC Conditions	Compliance
<i>Specific Conditions</i>		
	mine lease by establishing a network of existing wells and installing new piezometers during the mining operation. The periodic monitoring [(at least four times in a year- pre-monsoon (April-May), monsoon (August), post-monsoon (November) and winter (January); once in each season)] shall be carried out in consultation with the State Ground Water Board/Central Ground Water Authority and the data thus collected may be sent regularly to the Ministry of Environment and Forests and its Regional Office	Ground water quality and Ground water level are being monitored periodically in and around the lease areas. All the monitoring results are being submitted to regulatory agencies. At five locations, new piezometric borewell are installed. In one of well a telemetric system with online data facility for water level is also been installed. The monitoring details are enclosed as annexure-II.
12.	The mining operations shall be restricted to above ground water table and it should not intersect groundwater table. In case of working below ground water table, prior approval of the Ministry of Environment and Forests and Central Ground Water Authority shall be obtained, for which a detailed hydro-geological study shall be carried out.	Being complied with. The mining operations are being restricted to above the ground water table. However, in case of working below ground water table prior approval for CGWA shall be taken.
13.	The project proponent shall ensure that no natural watercourse and/or water resources shall be obstructed due to any mining operations. The Balijore Nallah shall be left undisturbed and protected.	Complied with. The nallah has huge ground water recharge potential as lies between two hills of Noamundi. To protect the nallah from soil erosion & siltation the pitching work at some part was done. Various water recharge structures such as storage cum percolation ponds injection wells, contour trenches were also made adjacent of it along with other areas as per hydrogeology study and recommendations from State Ground Water Board. However, the nallah kept protected and undisturbed at various places.  <i>Natural flow of Balijore nala, at Noamundi</i> Any kind suggestion from good office of MoEF&CC, Ranchi shall be welcome for protection of Balijore Nallah.
14.	The project proponent shall regularly monitor the flow rate of the Balijore Nallah flowing through the mine lease and maintain the	Complied with. The flow rate of the Balijore Nallah is being

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Sl. No.	EC Conditions	Compliance
<i>Specific Conditions</i>		
	records.	monitored on monthly basis and the records are maintained (enclosed as annexure-III).
15.	<p>There shall be no external over burden dumps at the end of the mine life. The reclaimed and rehabilitated area shall be afforested. Monitoring and management of rehabilitated areas shall continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment &amp; Forests and its Regional Office located at Bhubaneswar on six monthly basis.</p>	<p>Complied with.</p> <p>There shall not be any external over burden dumps at the end of mine life. Currently two Over Burden (OB) dumped are being made as per plan at earmarked area. Which are progressively stabilized by native species plantation and grass vegetation as per direction of MoEF&amp;CC.</p> <p>In FY 21 around 12647 saplings were planted in the mine lease area till date.</p>  <p><i>Plantation on Waste dump D2</i></p> <p>Grassing on bunds of haul roads to control wind pollution also been practiced as per kind suggestion from MoEF&amp;CC office at mine.</p>  <p><i>Local grass plantation on bunds of haul roads at mine.</i></p>

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Sl. No.	EC Conditions	Compliance
<i>Specific Conditions</i>		
16.	<p>Catch drains and siltation ponds of appropriate size shall be constructed around the mine working, soil, mineral and temporary OB dump(s) to prevent run off of water and flow of sediments directly into Balijore Nallah, Kundra Nallah, Jojo Nallah, Mahadev Nallah, Baitarni River and other water bodies. The water so collected should be utilized for watering the mine area, roads, green belt development etc. The drains shall be regularly de-silted particularly after monsoon and maintained properly. Garland drains, settling tanks and check dams of appropriate size, gradient and length shall be constructed both around the mine pit and over burden dump(s) to prevent run off of water and flow of sediments directly into Balijore Nallah, Kundra Nallah, Jojo Nallah, Mahadev Nallah, Baitarni River and other water bodies and sump capacity should be designed keeping 50% safety margin over and above peak sudden rainfall (based on 50 years data) and maximum discharge in the area adjoining the mine site. Sump capacity should also provide adequate retention period to allow proper settling of silt material. Sedimentation pits shall be constructed at the corners of the garland drains and de-silted at regular intervals.</p>	<p>Garland drains with settling pits have been constructed all along the OB dumps. Settling pits have also been provided to arrest the silt flow from area. The de-siltation of these check dams settling pits are done regularly and properly maintained. Sedimentation pits have been constructed at the corners of the garland drains to take care of run off of water even during peak rain fall and they are being de-silted regularly before and after the monsoon. Garland drains, settling tanks and Check dams had been constructed both around the mine pit and over burden dump(s).</p> <p>Garland drain from jig waste to hopper area has been made newly as per kind suggestion of MoEF&amp;CC officials.</p>  <p><i>garland drains, Settling pits at mine</i></p>  <p><i>De-siltation of slime &amp; check dams before monsoon.</i></p> <p>The Water quality report of surrounding natural nallahs such as Balijore Nallah, Kundra Nallah, Jojo Nallah, Mahadev Nallah, Baitarni River is also enclosed here with as annexure IV.</p>
17.	<p>Dimension of the retaining wall at the toe of temporary over burden dumps and OB benches within the mine to check run-off and siltation shall be based on the rain fall data.</p>	<p>Retaining wall and Garland drains of appropriate size have been constructed around the OB dumps to check mine run-off.</p>  <p><i>Toewall at OB dumps</i></p>


4-Apr 2022

Sl. No.	EC Conditions	Compliance
<b>Specific Conditions</b>		
18.	<p>Plantation shall be raised in an area of 990.601ha including a 7.5m wide green belt in the safety zone around the mining lease, backfilled and reclaimed area, around the higher benches of excavated void to be converted in to water body, roads etc. by planting the native species in consultation with the local DFO/Agriculture Department. The density of the trees should be around 2500 plants per ha.</p>	<p>In this financial year i.e 2020-21 plantation of about 12647 saplings is done on Waste dump D2, Kurtha dump and in township areas . In addition to this Avenue plantation is in progress</p>  <p style="text-align: center;"><i>Plantation in Noamundi Mines</i></p>  <p style="text-align: center;"><i>Avenue Plantation outside the mine lease</i></p>
19.	<p>Effective safeguard measures such as regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of SPM and RPM such as haul road, loading and unloading point and transfer points. It shall be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard.</p>	<p>Being complied with. Fixed and mobile water sprinklers are installed and used in the area. Regular water sprinkling is also being done on the haul roads. Mist sprays are also installed in the area along in high dust generated areas such as loading unloading area. Fog based dust separators also installed at crushers and used along with dust extraction system.</p>   <p style="text-align: center;"><i>Other dust control measures in area</i></p>
20.	<p>Mine water discharge and/or any waste water shall be properly treated to meet the prescribed standards before reuse/discharge. The run off from temporary OB dumps and other surface run off shall be analysed for iron and in case its concentration is found higher than the permissible limit, the waste water should be treated before discharge/reuse.</p>	<p>There is no waste water discharge from the mine and mineral processing plant, entire unit is "Zero Discharge Unit".</p> <p>After mineral processing (wet plant) the water is collected in slime pond, where decanted water from the slime dam is completely recycled &amp; reused in the beneficiation plant and slime is recovered and stored for future use. Thus no water is being discharged to environment.</p>



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Sl. No.	EC Conditions	Compliance
<i>Specific Conditions</i>		
21.	The decanted water from the beneficiation plant and slime/tailing pond shall be re-circulated within the mine and there shall be zero discharge from the mine.	Being complied with
22.	Regular monitoring of the flow rate of the springs and perennial nallahs shall be carried out and records maintained.	Flow rate of Balijhore nallah is monitored regularly and is enclosed as annexure-III.
23.	Regular monitoring of water quality upstream and downstream of Balijore Nallah, Kundra Nallah, Jojo Nallah, Mahadev Nallah shall be carried out and record of monitoring data should be maintained and submitted to Ministry of Environment and Forests, its Regional Office, Bhubneswar, Central Groundwater Authority, Regional Director, Central Ground Water Board, State Pollution Control Board and Central Pollution Control Board.	Water quality monitoring of Balijore Nallah, Kundra Nallah, Jojo Nallah, Mahadev Nallah, are being carried out and monitoring results, so obtained are sent to Regional office, MoEF&CC, Jharkhand State Pollution Control Board, Ranchi and Central Pollution Control Board. Water Quality Analysis is enclosed as annexure-IV.
24.	Appropriate mitigate measures shall be taken to prevent pollution of Baitarni River, if any, in consultation with the State Pollution Control Board.	Baitarani River is flowing at a distance of about 12 Km from the mine and is not being polluted because of mining operations of Noamundi Iron Mine. However, different mitigation measures are being implemented for betterment of environment in and around the mine in consultation with the Jharkhand State Pollution Control Board.
25.	The project proponent shall obtain necessary prior permission of the competent authorities for drawl of requisite quantity of surface water for the project. Ground water shall not be used for the mining operations.	Being complied with. Only Surface water from Baitarani is being used for mining and processing purpose. At present, we have permission for drawl of 9786 KLD of surface water and our operation is being managed well within that quantity. Apart from this, we are recycling our slime dam water to meet basic water requirement of wet plant up to some extent. However, for increased requirement, we have applied for drawl of additional quantity of water to the regulatory agency.
26.	Suitable rainwater harvesting measures on long term basis shall be planned and implemented in consultation with Regional Director, Central Ground Water Board.	Being complied with. Rain water harvesting structures and several ground water recharge structures have been constructed at the mine site hiring the expertise of KRG Foundation, Chennai and they are now operational.  Technical approval for design and Plan of Rain Water Harvesting (RWH) for Ground Water Recharge has already been approved by Hon. Director, Ground Water Directorate, Water

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Sl. No.	EC Conditions	Compliance
<b>Specific Conditions</b>		
		<p>Resources Dept. Jharkhand vide letter no. GWD 317/Ranchi, dated 14<sup>th</sup> Jun, 2012.</p> <p>At Noamundi area the various RWH structures in the form of Check Dams, Saucer ponds, Gabion Structures, Trenches and contour are made based on recommendation of Hon. Director, Ground Water Directorate, Water Resources Dept. Jharkhand and available land in the area.</p>  <p><i>RWH structure for ground water augmentation in the area</i></p>
27.	<p>Vehicular emissions shall be kept under control and regularly monitored. Measures shall be taken for maintenance of vehicles used in mining operations and in transportation of mineral from mine face to the beneficiation plant. The vehicles shall be covered with a tarpaulin and shall not be overloaded.</p>	<p>Being complied with.</p>
28.	<p>Blasting operation shall be carried out only during the daytime. Controlled blasting shall be practiced. The mitigative measures for control of ground vibrations and to arrest fly rocks and boulders should be implemented.</p>	<p>Being complied with. Blasting is carried out only during day time. Controlled blasting is practiced with delay detonators for control of ground vibrations and to arrest fly rocks. Scientific studies are also being conducted from reputed agencies such as CIMFR, Dhanbad and all the recommendations followed for control of ground vibrations and fly rocks &amp; boulders.</p>
29.	<p>Drills shall either be operated with dust extractors or equipped with water injection system.</p>	<p>Being complied with.</p> <p>All the drill are equipped with water injection system.</p>
30.	<p>Mineral handling plant shall be provided with adequate number of high efficiency dust extraction system. Loading and unloading areas including all the transfer points should also have efficient dust control arrangements. These should be properly maintained and operated.</p>	<p>Being complied with.</p> <p>Dust extraction system is provided at Primary Crusher area to eliminate the generation of dust.</p> <p>De-dusting unit are installed at crushing plant &amp; is being regularly monitored. The last report is enclosed in annexure-V.</p>


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Sl. No.	EC Conditions	Compliance
<i>Specific Conditions</i>		
		 <p data-bbox="917 678 1412 705"><i>Dust Extraction system at crusher Noamundi</i></p>
31.	Consent to operate shall be obtained from State Pollution Control Board prior to start of enhanced production from the mine.	Noamundi has valid consent to operate from Jharkhand State Pollution Control Board, which is valid till 31 <sup>st</sup> Dec 2025.
32.	Sewage treatment plant shall be installed for the colony. ETP shall also be provided for workshop and wastewater generated during mining operation.	<p data-bbox="829 869 1500 1048">Being complied with. Two Sewage Treatment Plant (STP) of 50 KLD each and two Effluent Treatment Plant (ETP) of 10 KLD each are already installed &amp; working smoothly in colony area of Noamundi.</p>  <p data-bbox="893 1361 1433 1393"><i>Sewage &amp; Effluent Treatment Plant at Noamundi</i></p> <p data-bbox="829 1444 1500 1624">For the workshops and all other areas and oil trap is installed with collection system. The entire water is reused in other activities such as gardening &amp; dust suppressions. No wastewater generated is discharged outside from mine.</p>
33.	Digital processing of the entire lease area using remote sensing technique shall be carried out regularly once in three years for monitoring land use pattern and report submitted to Ministry of Environment and Forests and its Regional Office, Bhubaneswar.	The digital processing of entire lease area is being carried out regularly. The current land use pattern is made by M/s Geo Consultants Pvt. Ltd. the authorized agency by ORSAC, Bhubaneswar. The land use land cover change map as on date is enclosed as annexure-VI.
34.	Regular monitoring of ambient air quality including free silica shall be carried out and records maintained.	Ambient air quality is regularly monitored and records maintained. All the monitoring details are enclosed as annexure-I.
35.	Pre-placement medical examination and periodical medical examination of the workers	Pre-placement medical examination and periodical examination of the workers engaged is being

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Sl. No.	EC Conditions	Compliance
<b>Specific Conditions</b>		
	engaged in the project shall be carried out and records maintained. For the purpose, schedule of health examination of the workers should be drawn and followed accordingly.	conducted & record maintained. The schedule of Periodical Medical Examination is once in every 3 years for the employees of age more than 40 years and once in 5 years for the employees of age less than 45 years.
36.	The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered fauna such as wolf, elephant, sloth bear, rhesus macaque etc. spotted in the core and buffer zone of the mine and contribute towards the cost of implementation of the plan and/or Regional Wildlife Management Plan for conservation of flora and fauna so prepared by the State Forest and Wildlife Department. The amount so contributed shall be included in the project cost. A copy of action plan shall be submitted to the Ministry and its Regional Office, Bhubaneswar within 3 months.	The site specific wildlife conservation plan (SSWLCP) has been approved by Chief Wildlife Warden on 28.08.2020. The impact of mining project on wildlife of the study area and detailed mitigative measures are part of this plan. The total approved cost for implementation of SSWLCP is Rs.25.26 crores (to be spent over a 10-year period).  As required, a site specific wild life conservation plan has also been submitted to the Ministry and its Regional Office, Bhubaneswar.
37.	A Final Mine Closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval.	A progressive mine closure plan approved by IBM is in place. The final mine closure plan along with details of Corpus fund will be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval.
<b>General Conditions</b>		
1.	No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forests.	Being complied with. We are operating as per the approved mining technology and scope of working mentioned in Environmental Clearance granted to us and No change in mining technology and scope of working shall be made and adhered to the condition of MoEF&CC.
2.	No change in the calendar plan including excavation, quantum of mineral iron ore and waste should be made.	Being complied with. No change in calendar plan is made.
3.	At least four ambient air quality-monitoring should be established in the core zone as well as in the buffer zone for RSPM (Particulate matter with size less than 10 micron i.e., PM10) and NOX monitoring. Location of the stations should be decided based on the meteorological data, topographical features and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the State Pollution Control Board. The data so recorded should be regularly submitted to the Ministry including its Regional office located	Ambient Air Quality monitoring is being regularly carried out at four different stations within the core zone and Buffer zone respectively, which were located in consultation with the visiting officers of State Pollution control Board, Jharkhand and reports are being submitted to Regional office, MoEF&CC, Ranchi half yearly and to JSPCB monthly. Ambient Air Quality report is enclosed as Annexure-VII.  Apart from above three numbers of continuous online ambient quality stations (CAAQMS) are

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<b>Specific Conditions</b>		
	at Bhubaneswar and the State Pollution Control Board /Central Pollution Control Board once in six months.	<p>also installed in the core buffer area of mine Various parameters such as PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>x</sub>, NO<sub>x</sub> is being monitored for every 15 minutes and the date of same is continuously uploaded in Pollution Control Board server. The data is same is also been displayed using electronic display board in public domain.</p>  <p style="text-align: center;"><i>CAAQMS station of Noamundi</i></p>
4.	Measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in operations of HEMM etc. should be provided with ear plugs / muffs.	Adequate measures are being taken care. All the machines of high noise generated are covered with acoustic enclosure, in separate closed room. Noise generation is eliminated at source by regular maintenance of machines and proper enclosures. Apart from above adequate PPE is also provided to all persons working in the mines. All HEMM operator's cabins are made of soundproofs with air conditioning system. Noise monitoring of area is regularly being done the data of same is enclosed as Annexure-VIII.
5.	There will be zero waste water discharge from the plant.	Being complied. No water is being discharged from plant. Entire process water is recycled and reused. The High Rate Thickener is installed for rapid recovery of water from system in place of conventional thickeners.
6.	Personnel working in dusty areas should wear protective respiratory devices and they should also be provided with adequate training and information on safety and health aspects.	Adequate dust masks are provided to employees engaged in dusty areas. The employees are also given regular awareness training on safety and health aspects as part of implementation process of OHSAS- 18001 & SA 8000 systems.
7.	Occupational health surveillance program of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed.	Periodical Medical Examination of employees and contractor workers are organized regularly to observe any contractions due to exposure to dust and other occupational hazards.
8.	A separate environmental management cell with suitable qualified personnel should be set-up under the control of a Senior Executive who will report directly to the Head of the Organization.	Complied with. A separate environmental management cell is in place with the people having relevant qualification on environmental science.

*[Handwritten signature]*

Sl. No.	EC Conditions	Compliance
<b>Specific Conditions</b>		
9.	The funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purpose. Year wise expenditure should be reported to the Ministry and its Regional Office located at Bhubaneswar.	Funds allocated for environmental management are spent only for environment related purposes and not diverted to any other purpose. Expenditure details of environmental protection measures during 2020-21 at Noamundi Iron Mine are enclosed as annexure-IX.
10.	The project authorities should inform to the Regional Office located at Bhubaneswar regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.	Not applicable. Noamundi is an operational Iron mine of TATA Steel Ltd from last several decades. Thus financial closure & it's approval is not applicable.
11.	The Regional Office of this Ministry located at Bhubaneswar shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data/ information/ monitoring reports.	Being complied with. We extend full co-operation to the officers of the Regional Office during their visit and furnish the required data, information and monitoring reports.
12.	The project proponent shall submit six monthly reports on the status of compliance of the stipulated environmental clearance conditions including results of monitored data (both in hard copies as well as by e-mail) to the Ministry of Environment and Forests, its Regional Office Bhubaneswar, the respective Zonal Office of Central Pollution Control Board and the State Pollution Control Board. The proponent shall upload the status of compliance of the 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 the Ministry of Environment and Forests, Bhubaneswar, the respective Zonal Officer of Central Pollution Control Board and the State Pollution Control Board.	Complied with. Six monthly compliance reports are being submitted regularly on the status of implementation of the stipulated environmental conditions & safeguards to the MoEF&CC, its Regional Office Ranchi, Central Pollution Control Board and State Pollution Control Board Jharkhand. Further, the six-monthly compliance reports along with the monitoring results is being uploaded on Tata Steel's website <a href="http://www.tatasteelindia.com">www.tatasteelindia.com</a> and updated periodically.
13.	A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parisad/ 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.	Complied with
14.	The State Pollution Control Board should	Noted.

*W. Anil*



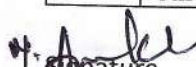
**Compliance status**  
on  
**Impact of Mining on Habitations-Issue ..related**

**Noamundi Iron Mine, TATA Steel Ltd.**

(October 2020 to March 2021)




Conditions based on OM dated 29<sup>th</sup> Oct., 2014 vide no. Z-11013/57/2014-IA.II(M)

S. No.	Condition	Compliance Status
<p>Name of Project: Noamundi Iron Mine, Tata Steel Ltd. Clearance Letter no.: J-11015/104/2011-IA.II (M), dated: 10/06/2013 Period of Compliance: October 2020 to March 2021</p>		
A	The Project Authority shall adopt Best Mining Practice for the given mining conditions. In the mining area, adequate number of check dams, retaining walls/structures, garland drains and settling ponds should be provided to arrest the wash – off with rain water in catchment area.	Being complied.  Adequate no. of check dams, retaining walls / structures, garland drains and settling ponds are made in mine to arrest the rain water. In addition to that various rain water harvesting structures are also made in and around mine.
B	The natural water bodies and or streams which are flowing in and around the village should not be disturbed. The Water Table should be nurtured so as not to go down below the pre-mining period. In case of any water scarcity in the area, the Project Authorities have to provide water to the villagers for their use. A provision for regular monitoring of water table in open dug well located in village should be incorporated to ascertain the impact of mining over ground water table.	Complied with.  The water level in open dug well are regularly been monitored at desired frequency of various villages in & around mine of Noamundi. Various rain water harvesting structures are also made in and around mine.
C	The illumination and sound at night at project sites disturb the villages in respect of both human and animal population. Consequent sleeping disorders and stress may affect the health in the villages located close to mining operations. Habitations have a right to darkness and minimal noise levels at night. The Project Proponents (PPs) must ensure that the biological clock of the villagers is not disturbed by orienting the floodlights/ masks away from the noise levels well within the prescribed limit's for day/night hours.	Being complied.  The mine is being operated in hill top of iron ore deposit & the habitation is far away from mining operations. However, various technologies are used to reduce the noise level from mining & processing operations. Thick green vegetation cover is also being maintained to absorb noise from the area apart from various other measures.
D	The Project Authority shall make necessary alternative arrangements, where required, in consultation with the State Government to provide alternate areas for livestock grazing. In this context, Project Authority should implement the directions of the Hon'ble Supreme Court with regard to acquiring grazing land. The sparse trees on such grazing ground, which provide mid – day shelter from the scorching sun should be scrupulously guarded against felling lest the cattle abandon the grazing ground or return home by noon.	Complied with.
E	Where ever blasting is undertaken as part of mining activity, the Project Authority shall carry out vibration studies well before approaching any such habitats or other buildings to evaluate the Zone of influence and	Vibration study for scientific blasting is regularly been done from CSIR recognized agency. And as per recommendations the blasting is been done only in day time with

  
Signature

Sl. No.	EC Conditions	Compliance
<i>Specific Conditions</i>		
	display a copy of the clearance letter at the Regional office, District Industry Centre and the Collector's office/ Tehsildar's Office for 30 days.	
15.	The environmental 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 Office of the Ministry of Environment and Forests, Bhubaneswar by email	The environmental statement for financial year 2019-20 has been submitted to the State Pollution Control Board on vide letter no. MD/ENV/810/120/2020, dated: 15.09.2020 and the same has been hosted on Company's website www.tatasteelindia.com. Further, compliance status on environmental clearance conditions was also sent to the Regional Office of the Ministry of Environment and Forests, Ranchi.
16.	The project authorities should advertise at least in two local newspapers of the District or State in which the project is located and widely circulated, one of which shall be in the vernacular language of the locality concerned, within 7 days of the issue of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and also at web site of the Ministry of Environment and Forests at <a href="http://envfor.nic.in">http://envfor.nic.in</a> and a copy of the same should be forwarded to the Regional Office of this Ministry located at Bhubaneswar.	Details of Environment Clearance with regard to Noamundi Iron Mine were published both in English and Hindi in local newspapers named "The Hindustan Times" and "Dainik Jagran" respectively on 15th June, 2013. The copy of the newspaper advertisement was sent to the Regional Office, MoEF, Bhubaneswar vide our letter no. MD/ENV/245A/101/2013, dated 19 <sup>th</sup> June'2013, same is enclosed as Annexure-X.

*M. Anbar*

S. No.	Condition	Compliance Status
<p>Name of Project: Noamundi Iron Mine, Tata Steel Ltd.  Clearance Letter no.: J-11015/104/2011-IA.II (M), dated: 10/06/2013  Period of Compliance: October 2020 to March 2021</p>		
	<p>impact of blasting on the neighbourhood. Within 500 meters of such sites vulnerable to blasting vibrations, avoidance of use of explosives and adoption of alternative means of mineral extraction, such as ripper/dozer combination/rock breakers/ surface miners etc. should be seriously considered and practiced wherever practicable.</p>	<p>electronic delay detonators for adequate blast and fragmentation. The data for each blast is been maintained and no mining is being done within 500m of public works.</p>
F	<p>Main haulage road in the mine should be provided with permanent water sprinklers and other roads should be regularly wetted with water tankers fitted with sprinklers. Crusher and material transfer points should invariably be provided with Bag filters and or dry logging system. Belt- conveyors should be fully covered to avoid air borne dust.</p>	<p>The main haulage road in the mine is provided with permanent water sprinklers. Apart from above, mobile and spray mist type sprinklers are also used in mine.</p>  <p><i>Mobile &amp; Fixed water sprinklers in Noamundi mines</i></p>  <p><i>Mist type dust suppression measures</i></p> <p>All the mineral transport shall be done through closed conveyors.</p>  <p><i>Closed conveyor used in mineral transport</i></p>
G	<p>The Project Authority shall ensure that the productivity of agricultural crops is not affected due to mining operations. Crop Liability Insurance Policy has to be taken by the PP as a precaution to compensate for any crop loss. The impact zone shall be 5km from the boundary of mine lease-area for such insurance policy. In case, several mines are located in a cluster, the Associations of owners of the cluster mines, formed inter-alia, to sub-serve such an objective, shall take responsibility for securing such Crop Liability Policy.</p>	<p>Not applicable</p> <p>Noamundi Iron mine is an operational mine since last several decades, and scientific &amp; sustainable mining practices are been adopted.</p>

  
Signature

S. No.	Condition	Compliance Status
<p>Name of Project: Noamundi Iron Mine, Tata Steel Ltd.  Clearance Letter no.: J-11015/104/2011-IA.II (M), dated: 10/06/2013  Period of Compliance: October 2020 to March 2021</p>		
H	<p>In case any village is located within the mining leasehold which is not likely to be affected due to mining activities during the life of mine, the Expert. Appraisal Committee (EAC) should consider the proposal of Environmental Clearance (EC) for reduced mining area. The Mining lease may be executed for the area for which EC is accorded. The mining plan may also be accordingly revised and required stipulations under the MMDR Act, 1957 and MCR, 1960 met.</p>	<p>Noted.   However, no village is located within mine lease area and all mining lease area are mineralized.</p>
I	<p>Transportation of the minerals by road passing through the village shall not be allowed. A 'bypass' road should be constructed (say, leaving a gap of at least 200 meters) for the purpose of transportation of the minerals so that the impact of sound, dust and accidents could be mitigated. The PP shall bear the cost towards the widening and strengthening of existing public road network in case the same is proposed to be used for the Project. No road movement should be allowed on existing village road network without appropriately increasing the carrying capacity of such roads.</p>	<p>No road transportation is done from mine in public road. All the material is transferred by railways.</p>
J	<p>Likewise, alteration or re-routing of foot paths, pagdandies, cart roads, and village infrastructure/public utilities or roads (for purposes of land acquisition for mining) shall be avoided to the extent possible and in case such acquisition is inevitable, alternative arrangements shall be made first and then only the area acquired. In these types of cases, Inspection Reports by site visit by experts may be insisted upon which should be done through reputed Institutes.</p>	<p>Not applicable</p>
K	<p>As CSR activities by Companies including the Mining Establishments has become mandatory up to 2% of their financial turn-over, Socio Economic Development of the neighborhood Habitats could also be planned and executed by the PPs more systematically based on the 'Need based door to door survey' by established Social Institutes/Workers on the lines as required under TOR. "R&amp;R Plan/compensation details for the Project affected People (PAP) should be furnished. While preparing the R&amp;R Plan, the relevant State/National Rehabilitation &amp; Resettlement Policy should be kept in view. In respect of SC's /ST's and other weaker sections of the society in the study area, a need based sample survey, family wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village located in the mine lease area will be shifted or not. The issues related to shifting of village including their R&amp;R and socio-economic aspects should be discussed in the EIA Report."</p>	<p>Complied.   As Noamundi Iron Mine is an operational mine from several decades the PAP is not applicable. However, various surveys are been done as per requirement for social beneficiation.</p>

  
Signature

LIST OF ANNEXURES

NOAMUNDI IRON MINE

Annexure 1	Mineralogical reports from Oct 20 to Mar 21
Annexure 2	Ground water level and quality reports from Oct 20 to Mar 21
Annexure 3	Flow rate of balijhore nallah
Annexure 4	Surface water quality reports from Oct 20 to Mar 21
Annexure 5	Stack emission reports from Oct 20 to Mar 21
Annexure 6	Land use
Annexure 7	Air quality reports
Annexure 8	Ambient Noise quality
Annexure 9	Environment Expenditure
Annexure 10	Copy of advertisements



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**TEST REPORT**

**Mineralogical Composition Report-December-2020**

Report No.: AN/MC/TS-NIM/2020/323-10		Date: 02/01/2021	
Name and Address of Industry:-	M/s Noamundi Iron Mines (M/s TATA Steel Limited)	W. O. No.	
		3000132460/962 15.05.2020	
Sample Description/Type	Mineralogical Composition	Sample Ref. No.:-	2020/Mon-249/NIM/MC-1
Sample Drawn By:-	Anacon Representative	Sample Inward Date:-	22.12.2020
Test Started On:-	22.12.2020	Test Completed On:-	24.12.2020

Date of sampling	Location	Parameter	Unit	Result
16.12.2020	Near Mines Area	Silica	%	0.031
		FeO	%	0.043
		CaO	%	0.028
		Al <sub>2</sub> O <sub>3</sub>	%	< 0.01
		P <sub>2</sub> O <sub>5</sub>	%	< 0.01

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For ANACON LABORATORIES PVT.LTD.

Verified by

Shashikant Satdeve  
(Sr. Chemist)

Authorized Signatory

Dr. (Mrs.) S.D. Garway  
(Quality Manager)

Laboratory address : FP-34, 35, Food Park, 5 Star Industrial Estate, MIDC Bulburi, Nagpur - 441 122.  
Email : support@anacon.in

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## TEST REPORT

### Mineralogical Composition Report-March-2021

Report No.: AN/MC/TS-NIM/2021/14-11			Date: 02/04/2021
Name and Address of Industry:-	M/s Noamundi Iron Mines (M/s TATA Steel Limited)		W. O. No.
			3000132460/962 15.05.2020
Sample Description/Type	Mineralogical Composition	Sample Ref. No.:-	2021/Mon-74/NIM/MC-1
Sample Drawn By:-	Anacon Representative	Sample Inward Date:-	15.03.2021
Test Started On:-	16.03.2021	Test Completed On:-	18.03.2021

Date of sampling	Location	Parameter	Unit	Result
11.03.2021	Near Mines Area	Silica	%	0.032
		FeO	%	0.041
		CaO	%	0.026
		Al <sub>2</sub> O <sub>3</sub>	%	< 0.01
		P <sub>2</sub> O <sub>5</sub>	%	< 0.01

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For ANACON LABORATORIES PVT.LTD.

Verified by

Shashikant Satdeve  
(Sr. Chemist)

Authorized Signatory

Chinmay Garway  
(Deputy Quality Manager)

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## Ground Water Level

### Special condition no. (xi) Of EC vide no.J-11015/104/2011-IA.II (M), dated 10th June, 2013.

*(xi) Regular monitoring of ground water level and quality shall be carried out in and around the mine lease by establishing a network of existing wells and installing new piezometers during the mining operation. The periodic monitoring {at least four times in a year - pre-monsoon (April- May), monsoon (August), post-monsoon (November) and winter (January); once in each season} shall be carried out in consultation with the State Ground Water Board / Central Ground Water Authority and the data thus collected may be sent regularly to the Ministry of Environment and Forests and its Regional Office Bhubaneswar, the Central Ground Water Authority and the Regional Director, Central Ground Water Board. If at any stage, it is observed that the ground water table is getting depleted due to mining activity, necessary corrective measures shall be carried out.*

Noamundi Iron Mine of M/s Tata Steel Limited is an operational opencast captive iron mine. Regular monitoring of ground water level in and around the mine lease of existing well is regularly been done in desired frequency. As per recent hydro-geological study & regulatory approval, few additional locations are also incorporated along with proposed piezometers in the area. Monitored water level for of area for the month of November 2020 and January 2021 are as follows:

Sl. No.	Location	Month	
		November 2020	January 2021
<b>Existing Dug Well Locations:</b>			
1.	Mohudi Railway Station, Kash Moudi Inside Home	2 m 50 cm	2 m 40 cm
2.	Noamundi Basti, Near Football field	5 m 60 cm	6 m 90 cm
3.	Near Plant Site, In front of Bottom Bin back Gate	2 m 41 cm	2 m 30 cm
4.	Serbil	3 m 90 cm	4 m 40 cm
6.	Mohudi Village exit	1 m 50 cm	1 m 60 cm
7.	Mohudi Village near road	4 m 90 cm	5 m 20 cm
8.	Kash Mohudi Railway Station (Near road)	1 m 40 cm	1 m 50 cm
9.	Natho Sahi (near pond)	2 m 32 cm	2 m 40 cm
10.	Natho Sahi (on the road to Matia home)	1 m 25 cm	1 m 32 cm
11.	Noamundi Basti (inside house)	2 m 19 cm	2 m 28 cm
12.	Noamundi Basti (near pond)	1 m 50 cm	1 m 80 cm
<b>New Dug Well Locations:</b>			
13.	Natho Sahi (near Rain water harvesting)	1m 74 cm	1 m 80 cm
14.	College Road	2 m 13 cm	2 m 14 cm
15.	Noamundi Bazar (In front of Petrol Pump)	3 m 45 cm	3 m 50 cm
16.	Lakhansahi (Near Manish House)	10 m 40 cm	10 m 50 cm
<b>Newly Constructed Piezometer Locations:</b>			
17.	New Township, Near DAV School, Noamundi	22 m 90 cm	22 m 65 cm
18.	New Township, Near Aqua Park, Noamundi	23 m 06 cm	22 m 50 cm
19.	Jojo Camp Security Gate, Noamundi	6 m 87 cm	7 m 26 cm
20.	Bottom Bin near security Barrack	8 m 87 cm	7 m 12 cm
21.	Bottom bin near well	1 m 72 cm	2 m 40 cm
22.	Bore well near power house	15 m 51 cm	16 m 00 cm





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Test Report No. : ALPL/30112020/01-3

dated 30.11.2020

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<b>Issued To :</b> M/s Noamundi Iron Mines (M/s TATA Steel Limited) Noamundi, Jharkhand Postal Code: 833217		<b>Sample Inward No.</b> 2020/MON-11/8/18-3	<b>Analysis Start</b> 23.11.2020
		<b>Inward Date</b> 23.11.2020	<b>Analysis End</b> 30.11.2020
		<b>Reference</b> W.O.- 3000132460/962	<b>Sample Category</b> Water
		<b>Reference Date</b> 15.05.2020	
<b>Sample Name</b> Ground Water	<b>Sample Source</b> Dugwell	<b>Sample Particulars</b> Sample Code-GW-1	<b>Location Co-ordinates</b> Lat: 22°9'30.46"N, Long: 85°28'53.38"E
<b>Sample Collected By</b> Anacon Representative Mr. K. Pandey		<b>Sampling Date</b> 18.11.2020	<b>Quantity Received</b> 2.0 Lit & 250 ml
		<b>Sampling Time</b> Not Mentioned	<b>Sampling Location</b> Noamundi Basti (Nr. Play Ground)

### TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 2		Test Result
				Acceptable Limit	Permissible Limit	
I	<b>Biological Testing I.Water</b>					
1	<i>Escherichia coli</i>	Per 100 ml	IS 15185 : 2016	Absent	Absent	Absent
II	<b>Chemical Testing I.Water</b>					
2	pH value	-	IS 3025 (Part 11) : 1983	6.5 to 8.5	No relaxation	7.36 at 25°C
3	Turbidity	NTU	IS 3025 (Part 10) : 1984	1	5	0.6
4	Colour	Hazen units	IS 3025 (Part 4) : 1983	5	15	1
5	Odour	-	IS 3025 (Part 5) : 2018	Agreeable	Agreeable	Agreeable
6	Taste	-	IS 3025 (Part 8) : 1984	Agreeable	Agreeable	Agreeable
7	Free residual chlorine	mg/l	IS 3025 (Part 26) : 1986	Min. 0.2	1	BDL(DL-0.1)
8	Total dissolved solids	mg/l	IS 3025 (Part 16) : 1984	500	2000	238
9	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.0	1.5	BDL(DL-0.1)
10	Cyanide (as CN)	mg/l	IS 3025 (Part 27) : 1986	0.05	No relaxation	BDL(DL-0.005)
11	Chloride (as Cl)	mg/l	IS 3025 (Part 32) : 1988	250	1000	45.33
12	Total Alkalinity (as CaCO <sub>3</sub> )	mg/l	IS 3025 (Part 23) : 1986	200	600	126
13	Total hardness (as CaCO <sub>3</sub> )	mg/l	IS 3025 (Part 21) : 2009	200	600	166.6
14	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : 1991	75	200	37.63
15	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 1994	30	100	17.66
16	Sulphate (as SO <sub>4</sub> )	mg/l	IS 3025 (Part 24) : 1986	200	400	11.14
17	Nitrate (as NO <sub>3</sub> )	mg/l	APHA Method 23 <sup>rd</sup> Edition	45	No relaxation	7.16
18	Phenolic compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	IS 3025 (Part 43) : 1992	0.001	0.002	BDL(DL-0.001)
19	Anionic detergents (as MBAS)	mg/l	IS 13428 : 2005 Annex K	0.2	1.0	BDL(DL-0.01)

NOTES: ♦ Please see watermark "Original Test Report" to confirm the authenticity of this report. ♦ Results shall be referred to tested sample(s) and applicable to tested parameters only. ♦ Test report shall not be reproduced except in full without prior written approval of Anacon Labs. ♦ Liability of Anacon Labs is limited to invoiced amount only. ♦ Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise. ♦ "mg/l" is equivalent to "ppm". ♦ Result for test no. 7 is not relevant. ♦ BDL- Below detection limit ♦ DL- Indicates detection limit of instrument/method and shall be considered as 'absent'.

Verified By

Swati Shrivastava  
Technical Manager

Pooja Kothare  
Technical Manager

Authorized Signatories

Dr. (Mrs.) Anupa Tankhiwale  
Sr. Technical Manager

Dr. (Mrs.) S.D. Garway  
Quality Manager

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dated 30.11.2020

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<b>Issued To :</b> M/s Noamundi Iron Mines (M/s TATA Steel Limited) Noamundi, Jharkhand Postal Code: 833217		<b>Sample Inward No.</b> 2020/MON-11/8/18-3	<b>Analysis Start</b> 23.11.2020
		<b>Inward Date</b> 23.11.2020	<b>Analysis End</b> 30.11.2020
		<b>Reference</b> W.O.- 3000132460/962	<b>Sample Category</b> Water
		<b>Reference Date</b> 15.05.2020	
<b>Sample Name</b> Ground Water	<b>Sample Source</b> Dugwell	<b>Sample Particulars</b> Sample Code-GW-1	<b>Location Co-ordinates</b> Lat: 22°9'30.46"N, Long: 85°28'53.38"E
			<b>Quantity Received</b> 2.0 Ltr & 250 ml
<b>Sample Collected By</b> Anacon Representative Mr. K. Pandey		<b>Sampling Date</b> 18.11.2020	<b>Sampling Time</b> Not Mentioned
<b>Sampling Location</b> Noamundi Basti (Nr. Play Ground)			

**TEST RESULTS**

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 2		Test Result
				Acceptable Limit	Permissible Limit *	
<b>II</b>	<b>Chemical Testing</b>					
	<b>2. Residues In Water</b>					
20	Iron (as Fe)	mg/l	IS 3025 (Part 2) : 2019	1.0	No relaxation	0.09
21	Copper (as Cu)	mg/l	IS 3025 (Part 2) : 2019	0.05	1.5	BDL(DL-0.03)
22	Manganese (as Mn)	mg/l	IS 3025 (Part 2) : 2019	0.1	0.3	BDL(DL-0.05)
23	Mercury (as Hg)	mg/l	IS : 3025 (Part 48) : 1994	0.001	No relaxation	BDL(DL-0.0005)
24	Cadmium (as Cd)	mg/l	IS : 3025 (Part 41) : 1992	0.003	No relaxation	BDL(DL-0.001)
25	Selenium (as Se)	mg/l	IS : 3025 (Part 56) : 2003	0.01	No relaxation	BDL(DL-0.001)
26	Arsenic (as As)	mg/l	IS : 3025 (Part 37) : 1988	0.01	No relaxation	BDL(DL-0.01)
27	Aluminium (as Al)	mg/l	IS 15302 : 2003	0.03	0.2	BDL(DL-0.01)
28	Lead (as Pb)	mg/l	IS 3025 (Part 47) : 2003	0.01	No relaxation	BDL(DL-0.001)
29	Zinc (as Zn)	mg/l	IS 3025 (Part 2) : 2019	5	15	BDL(DL-0.1)
30	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2) : 2019	0.05	No relaxation	BDL(DL-0.03)
31	Boron (as B)	mg/l	IS 3025 (Part 2) : 2019	0.5	2.4	BDL(DL-0.1)
32	Polynuclear aromatic hydrocarbon (PAH)	µg/l	ANqr RES-30	0.1	No relaxation	BDL(DL-0.03)
33	Mineral Oil	mg/l	ANqr RES-40	0.5	No relaxation	BDL(DL-0.001)

NOTES: ♦ Please see watermark "Original Test Report" to confirm the authenticity of this report. ♦ Results shall be referred to tested sample(s) and applicable to tested parameters only. ♦ Test report shall not be reproduced except in full without prior written approval of Anacon Labs. ♦ Liability of Anacon Labs is limited to invoiced amount only. ♦ Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise. ♦ "mg/l" is equivalent to "ppm". ♦ BDL- Below detection limit ♦ DL- Indicates detection limit of instrument/method and shall be considered as "absent". ♦ ANqr RES-30 & 40 : Inhouse validated method.

Verified By

Shashikant Satheve  
Sr. Chemist

Sonali Gharpare  
Technical Manager

Authorized Signatory

Dr. (Mrs.) S.D. Garway  
Quality Manager

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♦ Agricultural & Process Food Products Export Development Authority (APEDA) ♦ Export Inspection Council (EIC) ♦ Agmark

## TEST REPORT

Test Report No.: ALPL/30112020/01-3

dated 30.11.2020

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Issued To: M/s Noamundi Iron Mines (M/s TATA Steel Limited) Noamundi, Jharkhand Postal Code: 833217		Sample Inward No. 2020/MON-11/8/18-3	Analysis Start 23.11.2020	
		Inward Date 23.11.2020	Analysis End 30.11.2020	
		Reference W.O.- 3000132460/962	Sample Category Water	
		Reference Date 15.05.2020		
Sample Name Ground Water	Sample Source Dugwell	Sample Particulars Sample Code-GW-1	Location Co-ordinates Lat: 22°0'30.46"N, Long: 85°28'53.38"E	Quantity Received 2.0 Lit & 250 ml
Sample Collected By Anacon Representative Mr. K. Pandey		Sampling Date 18.11.2020	Sampling Time Not Mentioned	Sampling Location Noamundi Busi (Nr. Play Ground)

### TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 2		Test Result
				Acceptable Limit	Permissible Limit <sup>1</sup>	
II	Chemical Testing					
	2. Residues In Water					
34	Pesticide Residues					
i	Alpha-HCH	µg/l	ANqr RES-28	0.01	No relaxation	BDL(DL-0.01)
ii	Beta HCH	µg/l	ANqr RES-28	0.04	No relaxation	BDL(DL-0.03)
iii	Delta- HCH	µg/l	ANqr RES-28	0.04	No relaxation	BDL(DL-0.03)
iv	Alachlor	µg/l	ANqr RES-28	20	No relaxation	BDL(DL-0.03)
v	Aldrin / Dieldrin	µg/l	ANqr RES-28	0.03	No relaxation	BDL(DL-0.03)
vi	Atrazine	µg/l	ANqr RES-29	2	No relaxation	BDL(DL-0.03)
vii	Butachlor	µg/l	ANqr RES-29	125	No relaxation	BDL(DL-0.03)
viii	Chlorpyrifos	µg/l	ANqr RES-28	30	No relaxation	BDL(DL-0.03)
ix	DDT and its Isomers	µg/l	ANqr RES-28	1	No relaxation	BDL(DL-0.03)
x	Gamma - HCH (Lindane)	µg/l	ANqr RES-28	2	No relaxation	BDL(DL-0.03)
xi	2,4-Dichlorophenoxyacetic acid	µg/l	ANqr RES-29	30	No relaxation	BDL(DL-0.03)
xii	Endosulphan	µg/l	ANqr RES-28	0.4	No relaxation	BDL(DL-0.03)
xiii	Ethion	µg/l	ANqr RES-29	3	No relaxation	BDL(DL-0.03)
xiv	Isoproturon	µg/l	ANqr RES-29	9	No relaxation	BDL(DL-0.03)
xv	Malathion	µg/l	ANqr RES-29	190	No relaxation	BDL(DL-0.03)
xvi	Methyl Parathion	µg/l	ANqr RES-29	0.3	No relaxation	BDL(DL-0.03)
xvii	Monocrotophos	µg/l	ANqr RES-29	1	No relaxation	BDL(DL-0.03)
xviii	Phorate	µg/l	ANqr RES-29	2	No relaxation	BDL(DL-0.03)

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REMARKS: As requested by the client, sample was tested for above parameters only. Sample complies with IS:10500:2012, for tests conducted, indicating that it is fit for drinking purpose with respect to tested parameters.

Verified By

Sonali Gharpure  
Technical Manager

Authorized Signatory

Dr. (Mrs.) S.D. Garway  
Quality Manager

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## TEST REPORT

Approved by: ♦ Food Safety & Standards Authority of India Under FSS Act ♦ Bureau of Indian Standards (BIS)  
♦ Agricultural & Process Food Products Export Development Authority (APEDA) ♦ Export Inspection Council (EIC) ♦ Agmark

Test Report No. : ALPL/30112020/01-4

dated 30.11.2020

Page 1 of 3

Issued To : M/s Noamundi Iron Mines (M/s TATA Steel Limited) Noamundi, Jharkhand Postal Code: 833217		Sample Inward No. 2020/MON-11/8/18-4	Analysis Start 23.11.2020
		Inward Date 23.11.2020	Analysis End 30.11.2020
		Reference W.O.- 3000132460/962	
		Reference Date 15.05.2020	Sample Category Water
Sample Name Ground Water	Sample Source Dugwell	Sample Particulars Sample Code-GW-2	Location Co-ordinates Lat: 22°9'25.41"N, Long: 85°30'21.34"E
Sample Collected By Anacon Representative Mr. K. Pandey		Sampling Date 18.11.2020	Quantity Received 2.0 Ltr & 250 ml
		Sampling Time Not Mentioned	Sampling Location Noamundi Bazar (Nr. Petrol Pump)

## TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 2		Test Result
				Acceptable Limit	Permissible Limit <sup>a</sup>	
I	<b>Biological Testing I.Water</b>					
1	<i>Escherichia coli</i>	Per 100 ml	IS 15185 : 2016	Absent	Absent	Absent
II	<b>Chemical Testing I.Water</b>					
2	pH value	-	IS 3025 (Part 11) : 1983	6.5 to 8.5	No relaxation	7.38at 25°C
3	Turbidity	NTU	IS 3025 (Part 10) : 1984	1	5	0.6
4	Colour	Hazen units	IS 3025 (Part 4) : 1983	5	15	1
5	Odour	-	IS 3025 (Part 5) : 2018	Agreeable	Agreeable	Agreeable
6	Taste	-	IS 3025 (Part 8) : 1984	Agreeable	Agreeable	Agreeable
7	Free residual chlorine	mg/l	IS 3025 (Part 26) : 1986	Min. 0.2	1	BDL(DL-0.1)
8	Total dissolved solids	mg/l	IS 3025 (Part 16) : 1984	500	2000	242
9	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.0	1.5	BDL(DL-0.1)
10	Cyanide (as CN)	mg/l	IS 3025 (Part 27) : 1986	0.05	No relaxation	BDL(DL-0.005)
11	Chloride (as Cl)	mg/l	IS 3025 (Part 32) : 1988	250	1000	31.54
12	Total Alkalinity (as CaCO <sub>3</sub> )	mg/l	IS 3025 (Part 23) : 1986	200	600	132
13	Total hardness (as CaCO <sub>3</sub> )	mg/l	IS 3025 (Part 21) : 2009	200	600	129.36
14	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : 1991	75	200	30.58
15	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 1994	30	100	12.89
16	Sulphate (as SO <sub>4</sub> )	mg/l	IS 3025 (Part 24) : 1986	200	400	9.07
17	Nitrate (as NO <sub>3</sub> )	mg/l	APHA Method 23 <sup>rd</sup> Edition	45	No relaxation	6.22
18	Phenolic compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	IS 3025 (Part 43) : 1992	0.001	0.002	BDL(DL-0.001)
19	Anionic detergents (as MBAS)	mg/l	IS 13428 : 2005 Annex K	0.2	1.0	BDL(DL-0.01)

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Verified By

*For Swati*  
Swati Shrivastava  
Technical Manager

*For Beoja*  
Beoja Kathube  
Technical Manager

Authorized Signatories

*For Anupa*  
Dr. (Mrs.) Anupa Tankhiwale  
Sr. Technical Manager

*For S.D.*  
Dr. (Mrs.) S.D. Garway  
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♦ Agricultural & Process Food Products Export Development Authority (APEDA) ♦ Export Inspection Council (EIC) ♦ Agmark**TEST REPORT**

Test Report No. : AL/PL/30112020/01-4		dated 30.11.2020		Page 2 of 3	
<b>Issued To :</b> M/s Noamundi Iron Mines (M/s TATA Steel Limited) Noamundi, Jharkhand Postal Code: 833217		<b>Sample Inward No.</b> 2020/MON-11/8/18-4 <b>Inward Date</b> 23.11.2020 <b>Reference</b> W.O.- 3000132460/962 <b>Reference Date</b> 15.05.2020		<b>Analysis Start</b> 23.11.2020 <b>Analysis End</b> 30.11.2020 <b>Sample Category</b> Water	
<b>Sample Name</b> Ground Water	<b>Sample Source</b> Dugwell	<b>Sample Particulars</b> Sample Code-GW-2	<b>Location Co-ordinates</b> Lat: 22°9'25.41"N, Long: 85°30'21.34"E		<b>Quantity Received</b> 2.0 Ltr & 250 ml
<b>Sample Collected By</b> Anacon Representative Mr. K. Pandey		<b>Sampling Date</b> 18.11.2020	<b>Sampling Time</b> Not Mentioned	<b>Sampling Location</b> Noamundi Bazar (Nr. Petrol Pump)	

**TEST RESULTS**

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 2		Test Result
				Acceptable Limit	Permissible Limit <sup>F</sup>	
<b>II Chemical Testing</b>						
<b>2. Residues In Water</b>						
20	Iron (as Fe)	mg/l	IS 3025 (Part 2) : 2019	1.0	No relaxation	0.13
21	Copper (as Cu)	mg/l	IS 3025 (Part 2) : 2019	0.05	1.5	BDL(DL-0.03)
22	Manganese (as Mn)	mg/l	IS 3025 (Part 2) : 2019	0.1	0.3	BDL(DL-0.05)
23	Mercury (as Hg)	mg/l	IS : 3025 (Part 48) : 1994	0.001	No relaxation	BDL(DL-0.0005)
24	Cadmium (as Cd)	mg/l	IS : 3025 (Part 41) : 1992	0.003	No relaxation	BDL(DL-0.001)
25	Selenium (as Se)	mg/l	IS : 3025 (Part 56) : 2003	0.01	No relaxation	BDL(DL-0.001)
26	Arsenic (as As)	mg/l	IS : 3025 (Part 37) : 1988	0.01	No relaxation	BDL(DL-0.01)
27	Aluminium (as Al)	mg/l	IS 15302 : 2003	0.03	0.2	BDL(DL-0.01)
28	Lead (as Pb)	mg/l	IS 3025 (Part 47) : 2003	0.01	No relaxation	BDL(DL-0.001)
29	Zinc (as Zn)	mg/l	IS 3025 (Part 2) : 2019	5	15	BDL(DL-0.1)
30	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2) : 2019	0.05	No relaxation	BDL(DL-0.03)
31	Boron (as B)	mg/l	IS 3025 (Part 2) : 2019	0.5	2.4	BDL(DL-0.1)
32	Polynuclear aromatic hydrocarbon (PAH)	µg/l	ANqr RES-30	0.1	No relaxation	BDL(DL-0.03)
33	Mineral Oil	mg/l	ANqr RES-40	0.5	No relaxation	BDL(DL-0.001)

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Verified By

*Shashikant Satdeve*  
Shashikant Satdeve  
Sr. Chemist

*Sonal Gharpure*  
Sonal Gharpure  
Technical Manager

Authorized Signatory

*S.D. Garway*  
Dr. (Mrs.) S.D. Garway  
Quality Manager

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**TEST REPORT**

Test Report No. : ALPL/30112020/01-4

dated 30.11.2020

Page 3 of 3

<b>Issued To:</b> M/s Noamundi Iron Mines (M/s TATA Steel Limited) Noamundi, Jharkhand Postal Code: 833217		<b>Sample Inward No.</b> 2020/MON-11/8/18-4	<b>Inward Date</b> 23.11.2020	<b>Reference</b> W.O. - 3080132460/962	<b>Reference Date</b> 15.05.2020	<b>Analysis Start</b> 23.11.2020	<b>Analysis End</b> 30.11.2020	<b>Sample Category</b> Water
<b>Sample Name</b> Ground Water	<b>Sample Source</b> Dugwell	<b>Sample Particulars</b> Sample Code-GW-2	<b>Location Co-ordinates</b> Lat: 22°9'25.41"N, Long: 85°30'21.34"E		<b>Quantity Received</b> 2.0 Ltr & 250 ml			
<b>Sample Collected By</b> Anacon Representative Mr. K. Pandey		<b>Sampling Date</b> 18.11.2020	<b>Sampling Time</b> Not Mentioned	<b>Sampling Location</b> Noamundi Bazar (Nr. Petrol Pump)				

**TEST RESULTS**

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 2		Test Result
				Acceptable Limit	Permissible Limit <sup>#</sup>	
<b>II</b>	<b>Chemical Testing</b>					
	<b>2. Residues In Water</b>					
34	<b>Pesticide Residues</b>					
i	Alpha-HCH	µg/l	ANqr RES-28	0.01	No relaxation	BDL(DL-0.01)
ii	Beta HCH	µg/l	ANqr RES-28	0.04	No relaxation	BDL(DL-0.03)
iii	Delta- HCH	µg/l	ANqr RES-28	0.04	No relaxation	BDL(DL-0.03)
iv	Alachlor	µg/l	ANqr RES-28	20	No relaxation	BDL(DL-0.03)
v	Aldrin / Dieldrin	µg/l	ANqr RES-28	0.03	No relaxation	BDL(DL-0.03)
vi	Atrazine	µg/l	ANqr RES-29	2	No relaxation	BDL(DL-0.03)
vii	Butachlor	µg/l	ANqr RES-29	125	No relaxation	BDL(DL-0.03)
viii	Chlorpyrifos	µg/l	ANqr RES-28	30	No relaxation	BDL(DL-0.03)
ix	DDT and its Isomers	µg/l	ANqr RES-28	1	No relaxation	BDL(DL-0.03)
x	Gamma - HCH (Lindane)	µg/l	ANqr RES-28	2	No relaxation	BDL(DL-0.03)
xi	2,4-Dichlorophenoxyacetic acid	µg/l	ANqr RES-29	30	No relaxation	BDL(DL-0.03)
xii	Endosulphan	µg/l	ANqr RES-28	0.4	No relaxation	BDL(DL-0.03)
xiii	Ethion	µg/l	ANqr RES-29	3	No relaxation	BDL(DL-0.03)
xiv	Isoproturon	µg/l	ANqr RES-29	9	No relaxation	BDL(DL-0.03)
xv	Malathion	µg/l	ANqr RES-29	190	No relaxation	BDL(DL-0.03)
xvi	Methyl Parathion	µg/l	ANqr RES-29	0.3	No relaxation	BDL(DL-0.03)
xvii	Monocrotophos	µg/l	ANqr RES-29	1	No relaxation	BDL(DL-0.03)
xviii	Phorate	µg/l	ANqr RES-29	2	No relaxation	BDL(DL-0.03)

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**REMARKS:** As requested by the client, sample was tested for above parameters only. Sample complies with IS:10500:2012, for tests conducted, indicating that it is fit for drinking purpose with respect to tested parameters.

Verified By

  
Sonali Gharpure  
Technical Manager

Authorized Signatory

  
Dr. (Mrs.) S.D. Garway  
Quality Manager

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♦ Agricultural & Process Food Products Export Development Authority (APEDA) ♦ Export Inspection Council (EIC) ♦ Agmark**TEST REPORT**

Test Report No. : ALPL/30112020/01-5

dated 30.11.2020

Page 1 of 3

M/s Noamundi Iron Mines (M/s TATA Steel Limited) Noamundi, Jharkhand Postal Code: 833217		Sample Inward No.	2020/MON-11/8/18-5	Analysis Start	23.11.2020
		Inward Date	23.11.2020	Analysis End	30.11.2020
		Reference	W.O.- 3000132460/962	Sample Category	Water
		Reference Date	15.05.2020		
Sample Name	Sample Source	Sample Particulars	Location Co-ordinates	Quantity Received	
Ground Water	Dugwell	Sample Code-GW-3	Lat: 22°8'54.89"N, Long: 85°31'8.03"E	2.0 Lit & 250 ml	
Sample Collected By Anacon Representative Mr. K. Pandey		Sampling Date	18.11.2020	Sampling Time	Not Mentioned
				Sampling Location Mahudi Village (Railway Station Road)	

**TEST RESULTS**

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 2		Test Result
				Acceptable Limit	Permissible Limit <sup>A</sup>	
I	<b>Biological Testing - 1.Water</b>					
1	<i>Escherichia coli</i>	Per 100 ml	IS 15185 : 2016	Absent	Absent	Absent
II	<b>Chemical Testing - 1.Water</b>					
2	pH value	-	IS 3025 (Part 11) : 1983	6.5 to 8.5	No relaxation	7.47 at 25°C
3	Turbidity	NTU	IS 3025 (Part 10) : 1984	1	5	0.8
4	Colour	Hazen units	IS 3025 (Part 4) : 1983	5	15	1
5	Odour	-	IS 3025 (Part 5) : 2018	Agreeable	Agreeable	Agreeable
6	Taste	-	IS 3025 (Part 8) : 1984	Agreeable	Agreeable	Agreeable
7	Free residual chlorine	mg/l	IS 3025 (Part 26) : 1986	Min. 0.2	1	BDL(DL-0.1)
8	Total dissolved solids	mg/l	IS 3025 (Part 16) : 1984	500	2000	248
9	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.0	1.5	BDL(DL-0.1)
10	Cyanide (as CN)	mg/l	IS 3025 (Part 27) : 1986	0.05	No relaxation	BDL(DL-0.005)
11	Chloride (as Cl)	mg/l	IS 3025 (Part 32) : 1988	250	1000	41.39
12	Total Alkalinity (as CaCO <sub>3</sub> )	mg/l	IS 3025 (Part 23) : 1986	200	600	134
13	Total hardness (as CaCO <sub>3</sub> )	mg/l	IS 3025 (Part 21) : 2009	200	600	162.68
14	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : 1991	75	200	45.47
15	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 1994	30	100	11.93
16	Sulphate (as SO <sub>4</sub> )	mg/l	IS 3025 (Part 24) : 1986	200	400	13.22
17	Nitrate (as NO <sub>3</sub> )	mg/l	APHA Method 23 <sup>rd</sup> Edition	45	No relaxation	5.67
18	Phenolic compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	IS 3025 (Part 43) : 1992	0.001	0.002	BDL(DL-0.001)
19	Anionic detergents (as MBAS)	mg/l	IS 13428 : 2005 Annex K	0.2	1.0	BDL(DL-0.01)

NOTES: ♦ Please see watermark "Original Test Report" to confirm the authenticity of this report. ♦ Results shall be referred to tested sample(s) and applicable to tested parameters only.  
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Verified By

*Swati Shrivastava*  
Swati Shrivastava  
Technical Manager

*Pooja Kulkarni*  
Pooja Kulkarni  
Technical Manager

Authorized Signatories

*Anupa Tankhivale*  
Dr.(Mrs.) Anupa Tankhivale  
Sr. Technical Manager

*S.D. Garway*  
Dr. (Mrs.) S.D. Garway  
Quality Manager

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### TEST REPORT

Test Report No. : ALPL/30112020/01-5

dated 30.11.2020

Page 2 of 3

M/s Noamundi Iron Mines (M/s TATA Steel Limited) Noamundi, Jharkhand Postal Code: 833217		Sample Inward No.	2020/MON-11/8/18-5	Analysis Start	23.11.2020
		Inward Date	23.11.2020	Analysis End	30.11.2020
		Reference	W.O.- 3000132460/962	Sample Category	Water
		Reference Date	15.05.2020		
Sample Name	Sample Source	Sample Particulars	Location Co-ordinates	Quantity Received	
Ground Water	Dugwell	Sample Code-GW-3	Lat: 22°8'54.89"N, Long: 85°11'8.03"E	2.0 Ltr & 250 ml	
Sample Collected By Anacon Representative Mr. K. Pandey		Sampling Date	18.11.2020	Sampling Time	Not Mentioned
				Sampling Location Mahudi Village (Railway Station Road)	

### TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 2		Test Result
				Acceptable Limit	Permissible Limit <sup>†</sup>	
II	<b>Chemical Testing</b>					
	<b>2. Residues in Water</b>					
20	Iron (as Fe)	mg/l	IS 3025 (Part 2) : 2019	1.0	No relaxation	0.20
21	Copper (as Cu)	mg/l	IS 3025 (Part 2) : 2019	0.05	1.5	BDL(DL-0.03)
22	Manganese (as Mn)	mg/l	IS 3025 (Part 2) : 2019	0.1	0.3	BDL(DL-0.05)
23	Mercury (as Hg)	mg/l	IS : 3025 (Part 48) : 1994	0.001	No relaxation	BDL(DL-0.0005)
24	Cadmium (as Cd)	mg/l	IS : 3025 (Part 41) : 1992	0.003	No relaxation	BDL(DL-0.001)
25	Selenium (as Se)	mg/l	IS : 3025 (Part 56) : 2003	0.01	No relaxation	BDL(DL-0.001)
26	Arsenic (as As)	mg/l	IS : 3025 (Part 37) : 1988	0.01	No relaxation	BDL(DL-0.01)
27	Aluminium (as Al)	mg/l	IS 15302 : 2003	0.03	0.2	BDL(DL-0.01)
28	Lead (as Pb)	mg/l	IS 3025 (Part 47) : 2003	0.01	No relaxation	BDL(DL-0.001)
29	Zinc (as Zn)	mg/l	IS 3025 (Part 2) : 2019	5	15	BDL(DL-0.1)
30	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2) : 2019	0.05	No relaxation	BDL(DL-0.03)
31	Boron (as B)	mg/l	IS 3025 (Part 2) : 2019	0.5	2.4	BDL(DL-0.1)
32	Polynuclear aromatic hydrocarbon (PAH)	µg/l	ANqr RES-30	0.1	No relaxation	BDL(DL-0.03)
33	Mineral Oil	mg/l	ANqr RES-40	0.5	No relaxation	BDL(DL-0.001)

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Verified By

Shashikant Satdeve  
Sr. Chemist

Sonali Gharpure  
Technical Manager

Authorized Signatory

Dr. (Mrs.) S.D. Garway  
Quality Manager

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## TEST REPORT

Test Report No. : ALPL/30112020/01-5

dated 30.11.2020

Page 3 of 3

M/s Noamundi Iron Mines (M/s TATA Steel Limited) Noamundi, Jharkhand Postal Code: 833217		Sample Inward No.	2020/MON-11/8/18-5	Analysis Start	23.11.2020
		Inward Date	23.11.2020	Analysis End	30.11.2020
		Reference	W.O. - 3000132460/962	Sample Category	Water
		Reference Date	15.05.2020		
Sample Name	Sample Source	Sample Particulars	Location Co-ordinates	Quantity Received	
Ground Water	Dugwell	Sample Code-GW-3	Lat: 22°8'54.89"N, Long: 85°31'8.03"E	2.0 Ltr & 250 ml	
Sample Collected By		Sampling Date	Sampling Time	Sampling Location	
Anacon Representative Mr. K. Pandey		18.11.2020	Not Mentioned	Mahadi Village (Railway Station Road)	

## TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 2		Test Result
				Acceptable Limit	Permissible Limit <sup>#</sup>	
II	Chemical Testing					
	2. Residues in Water					
34	Pesticide Residues					
i	Alpha-HCH	µg/l	ANqr RES-28	0.01	No relaxation	BDL(DL-0.01)
ii	Beta HCH	µg/l	ANqr RES-28	0.04	No relaxation	BDL(DL-0.03)
iii	Delta- HCH	µg/l	ANqr RES-28	0.04	No relaxation	BDL(DL-0.03)
iv	Alachlor	µg/l	ANqr RES-28	20	No relaxation	BDL(DL-0.03)
v	Aldrin / Dieldrin	µg/l	ANqr RES-28	0.03	No relaxation	BDL(DL-0.03)
vi	Atrazine	µg/l	ANqr RES-29	2	No relaxation	BDL(DL-0.03)
vii	Butachlor	µg/l	ANqr RES-29	125	No relaxation	BDL(DL-0.03)
viii	Chlorpyrifos	µg/l	ANqr RES-28	30	No relaxation	BDL(DL-0.03)
ix	DDT and its Isomers	µg/l	ANqr RES-28	1	No relaxation	BDL(DL-0.03)
x	Gamma - HCH (Lindane)	µg/l	ANqr RES-28	2	No relaxation	BDL(DL-0.03)
xi	2,4-Dichlorophenoxyacetic acid	µg/l	ANqr RES-29	30	No relaxation	BDL(DL-0.03)
xii	Endosulphan	µg/l	ANqr RES-28	0.4	No relaxation	BDL(DL-0.03)
xiii	Ethion	µg/l	ANqr RES-29	3	No relaxation	BDL(DL-0.03)
xiv	Isoproturon	µg/l	ANqr RES-29	9	No relaxation	BDL(DL-0.03)
xv	Malathion	µg/l	ANqr RES-29	190	No relaxation	BDL(DL-0.03)
xvi	Methyl Parathion	µg/l	ANqr RES-29	0.3	No relaxation	BDL(DL-0.03)
xvii	Monocrotophos	µg/l	ANqr RES-29	1	No relaxation	BDL(DL-0.03)
xviii	Phorate	µg/l	ANqr RES-29	2	No relaxation	BDL(DL-0.03)

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REMARKS : As requested by the client, sample was tested for above parameters only. Sample complies with IS:10500:2012, for tests conducted, indicating that it is fit for drinking purpose with respect to tested parameters.

Verified By

Sonali Gharpure  
Technical Manager

Authorized Signatory

Dr. (Mrs.) S.D. Garway  
Quality Manager

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**TEST REPORT**

Test Report No. : ALPL/30112020/01-6

dated 30.11.2020

Page 1 of 3

M/s Noamundi Iron Mines (M/s TATA Steel Limited) Noamundi, Jharkhand Postal Code: 833217		Sample Inward No. 2020/MON-11/8/18-6	Analysis Start 23.11.2020
		Inward Date 23.11.2020	Analysis End 30.11.2020
		Reference W.O.- 3000132460/962	
		Reference Date 15.05.2020	Sample Category Water
Sample Name Ground Water	Sample Source Dugwell	Sample Particulars Sample Code-GW-4	Location Co-ordinates Lat: 22°8'52.58"N, Long: 85°30'28.50"E
Sample Collected By Anacon Representative Mr. K. Pandey		Sampling Date 18.11.2020	Quantity Received 2.0 Ltr & 250 ml
		Sampling Time Not Mentioned	Sampling Location Bottom Bin (Nr. Barrack)

**TEST RESULTS**

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 2		Test Result
				Acceptable Limit	Permissible Limit *	
<b>I Biological Testing - I.Water</b>						
1	<i>Escherichia coli</i>	Per 100 ml	IS 15185 : 2016	Absent	Absent	Absent
<b>II Chemical Testing - I.Water</b>						
2	pH value	-	IS 3025 (Part 11) : 1983	6.5 to 8.5	No relaxation	7.36 at 25°C
3	Turbidity	NTU	IS 3025 (Part 10) : 1984	1	5	0.5
4	Colour	Hazen units	IS 3025 (Part 4) : 1983	5	15	1
5	Odour	-	IS 3025 (Part 5) : 2018	Agreeable	Agreeable	Agreeable
6	Taste	-	IS 3025 (Part 8) : 1984	Agreeable	Agreeable	Agreeable
7	Free residual chlorine	mg/l	IS 3025 (Part 26) : 1986	Min. 0.2	1	BDL(DL-0.1)
8	Total dissolved solids	mg/l	IS 3025 (Part 16) : 1984	500	2000	268
9	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.0	1.5	BDL(DL-0.1)
10	Cyanide (as CN)	mg/l	IS 3025 (Part 27) : 1986	0.05	No relaxation	BDL(DL-0.005)
11	Chloride (as Cl)	mg/l	IS 3025 (Part 32) : 1988	250	1000	38.43
12	Total Alkalinity (as CaCO <sub>3</sub> )	mg/l	IS 3025 (Part 23) : 1986	200	600	156
13	Total hardness (as CaCO <sub>3</sub> )	mg/l	IS 3025 (Part 21) : 2009	200	600	150.92
14	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : 1991	75	200	42.34
15	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 1994	30	100	10.98
16	Sulphate (as SO <sub>4</sub> )	mg/l	IS 3025 (Part 24) : 1986	200	400	12.44
17	Nitrate (as NO <sub>3</sub> )	mg/l	APHA Method 23 <sup>rd</sup> Edition	45	No relaxation	6.81
18	Phenolic compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	IS 3025 (Part 43) : 1992	0.001	0.002	BDL(DL-0.001)
19	Anionic detergents (as MBAS)	mg/l	IS 13428 : 2005 Annex K	0.2	1.0	BDL(DL-0.01)

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Verified By

*for Pooja*  
Swati Shrivastava  
Technical Manager

*Pooja*  
Pooja Kulkarni  
Technical Manager

Authorized Signatories

*Anupa*  
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## TEST REPORT

Test Report No. : ALPL/30112020/01-6

dated 30.11.2020

Page 2 of 3

M/s Noamundi Iron Mines (M/s TATA Steel Limited) Noamundi, Jharkhand Postal Code: 833217		Sample Inward No.	2020/MON-11/8/18-6	Analysis Start	23.11.2020
		Inward Date	23.11.2020	Analysis End	30.11.2020
		Reference	W.O.- 3000132460/962	Sample Category	Water
		Reference Date	15.05.2020		
Sample Name	Sample Source	Sample Particulars	Location Co-ordinates	Quantity Received	
Ground Water	Dugwell	Sample Code-GW-4	Lat: 22°8'52.58"N, Long: 85°30'28.50"E	2.0 Ltr & 250 ml	
Sample Collected By Anacon Representative Mr. K. Pandey		Sampling Date	18.11.2020	Sampling Time	Not Mentioned
				Sampling Location	Bottom Bin (Nr. Barrack)

## TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 2		Test Result
				Acceptable Limit	Permissible Limit*	
II	Chemical Testing					
	2. Residues in Water					
20	Iron (as Fe)	mg/l	IS 3025 (Part 2) : 2019	1.0	No relaxation	0.21
21	Copper (as Cu)	mg/l	IS 3025 (Part 2) : 2019	0.05	1.5	BDL(DL-0.03)
22	Manganese (as Mn)	mg/l	IS 3025 (Part 2) : 2019	0.1	0.3	BDL(DL-0.05)
23	Mercury (as Hg)	mg/l	IS : 3025 (Part 48) : 1994	0.001	No relaxation	BDL(DL-0.0005)
24	Cadmium (as Cd)	mg/l	IS : 3025 (Part 41) : 1992	0.003	No relaxation	BDL(DL-0.001)
25	Selenium (as Se)	mg/l	IS : 3025 (Part 56) : 2003	0.01	No relaxation	BDL(DL-0.001)
26	Arsenic (as As)	mg/l	IS : 3025 (Part 37) : 1988	0.01	No relaxation	BDL(DL-0.01)
27	Aluminium (as Al)	mg/l	IS 15402 : 2003	0.05	0.2	BDL(DL-0.01)
28	Lead (as Pb)	mg/l	IS 3025 (Part 47) : 2003	0.01	No relaxation	BDL(DL-0.001)
29	Zinc (as Zn)	mg/l	IS 3025 (Part 2) : 2019	5	15	BDL(DL-0.1)
30	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2) : 2019	0.05	No relaxation	BDL(DL-0.03)
31	Boron (as B)	mg/l	IS 3025 (Part 2) : 2019	0.5	2.4	BDL(DL-0.1)
32	Polynuclear aromatic hydrocarbon (PAH)	µg/l	ANqr RES-30	0.1	No relaxation	BDL(DL-0.03)
33	Mineral Oil	mg/l	ANqr RES-40	0.5	No relaxation	BDL(DL-0.001)

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Verified By

  
Shashikant Sardave  
Sr. Chemist

  
Sonali Gharpure  
Technical Manager

Authorized Signatory

  
Dr. (Mrs.) S.D. Garway  
Quality Manager

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## TEST REPORT

Test Report No. : ALPL/30112020/01-6

dated 30.11.2020

Page 3 of 3

M/s Noamundi Iron Mines (M/s TATA Steel Limited) Noamundi, Jharkhand Postal Code: 833217		Sample Inward No.	2020/MON-11/8/18-6	Analysis Start	23.11.2020
		Inward Date	23.11.2020	Analysis End	30.11.2020
		Reference	W.O.- 3000132460/962	Sample Category	Water
		Reference Date	15.05.2020		
Sample Name	Sample Source	Sample Particulars	Location Co-ordinates	Quantity Received	
Ground Water	Dugwell	Sample Code-GW-4	Lat: 22°8'52.58"N, Long: 85°30'28.50"E	2.0 Ltr & 250 ml	
Sample Collected By		Sampling Date	Sampling Time	Sampling Location	
Anacon Representative Mr. K. Pandey		18.11.2020	Not Mentioned	Bottom Bin (Nr. Barrack)	

## TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 2		Test Result
				Acceptable Limit	Permissible Limit *	
<b>II Chemical Testing</b>						
<b>2. Residues In Water</b>						
34	Pesticide Residues					
i	Alpha-HCH	µg/l	ANqr RES-28	0.01	No relaxation	BDL(DL-0.01)
ii	Beta HCH	µg/l	ANqr RES-28	0.04	No relaxation	BDL(DL-0.03)
iii	Delta- HCH	µg/l	ANqr RES-28	0.04	No relaxation	BDL(DL-0.03)
iv	Alachlor	µg/l	ANqr RES-28	20	No relaxation	BDL(DL-0.03)
v	Aldrin / Dieldrin	µg/l	ANqr RES-28	0.03	No relaxation	BDL(DL-0.03)
vi	Atrazine	µg/l	ANqr RES-29	2	No relaxation	BDL(DL-0.03)
vii	Butachlor	µg/l	ANqr RES-29	125	No relaxation	BDL(DL-0.03)
viii	Chlorpyrifos	µg/l	ANqr RES-28	30	No relaxation	BDL(DL-0.03)
ix	DDT and its Isomers	µg/l	ANqr RES-28	1	No relaxation	BDL(DL-0.03)
x	Gamma - HCH (Lindane)	µg/l	ANqr RES-28	2	No relaxation	BDL(DL-0.03)
xi	2,4-Dichlorophenoxyacetic acid	µg/l	ANqr RES-29	30	No relaxation	BDL(DL-0.03)
xii	Endosulphan	µg/l	ANqr RES-28	0.4	No relaxation	BDL(DL-0.03)
xiii	Ethion	µg/l	ANqr RES-29	3	No relaxation	BDL(DL-0.03)
xiv	Isoproturon	µg/l	ANqr RES-29	9	No relaxation	BDL(DL-0.03)
xv	Malathion	µg/l	ANqr RES-29	190	No relaxation	BDL(DL-0.03)
xvi	Methyl Parathion	µg/l	ANqr RES-29	0.3	No relaxation	BDL(DL-0.03)
xvii	Monocrotophos	µg/l	ANqr RES-29	1	No relaxation	BDL(DL-0.03)
xviii	Phorate	µg/l	ANqr RES-29	2	No relaxation	BDL(DL-0.03)

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REMARKS : As requested by the client, sample was tested for above parameters only. Sample complies with IS:10500:2012, for tests conducted, indicating that it is fit for drinking purpose with respect to tested parameters.

Verified By

  
Sonali Gharpure  
Technical Manager

Authorized Signatory

  
Dr. (Mrs.) S.D. Garway  
Quality Manager

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**TEST REPORT**



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Test Report No. : ALPL/27022021/01-35

dated 27/02/2021

Page 1 of 3

Issued To : M/s Noamundi Iron Mines (M/s TATA Steel Limited) Noamundi, Jharkhand Postal Code: 833217		Sample Inward No. : 2021/MON-21/60-44	Analysis Start : 22/02/2021
		Inward Date : 22/02/2021	Analysis End : 27/02/2021
		Reference : W.O.- 3000132460/962	Sample Category : Water
		Reference Date : 15.05.2020	
Sample Name : Ground Water	Sample Source : Dugwell	Sample Particulars : Sample Code-GW-1	Location Co-ordinates : Lat: 22°9'30.46"N, Long: 85°28'53.38"E
Sample Collected By : Anacon Representative Mr. K. Pandey		Sampling Date : 16/02/2021	Quantity Received : 2.0 Ltr & 250 ml
		Sampling Time : 2.20 pm	Sampling Location : Noamundi Basti (Nr. Play Ground)

**TEST RESULTS**

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 2		Test Result
				Acceptable Limit	Permissible Limit*	
<b>I Biological Testing 1.Water</b>						
1	<i>Escherichia coli</i>	Per 100 ml	IS 15185 : 2016	Absent	Absent	Absent
<b>II Chemical Testing 1.Water</b>						
2	pH value	-	IS 3025 (Part 11) : 1983	6.5 to 8.5	No relaxation	7.33 at 25°C
3	Turbidity	NTU	IS 3025 (Part 10) : 1984	1	5	0.4
4	Colour	Hazen units	IS 3025 (Part 4) : 1983	5	15	1
5	Odour	-	IS 3025 (Part 5) : 2018	Agreeable	Agreeable	Agreeable
6	Taste	-	IS 3025 (Part 8) : 1984	Agreeable	Agreeable	Agreeable
7	Free residual chlorine	mg/l	IS 3025 (Part 26) : 1986	Min. 0.2	1	BDL(DL-0.1)
8	Total dissolved solids	mg/l	IS 3025 (Part 16) : 1984	500	2000	232
9	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.0	1.5	BDL(DL-0.1)
10	Cyanide (as CN)	mg/l	IS 3025 (Part 27) : 1986	0.05	No relaxation	BDL(DL-0.005)
11	Chloride (as Cl)	mg/l	IS 3025 (Part 32) : 1988	250	1000	47.59
12	Total Alkalinity (as CaCO <sub>3</sub> )	mg/l	IS 3025 (Part 23) : 1986	200	600	124
13	Total hardness (as CaCO <sub>3</sub> )	mg/l	IS 3025 (Part 21) : 2009	200	600	156.42
14	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : 1991	75	200	34.92
15	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 1994	30	100	16.06
16	Sulphate (as SO <sub>4</sub> )	mg/l	IS 3025 (Part 24) : 1986	200	400	14.25
17	Nitrate (as NO <sub>3</sub> )	mg/l	APHA Method 23 <sup>rd</sup> Edition	45	No relaxation	8.29
18	Phenolic compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	IS 3025 (Part 43) : 1992	0.001	0.002	BDL(DL-0.001)
19	Anionic detergents (as MBAS)	mg/l	IS 13428 : 2005 Annex K	0.2	1.0	BDL(DL-0.01)

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Verified By

*Swati Shrivastava*  
Swati Shrivastava  
Technical Manager

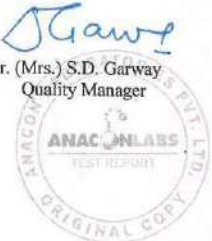
Authorized Signatories

*Pooja Kathane*  
Pooja Kathane  
Technical Manager

*Dr. (Mrs.) S.D. Garway*  
Dr. (Mrs.) S.D. Garway  
Quality Manager

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**TEST REPORT**

Test Report No. : ALPL/27022021/01-35

dated 27/02/2021

Page 2 of 3

<b>Issued To :</b> M/s Noamundi Iron Mines (M/s TATA Steel Limited) Noamundi, Jharkhand Postal Code: 833217		<b>Sample Inward No.</b> 2021/MON-21/60-44 <b>Inward Date</b> 22/02/2021 <b>Reference</b> W.O.- 3000132460/962 <b>Reference Date</b> 15.05.2020	<b>Analysis Start</b> 22/02/2021 <b>Analysis End</b> 27/02/2021 <b>Sample Category</b> Water	
<b>Sample Name</b> Ground Water	<b>Sample Source</b> Dugwell	<b>Sample Particulars</b> Sample Code-GW-1	<b>Location Co-ordinates</b> Lat: 22°9'30.46"N, Long: 85°28'53.38"E	<b>Quantity Received</b> 2.0 Ltr & 250 ml
<b>Sample Collected By</b> Anacon Representative Mr. K. Pandey		<b>Sampling Date</b> 16/02/2021	<b>Sampling Time</b> 2.20 pm	<b>Sampling Location</b> Noamundi Basti (Nr. Play Ground)

**TEST RESULTS**

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 2		Test Result
				Acceptable Limit	Permissible Limit #	
II	<b>Chemical Testing</b> <b>2. Residues In Water</b>					
20	Iron (as Fe)	mg/l	IS 3025 (Part 2) : 2019	1.0	No relaxation	0.07
21	Copper (as Cu)	mg/l	IS 3025 (Part 2) : 2019	0.05	1.5	BDL(DL-0.03)
22	Manganese (as Mn)	mg/l	IS 3025 (Part 2) : 2019	0.1	0.3	BDL(DL-0.05)
23	Mercury (as Hg)	mg/l	IS : 3025 (Part 48) : 1994	0.001	No relaxation	BDL(DL-0.0005)
24	Cadmium (as Cd)	mg/l	IS : 3025 (Part 41) : 1992	0.003	No relaxation	BDL(DL-0.001)
25	Selenium (as Se)	mg/l	IS : 3025 (Part 56) : 2003	0.01	No relaxation	BDL(DL-0.001)
26	Arsenic (as As)	mg/l	IS : 3025 (Part 37) : 1988	0.01	No relaxation	BDL(DL-0.01)
27	Aluminium (as Al)	mg/l	IS 15302 : 2003	0.03	0.2	BDL(DL-0.01)
28	Lead (as Pb)	mg/l	IS 3025 (Part 47) : 2003	0.01	No relaxation	BDL(DL-0.001)
29	Zinc (as Zn)	mg/l	IS 3025 (Part 2) : 2019	5	15	BDL(DL-0.1)
30	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2) : 2019	0.05	No relaxation	BDL(DL-0.03)
31	Boron (as B)	mg/l	IS 3025 (Part 2) : 2019	0.5	2.4	BDL(DL-0.1)
32	Polynuclear aromatic hydrocarbon (PAH)	µg/l	ANqr RES-30	0.1	No relaxation	BDL(DL-0.03)
33	Mineral Oil	mg/l	ANqr RES-40	0.5	No relaxation	BDL(DL-0.001)

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Verified By

Shashikant Satdeve  
Sr. ChemistSonali Gharpure  
Technical Manager

Authorized Signatory

Dr. (Mrs.) S.D. Garway  
Quality Manager

Laboratory address : FP-34, 35, Food Park, 5 Star Industrial Estate, MIDC Bulburi, Nagpur - 441 122.  
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## TEST REPORT

Test Report No. : ALPL/27022021/01-35

dated 27/02/2021

Page 3 of 3

<b>Issued To :</b> M/s Noamundi Iron Mines (M/s TATA Steel Limited) Noamundi, Jharkhand Postal Code: 833217		<b>Sample Inward No.</b> 2021/MON-21/60-44 <b>Inward Date</b> 22/02/2021 <b>Reference</b> W.O.- 3000132460/962 <b>Reference Date</b> 15.05.2020	<b>Analysis Start</b> 22/02/2021 <b>Analysis End</b> 27/02/2021 <b>Sample Category</b> Water
<b>Sample Name</b> Ground Water	<b>Sample Source</b> Dugwell	<b>Sample Particulars</b> Sample Code-GW-1	<b>Location Co-ordinates</b> Lat: 22°9'30.46"N, Long: 85°28'53.38"E
<b>Sample Collected By</b> Anacon Representative Mr. K. Pandey		<b>Sampling Date</b> 16/02/2021	<b>Quantity Received</b> 2.0 Ltr & 250 ml
		<b>Sampling Time</b> 2.20 pm	<b>Sampling Location</b> Noamundi Basti (Nr. Play Ground)

### TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 2		Test Result
				Acceptable Limit	Permissible Limit <sup>#</sup>	
<b>II</b>	<b>Chemical Testing</b>					
	<b>2. Residues In Water</b>					
34	Pesticide Residues					
i	Alpha-HCH	µg/l	ANqr RES-28	0.01	No relaxation	BDL(DL-0.01)
ii	Beta HCH	µg/l	ANqr RES-28	0.04	No relaxation	BDL(DL-0.03)
iii	Delta- HCH	µg/l	ANqr RES-28	0.04	No relaxation	BDL(DL-0.03)
iv	Alachlor	µg/l	ANqr RES-28	20	No relaxation	BDL(DL-0.03)
v	Aldrin / Dieldrin	µg/l	ANqr RES-28	0.03	No relaxation	BDL(DL-0.03)
vi	Atrazine	µg/l	ANqr RES-29	2	No relaxation	BDL(DL-0.03)
vii	Butachlor	µg/l	ANqr RES-29	125	No relaxation	BDL(DL-0.03)
viii	Chlorpyrifos	µg/l	ANqr RES-28	30	No relaxation	BDL(DL-0.03)
ix	DDT and its Isomers	µg/l	ANqr RES-28	1	No relaxation	BDL(DL-0.03)
x	Gamma - HCH (Lindane)	µg/l	ANqr RES-28	2	No relaxation	BDL(DL-0.03)
xi	2,4-Dichlorophenoxyacetic acid	µg/l	ANqr RES-29	30	No relaxation	BDL(DL-0.03)
xii	Endosulphan	µg/l	ANqr RES-28	0.4	No relaxation	BDL(DL-0.03)
xiii	Ethion	µg/l	ANqr RES-29	3	No relaxation	BDL(DL-0.03)
xiv	Isoproturon	µg/l	ANqr RES-29	9	No relaxation	BDL(DL-0.03)
xv	Malathion	µg/l	ANqr RES-29	190	No relaxation	BDL(DL-0.03)
xvi	Methyl Parathion	µg/l	ANqr RES-29	0.3	No relaxation	BDL(DL-0.03)
xvii	Monocrotophos	µg/l	ANqr RES-29	1	No relaxation	BDL(DL-0.03)
xviii	Phorate	µg/l	ANqr RES-29	2	No relaxation	BDL(DL-0.03)


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**REMARKS :** As requested by the client, sample was tested for above parameters only. Sample complies with IS:10500:2012, for tests conducted, indicating that it is fit for drinking purpose with respect to tested parameters.

Verified By

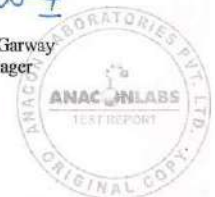
  
 Sonali Gharpure  
 Technical Manager

Authorized Signatory

  
 Dr. (Mrs.) S.D. Garway  
 Quality Manager

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**TEST REPORT**

Test Report No. : ALPL/27022021/01-36

dated 27/02/2021

Page 1 of 3

<b>Issued To :</b> M/s Noamundi Iron Mines (M/s TATA Steel Limited) Noamundi, Jharkhand Postal Code: 833217		<b>Sample Inward No.</b> 2021/MON-21/60-45	<b>Analysis Start</b> 22/02/2021
		<b>Inward Date</b> 22/02/2021	<b>Analysis End</b> 27/02/2021
		<b>Reference</b> W.O.- 3000132460/962	<b>Sample Category</b> Water
		<b>Reference Date</b> 15.05.2020	
<b>Sample Name</b> Ground Water	<b>Sample Source</b> Dugwell	<b>Sample Particulars</b> Sample Code-GW-2	<b>Location Co-ordinates</b> Lat: 22°9'25.41"N, Long: 85°30'21.34"E
			<b>Quantity Received</b> 2.0 Ltr & 250 ml
<b>Sample Collected By</b> Anacon Representative Mr. K. Pandey		<b>Sampling Date</b> 16/02/2021	<b>Sampling Time</b> 2.40 pm
			<b>Sampling Location</b> Noamundi Bazar (Nr. Petrol Pump)

**TEST RESULTS**

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 2		Test Result
				Acceptable Limit	Permissible Limit #	
<b>I Biological Testing 1.Water</b>						
1	Escherichia coli	Per 100 ml	IS 15185 : 2016	Absent	Absent	Absent
<b>II Chemical Testing 1.Water</b>						
2	pH value	-	IS 3025 (Part 11) : 1983	6.5 to 8.5	No relaxation	7.42 at 25°C
3	Turbidity	NTU	IS 3025 (Part 10) : 1984	1	5	0.7
4	Colour	Hazen units	IS 3025 (Part 4) : 1983	5	15	1
5	Odour	-	IS 3025 (Part 5) : 2018	Agreeable	Agreeable	Agreeable
6	Taste	-	IS 3025 (Part 8) : 1984	Agreeable	Agreeable	Agreeable
7	Free residual chlorine	mg/l	IS 3025 (Part 26) : 1986	Min. 0.2	1	BDL(DL-0.1)
8	Total dissolved solids	mg/l	IS 3025 (Part 16) : 1984	500	2000	240
9	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.0	1.5	BDL(DL-0.1)
10	Cyanide (as CN)	mg/l	IS 3025 (Part 27) : 1986	0.05	No relaxation	BDL(DL-0.005)
11	Chloride (as Cl)	mg/l	IS 3025 (Part 32) : 1988	250	1000	33.99
12	Total Alkalinity (as CaCO <sub>3</sub> )	mg/l	IS 3025 (Part 23) : 1986	200	600	130
13	Total hardness (as CaCO <sub>3</sub> )	mg/l	IS 3025 (Part 21) : 2009	200	600	130.68
14	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : 1991	75	200	31.82
15	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 1994	30	100	11.81
16	Sulphate (as SO <sub>4</sub> )	mg/l	IS 3025 (Part 24) : 1986	200	400	9.85
17	Nitrate (as NO <sub>3</sub> )	mg/l	APHA Method 23 <sup>rd</sup> Edition	45	No relaxation	7.48
18	Phenolic compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	IS 3025 (Part 43) : 1992	0.001	0.002	BDL(DL-0.001)
19	Anionic detergents (as MBAS)	mg/l	IS 13428 : 2005 Annex K	0.2	1.0	BDL(DL-0.01)

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Verified By

Swati Shrivastava  
Technical Manager

Authorized Signatories

Pooja Kathane  
Technical Manager

Dr. (Mrs.) S.D. Garway  
Quality Manager

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- Bureau of India Standards (BIS) • Export inspection council (EIC); AGMARK.

### TEST REPORT

Test Report No. : ALPL/27022021/01-36

dated 27/02/2021

Page 2 of 3

<b>Issued To :</b> M/s Noamundi Iron Mines (M/s TATA Steel Limited) Noamundi, Jharkhand Postal Code: 833217		<b>Sample Inward No.</b> 2021/MON-21/60-45	<b>Analysis Start</b> 22/02/2021
		<b>Inward Date</b> 22/02/2021	<b>Analysis End</b> 27/02/2021
		<b>Reference</b> W.O.- 3000132460/962	
		<b>Reference Date</b> 15.05.2020	<b>Sample Category</b> Water
<b>Sample Name</b> Ground Water	<b>Sample Source</b> Dugwell	<b>Sample Particulars</b> Sample Code-GW-2	<b>Location Co-ordinates</b> Lat: 22°9'25.41"N, Long: 85°30'21.34"E
<b>Sample Collected By</b> Anacon Representative Mr. K. Pandey		<b>Sampling Date</b> 16/02/2021	<b>Quantity Received</b> 2.0 Ltr & 250 ml
		<b>Sampling Time</b> 2.40 pm	<b>Sampling Location</b> Noamundi Bazar (Nr. Petrol Pump)

#### TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 2		Test Result
				Acceptable Limit	Permissible Limit #	
II	<b>Chemical Testing</b>					
	<b>2. Residues In Water</b>					
20	Iron (as Fe)	mg/l	IS 3025 (Part 2) : 2019	1.0	No relaxation	0.16
21	Copper (as Cu)	mg/l	IS 3025 (Part 2) : 2019	0.05	1.5	BDL(DL-0.03)
22	Manganese (as Mn)	mg/l	IS 3025 (Part 2) : 2019	0.1	0.3	BDL(DL-0.05)
23	Mercury (as Hg)	mg/l	IS : 3025 (Part 48) : 1994	0.001	No relaxation	BDL(DL-0.0005)
24.	Cadmium (as Cd)	mg/l	IS : 3025 (Part 41) : 1992	0.003	No relaxation	BDL(DL-0.001)
25	Selenium (as Se)	mg/l	IS : 3025 (Part 56) : 2003	0.01	No relaxation	BDL(DL-0.001)
26	Arsenic (as As)	mg/l	IS : 3025 (Part 37) : 1988	0.01	No relaxation	BDL(DL-0.01)
27	Aluminium (as Al)	mg/l	IS 15302 : 2003	0.03	0.2	BDL(DL-0.01)
28	Lead (as Pb)	mg/l	IS 3025 (Part 47) : 2003	0.01	No relaxation	BDL(DL-0.001)
29	Zinc (as Zn)	mg/l	IS 3025 (Part 2) : 2019	5	15	BDL(DL-0.1)
30	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2) : 2019	0.05	No relaxation	BDL(DL-0.03)
31	Boron (as B)	mg/l	IS 3025 (Part 2) : 2019	0.5	2.4	BDL(DL-0.1)
32	Polynuclear aromatic hydrocarbon (PAH)	µg/l	ANqr RES-30	0.1	No relaxation	BDL(DL-0.03)
33.	Mineral Oil	mg/l	ANqr RES-40	0.5	No relaxation	BDL(DL-0.001)

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Verified By

Shashikant Satdeve  
Sr. Chemist

Sonali Gharpure  
Technical Manager

Authorized Signatory

Dr. (Mrs.) S.D. Garway  
Quality Manager

Laboratory address : FP-34, 35, Food Park, 5 Star Industrial Estate, MIDC Butibori, Nagpur - 441 122.  
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## TEST REPORT

Test Report No. : ALPL/27022021/ 01-36

dated 27/02/2021

Page 3 of 3

<b>Issued To :</b> M/s Noamundi Iron Mines (M/s TATA Steel Limited) Noamundi, Jharkhand Postal Code: 833217		<b>Sample Inward No.</b> 2021/MON-21/60-45 <b>Inward Date</b> 22/02/2021 <b>Reference</b> W.O.- 3000132460/962 <b>Reference Date</b> 15.05.2020	<b>Analysis Start</b> 22/02/2021 <b>Analysis End</b> 27/02/2021 <b>Sample Category</b> Water
<b>Sample Name</b> Ground Water	<b>Sample Source</b> Dugwell	<b>Sample Particulars</b> Sample Code-GW-2	<b>Location Co-ordinates</b> Lat: 22°9'25.41"N, Long: 85°30'21.34"E
<b>Sample Collected By</b> Anacon Representative Mr. K. Pandey		<b>Sampling Date</b> 16/02/2021	<b>Sampling Time</b> 2.40 pm
		<b>Quantity Received</b> 2.0 Ltr & 250 ml	
		<b>Sampling Location</b> Noamundi Bazar (Nr. Petrol Pump)	

### TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 2		Test Result
				Acceptable Limit	Permissible Limit #	
II	<b>Chemical Testing</b>					
	<b>2. Residues In Water</b>					
34	<b>Pesticide Residues</b>					
i	Alpha-HCH	µg/l	ANqr RES-28	0.01	No relaxation	BDL(DL-0.01)
ii	Beta HCH	µg/l	ANqr RES-28	0.04	No relaxation	BDL(DL-0.03)
iii	Delta- HCH	µg/l	ANqr RES-28	0.04	No relaxation	BDL(DL-0.03)
iv	Alachlor	µg/l	ANqr RES-28	20	No relaxation	BDL(DL-0.03)
v	Aldrin / Dieldrin	µg/l	ANqr RES-28	0.03	No relaxation	BDL(DL-0.03)
vi	Atrazine	µg/l	ANqr RES-29	2	No relaxation	BDL(DL-0.03)
vii	Butachlor	µg/l	ANqr RES-29	125	No relaxation	BDL(DL-0.03)
viii	Chlorpyrifos	µg/l	ANqr RES-28	30	No relaxation	BDL(DL-0.03)
ix	DDT and its Isomers	µg/l	ANqr RES-28	1	No relaxation	BDL(DL-0.03)
x	Gamma - HCH (Lindane)	µg/l	ANqr RES-28	2	No relaxation	BDL(DL-0.03)
xi	2,4-Dichlorophenoxyacetic acid	µg/l	ANqr RES-29	30	No relaxation	BDL(DL-0.03)
xii	Endosulphan	µg/l	ANqr RES-28	0.4	No relaxation	BDL(DL-0.03)
xiii	Ethion	µg/l	ANqr RES-29	3	No relaxation	BDL(DL-0.03)
xiv	Isoproturon	µg/l	ANqr RES-29	9	No relaxation	BDL(DL-0.03)
xv	Malathion	µg/l	ANqr RES-29	190	No relaxation	BDL(DL-0.03)
xvi	Methyl Parathion	µg/l	ANqr RES-29	0.3	No relaxation	BDL(DL-0.03)
xvii	Monocrotophos	µg/l	ANqr RES-29	1	No relaxation	BDL(DL-0.03)
xviii	Phorate	µg/l	ANqr RES-29	2	No relaxation	BDL(DL-0.03)

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**REMARKS :** As requested by the client, sample was tested for above parameters only. Sample complies with IS:10500:2012, for tests conducted, indicating that it is fit for drinking purpose with respect to tested parameters.

Verified By

Sonali Gharpure  
Technical Manager

Authorized Signatory

Dr. (Mrs.) S.D. Garway  
Quality Manager

Laboratory address : FP-34, 35, Food Park, 5 Star Industrial Estate, MIDC Butibori, Nagpur - 441 122.

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## TEST REPORT

Test Report No. : ALPL/27022021/01-37

dated 27/02/2021

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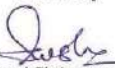
M/s Noamundi Iron Mines (M/s TATA Steel Limited) Noamundi, Jharkhand Postal Code: 833217		Sample Inward No.	2021/MON-21/60-46	Analysis Start	22/02/2021
		Inward Date	22/02/2021	Analysis End	27/02/2021
		Reference	W.O.- 3000132460/962	Sample Category	Water
		Reference Date	15.05.2020		
Sample Name	Sample Source	Sample Particulars	Location Co-ordinates	Quantity Received	
Ground Water	Dugwell	Sample Code-GW-3	Lat: 22°8'54.89"N, Long: 85°31'8.03"E	2.0 Ltr & 250 ml	
Sample Collected By Anacon Representative Mr. K. Pandey		Sampling Date	Sampling Time	Sampling Location	
		16/02/2021	3.20 pm	Mahudi Village (Railway Station Road)	

### TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 2		Test Result
				Acceptable Limit	Permissible Limit <sup>#</sup>	
I	<b>Biological Testing 1.Water</b>					
1	<i>Escherichia coli</i>	Per 100 ml	IS 15185 : 2016	Absent	Absent	Absent
II	<b>Chemical Testing 1.Water</b>					
2	pH value	-	IS 3025 (Part 11) : 1983	6.5 to 8.5	No relaxation	7.42 at 25°C
3	Turbidity	NTU	IS 3025 (Part 10) : 1984	1	5	0.6
4	Colour	Hazen units	IS 3025 (Part 4) : 1983	5	15	1
5	Odour	-	IS 3025 (Part 5) : 2018	Agreeable	Agreeable	Agreeable
6	Taste	-	IS 3025 (Part 8) : 1984	Agreeable	Agreeable	Agreeable
7	Free residual chlorine	mg/l	IS 3025 (Part 26) : 1986	Min. 0.2	1	BDL(DL-0.1)
8	Total dissolved solids	mg/l	IS 3025 (Part 16) : 1984	500	2000	244
9	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.0	1.5	BDL(DL-0.1)
10	Cyanide (as CN)	mg/l	IS 3025 (Part 27) : 1986	0.05	No relaxation	BDL(DL-0.005)
11	Chloride (as Cl)	mg/l	IS 3025 (Part 32) : 1988	250	1000	44.68
12	Total Alkalinity (as CaCO <sub>3</sub> )	mg/l	IS 3025 (Part 23) : 1986	200	600	130
13	Total hardness (as CaCO <sub>3</sub> )	mg/l	IS 3025 (Part 21) : 2009	200	600	168.3
14	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : 1991	75	200	48.89
15	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 1994	30	100	10.39
16	Sulphate (as SO <sub>4</sub> )	mg/l	IS 3025 (Part 24) : 1986	200	400	14.77
17	Nitrate (as NO <sub>3</sub> )	mg/l	APHA Method 23 <sup>rd</sup> Edition	45	No relaxation	6.07
18	Phenolic compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	IS 3025 (Part 43) : 1992	0.001	0.002	BDL(DL-0.001)
19	Anionic detergents (as MBAS)	mg/l	IS 13428 : 2005 Annex K	0.2	1.0	BDL(DL-0.01)

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Verified By

  
Swati Shrivastava  
Technical Manager

Authorized Signatories

  
Pooja Kathane  
Technical Manager

  
Dr. (Mrs.) S.D. Garway  
Quality Manager

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## TEST REPORT

Test Report No. : ALPL/27022021/ 01-37

dated 27/02/2021

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M/s Noamundi Iron Mines (M/s TATA Steel Limited) Noamundi, Jharkhand Postal Code: 833217		Sample Inward No. 2021/MON-21/60-46	Analysis Start 22/02/2021
		Inward Date 22/02/2021	Analysis End 27/02/2021
		Reference W.O.- 3000132460/962	Sample Category Water
		Reference Date 15.05.2020	
Sample Name Ground Water	Sample Source Dugwell	Sample Particulars Sample Code-GW-3	Location Co-ordinates Lat: 22°8'54.89"N, Long: 85°31'8.03"E
Sample Collected By Anacon Representative Mr. K. Pandey		Sampling Date 16/02/2021	Quantity Received 2.0 Ltr & 250 ml
		Sampling Time 3.20 pm	Sampling Location Mahudi Village (Railway Station Road)

### TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 2		Test Result
				Acceptable Limit	Permissible Limit <sup>a</sup>	
II	Chemical Testing					
	2. Residues In Water					
20	Iron (as Fe)	mg/l	IS 3025 (Part 2) : 2019	1.0	No relaxation	0.17
21	Copper (as Cu)	mg/l	IS 3025 (Part 2) : 2019	0.05	1.5	BDL(DL-0.03)
22	Manganese (as Mn)	mg/l	IS 3025 (Part 2) : 2019	0.1	0.3	BDL(DL-0.05)
23	Mercury (as Hg)	mg/l	IS : 3025 (Part 48) : 1994	0.001	No relaxation	BDL(DL-0.0005)
24	Cadmium (as Cd)	mg/l	IS : 3025 (Part 41) : 1992	0.003	No relaxation	BDL(DL-0.001)
25	Selenium (as Se)	mg/l	IS : 3025 (Part 56) : 2003	0.01	No relaxation	BDL(DL-0.001)
26	Arsenic (as As)	mg/l	IS : 3025 (Part 37) : 1988	0.01	No relaxation	BDL(DL-0.01)
27	Aluminium (as Al)	mg/l	IS 15302 : 2003	0.03	0.2	BDL(DL-0.01)
28	Lead (as Pb)	mg/l	IS 3025 (Part 47) : 2003	0.01	No relaxation	BDL(DL-0.001)
29	Zinc (as Zn)	mg/l	IS 3025 (Part 2) : 2019	5	15	BDL(DL-0.1)
30	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2) : 2019	0.05	No relaxation	BDL(DL-0.03)
31	Boron (as B)	mg/l	IS 3025 (Part 2) : 2019	0.5	2.4	BDL(DL-0.1)
32	Polynuclear aromatic hydrocarbon (PAH)	µg/l	ANqr RES-30	0.1	No relaxation	BDL(DL-0.03)
33	Mineral Oil	mg/l	ANqr RES-40	0.5	No relaxation	BDL(DL-0.001)

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Verified By

Shashikant Satdeve  
Sr. Chemist

Sonali Gharpure  
Technical Manager

Authorized Signatory

Dr. (Mrs.) S.D. Garway  
Quality Manager

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**TEST REPORT**

Test Report No. : ALPL/27022021/01-37

dated 27/02/2021

Page 3 of 3

M/s Noamundi Iron Mines (M/s TATA Steel Limited) Noamundi, Jharkhand Postal Code: 833217		Sample Inward No. 2021/MON-21/60-46	Analysis Start 22/02/2021
		Inward Date 22/02/2021	Analysis End 27/02/2021
		Reference W.O.- 3000132460/962	Sample Category Water
		Reference Date 15.05.2020	
Sample Name Ground Water	Sample Source Dugwell	Sample Particulars Sample Code-GW-3	Location Co-ordinates Lat: 22°8'54.89"N, Long: 85°31'8.03"E
Sample Collected By Anacon Representative Mr. K. Pandey		Sampling Date 16/02/2021	Quantity Received 2.0 Ltr & 250 ml
		Sampling Time 3.20 pm	Sampling Location Mahudi Village (Railway Station Road)

**TEST RESULTS**

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 2		Test Result
				Acceptable Limit	Permissible Limit #	
<b>II Chemical Testing</b>						
<b>2. Residues In Water</b>						
34	Pesticide Residues					
i	Alpha-HCH	µg/l	ANqr RES-28	0.01	No relaxation	BDL(DL-0.01)
ii	Beta HCH	µg/l	ANqr RES-28	0.04	No relaxation	BDL(DL-0.03)
iii	Delta- HCH	µg/l	ANqr RES-28	0.04	No relaxation	BDL(DL-0.03)
iv	Alachlor	µg/l	ANqr RES-28	20	No relaxation	BDL(DL-0.03)
v	Aldrin / Dieldrin	µg/l	ANqr RES-28	0.03	No relaxation	BDL(DL-0.03)
vi	Atrazine	µg/l	ANqr RES-29	2	No relaxation	BDL(DL-0.03)
vii	Butachlor	µg/l	ANqr RES-29	125	No relaxation	BDL(DL-0.03)
viii	Chlorpyrifos	µg/l	ANqr RES-28	30	No relaxation	BDL(DL-0.03)
ix	DDT and its Isomers	µg/l	ANqr RES-28	1	No relaxation	BDL(DL-0.03)
x	Gamma - HCH (Lindane)	µg/l	ANqr RES-28	2	No relaxation	BDL(DL-0.03)
xi	2,4-Dichlorophenoxyacetic acid	µg/l	ANqr RES-29	30	No relaxation	BDL(DL-0.03)
xii	Endosulphan	µg/l	ANqr RES-28	0.4	No relaxation	BDL(DL-0.03)
xiii	Ethion	µg/l	ANqr RES-29	3	No relaxation	BDL(DL-0.03)
xiv	Isoproturon	µg/l	ANqr RES-29	9	No relaxation	BDL(DL-0.03)
xv	Malathion	µg/l	ANqr RES-29	190	No relaxation	BDL(DL-0.03)
xvi	Methyl Parathion	µg/l	ANqr RES-29	0.3	No relaxation	BDL(DL-0.03)
xvii	Monocrotophos	µg/l	ANqr RES-29	1	No relaxation	BDL(DL-0.03)
xviii	Phorate	µg/l	ANqr RES-29	2	No relaxation	BDL(DL-0.03)

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REMARKS : As requested by the client, sample was tested for above parameters only. Sample complies with IS:10500:2012, for tests conducted, indicating that it is fit for drinking purpose with respect to tested parameters.

Verified By

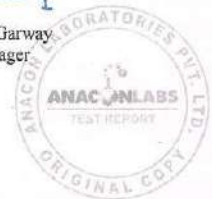
  
Sonali Gharpure  
Technical Manager

Authorized Signatory

  
Dr. (Mrs.) S.D. Garway  
Quality Manager

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## TEST REPORT

Test Report No. : ALPL/27022021/01-38

dated 27/02/2021

Page 1 of 3

M/s Noamundi Iron Mines (M/s TATA Steel Limited) Noamundi, Jharkhand Postal Code: 833217		Sample Inward No. 2021/MON-21/60-47	Analysis Start 22/02/2021
		Inward Date 22/02/2021	Analysis End 27/02/2021
		Reference W.O.- 3000132460/962	
		Reference Date 15.05.2020	Sample Category Water
Sample Name Ground Water	Sample Source Dugwell	Sample Particulars Sample Code-GW-4	Location Co-ordinates Lat: 22°8'52.58"N, Long: 85°30'28.50"E
Sample Collected By Anacon Representative Mr. K. Pandey		Sampling Date 16/02/2021	Quantity Received 2.0 Ltr & 250 ml
		Sampling Time 3.50 pm	Sampling Location Bottom Bin (Nr. Barrack)

### TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 2		Test Result
				Acceptable Limit	Permissible Limit #	
<b>I</b>	<b>Biological Testing I.Water</b>					
1	<i>Escherichia coli</i>	Per 100 ml	IS 15185 : 2016	Absent	Absent	Absent
<b>II</b>	<b>Chemical Testing I.Water</b>					
2	pH value	-	IS 3025 (Part 11) : 1983	6.5 to 8.5	No relaxation	7.42 at 25°C
3	Turbidity	NTU	IS 3025 (Part 10) : 1984	1	5	0.4
4	Colour	Hazen units	IS 3025 (Part 4) : 1983	5	15	1
5	Odour	-	IS 3025 (Part 5) : 2018	Agreeable	Agreeable	Agreeable
6	Taste	-	IS 3025 (Part 8) : 1984	Agreeable	Agreeable	Agreeable
7	Free residual chlorine	mg/l	IS 3025 (Part 26) : 1986	Min. 0.2	1	BDL(DL-0.1)
8	Total dissolved solids	mg/l	IS 3025 (Part 16) : 1984	500	2000	264
9	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.0	1.5	BDL(DL-0.1)
10	Cyanide (as CN)	mg/l	IS 3025 (Part 27) : 1986	0.05	No relaxation	BDL(DL-0.005)
11	Chloride (as Cl)	mg/l	IS 3025 (Part 32) : 1988	250	1000	42.74
12	Total Alkalinity (as CaCO <sub>3</sub> )	mg/l	IS 3025 (Part 23) : 1986	200	600	160
13	Total hardness (as CaCO <sub>3</sub> )	mg/l	IS 3025 (Part 21) : 2009	200	600	154.44
14	Calcium (as Ca)	mg/l	IS 3025 (Part 40) : 1991	75	200	45.01
15	Magnesium (as Mg)	mg/l	IS 3025 (Part 46) : 1994	30	100	9.45
16	Sulphate (as SO <sub>4</sub> )	mg/l	IS 3025 (Part 24) : 1986	200	400	10.63
17	Nitrate (as NO <sub>3</sub> )	mg/l	APHA Method 23 <sup>rd</sup> Edition	45	No relaxation	7.46
18	Phenolic compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	IS 3025 (Part 43) : 1992	0.001	0.002	BDL(DL-0.001)
19	Anionic detergents (as MBAS)	mg/l	IS 13428 : 2005 Annex K	0.2	1.0	BDL(DL-0.01)

**NOTES:** • Please see watermark "Original Test Report" to confirm the authenticity of this report. • Results shall be referred to tested sample(s) and applicable to tested parameters only. • Test report shall not be reproduced except in full without prior written approval of Anacon Labs. • Liability of Anacon Labs is limited to invoiced amount only. • Non-perishable and perishable sample(s) shall be disposed off after 30 days and 15 days respectively from the date of issue of Test Report, unless specified otherwise. • 'mg/l' is equivalent to 'ppm'. • Result for test no. 7 is not relevant. • BDL- Below detection limit • DL- Indicates detection limit of instrument/method and shall be considered as 'absent'.

Verified By

*Swati Shrivastava*  
Swati Shrivastava  
Technical Manager

Authorized Signatories

*Pooja Kathane*  
Pooja Kathane  
Technical Manager

*Dr. (Mrs.) S.D. Garway*  
Dr. (Mrs.) S.D. Garway  
Quality Manager

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- Bureau of India Standards (BIS) • Export Inspection council (EIC); AGMARK.

**TEST REPORT**

Test Report No. : ALPL/27022021/01-38

dated 27/02/2021

Page 2 of 3

M/s Noamundi Iron Mines (M/s TATA Steel Limited) Noamundi, Jharkhand Postal Code: 833217		Sample Inward No. 2021/MON-21/60-47	Analysis Start 22/02/2021
		Inward Date 22/02/2021	Analysis End 27/02/2021
		Reference W.O.- 3000132460/962	Sample Category Water
		Reference Date 15.05.2020	
Sample Name Ground Water	Sample Source Dugwell	Sample Particulars Sample Code-GW-4	Location Co-ordinates Lat: 22°8'52.58"N, Long: 85°30'28.50"E
Sample Collected By Anacon Representative Mr. K. Pandey		Sampling Date 16/02/2021	Quantity Received 2.0 Ltr & 250 ml
		Sampling Time 3.50 pm	Sampling Location Bottom Bin (Nr. Barrack)

**TEST RESULTS**

S.N.	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 2		Test Result
				Acceptable Limit	Permissible Limit #	
II	Chemical Testing 2. Residues In Water					
20	Iron (as Fe)	mg/l	IS 3025 (Part 2) : 2019	1.0	No relaxation	0.24
21	Copper (as Cu)	mg/l	IS 3025 (Part 2) : 2019	0.05	1.5	BDL(DL-0.03)
22	Manganese (as Mn)	mg/l	IS 3025 (Part 2) : 2019	0.1	0.3	BDL(DL-0.05)
23	Mercury (as Hg)	mg/l	IS : 3025 (Part 48) : 1994	0.001	No relaxation	BDL(DL-0.0005)
24	Cadmium (as Cd)	mg/l	IS : 3025 (Part 41) : 1992	0.003	No relaxation	BDL(DL-0.001)
25	Selenium (as Se)	mg/l	IS : 3025 (Part 56) : 2003	0.01	No relaxation	BDL(DL-0.001)
26	Arsenic (as As)	mg/l	IS : 3025 (Part 37) : 1988	0.01	No relaxation	BDL(DL-0.01)
27	Aluminium (as Al)	mg/l	IS 15302 : 2003	0.03	0.2	BDL(DL-0.01)
28	Lead (as Pb)	mg/l	IS 3025 (Part 47) : 2003	0.01	No relaxation	BDL(DL-0.001)
29	Zinc (as Zn)	mg/l	IS 3025 (Part 2) : 2019	5	15	BDL(DL-0.1)
30	Total Chromium (as Cr)	mg/l	IS 3025 (Part 2) : 2019	0.05	No relaxation	BDL(DL-0.03)
31	Boron (as B)	mg/l	IS 3025 (Part 2) : 2019	0.5	2.4	BDL(DL-0.1)
32	Polynuclear aromatic hydrocarbon (PAH)	µg/l	ANqr RES-30	0.1	No relaxation	BDL(DL-0.03)
33	Mineral Oil	mg/l	ANqr RES-40	0.5	No relaxation	BDL(DL-0.001)

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Verified By

  
Shashikant Satdeve  
Sr. Chemist

  
Sonali Gharpure  
Technical Manager

Authorized Signatory

  
Dr. (Mrs.) S.D. Garway  
Quality Manager

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## TEST REPORT

Test Report No. : ALPL/27022021/01-38

dated 27/02/2021

Page 3 of 3

M/s Noamundi Iron Mines (M/s TATA Steel Limited) Noamundi, Jharkhand Postal Code: 833217		Sample Inward No. 2021/MON-21/60-47	Analysis Start 22/02/2021
		Inward Date 22/02/2021	Analysis End 27/02/2021
		Reference W.O.- 3000132460/962	
		Reference Date 15.05.2020	Sample Category Water
Sample Name Ground Water	Sample Source Dugwell	Sample Particulars Sample Code-GW-4	Location Co-ordinates Lat: 22°8'52.58"N, Long: 85°30'28.50"E
Sample Collected By Anacon Representative Mr. K. Pandey		Sampling Date 16/02/2021	Quantity Received 2.0 Ltr & 250 ml
		Sampling Time 3.50 pm	Sampling Location Bottom Bin (Nr. Barrack)

### TEST RESULTS

S.N:	Test Parameter	Measurement Unit	Test Method	Requirement as per IS 10500 : 2012 (Drinking Water Specifications) Including Amendment No. 2		Test Result
				Acceptable Limit	Permissible Limit #	
II	Chemical Testing					
	2. Residues In Water					
34	Pesticide Residues					
i	Alpha-HCH	µg/l	ANqr RES-28	0.01	No relaxation	BDL(DL-0.01)
ii	Beta HCH	µg/l	ANqr RES-28	0.04	No relaxation	BDL(DL-0.03)
iii	Delta- HCH	µg/l	ANqr RES-28	0.04	No relaxation	BDL(DL-0.03)
iv	Alachlor	µg/l	ANqr RES-28	20	No relaxation	BDL(DL-0.03)
v	Aldrin / Dieldrin	µg/l	ANqr RES-28	0.03	No relaxation	BDL(DL-0.03)
vi	Atrazine	µg/l	ANqr RES-29	2	No relaxation	BDL(DL-0.03)
vii	Butachlor	µg/l	ANqr RES-29	125	No relaxation	BDL(DL-0.03)
viii	Chlorpyrifos	µg/l	ANqr RES-28	30	No relaxation	BDL(DL-0.03)
ix	DDT and its Isomers	µg/l	ANqr RES-28	1	No relaxation	BDL(DL-0.03)
x	Gamma - HCH (Lindane)	µg/l	ANqr RES-28	2	No relaxation	BDL(DL-0.03)
xi	2,4-Dichlorophenoxyacetic acid	µg/l	ANqr RES-29	30	No relaxation	BDL(DL-0.03)
xii	Endosulphan	µg/l	ANqr RES-28	0.4	No relaxation	BDL(DL-0.03)
xiii	Ethion	µg/l	ANqr RES-29	3	No relaxation	BDL(DL-0.03)
xiv	Isoproturon	µg/l	ANqr RES-29	9	No relaxation	BDL(DL-0.03)
xv	Malathion	µg/l	ANqr RES-29	190	No relaxation	BDL(DL-0.03)
xvi	Methyl Parathion	µg/l	ANqr RES-29	0.3	No relaxation	BDL(DL-0.03)
xvii	Monocrotophos	µg/l	ANqr RES-29	1	No relaxation	BDL(DL-0.03)
xviii	Phorate	µg/l	ANqr RES-29	2	No relaxation	BDL(DL-0.03)

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REMARKS : As requested by the client, sample was tested for above parameters only. Sample complies with IS:10500:2012, for tests conducted, indicating that it is fit for drinking purpose with respect to tested parameters.

Verified By

  
Sonali Gharpure  
Technical Manager

Authorized Signatory

  
Dr. (Mrs.) S.D. Garway  
Quality Manager

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**Flow Rate of Balijhor Nalla**

**(October 2020 – March 2021)**

**ANALYSIS OF WATER QUALITY**  
**Sample collected from Balijhore Nalla**

<b>Parameters</b>	<b>Oct- 20</b>	<b>Nov-20</b>	<b>Dec-20</b>	<b>Jan-21</b>	<b>Feb-21</b>	<b>Mar-21</b>
BOD mg/l	1.45	1.9	1.80	1.60	1.70	1.50
CPCB Limit (30 mg/l)						
TSS mg/l	35.80	12.60	14.9	24.50	19.60	29.60
CPCB Limit (100 mg/l)						
Flow Rate Cum/hr	88.3	29.4	30.8	41.06	35.33	54.55

\* There is no any industrial effluents discharge from the mine.

Manager (Environment)



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♦ Agricultural & Process Food Products Export Development Authority (APEDA) ♦ Export Inspection Council (EIC) ♦ Agmark

**TEST REPORT**

Test Report No. : ALPL/30112020/01-7&amp;8

dated 30.11.2020

Page | of 1

<b>Issued To :</b> M/s Noamundi Iron Mines (M/s TATA Steel Limited) Noamundi, Jharkhand Postal Code: 833217		<b>Sample Inward No.</b> 2020/MON-11/8/18-7&8	<b>Analysis Start</b> 23.11.2020
		<b>Inward Date</b> 23.11.2020	<b>Analysis End</b> 30.11.2020
		<b>Reference</b> W.O.- 3000132460/962	
		<b>Reference Date</b> 15.05.2020	<b>Sample Category</b> Water
<b>Sample Name</b> Surface Water	<b>Sample Source</b> Balijhora Nallah	<b>Sample Particulars</b> Sample Code-SW-1 & 2	<b>Location Coordinate</b> SW-1 Lat: 22°8'59.17"N; Long: 85°29'37.62"E SW-2 Lat: 22°9'35.88"N; Long: 85°29'49.87"E
<b>Sample Collected By</b> Anacon Representative Mr. K. Pandey		<b>Sampling Date</b> 18.11.2020	<b>Sampling Time</b> Not Mentioned
		<b>Sampling Location</b> Balijhora Nallah (SW-1; Nr. Aquam Park) 2. (SW-2; Nr. DVC)	
<b>TEST RESULTS</b>			

S.N.	Test Parameter	Measurement Unit	Test Method	Standards as per IS 2296:1992 Class C	Test Result	
					SW-1	SW-2
<b>I Biological Testing - 1. Water</b>						
1	Total Coliform	MPN/100ml	IS 1622 : 1981	5000	<2	<2
<b>II Chemical Testing - 1. Water</b>						
2	pH value	-	IS 3025 (Part 11) : 1983	6.0 to 9.0	7.46 at 25°C	7.42 at 25°C
3	Colour	Hazen units	IS 3025 (Part 4) : 1983	300	1	1
4	Dissolved Oxygen	mg/l	IS 3025 (Part 38) : 1989	4.0	6.3	6.2
5	Total Suspended Solid (as TSS)	mg/l	IS 3025 (Part 17) : 1984	--	BDL(DL-10)	BDL(DL-10)
6	BOD (3 days at 27°C)	mg/l	IS 3025 (Part 44) : 1993	3.0	2.37	2.75
7	Chemical oxygen demand	mg/l	IS 3025 (Part 58) : 2006	--	12	16
8	Total Dissolved Solids (TDS)	mg/l	IS 3025 (Part 16) : 1984	1500	212	224
9	Copper (as Cu)	mg/l	IS 3025 (Part 2) : 2019	1.5	BDL(DL-0.03)	BDL(DL-0.03)
10	Chloride (as Cl)	mg/l	IS 3025 (Part 32) : 1988	600	53.22	60.12
11	Sulphate (as SO <sub>4</sub> )	mg/l	IS 3025 (Part 24) : 1986	400	4.15	8.81
12	Nitrate (as NO <sub>3</sub> )	mg/l	IS 3025 (Part 54) : 1988	50	6.03	5.06
13	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.5	0.23	0.46
14	Cyanide (as CN)	mg/l	IS 3025 (Part 27) : 1986	0.05	BDL(DL-0.005)	BDL(DL-0.005)
15	Phenolic compounds (as OMS/cm)	mg/l	IS 3025 (Part 43) : 1901	0.005	BDL(DL-0.001)	BDL(DL-0.001)
16	Anionic Detergent	mg/l	IS 13428 : 2005 Annex K	1.0	BDL(DL-0.01)	BDL(DL-0.01)
<b>Chemical Testing - 2. Residues In Water</b>						
17	Iron (as Fe)	mg/l	IS 3025 (Part 2) : 2019	0.5	0.13	0.17
18	Cadmium (as Cd)	mg/l	IS 3025 (Part 41) : 1992	0.01	BDL(DL-0.001)	BDL(DL-0.001)
19	Selenium (as Se)	mg/l	IS 3025 (Part 2) : 2019	0.05	BDL(DL-0.001)	BDL(DL-0.001)
20	Arsenic (as As)	mg/l	IS 3025 (Part 37) : 1988	0.2	BDL(DL-0.001)	BDL(DL-0.001)
21	Lead (as Pb)	mg/l	IS 3025 (Part 47) : 2003	0.1	BDL(DL-0.05)	BDL(DL-0.05)
22	Zinc (as Zn)	mg/l	IS 3025 (Part 2) : 2019	15	BDL(DL-0.05)	BDL(DL-0.05)
23	Hexa Chromium (as Cr <sup>6+</sup> )	mg/l	IS 3025 (Part 2) : 2019	0.05	BDL(DL-0.001)	BDL(DL-0.001)
24	Mercury (as Hg)	mg/l	IS : 3025 (Part 48) : 1994	--	BDL(DL-0.005)	BDL(DL-0.005)
25	Manganese (as Mn)	mg/l	IS 3025 (Part 2) : 2019	--	BDL(DL-0.05)	BDL(DL-0.05)

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**REMARKS :** As requested by the client, sample was tested for above parameters only.

Verified By

Authorized Signatories

 Swati Shrivastava  
 Shashikant Sakdeve  
 Pooja Rathore  
 Dr. (Mrs.) Anupa Tankhiwale  
 Dr. (Mrs.) S.D. Garway

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Sr. Chemist

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**TEST REPORT**

Test Report No. : AL/PL/30112020/01-9&10 dated 30.11.2020 Page 1 of 1

<b>Issued To :</b> M/s Noamundi Iron Mines (M/s TATA Steel Limited) Noamundi, Jharkhand Postal Code: 833217		<b>Sample Inward No.</b> 2020/MON-11/8/18-9&10 <b>Inward Date</b> 23.11.2020 <b>Reference</b> W.O.- 3000132460/962 <b>Reference Date</b> 15.05.2020	<b>Analysis Start</b> 23.11.2020 <b>Analysis End</b> 30.11.2020 <b>Sample Category</b> Water	
<b>Sample Name</b> Surface Water	<b>Sample Source</b> 1. River (SW-3) 2. Mine Pit Water (SW-4)	<b>Sample Particulars</b> Sample Code-SW-3 & 4	<b>Sample Condition</b> Sealed & Ice Preserved	<b>Quantity Received</b> 2.0 Ltr & 250 ml
<b>Sample Collected By</b> Anacon Representative Mr. K. Pandey		<b>Sampling Date</b> 18.11.2020	<b>Sampling Time</b> Not Mentioned	<b>Sampling Location</b> 1. Baitarni River (SW-3) 2. Noamundi - Mine Pit Water (SW-4)

**TEST RESULTS**

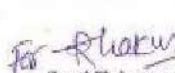


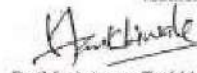
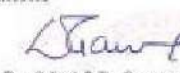
S.N.	Test Parameter	Measurement Unit	Test Method	Standards as per IS 2296:1992 Class C	Test Result	
					SW-1	SW-2
<b>I Biological Testing - 1. Water</b>						
1	Total Coliform	MPN/100ml	IS 1622 : 1981	5000	<2	<2
<b>II Chemical Testing - 1. Water</b>						
2	pH value	-	IS 3025 (Part 11) : 1983	6.0 to 9.0	7.42 at 25°C	7.47 at 25°C
3	Colour	Hazen units	IS 3025 (Part 4) : 1983	300	1	1
4	Dissolved Oxygen	mg/l	IS 3025 (Part 38) : 1989	4.0	6.2	6.2
5	Total Suspended Solid (as TSS)	mg/l	IS 3025 (Part 17) : 1984	--	BDL(DL-10)	BDL(DL-10)
6	BOD (3 days at 27°C)	mg/l	IS 3025 (Part 44) : 1993	3.0	2.30	2.81
7	Chemical oxygen demand	mg/l	IS 3025 (Part 58) : 2006	--	8	12
8	Total Dissolved Solids (TDS)	mg/l	IS 3025 (Part 16) : 1984	1500	214	218
9	Copper (as Cu)	mg/l	IS 3025 (Part 2) : 2019	1.5	BDL(DL-0.03)	BDL(DL-0.03)
10	Chloride (as Cl)	mg/l	IS 3025 (Part 32) : 1988	600	55.19	64.06
11	Sulphate (as SO <sub>4</sub> )	mg/l	IS 3025 (Part 24) : 1986	400	9.07	8.03
12	Nitrate (as NO <sub>3</sub> )	mg/l	IS 3025 (Part 34) : 1988	50	6.03	5.50
13	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.5	0.32	0.40
14	Cyanide (as CN)	mg/l	IS 3025 (Part 27) : 1986	0.05	BDL(DL-0.005)	BDL(DL-0.005)
15	Phenolic compounds (as COCSON)	mg/l	IS 3025 (Part 45) : 1001	0.005	BDL(DL-0.001)	BDL(DL-0.001)
16	Anionic Detergent	mg/l	IS 13428 : 2005 Annex K	1.0	BDL(DL-0.01)	BDL(DL-0.01)
<b>Chemical Testing - 2. Residues In Water</b>						
17	Iron (as Fe)	mg/l	IS 3025 (Part 2) : 2019	0.5	0.14	0.18
18	Cadmium (as Cd)	mg/l	IS 3025 (Part 41) : 1992	0.01	BDL(DL-0.001)	BDL(DL-0.001)
19	Selenium (as Se)	mg/l	IS 3025 (Part 2) : 2019	0.05	BDL(DL-0.001)	BDL(DL-0.001)
20	Arsenic (as As)	mg/l	IS 3025 (Part 37) : 1988	0.2	BDL(DL-0.001)	BDL(DL-0.001)
21	Lead (as Pb)	mg/l	IS 3025 (Part 47) : 2003	0.1	BDL(DL-0.05)	BDL(DL-0.05)
22	Zinc (as Zn)	mg/l	IS 3025 (Part 2) : 2019	15	BDL(DL-0.05)	BDL(DL-0.05)
23	Hexa Chromium (as Cr <sup>VI</sup> )	mg/l	IS 3025 (Part 2) : 2019	0.05	BDL(DL-0.001)	BDL(DL-0.001)
24	Mercury (as Hg)	mg/l	IS : 3025 (Part 48) : 1994	--	BDL(DL-0.005)	BDL(DL-0.005)
25	Manganese (as Mn)	mg/l	IS 3025 (Part 2) : 2019	--	BDL(DL-0.05)	BDL(DL-0.05)

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REMARKS : As requested by the client, sample was tested for above parameters only.

Verified By

Authorized Signatories

 Swati Shrivastava, Technical Manager  
 Shashikant Satdeve, Sr. Chemist  
 Pooja Kulkarni, Technical Manager  
 Dr. (Mrs.) Anupa Tankhiwale, Sr. Technical Manager  
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Test Report No. : ALPL/27022021/01-39

dated 27/02/2021

Page 1 of 1

<b>Issued To :</b> M/s Noamundi Iron Mines (M/s TATA Steel Limited) Noamundi, Jharkhand Postal Code: 833217		<b>Sample Inward No.</b> 2021/MON-21/60-48&49	<b>Analysis Start</b> 23/02/2021
		<b>Inward Date</b> 22/02/2021	<b>Analysis End</b> 27/02/2021
		<b>Reference</b> W.O. 3000132460/962	<b>Sample Category</b> Water
		<b>Reference Date</b> 15.05.2020	
<b>Sample Name</b> Surface Water	<b>Sample Source</b> Balijhora Nallah	<b>Sample Particulars</b> Sample Code-SW-1 & 2	<b>Location Coordinate</b> SW-1 Lat: 22°8'59.1"N; Long: 85°29'37.62"E SW-2 Lat: 22°9'35.88"N; Long: 85°29'49.87"E
<b>Sample Collected By</b> Anacon Representative Mr. K. Pandey		<b>Sampling Date</b> 16/02/2021	<b>Sampling Time</b> 11.30 am to 3 pm
		<b>Sampling Location</b> Balijhore Nallah (SW-1; Nr. Aqua Park) 2. (SW-2; Nr. DVC)	
		<b>Quantity Received</b> 2.0 Ltr & 250 ml	

**TEST RESULTS**


S.N.	Test Parameter	Measurement Unit	Test Method	Standards as per IS 2296:1992 Class C	Test Result	
					SW-1	SW-2
<b>I Biological Testing 1.Water</b>						
1	Total Coliform	MPN/100ml	IS 1622 : 1981	5000	<2	<2
<b>II Chemical Testing 1.Water</b>						
2	pH value	-	IS 3025 (Part 11) : 1983	6.0 to 9.0	7.40 at 25°C	7.44 at 25°C
3	Colour	Hazen units	IS 3025 (Part 4) : 1983	300	1	1
4	Dissolved Oxygen	mg/l	IS 3025 (Part 38) :1989	4.0	6.1	6.0
5	Total Suspended Solid (as TSS)	mg/l	IS 3025 (Part 17) :1984	---	BDL(DL-10)	BDL(DL-10)
6	BOD (3 days at 27°C)	mg/l	IS 3025 (Part 44) :1993	3.0	BDL(DL-2)	BDL(DL-2)
7	Chemical oxygen demand	mg/l	IS 3025 (Part 58) :2006	--	BDL(DL-4)	BDL(DL-4)
8	Total Dissolved Solids (TDS)	mg/l	IS 3025 (Part 16) : 1984	1500	210	222
9	Copper (as Cu)	mg/l	IS 3025 (Part 2) : 2019	1.5	BDL(DL-0.03)	BDL(DL-0.03)
10	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :1988	600	55.31	63.14
11	Sulphate (as SO <sub>4</sub> )	mg/l	IS 3025 (Part 24) : 1986	400	5.70	7.26
12	Nitrate (as NO <sub>3</sub> )	mg/l	IS 3025 (Part 34) : 1988	50	6.53	5.44
13	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.5	0.21	0.43
14	Cyanide (as CN)	mg/l	IS 3025 (Part 27) : 1986	0.05	BDL(DL-0.005)	BDL(DL-0.005)
15	Phenolic compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	IS 3025 (Part 43) :1001	0.005	BDL(DL-0.001)	BDL(DL-0.001)
16	Anionic Detergent	mg/l	IS 13428 : 2005 Annex K	1.0	BDL(DL-0.01)	BDL(DL-0.01)
<b>Chemical Testing 2. Residues In Water</b>						
17	Iron (as Fe)	mg/l	IS 3025 (Part 2) : 2019	0.5	0.14	0.16
18	Cadmium (as Cd)	mg/l	IS 3025 (Part 41) : 1992	0.01	BDL(DL-0.001)	BDL(DL-0.001)
19	Selenium (as Se)	mg/l	IS 3025 (Part 2) : 2019	0.05	BDL(DL-0.001)	BDL(DL-0.001)
20	Arsenic (as As)	mg/l	IS 3025 (Part 37) : 1988	0.2	BDL(DL-0.001)	BDL(DL-0.001)
21	Lead (as Pb)	mg/l	IS 3025 (Part 47) : 2003	0.1	BDL(DL-0.05)	BDL(DL-0.05)
22	Zinc (as Zn)	mg/l	IS 3025 (Part 2) : 2019	15	BDL(DL-0.05)	BDL(DL-0.05)
23	Hexa Chromium (as Cr <sup>+6</sup> )	mg/l	IS 3025 (Part 2) :2019	0.05	BDL(DL-0.001)	BDL(DL-0.001)
24	Mercury (as Hg)	mg/l	IS : 3025 (Part 48) : 1994	--	BDL(DL-0.005)	BDL(DL-0.005)
25	Manganese (as Mn)	mg/l	IS 3025 (Part 2) : 2019	--	BDL(DL-0.05)	BDL(DL-0.05)

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REMARKS : As requested by the client, sample was tested for above parameters only.

Verified By

  
Swati Shrivastava  
Technical Manager

  
Shashikant Satdeve  
Sr. Chemist

Authorized Signatories

  
Pooja Kathane  
Technical Manager

  
Dr. (Mrs.) S.D. Garway  
Quality Manager

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Test Report No. : ALPL/27022021/01-39

dated 27/02/2021

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<b>Issued To :</b> M/s Noamundi Iron Mines (M/s TATA Steel Limited) Noamundi, Jharkhand Postal Code: 833217		<b>Sample Inward No.</b> 2021/MON-21/60-50&51	<b>Analysis Start</b> 23/02/2021
		<b>Inward Date</b> 22/02/2021	<b>Analysis End</b> 27/02/2021
		<b>Reference</b> W.O.- 3000132460/962	
		<b>Reference Date</b> 15.05.2020	<b>Sample Category</b> Water
<b>Sample Name</b> Surface Water	<b>Sample Source</b> 1. River (SW-3) 2. Mine Pit Water (SW-4)	<b>Sample Particulars</b> Sample Code-SW-3 & 4	<b>Sample Condition</b> Sealed & Ice Preserved
<b>Sample Collected By</b> Anacon Representative Mr. K. Pandey			<b>Quantity Received</b> 2.0 Ltr & 250 ml
<b>Sampling Date</b> 16/02/2021		<b>Sampling Time</b> 11.30 am to 3 pm	<b>Sampling Location</b> 1. Baitarani River (SW-3) 2. Noamundi - Mine Pit Water (SW-4)

**TEST RESULTS**

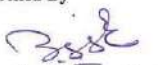
S.N.	Test Parameter	Measurement Unit	Test Method	Standards as per IS 2296:1992 Class C	Test Result	
					SW-1	SW-2
<b>I Biological Testing 1.Water</b>						
1	Total Coliform	MPN/100ml	IS 1622 : 1981	5000	<2	<2
<b>II Chemical Testing 1.Water</b>						
2	pH value	-	IS 3025 (Part 11) : 1983	6.0 to 9.0	7.38 at 25°C	7.44 at 25°C
3	Colour	Hazen units	IS 3025 (Part 4) : 1983	300	1	1
4	Dissolved Oxygen	mg/l	IS 3025 (Part 38) :1989	4.0	6.1	6.0
5	Total Suspended Solid (as TSS)	mg/l	IS 3025 (Part 17) :1984	--	BDL(DL-10)	BDL(DL-10)
6	BOD (3 days at 27°C)	mg/l	IS 3025 (Part 44) :1993	3.0	BDL(DL-2)	BDL(DL-2)
7	Chemical oxygen demand	mg/l	IS 3025 (Part 58) :2006	--	BDL(DL-4)	BDL(DL-4)
8	Total Dissolved Solids (TDS)	mg/l	IS 3025 (Part 16) : 1984	1500	212	220
9	Copper (as Cu)	mg/l	IS 3025 (Part 2) : 2019	1.5	BDL(DL-0.03)	BDL(DL-0.03)
10	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :1988	600	49.54	60.22
11	Sulphate (as SO <sub>4</sub> )	mg/l	IS 3025 (Part 24) : 1986	400	11.40	9.31
12	Nitrate (as NO <sub>3</sub> )	mg/l	IS 3025 (Part 34) : 1988	50	6.11	6.55
13	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.5	0.30	0.38
14	Cyanide (as CN)	mg/l	IS 3025 (Part 27) : 1986	0.05	BDL(DL-0.005)	BDL(DL-0.005)
15	Phenolic compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	IS 3025 (Part 43) :1001	0.005	BDL(DL-0.001)	BDL(DL-0.001)
16	Anionic Detergent	mg/l	IS 13428 : 2005 Annex K	1.0	BDL(DL-0.01)	BDL(DL-0.01)
<b>Chemical Testing 2. Residues In Water</b>						
17	Iron (as Fe)	mg/l	IS 3025 (Part 2) : 2019	0.5	0.17	0.21
18	Cadmium (as Cd)	mg/l	IS 3025 (Part 41) : 1992	0.01	BDL(DL-0.001)	BDL(DL-0.001)
19	Selenium (as Se)	mg/l	IS 3025 (Part 2) : 2019	0.05	BDL(DL-0.001)	BDL(DL-0.001)
20	Arsenic (as As)	mg/l	IS 3025 (Part 37) : 1988	0.2	BDL(DL-0.001)	BDL(DL-0.001)
21	Lead (as Pb)	mg/l	IS 3025 (Part 47) : 2003	0.1	BDL(DL-0.05)	BDL(DL-0.05)
22	Zinc (as Zn)	mg/l	IS 3025 (Part 2) : 2019	15	BDL(DL-0.05)	BDL(DL-0.05)
23	Hexa Chromium (as Cr <sup>VI</sup> )	mg/l	IS 3025 (Part 2) :2019	0.05	BDL(DL-0.001)	BDL(DL-0.001)
24	Mercury (as Hg)	mg/l	IS : 3025 (Part 48) : 1994	--	BDL(DL-0.005)	BDL(DL-0.005)
25	Manganese (as Mn)	mg/l	IS 3025 (Part 2) : 2019	--	BDL(DL-0.05)	BDL(DL-0.05)

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**REMARKS :** As requested by the client, sample was tested for above parameters only.

Verified By

  
Swati Shrivastava  
Technical Manager

  
Shashikant Satdeve  
Sr. Chemist

Authorized Signatories

  
Pooja Kathiane  
Technical Manager

  
Dr. (Mrs.) S.D. Garway  
Quality Manager

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# TEST REPORT

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- Approved by : Food Safety & Standards Authority of India under FSS Act;
- Bureau of Indian Standards (BIS); Agricultural & Processed Food Products Export Development Authority (APEDA);
- Export inspection council (EIC); AGMARK.

Test Report No. : ALPL/31122020/10-4&5

dated 31.12.2020

Page 1 of 1

<b>Issued To :</b> M/s Noamundi Iron Mines (M/s TATA Steel Limited) Noamundi, Jharkhand Postal Code: 833217		<b>Sample Inward No.</b> 2020/MON-12/10/24-4&5	<b>Inward Date</b> 23.12.2020	<b>Analysis Start</b> 23.12.2020	<b>Analysis End</b> 30.12.2020
		<b>Reference</b> W.O.- 3000132460/962		<b>Sample Category</b> Water	
		<b>Reference Date</b> 15.05.2020			
<b>Sample Name</b> Surface Water	<b>Sample Source</b> 1.Upstream & 2. Downstream	<b>Sample Particulars</b> Sample Code-SW-1 & 2	<b>Sample Condition</b> Sealed & Ice Preserved	<b>Quantity Received</b> 2.0 Ltr & 250 ml	
<b>Sample Collected By</b> Anacon Representative Mr. K.Pandey		<b>Sampling Date</b> 18.12.2020	<b>Sampling Time</b> 11.40 am	<b>Sampling Location</b> 1. Kundra Nallah (Nr. Joda Pump House) (SW-1) 2. Kundra Nallah (Nr. Banaikala Village) (SW-2)	

### TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Standards as per IS 2296:1992 Class C	Test Result	
					SW-1	SW-2
<b>I Biological Testing 1.Water</b>						
1	Total Coliform	MPN/100ml	IS 1622 : 1981	5000	<2	<2
<b>II Chemical Testing 1.Water</b>						
2	pH value	-	IS 3025 (Part 11) : 1983	6.0 to 9.0	7.48 at 25°C	7.57 at 25°C
3	Colour	Hazen units	IS 3025 (Part 4) : 1983	300	2	3
4	Dissolved Oxygen	mg/l	IS 3025 (Part 38) :1989	4.0	6.4	6.2
5	Total Suspended Solid (as TSS)	mg/l	IS 3025 (Part 17) :1984	--	48	54
6	BOD (3 days at 27°C)	mg/l	IS 3025 (Part 44) :1993	3.0	BDL(DL-2)	BDL(DL-2)
7	Chemical oxygen demand	mg/l	IS 3025 (Part 58) :2006	--	BDL(DL-4)	BDL(DL-4)
8	Total Dissolved Solids (TDS)	mg/l	IS 3025 (Part 16) : 1984	1500	173	181
9	Copper (as Cu)	mg/l	IS 3025 (Part 2) : 2019	1.5	0.02	0.03
10	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :1988	600	48.27	54.93
11	Sulphate (as SO <sub>4</sub> )	mg/l	IS 3025 (Part 24) : 1986	400	5.31	6.14
12	Nitrate (as NO <sub>3</sub> )	mg/l	IS 3025 (Part 34) : 1988	50	3.16	2.92
13	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.5	0.27	0.31
14	Cyanide (as CN)	mg/l	IS 3025 (Part 27) : 1986	0.05	BDL(DL-0.005)	BDL(DL-0.005)
15	Phenolic compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	IS 3025 (Part 43) :1001	0.005	BDL(DL-0.001)	BDL(DL-0.001)
16	Anionic Detergent	mg/l	IS 13428 : 2005 Annex K	1.0	BDL(DL-0.01)	BDL(DL-0.01)
<b>Chemical Testing 2. Residues In Water</b>						
17	Iron (as Fe)	mg/l	IS 3025 (Part 2) : 2019	0.5	0.26	0.28
18	Cadmium (as Cd)	mg/l	IS 3025 (Part 41) : 1992	0.01	BDL(DL-0.001)	BDL(DL-0.001)
19	Selenium (as Se)	mg/l	IS 3025 (Part 2) : 2019	0.05	BDL(DL-0.001)	BDL(DL-0.001)
20	Arsenic (as As)	mg/l	IS 3025 (Part 37) : 1988	0.2	BDL(DL-0.01)	BDL(DL-0.01)
21	Lead (as Pb)	mg/l	IS 3025 (Part 47) : 2003	0.1	BDL(DL-0.001)	BDL(DL-0.001)
22	Zinc (as Zn)	mg/l	IS 3025 (Part 2) : 2019	15	BDL(DL-0.1)	BDL(DL-0.1)
23	Hexa Chromium (as Cr <sup>6+</sup> )	mg/l	IS 3025 (Part 2) :2019	0.05	BDL(DL-0.03)	BDL(DL-0.03)
24	Mercury (as Hg)	mg/l	IS : 3025 (Part 48) : 1994	--	BDL(DL-0.0005)	BDL(DL-0.0005)
25	Manganese (as Mn)	mg/l	IS 3025 (Part 2) : 2019	--	BDL(DL-0.05)	BDL(DL-0.05)

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- Export inspection council (EIC); AGMARK.

Test Report No. : ALPL/31122020/10-4&5		dated 31.12.2020		Page 1 of 1	
<b>Issued To :</b> M/s Noamundi Iron Mines (M/s TATA Steel Limited) Noamundi, Jharkhand Postal Code: 833217		<b>Sample Inward No.</b> 2020/MON-12/10/24-6&7 <b>Inward Date</b> 23.12.2020 <b>Reference</b> W.O.- 3000132460/962 <b>Reference Date</b> 15.05.2020		<b>Analysis Start</b> 23.12.2020 <b>Analysis End</b> 30.12.2020 <b>Sample Category</b> Water	
<b>Sample Name</b>	<b>Sample Source</b>	<b>Sample Particulars</b>	<b>Location Co-ordinates</b>	<b>Quantity Received</b>	
Surface Water	Mahadev Nallah	Sample Code-SW-3 & 4	SW-1; Lat: 22°6'42.61"N, Long: 85°28'8.97"E SW-2; Lat: 22°6'39.52"N, Long: 85°28'10.41"E	2.0 Ltr & 250 ml	
<b>Sample Collected By</b>		<b>Sampling Date</b>	<b>Sampling Time</b>	<b>Sampling Location</b>	
Anacon Representative Mr. K. Pandey		18.12.2020	12.20 pm	1.Mahadev Nallah (Murga Nallah) Upstream (SW-3) 2.Mahadev Nallah (Murga Nallah) Downstream (SW-4)	

### TEST RESULTS

S.N.	Test Parameter	Measurement Unit	Test Method	Standards as per IS 2296:1992 Class C	Test Result	
					SW-3	SW-4
<b>I Biological Testing 1.Water</b>						
1	Total Coliform	MPN/100ml	IS 1622 : 1981	5000	<2	<2
<b>II Chemical Testing 1.Water</b>						
2	pH value	-	IS 3025 (Part 11) : 1983	6.0 to 9.0	7.43 at 25°C	7.31 at 25°C
3	Colour	Hazen units	IS 3025 (Part 4) : 1983	300	1	1
4	Dissolved Oxygen	mg/l	IS 3025 (Part 38) : 1989	4.0	6.2	6.1
5	Total Suspended Solid (as TSS)	mg/l	IS 3025 (Part 17) : 1984	--	BDL(DL-10)	BDL(DL-10)
6	BOD (3 days at 27°C)	mg/l	IS 3025 (Part 44) : 1993	3.0	BDL(DL-2)	BDL(DL-2)
7	Chemical oxygen demand	mg/l	IS 3025 (Part 58) : 2006	--	BDL(DL-4)	BDL(DL-4)
8	Total Dissolved Solids (TDS)	mg/l	IS 3025 (Part 16) : 1984	1500	241	259
9	Copper (as Cu)	mg/l	IS 3025 (Part 2) : 2019	1.5	BDL(DL-0.05)	BDL(DL-0.05)
10	Chloride (as Cl)	mg/l	IS 3025 (Part 32) : 1988	600	68.94	71.62
11	Sulphate (as SO <sub>4</sub> )	mg/l	IS 3025 (Part 24) : 1986	400	9.27	12.46
12	Nitrate (as NO <sub>3</sub> )	mg/l	IS 3025 (Part 34) : 1988	50	7.42	6.97
13	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.5	BDL(DL-0.1)	BDL(DL-0.1)
14	Cyanide (as CN)	mg/l	IS 3025 (Part 27) : 1986	0.05	BDL(DL-0.005)	BDL(DL-0.005)
15	Phenolic compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	IS 3025 (Part 43) : 1001	0.005	BDL(DL-0.001)	BDL(DL-0.001)
16	Anionic Detergent	mg/l	IS 13428 : 2005 Annex K	1.0	BDL(DL-0.01)	BDL(DL-0.01)
<b>III Chemical Testing 2. Residues In Water</b>						
17	Iron (as Fe)	mg/l	IS 3025 (Part 2) : 2019	0.5	0.21	0.17
18	Cadmium (as Cd)	mg/l	IS 3025 (Part 41) : 1992	0.01	BDL(DL-0.001)	BDL(DL-0.001)
19	Selenium (as Se)	mg/l	IS 3025 (Part 2) : 2019	0.05	BDL(DL-0.001)	BDL(DL-0.001)
20	Arsenic (as As)	mg/l	IS 3025 (Part 37) : 1988	0.2	BDL(DL-0.01)	BDL(DL-0.01)
21	Lead (as Pb)	mg/l	IS 3025 (Part 47) : 2003	0.1	BDL(DL-0.001)	BDL(DL-0.001)
22	Zinc (as Zn)	mg/l	IS 3025 (Part 2) : 2019	15	BDL(DL-0.1)	BDL(DL-0.1)
23	Hexa Chromium (as Cr <sup>VI</sup> )	mg/l	IS 3025 (Part 2) : 2019	0.05	BDL(DL-0.03)	BDL(DL-0.03)
24	Mercury (as Hg)	mg/l	IS : 3025 (Part 48) : 1994	--	BDL(DL-0.0005)	BDL(DL-0.0005)
25	Manganese (as Mn)	mg/l	IS 3025 (Part 2) : 2019	--	BDL(DL-0.05)	BDL(DL-0.05)

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**REMARKS :** As requested by the client, sample was tested for above parameters only.

Verified By

Swati Shrivastava  
Technical Manager

Shashikant Satdeve  
Sr. Chemist

Authorized Signatories

Pooja Kathane  
Technical Manager

Dr. (Mrs.) S.D. Gurway  
Quality Manager

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- Export inspection council (EIC); AGMARK.

**TEST REPORT**

Test Report No. : ALPL/31122020/10-6&7

dated 31.12.2020

Page 1 of 1

<b>Issued To :</b> M/s Noamundi Iron Mines (M/s TATA Steel Limited) Noamundi, Jharkhand Postal Code: 833217		<b>Sample Inward No.</b> 2020/MON-12/10/24-8&9 <b>Inward Date</b> 23.12.2020 <b>Reference</b> W.O.- 3000132460/962 <b>Reference Date</b> 15.05.2020	<b>Analysis Start</b> 23.12.2020 <b>Analysis End</b> 30.12.2020 <b>Sample Category</b> Water
<b>Sample Name</b> Surface Water	<b>Sample Source</b> Jojo Nallah	<b>Sample Particulars</b> Sample Code-SW-5 & 6	<b>Location Co-ordinates</b> SW-3; Lat: 22°7'40.96"N, Long: 85°28'07.81"E SW-4; Lat: 22°8'07.02"N, Long: 85°28'12.71"E
<b>Sample Collected By</b> Anacon Representative Mr. K. Pandey		<b>Sampling Date</b> 18.12.2020	<b>Sampling Time</b> 2.30 pm
<b>Quantity Received</b> 2.0 Ltr & 250 ml			
<b>Sampling Location</b> 1. Jojo Nallah Upstream (SW-5) 2. Jojo Nallah Downstream (SW-6)			

**TEST RESULTS**

S.N.	Test Parameter	Measurement Unit	Test Method	Standards as per IS 2296:1992 Class C	Test Result	
					SW-5	SW-6
<b>I Biological Testing 1.Water</b>						
1	Total Coliform	MPN/100ml	IS 1622 : 1981	5000	<2	<2
<b>II Chemical Testing 1.Water</b>						
2	pH value	-	IS 3025 (Part 11) : 1983	6.0 to 9.0	7.31 at 25°C	7.38 at 25°C
3	Colour	Hazen units	IS 3025 (Part 4) : 1983	300	2	1
4	Dissolved Oxygen	mg/l	IS 3025 (Part 38) :1989	4.0	6.3	6.0
5	Total Suspended Solid (as TSS)	mg/l	IS 3025 (Part 17) :1984	--	BDL(DL-10)	BDL(DL-10)
6	BOD (3 days at 27°C)	mg/l	IS 3025 (Part 44) :1993	3.0	BDL(DL-2)	BDL(DL-2)
7	Chemical oxygen demand	mg/l	IS 3025 (Part 58) :2006	--	BDL(DL-4)	BDL(DL-4)
8	Total Dissolved Solids (TDS)	mg/l	IS 3025 (Part 16) : 1984	1500	246	253
9	Copper (as Cu)	mg/l	IS 3025 (Part 2) : 2019	1.5	BDL(DL-0.05)	BDL(DL-0.05)
10	Chloride (as Cl)	mg/l	IS 3025 (Part 32) :1988	600	62.91	59.27
11	Sulphate (as SO <sub>4</sub> )	mg/l	IS 3025 (Part 24) : 1986	400	8.16	11.24
12	Nitrate (as NO <sub>3</sub> )	mg/l	IS 3025 (Part 34) : 1988	50	7.29	8.16
13	Fluoride (as F)	mg/l	IS 3025 (Part 60) : 2008	1.5	BDL(DL-0.1)	BDL(DL-0.1)
14	Cyanide (as CN)	mg/l	IS 3025 (Part 27) : 1986	0.05	BDL(DL-0.005)	BDL(DL-0.005)
15	Phenolic compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	IS 3025 (Part 43) :1001	0.005	BDL(DL-0.001)	BDL(DL-0.001)
16	Anionic Detergent	mg/l	IS 13428 : 2005 Annex K	1.0	BDL(DL-0.01)	BDL(DL-0.01)
<b>III Chemical Testing 2. Residues In Water</b>						
17	Iron (as Fe)	mg/l	IS 3025 (Part 2) : 2019	0.5	0.18	0.21
18	Cadmium (as Cd)	mg/l	IS 3025 (Part 41) : 1992	0.01	BDL(DL-0.001)	BDL(DL-0.001)
19	Selenium (as Se)	mg/l	IS 3025 (Part 2) : 2019	0.05	BDL(DL-0.001)	BDL(DL-0.001)
20	Arsenic (as As)	mg/l	IS 3025 (Part 37) : 1988	0.2	BDL(DL-0.01)	BDL(DL-0.01)
21	Lead (as Pb)	mg/l	IS 3025 (Part 47) : 2003	0.1	BDL(DL-0.001)	BDL(DL-0.001)
22	Zinc (as Zn)	mg/l	IS 3025 (Part 2) : 2019	15	BDL(DL-0.1)	BDL(DL-0.1)
23	Hexa Chromium (as Cr <sup>VI</sup> )	mg/l	IS 3025 (Part 2) : 2019	0.05	BDL(DL-0.03)	BDL(DL-0.03)
24	Mercury (as Hg)	mg/l	IS : 3025 (Part 48) : 1994	--	BDL(DL-0.0005)	BDL(DL-0.0005)
25	Manganese (as Mn)	mg/l	IS 3025 (Part 2) : 2019	--	BDL(DL-0.05)	BDL(DL-0.05)

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**REMARKS :** As requested by the client, sample was tested for above parameters only.

Verified By

*Swati Shrivastava*

Swati Shrivastava  
Technical Manager

*Shashikant Satdeve*

Shashikant Satdeve  
Sr. Chemist

Authorized Signatories

*Pooja Kuthane*

Pooja Kuthane  
Technical Manager

*Dr. (Mrs.) S.D. Garway*

Dr. (Mrs.) S.D. Garway  
Quality Manager

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- Export Inspection Council (EIC); AGMARK.

## TEST REPORT

### Stack Emission Report for the month of December-2020

Report No.: AN/SE/TS-NIM/2020/323-17		Date: 31/12/2020	
Issued to	M/s Noamundi Iron Mine (M/s TATA Steel Limited)		Order Reference
			3000132460/962, date: 15.05.20
Sample Description/Type	Stack Emission Monitoring	Sample Collected by	Anacon Representative
Sampling Location	Crusher	Sample Quantity/ Packing	Thimble: 1 X 1 No. SO: 30 mL X 1 No. PVC Bottle NO: 25 mL X 1 No. PVC. Bottle
Date of Sampling	10 <sup>th</sup> Dec, 2020	Sample Inward Date	14 <sup>th</sup> December, 2020
Sample Reference No.	2020/Mon-249-S/8		
Analysis Start date	14 <sup>th</sup> December, 2020	Analysis End date	15 <sup>th</sup> December, 2020

Stack details:			
Stack Identity	De-Dusting Unit		--
Stack attached to	Primary Crusher		--
Material of construction	MS		--
Shape of Stack	Circular		--
Stack diameter	0.15		Meter
Height of sampling point from GL	9.5		Meter
Parameter	Units	Results	Method Reference
Flue gas temperature	°C	45	IS:11255 (Part 3)
Flue gas velocity	m/s	11.47	IS:11255 (Part 3)
Total gas quantity	m <sup>3</sup> /h	729.98	IS:11255 (Part 3)
Total gas quantity at NTP	Nm <sup>3</sup> /h	665.37	IS:11255 (Part 3)
Total Particulate Matter (PM)	mg/Nm <sup>3</sup>	28.92	IS:11255 (Part 1)

Thanks for utilizing our services.

For ANACON LABORATORIES PVT.LTD.

Verified by

Mr. Sandip Bakde  
(Technical Manager)

Authorized Signatory

Dr. (Mrs.) S.D. Garway  
(Quality Manager)

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Email : support@anacon.in

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**TEST REPORT**

### Stack Emission Report for the month of March-2021

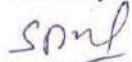
Report No.: AN/SE/TS-NEM/2021/12-6		Date: 02/04/2021	
Issued to	M/s Noamundi Iron Mine (M/s TATA Steel Limited)		Order Reference 3000132460/962, date: 15.05.20
Sample Description/Type	Stack Emission Monitoring	Sample Collected by	Anacon Representative
Sampling Location	Crusher	Sample Quantity/ Packing	Thimble: 1 X 1 No. SO <sub>2</sub> : 30 mL X 1 No. PVC Bottle NO <sub>x</sub> : 25 mL X 1 No. PVC Bottle
Date of Sampling	16.03.2021	Sample Inward Date	22 <sup>nd</sup> March, 2021
Sample Reference No.	2020/Mon-74-S/1		
Analysis Start date	22 <sup>nd</sup> March, 2021	Analysis End date	23 <sup>rd</sup> March, 2021

Stack details:			
Parameter	Units	Results	Method Reference
Stack Identity		De-Dusting Unit	--
Stack attached to		Primary Crusher	--
Material of construction		MS	--
Shape of Stack		Circular	--
Stack diameter		0.15	Meter
Height of sampling point from GL		9.5	Meter
Parameter	Units	Results	Method Reference
Flue gas temperature	°C	47	IS:11255 (Part 3)
Flue gas velocity	m/s	11.75	IS:11255 (Part 3)
Total gas quantity	m <sup>3</sup> /h	747.80	IS:11255 (Part 3)
Total gas quantity at NTP	Nm <sup>3</sup> /h	677.36	IS:11255 (Part 3)
Total Particulate Matter (PM)	mg/Nm <sup>3</sup>	25.92	IS:11255 (Part 1)

Thanks for utilizing our services.

For ANACON LABORATORIES PVT.LTD.

Verified by

  
Mr. Sandip Bakde  
(Technical Manager)

Authorized Signatory

  
Chinmay Garway  
(Deputy Quality Manager)

Laboratory address : FP-34, 35, Food Park, 5 Star Industrial Estate, MIDC Butibori, Nagpur - 441 122.

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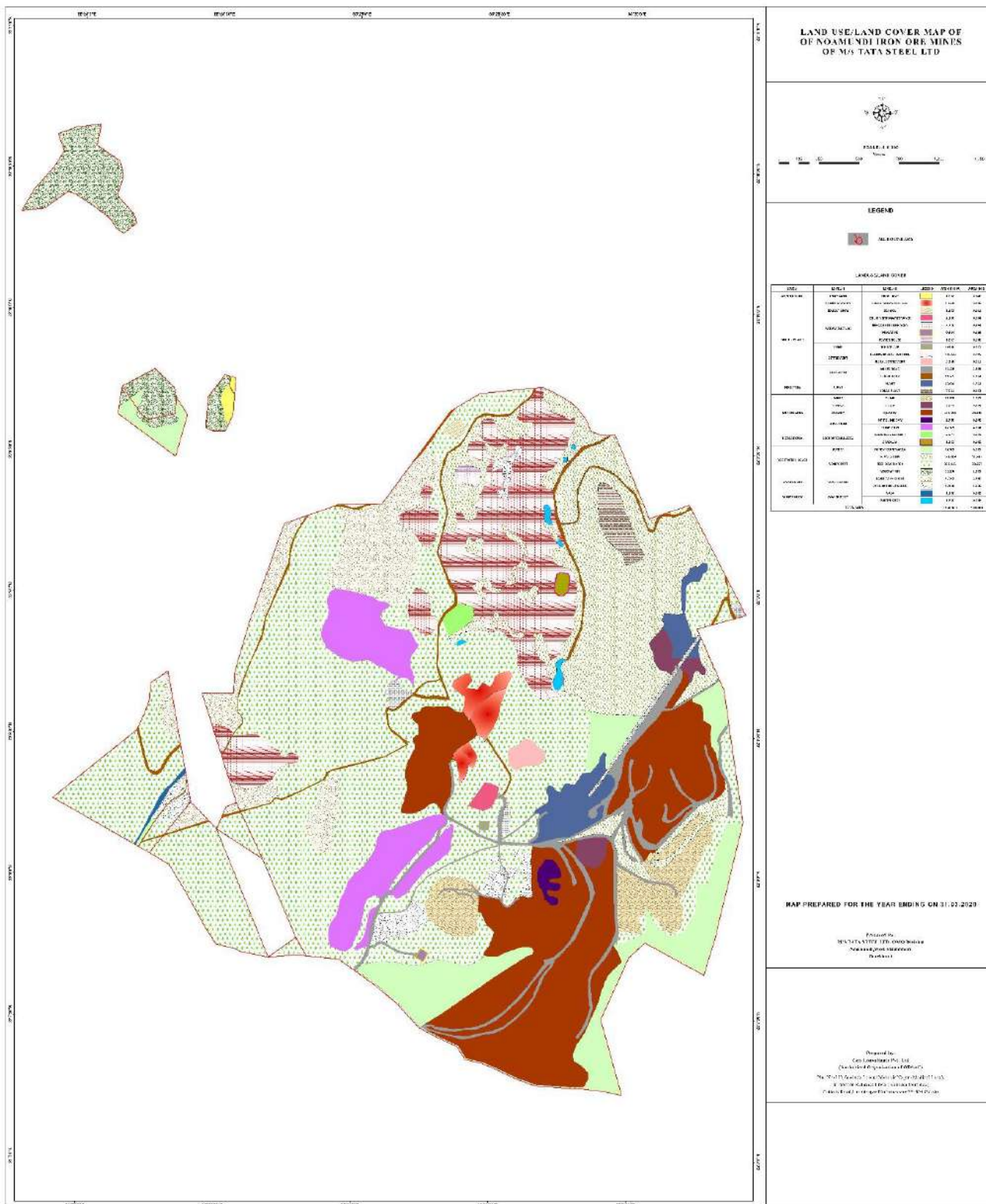
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Land use/ Land cover (Core Zone) – Noamundi Iron Mine



**NOAMUNDI IRON MINE  
AVERAGE AIR QUALITY REPORT (CORE ZONE)**

Month	MRSS Building					Bottom Bin					Near WTP					Near Hospital				
	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO
Oct 20	60.5	26.5	8.1	18.7	0.369	64.6	28.2	8.6	17.6	0.358	57.1	25.0	7.8	16.5	0.326	62.2	26.2	8.5	17.9	0.385
Nov 20	59.3	25.0	7.8	17.6	0.357	62.9	26.6	8.2	18.1	0.343	58.1	23.9	8.0	17.0	0.321	60.2	23.2	7.6	18.0	0.340
Dec 20	58.7	24.5	8.7	18.5	0.306	62.8	26.6	8.9	18.5	0.342	56.2	22.4	8.2	17.8	0.335	61.4	23.1	7.8	18.8	0.318
Jan 21	64.7	26.3	10.3	19.7	0.340	63.3	24.7	10.2	19.6	0.312	57.1	22.7	8.8	18.9	0.340	62.7	23.1	8.6	20.6	0.325
Feb 21	58.8	23.2	9.8	19.3	0.298	59.3	27.2	10.6	20.0	0.322	58.6	22.0	9.4	18.6	0.314	54.3	19.0	7.5	18.6	0.319
Mar 21	63.1	23.5	8.7	19.0	0.296	59.5	21.7	9.5	18.4	0.304	56.3	20.3	8.9	17.4	0.306	51.4	17.5	7.6	17.0	0.294

**AVERAGE AIR QUALITY REPORT (BUFFER ZONE)**

Month	Tankura Village					Miralgara Village					Kitabeda Village					Baita Village				
	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO
Oct 20	51.1	19.4	7.9	11.2	0.243	52.3	21.5	6.8	7.8	0.217	50.5	21.7	7.1	15.6	0.289	57.2	20.8	7.9	15.9	0.281
Nov 20	52.5	17.3	7.4	10.2	0.233	55.2	20.3	6.5	9.0	0.207	51.5	20.6	7.9	16.5	0.3	55.8	20.6	7.4	16.7	0.296
Dec 20	58.7	20.5	8.1	15.2	0.286	57.4	19.9	7.8	14.9	0.272	56.7	21.5	8.4	17.2	0.303	57.6	21.4	8.1	17.0	0.303
Jan 21	55.0	18.0	7.7	12.3	0.254	49.5	15.6	6.7	13.2	0.228	49.7	17.2	7.8	17.2	0.263	53.6	20.5	10.5	17.7	0.287
Feb 21	51.1	17.2	7.9	12.0	0.212	50.0	15.6	6.8	13.8	0.227	54.2	18.9	10.3	17.5	0.288	49.6	17.3	8.3	17.2	0.273
Mar 21	54.5	17.4	8.0	12.0	0.215	50.2	15.5	6.9	14.3	0.199	51.1	17.9	9.2	16.8	0.272	46.0	16.8	8.0	15.6	0.205

Unit of measurement for all parameters except CO is µg/m<sup>3</sup>. Co is in mg/m<sup>3</sup>

  
 N. Anwar  
 Manager (Environment)

## AMBIENT NOISE QUALITY AT NOAMUNDI

(October 2020 – March 2021)

	Location	Day Time 8.00 am to 10.00 pm	Limits in dB(A) Leq	Night Time 8.00 am to 10.00 pm	Limits in dB(A) Leq
Residential area	Hospital Premises	47.82	55.00	38.10	45.00
	Training Centre	52.27		41.47	
	Chief Office	53.57		41.15	
	Township	52.55		41.68	
Industrial area	Mining area	66.07	75.00	53.42	70.00
	Plant area	64.97		52.40	

Manager (Environment)

## Environmental Expenditure (2020-21)

**Noamundi Iron Mine, TATA Steel Ltd**

Sl. No.	Heads / Item	Expenditure (Lakhs)	
		Capital	Recurring
1.	General housekeeping at HEMM shed & upkeep of recycling pit at mega center	--	04.00
2.	Haz. waste disposal to common Haz. Waste facility	--	1.50
3.	Operation of Parks & Gardens at Railway sidings	--	2.50
4.	Operation of mobile water sprinklers at Railway sidings	--	11.50
5.	Operation & Maintenance of dry fog system at Railway sidings (1000TPH)	--	7.20
6.	Housekeeping & maintenance of Rapid Loading System, stackers, bins, Over Laying Conveyors at Railway siding areas	--	250
7.	Operation & maintenance of STPs & ETPs	--	38
8.	Operation & maintenance of WTP	--	35
9.	Operation and maintenance of solar power plant	--	5
10.	Operation & maintenance of municipal solid waste (collection, segregation, development of compost) in colony & Other area	--	36
11.	Installation of 2 composter machines	20	
12.	Development & maintenance of Gardens	--	132.00
13.	Development of Nursery & sapling for plantation	--	95.00
14.	Tree Planation & maintenance in & around Noamundi	--	156.28
15.	Special studies at Noamundi Mines (Biodiversity)	--	19
16.	Environmental monitoring in & around Noamundi	--	8.7
17.	CAAQMS maintenance & operation & display board	--	8.5
18.	Niche nesting- Biodiversity initiatives	--	6.8
19.	Toe wall and garland drain construction	--	5.1
20.	Operation and maintenance of fixed and mobile water sprinklers	--	175
21.	Desilting of thickeners & check dam, Housekeeping of plant, spillage control measures at Processing plant	--	180
22.	Operation & assistance in waste collection & check dam de-siltation, disposal of slime at dump, housekeeping of plant etc	--	30
23.	Maintenance & upkeep of High rate Thickener, flocculent addition etc	--	270
24.	Water recycling & reusing system in plant	--	450
<b>Total</b>		<b>20</b>	<b>1927.08</b>
<b>Environmental Expenditure for the year 2020-21 at Noamundi Iron Mine =~19.47Cr</b>			

HINDUSTAN TIMES, MARCH 15, 2013

# Popovich v Spoelstra

## EARLY DAYS Heat coach confident of comeback as fans fret over James' form



Miami Heat's LeBron James (1) was a shadow of himself in Game 3.

MIAMI — Erik Spoelstra, the Miami Heat coach, is confident that his team will overcome a 2-1 deficit in the Eastern Conference Finals against the Detroit Pistons. Spoelstra, who coached the Heat from 2008 to 2010, says his team has the talent and experience to win the series. He points to the team's performance in Game 3, where they were downed by a 20-point deficit, as evidence of their resilience. "I've coached in the playoffs before, and I know how to handle adversity," Spoelstra says. "We're going to be back in there, and we're going to win."

MIAMI — Tom Popovich, the Miami Heat assistant coach, is confident that his team will overcome a 2-1 deficit in the Eastern Conference Finals against the Detroit Pistons. Popovich, who coached the Heat from 2008 to 2010, says his team has the talent and experience to win the series. He points to the team's performance in Game 3, where they were downed by a 20-point deficit, as evidence of their resilience. "I've coached in the playoffs before, and I know how to handle adversity," Popovich says. "We're going to be back in there, and we're going to win."

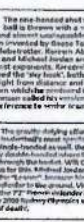
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### SHOT SELECTION

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### RUPINDERPAL HELPS INDIA SALVAGE DRAW



INDIA — Rupinder Pal Singh, the Indian cricketer, is confident that he will help his team win the match against the West Indies. Pal Singh, who has been struggling in the match, says he is focused on his team's success. "I know I can't do it all myself," Pal Singh says. "I know I need my teammates, and I know I need my coach. But I know we can win this match. We're going to be back in there, and we're going to win."

### INDIAN CRICKETERS

INDIA — The Indian cricket team is confident that they will win the match against the West Indies. The team's captain, Virat Kohli, says his team has the talent and experience to win the match. "I know we can win this match," Kohli says. "I know we have the talent and experience to win. We're going to be back in there, and we're going to win."

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INDIAN STATE ELECTRICITY BOARD  
TENDER FOR SUPPLY OF...  
Tender No. 1/2013-14  
Date of opening: 22.03.2013

INDIAN STATE ELECTRICITY BOARD  
TENDER FOR SUPPLY OF...  
Tender No. 2/2013-14  
Date of opening: 22.03.2013

INDIAN STATE ELECTRICITY BOARD  
TENDER FOR SUPPLY OF...  
Tender No. 3/2013-14  
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TENDER FOR SUPPLY OF...  
Tender No. 4/2013-14  
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TENDER FOR SUPPLY OF...  
Tender No. 5/2013-14  
Date of opening: 22.03.2013

INDIAN STATE ELECTRICITY BOARD  
TENDER FOR SUPPLY OF...  
Tender No. 6/2013-14  
Date of opening: 22.03.2013

INDIAN STATE ELECTRICITY BOARD  
TENDER FOR SUPPLY OF...  
Tender No. 7/2013-14  
Date of opening: 22.03.2013

INDIAN STATE ELECTRICITY BOARD  
TENDER FOR SUPPLY OF...  
Tender No. 8/2013-14  
Date of opening: 22.03.2013

INDIAN STATE ELECTRICITY BOARD  
TENDER FOR SUPPLY OF...  
Tender No. 9/2013-14  
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TENDER FOR SUPPLY OF...  
Tender No. 10/2013-14  
Date of opening: 22.03.2013

INDIAN STATE ELECTRICITY BOARD  
TENDER FOR SUPPLY OF...  
Tender No. 11/2013-14  
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Tender No. 12/2013-14  
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### NOTICE INVITING TENDER

NOTICE INVITING TENDER FOR SUPPLY OF...  
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TENDER FOR SUPPLY OF...  
Tender No. 13/2013-14  
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TENDER FOR SUPPLY OF...  
Tender No. 14/2013-14  
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TENDER FOR SUPPLY OF...  
Tender No. 15/2013-14  
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INDIAN STATE ELECTRICITY BOARD  
TENDER FOR SUPPLY OF...  
Tender No. 16/2013-14  
Date of opening: 22.03.2013

INDIAN STATE ELECTRICITY BOARD  
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INDIAN STATE ELECTRICITY BOARD  
TENDER FOR SUPPLY OF...  
Tender No. 18/2013-14  
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INDIAN STATE ELECTRICITY BOARD  
TENDER FOR SUPPLY OF...  
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INDIAN STATE ELECTRICITY BOARD  
TENDER FOR SUPPLY OF...  
Tender No. 20/2013-14  
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INDIAN STATE ELECTRICITY BOARD  
TENDER FOR SUPPLY OF...  
Tender No. 21/2013-14  
Date of opening: 22.03.2013

INDIAN STATE ELECTRICITY BOARD  
TENDER FOR SUPPLY OF...  
Tender No. 22/2013-14  
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Tender No. 23/2013-14  
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Tender No. 24/2013-14  
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NOTICE INVITING TENDER FOR SUPPLY OF...  
Tender No. 25/2013-14  
Date of opening: 22.03.2013

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NOTICE INVITING TENDER FOR SUPPLY OF...  
Tender No. 26/2013-14  
Date of opening: 22.03.2013

### NOTICE INVITING TENDER

NOTICE INVITING TENDER FOR SUPPLY OF...  
Tender No. 27/2013-14  
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NOTICE INVITING TENDER FOR SUPPLY OF...  
Tender No. 28/2013-14  
Date of opening: 22.03.2013

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NOTICE INVITING TENDER FOR SUPPLY OF...  
Tender No. 29/2013-14  
Date of opening: 22.03.2013

### NOTICE INVITING TENDER

NOTICE INVITING TENDER FOR SUPPLY OF...  
Tender No. 30/2013-14  
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NOTICE INVITING TENDER FOR SUPPLY OF...  
Tender No. 31/2013-14  
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NOTICE INVITING TENDER FOR SUPPLY OF...  
Tender No. 32/2013-14  
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NOTICE INVITING TENDER FOR SUPPLY OF...  
Tender No. 33/2013-14  
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Tender No. 34/2013-14  
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NOTICE INVITING TENDER FOR SUPPLY OF...  
Tender No. 35/2013-14  
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NOTICE INVITING TENDER FOR SUPPLY OF...  
Tender No. 36/2013-14  
Date of opening: 22.03.2013

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NOTICE INVITING TENDER FOR SUPPLY OF...  
Tender No. 37/2013-14  
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NOTICE INVITING TENDER FOR SUPPLY OF...  
Tender No. 38/2013-14  
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Tender No. 39/2013-14  
Date of opening: 22.03.2013

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Tender No. 40/2013-14  
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Tender No. 41/2013-14  
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Tender No. 42/2013-14  
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Tender No. 43/2013-14  
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Tender No. 44/2013-14  
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Tender No. 46/2013-14  
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Tender No. 48/2013-14  
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