



By-Email

Ref.No.: MGM/P&E/ 372/20

Date: 01/12/2020

**To,**  
**The Additional Director,**  
**Ministry of Environment and Forest & Climate Change,**  
**Eastern Region Office,**  
**A/3, Chandrasekharpur,**  
**Bhubaneswar-751023**

**Subject:** Submission of half-yearly compliance report on the stipulated environmental clearance terms and conditions in respect of Joda West Iron and Manganese Mine of M/s TATA Steel Ltd., for the period from October'2019 to March'2020.

**Reference:**

- 1) MoEF Letter Ref No: J-11015/86/2004-IA. II(M) DATED 13<sup>th</sup> Sep 2005.
- 2) MoEF&CC's notification vide S.O-5845 (E), dt. 28<sup>th</sup> Nov 2018.

**Respected Sir,**

We are herewith submitting the six-monthly compliance report on the status of the implementation of the conditions stipulated in environmental clearance awarded to us vide MoEF Letter Ref No: - **J-11015/86/2004-IA. II(M) DATED 13th Sep 2005** in respect of Joda West Iron and Manganese Mine of M/s TATA Steel Ltd. for the period from April'20 to Sep'20 for your kind perusal.

This is in reference to the MoEF&CC's notification vide S.O-5845, dt. 28<sup>th</sup> Nov 2018, the six-monthly compliance report is being submitted only in soft copy mode, shared with your good office at e-mail @ [roez.bsr-mef@nic.in](mailto:roez.bsr-mef@nic.in).

We believe the above submission is in order.

Thanking you,

Yours faithfully,

F: TATA STEEL LTD.

  
Agent & Head  
Manganese Group of Mines  
Ferro Alloys Mineral Division  
Encl: As above.

**Copy To:**

- 1) Zonal Office Kolkata, Central Pollution Control Board, South end Conclave, Block 502, 5th and 6th Floors, 1582 Rajdanga Main Road, Kolkata, West Bengal 700107.
- 2) The Member Secretary, State Pollution Control Board, A/118, Nilakantha Nagar, Bhubaneswar, Odisha-751012.
- 3) The Regional Officer, State Pollution Control Board, Baniapat, DD College Road, Keonjhar, Odisha-758001.

**TATA STEEL LTD.**

Ferro Alloys & Minerals Division, Manganese Group of Mines, At/P.O.: Bichhakundi, Via: Joda,  
Dist: Keonjhar Odisha – 758 034 Tel.: 9238101370, e-mail : mnminesadmin@tatasteel.com  
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Corporate Identity Number L27100MH1907PLC000260 website : www.tatasteel.com



# **Half-Yearly Compliance Report**

**On**

## **Environmental Clearance Conditions**

**(MoEF Letter Ref No: - J-11015/86/2004-IA. II(M) DATED 13.09.2005)**

**Period: April'20 – September'20**

**Submitted By:**

**Joda West Iron & Manganese Mine**

**M/s. Tata Steel Limited**

**At/Po: Joda, Via-Joda**

**District- Keonjhar, Odisha -758034**

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**Compliance to the Environment Clearance Letter No: -11015/86/2004-IA. II(M) DATED 13.09.2005 in respect of Expansion of the Joda West Manganese Mine of M/s Tata Steel Limited for the enhancement of production capacity from 0.45LTPA to 1.80 LTPA, in villages Joda, Bichhakundi, Kamarjoda, Banspani and Bhuyan Roida, Tehsil-Barbil, District-Keonjhar, Odisha.**

**Table. A. Specific Condition:**

Sl. No	Specific Conditions	Compliance Status (Apr'20 to Sep'20)
(i)	Mining shall not be undertaken in areas of forestland within the lease without the necessary approvals / forestry clearance.	<b><u>Complied.</u></b> We have obtained the Forest Clearance vide MoEF's letter no. F.No.8-89/2004-FC, dt.10.08.2007 over an area of 436.678 ha of forest land within Joda West Iron and Mn. Mine. Diversion Proposal for 809.874 ha of forest land has been applied is under process.  Presently, the mining operation and allied activities are confined within the approved diverted area only.
(ii)	Topsoil should be stacked properly with proper slope at earmarked site(s) with adequate measures and should be used for reclamation and rehabilitation of mined out area.	<b><u>Complied.</u></b> No top soil has been generated during the period from April'20 to Sep'20. Topsoil generated during the mining operation shall be subsequently used for the greenbelt development and maintenance activities.
(iii)	OB and other wastes should be stacked at earmarked sites only and should not be kept active for long periods of time.  Plantation should be taken up for soil stabilization along the slopes of the dump and terraced after every 5-6 m of height and overall slope angle shall be maintained not exceeding 28°. Sedimentation pits shall be constructed at the corners of the garland drains.  Retention/toe walls shall be provided at the base of the dumps.	<b><u>Complied.</u></b> Overburden dumps are maintained as per the mining scheme/plan approved by Indian Bureau of Mines.  The dump is terraced at every 10m and overall slope is maintained well within 28° as per approved Scheme of Mining. The dumps are stabilised by means of biological reclamation with the plantation of Vertiber grass on the slopes and native varieties of forestry saplings.  The retaining wall and garland drain with sedimentation pit at corners near toe at low lying area and uplift portion of OB dump has been constructed.
(iv)	Catch drains and siltation ponds of appropriate size should be constructed to arrest silt and sediment flows from soil, OB and mineral dumps. The drains should be regularly desilted and maintained properly. Garland drains (size, gradient & length) and sump capacity should be designed keeping 50% safety margin over and above the peak sudden rainfall and maximum	<b><u>Complied.</u></b> Existing catch drains and garland drains are covering the entire dump slope at bottom part. The run off from garland drains are collected in settling/sedimentation pits. The catch drains and sedimentation pits are periodically de-silted and maintained properly.  Size, gradient and length of the drains are adequate to take care of the peak flow.

Six Monthly EC Compliance Report-Joda West Manganese Mine, M/s Tata Steel Limited for Apr'20 to Sep'20

Sl. No	Specific Conditions	Compliance Status (Apr'20 to Sep'20)
	<p>discharge in the area adjoining the mine site. Sump capacity should also provide adequate retention period to allow proper settling of silt material.</p> <p>Storm water return system should be provided. Storm water should not be allowed to go to the effluent treatment plant during high rainfall/super cyclone period. A separate storm water sump for this purpose should be created.</p>	<p>A series of check dams and settling pits have been provided for arresting the silt in the runoff sludge.</p>
(v)	<p>Dimension of retaining wall at the toe of OB dumps and benches within the mine to check run-off and siltation should be based on the rainfall data.</p>	<p><b><u>Complied.</u></b></p> <p>To prevent the siltation and check the run-off, retaining wall and garland drain are provided with the dimension as follows:  <u>Dimension of the Retaining Wall:</u>                      Height – 1 to 1.2 mtr. Width – 1 mtr.  <u>Dimension of the Garland Drain:</u>                      Depth – 1.20 to 1.5 mtr. Width – 1 to 1.2 mtr.</p> <p>Multi-stage check dams have been constructed in series at H' Quarry to arrest sedimentation/silt prior to its confluence with Kundra Nallah.</p>
(vi)	<p>Trace Metals such as Ni, Co, As and Hg should be analyzed in dust fall and soil samples for at least one year during summer, monsoon and winter seasons. If concentrations of these metals are found below the standards then with prior approval of MOEF this specific monitoring could be discontinued.</p>	<p><b><u>Complied.</u></b></p> <p>Environmental monitoring was ensured till June'20.</p>
(vii)	<p>Mineral and OB transportation shall be done in trucks/dumpers covered with tarpaulins.</p> <p>Vehicular emissions should be kept under control and regularly monitored.</p> <p>Suitable measures should be taken to check fugitive emissions from haulage roads &amp; transfer points, etc.</p>	<p><b>Complied.</b></p> <p>The trucks are being covered with tarpaulin during dispatch of manganese ore from mine to Ferro Alloys Plant and Railway Siding located at Joda. OB is being transported by shovel – dumper combination from mine face to dumps located near the quarry itself within 1.5 Km. So, it is not in practice to cover the OB transportation trucks with tarpaulin.</p> <p>All the trucks meant for transportation of mineral from mine to our captive plant &amp; railway siding at Joda is bearing the "Pollution under Control" certificate. The emissions are under control.</p> <p>Apart from the regular water sprinkling by mobile water tanker, permanent/fixed type water sprinklers have been installed along the haul roads in D-Quarry.</p> <p>Environmental monitoring was ensured till June'20.</p>

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Sl. No	Specific Conditions	Compliance Status (Apr'20 to Sep'20)
(viii)	A green belt of adequate width should be raised by planting the native species around ML area. Plantation should also be carried out along roads, OB dump sites etc. in consultation with the local DFO / Agriculture Department. The density of the trees should be not less than 2500 plants per ha.	<p><b><u>Complied.</u></b></p> <p>Mine reclamation and rehabilitation work is carried out by biodiversity management plan (BMP) of the unit, emphasizing on the plantation of native varieties of forestry species. We have planted around 11.54 lakh nos. of trees over an area around 225.9 ha till 2019-20. at safety zone, OB dump and as avenue plantation. The tree density is maintained at the rate of more than 2500 saplings per ha.</p> <p>During April'20 to Sep'20, only soil conditioning work has been ensured; however, we shall be planting around 15000saplings by the end of FY 2020-21.</p>
(ix)	Groundwater shall not be used for mine operations. Prior approval of CGWA shall be obtained for using groundwater.	<p><b><u>Complied.</u></b></p> <p>We had obtained NOC from CGWA vide NOC No. CGWA/NOC/MIN/ORIG/2018/3888, Dated 09.08.2018 for a quantity of 146 cum/day. The NOC was valid till 31-03-2020; however, Site inspection by the Nodal officer from CGWB, Bhubaneswar has been ensured. Renewed NOC is awaited.</p>
(x)	Mining will not intersect groundwater. Prior permission of the MOEF and CGWA shall be taken to mine below water table.	<p><b><u>Complied.</u></b></p> <p>Mining is not intersecting the ground water as the Ground water table being at lower level in comparison to prevailing pit depth; However, seepage of very low potential is getting evidenced at one point of the D-Quarry. It shall be assessed and regularised in the renewal of NOC from CGWA.</p>
(xi)	Regular monitoring of ground water level and quality should be carried out by establishing a network of existing wells and constructing new piezometers. The monitoring should be done for quantity four times a year in pre-monsoon (April / May), monsoon (August). Post-monsoon (November) and winter (January) seasons and for quality in May. Data thus collected should be submitted to the MoEF & CGWA quarterly.	<p><b><u>Complied.</u></b></p> <p>Ground water level &amp; quality at existing wells (open dug wells/borewells/piezometers) is monitored from time to time.</p> <p>Environmental monitoring was ensured till June'20.</p>
(xii)	Trace metals such as Fe, Cr <sup>+6</sup> , Cu, Se, As, Cd, Hg, Pb, Zn and Mn at specific locations for both surface water downstream and in ground water at lower elevations from mine area, shall be periodically monitored in consultation with the OSPCB and State Ground Water Board. Suitable treatment measures shall be undertaken in case levels are found to be higher than permissible limits.	<p><b><u>Complied.</u></b></p> <p>Environmental monitoring was ensured till June'20.</p>

**Six Monthly EC Compliance Report-Joda West Manganese Mine, M/s Tata Steel Limited for Apr'20 to Sep'20**

<b>Sl. No</b>	<b>Specific Conditions</b>	<b>Compliance Status (Apr'20 to Sep'20)</b>
(xiii)	"Consent to Operate" should be obtained from SPCB before expanding mining activities.	<b><u>Complied.</u></b> Consent to operate has been granted by Odisha State Pollution Control Board, vide letter no. 5095/IND-I-CON-186 dated 25.05.2019 and Consent order no. 67 valid 31.03.2021.
(xiv)	Conservation Plan for conservation of endangered fauna including the Indian Elephant found in and around the mine area shall be prepared and implemented in consultation with identified agencies/institutions and with the State Forest Department. The Plan should be dovetailed with that prepared/under implementation/proposed for the endangered fauna found in the Reserve Forest in the buffer zone of the project site. The costs for the specific activities/tasks should be earmarked in the Conservation Plan and shall not be diverted for any other purpose. Year-wise status of the implementation of the Plan and the expenditure thereon should be reported to the Ministry of Environment & forests, RO, Bhubaneswar.	<b><u>Complied.</u></b> Site Specific Wildlife Management Plan has been approved vide memo no. 7726/1WL-SSP-93/2015 dated 31 <sup>st</sup> Aug 2015. A regional wild life conservation plan has been prepared by the state forest department for Bonai & Keonjhar divisions. Towards the implementation cost, we have deposited the fund as assessed by the divisional forest officer. Details is as follows: 1. Rs. 56,30,000/- dt. 05.07.2006 2. Rs. 2,31,24,380/- dt. 07.09.2011 3. Rs 3,30,67,537- dt. 19.05.2015 Apart from this we have also deposited an amount of Rs. 9,79,48,000/- on 12.12.2017 towards implementation of Site Specific Wild Life Conservation Plan (SSWLCP) prepared and approved by the State Forest Department.
(xv)	A Final Mine Closure Plan along with details of Corpus Fund should be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval.	<b><u>Complied.</u></b> The final mine closure plan along with details of Corpus fund will be submitted to the Ministry of Environment & Forests in advance of final mine closure for approval.

**Table. B General Conditions**

<b>Sl. No</b>	<b>General Condition</b>	<b>Compliance Status (Apr'20 to Sep'20)</b>
<b>i.</b>	No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forests.	<b><u>Complied.</u></b> So far, Mining is carried out as proposed. Any changes in terms of mining technology and scope of working when envisaged, prior approval shall be obtained.
<b>ii.</b>	No change in the calendar plan including excavation, quantum of manganese ore and waste should be made.	<b><u>Complied.</u></b> Production and excavation quantum is regulated by the Mine Plan approved by Indian bureau of Mines (IBM).

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Sl. No	General Condition	Compliance Status (Apr'20 to Sep'20)
iii.	<p>Four ambient air quality-monitoring stations should be established in the core zone as well as in the buffer zone for RPM. SPM, SO<sub>2</sub>, NO<sub>x</sub>. Monitoring. Location of the stations should be decided based on the meteorological data, topographical features, and environmentally and ecologically sensitive targets in consultation with the State Pollution Control Board.</p> <p>Data on ambient air quality (RPM, SPM, SO<sub>2</sub> &amp; NO<sub>x</sub>.) should be regularly submitted to the Ministry including its Regional office at Bhubaneswar and the State Pollution Control Board / Central Pollution Control Board once in six months.</p>	<p><b><u>Complied.</u></b></p> <p>Environmental monitoring was ensured till June'20.</p>
iv.	<p>Drills should be wet operated or with dust extractors and controlled blasting should be practiced.</p>	<p><b><u>Complied.</u></b></p> <p>Wet drilling concept is already in place. Controlled blasting technique with NONEL is in practice.</p>
v.	<p>Fugitive dust emissions from all the sources should be controlled regularly monitored and data recorded properly. Water spraying arrangements on haul roads, wagon loading, dumpers/ trucks, loading &amp; unloading points should be provided and properly maintained.</p>	<p><b><u>Complied.</u></b></p> <p>All the dust prone areas are adequately sprinkled by mobile sprinklers. Additionally, we have also installed fixed-type water sprinklers along haul road at D-Quarry. Environmental monitoring was ensured till June'20.</p>
vi.	<p>Adequate measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in blasting and drilling operations, operations of HEMM, etc should be provided with ear plugs/ muffs.</p>	<p><b><u>Complied.</u></b></p> <p>Ear plugs &amp; Ear muffs are provided to the workers working in mining operation &amp; DG operations.</p> <p>Environmental monitoring was ensured till June'20.</p>
vii.	<p>Industrial waste water (workshop and waste water from the mine) should be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19<sup>th</sup> May 1993 and 31<sup>st</sup> December 1993 or as amended from time to time. Oil and grease trap should be installed before discharge of workshop effluents.</p>	<p><b><u>Complied.</u></b></p> <p>The oil separation system has been provided at workshop and working effectively.</p> <p>Environmental monitoring was ensured till June'20.</p>
viii.	<p>Environmental laboratory should be established with adequate number and type of pollution monitoring and analysis equipment in consultation with the State</p>	<p><b><u>Complied.</u></b></p> <p>Environmental Laboratory has not been established; however entire monitoring</p>

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Sl. No	General Condition	Compliance Status (Apr'20 to Sep'20)
	Pollution Control Board.	services are carried out by engaging a third party recognised by MoEF&CC and/or SPCB. Environmental monitoring was ensured till June'20.
ix.	<p>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.</p> <p>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.</p>	<p style="text-align: center;"><b><u>Complied.</u></b></p> <p>Personnel Protective Equipment's (PPEs) are being mandatorily used by all the workers as per applicability. It is regularly ensured at the entry points. Safe Operating Procedure based training is imparted to all the workers apart from the initial VT training. Periodical Medical Examination of employees (departmental &amp; contractual) are conducted as per prescribed norms of Mines Rule, 1955. The initial and periodical examination includes blood haematology, blood pressure, detailed cardiovascular assessment, neurological examination etc. All chest radiographs are being classified for detection of pneumoconiosis, diagnosis and documentation made in accordance to ILO classifications.</p>
x.	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.	<p style="text-align: center;"><b><u>Complied.</u></b></p> <p>A central environmental management cell has been established, wherein an environmental manager ensures the implementation of environmental management plans/protection measures at the mining site(s) or the units and reports to the Chief environment via Head Environment Management, who directly reports to the Head of the Organisation.</p>
xi.	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.	<p style="text-align: center;"><b><u>Complied.</u></b></p> <p>A dedicated cost centre for maintaining all environmental expenditure.</p>

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Sl. No	General Condition	Compliance Status (Apr'20 to Sep'20)
xii.	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	<b><u>Complied.</u></b> All necessary cooperation is extended to all the Govt officials/authorities during their inspection at our sites.
xiii.	A copy of clearance letter will be marked to the concerned Panchayat/local NGO, if any, from whom suggestion/ representation has been received while processing the proposal.	<b><u>Complied.</u></b> Copy of the clearance letter marked to Chairman, Municipal Council, Joda on 12.01.2006.
xiv.	The State Pollution Control Board should display a copy of the clearance letter at the Regional Office, District Industry Centre and Collector's Office/Tehsildar's Office for 30 days.	This is applicable for the Odisha State Pollution Control Board.
xv.	The project authorities should advertise at least in two local newspapers widely circulated around the project, one of which shall be in the vernacular of the locality concerned within seven 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 may also be seen at Web Site of the Ministry of Environment & 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.	<b><u>Complied.</u></b> A detail of Environmental Clearance with regard to Joda West Manganese Mine was published in Oriya News Papers Dharitri & Sambad 17.10.2005.
xvi.	The Ministry or any other competent authority may stipulate any further condition for environmental protection.	Noted.
xvii.	Failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance.	Noted.
xviii.	The above conditions will be enforced, inter alia, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1991 along with their amendments and rules.	Noted.

**A. Additional Conditions as per MoEFCC Letter No. 106-9/11/EPE dt. 02.12.2014 issued to all Non-Coal Mining Projects.**

Sl. No.	Stipulated Condition	Compliance Status (Apr'20 to Sep'20)
i.	The project authority shall adopt best mining practices for given conditions in the mining area, adequate number of check dam, retaining wall/ structure, garland drains and settling ponds should be provided to arrest the wash off with rain water in catchment area.	<b><u>Complied.</u></b> The best scientific method of mining is in practice at Joda West Iron and Manganese Mine. Garland drain and Retaining wall are provided at the toe of the overburden dumps. Settling ponds are done at intervals along the garland drain. A five-stage check dam has been provided at H Quarry of the mine to arrest the surface run off with rain water.
ii.	The natural water bodies and or stream 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 authority has to provide water to the villagers for their use. A provision for regular monitoring of water table in open dug well.	<b><u>Complied</u></b> The natural water bodies which are flowing around the nearby villages are not disturbed by mining activity. The ground water table is being monitored regularly from the open well and tube well of nearby villages. Drinking water is provided to the villagers through pipe line and overhead tanks.
iii.	The illumination and sound at night at project sites disturb the village in respect of both human and animal population. Consequent sleeping disorder and stress may affect the health in the village located close to mining operation. Habitations have a right to darkness and minimal noise level at night. The Project Proponents must ensure that the biological clock of the village is not disturbed by orienting the floodlights mask way from the village and keeping the noise levels well within prescribed limits for day/ night hours.	<b><u>Complied.</u></b> The operation of the mine is restricted to the day light hours only. Hence, there is no disturbance to the habitats located close to the mining operation.
iv.	The project Authority shall make necessary alternative arrangement, where required, in consultation with state Government to provide alternative areas for livestock grazing. In this case context, the Project Authority should implement the direction of Hon'ble Supreme Court with regard to acquiring grazing land. The sparse tress on such grazing ground, which provides mid-day shelter from the scorching sun, should be scrupulously guarded felling lest the cattle abandon the grazing ground or return home by noon.	Not Applicable since there is no grazing land within the M.L. area.

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Sl. No.	Stipulated Condition	Compliance Status (Apr'20 to Sep'20)
v.	<p>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 building to evaluate the zone of influence and impact of blasting on neighbourhood. Within 500 meters of such sites vulnerable to blasting vibration, avoidance of use of explosives and adoption of alternative means of mineral extraction such as ripper/dozer combination/ rock breakers/ surface mineral etc should be seriously considered and practiced wherever practicable. A provision for monitoring of each blast should be made so that impact of blasting on nearby habitation and dwelling unit could be ascertained. The covenant of lease deed under rule 31 of MCR 1960 provided that no mining operation shall be carried out within 50 meters of public works such as public roads and building or inhabited sites except with prior permission from the competent Authority.</p>	<p><b><u>Complied.</u></b>                      Deep hole drilling and controlled blasting technique has been adopted in the mine. Vibration study has been done with the help of CIMFR and vibration limit (ppv) found within the limit prescribed by DGMS.</p>
vi.	<p>Main haulage road in the mines should be provided with permanent water sprinkler and other road should be regularly wetted water tanker fitted with sprinkler. Crusher and material transfer points should be invariably be provided with bag filter and or dry fogging system. Belt conveyor fully covered to avoid air borne dust.</p>	<p><b><u>Complied.</u></b>                      The main haulage road, mineral stacking area overburden dumping areas are regularly sprinkled with water by using water tankers. A part of the D-Quarry has been covered under the permanent/fixed water sprinkling arrangement.</p>
vii.	<p>The project Authority shall ensure that productivity of agriculture crops is not affected due to the mining operation. Crop Liability Insurance Policy has to be taken by PP as a precaution to compensate for the crop loss. The impact zone shall be 5 Km from the boundary of mine lease area for insurance policy. In case, several mines are located in cluster mines, formed inter - alia, to sub serve such and objective shall be responsibility for securing such Crop Liability Policy.</p>	<p><b><u>Complied.</u></b>                      Not Applicable since there is no crop land affected within the Mine Lease (ML) area or in vicinity to the ML Area.</p>
viii.	<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 also accordingly revised and required</p>	<p>Not Applicable.</p>

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Sl. No.	Stipulated Condition	Compliance Status (Apr'20 to Sep'20)
	stipulation under the MMDR Act 1957 and MCR 1969 met.	
ix.	Transportation of 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 m) for the purpose of transportation of 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 same is proposed to be used for the project. No road movement should be allowed on existing village road network without appropriately increasing carrying capacity of such road	There is no transportation road passing through any village.
x.	Likewise, alteration or re-routing of foot paths, pagdandies, cart road and village infrastructure/ public utilities or roads (for purpose of land acquisition for mining) shall be avoided to extent possible and in such case acquisition is inevitable, alternative arrangements shall be made first and the only the area can be acquired. In these types of cases Inspection reports by site visit by expert may be insisted upon which should be done through reputed Institutes.	Not Applicable
xi.	The CSR activates by companies including mining establishment has become mandatory up to 2% their financial turn over, socio Economic Development of neighborhood. Habitats could also be planned and executed by the PPs more systemically based on need	

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<b>Sl. No.</b>	<b>Stipulated Condition</b>	<b>Compliance Status (Apr'20 to Sep'20)</b>
	<p>based door to door survey by established Social Institute/ Workers on the lines as required under TOR. "R&amp;R Plan// compensation details for 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 SCs and STs and weaker section of society in study, a need based sample survey, family-wise, should be undertaken to assess their requirement, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line department of State Government. It may be clearly brought out whether the village including their R&amp;R and socio-economics aspect should be discussed in EIA report.</p>	<p><b><u>Complied on ongoing basis.</u></b>                      Tata Steel has taken up many social initiatives for the upliftment of the education, health and other socio-economic development of the neighbouring villages. TSRDS (Tata Steel Rural Development Society) has been pioneering the initiatives through CSR activities.                       R&amp;R policy has not been applicable for the Project Proponent (PP) till now.</p>

**Agent & Head,**  
**Manganese Group of Mines**  
 Ferro Alloys Mineral Division  
 (Joda West Iron and Mn.Mine)  
 M/s Tata Steel Limited

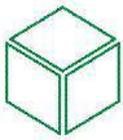
**Date:**

Sl. No.	Stipulated Condition	Compliance Status (Apr'20 to Sep'20)
	<p>based door to door survey by established Social Institute/ Workers on the lines as required under TOR. "R&amp;R Plan// compensation details for 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 SCs and STs and weaker section of society in study, a need based sample survey, family-wise, should be undertaken to assess their requirement, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line department of State Government. It may be clearly brought out whether the village including their R&amp;R and socio-economics aspect should be discussed in EIA report.</p>	<p>Society) has been pioneering the initiatives through CSR activities.</p> <p>R&amp;R policy has not been applicable for the Project Proponent (PP) till now.</p>

*Amit*

**Agent & Head,**  
**Manganese Group of Mines**  
 Ferro Alloys Mineral Division  
 (Joda West Iron and Mn.Mine)  
 M/s Tata Steel Limited

Date: 01/12/2020



# Visiontek Consultancy Services Pvt. Ltd.

(An Enviro Engineering Consulting Cell)



ISO 9001: 2008

ISO 14001: 2015

OHSAS 45001: 2018

Ref: Envlab/20/061

Date: 03.05.2020

## METEOROLOGICAL DATA FOR APRIL-2020

1. Name of The Client : **Joda West Manganese Mines (M/s TATA Steel Ltd)**
2. Location : Mines Office
3. Sample Collected By : VCSPL Representative in presence of TATA Representative

Date	Temperature( <sup>0</sup> C) (Avg.)	Relative Humidity (%) (Avg.)	Wind Speed m/sec		Wind Direction	Rain fall (mm)
			Min	Max		
01-Apr-20	37.4	26.2	49.3	29.3	3.9	0.6
02-Apr-20	38.2	27.4	56.4	25.1	5.0	0.8
03-Apr-20	39.6	26.3	63.0	26.9	4.7	0.6
04-Apr-20	38.7	25.8	69.4	28.1	3.3	1.4
05-Apr-20	37.2	26.3	53.2	26.4	4.4	0.8
06-Apr-20	38.9	27.5	45.7	22.9	4.7	1.1
07-Apr-20	40.1	25.1	48.3	25.5	2.5	1.1
08-Apr-20	37.4	24.3	62.1	38.0	3.6	0.6
09-Apr-20	37.1	25.4	61.6	35.4	2.8	0.8
10-Apr-20	40.2	25.8	50.6	25.2	4.2	0.6
11-Apr-20	39.6	26.1	59.2	31.0	4.4	1.1
12-Apr-20	40.5	26	60.4	26.3	5.8	0.8
13-Apr-20	42.7	25.2	44.7	21.7	4.7	1.1
14-Apr-20	43.5	24.4	54.3	24.2	3.6	1.1
15-Apr-20	40.9	24.8	65.2	34.0	2.8	1.9
16-Apr-20	39.5	25.1	53.6	30.3	3.3	1.1
17-Apr-20	40.2	23.2	67.8	26.5	4.2	2.2
18-Apr-20	41.1	24.7	80.2	25.9	3.6	1.1
19-Apr-20	39.6	23.6	71.3	36.7	7.5	0.8
20-Apr-20	40.5	24.2	67.3	29.2	3.9	1.1
21-Apr-20	38.7	22.8	64.5	25.3	6.1	1.1
22-Apr-20	35.2	23.1	85.1	37.2	5.0	2.2
23-Apr-20	36.2	22.4	91.2	43.2	5.3	2.2
24-Apr-20	32.3	23.6	81.6	46.1	7.5	2.5
25-Apr-20	35.1	24.3	88.7	44.8	5.3	1.4
26-Apr-20	33.9	16.8	87.3	48.3	3.3	1.7
27-Apr-20	37.4	19.3	82.5	39.6	5.0	0.8
28-Apr-20	33.4	22.2	83.0	42.8	4.2	1.1
29-Apr-20	31.5	24.1	82.6	37.3	4.7	0.6
30-Apr-20	34.2	23.3	78.4	41.4	4.7	1.7

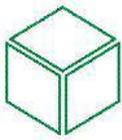
Source: Site Specific Meteorological data & www.worldweatheronline.com

*M. Anand*  
Prepared by



*Puja Mohan*  
Verified by





Ref: Envlab/20/062

Date: 03.05.2020

## AAQ MONITORING REPORT FOR APRIL-2020 (CORE ZONE)

1. Name of Industry : **Joda West Manganese Mines ( M/s TATA Steel Limited)**
2. Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Analyzer, VOC Sampler
3. Sampling Location : **AAQMS-1:Time Office**
4. Sample collected by : VCSPL representative in presence of TATA representative.

Sl. No.	Date of Monitoring	Concentration of Pollutants												
		PM <sub>10</sub> (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>x</sub> (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	NH <sub>3</sub> (µg/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )	As (ng/m <sup>3</sup> )	Benzene (µg/m <sup>3</sup> )	Benzo(a) pyrene (ng/m <sup>3</sup> )	Mn (µg/m <sup>3</sup> )
1	02.04.2020	71.2	42.72	5.8	11.4	7.8	0.52	26.1	<0.001	< 0.01	< 0.001	< 0.001	< 0.002	0.012
2	06.04.2020	66.8	40.08	5.6	11.6	7.2	0.48	24.4	<0.001	< 0.01	< 0.001	< 0.001	< 0.002	0.012
3	09.04.2020	74.2	44.52	5.2	11.8	7.8	0.42	22.6	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	0.011
4	13.04.2020	74.6	44.76	5.6	12.4	8.4	0.44	23.8	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	0.014
5	16.04.2020	68.8	41.28	6.2	12.6	8.6	0.51	24.4	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	0.013
6	20.04.2020	70.8	42.48	6.8	11.4	8.1	0.52	24.2	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	0.01
7	23.04.2020	71.2	42.72	7.2	11.8	7.6	0.46	21.6	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	0.01
8	27.04.2020	68.2	40.92	7.7	12.2	7.4	0.44	21.8	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	0.012
9	30.04.2020	71.2	42.72	7.8	10.8	8.2	0.42	22.8	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	0.011
Average		70.78	42.47	6.43	11.78	7.90	0.47	23.52	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	0.011
Limit as per CPCB notification, New Delhi, 18th Nov, 2009. for Ambient air quality		100	60	80	80	180	4	400	1	20	6	5	1	---
Sampling and Analysis done according to		IS: 5182(Part -23)-1999	USEPA CFR-40,Part-50, Appendix -L	IS: 5182 (Part-2)-2001	IS: 5182 (Part-6)-2006	IS: 5182 (Part-9)-1974	IS 5182 : Part.10-1999	Air Sampling , 3 <sup>rd</sup> Edn.By James P. Lodge (Method-401)	EPA IO-3.2	EPA IO-3.2	APHA 22 <sup>nd</sup> -3114 C	IS 5182 : Part. 11	IS 5182 : Part. 12	EPA IO-3.2

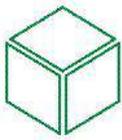
**BDL Values:** SO<sub>2</sub>< 4 µg/m<sup>3</sup>, NO<sub>x</sub>< 9 µg/m<sup>3</sup>, O<sub>3</sub><4 µg/m<sup>3</sup>, NH<sub>3</sub><20 µg/m<sup>3</sup>, Ni<0.01 ng/m<sup>3</sup>, As < 0.001 ng/m<sup>3</sup>, C<sub>6</sub>H<sub>6</sub><0.001 µg/m<sup>3</sup>, BaP<0.002 ng/m<sup>3</sup>, Pb<0.001 µg/m<sup>3</sup>, CO<0.1 mg/m<sup>3</sup>, Mn<0.001 µg/m<sup>3</sup>

*Mande*  
Prepared by



*Puja Mohanty*  
Verified by





Ref: Envlab/20/063

Date: 03.05.2020

## AAQ MONITORING REPORT FOR APRIL-2020 (CORE ZONE)

1. Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)
2. Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Analyzer, VOC Sampler
3. Sampling Location : AAQMS-2:H-Quarry
4. Sample collected by : VCSPL representative in presence of TATA representative.

Sl. No.	Date of Monitoring	Concentration of Pollutants												
		PM <sub>10</sub> (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>x</sub> (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	NH <sub>3</sub> (µg/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )	As (ng/m <sup>3</sup> )	Benzene (µg/m <sup>3</sup> )	Benzo(a) pyrene (ng/m <sup>3</sup> )	Mn (µg/m <sup>3</sup> )
1	02.04.2020	65.8	39.48	8.2	10.8	7.6	0.49	24.8	<0.001	<0.01	<0.001	<0.001	<0.002	<0.001
2	06.04.2020	68.8	41.28	8.4	11.4	7.8	0.46	25.2	<0.001	<0.01	<0.001	<0.001	<0.002	<0.001
3	09.04.2020	66.8	40.08	8.2	11.6	8.4	0.44	25.8	<0.001	<0.01	<0.001	<0.001	<0.002	<0.001
4	13.04.2020	64.6	38.76	7.8	12.2	8.6	0.51	26.6	<0.001	<0.01	<0.001	<0.001	<0.002	<0.001
5	16.04.2020	62.8	37.68	7.6	12.4	9.1	0.52	27.4	<0.001	<0.01	<0.001	<0.001	<0.002	<0.001
6	20.04.2020	66.4	39.84	8.1	11.8	9.2	0.44	27.8	<0.001	<0.01	<0.001	<0.001	<0.002	<0.001
7	23.04.2020	70.2	42.12	8	12.2	8.8	0.46	26.2	<0.001	<0.01	<0.001	<0.001	<0.002	<0.001
8	27.04.2020	63.6	38.16	7.4	12.1	7.6	0.48	25.8	<0.001	<0.01	<0.001	<0.001	<0.002	<0.001
9	30.04.2020	62.4	37.44	7.2	11.2	8.4	0.52	26.1	<0.001	<0.01	<0.001	<0.001	<0.002	<0.001
Average		65.71	39.43	7.88	11.74	8.39	0.48	26.19	<0.001	<0.01	<0.001	<0.001	<0.002	<0.001
Limit as per CPCB notification, New Delhi, 18th Nov, 2009. for Ambient air quality		100	60	80	80	180	4	400	1	20	6	5	1	---
Sampling and Analysis done according to		IS: 5182(Part -23)-1999	USEPA CFR-40,Part-50, Appendix -L	IS: 5182 (Part-2)-2001	IS: 5182 (Part-6)-2006	IS: 5182 (Part-9)-1974	IS 5182 : Part.10-1999	Air Sampling, 3 <sup>rd</sup> Edn. By James P. Lodge (Method-401)	EPA IO-3.2	EPA IO-3.2	APHA 22 <sup>nd</sup> -3114 C	IS 5182 : Part. 11	IS 5182 : Part. 12	EPA IO-3.2

BDL Values: SO<sub>2</sub>< 4 µg/m<sup>3</sup>, NO<sub>x</sub>< 9 µg/m<sup>3</sup>, O<sub>3</sub><4 µg/m<sup>3</sup>, NH<sub>3</sub><20 µg/m<sup>3</sup>, Ni<0.01 ng/m<sup>3</sup>, As < 0.001 ng/m<sup>3</sup>, C<sub>6</sub>H<sub>6</sub><0.001 µg/m<sup>3</sup>, BaP<0.002 ng/m<sup>3</sup>, Pb<0.001 µg/m<sup>3</sup>, CO<0.1 mg/m<sup>3</sup>, Mn<0.001 µg/m<sup>3</sup>

*Manda*

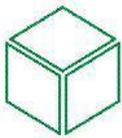
Prepared by



*Puja Mohanty*

Verified by





Ref: Envlab/20/064

Date: 03.05.2020

## AAQ MONITORING REPORT FOR APRIL-2020 (BUFFER ZONE)

1. Name of Industry : **Joda West Manganese Mines ( M/s TATA Steel Limited)**
2. Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Analyzer, VOC Sampler
3. Sample collected by : VCSPL representative in presence of TATA representative.

Date of Monitoring	Concentration of Pollutants												
	PM <sub>10</sub> (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>x</sub> (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	NH <sub>3</sub> (µg/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )	As (ng/m <sup>3</sup> )	Benzene (µg/m <sup>3</sup> )	Benzo(a) pyrene (ng/m <sup>3</sup> )	HC (µg/m <sup>3</sup> )
24.04.2020 BZ1: Khandbandh	57.4	34.44	6.2	12.4	10.6	0.71	<20	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	<0.001
24.04.2020 BZ2: Bounsapani	64.6	38.76	7.1	12.1	11.1	0.94	<20	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	<0.001
25.04.2020 BZ3: Baneikala	71.8	43.08	8.2	11.6	10.8	0.81	<20	< 0.001	< 0.01	< 0.001	< 0.001	< 0.002	<0.001
Limit as per CPCB notification, New Delhi, 18th Nov, 2009. for Ambient air quality	100	60	80	80	180	4	400	1	20	6	5	1	---
Sampling and Analysis done according to	IS: 5182(Part -23)-1999	USEPA CFR- 40,Part- 50, Appendix -L	IS: 5182 (Part- 2)-2001	IS: 5182 (Part- 6)- 2006	IS: 5182 (Part- 9)- 1974	IS 5182 : Part.10- 1999	Air Sampling , 3 <sup>rd</sup> Edn.By James P. Lodge (Method- 401)	EPA IO- 3.2	EPA IO-3.2	APHA 22 <sup>nd</sup> - 3114 C	IS 5182 : Part. 11	IS 5182 : Part. 12	--

BDL Values: SO<sub>2</sub>< 4 µg/m<sup>3</sup>, NO<sub>x</sub>< 9 µg/m<sup>3</sup>, O<sub>3</sub><4 µg/m<sup>3</sup>, NH<sub>3</sub><20 µg/m<sup>3</sup>, Ni<0.01 ng/m<sup>3</sup>, As < 0.001 ng/m<sup>3</sup>, C<sub>6</sub>H<sub>6</sub><0.001 µg/m<sup>3</sup>, BaP<0.002 ng/m<sup>3</sup>, Pb<0.001 µg/m<sup>3</sup>, CO<0.1 mg/m<sup>3</sup>, HC<0.001 µg/m<sup>3</sup>

*M. P. Singh*

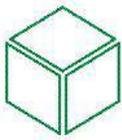
Prepared by



*Pooja Mishra*

Verified by





Ref: Envlab/20/065

Date: 03.05.2020

### DAILY DRINKING WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF APRIL-2020

1. Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)
2. Sampling location : DW-1: Water Treatment Plant
3. Sample collected by : VCSPL Representative in presence of TATA Representative

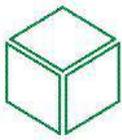
Sl No	Test Parameters	Norms as per IS: 10500-2012		Analysis Results									
		Desirable Limit	Permissible Limit	01-04-20	02-04-20	03-04-20	04-04-20	05-04-20	06-04-20	07-04-20	08-04-20	09-04-20	10-04-20
1	pH value (25°C)	6.5 - 8.5	No Relaxation	7.61	7.58	7.55	7.52	7.51	7.44	7.46	7.42	7.44	7.42
2	Turbidity in NTU	1	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
3	Residual Free Chlorine in mg/l	0.2(Min.)	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sl No	Test Parameters	Norms as per IS: 10500-2012		Analysis Results									
		Desirable Limit	Desirable Limit	11-04-20	12-04-20	13-04-20	14-04-20	15-04-20	16-04-20	17-04-20	18-04-20	19-04-20	20-04-20
1	pH value (25°C)	6.5 - 8.5	6.5 - 8.5	7.38	7.40	7.42	7.44	7.41	7.32	7.36	7.33	7.38	7.42
2	Turbidity in NTU	1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
3	Residual Free Chlorine in mg/l	0.2(Min.)	0.2(Min.)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sl No	Test Parameters	Norms as per IS: 10500-2012		Analysis Results									
		Desirable Limit	Desirable Limit	21-04-20	22-04-20	23-04-20	24-04-20	25-04-20	26-04-20	27-04-20	28-04-20	29-04-20	30-04-20
1	pH value (25°C)	6.5 - 8.5	6.5 - 8.5	7.48	7.51	7.56	7.52	7.52	7.48	7.44	7.42	7.46	7.41
2	Turbidity in NTU	1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
3	Residual Free Chlorine in mg/l	0.2(Min.)	0.2(Min.)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

*M. Anand*  
Prepared by



*Puja Mohanty*  
Verified by





Ref: Envlab/20/066

Date: 03.05.2020

## SURFACE WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF APRIL-20

1. Name of Industry : **Joda West Manganese Mines ( M/s TATA Steel Limited)**
2. Sampling location : **SW-1: Kundra Nallah Enterinh H.Quarry  
SW-2: Kundra Nallah Leaving H.Quarry**
3. Date of Analysis : 13.04.2020 to 18.04.2020
4. Sample collected by : VCSPL Representative in presence of TATA Representative

Sl. No.	Parameter	Testing Methods	Unit	Standards as per IS-2296:1992 Class -'C'	Analysis Results	
					11.04.2020	
					SW-1	SW-2
1	Dissolved Oxygen (minimum)	APHA 2540 C	mg/l	4	6.6	6.8
2	BOD (3) days at 27°C (max)	APHA 5210 B	mg/l	3	< 1.8	< 1.8
3	Total Coli form	APHA 9221 B	MPN/100 ml	5000	190	120
4	pH Value	APHA 4500H <sup>+</sup> B	--	6.0-9.0	7.61	7.66
5	Colour (max)	APHA 2120 B, C	Hazen	300	CL	CL
6	Total Dissolved Solids	APHA 2540 C	mg/l	1500	176	188
7	Copper as Cu (max)	APHA 3111 B,C	mg/l	1.5	<0.02	<0.05
8	Iron as Fe (max)	APHA 3500Fe, B	mg/l	0.5	0.42	0.51
9	Chloride (max)	APHA 4500Cl <sup>-</sup> B	mg/l	600	51.2	54.4
10	Sulphates (SO <sub>4</sub> ) (max)	APHA 4500 SO <sub>4</sub> <sup>2-</sup> E	mg/l	400	5.6	6.2
11	Nitrate as NO <sub>3</sub> (max)	APHA 4500 NO <sub>3</sub> <sup>-</sup> E	mg/l	50	4.2	4.6
12	Fluoride as F (max)	APHA 4500F C	mg/l	1.5	0.018	0.024
13	Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH (max)	APHA 5530 B,D	mg/l	0.005	<0.001	<0.001
14	Cadmium as Cd (max)	APHA 3111 B,C	mg/l	0.01	<0.01	<0.01
15	Selenium as Se (max)	APHA 3114 B	mg/l	0.05	<0.001	<0.001
16	Arsenic as As	APHA 3114 B	mg/l	0.2	<0.004	<0.004
17	Cyanide as CN (max)	APHA 4500 CN <sup>-</sup> C,D	mg/l	0.05	ND	ND
18	Lead as Pb(max)	APHA 3111 B,C	mg/l	0.1	<0.01	<0.01
19	Zinc as Zn(max)	APHA 3111 B,C	mg/l	15	<0.05	<0.05
20	Hexa Chromium as Cr <sup>+6</sup>	APHA 3500Cr B	mg/l	0.05	<0.01	<0.01
21	Anionic Detergents (max)	APHA 5540 C	mg/l	1.0	<0.2	<0.2

M. Anand  
Prepared by



Pooja Mishra  
Verified by





# Visiontek Consultancy Services Pvt. Ltd.

(An Enviro Engineering Consulting Cell)



ISO 9001: 2008

ISO 14001: 2015

OHSAS 45001: 2018

Ref: Envlab/20/067

Date: 03.05.2020

## DOMESTIC EFFLUENT WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF APRIL-2020

1. Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)
2. Sampling Location : STPW-1: STP-Inlet  
STPW-2: STP-Outlet Near Vegetable Garden
3. Date of sampling : 13.04.2020
4. Date of analysis : 14.04.2020 TO 20.04.2020
5. Sample collected by : VCSPL Representative in presence of TATA Representative

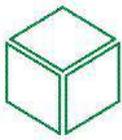
Sl. No.	Parameters	Testing Methods	Unit	Standards (In land Surface water)	Analysis Results	
					STPW-1	STPW-2
1	Colour & Odour	APHA 2120 B, C & APHA 2150 B	Hazen	Colourless/Odourless as far as practicable	<5& pungent smell	<5 & U/O
2	Suspended Solids	APHA 2540 D	mg/l	100	68	44
3	Particulate size of SS	APHA 2540 D		Shall pass 850 micron IS Sieve	< 850	< 850
4	pH Value	APHA 4500H <sup>+</sup> B	--	5.5-9.0	7.16	7.26
5	Temperature	APHA 2550-B	°C	Shall not exceed 5°C above the receiving water temperature	28	28
6	Oil & Grease(max)	APHA 5520 B	mg/l	10	4.6	ND
7	Total Residual Chlorine	APHA 4500Cl, B	mg/l	1	ND	ND
8	Ammonical Nitrogen (as N)	APHA 4500-NH <sub>3</sub> C	mg/l	50	8.6	1.80
9	Total Kjeldahl nitrogen (as NH <sub>3</sub> )	APHA 4500-N <sub>org</sub> C	mg/l	100	23.2	4.8
10	Free ammonia (as NH <sub>3</sub> )	APHA 4500-NH <sub>3</sub> F	mg/l	5	ND	ND
11	BOD(3 days at 27°C (max)	APHA 5210 B	mg/l	30	28	4.6
12	Chemical Oxygen Demand as COD	APHA 5220-C	mg/l	250	176	30
13	Arsenic as As	APHA 3114 B	mg/l	0.2	<0.001	<0.001
14	Mercury (Hg)	APHA 3500 Hg	mg/l	0.01	<0.001	<0.001
15	Lead as Pb(max)	APHA 3111 B, C	mg/l	0.1	<0.01	<0.01
16	Cadmium as Cd (max)	APHA 3111 B, C	mg/l	2	<0.001	<0.001
17	Hexavalent Chromium as Cr <sup>+6</sup>	APHA 3500Cr B	mg/l	0.1	<0.05	<0.05
18	Total Chromium (Cr)	APHA3500-Cr, B	mg/l	2	<0.05	<0.05
19	Copper as Cu (max)	APHA 3111 B, C	mg/l	3	<0.05	<0.05
20	Zinc as Zn(max)	APHA 3111 B, C	mg/l	5	0.72	<0.05
21	Selenium (Se) (max)	APHA 3114 B	mg/l	0.05	<0.001	<0.001
22	Nickel (Ni)	APHA 3500-Ni	mg/l	3	<0.001	<0.001
23	Cyanide as CN (max)	APHA 4500 CN- C,D	mg/l	0.2	ND	ND
24	Fluoride as F (max)	APHA 4500F- C	mg/l	2	0.32	0.086
25	Dissolved Phosphates (P)	APHA4500-P D	mg/l	5	0.56	<0.05
26	Sulphide (S)	APHA 4500-S <sub>2</sub> -D	mg/l	2	< 0.1	< 0.1
27	Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH (max)	APHA 5530 B, D	mg/l	1	<0.001	<0.001
28	Bio-assay test	APHA 8910-C		90% survival of fish after 96 hours in 100% effluent	96% survival of fishes	98% survival of fishes
29	Manganese (Mn)	APHA 3500-Mn, B	mg/l	2	0.054	<0.005
30	Iron as Fe (max)	APHA3500-Fe, B	mg/l	3	3.2	1.8
31	Vanadium (V)	APHA 3500-V	mg/l	0.2	<0.001	<0.001
32	Nitrate Nitrogen	APHA 4500-NO <sub>3</sub> E	mg/l	10	4.8	2.1

Prepared by



Verified by





Ref: Envlab/20/068

Date: 03.05.2020

## FUGITIVE DUST ANALYSIS REPORT FOR THE MONTH OF APRIL-2020

1. Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)  
2. Sample collected by : VCSPL Representative in presence of TATA Representative

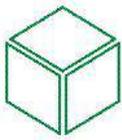
	Sampling Location			Apr-20
L-1	Near Screening Plant	Prescribed Standard	Monitoring Date	22.04.2020
Parameters	Method of Measurement	1200( $\mu\text{g}/\text{m}^3$ )		611
SPM	Gravimetric method			
L-2	Near Stack Yard (D-Quarry)	Prescribed Standard	Monitoring Date	22.04.2020
Parameters	Method of Measurement	1200( $\mu\text{g}/\text{m}^3$ )		526
SPM	Gravimetric method			
L-3	Near Sorting Yard (H-Quarry)	Prescribed Standard	Monitoring Date	22.04.2020
Parameters	Method of Measurement	1200( $\mu\text{g}/\text{m}^3$ )		528.8
SPM	Gravimetric method			
L-4	Near Sorting Yard (D-Quarry)	Prescribed Standard	Monitoring Date	22.04.2020
Parameters	Method of Measurement	1200( $\mu\text{g}/\text{m}^3$ )		534.2
SPM	Gravimetric method			

*M. Panda*  
Prepared by



*Puja Mohanty*  
Verified by





Ref: Envlab/20/069

Date: 03.05.2020

## DRINKING WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF APRIL-2020

1. Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)
2. Sampling location : DW-1: Near Canteen
3. Date of sampling : 07.04.2020
4. Date of analysis : 08.04.2020 TO 14.04.2020
5. Sample collected by : VCSPL Representative in presence of TATA Representative

Sl. No	Parameter	Testing Methods	Unit	Norms as per IS:10500-2012 Amended on 2015 & 2018		Analysis Results
				Desirable Limit	Permissible Limit	DW-1
<b>Microbiological Analysis</b>						
1	Total Coliform Organism MPN/100ml	APHA 9221-B	MPN/100ml	Shall not be detectable in any 100 ml sample		<1.1
2	Fecal Coliforms	APHA9221-E	MPN/100ml	Shall not be detectable in any 100 ml sample		<1.1
3	E. Coli	APHA9221-F	MPN/100ml	Shall not be detectable in any 100 ml sample		Absent
<b>Chemical Analysis</b>						
	Parameter	Testing Methods	Unit	Desirable Limit	Permissible Limit	Analysis Results
1	Colour	APHA 2120 B,	Hazen	5	15	CL
2	Odour	APHA 2150 B	--	Agreeable	Agreeable	Agreeable
3	Taste	APHA 2160 C	--	Agreeable	Agreeable	Agreeable
4	pH value at 25°C	APHA 4500H <sup>+</sup> B	NTU	6.5-8.5	No Relaxation	7.81
5	Turbidity	APHA 2130 B	--	1	5	<1.0
6	Total Dissolved Solids	APHA 2540 C	mg/l	500	2000	90
7	Aluminium (as Al)	APHA 3500Al B	mg/l	0.03	0.2	<0.001
8	Anionic Detergents (as MBAS)	APHA 5540 C	mg/l	0.2	1	0.26
9	Boron (as B)	APHA 4500B, B	mg/l	0.5	2.4	<0.01
10	Calcium (as Ca)	APHA 3500Ca B	mg/l	75	200	38
11	Chloride (as Cl)	APHA 4500Cl <sup>-</sup> B	mg/l	250	1000	51.2
12	Copper (as Cu)	APHA 3111 B	mg/l	0.05	1.5	<0.05
13	Fluoride (as F <sup>-</sup> )	APHA 4500F- D	mg/l	0.05	1.5	<0.01
14	Residual Free Chlorine	APHA 4500Cl <sup>-</sup> B	mg/l	0.2	1	ND
15	Iron (as Fe)	APHA 3500Fe, B	mg/l	1.0	No Relaxation	0.34
16	Magnesium (as Mg)	APHA 3500Mg B	mg/l	30	100	20.6
17	Manganese (as Mn)	APHA 3500Mn B	mg/l	0.1	0.3	<0.005
18	Mineral Oil	APHA 5220 B	mg/l	0.5	No Relaxation	<0.01
19	Nitrate (as NO <sub>3</sub> )	APHA 4500 NO3- E	mg/l	45	No Relaxation	0.84
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	APHA 5530 B,D	mg/l	0.001	0.002	<0.001
21	Selenium (as Se)	APHA 3114 B	mg/l	0.01	No Relaxation	<0.001
22	Sulphate (as SO <sub>4</sub> )	APHA 4500 SO42- E	mg/l	200	400	5.6
23	Alkalinity (as CaCO <sub>3</sub> )	APHA 2320 B	mg/l	200	600	51.2
24	Total Hardness(as CaCO <sub>3</sub> )	APHA 2340 C	mg/l	200	600	60.2
25	Cadmium (as Cd)	APHA 3111 B,C	mg/l	0.003	No Relaxation	<0.001
26	Cyanide (as CN)	APHA 4500 CN- C,D	mg/l	0.05	No Relaxation	ND
27	Lead (as Pb)	APHA 3111 B,C	mg/l	0.01	No Relaxation	<0.01
28	Mercury (as Hg)	APHA 3500 Hg B	mg/l	0.001	No Relaxation	<0.001
29	Arsenic (as As)	APHA 3114 B	mg/l	0.01	0.05	<0.001
30	Zinc (as Zn)	APHA 3111 B,C	mg/l	5	15	<0.05
31	Chromium (as Cr+6)	APHA 3500Cr B	mg/l	--	--	<0.05
32	Poly Aromatic Hydrocarbon as PAH	APHA 6440 B	µg/l	0.0001	No Relaxation	<0.0001
33	Pesticide	APHA 6630 B,C	mg/l	--	No Relaxation	Absent

*Mande*

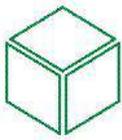


Prepared by

*Puja Mohanty*



Verified by



Ref: Envlab/20/070

Date: 03.05.2020

## OIL SEPRATION PIT WATER QUAITY ANALYSIS REPORT-APRIL-2020

1. Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)  
 2. Sampling Location : WW-1: Workshop Water  
 3. Date of sampling : 17.04.2020  
 4. Date of analysis : 18.04.2020 to 23.04.2020  
 5. Sample collected by : VCSPL Representative in presence of TATA Representative

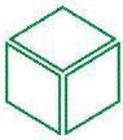
Sl.	Parameters	Unit	Testing Method	General Standards for discharge of Environmental Pollutants Part A- Effluents	Analysis Report
1	Colour	Hazen	APHA 2120 B,C	5	CL
2	Odour	-	APHA 2150 B	Unobjectionable	U/O
3	pH at 25 degree C	-	APHA 4500 H <sup>+</sup> B	5.5-9.0	7.32
4	Total Dissolved Solids	mg/l	APHA 2540 C	-	142
5	Copper as Cu	mg/l	APHA 3111 B,C	3.0	<0.02
6	Fluoride as F	mg/l	APHA 4500 F <sup>-</sup> C	2.0	0.036
7	Total Residual Chlorine	mg/l	APHA 4500 Cl <sub>2</sub> b	1.0	ND
8	Iron as Fe	mg/l	APHA 3500 Fe B	3.0	0.68
9	Manganese as Mn	mg/l	APHA 3500 Mn B	2.0	1.16
10	Nitrate as NO <sub>3</sub>	mg/l	APHA 4500 NO <sub>3</sub> E	10.0	4.2
11	Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH	mg/l	APHA 5530 B,D	1.0	<0.05
12	Selenium as Se	mg/l	APHA 3114 B	0.05	<0.001
13	Cadmium as Cd	mg/l	APHA 3111 B,C	2.0	<0.001
14	Cyanide as CN	mg/l	APHA 4500 CN <sup>-</sup> C,D	0.2	ND
15	Lead as Pb	mg/l	APHA 3111 B,C	0.1	<0.01
16	Mercury as Hg	mg/l	APHA 3500 Hg	0.01	<0.001
17	Nickel as Ni	mg/l	APHA 3500 Ni	3.0	<0.05
18	Arsenic as As	mg/l	APHA 3114 B	0.2	<0.004
19	Total Chromium as Cr	mg/l	APHA 3500 Cr B	2.0	<0.05
20	Zinc as Zn	mg/l	APHA 3111 B,C	5.0	<0.05
21	Hexavalent Chromium as Cr <sup>+6</sup>	mg/l	APHA 3500 Cr B	0.1	<0.01
22	Vanadium as V	mg/l	APHA 3500 V	0.2	<0.001
23	Total Suspended Solids	mg/l	APHA 2540 D	100	46
24	Temperature	°C	APHA 2550 B	shall not exceed 50C above the receiving water temperature	32
25	Dissolved Oxygen	mg/l	APHA 2540 C	-	6.8
26	BOD	mg/l	APHA 5210 B	30	<1.8
27	COD	mg/l	APHA 5220 C	250	21.2
28	Oil & Grease	mg/l	APHA 5520 B	10	ND
29	Ammonical Nitrogen as N	mg/l	APHA 4500 NH <sub>3</sub> C	50	ND
30	Total Kjeldahl Nitrogen as N	mg/l	APHA 4500 N <sub>ORG</sub> C	100	4.6
31	Sulphide as S	mg/l	APHA 4500 S <sub>2</sub> D	2.0	ND
32	Free Ammonia as NH <sub>3</sub>	mg/l	APHA 4500 NH <sub>3</sub> F	5.0	ND
33	Particulate Size of Suspended Solids	mg/l	APHA 2540 D	850 µm	Passes through 850 mm IS Sieve
34	Bio-assay	mg/l	APHA 8910 C	90% survival in 100% effluent	98% survival in 100% effluent
35	Dissolved Phosphates as PO <sub>4</sub>	mg/l	APHA 4500 P D	5.0	<0.05

Prepared by *Pamela*



Verified by *Pooja Mishra*





Ref: Envlab/20/071

Date: 03.05.2020

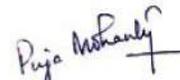
## AMBIENT NOISE MONITORING REPORT FOR APRIL-2020

1. Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)
2. Monitored by : VCSPL Representative in presence of TATA Representative

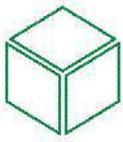
Sl. No	Monitoring Date	Name of Location	Unit	Day time Equivalent	Standard As per CPCB	Night time Equivalent	Standard As per CPCB
				Result		Result	
1	20.04.2020	Town ship	dB (A)	66.6	75	58.8	70
2		Hospital		42.6	50	34.8	40
3		Mines Area		60.8	75	57.4	70
4		Railway Sliding		67.4	75	55.8	70

  
Prepared by



  
Verified by





Ref: Envlab/20/072

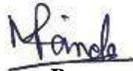
Date: 03.05.2020

## PERSONAL DUST SAMPLING ANALYSIS REPORT FOR THE MONTH OF APRIL-2020

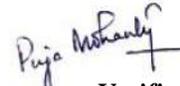
Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)

Sample collected by : VCSPL representative in presence of TATA representative.

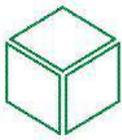
Sl.No	Date of sampling	Name of the Person	Personal Number	Standard	Particulate matter as PM (mg/m <sup>3</sup> )
1	21.04.2020	Suresh Naik	TSP/801522/0919	5 mg/m <sup>3</sup>	4.6
2		Kumari Patra	TSP/801276/0919		4.2
3		Laxmi Munda	TSP/775944/0819		4.1
4		Jema Patra	TSP/775945/0819		4.6
5		Rajesh Patra	TSP/785783/0819		4.8
6		Sitara Hessa	TSP/770136/0819		4.2
7		Ajay Das	TSP/770126/0819		4.2
8		Sarjen Kulei	TSP/770178/0819		4.1

  
Prepared by



  
Verified by





Ref: Envlab/20/073

Date: 03.05.2020

## GROUND WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF APRIL-20

1. Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)
2. Sampling location : **GW-1: Premabasti BW**  
**GW-2: Kamar Joda OW**
3. Date of sampling : 09.04.2020
4. Date of analysis : 10.04.2020 TO 15.04.2020
5. Sample collected by : VCSPL Representative in presence of TATA Representative

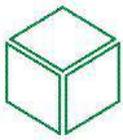
Sl. No	Parameter	Testing Methods	Unit	Standard as Per IS 10500:2012	Analysis Results	
					GW-1	GW-2
1	Color	APHA 2120 B, C	Hazen	5	CL	CL
2	Odour	APHA 2150 B	--	Agreeable	Agreeable	Agreeable
3	Taste	APHA 2160 C	--	Agreeable	Agreeable	Agreeable
4	Turbidity	APHA 2130 B	NTU	1	1.2	1.4
5	pH Value	APHA 4500H+ B	--	6.5-8.5	7.51	7.48
6	Total Hardness (as CaCO <sub>3</sub> )	APHA 2540 C	mg/l	300	112.0	118.0
7	Iron (as Fe)	APHA 3500Al B	mg/l	0.3	0.22	0.31
8	Chloride (as Cl <sup>-</sup> )	APHA 5540 C	mg/l	250	50.0	42.0
9	Residual, free Chlorine	APHA 4500B, B	mg/l	0.2	ND	ND
10	Dissolved Solids	APHA 3500Ca B	mg/l	500	164.0	150.0
11	Calcium (as Ca)	APHA 4500Cl- B	mg/l	75	32.0	28.0
12	Magnesium (as Mg)	APHA 3111 B,C	mg/l	30	14.8	14.0
13	Copper (as Cu)	APHA 4500F- C	mg/l	0.05	<0.02	<0.02
14	Manganese (as Mn)	APHA 4500Cl, B	mg/l	0.1	0.02	0.022
15	Sulphate (as SO <sub>4</sub> )	APHA 3500Fe, B	mg/l	200	6.8	6.2
16	Nitrate (as NO <sub>3</sub> )	APHA 3500Mg B	mg/l	45	4.2	4.4
17	Fluoride (as F)	APHA 3500Mn B	mg/l	1	0.036	0.041
18	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	APHA 5220 B	mg/l	0.001	<0.001	<0.001
19	Mercury (as Hg)	APHA 4500 NO <sub>3</sub> E	mg/l	0.001	<0.002	<0.002
20	Cadmium (as Cd)	APHA 5530 B,D	mg/l	0.003	<0.01	<0.01
21	Selenium (as Se)	APHA 3114 B	mg/l	0.01	<0.001	<0.001
22	Arsenic (as As)	APHA 4500 SO <sub>4</sub> <sup>2-</sup> E	mg/l	0.01	<0.004	<0.004
23	Cyanide (as CN)	APHA 2320 B	mg/l	0.05	<0.01	<0.01
24	Lead (as Pb)	APHA 2340 C	mg/l	0.01	<0.01	<0.01
25	Zinc (as Zn)	APHA 3111 B,C	mg/l	5	3.2	2.8
26	Anionic Detergents (as MBAS)	APHA 4500 CN- C,D	mg/l	0.2	<0.2	<0.2
27	Chromium (as Cr <sup>+6</sup> )	APHA 3111 B,C	mg/l		<0.01	<0.01
28	Mineral Oil	APHA 3500 Hg	mg/l	0.01	<0.01	<0.01
29	Alkalinity	APHA 3114 B	mg/l	200	68.0	72.0
30	Aluminium as( Al)	APHA 3111 B,C	mg/l	0.03	<1.0	<1.0
31	Boron (as B)	APHA 3500Cr B	mg/l	0.5	<0.1	<0.1
32	Poly Aromatic Hydrocarbon (as PAH)	APHA 6440 B	µg/l	<0.0001	<0.0001	<0.0001
33	Pesticide	APHA 6630 B,C	mg/l	Absent	Absent	Absent

*M. Panda*  
Prepared by



*Puja Mohanty*  
Verified by





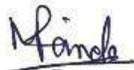
Ref: Envlab/20/074

Date: 03.05.2020

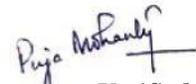
## GROUND WATER LEVEL ANALYSIS REPORT FOR THE MONTH OF APRIL-20

1. Name of Industry : **Joda West Manganese Mines ( M/s TATA Steel Limited)**
2. Sampling location : **GWL-1: Kamar joda OW**  
**GWL-2: Banaikala OW**
3. Date of sampling : 09.04.2020
4. Sample collected by : VCSPL Representative in presence of TATA Representative

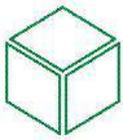
SL.NO	Monitoring Date	Analysis Result (mt/bgl)
1	Kamar Joda OW	5.6
2	Banaikala OW	5.2

  
Prepared by



  
Verified by





Ref: Envlab/20/075

Date: 03.05.2020

## GROUND WATER TRACE METALS ANALYSIS REPORT FOR THE MONTH OF APRIL-20

1. Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)
2. Date of sampling : 16.04.2020
3. Sample collected by : VCSPL Representative in presence of TATA Representative

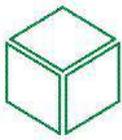
Sl. No	Parameter	Testing Methods	Unit	Standard as per IS - 10500:2012 Amended on 2015 & 2018	Analysis Results	
					GW-1: Pramabasti	GW-2: Kamar Joda OW
1	Iron (as Fe)	APHA 3500Fe, B	mg/l	1	0.26	0.24
2	Copper (as Cu)	APHA 3111 B,C	mg/l	0.05	< 0.05	<0.05
3	Manganese (as Mn)	APHA 3500Mn B	mg/l	0.1	0.016	0.018
4	Chromium (as Cr <sup>+6</sup> )	APHA 3500Cr B	mg/l		< 0.05	< 0.05
5	Mercury (as Hg)	APHA 3500 Hg	mg/l	0.001	< 0.001	< 0.001
6	Cadmium (as Cd)	APHA 3111 B,C	mg/l	0.003	< 0.01	< 0.01
7	Selenium (as Se)	APHA 3114 B	mg/l	0.01	< 0.001	< 0.001
8	Arsenic (as As)	APHA 3114 B	mg/l	0.01	< 0.001	< 0.001
9	Lead (as Pb)	APHA 3111 B,C	mg/l	0.01	< 0.01	< 0.01
10	Zinc (as Zn)	APHA 3111 B,C	mg/l	5	3.2	3.4

*Manch*  
Prepared by



*Puja Mohanty*  
Verified by





# Visiontek Consultancy Services Pvt. Ltd.

(An Enviro Engineering Consulting Cell)



ISO 9001: 2008

ISO 14001: 2015

OHSAS 45001: 2018

Ref: Envlab/20/076

Date: 03.05.2020

## QUARRY WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF APRIL-2020

1. Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)
2. Sampling location : QW-1:D-Quarry
3. Sampling Date : 13.04.2020
4. Date of Analysis : 14.04.2020 TO 20.04.2020
5. Sample collected by : VCSPL Representative in presence of TATA Representative

Sl.No.	Parameters	Unit	Testing Methods	General Standards for discharge of Environmental Pollutants Part A- Effluents	Analysis Report
1	Colour	Hazen	APHA 2120 B, C	5	CL
2	Odour	--	APHA 2150 B	Unobjectionable	U/O
3	pH at 25°C	--	APHA 4500H <sup>+</sup> B -	5.5-9.0	7.56
4	Total Dissolved Solids	mg/l	APHA 2540 C	-	128
5	Copper as Cu	mg/l	APHA 3111 B,C	3.0	<0.05
6	Fluoride as F	mg/l	APHA 4500F C	2.0	0.026
7	Total Residual Chlorine	mg/l	APHA 4500Cl, B	1.0	ND
8	Iron as Fe	mg/l	APHA 3500Fe, B	3.0	0.66
9	Manganese as Mn	mg/l	APHA 3500Mn B	2.0	0.078
10	Nitrate as NO <sub>3</sub>	mg/l	APHA 4500 NO <sub>3</sub> <sup>-</sup> E	10.0	3.2
11	Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH	mg/l	APHA 5530 B,D	1.0	<0.001
12	Selenium as Se	mg/l	APHA 3114 B	0.05	<0.001
13	Cadmium as Cd	mg/l	APHA 3111 B,C	2.0	<0.001
14	Cyanide as CN	mg/l	APHA 4500 CN <sup>-</sup> C,D	0.2	ND
15	Lead as Pb	mg/l	APHA 3111 B,C	0.1	<0.01
16	Mercury as Hg	mg/l	APHA 3500 Hg	0.01	<0.001
17	Nickel as Ni	mg/l	APHA 3500-Ni	3.0	<0.001
18	Arsenic as As	mg/l	APHA 3114 B	0.2	<0.001
19	Total Chromium as Cr	mg/l	APHA 3500Cr B	2.0	<0.05
20	Zinc as Zn	mg/l	APHA 3111 B,C	5.0	<0.05
21	Hexavalent Chromium as Cr <sup>+6</sup>	mg/l	APHA 3500Cr B	0.1	<0.05
22	Vanadium as V	mg/l	APHA 3500-V	0.2	<0.001
23	Total Suspended Solids	mg/l	APHA 2540 D	100	66
24	Temperature	°C	APHA 2550-B	shall not exceed 5°C above the receiving water temperature	32
25	Dissolved Oxygen	mg/l	APHA 2540 C	-	6.6
26	Biochemical Oxygen Demand as BOD	mg/l	APHA 5210 B	30	<1.8
27	Chemical Oxygen Demand as COD	mg/l	APHA 5220-C	250	15.2
28	Oil & Grease	mg/l	APHA 5520 B	10	ND
29	Ammonical Nitrogen as N	mg/l	APHA 4500-NH <sub>3</sub> ,C	50	ND
30	Total Kjeldahl Nitrogen as N	mg/l	APHA 4500-Norg C	100	3.2
31	Sulphide as S	mg/l	APHA 4500-S <sub>2</sub> -D	2.0	ND
32	Free Ammonia as NH <sub>3</sub>	mg/l	APHA 4500-NH <sub>3</sub> ,F	5.0	ND
33	Particulate Size of Suspended Solids	mg/l	APHA 2540 D	850 µm IS Sieve	Passes through 850 mm IS Sieve
34	Bio-assay	mg/l	APHA 8910-C	90% survival in 100% effluent	All fishes survive in 100% effluent after 96 hrs
35	Dissolved Phosphates as PO <sub>4</sub>	mg/l	APHA4500-P D	5.0	<0.05

*M. Anand*

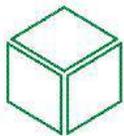
Prepared by



*Puja Mohanty*

Verified by





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ISO 9001 : 2008  
ISO 14001: 2015

OHSAS 45001: 2018

Ref: Envlab/20/077

Date: 03.05.2020

## QUARRY WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF APRIL-2020

1. Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)
2. Sampling location : QW-2:H-Quarry
3. Sampling Date : 13.04.2020
4. Date of Analysis : 14.04.2020 TO 20.04.2020
5. Sample collected by : VCSPL Representative in presence of TATA Representative

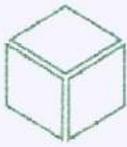
Sl.No.	Parameters	Unit	Testing Methods	General Standards for discharge of Environmental Pollutants Part A- Effluents	Analysis Report
1	Colour	Hazen	APHA 2120 B, C	5	CL
2	Odour	--	APHA 2150 B	Unobjectionable	U/O
3	pH at 25°C	--	APHA 4500H <sup>+</sup> B -	5.5-9.0	7.84
4	Total Dissolved Solids	mg/l	APHA 2540 C	-	124
5	Copper as Cu	mg/l	APHA 3111 B,C	3.0	<0.05
6	Fluoride as F	mg/l	APHA 4500F C	2.0	0.061
7	Total Residual Chlorine	mg/l	APHA 4500Cl, B	1.0	ND
8	Iron as Fe	mg/l	APHA 3500Fe, B	3.0	0.74
9	Manganese as Mn	mg/l	APHA 3500Mn B	2.0	2.4
10	Nitrate as NO <sub>3</sub>	mg/l	APHA 4500 NO <sub>3</sub> <sup>-</sup> E	10.0	1.8
11	Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH	mg/l	APHA 5530 B,D	1.0	<0.001
12	Selenium as Se	mg/l	APHA 3114 B	0.05	<0.001
13	Cadmium as Cd	mg/l	APHA 3111 B,C	2.0	<0.001
14	Cyanide as CN	mg/l	APHA 4500 CN <sup>-</sup> C,D	0.2	ND
15	Lead as Pb	mg/l	APHA 3111 B,C	0.1	<0.01
16	Mercury as Hg	mg/l	APHA 3500 Hg	0.01	<0.001
17	Nickel as Ni	mg/l	APHA 3500-Ni	3.0	<0.001
18	Arsenic as As	mg/l	APHA 3114 B	0.2	<0.001
19	Total Chromium as Cr	mg/l	APHA 3500Cr B	2.0	<0.05
20	Zinc as Zn	mg/l	APHA 3111 B,C	5.0	<0.05
21	Hexavalent Chromium as Cr <sup>6+</sup>	mg/l	APHA 3500Cr B	0.1	<0.05
22	Vanadium as V	mg/l	APHA 3500-V	0.2	<0.001
23	Total Suspended Solids	mg/l	APHA 2540 D	100	80
24	Temperature	°C	APHA 2550-B	shall not exceed 5°C above the receiving water temperature	32
25	Dissolved Oxygen	mg/l	APHA 2540 C	-	7.1
26	Biochemical Oxygen Demand as BOD	mg/l	APHA 5210 B	30	<1.8
27	Chemical Oxygen Demand as COD	mg/l	APHA 5220-C	250	30
28	Oil & Grease	mg/l	APHA 5520 B	10	ND
29	Ammonical Nitrogen as N	mg/l	APHA 4500-NH <sub>3</sub> ,C	50	ND
30	Total Kjeldahl Nitrogen as N	mg/l	APHA 4500-Norg C	100	0.91
31	Sulphide as S	mg/l	APHA 4500-S <sub>2</sub> -D	2.0	ND
32	Free Ammonia as NH <sub>3</sub>	mg/l	APHA 4500-NH <sub>3</sub> ,F	5.0	ND
33	Particulate Size of Suspended Solids	mg/l	APHA 2540 D	850 µm IS Sieve	Passes through 850 mm IS Sieve
34	Bio-assay	mg/l	APHA 8910-C	90% survival in 100% effluent	All fishes survive in 100% effluent after 96 hrs
35	Dissolved Phosphates as PO <sub>4</sub>	mg/l	APHA4500-P D	5.0	<0.05

*M. Anand*  
Prepared by



*Puja Anand*  
Verified by





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ISO 9001: 2008

ISO 14001: 2015

OHSAS 45001: 2018

Ref: EnvLab/20/R-0518

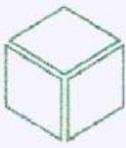
Date: 01/06/2020

## METEOROLOGICAL DATA FOR MAY-20

1. Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)  
 2. Sampling Location : Mines Office  
 3. Sample collected by : VCSPL representative in presence of TATA representative.

Date	Temperature(°C)		Relative Humidity (%)		Wind Speed m/sec		Wind Direction	Rain fall (mm)
	Max	Min	Max	Min	Max	Min		
1-May-20	35.2	24.5	94.7	31.2	3.6	1.9	SSE	0.9
2-May-20	34.3	27.9	83.6	34.5	5	1.9	SES	0.1
3-May-20	36.1	24.1	91.2	25.9	5.8	2.5	SSE	0
4-May-20	34.2	21.3	90.5	59.8	4.2	2.8	SSE	6.6
5-May-20	37.4	21.6	89.4	34.6	3.6	2.2	SSE	0.2
6-May-20	35.2	26.4	87.3	42.1	3.9	2.5	SE	0.1
7-May-20	38.9	27.2	78.2	28.7	4.2	0.8	WSW	0
8-May-20	39.2	27.3	82.1	25.8	3.3	1.4	SSE	0
9-May-20	38.3	28.2	70.4	31.2	3.3	1.9	SE	0
10-May-20	38.7	27.4	78.9	23.8	6.6	1.1	SE	0
11-May-20	37.6	26.1	73.2	33.4	5.3	1.9	SSW	0
12-May-20	39.8	29.4	65.4	31.9	4.2	1.1	SSE	0
13-May-20	36.5	26.5	63.2	26.5	4.2	2.5	SSE	0
14-May-20	39.4	27.1	62.9	21.9	3.9	2.5	SW	0
15-May-20	40.7	25.3	60.4	24.7	4.2	2.5	SW	0
16-May-20	38.6	25.2	87.6	30.2	3.3	2.2	SSW	0.3
17-May-20	41.5	27.9	85.4	22.6	3.6	1.1	S	0
18-May-20	39.8	25.1	90.2	24.1	7.5	1.4	SSE	0
19-May-20	27.5	23.5	78.3	37.8	5.5	2.2	S	0
20-May-20	23.3	19.6	85.6	41.4	14.1	4.7	SSE	27.3
21-May-20	32.6	21.2	78.2	37.4	4.7	2.8	E	0.1
22-May-20	38.7	25.7	84.3	28.2	3.9	2.8	NNE	0
23-May-20	40.1	25.3	92.3	23.1	4.4	3	WNW	0
24-May-20	39.1	26.4	90.6	29.6	6.1	3.6	SSW	0
25-May-20	38.7	24.8	89.6	25.4	4.7	3.3	SSE	0
26-May-20	40.2	25.2	85.7	47.3	5.3	2.7	SSE	0
27-May-20	40.6	26.2	84.3	40.6	3.9	3.3	SW	0.1
28-May-20	35.2	27.1	77.5	33.5	5	2.5	SW	0.8
29-May-20	37.9	25.8	79.4	36.9	4.7	2.7	S	2
30-May-20	38.5	24.3	90.1	32.1	4.2	2.5	SSE	1.5
31-May-20	35.2	24.5	94.7	31.2	3.6	1.9	SSE	0.9





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ISO 9001 : 2008  
ISO 14001: 2015  
OHSAS 45001: 2018

Ref: EnvLab/20/R-0519

## AMBIENT AIR QUALITY MONITORING REPORT FOR MAY-2020 (CORE ZONE)

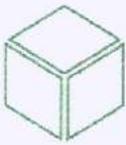
- Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)
- Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Analyzer, VOC Sampler
- Sampling Location : AAQMS-1: Time Office
- Sample collected by : VCSPL representative in presence of TATA representative.

Date	PARAMETERS													Mn ( $\mu\text{g}/\text{m}^3$ )
	PM <sub>10</sub> ( $\mu\text{g}/\text{m}^3$ )	PM <sub>2.5</sub> ( $\mu\text{g}/\text{m}^3$ )	SO <sub>2</sub> ( $\mu\text{g}/\text{m}^3$ )	NOx ( $\mu\text{g}/\text{m}^3$ )	O <sub>3</sub> ( $\mu\text{g}/\text{m}^3$ )	CO ( $\text{mg}/\text{m}^3$ )	NH <sub>3</sub> ( $\mu\text{g}/\text{m}^3$ )	Pb ( $\mu\text{g}/\text{m}^3$ )	Ni ( $\text{ng}/\text{m}^3$ )	As ( $\text{ng}/\text{m}^3$ )	C <sub>6</sub> H <sub>6</sub> ( $\mu\text{g}/\text{m}^3$ )	BaP ( $\text{ng}/\text{m}^3$ )		
01.05.2020	64.6	38.8	6.6	12.4	7.4	0.42	23.8	BDL	BDL	BDL	BDL	BDL	BDL	0.011
05.05.2020	66.8	40.1	6.2	13.6	7.6	0.44	24.6	BDL	BDL	BDL	BDL	BDL	BDL	0.012
08.05.2020	70.2	42.1	6.4	12.4	8.1	0.46	24.8	BDL	BDL	BDL	BDL	BDL	BDL	0.01
12.05.2020	70.8	42.5	6.8	13.2	8.4	0.48	25.2	BDL	BDL	BDL	BDL	BDL	BDL	0.011
15.05.2020	62.8	37.7	7.1	12.6	8.2	0.52	24.6	BDL	BDL	BDL	BDL	BDL	BDL	0.011
19.05.2020	64.6	38.8	7.2	12.2	8.4	0.51	22.8	BDL	BDL	BDL	BDL	BDL	BDL	0.013
22.05.2020	71.2	42.7	6.9	12.1	7.8	0.44	23.2	BDL	BDL	BDL	BDL	BDL	BDL	0.014
26.05.2020	68.2	40.9	7.4	13.4	7.6	0.48	23.8	BDL	BDL	BDL	BDL	BDL	BDL	0.015
29.05.2020	66.4	39.8	7.3	13.8	8.1	0.46	24.2	BDL	BDL	BDL	BDL	BDL	BDL	0.013
Average	66.4	39.8	7.3	13.8	8.1	0.46	24.2	BDL	BDL	BDL	BDL	BDL	BDL	0.013
Limit as per CPCB notification, New Delhi, 18th Nov, 2009, for Ambient air quality	100	60	80	80	180	4	400	1	20	6	5	1	—	
Sampling and Analysis done according to	IS: 5182(Part -23)-2009	USEPA CFR- 40,Part-50, Appendix- L	IS: 5182 (Part-2)- 2001	IS: 5182 (Part-6)- 2006	IS: 5182 (Part-9)- 2074	IS 5182 : Part-10- 2099	Air Sampling, 3rd Edn. By James P. Lodge (Method- 401)	EPA IO- 3.2	EPA IO- 3.2	APHA 22nd-3114 C	IS 5182 : Part. II	IS 5182 : Part. 12	EPA IO- 3.2	

Date: 01/06/2020

BDL Values: SO<sub>2</sub> < 4  $\mu\text{g}/\text{m}^3$ , NO<sub>x</sub> < 9  $\mu\text{g}/\text{m}^3$ , NH<sub>3</sub> < 20  $\mu\text{g}/\text{m}^3$ , O<sub>3</sub> < 4  $\mu\text{g}/\text{m}^3$ , CO < 0.1  $\text{mg}/\text{m}^3$ , Mn < 0.001  $\mu\text{g}/\text{m}^3$ , As < 0.001  $\text{ng}/\text{m}^3$ , Ni < 0.001  $\text{ng}/\text{m}^3$ , Pb < 0.001  $\mu\text{g}/\text{m}^3$ , C<sub>6</sub>H<sub>6</sub> < 0.001  $\mu\text{g}/\text{m}^3$ , BaP < 0.001  $\text{ng}/\text{m}^3$ .





Ref:

EnvLab/2019-0520

## AMBIENT AIR QUALITY MONITORING REPORT FOR MAY-2020 (CORE ZONE)

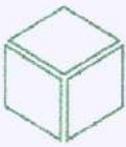
- Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)
- Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Analyzer, VOC Sampler
- Sampling Location : AAQMS-2:H.Quarry
- Sample collected by : VCSPL representative in presence of TATA representative.

Date	PARAMETERS											Mn ( $\mu\text{g}/\text{m}^3$ )	
	PM <sub>10</sub> ( $\mu\text{g}/\text{m}^3$ )	PM <sub>2.5</sub> ( $\mu\text{g}/\text{m}^3$ )	SO <sub>2</sub> ( $\mu\text{g}/\text{m}^3$ )	NOx ( $\mu\text{g}/\text{m}^3$ )	O <sub>3</sub> ( $\mu\text{g}/\text{m}^3$ )	CO ( $\text{mg}/\text{m}^3$ )	NH <sub>3</sub> ( $\mu\text{g}/\text{m}^3$ )	Pb ( $\mu\text{g}/\text{m}^3$ )	Ni ( $\text{ng}/\text{m}^3$ )	As ( $\text{ng}/\text{m}^3$ )	C <sub>6</sub> H <sub>6</sub> ( $\mu\text{g}/\text{m}^3$ )		BaP ( $\text{ng}/\text{m}^3$ )
01.05.2020	70.2	42.1	8.8	11.8	7.2	0.46	24.8	BDL	BDL	BDL	BDL	BDL	BDL
05.05.2020	71.4	42.8	9.2	12.2	7.4	0.44	24.6	BDL	BDL	BDL	BDL	BDL	BDL
08.05.2020	71.2	42.7	9.6	12.4	7.6	0.48	25.2	BDL	BDL	BDL	BDL	BDL	BDL
12.05.2020	66.8	40.1	9.1	12.6	8.4	0.52	25.8	BDL	BDL	BDL	BDL	BDL	BDL
15.05.2020	66.2	39.7	9.4	13.2	8.2	0.54	26.6	BDL	BDL	BDL	BDL	BDL	BDL
19.05.2020	69.6	41.8	8.9	13.6	8.4	0.55	26.6	BDL	BDL	BDL	BDL	BDL	BDL
22.05.2020	68.8	41.3	8.8	12.8	9.2	0.52	25.4	BDL	BDL	BDL	BDL	BDL	BDL
26.05.2020	72.8	43.7	8.2	12.4	9.6	0.51	25.8	BDL	BDL	BDL	BDL	BDL	BDL
29.05.2020	71.6	43.0	9.2	12.2	8.8	0.54	26.1	BDL	BDL	BDL	BDL	BDL	BDL
Average	69.8	41.9	9.0	12.6	8.3	0.5	25.7	BDL	BDL	BDL	BDL	BDL	BDL
Limit as per CPCB notification, New Delhi, 18th Nov, 2009, for Ambient air quality	100	60	80	80	180	4	400	1	20	6	5	1	---
Sampling and Analysis done according to	IS: 5182(Part-23)-2019	USEPA CFR-40, Part-50, Appendix-L	IS: 5182 (Part-2)-2001	IS: 5182 (Part-6)-2006	IS: 5182 (Part-9)-2014	IS 5182: Part.10-2019	Air Sampling, 3rd Edn. By James P. Lodge (Method-401)	EPA 10 <sup>2</sup> -3.2	EPA 10-3.2	APHA 22nd-3114 C	IS 5182: Part. II	IS 5182: Part.12	EPA IO-3.2

BDL Values: SO<sub>2</sub> < 4  $\mu\text{g}/\text{m}^3$ , NOx < 9  $\mu\text{g}/\text{m}^3$ , O<sub>3</sub> < 4  $\mu\text{g}/\text{m}^3$ , NH<sub>3</sub> < 20  $\mu\text{g}/\text{m}^3$ , Ni < 0.01  $\text{ng}/\text{m}^3$ , As < 0.001  $\text{ng}/\text{m}^3$ , C<sub>6</sub>H<sub>6</sub> < 0.001  $\mu\text{g}/\text{m}^3$ , BaP < 0.002  $\text{ng}/\text{m}^3$ , Pb < 0.001  $\mu\text{g}/\text{m}^3$ , Min < 0.001  $\mu\text{g}/\text{m}^3$

Date: 01/08/2020





Ref:  
EnvLab/20/2-0521

Date: 01/06/2020

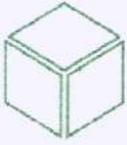
## AMBIENT AIR QUALITY MONITORING REPORT FOR MAY-2020 (BUFFER ZONE)

1. Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)
2. Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Analyzer
3. Sample Collected by : VCSPL Representative in presence of TATA Representative

Date	PARAMETERS												
	PM <sub>10</sub> (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NOx (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	NH <sub>3</sub> (µg/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )	As (ng/m <sup>3</sup> )	C <sub>6</sub> H <sub>6</sub> (µg/m <sup>3</sup> )	BaP (ng/m <sup>3</sup> )	HC (ng/m <sup>3</sup> )
Khondbondh 07.05.2020	58.8	36.2	6.6	11.8	10.8	0.78	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Bounsapani 09.05.2020	68.2	41.2	7.6	12.6	11.8	0.96	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Baneikela 09.05.2020	72.2	44.1	8.8	11.8	11.1	0.84	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Limit as per CPCB notification, New Delhi, 18th Nov, 2009, for Ambient air quality	100	60	80	80	180	4	400	1	20	6	5	1	—
Sampling and Analysis done according to	IS: 5182(Part -23)-2099	USEPA CFR- 40,Part- 50, Appendix- L	IS: 5182 (Part-2)- 2001	IS: 5182 (Part-6)- 2006	IS: 5182 (Part-9)- 2074	IS 5182 : Part 10- 2099	Air Sampling, 3rd Edn. By James P. Lodge (Method- 401)	EPA 10- 3.2	EPA 10- 3.2	APHA 22nd- 3114 C	IS 5182 : Part. 11	IS 5182 : Part. 12	—

BDL Values: SO<sub>2</sub> < 4 µg/m<sup>3</sup>, NOx < 9 µg/m<sup>3</sup>, O<sub>3</sub> < 4 µg/m<sup>3</sup>, NH<sub>3</sub> < 20 µg/m<sup>3</sup>, Ni < 0.01 ng/m<sup>3</sup>, As < 0.001 ng/m<sup>3</sup>, C<sub>6</sub>H<sub>6</sub> < 0.001 µg/m<sup>3</sup>, BaP < 0.002 ng/m<sup>3</sup>, Pb < 0.001 µg/m<sup>3</sup>, CO < 0.1 mg/m<sup>3</sup>, HC < 0.001 µg/m<sup>3</sup>





# Visiontek Consultancy Services Pvt. Ltd.

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ISO 9001 : 2008

ISO 14001: 2015

OHSAS 45001: 2018

Ref: EnvLab/20/R-0522

Date: 01/06/2020

## DRINKING WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF MAY-2020

1. Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)
2. Sampling location : DW-1: Near Canteen
3. Date of sampling : 31.05.2020
4. Date of analysis : 01.06.2020 TO 06.06.2020
5. Sample collected by : VCSPL Representative in presence of TATA Representative

Sl. No	Parameter	Testing Methods	Unit	Norms as per IS:10500-2012 Amended on 2015 & 2018		Analysis Results
						DW-1
<b>Microbiological Analysis</b>						
1	Total Coliform Organism MPN/100ml	APHA 9221-B	MPN/100ml	Shall not be detectable in any 100 ml sample		<1.1
2	Fecal Coliforms	APHA9221-E	MPN/100ml			<1.1
3	E. Coli	APHA9221-F	MPN/100ml	Shall not be detectable in any 100 ml sample		Absent
<b>Chemical Analysis</b>						
	Parameter	Testing Methods	Unit	Desirable Limit	Permissible Limit	Analysis Results
1	Colour	APHA 2120 B,	Hazen	5	15	CL
2	Odour	APHA 2150 B	--	Agreeable	Agreeable	Agreeable
3	Taste	APHA 2160 C	--	Agreeable	Agreeable	Agreeable
4	pH value at 25°C	APHA 4500H <sup>+</sup> B	NTU	6.5-8.5	No Relaxation	7.79
5	Turbidity	APHA 2130 B	--	1	5	<1.0
6	Total Dissolved Solids	APHA 2540 C	mg/l	500	2000	94
7	Aluminium (as Al)	APHA 3500Al B	mg/l	0.03	0.2	<0.001
8	Anionic Detergents (as MBAS)	APHA 5540 C	mg/l	0.2	1	0.28
9	Boron (as B)	APHA 4500B, B	mg/l	0.5	2.4	<0.01
10	Calcium (as Ca)	APHA 3500Ca B	mg/l	75	200	42
11	Chloride (as Cl)	APHA 4500Cl <sup>-</sup> B	mg/l	250	1000	58
12	Copper (as Cu)	APHA 3111 B	mg/l	0.05	1.5	<0.05
13	Fluoride (as F)	APHA 4500F- D	mg/l	0.05	1.5	<0.01
14	Residual Free Chlorine	APHA 4500Cl <sub>2</sub> B	mg/l	0.2	1	ND
15	Iron (as Fe)	APHA 3500Fe, B	mg/l	1.0	No Relaxation	0.38
16	Magnesium (as Mg)	APHA 3500Mg B	mg/l	30	100	21.8
17	Manganese (as Mn)	APHA 3500Mn B	mg/l	0.1	0.3	<0.005
18	Mineral Oil	APHA 5220 B	mg/l	0.5	No Relaxation	<0.01
19	Nitrate (as NO <sub>3</sub> )	APHA 4500 NO <sub>3</sub> - E	mg/l	45	No Relaxation	0.91
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	APHA 5530 B,D	mg/l	0.001	0.002	<0.001
21	Selenium (as Se)	APHA 3114 B	mg/l	0.01	No Relaxation	<0.001
22	Sulphate (as SO <sub>4</sub> )	APHA 4500 SO <sub>4</sub> - E	mg/l	200	400	6.2
23	Alkalinity (as CaCO <sub>3</sub> )	APHA 2320 B	mg/l	200	600	54.6
24	Total Hardness(as CaCO <sub>3</sub> )	APHA 2340 C	mg/l	200	600	68
25	Cadmium (as Cd)	APHA 3111 B,C	mg/l	0.003	No Relaxation	<0.001
26	Cyanide (as CN)	APHA 4500 CN- C,D	mg/l	0.05	No Relaxation	ND
27	Lead (as Pb)	APHA 3111 B,C	mg/l	0.01	No Relaxation	<0.01
28	Mercury (as Hg)	APHA 3500 Hg B	mg/l	0.001	No Relaxation	<0.001
29	Arsenic (as As)	APHA 3114 B	mg/l	0.01	0.05	<0.001
30	Zinc (as Zn)	APHA 3111 B,C	mg/l	5	15	<0.05
31	Chromium (as Cr <sup>+6</sup> )	APHA 3500Cr B	mg/l	--	--	<0.05
32	Poly Aromatic Hydrocarbon as PAH	APHA 6440 B	µg/l	0.0001	No Relaxation	<0.0001
33	Pesticide	APHA 6630 B,C	mg/l	--	No Relaxation	Absent

NoNote:CL: Colourless, ND: Not Detected.

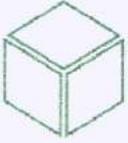
Prepared By

Verified By

Plot No.-M-22&23, Chandaka Industrial Estate, Patia, Bhubaneswar-751024, Dist-Khurda, Odisha Tel.: 7752017905

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ISO 9001 : 2008

ISO 14001 : 2015

OHSAS 45001 : 2018

Ref:

EnvLab/201R-0524

Date: 01/06/2020

## DAILY DRINKING WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF MAY -2020

- Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)
- Sampling location : DW-I: Water Treatment Plant
- Sample collected by : VCSPL Representative in presence of TATA Representative

Sl No	Test Parameters	Analysis Results												
		Norms as per IS: 10500-2012		5/1/2020	5/2/2020	5/3/2020	5/4/2020	5/5/2020	5/6/2020	5/7/2020	5/8/2020	5/9/2020	5/10/2020	5/11/2020
1	pH value (25°C)	Desirable Limit 6.5 - 8.5	Permissible Limit No Relaxation	7.51	7.56	7.52	7.54	7.51	7.48	7.44	7.46	7.52	7.54	7.51
2	Turbidity in NTU	1	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
3	Residual Free Chlorine in mg/l	0.2(Min.)	1	ND	ND									

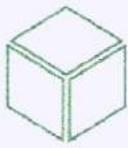
Sl No	Test Parameters	Analysis Results												
		Norms as per IS: 10500-2012		5/12/2020	5/13/2020	5/14/2020	5/15/2020	5/16/2020	5/17/2020	5/18/2020	5/19/2020	5/20/2020	5/21/2020	5/22/2020
1	pH value (25°C)	Desirable Limit 6.5 - 8.5	1	7.52	7.53	7.54	7.51	7.50	7.49	7.50	7.49	7.48	7.52	7.54
2	Turbidity in NTU	1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
3	Residual Free Chlorine in mg/l	0.2(Min.)	0.2(Min.)	ND										

Sl No	Test Parameters	Analysis Results											
		Norms as per IS: 10500-2012		5/23/2020	5/24/2020	5/25/2020	5/26/2020	5/27/2020	5/28/2020	5/29/2020	5/30/2020	5/31/2020	
1	pH value (25°C)	Desirable Limit 6.5 - 8.5	1	7.56	7.58	7.51	7.50	7.50	7.51	7.53	7.54	7.56	7.56
2	Turbidity in NTU	1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
3	Residual Free Chlorine in mg/l	0.2(Min.)	0.2(Min.)	ND	ND								

Prepared By: *[Signature]*  
Verified By: *[Signature]*

Note: ND: Not Detected.

Prepared By: *[Signature]*



# Visiontek Consultancy Services Pvt. Ltd.

(An Enviro Engineering Consulting Cell)



ISO 9001 : 2008

ISO 14001: 2015

OHSAS 45001: 2018

Ref: EnvLab/20/20-0525

Date: 01/06/2020

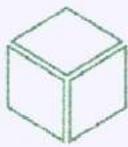
## SURFACE WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF MAY-2020

1. Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)
2. Sampling location : SW-1: Kundra Nallah Entering H. Quarry  
SW-2:Kundra Nallah Leaving H.Quarry
3. Date of Analysis : 20.05.2020 TO 25.05.2020
4. Sample collected by : VCSPL Representative in presence of TATA Representative

Sl. No.	Parameter	Testing Methods	Unit	Standards as per IS-2296:1992 Class - 'C'	Analysis Results	
					19.05.2020	
					SW-1	SW-2
1	Dissolved Oxygen (minimum)	APHA 2540 C	mg/l	4	6.2	6.8
2	BOD (3) days at 27°C (max)	APHA 5210 B	mg/l	3	< 1.8	< 1.8
3	Total Coli form	APHA 9221 B	MPN/100 ml	5000	180	220
4	pH Value	APHA 4500H <sup>+</sup> B	--	6.0-9.0	7.52	7.68
5	Colour (max)	APHA 2120 B, C	Hazen	300	CL	CL
6	Total Dissolved Solids	APHA 2540 C	mg/l	1500	184	196
7	Copper as Cu (max)	APHA 3111 B,C	mg/l	1.5	<0.02	<0.02
8	Iron as Fe (max)	APHA 3500Fe, B	mg/l	0.5	0.48	0.56
9	Chloride (max)	APHA 4500Cl <sup>-</sup> B	mg/l	600	52.8	56.2
10	Sulphates (SO <sub>4</sub> ) (max)	APHA 4500 SO <sub>4</sub> <sup>2-</sup> E	mg/l	400	5.8	6.1
11	Nitrate as NO <sub>3</sub> (max)	APHA 4500 NO <sub>3</sub> <sup>-</sup> E	mg/l	50	4.4	5.1
12	Fluoride as F (max)	APHA 4500F <sup>-</sup> C	mg/l	1.5	0.024	0.028
13	Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH (max)	APHA 5530 B,D	mg/l	0.005	<0.001	<0.001
14	Cadmium as Cd (max)	APHA 3111 B,C	mg/l	0.01	<0.01	<0.01
15	Selenium as Se (max)	APHA 3114 B	mg/l	0.05	<0.001	<0.001
16	Arsenic as As	APHA 3114 B	mg/l	0.2	<0.004	<0.004
17	Cyanide as CN (max)	APHA 4500 CN <sup>-</sup> C,D	mg/l	0.05	ND	ND
18	Lead as Pb(max)	APHA 3111 B,C	mg/l	0.1	<0.01	<0.01
19	Zinc as Zn(max)	APHA 3111 B,C	mg/l	15	<0.05	<0.05
20	Hexa Chromium as Cr <sup>+6</sup>	APHA 3500Cr B	mg/l	0.05	<0.01	<0.01
21	Anionic Detergents (max)	APHA 5540 C	mg/l	1.0	<0.2	<0.2

Note: ND: Not Detected.





Ref: EnvLab/20/R-0520

Date: 01/06/2020

**QUARRY WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF MAY -20**

1. Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)  
 2. Sampling location : QW-1:D-Quarry  
 3. Sampling Date : 14.05.2020  
 4. Date of Analysis : 15.05.2020 TO 20.05.2020  
 5. Sample collected by : VCSPL Representative in presence of TATA Representative

Sl.No.	Parameters	Unit	Testing Methods	General Standards for discharge of Environmental Pollutants Part A- Effluents	Analysis Report
1	Colour	Hazen	APHA 2120 B, C	5	CL
2	Odour	--	APHA 2150 B	Unobjectionable	U/O
3	pH at 25°C	--	APHA 4500H <sup>+</sup> B -	5.5-9.0	7.64
4	Total Dissolved Solids	mg/l	APHA 2540 C	-	136
5	Copper as Cu	mg/l	APHA 3111 B,C	3.0	<0.05
6	Fluoride as F	mg/l	APHA 4500F <sup>-</sup> C	2.0	0.028
7	Total Residual Chlorine	mg/l	APHA 4500Cl, B	1.0	ND
8	Iron as Fe	mg/l	APHA 3500Fe, B	3.0	0.38
9	Manganese as Mn	mg/l	APHA 3500Mn B	2.0	0.084
10	Nitrate as NO <sub>3</sub>	mg/l	APHA 4500 NO <sub>3</sub> <sup>-</sup> E	10.0	3.2
11	Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH	mg/l	APHA 5530 B,D	1.0	<0.001
12	Selenium as Se	mg/l	APHA 3114 B	0.05	<0.001
13	Cadmium as Cd	mg/l	APHA 3111 B,C	2.0	<0.001
14	Cyanide as CN	mg/l	APHA 4500 CN <sup>-</sup> C,D	0.2	ND
15	Lead as Pb	mg/l	APHA 3111 B,C	0.1	<0.01
16	Mercury as Hg	mg/l	APHA 3500 Hg	0.01	<0.001
17	Nickel as Ni	mg/l	APHA 3500-Ni	3.0	<0.001
18	Arsenic as As	mg/l	APHA 3114 B	0.2	<0.001
19	Total Chromium as Cr	mg/l	APHA 3500Cr B	2.0	<0.05
20	Zinc as Zn	mg/l	APHA 3111 B,C	5.0	<0.05
21	Hexavalent Chromium as Cr <sup>+6</sup>	mg/l	APHA 3500Cr B	0.1	<0.05
22	Vanadium as V	mg/l	APHA 3500-V	0.2	<0.001
23	Total Suspended Solids	mg/l	APHA 2540 D	100	68
24	Temperature	°C	APHA 2550-B	shall not exceed 5°C above the receiving water temperature	36
25	Dissolved Oxygen	mg/l	APHA 2540 C	-	6.6
26	Biochemical Oxygen Demand as BOD	mg/l	APHA 5210 B	30	<1.8
27	Chemical Oxygen Demand as COD	mg/l	APHA 5220-C	250	15.6
28	Oil & Grease	mg/l	APHA 5520 B	10	ND
29	Ammonical Nitrogen as N	mg/l	APHA 4500-NH <sub>3</sub> ,C	50	ND
30	Total Kjeldahl Nitrogen as N	mg/l	APHA 4500-Norg C	100	4.1
31	Sulphide as S	mg/l	APHA 4500-S <sub>2</sub> -D	2.0	ND
32	Free Ammonia as NH <sub>3</sub>	mg/l	APHA 4500-NH <sub>3</sub> ,F	5.0	ND
33	Particulate Size of Suspended Solids	mg/l	APHA 2540 D	850 µm IS Sieve	Passes through 850 mm IS Sieve
34	Bio-assay	mg/l	APHA 8910-C	90% survival in 100% effluent	All fishes survive in 100% effluent after 96 hrs
35	Dissolved Phosphates as PO <sub>4</sub>	mg/l	APHA4500-P D	5.0	<0.05

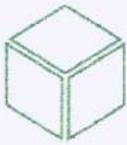
Note: ND: Not Detected.

Prepared By



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ISO 9001 : 2008

ISO 14001: 2015

OHSAS 45001: 2018

Ref: EnvLab/20/R-0527

Date: 01/06/2020

## QUARRY WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF MAY-20

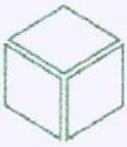
1. Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)
2. Sampling location : QW-2:H-Quarry
3. Sampling Date : 14.05.2020
4. Date of Analysis : 15.05.2020 TO 20.05.2020
5. Sample collected by : VCSPL Representative in presence of TATA Representative

Sl.No.	Parameters	Unit	Testing Methods	General Standards for discharge of Environmental Pollutants Part A- Effluents	Analysis Report
1	Colour	Hazen	APHA 2120 B, C	5	CL
2	Odour	--	APHA 2150 B	Unobjectionable	U/O
3	pH at 25°C	--	APHA 4500H <sup>+</sup> B -	5.5-9.0	7.91
4	Total Dissolved Solids	mg/l	APHA 2540 C	-	132
5	Copper as Cu	mg/l	APHA 3111 B,C	3.0	<0.05
6	Fluoride as F	mg/l	APHA 4500F- C	2.0	0.052
7	Total Residual Chlorine	mg/l	APHA 4500Cl, B	1.0	ND
8	Iron as Fe	mg/l	APHA 3500Fe, B	3.0	0.81
9	Manganese as Mn	mg/l	APHA 3500Mn B	2.0	2.8
10	Nitrate as NO <sub>3</sub>	mg/l	APHA 4500 NO <sub>3</sub> <sup>-</sup> E	10.0	2.42
11	Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH	mg/l	APHA 5530 B,D	1.0	<0.001
12	Selenium as Se	mg/l	APHA 3114 B	0.05	<0.001
13	Cadmium as Cd	mg/l	APHA 3111 B,C	2.0	<0.001
14	Cyanide as CN	mg/l	APHA 4500 CN- C,D	0.2	ND
15	Lead as Pb	mg/l	APHA 3111 B,C	0.1	<0.01
16	Mercury as Hg	mg/l	APHA 3500 Hg	0.01	<0.001
17	Nickel as Ni	mg/l	APHA 3500-Ni	3.0	<0.001
18	Arsenic as As	mg/l	APHA 3114 B	0.2	<0.001
19	Total Chromium as Cr	mg/l	APHA 3500Cr B	2.0	<0.05
20	Zinc as Zn	mg/l	APHA 3111 B,C	5.0	<0.05
21	Hexavalent Chromium as Cr <sup>+6</sup>	mg/l	APHA 3500Cr B	0.1	<0.05
22	Vanadium as V	mg/l	APHA 3500-V	0.2	<0.001
23	Total Suspended Solids	mg/l	APHA 2540 D	100	72
24	Temperature	0C	APHA 2550-B	shall not exceed 5°C above the receiving water temperature	30
25	Dissolved Oxygen	mg/l	APHA 2540 C	-	6.6
26	Biochemical Oxygen Demand as BOD	mg/l	APHA 5210 B	30	<1.8
27	Chemical Oxygen Demand as COD	mg/l	APHA 5220-C	250	32
28	Oil & Grease	mg/l	APHA 5520 B	10	ND
29	Ammonical Nitrogen as N	mg/l	APHA 4500-NH <sub>3</sub> ,C	50	ND
30	Total Kjeldahl Nitrogen as N	mg/l	APHA 4500-Norg C	100	0.88
31	Sulphide as S	mg/l	APHA 4500-S <sub>2</sub> -D	2.0	ND
32	Free Ammonia as NH <sub>3</sub>	mg/l	APHA 4500-NH <sub>3</sub> ,F	5.0	ND
33	Particulate Size of Suspended Solids	mg/l	APHA 2540 D	850 µm IS Sieve	Passes through 850 mm IS Sieve
34	Bio-assay	mg/l	APHA 8910-C	90% survival in 100% effluent	All fishes survive in 100% effluent after 96 hrs
35	Dissolved Phosphates as PO <sub>4</sub>	mg/l	APHA4500-P D	5.0	<0.05

Note: ND: Not Detected.

Prepared By

Verified By



Ref: EnvLab/20/R-0528

Date: 01/06/2020

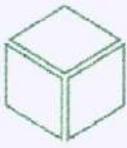
## AMBIENT NOISE MONITORING REPORT FOR MAY-20

1. Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)
2. Monitored by : VCSPL Representative in presence of TATA Representative

Sl. No	Monitoring Date	Name of Location	Unit	Day time Equivalent	Standard As per CPCB	Night time Equivalent	Standard As per CPCB
				Result		Result	
1	23.05.2020	Town ship	dB (A)	68	75	59	70
2		Hospital		42	50	38	40
3		Mines Area		63	75	60	70
4		Railway Sliding		69	75	58	70

Prepared By





Ref: EnvLab/20/R-0529

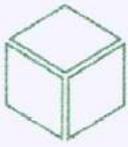
Date: 01/06/2020

## PERSONAL DUST SAMPLING ANALYSIS REPORT FOR THE MONTH OF MAY-20

Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)  
Sample collected by : VCSPL representative in presence of TATA representative.

Sl.No	Date of sampling	Name of the Person	Personal Number	Standard	Particulate matter as PM (mg/m <sup>3</sup> )
1	21.05.2020	Jema Patra	TSP/775945/0819	5 mg/m <sup>3</sup>	4.8
2		Rajesh Patra	TSP/785783/0819		4.2
3		Ajay Das	TSP/770126/0819		4.1
4		Sarjen Kulei	TSP/770178/0819		4.4
5		Suresh Naik	TSP/801522/0919		4.7
6		Kumari Patra	TSP/801276/0919		4.6
7		Laxmi Munda	TSP/775944/0819		4.5
8		Sitara Hessa	TSP/770136/0819		4.3





Ref: EnvLab/20/R-0530

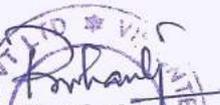
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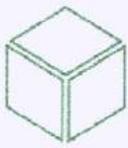
## FUGITIVE EMISSION ANALYSIS REPORT FOR THE MONTH OF MAY-20

- 1.Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)  
2.Sample Collected By : VCSPL Representative in presence of TATA Representative

L-1	Near Screening Plant	Prescribed Standard	Monitoring Date	Analysis Result
Parameters	Method of Measurement			
SPM	Gravimetric method	1200( $\mu\text{g}/\text{m}^3$ )	24.05.2020	624.0
L-2	Near Stack Yard (D-Quarry)	Prescribed Standard	Monitoring Date	Analysis Result
Parameters	Method of Measurement			
SPM	Gravimetric method	1200( $\mu\text{g}/\text{m}^3$ )	24.05.2020	534.4
L-3	Near Sorting Yard (H-Quarry)	Prescribed Standard	Monitoring Date	Analysis Result
Parameters	Method of Measurement			
SPM	Gravimetric method	1200( $\mu\text{g}/\text{m}^3$ )	24.05.2020	532.8
L-4	Near Sorting Yard (D-Quarry)	Prescribed Standard	Monitoring Date	Analysis Result
Parameters	Method of Measurement			
SPM	Gravimetric method	1200( $\mu\text{g}/\text{m}^3$ )	24.05.2020	546.2

Prepared By  
  


Verified By  
  

# Visiontek Consultancy Services Pvt. Ltd.

(An Enviro Engineering Consulting Cell)



ISO 9001 : 2008  
ISO 14001 : 2015  
OHSAS 45001 : 2018

Ref: EnvLab/20/2-0531

Date: 01/06/2020

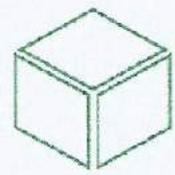
## OIL SEPARATION PIT WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF MAY-20

1. Name of Industry : Jodawest Manganese Mines ( M/s TATA Steel Limited)
2. Sampling Location : WW-1: Workshop Water
3. Date of sampling : 23.05.2020
4. Date of analysis : 25.05.2020 to 30.05.2020
5. Sample collected by : VCSPL Representative in presence of TATA Representative

Sl.	Parameters	Unit	General Standards for discharge of Environmental Pollutants Part A-Effluents	Analysis Report
				May-20
1	Colour	Hazen	5	CL
2	Odour	-	Unobjectionable	U/O
3	pH at 25 degree C	-	5.5-9.0	7.41
4	Total Dissolved Solids	mg/l	-	148
5	Copper as Cu	mg/l	3.0	<0.02
6	Fluoride as F	mg/l	2.0	0.041
7	Total Residual Chlorine	mg/l	1.0	ND
8	Iron as Fe	mg/l	3.0	0.71
9	Manganese as Mn	mg/l	2.0	1.24
10	Nitrate as NO <sub>3</sub>	mg/l	10.0	4.8
11	Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH	mg/l	1.0	<0.05
12	Selenium as Se	mg/l	0.05	<0.001
13	Cadmium as Cd	mg/l	2.0	<0.001
14	Cyanide as CN	mg/l	0.2	ND
15	Lead as Pb	mg/l	0.1	<0.01
16	Mercury as Hg	mg/l	0.01	<0.001
17	Nickel as Ni	mg/l	3.0	<0.05
18	Arsenic as As	mg/l	0.2	<0.004
19	Total Chromium as Cr	mg/l	2.0	<0.05
20	Zinc as Zn	mg/l	5.0	<0.05
21	Hexavalent Chromium as Cr <sup>+6</sup>	mg/l	0.1	<0.01
22	Vanadium as V	mg/l	0.2	<0.001
23	Total Suspended Solids	mg/l	100	48
24	Temperature	0C	shall not exceed 5 <sup>0</sup> C above the receiving water temperature	34
25	Dissolved Oxygen	mg/l	-	6.6
26	BOD at 27 <sup>0</sup> C for 3 days	mg/l	30	<1.8
27	Chemical Oxygen Demand as COD	mg/l	250	23.6
28	Oil & Grease	mg/l	10	ND
29	Ammonical Nitrogen as N	mg/l	50	ND
30	Total Kjeldahl Nitrogen as N	mg/l	100	5.2
31	Sulphide as S	mg/l	2.0	ND
32	Free Ammonia as NH <sub>3</sub>	mg/l	5.0	ND
33	Particulate Size of Suspended Solids	mg/l	850 µm IS Sieve	Passes through 850 mm IS Sieve
34	Bio-assay	mg/l	90% survival in 100% effluent	96% survival in 100% effluent
35	Dissolved Phosphates as PO <sub>4</sub>	mg/l	5.0	<0.05

Prepared By  
  
 Visiontek Consultancy Services Pvt. Ltd.

Verified By  
  
 Visiontek Consultancy Services Pvt. Ltd.



Ref: *Enviro/20/R-1414*

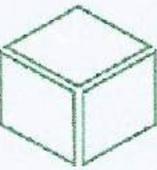
Date: *06.07.20*

## METEOROLOGICAL DATA FOR JUNE 2020

1. Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)
2. Sampling Location : Mines Office
3. Sample collected by : VCSPL representative in presence of TATA representative.

Date	Temperature(°C)		Relative Humidity (%)		Wind Speed m/sec		Wind Direction	Rain fall (mm)
	Max	Min	Max	Min	Max	Min		
1-Jun-20	37.2	26.2	88.9	55.1	4.2	2.5	S	0.6
2-Jun-20	34.5	24.5	79.8	48.7	2.5	1.1	SSW	1.3
3-Jun-20	35.2	23.9	83.2	45.6	2.8	1.1	S	0.9
4-Jun-20	34.9	27.6	76.4	55.9	3.3	0.8	SSW	3.3
5-Jun-20	35.7	26.4	84.1	40.6	6.1	2.2	SSW	1.3
6-Jun-20	36.3	28.1	72.9	39.7	4.2	1.9	WSW	0.2
7-Jun-20	35.1	27.8	68.7	42.3	2.5	1.1	SSW	0.3
8-Jun-20	36.9	24.5	73.4	43.6	4.2	0.8	SSW	8.9
9-Jun-20	36.4	23.9	71.2	41.9	3.9	0.8	SE	0.1
10-Jun-20	35.7	27.1	76.9	50.6	4.2	0.6	SE	0.9
11-Jun-20	33.2	26.5	84.7	54.7	4.2	0.8	SE	11.9
12-Jun-20	31.7	25.4	89.3	58.3	4.7	1.7	SE	16.8
13-Jun-20	33.6	26.8	88.4	56.9	3.3	1.7	SE	7.8
14-Jun-20	34.2	26.2	89.6	58.2	3	1.4	WSW	5.3
15-Jun-20	33.9	26.8	87.2	53.4	2.2	1.1	SW	13.6
16-Jun-20	39.5	27.9	91.4	60.9	4.2	2.5	SW	10
17-Jun-20	29.6	22.4	93.2	61.4	6.4	2.2	SW	9.3
18-Jun-20	34.7	25.9	87.5	55.8	4.7	2.2	SW	1.3
19-Jun-20	35.1	23.1	84.9	54.3	4.2	2.8	WSW	2.4
20-Jun-20	33.8	26.3	85.1	56.8	2.8	1.1	WSW	9.9
21-Jun-20	32.1	24.7	88.6	55.7	4.2	1.9	SW	5.2
22-Jun-20	33.8	25.8	89.7	58.2	5.3	1.9	S	6.2
23-Jun-20	36.9	26.1	84.2	58.6	4.6	0.9	SW	2.5
24-Jun-20	39.7	27.8	81.6	54.7	5	1.1	SSW	6
25-Jun-20	37.2	26.9	80.9	53.2	4.9	1.3	WSW	10.9
26-Jun-20	36.4	25.7	77.5	49.8	3.9	2.1	SW	3.1
27-Jun-20	38.6	27.3	78.4	50.1	5.2	1.6	SW	2.2
28-Jun-20	39.7	28.5	75.3	49.3	4.7	0.8	SE	3.6
29-Jun-20	37.5	26.9	79.4	52.3	3.2	2.3	SW	4.8
30-Jun-20	36.8	27.4	80.2	52.5	4.3	1.7	S	5.9





Ref: EnviroLab/20/R-1415

Date: 06.07.20

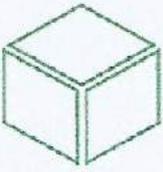
## AMBIENT AIR QUALITY MONITORING REPORT FOR JUNE 2020 (CORE ZONE)

- Name of Industry : **Joda West Manganese Mines ( M/s TATA Steel Limited)**
- Monitoring Instruments : **RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Analyzer, VOC Sampler**
- Sampling Location : **AAQMS-1; Time Office**
- Sample collected by : **VCSPL representative in presence of TATA representative.**

Date	PARAMETERS												
	PM <sub>10</sub> (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NOx (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	CO mg/m <sup>3</sup>	NH <sub>3</sub> (µg/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )	As (ng/m <sup>3</sup> )	C <sub>6</sub> H <sub>6</sub> (µg/m <sup>3</sup> )	BaP (ng/m <sup>3</sup> )	Mn µg/m <sup>3</sup>
02.06.2020	68.8	41.28	6.6	11.8	8.2	0.51	23.8	BDL	BDL	BDL	BDL	BDL	0.012
05.06.2020	72.8	43.68	6.8	12.6	8.1	0.49	24.2	BDL	BDL	BDL	BDL	BDL	0.014
09.06.2020	73.4	44.04	7.1	12.8	8.4	0.48	24.8	BDL	BDL	BDL	BDL	BDL	0.016
12.06.2020	73.8	44.28	7.4	13.2	8.8	0.44	25.2	BDL	BDL	BDL	BDL	BDL	0.011
16.06.2020	74.1	44.46	7.7	12.9	9.1	0.49	24.7	BDL	BDL	BDL	BDL	BDL	0.011
19.06.2020	74.6	44.76	7.1	13.6	8.9	0.51	25.6	BDL	BDL	BDL	BDL	BDL	0.011
23.06.2020	73.9	44.34	7.2	13.8	8.6	0.48	25.2	BDL	BDL	BDL	BDL	BDL	0.013
<b>Average</b>	<b>73.06</b>	<b>43.83</b>	<b>7.13</b>	<b>12.96</b>	<b>8.59</b>	<b>0.49</b>	<b>24.79</b>	<b>BDL</b>	<b>BDL</b>	<b>BDL</b>	<b>BDL</b>	<b>BDL</b>	<b>0.013</b>
Limit as per CPCB notification, New Delhi, 18th Nov, 2009, for Ambient air quality	100	60	80	80	180	4	400	1	20	6	5	1	--
Sampling and Analysis done according to	IS: 5182(Part -23)-2099	USEPA CFR- 40,Part-50, Appendix- L	IS: 5182 (Part-2)- 2001	IS: 5182 (Part-6)- 2006	IS: 5182 (Part-9)- 2074	IS 5182 : Part.10- 2099	Air Sampling, 3rd Edn.By James P. Lodge (Method- 401)	EPA IO- 3.2	EPA IO- 3.2	APHA 22nd-3114 C	IS 5182 : Part. 11	IS 5182 : Part. 12	EPA IO- 3.2

BDL Values: SO<sub>2</sub> < 4 µg/m<sup>3</sup>, NOx < 9 µg/m<sup>3</sup>, O<sub>3</sub> < 4 µg/m<sup>3</sup>, NH<sub>3</sub> < 20 µg/m<sup>3</sup>, Ni < 0.01 ng/m<sup>3</sup>, As < 0.001 ng/m<sup>3</sup>, C<sub>6</sub>H<sub>6</sub> < 0.001 µg/m<sup>3</sup>, BaP < 0.002 ng/m<sup>3</sup>, Pb < 0.001 µg/m<sup>3</sup>





Ref: Envlab/2019/R-1416

Date: 06.07.20

## AMBIENT AIR QUALITY MONITORING REPORT FOR JUNE 2020 (CORE ZONE)

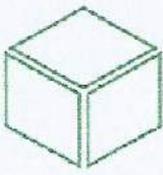
- Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)
- Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Analyzer, VOC Sampler
- Sampling Location : AAQMS-2:H.Quarry
- Sample collected by : VCSPL representative in presence of TATA representative.

### PARAMETERS

Date	PM <sub>10</sub> ( $\mu\text{g}/\text{m}^3$ )	PM <sub>2.5</sub> ( $\mu\text{g}/\text{m}^3$ )	SO <sub>2</sub> ( $\mu\text{g}/\text{m}^3$ )	NOx ( $\mu\text{g}/\text{m}^3$ )	O <sub>3</sub> ( $\mu\text{g}/\text{m}^3$ )	CO ( $\text{mg}/\text{m}^3$ )	NH <sub>3</sub> ( $\mu\text{g}/\text{m}^3$ )	Pb ( $\mu\text{g}/\text{m}^3$ )	Ni ( $\text{ng}/\text{m}^3$ )	As ( $\text{ng}/\text{m}^3$ )	C <sub>6</sub> H <sub>6</sub> ( $\mu\text{g}/\text{m}^3$ )	BaP ( $\text{ng}/\text{m}^3$ )	Mn ( $\mu\text{g}/\text{m}^3$ )
02.06.2020	62.8	37.68	7.8	12.2	8.4	0.46	25.2	BDL	BDL	BDL	BDL	BDL	BDL
05.06.2020	66.9	40.14	7.9	12.6	8.8	0.44	25.8	BDL	BDL	BDL	BDL	BDL	BDL
09.06.2020	70.2	42.12	8.1	13.4	8.2	0.51	26.6	BDL	BDL	BDL	BDL	BDL	BDL
12.06.2020	70.8	42.48	8.4	13.8	8.4	0.52	27.4	BDL	BDL	BDL	BDL	BDL	BDL
16.06.2020	71.2	42.72	8.2	14.2	9.1	0.44	27.8	BDL	BDL	BDL	BDL	BDL	BDL
19.06.2020	70.6	42.36	8.1	13.6	9.6	0.46	26.2	BDL	BDL	BDL	BDL	BDL	BDL
23.06.2020	68.8	41.28	8.2	13.4	9.2	0.48	25.8	BDL	BDL	BDL	BDL	BDL	BDL
Average	68.76	41.25	8.10	13.31	8.81	0.47	26.40	BDL	BDL	BDL	BDL	BDL	BDL
Limit as per CPCB notification, New Delhi, 18th Nov, 2009, for Ambient air quality	100	60	80	80	180	4	400	1	20	6	5	1	--
Sampling and Analysis done according to	IS: 5182(Part-23)-2099	USEPA CFR-40, Part-50, Appendix-L	IS: 5182 (Part-2)-2001	IS: 5182 (Part-6)-2006	IS: 5182 (Part-9)-2074	IS 5182: Part-10-2099	Air Sampling, 3rd Edn. By James P. Lodge (Method-401)	EPA IO-3.2	EPA IO-3.2	APHA 22nd-3114 C	IS 5182: Part. 11	IS 5182: Part. 12	EPA IO-3.2

BDL Values: SO<sub>2</sub>< 4  $\mu\text{g}/\text{m}^3$ , NOx< 9  $\mu\text{g}/\text{m}^3$ , O<sub>3</sub>< 4  $\mu\text{g}/\text{m}^3$ , NH<sub>3</sub>< 20  $\mu\text{g}/\text{m}^3$ , Ni<0.01  $\text{ng}/\text{m}^3$ , As < 0.001  $\text{ng}/\text{m}^3$ , C<sub>6</sub>H<sub>6</sub><0.001  $\mu\text{g}/\text{m}^3$ , BaP<0.002  $\text{ng}/\text{m}^3$ , Pb<0.001  $\mu\text{g}/\text{m}^3$ , CO<0.1  $\text{mg}/\text{m}^3$ , Mn<0.001  $\mu\text{g}/\text{m}^3$





Ref.: Enulab/2019R-1417

Date: 06.07.20

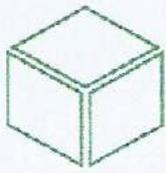
## AMBIENT AIR QUALITY MONITORING REPORT FOR JUNE 2020 (BUFFER ZONE)

- Name of Industry : Joda West Manganese Mines (M/s TATA Steel Limited)
- Monitoring Instruments : RDS (APM 460 BL), FPS (APM 550) Envirotech, CO Analyzer
- Sample Collected by : VCSPL Representative in presence of TATA Representative

Date	PARAMETERS												
	PM <sub>10</sub> (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>x</sub> (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	NH <sub>3</sub> (µg/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )	As (ng/m <sup>3</sup> )	C <sub>6</sub> H <sub>6</sub> (µg/m <sup>3</sup> )	BaP (ng/m <sup>3</sup> )	HC (ng/m <sup>3</sup> )
Khondbondh 18.06.2020	54.8	32.9	6.8	13.2	10.8	0.74	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Bounsapani 18.06.2020	62.8	37.7	7.8	12.8	11.9	0.92	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Banikela 20.06.2020	73.2	43.9	8.8	11.8	10.9	0.84	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Limit as per CPCB notification, New Delhi, 18th Nov, 2009, for Ambient air quality	100	60	80	80	180	4	400	20	6	5	1	---	---
Sampling and Analysis done according to	IS: 5182(Part -23)-2099	USEPA CFR- 40,Part- 50, Appendix- L	IS: 5182 (Part-2)- 2001	IS: 5182 (Part-6)- 2006	IS: 5182 (Part-9)- 2074	IS 5182: Part.10- 2099	Air Sampling, 3rd Edn. By James P. Lodge (Method- 401)	EPA IO- 3.2	EPA IO- 3.2	IS 5182: Part. 11	IS 5182: Part. 12	---	---

BDL Values: SO<sub>2</sub> < 4 µg/m<sup>3</sup>, NO<sub>x</sub> < 9 µg/m<sup>3</sup>, O<sub>3</sub> < 4 µg/m<sup>3</sup>, NH<sub>3</sub> < 20 µg/m<sup>3</sup>, Ni < 0.01 ng/m<sup>3</sup>, As < 0.001 ng/m<sup>3</sup>, C<sub>6</sub>H<sub>6</sub> < 0.001 µg/m<sup>3</sup>, BaP < 0.002 ng/m<sup>3</sup>, Pb < 0.001 µg/m<sup>3</sup>, CO < 0.1 mg/m<sup>3</sup>, HC < 0.001 µg/m<sup>3</sup>





Ref.: *Formal/20/R-1418*

Date: *06.07.20*

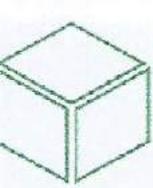
## DRINKING WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF JUNE 2020

1. Name of Industry : **Joda West Manganese Mines ( M/s TATA Steel Limited)**
2. Sampling location : **DW-1: Near Canteen**
3. Date of sampling : **10.06.2020**
4. Date of analysis : **11.06.2020 TO 18.06.2020**
5. Sample collected by : **VCSPL Representative in presence of TATA Representative**

Sl. No	Parameter	Testing Methods	Unit	Norms as per IS:10500-2012 Amended on 2015 & 2018		Analysis Results
						DW-1
<b>Microbiological Analysis</b>						
1	Total Coliform Organism MPN/100ml	APHA 9221-B	MPN/100ml	Shall not be detectable in any 100 ml sample		<1.1
2	Fecal Coliforms	APHA9221-E	MPN/100ml			<1.1
3	E. Coli	APHA9221-F	MPN/100ml	Shall not be detectable in any 100 ml sample		Absent
<b>Chemical Analysis</b>						
	Parameter	Testing Methods	Unit	Desirable Limit	Permissible Limit	Analysis Results
1	Colour	APHA 2120 B,	Hazen	5	15	CL
2	Odour	APHA 2150 B	--	Agreeable	Agreeable	Agreeable
3	Taste	APHA 2160 C	--	Agreeable	Agreeable	Agreeable
4	pH value at 25°C	APHA 4500H <sup>+</sup> B	NTU	6.5-8.5	No Relaxation	7.78
5	Turbidity	APHA 2130 B	--	1	5	<1.0
6	Total Dissolved Solids	APHA 2540 C	mg/l	500	2000	80
7	Aluminium (as Al)	APHA 3500Al B	mg/l	0.03	0.2	<0.001
8	Anionic Detergents (as MBAS)	APHA 5540 C	mg/l	0.2	1	0.18
9	Boron (as B)	APHA 4500B, B	mg/l	0.5	2.4	<0.01
10	Calcium (as Ca)	APHA 3500Ca B	mg/l	75	200	30
11	Chloride (as Cl)	APHA 4500Cl <sup>-</sup> B	mg/l	250	1000	52
12	Copper (as Cu)	APHA 3111 B	mg/l	0.05	1.5	<0.05
13	Fluoride (as F <sup>-</sup> )	APHA 4500F- D	mg/l	0.05	1.5	<0.01
14	Residual Free Chlorine	APHA 4500Cl, B	mg/l	0.2	1	ND
15	Iron (as Fe)	APHA 3500Fe, B	mg/l	1.0	No Relaxation	0.31
16	Magnesium (as Mg)	APHA 3500Mg B	mg/l	30	100	18
17	Manganese (as Mn)	APHA 3500Mn B	mg/l	0.1	0.3	<0.005
18	Mineral Oil	APHA 5220 B	mg/l	0.5	No Relaxation	<0.01
19	Nitrate (as NO <sub>3</sub> )	APHA 4500 NO3- E	mg/l	45	No Relaxation	0.78
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	APHA 5530 B,D	mg/l	0.001	0.002	<0.001
21	Selenium (as Se)	APHA 3114 B	mg/l	0.01	No Relaxation	<0.001
22	Sulphate (as SO <sub>4</sub> )	APHA 4500 SO42- E	mg/l	200	400	6
23	Alkalinity (as CaCO <sub>3</sub> )	APHA 2320 B	mg/l	200	600	54
24	Total Hardness(as CaCO <sub>3</sub> )	APHA 2340 C	mg/l	200	600	60
25	Cadmium (as Cd)	APHA 3111 B,C	mg/l	0.003	No Relaxation	<0.001
26	Cyanide (as CN)	APHA 4500 CN- C,D	mg/l	0.05	No Relaxation	ND
27	Lead (as Pb)	APHA 3111 B,C	mg/l	0.01	No Relaxation	<0.01
28	Mercury (as Hg)	APHA 3500 Hg B	mg/l	0.001	No Relaxation	<0.001
29	Arsenic (as As)	APHA 3114 B	mg/l	0.01	0.05	<0.001
30	Zinc (as Zn)	APHA 3111 B,C	mg/l	5	15	<0.05
31	Chromium (as Cr <sup>6+</sup> )	APHA 3500Cr B	mg/l	--	--	<0.05
32	Poly Aromatic Hydrocarbon as PAH	APHA 6440 B	µg/l	0.0001	No Relaxation	<0.0001
33	Pesticide	APHA 6630 B,C	mg/l	--	No Relaxation	Absent

Note: CL: Colourless, ND: Not Detected.





Ref.: Konlab/20/  
R-1419

Date: 08/07/20

## DAILY DRINKING WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF JUNE 2020

- Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)
- Sampling location : DW-1; Water Treatment Plant
- Sample collected by : VCSPL Representative in presence of TATA Representative

SI No	Test Parameters	Analysis Results												
		Norms as per IS: 10500-2012		6/1/2020	6/2/2020	6/3/2020	6/4/2020	6/5/2020	6/6/2020	6/7/2020	6/8/2020	6/9/2020	6/10/2020	6/11/2020
1	pH value (25°C)	Desirable Limit 6.5 - 8.5	Permissible Limit No Relaxation	7.52	7.58	7.61	7.64	7.66	7.62	7.61	7.60	7.58	7.55	7.54
2	Turbidity in NTU	1	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
3	Residual Free Chlorine in mg/l	0.2(Min.)	1	ND										
		Analysis Results												
SI No	Test Parameters	Norms as per IS: 10500-2012		6/12/2020	6/13/2020	6/14/2020	6/15/2020	6/16/2020	6/17/2020	6/18/2020	6/19/2020	6/20/2020	6/21/2020	6/22/2020
		Desirable Limit	Relaxation	7.55	7.56	7.61	7.62	7.64	7.66	7.68	7.71	7.62	7.55	7.58
1	pH value (25°C)	6.5 - 8.5	6.5 - 8.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
2	Turbidity in NTU	1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
3	Residual Free Chlorine in mg/l	0.2(Min.)	0.2(Min.)	ND										
		Analysis Results												
SI No	Test Parameters	Norms as per IS: 10500-2012		6/23/2020	6/24/2020	6/25/2020	6/26/2020	6/27/2020	6/28/2020	6/29/2020	6/30/2020			
		Desirable Limit	Relaxation	7.61	7.56	7.58	7.59	7.62	7.66	7.62	7.66	<1	ND	ND
1	pH value (25°C)	6.5 - 8.5	6.5 - 8.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
2	Turbidity in NTU	1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
3	Residual Free Chlorine in mg/l	0.2(Min.)	0.2(Min.)	ND										





Ref: *EnviroLab/20/R-1420*

Date: *06/07/20*

## SURFACE WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF JUNE 2020

1. Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)  
 2. Sampling location : SW-1: Kundra Nallah Entering H. Quarry  
 SW-2:Kundra Nallah Leaving H.Quarry  
 3. Date of Analysis : 10.06.2020 TO 16.06.2020  
 4. Sample collected by : VCSPL Representative in presence of TATA Representative

Sl. No.	Parameter	Testing Methods	Unit	Standards as per IS-2296:1992 Class -'C'	Analysis Results	
					09.06.2020	
					SW-1	SW-2
1	Dissolved Oxygen (minimum)	APHA 2540 C	mg/l	4	6.4	6.8
2	BOD (3) days at 27°C (max)	APHA 5210 B	mg/l	3	< 1.8	< 1.8
3	Total Coli form	APHA 9221 B	MPN/100 ml	5000	180	110
4	pH Value	APHA 4500H <sup>+</sup> B	--	6.0-9.0	7.59	7.62
5	Colour (max)	APHA 2120 B, C	Hazen	300	CL	CL
6	Total Dissolved Solids	APHA 2540 C	mg/l	1500	184	180
7	Copper as Cu (max)	APHA 3111 B,C	mg/l	1.5	<0.02	<0.05
8	Iron as Fe (max)	APHA 3500Fe, B	mg/l	0.5	0.46	0.48
9	Chloride (max)	APHA 4500Cl <sup>-</sup> B	mg/l	600	54	58
10	Sulphates (SO <sub>4</sub> ) (max)	APHA 4500 SO <sub>4</sub> <sup>2-</sup> E	mg/l	400	6	6.4
11	Nitrate as NO <sub>3</sub> (max)	APHA 4500 NO <sub>3</sub> <sup>-</sup> E	mg/l	50	4	4.8
12	Fluoride as F (max)	APHA 4500F <sup>-</sup> C	mg/l	1.5	0.021	0.026
13	Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH (max)	APHA 5530 B,D	mg/l	0.005	<0.001	<0.001
14	Cadmium as Cd (max)	APHA 3111 B,C	mg/l	0.01	<0.01	<0.01
15	Selenium as Se (max)	APHA 3114 B	mg/l	0.05	<0.001	<0.001
16	Arsenic as As	APHA 3114 B	mg/l	0.2	<0.004	<0.004
17	Cyanide as CN (max)	APHA 4500 CN <sup>-</sup> C,D	mg/l	0.05	ND	ND
18	Lead as Pb(max)	APHA 3111 B,C	mg/l	0.1	<0.01	<0.01
19	Zinc as Zn(max)	APHA 3111 B,C	mg/l	15	<0.05	<0.05
20	Hexa Chromium as Cr <sup>+6</sup>	APHA 3500Cr B	mg/l	0.05	<0.01	<0.01
21	Anionic Detergents (max)	APHA 5540 C	mg/l	1.0	<0.2	<0.2

Note: ND: Not Detected.





Ref.: *Envlab/20/R-1421*

Date: *06/07/20*

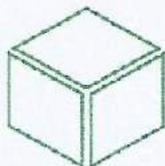
## QUARRY WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF JUNE 2020

1. Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)
2. Sampling location : QW-1:D-Quarry
3. Sampling Date : 11.06.2020
4. Date of Analysis : 12.06.2020 TO 18.06.2020
5. Sample collected by : VCSPL Representative in presence of TATA Representative

Sl.No.	Parameters	Unit	Testing Methods	General Standards for discharge of Environmental Pollutants Part A-Effluents	Analysis Report
1	Colour	Hazen	APHA 2120 B, C	5	CL
2	Odour	--	APHA 2150 B	Unobjectionable	U/O
3	pH at 25°C	--	APHA 4500H <sup>+</sup> B -	5.5-9.0	7.58
4	Total Dissolved Solids	mg/l	APHA 2540 C	-	116
5	Copper as Cu	mg/l	APHA 3111 B,C	3.0	<0.05
6	Fluoride as F	mg/l	APHA 4500F C	2.0	0.026
7	Total Residual Chlorine	mg/l	APHA 4500Cl, B	1.0	ND
8	Iron as Fe	mg/l	APHA 3500Fe, B	3.0	0.69
9	Manganese as Mn	mg/l	APHA 3500Mn B	2.0	0.084
10	Nitrate as NO <sub>3</sub>	mg/l	APHA 4500 NO <sub>3</sub> E	10.0	3.8
11	Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH	mg/l	APHA 5530 B,D	1.0	<0.001
12	Selenium as Se	mg/l	APHA 3114 B	0.05	<0.001
13	Cadmium as Cd	mg/l	APHA 3111 B,C	2.0	<0.001
14	Cyanide as CN	mg/l	APHA 4500 CN <sup>-</sup> C,D	0.2	ND
15	Lead as Pb	mg/l	APHA 3111 B,C	0.1	<0.01
16	Mercury as Hg	mg/l	APHA 3500 Hg	0.01	<0.001
17	Nickel as Ni	mg/l	APHA 3500-Ni	3.0	<0.001
18	Arsenic as As	mg/l	APHA 3114 B	0.2	<0.001
19	Total Chromium as Cr	mg/l	APHA 3500Cr B	2.0	<0.05
20	Zinc as Zn	mg/l	APHA 3111 B,C	5.0	<0.05
21	Hexavalent Chromium as Cr <sup>VI</sup>	mg/l	APHA 3500Cr B	0.1	<0.05
22	Vanadium as V	mg/l	APHA 3500-V	0.2	<0.001
23	Total Suspended Solids	mg/l	APHA 2540 D	100	72
24	Temperature	°C	APHA 2550-B	shall not exceed 5°C above the receiving water temperature	34
25	Dissolved Oxygen	mg/l	APHA 2540 C	-	6.9
26	Biochemical Oxygen Demand as BOD	mg/l	APHA 5210 B	30	<1.8
27	Chemical Oxygen Demand as COD	mg/l	APHA 5220-C	250	16.2
28	Oil & Grease	mg/l	APHA 5520 B	10	ND
29	Ammonical Nitrogen as N	mg/l	APHA 4500-NH <sub>3</sub> C	50	ND
30	Total Kjeldahl Nitrogen as N	mg/l	APHA 4500-Norg C	100	3.9
31	Sulphide as S <sup>2-</sup>	mg/l	APHA 4500-S <sub>2</sub> -D	2.0	ND
32	Free Ammonia as NH <sub>3</sub>	mg/l	APHA 4500-NH <sub>3</sub> ,F	5.0	ND
33	Particulate Size of Suspended Solids	mg/l	APHA 2540 D	850 µm IS Sieve	Passes through 850 mm IS Sieve
34	Bio-assay	mg/l	APHA 8910-C	90% survival in 100% effluent	All fishes survive in 96% effluent after 96 hrs
35	Dissolved Phosphates as PO <sub>4</sub>	mg/l	APHA4500-P D	5.0	<0.05

Note: *NO. Cont. Detected.*





Ref.: *Enwlab/20/R-1422*

Date: *06/07/20*

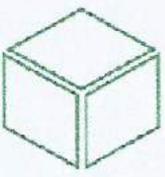
## QUARRY WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF JUNE 2020

1. Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)
2. Sampling location : QW-2: INLET (H-QUARRY) WTP
3. Sampling Date : 11.06 2020
4. Date of Analysis : 12.06.2020 TO 18.06.2020
5. Sample collected by : VCSPL Representative in presence of TATA Representative

Sl.No.	Parameters	Unit	Testing Methods	General Standards for discharge of Environmental Pollutants Part A- Effluents	Analysis Report
1	Colour	Hazen	APHA 2120 B, C	5	CL
2	Odour	--	APHA 2150 B	Unobjectionable	U/O
3	pH at 25°C	--	APHA 4500H <sup>+</sup> B -	5.5-9.0	7.74
4	Total Dissolved Solids	mg/l	APHA 2540 C	-	132
5	Copper as Cu	mg/l	APHA 3111 B,C	3.0	<0.05
6	Fluoride as F	mg/l	APHA 4500F- C	2.0	0.068
7	Total Residual Chlorine	mg/l	APHA 4500Cl, B	1.0	ND
8	Iron as Fe	mg/l	APHA 3500Fe, B	3.0	0.81
9	Manganese as Mn	mg/l	APHA 3500Mn B	2.0	2.9
10	Nitrate as NO <sub>3</sub>	mg/l	APHA 4500 NO <sub>3</sub> E	10.0	2.1
11	Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH	mg/l	APHA 5530 B,D	1.0	<0.001
12	Selenium as Se	mg/l	APHA 3114 B	0.05	<0.001
13	Cadmium as Cd	mg/l	APHA 3111 B,C	2.0	<0.001
14	Cyanide as CN	mg/l	APHA 4500 CN- C,D	0.2	ND
15	Lead as Pb	mg/l	APHA 3111 B,C	0.1	<0.01
16	Mercury as Hg	mg/l	APHA 3500 Hg	0.01	<0.001
17	Nickel as Ni	mg/l	APHA 3500-Ni	3.0	<0.001
18	Arsenic as As	mg/l	APHA 3114 B	0.2	<0.001
19	Total Chromium as Cr	mg/l	APHA 3500Cr B	2.0	<0.05
20	Zinc as Zn	mg/l	APHA 3111 B,C	5.0	<0.05
21	Hexavalent Chromium as Cr <sup>6+</sup>	mg/l	APHA 3500Cr B	0.1	<0.05
22	Vanadium as V	mg/l	APHA 3500-V	0.2	<0.001
23	Total Suspended Solids	mg/l	APHA 2540 D	100	86
24	Temperature	0C	APHA 2550-B	shall not exceed 5 <sup>o</sup> C above the receiving water temperature	34
25	Dissolved Oxygen	mg/l	APHA 2540 C	-	6.8
26	Biochemical Oxygen Demand as BOD	mg/l	APHA 5210 B	30	<1.8
27	Chemical Oxygen Demand as COD	mg/l	APHA 5220-C	250	36
28	Oil & Grease	mg/l	APHA 5520 B	10	ND
29	Ammonical Nitrogen as N	mg/l	APHA 4500-NH <sub>3</sub> ,C	50	ND
30	Total Kjeldahl Nitrogen as N	mg/l	APHA 4500-Norg C	100	0.94
31	Sulphide as S	mg/l	APHA 4500-S <sub>2</sub> -D	2.0	ND
32	Free Ammonia as NH <sub>3</sub>	mg/l	APHA 4500-NH <sub>3</sub> ,F	5.0	ND
33	Particulate Size of Suspended Solids	mg/l	APHA 2540 D	850 μm IS Sieve	Passes through 850 mm IS Sieve
34	Bio-assay	mg/l	APHA 8910-C	90% survival in 100% effluent	All fishes survive in 98% effluent after 96 hrs
35	Dissolved Phosphates as PO <sub>4</sub>	mg/l	APHA4500-P D	5.0	<0.05

Note: ND: Not Detected.





Ref.: Enulab/20/R-1423

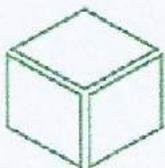
Date: 08/07/20

## AMBIENT NOISE MONITORING REPORT FOR JUNE 2020

1. Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)
2. Monitored by : VCSPL Representative in presence of TATA Representative

Sl. No	Monitoring Date	Name of Location	Unit	Day time Equivalent	Standard As per CPCB	Night time Equivalent	Standard As per CPCB
				Result		Result	
1	23.06.2020	Town ship	dB (A)	69	75	65	70
2		Hospital		46	50	36	40
3		Mines Area		71	75	66	70
4		Railway Sliding		68	75	62	70





Ref.: Kowalab/20PR-1424

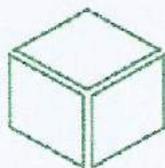
Date: 08/07/20

## PERSONAL DUST SAMPLING ANALYSIS REPORT FOR THE MONTH OF JUNE 2020

Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)  
Sample collected by : VCSPL representative in presence of TATA representative.

Sl.No	Date of sampling	Name of the Person	Personal Number	Standard	Particulate matter as PM (mg/m <sup>3</sup> )
1	22.06.2020	Suresh Naik	TSP/801522/0919	5 mg/m <sup>3</sup>	4.9
2		Kumari Patra	TSP/801276/0919		4.4
3		Laxmi Munda	TSP/775944/0819		4.2
4		Jema Patra	TSP/775945/0819		4.1
5		Rajesh Patra	TSP/785783/0819		4.8
6		Sitara Hessa	TSP/770136/0819		4.9
7		Ajay Das	TSP/770126/0819		4.5
8		Sarjen Kulei	TSP/770178/0819		4.1





Ref.: K01lab/20/R-1425

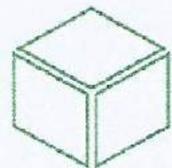
Date: 06/07/20

## FUGITIVE EMISSION ANALYSIS REPORT FOR THE MONTH OF JUNE 2020

1.Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)  
2.Sample Collected By : VCSPL Representative in presence of TATA Representative

L-1	Near Screening Plant	Prescribed Standard	Monitoring Date	Analysis Result
Parameters	Method of Measurement			
SPM	Gravimetric method	1200(mg/m <sup>3</sup> )	21.06.2020	626
L-2	Near Stack Yard (D-Quarry)	Prescribed Standard	Monitoring Date	Analysis Result
Parameters	Method of Measurement			
SPM	Gravimetric method	1200(mg/m <sup>3</sup> )	21.06.2020	578
L-3	Near Sorting Yard (H-Quarry)	Prescribed Standard	Monitoring Date	Analysis Result
Parameters	Method of Measurement			
SPM	Gravimetric method	1200(mg/m <sup>3</sup> )	22.06.2020	544
L-4	Near Sorting Yard (D-Quarry)	Prescribed Standard	Monitoring Date	Analysis Result
Parameters	Method of Measurement			
SPM	Gravimetric method	1200(mg/m <sup>3</sup> )	22.06.2020	568





Ref.: Kaulab/20/R-1426

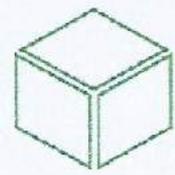
Date: 02/07/20

## DG STACK REPORT FOR THE MONTH OF JUNE 2020

1. Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)
2. Sampling location : ST1: 320 KvA DG Set
3. Date of Analysis : 24.06.2020
4. Sample collected by : VCSPL Representative in presence of TATA Representative

SL.No	Parameters Analyzed	Unit	CPCB LIMIT	Result
1	Stack Temperature	$^{\circ}\text{C}$	.....	148
2	Velocity	m/sec	.....	15.2
3	Concentration Of Particulate Matter As PM	$\text{mg}/\text{Nm}^3$	50	51.6
4	Oxides of Nitrogen as Nox	$\text{mg}/\text{Nm}^3$	400	80
5	Carbon Monoxide as CO	$\text{mg}/\text{Nm}^3$	150	44
6	Non Methyl Hydrocarbon as C	$\text{mg}/\text{Nm}^3$	....	7.9





Ref.: Enufab/20/R-1427

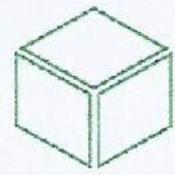
Date: 06/07/20

## DUSTFALL ANALYSIS REPORT FOR THE MONTH OF JUNE 2020

1. Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)
2. Sampling location : DF1: Mines Area
3. Sample collected by : VCSPL Representative in presence of TATA Representative

Date of Sampling	Total Dust Fall (t/km <sup>2</sup> /month)	Analysis Result			
		Co (%)	Ni (%)	Hg (%)	As (%)
01:06.2020 TO 30.06.2020	0.6	<0.001	<0.001	<0.001	<0.001





Ref.: *Kanulab/20/R-1428*

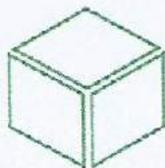
Date: *08/07/20*

## SOIL ANALYSIS REPORT FOR THE MONTH OF JUNE 2020

1. Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)
2. Sampling location : S1: Mines Area
3. Sample collected by : VCSPL Representative in presence of TATA Representative

Date of Sampling	Co (%)	Ni(%)	Hg(%)	As (%)
19.06.2020	0.049	0.062	<0.000002	<0.000002





Ref.: Kamlab/20/R-1429

Date: 06/07/20

## OIL SEPARATION PIT REPORT FOR THE MONTH OF JUNE 2020

1. Name of Industry : Joda West Manganese Mines ( M/s TATA Steel Limited)
2. Sampling location : WW1: Workshop Water
3. Date of Sampling : 13.06.2020
4. Date of Analysis : 15.06.2020 to 22.06.2020
5. Sample collected by : VCSPL Representative in presence of TATA Representative

Sl.	Parameters	Unit	General Standards for discharge of Environmental Pollutants Part A- Effluents	Analysis Report
				June 2020
1	Colour	Hazen	5 -	CL
2	Odour	-	Unobjectionable	U/O
3	pH at 25 degree C	-	5.5-9.0	7.41
4	Total Dissolved Solids	mg/l	-	152
5	Copper as Cu	mg/l	3.0	<0.02
6	Fluoride as F	mg/l	2.0	0.041
7	Total Residual Chlorine	mg/l	1.0	ND
8	Iron as Fe	mg/l	3.0	0.72
9	Manganese as Mn	mg/l	2.0	1.28
10	Nitrate as NO <sub>3</sub>	mg/l	10.0	4.9
11	Phenolic Compounds as C <sub>6</sub> H <sub>5</sub> OH	mg/l	1.0	<0.05
12	Selenium as Se	mg/l	0.05	<0.001
13	Cadmium as Cd	mg/l	2.0	<0.001
14	Cyanide as CN	mg/l	0.2	ND
15	Lead as Pb	mg/l	0.1	<0.01
16	Mercury as Hg	mg/l	0.01	<0.001
17	Nickel as Ni	mg/l	3.0	<0.05
18	Arsenic as As	mg/l	0.2	<0.004
19	Total Chromium as Cr	mg/l	2.0	<0.05
20	Zinc as Zn	mg/l	5.0	<0.05
21	Hexavalent Chromium as Cr <sup>+6</sup>	mg/l	0.1	<0.01
22	Vanadium as V	mg/l	0.2	<0.001
23	Total Suspended Solids	mg/l	100	52
24	Temperature	0C	shall not exceed 5 <sup>o</sup> C above the receiving water temperature	34
25	Dissolved Oxygen	mg/l	-	6.9
26	BOD at 27 <sup>o</sup> C for 3 days	mg/l	30	<1.8
27	COD	mg/l	250	24
28	Oil & Grease	mg/l	10	ND
29	Ammonical Nitrogen as N	mg/l	50	ND
30	Total Kjeldahl Nitrogen as N	mg/l	100	5.2
31	Sulphide as S	mg/l	2.0	ND
32	Free Ammonia as NH <sub>3</sub>	mg/l	5.0	ND
33	Particulate Size of Suspended Solids	mg/l	850 µm IS Sieve	Passes through 850 mm IS Sieve
34	Bio-assay	mg/l	90% survival in 100% effluent	98% survival in 96 HRS effluent
35	Dissolved Phosphates as PO <sub>4</sub>	mg/l	5.0	<0.05

