



**The Addnl. PCCF
Eastern Regional Office
Ministry of Environment, Forests & Climate Change,
Govt. of India
A/3, Chandrasekharpur
Bhubaneswar-751 013 (Odisha)**

MD/ENV/488/110/16

Date: 29.11.2016

Ref: Environmental Clearance letter no. J-11015/63/2008.IA.II(M) dated: 26.11.2010

Sub: Half-yearly compliance status report of Environmental Clearance conditions for the period April'16 - September'16 in respect of Katamati Iron Mine.

Dear Sir,

We are herewith submitting the six monthly compliance reports in respect of the stipulated Environmental Clearance conditions of Katamati Iron Mine for the period from **April'16 - September'16** as per EIA Notification, 2006. We are also sending you the soft copy of the report to your good office on email: mef.or@nic.in for your ready reference.

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

Thanking you,
Yours faithfully,

f: TATA Steel Limited

Atyay Kashyap
f **Head (Planning), OMQ**

Encl : As above

Copy to : The Chairman, Central Pollution Control Board, Southernd Conclave, Block 502, 5th & 6th Floors, 1582 Rajdanga Main Road, Kolkata - 700107 (W. B.)
: The Member Secretary, State Pollution Control Board, Paribesh Bhawan, A/118, Nilkanta Nagar, Unit - VIII, Bhubaneswar - 751012 (Odisha)
: The Regional Officer, State Pollution Control Board, College Road, At/PO-Baniapat, Keonjhar - 758001 (Odisha)

TATA STEEL LIMITED

Mines Division Noamundi 833 217 India

Tel 91 9234301340 Fax 91 6596 290737

Registered Office Bombay House 24 Homi Mody Street Fort Mumbai 400 001 India

Tel 91 22 66658282 Fax 91 22 66657724

Corporate Identity Number L27100MH1907PLC000260 Website www.tatasteel.com

COMPLIANCE REPORT PERIOD: APRIL'2016 - SEPTEMBER'2016

**ENVIRONMENTAL CLEARANCE TO
KATAMATI IRON MINE OF TATA STEEL LIMITED
VIDE MoEF's LETTER NO. J-11015/63/2008.IA.II(M) DATED: 26/11/2010
FOR PRODUCTION OF 8 MTPA (ROM)**

Special Condition:

Sl. No.	Condition	Compliance
1	The project proponent shall obtain Consent to Establish and Consent to Operate from The State Pollution Control Board, Odisha and effectively implement all the conditions stipulated therein	Both Consent to Establish and Consent to Operate has been obtained from State Pollution Control Board, Orissa for production of 8 MTPA (ROM) vide letter nos. 12850/IND-II-NOC-5109 dated: 04.08.2010 & 4811/IND-I-CON-185 dated: 18.03.2016 respectively. The Consent to Operate is valid till 31.03.2021.
2	Environment clearance is subject to grant of Forestry clearance. Necessary Forestry clearance under the Forest (Conservation) Act, 1980 for an area of 199.172 ha forestland involved in the project shall be obtained before starting mining operation in that area. No mining shall be undertaken in the forest area without obtaining requisite prior forestry clearance.	The forest diversion proposal has been submitted on 17.04.2007 over an area of 196.9719 ha (165.7928 ha fresh diversion and 31.1791 ha forest land broken prior to 1980) leaving a safety zone of 2.2001 ha. Now the mining operation is restricted within the non-forest land.
3	Environmental clearance is subject to final order of the Hon'ble Supreme Court of India in the matter of Goa Foundation Vs Union of India in Writ Petition (Civil) No. 460 of 2004, as may be applicable to this project.	There is no National Park, Sanctuaries, Elephant corridor and tiger reserves within 10 Km radius of the core zone. An authenticated map showing distance of all these ecologically sensitive areas from the mine has already been submitted with MoEF, New Delhi.
4	Environmental clearance is subject to obtaining clearance under the Wildlife (Protection) Act, 1972 from the competent authority, as may be applicable to this project.	No specific clearance under the Wildlife (Protection) Act, 1972 is required for the project.
5	The mining operations shall be restricted to above ground water table and it should not intersect the ground water table. In case of working below the ground water table, prior approval of the Ministry of Environment and Forests and the Central Ground Water Authority shall be obtained, for which a detailed hydro-geological study shall be carried out.	Mining operation is restricted above the ground water table. Now the lowest working depth is at 642 m RL and it has been estimated that the ground water level is at a depth of 519 m RL. Detail hydro-geological study was conducted to know the ground water level and the study confirms that, there will be no intersection of ground water table even at the ultimate working depth.
6	The project proponent shall ensure that no natural watercourse and /or water resources shall be obstructed due to any mining operations. Adequate measures shall be taken for conservation and protection of the first order and the second order streams, if any, emanating from	No natural watercourse or water resources are obstructed due to our mining operations. Further, no first order and the second order streams are emanating from the mine lease area.

Sl. No.	Condition	Compliance
	the mine lease area during the course of mining operation.	
7	The top Soil, if any shall temporarily be stored at earmarked site(s) only and it should not be kept unutilized for long. The topsoil shall be used for land reclamation and plantation.	Generation of top soil is very minimal. Whatever top soil is generated, we are keeping the same at the earmarked site(s) only inside the Mining Lease area and it is subsequently used for plantation purpose.
8	The sub grade material, if any shall be stacked at the earmarked sites.	There is proper demarcation of area for storage of sub-grade material and during course of mining, these material are stacked there.
9	The Over burden (OB) generated during the mining operations shall be stacked at earmarked dump site (s) only and it should not be kept active for a long period of time and its phase-wise stabilisation shall be carried out. Partial backfilling proposed after cessation of mining. The maximum height of the OB dump (s) shall not exceed 30m having three terraces of 10m each and the overall slope of the dumps shall not exceed 27 ⁰ . It shall be ensured that the OB dump(s) should be scientifically vegetated with suitable native species to prevent erosion and surface run off. In critical areas, use of geo textiles shall be undertaken for stabilization of the dumps. Monitoring and Management of rehabilitated areas shall continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment & Forests and its Regional Office located at Bhubaneswar on six monthly basis.	Over burden are dumped as per the mining plan and in the earmarked dumping areas only. The slopes of the OB dumps are terraced and the overall slope angle is maintained and not exceeding 27°. The inactive dump slopes are vegetated with native species and grass and vetiver grass for better slope stabilization. The compliance status is being regularly sent to the Regional office, MoEFCC, Bhubaneswar and SPCB, Odisha half yearly. Photographs of Plantation on dumps are attached as Annexure-I.

Sl. No.	Condition	Compliance
10	Catch drains and siltation ponds of appropriate size shall be constructed around the mine working, sub-grade, overburden and mineral dump(s) to prevent run off of water and flow of sediments directly into the Mahadev Nallah, Betlata Nallah, Baitarani River and other water bodies. The water so collected should be utilized for watering the mine area, roads, green belt development etc. The drains shall be regularly de-silted particularly after monsoon maintained properly. Garland drains, settling tanks and check dams of appropriate size, gradient and length shall be constructed around the mine pit, overburden dumps and sub-grade and mineral dump(s) to prevent run off of water and flow of sediments into the Mahadev Nallah, Betlata Nallah, Baitarani River and other water bodies and slump capacity should be designed keeping 50% safety margin over and above peak sudden rainfall (based on 50 years data) and maximum discharge in the area adjoining the mine site. Sump capacity should also provide adequate retention period to allow proper settling of silt material. Sedimentation pits shall be constructed at the corners of the garland drains and desilted at regular intervals	Garland drains of total running meterage of 1077 meters with settling pits, have been made all along the OB dumps to prevent run off of water and flow of sediments directly into the natural stream. Three sedimentation pits of adequate sizes have been constructed at the corners of the garland drains to take care of run-off water even during peak rain fall and they are being de-silted regularly during and after the monsoon. There is no effluent treatment plant as there is no outside discharge of any industrial effluent. Hence, storm water does not go to the effluent treatment plant. All the garland drains, settling pits and check dams of appropriate size, gradient and length been constructed both around the mine pit and over burden dump(s) to prevent run off of water and flow of sediments directly into water bodies. Photographs of toe wall, garland drain and settling pits are attached as Annexure-II .
11	Dimension of retaining wall at the toe of the OB dump(s) and the OB benches within the mine to check run-off and siltation should be based on the rainfall data.	Toe wall and Garland drains have been constructed around the OB dumps to check mine run-off. Size, gradient and length of the drains are adequate to take care of the water during peak rain fall. Photographs of toe wall, garland drain and settling pits are attached as Annexure-II .
12	Trace Metals such as Ni, Co, As and Hg should be analysed 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	We are monitoring trace metals in dust fall and soil samples. The results during the period are attached as Annexure-III .
13	Plantation shall be raised in an area of 370.155 ha including a 7.5m wide green belt in the safety zone around the mining lease, overburden dump(s), backfilled and reclaimed area, mine benches, around water body, roads etc. In consultation with the local DFO/Agriculture Department. The density of the tree should be around 2500 plants per hectare. Greenbelt shall be developed all along the mine lease area in a	Plantation over an area of 370.155 ha shall be attained at the end of mine life through progressive mine closure plan. However, both fencing and plantation over 7.5m wide area around the mining lease is in progress. Besides the above, concurrent reclamation and rehabilitation program have been established in the mining plan. Till September'2016, we have planted 40786 nos. of plants and 15000 grass tufts along roads, vacant places and inactive dump slopes and total plantation was done about

Sl. No.	Condition	Compliance
	phased manner and shall be completed within first five years	40786 nos. Moreover, vetiver plantation is carried out over 0.4 ha with 20000 slips. The density of plants is about 3550 nos. per hectare. Photographs of plantation are attached as Annexure-I .
14	The void left unfilled in an area of 11.2 ha shall be converted into water body. The higher benches of excavated void/mining pit shall be terraced and plantation done to stabilized the slopes. The slope of higher benches shall be made gentler for easy accessibility by local people to use the water body. Peripheral fencing shall be carried out all along the excavated area.	This being the activity at the end of mine life shall be achieved only after complete excavation of Iron ore as per plan.
15	Effective safeguard measures such as regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of particulate matter such as around crushing and screening plant, loading and unloading point and transfer point. Extensive water sprinkling shall be carried out on haul roads. It should be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard.	Regular water sprinkling is being done on the haul roads, loading & unloading points for effective dust suppression. Fixed water sprinklers have been put into operation within the crushing & screening plant for effective dust suppression. We are also installing new fixed water sprinkler of length 1 Km on main haul road. Photographs of Water Sprinkling are attached as Annexure-IV . Ambient Air Quality is being monitored regularly as per the norms stipulated in EC granted to us and the results are well within the prescribed limits. The results are also being sent to the OSPCB office, Bhubaneswar monthly. Ambient Air Quality report is attached as Annexure-V .
16	Regular monitoring of the flow rate of the springs and perennial nallahs flowing in and around the mine lease shall be carried out and records maintained.	Regular monitoring of the flow rate of Balijhor Nallah which is flowing outside of the mining lease area is carried out and record maintained. Flow Rate monitoring result of Balijhor nallah is attached as Annexure-VI .
17	The project authority should implement suitable conservation measures to augment ground water resources in the area in consultation with the Regional Director, Central Ground Water Board.	As a step towards conservation of ground water, it is not being used for mining operation purpose. Further, the rain water collected in the mines pits during monsoon is not pumped out. Rather it is allowed to be collected in the lowest level sumps to augment the ground water resources gradually. Moreover, since we don't have space in our Katamati iron Mien for Rain Water harvesting structure so a state-of-the art rain water harvesting ponds and ground water recharge structures have been constructed in our adjacent Noamundi Iron Mine and they are operational. Photographs of Rain water harvesting structure is attached as Annexure-VII .

Sl. No.	Condition	Compliance
18	Regular monitoring of ground water level and quality should be carried out in and around the mine lease by establishing a network of existing wells and constructing new piezometers during the mining operation. The periodic monitoring at least four times in a year – pre-monsoon (April-May), monsoon (August), post-monsoon (November) and winter (January) once in each season shall be carried out in consultation with the State Ground Water Board/ Central Ground Water Authority and the data thus collected may be sent regularly to the Ministry of Environment and Forests and its Regional Office Bhubaneswar, the Central Ground Water Authority and the Regional Director, Central Ground Water Board. If at any stage, it is observed that the ground water table is getting depleted due to the mining activity; necessary corrective measures shall be carried out.	Ground Water Quality and Ground Water Level are being monitored periodically during four times a year pre-monsoon (April-May), monsoon (August), post-monsoon (November) and winter (January). The results are being sent to Regional office, MoEFCC and SPCB, Odisha half yearly. Since, our mining operations are carried out above the ground water table; there will be no depletion of ground water table because of our mining activity. We also like to mention that because of Rain Water Harvesting structures at our Noamundi Iron Mine, the ground water level has been increased. The monitoring results of Ground water quality & Ground water level are annexed as Annexure-VIII & IX respectively.
19	Appropriate mitigative measures should be taken to prevent pollution of the Baitarani River in consultation with State Pollution Control Board.	Baitarani river is about 18 Km from our mine and is not polluted because of our operation. However, suitable mitigation measures for betterment of overall environment of the area are taken in consultation with the Orissa State Pollution Control Board.
20	The Project proponent shall obtain necessary prior permission of the competent authorities for drawl of requisite quantity of surface water required for the project. The ground water shall not be used for mining operations. Prior approval of Central Ground Water Authority shall be obtained for using ground water.	Application has already been submitted with Water Resource Department, Govt. of Odisha, for drawl of water and the approval is awaited. The present water requirement for the mine for dust suppression is managed from adjacent Noamundi Iron Mine of the Company.
21	Suitable rain water harvesting measures on long term basis shall be planned and implemented in consultation with the Regional Director, Central Ground Water Board.	Water conservation measures are continued. We don't have sufficient approved area for construction of rain water harvesting structure in Katamati Iron Mine. A pond is in use within our botanical park for collection of rain water during monsoon and the same is used for gardening purpose. However, rain water harvesting ponds and ground water recharge structures have been constructed at our Noamundi Iron mine, hiring the expertise of KRG Foundation, Chennai and they are now operational. Photographs of Rain water harvesting structure is shown as Annexure-VII .

Sl. No.	Condition	Compliance
22	Vehicular emission shall be kept under control and regular monitored. Measures shall be taken for maintenance of vehicles used in mining operations and in transportation of mineral. The mineral transportation shall be carried out through the covered trucks only and the vehicles carrying the mineral shall not be overloaded.	Mineral is being transported to Noamundi Processing Plant, which is adjacent to Katamati by 100 ton mining dumpers. Over loading of trucks is restricted to prevent spillage of material. OB/sub-grade is transported and dumped within the lease area and care is also taken to prevent over loading and spillage. Emission checks for all the vehicles are carried out half yearly. The vehicles those who do not meet the emission standard, are withdrawn from operation and maintained properly. A vehicle is kept abeyance from operation till it does not meet the emission standard. Effective water sprinkling is done on haul roads to control fugitive dust.
23	Blasting operation shall be carried out only during the daytime. Controlled blasting shall be practiced. The mitigative measures for control of ground vibrations and to arrest fly rocks and boulders should be implemented.	Blasting is carried out during day time only. Controlled Blasting is carried out for control of ground vibrations and to arrest fly rocks, as per the recommendations of CIMFR, Dhanbad.
24	Drills shall either be operated with Dust extractors or equipped with water injection system.	Wet drilling is in practice. All drills have been provided with dust suppression system. Photograph of wet drilling is shown in Annexure-IV .
25	Mineral handling plant shall be provided with adequate number of high efficiency dust extraction system. Loading and unloading areas including all the transfer points should also have efficient dust control arrangements. These should be properly maintained and operated.	The mineral handling plants are equipped with high efficiency dust extraction systems. Moreover, loading and unloading areas including transfer points have been provided with dust suppression facilities. Further, the dust extraction and suppression system are maintained properly for effective dust control. Photographs of Water Jet System and Water Mist system are shown in Annexure-IV .
26	Sewage treatment plant shall be installed for the colony. ETP shall also be provided for workshop and wastewater generated during mining operation.	There is a common residential colony at Noamundi both for the employees of Katamati Iron Mine & Noamundi Iron Mine. As per the topography of the residential area, installation of single Sewage Treatment Plant is not feasible. However, presently at two locations STP have been installed. STP shall be provided for all sewage water generated from the colony. There is also a common equipment workshop at Noamundi Iron Mine. For waste water from workshop, oil and grease separation pits are provided. Further, no waste water generated from Katamati Iron Mine is discharged outside of the lease and hence requires no treatment. Photographs of STP and Oil & Grease separation pit are attached as Annexure-X .
27	Pre-placement of medical examination and periodical examination of the workers engaged in the project shall be carried out and record maintained. For the purpose, schedule of health examination of the workers should be drawn and followed accordingly.	Pre-placement medical examination and periodical examination of the workers engaged are being conducted & record maintained. The schedule of Periodical Medical Examination is once in every 3 years for the employees of age more than 40 years and once in 5 years for the employees of age less than 40 years.

Sl. No.	Condition	Compliance
28	Effective safeguard measure shall be taken to ensure that the RSPM levels in the area are well below the prescribed standards.	Effective safeguard measure like Mobile & Stationary water sprinkling, dust suppression and extraction systems at loading & unloading point etc. have been provided to minimize fugitive dust emission. Photographs of effective safeguards are shown in Annexure-IV .
29	The height of stack shall be as per the prescribed standards/ guidelines.	There is no dust extraction Stack at present. However, the stack heights of the DG sets are more than the prescribed standards.
30	Trace metals such as Fe, Cr ⁺⁶ , Cu, Se, As, Cd, Hg, Pb, Zn and Mn shall be periodically monitored at specific locations in both surface water downstream and in ground water at lower elevations from mine area, in consultation with the SPCB, Odisha and State Ground Water Board. Suitable treatment measures shall be undertaken in case levels are found to be higher than permissible limits.	Trace metals are being monitored periodically both of surface water and ground water and the monitoring reports are being sent to pollution control board regularly. All parameters are within the prescribed limit. Ground Water Quality and Surface Water Quality results are attached as Annexure-VIII & Annexure-XI respectively.
31	Occupational health programme encompassing identification of hazardous, ranking of the risks, plan to handle such risk should be prepared and implemented effectively.	The mine is certified to both ISO 14001 & OHSAS 18001. Under OHSAS 18001 & DGMS guidelines, hazard identification, risk assessment and measures to minimise risk have been established and are implemented for all activities.
32	The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered flora and fauna namely elephant, sloth bear etc. Found in the study area. Action plan for conservation of flora and fauna prepared shall be implemented in consultation with the state forest and Wildlife Department. All the safeguard measures brought out in the Wildlife Conservation plan prepared specific to this project site shall be effectively implemented. Necessary allocation of funds for implementation of the conservation plan shall be made and the funds for implementation of the conservation plan shall be made and the funds so allocated shall be included in the project cost. A copy of action plan shall be submitted to the Regional Office of the Ministry of Environment and Forests, Bhubaneswar.	Tata Steel is taking all the precautionary measures towards conservation and protection of endangered flora and fauna. The endangered species as, wolf, sloth bear etc. are never seen in the area. However, approved site specific Wild Life Conservation Plan is in place and necessary fund allocation has been made for suitable implementation.
33	Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of	All constructional activities for the project have been completed and there was no requirement for construction of temporary housing since the mine has permanent infrastructural facilities.

Sl. No.	Condition	Compliance
	temporary structures to be removed after the completion of the project.	
34	Digital processing of the entire lease area using remote sensing technique shall be carried out regularly once in three years for monitoring land use pattern and report submitted to Ministry of Environment and Forests and its Regional Office, Bhubaneswar.	Digital processing of the lease area based on high resolution satellite imagery was carried out during 2015 by engagement of the expertise of M/s. ORSAC, GoI. The copy of the land use pattern is attached as Annexure-XII .
35	The critical parameters such as RSPM (Particulate matter with size less than 10 micrometre i.e., PM ₁₀) and NO _x in the ambient Air within the impact zone, peak particle velocity at 300m distance or within the nearest habitation, whichever is closer shall be monitored periodically. Further, quality of discharged water shall also be monitored (TDS, DO, PH, and total suspended Solids (TSS)). The monitored data shall be uploaded on the website of the company as well as displayed on a display board at the project site at a suitable location near the main gate of the company in public domain. The circular No. J-20012/1/2006-IA.II(M) dated: 27.05.2009 issued by Ministry of Environment and Forests, which is available on the website of the Ministry www.envfor.nic.in shall also be referred in this regard for its compliance.	The critical parameters like RSPM (Particulate matter with size less than 10 micrometre i.e., PM ₁₀) & NO _x in ambient air are being monitored regularly and all the results are well within the limits. Peak particle velocity at the time of blasting is also monitored regularly at 300m distance. Quality of discharged water (TDS, DO, pH, and total suspended Solids (TSS)) is also being monitored. All the monitoring data is being uploaded on the Company's website as part of this report and also as per the circular No. J-20012/1/2006-IA.II(M) dated: 27.05.2009 issued by Ministry of Environment and Forests, all the monitoring data is being displayed on the display board at the main entrance gate of the mine. Monitoring data is attached as Annexure-V .
36	A final Mine closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval.	A progressive mine closure plan approved by IBM is in place. The final mine closure plan along with details of Corpus fund will be submitted to the Ministry of Environment & Forests 5 years in advance.

General Condition:

Sl. No.	Condition	Compliance
1	No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forests.	We are operating as per the approved mining technology and scope of working mentioned in Environmental Clearance granted to us and No change in mining technology and scope of working shall be made and adhered to the condition of MoEFCC.

Sl. No.	Condition	Compliance															
2	No change in the calendar plan including excavation, quantum of iron ore and waste produced should be made.	<p>Calendar plan (IBM Approved Mining Plan) prepared for the mine is being strictly adhered to and we are well within the limits specified in Mining Plan as well as EC and CTO granted capacity.</p> <p>The production achieved (in Lakh Tonn) during 2016-17 (Till Sep'16) is as given below.</p> <table border="1" data-bbox="837 483 1543 685"> <thead> <tr> <th></th> <th>Plan</th> <th>Actual</th> </tr> </thead> <tbody> <tr> <td>ROM</td> <td>38.50</td> <td>14.90</td> </tr> <tr> <td>OB, Waste</td> <td>2.50</td> <td>1.95</td> </tr> <tr> <td>Sub-Grade</td> <td>5.35</td> <td>1.872</td> </tr> <tr> <td>Total Excavation</td> <td>46.40</td> <td>18.72</td> </tr> </tbody> </table>		Plan	Actual	ROM	38.50	14.90	OB, Waste	2.50	1.95	Sub-Grade	5.35	1.872	Total Excavation	46.40	18.72
	Plan	Actual															
ROM	38.50	14.90															
OB, Waste	2.50	1.95															
Sub-Grade	5.35	1.872															
Total Excavation	46.40	18.72															
3	At least four ambient air quality- monitoring stations should be established in the core zone as well as in the buffer zone for RSPM (Particulate matter with size less than 10micron i.e., PM ₁₀) and , NOx monitoring. Location of the stations should be decided based on the meteorological data, topographical features, and environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the State Pollution Control Board. .	<p>Ambient air quality monitoring is regularly being carried out at four different stations within the core zone, which were located in consultation with the visiting officers of State Pollution control Board, Bhubaneswar.</p> <p>The ambient air quality reports are being submitted to Regional office, MoEFCC, Bhubaneswar half yearly and to SPCB, Bhubaneswar monthly. Ambient Air Quality report is attached as Annexure-V.</p>															
4	Data on ambient air quality [RSPM(Particulate matter with size less than 10micron i.e., PM ₁₀) and , NOx] should be regularly submitted to the Ministry including its Regional Office at Bhubaneswar and to the State Pollution Control Board/ Central Pollution Control Board once in six months.	RSPM (Particulate matter with size less than 10 micron i.e., PM ₁₀) and , NOx in ambient air are being monitored as per standard guidelines and the reports are submitted to Regional office, MoEFCC, Bhubaneswar and SPCB, Odisha half yearly. Ambient Air Quality report is attached as Annexure-V .															
5	Fugitive dust emissions from all the sources should be controlled regularly. Water spraying arrangements on haul roads, loading and unloading and at transfer points should be provided and properly maintained.	Effective water sprinkling is being done on haul roads and at loading and unloading points. Dust suppression systems in the drills have been provided for functioning effectively. All the effective safeguards are shown in Annexure-IV .															
6	Measures should be taken for control of noise levels below 85dBA in the work environment. Workers engaged in operations of HEMM etc. should be provided with ear plugs/ muffs.	Suitable and proper measures are being taken for control of noise levels below 85 dBA in the work environment. High noise areas are earmarked and people working there are provided with ear protection equipment. All the HEMM's cabin is air conditioned so that there won't be any noise pollution. Regular noise monitoring is being done. People engaged in noisy operations are administered audiometric test annually. Effective safeguards for Noise Pollution and Noise Monitoring Data are attached as Annexure-XIII & XIV respectively.															

Sl. No.	Condition	Compliance
7	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 th May 1993 and 31 st December, 1993 or as amended from time to time. Oil and grease trap and retention ponds should be installed before discharge of workshop effluents.	The common facility for equipment maintenance for both the Noamundi and Katamati Iron Mines, exists at Noamundi. Oil & Grease separation pits have been provided there, to take care of effluents from the workshop. Its water quality is being monitored regularly and the parameters meet the prescribed standard. There is no waste water discharge from the mine. Photographs of Oil & Grease separation pit are shown in Annexure-X . The result of the workshop effluent is enclosed as Annexure-XV .
8	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. 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	Adequate dust masks are provided to employees engaged in dusty areas. It is also ensured that they use the same. Respirable dust survey is carried out at different locations. Periodical Medical Examination of employees and contractor workers are organized regularly to observe any contractions due to exposure to dust and other occupational hazards. Employees also undergo Lung Function Tests during the Periodical Medical Examination. No reportable disease has been found. The employees are also given regular awareness training on safety and health aspects as part of implementation process of OHSAS-18001 systems.
9	A separate Environment 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 Organisation	A separate environmental management cell is in place with the people having relevant qualification on environmental science. The Head of the environment department reports to General Manager i.e. the head of the organization.
10	The funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purposes. Year-wise expenditure should be reported to the Ministry and its Regional Office located at Bhubaneswar	Funds allocated for environmental management are spent only for environment related purposes and not diverted to any other purpose. During the year 2015-16 an amount of Rs.524.82 lakhs(approx.) was spent towards environmental protection measures at Katamati Iron Mine. Details of Expenditure are attached as Annexure-XVI .
11	The Project authorities should inform to the Regional Office located at Bhubaneswar regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.	This is a running mine. No specific date of start of land development work can be assigned. However, the copy of the Environmental Clearance has been sent to the Regional Office, MoEFCC, Bhubaneswar for necessary information.
12	The Regional Office of this Ministry located at Bhubaneswar shall monitor compliance of the stipulated conditions. The Project authorities should extend full co-operation to the officer (s) of the Regional Office by furnishing the requisite data/ information/ monitoring reports	We extend full co-operation to the officers of the Regional Office during their visit and furnish the required data, information and monitoring reports.

Sl. No.	Condition	Compliance
13	The Project proponent shall submit six monthly reports on the status of compliance of the stipulated environmental clearance conditions including results of monitored data (both in hard copies as well as by e-mail) to the Ministry of Environment and Forests, its Regional Office, Bhubaneswar, the respective Zonal office of Central Pollution Control Board and the State Pollution Control Board. The Proponent shall upload the status of compliance of the environmental clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the Ministry of Environment and Forests, Bhubaneswar, the respective zonal officer of Central Pollution Control Board and the State Pollution Control Board.	Six monthly compliance reports are being submitted regularly on the status of implementation of the stipulated environmental safeguards to the MoEFCC, its Regional Office Bhubaneswar, Central Pollution Control Board Kolkata and State Pollution Control Board, Bhubaneswar. Last six monthly compliance report submitted vide letter No. MD/ENV/190/110/16, dated: 24.05.2016. Further, the six monthly compliance reports along with the monitoring results is being uploaded on Tata Steel's website www.tatasteelindia.com and updated periodically.
14	A copy of the clearance letter shall be sent by the proponent to the concerned Panchayat, Zila Parisad/ Municipal Corporation, Urban Local Body and the local NGO, if any, from whom suggestions/representations, if any, were received while processing the proposal. The clearance letter shall also be put on the website of the company by the proponent.	A copy each of Environment Clearance has been sent to the Sarpanch, Deojhar Gram Panchayat, Sarpanch, Ansaikala Gram Panchayat, and President, Zila Parisad, Keonjhar on 1 st December 2010. EC letter has been uploaded on the Tata Steel website www.tatasteelindia.com .
15	The State Pollution Control Board should display a copy of the clearance letter at the Regional office, District Industry Centre and the Collector's office/ Tehsildar's Office for 30 days.	Complied from State Pollution Control Board, Bhubaneswar.
16	The environment statement for each financial year ending 31 st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as mentioned subsequently, shall also be put on the website of the company along with the status of compliance of Environmental clearance conditions and shall also be sent to the respective Regional Office of the Ministry of Environment and Forests, Bhubaneswar by e-mail.	The environmental statement for financial year 2015-16 has been submitted to the State Pollution Control Board on vide letter no. MD/ENV/394/120/16 dated: 29.09.2016 and the same had been hosted on Company's website www.tatasteelindia.com . Further, compliance status on environmental clearance conditions was also sent to the Regional Office of the Ministry of Environment and Forests, Bhubaneswar by e-mail on 30.05.2015.

Sl. No.	Condition	Compliance
17	The project authority should advertise at least in two local newspapers widely circulated, one of which shall be in the vernacular language of the locality concerned, within 7 days of the issue of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and also at web site of the Ministry of Environment and Forests at http://envfor.nic.in and a copy of the same should be forwarded to the Regional Office of this Ministry located at Bhubaneswar.	Details of Environment Clearance with regard to Katamati Iron Mine were published both in English and Hindi in local newspapers named “The Hindustan Times” and “Dainik Jagran” respectively on 15.06.2013. The copy of the newspaper advertisement was sent to the Regional Office, MoEFCC, Bhubaneswar vide our letter no. MD/ENV/245A/101/2013 dated: 19.06.2013.

Annexure-I: Dump Plantation



Annexure-II: Toe Wall, Garland Drain & Settling Pits



Annexure-III: Dust Fall Quality Report (As per BIS 10500:1991) (April'16-September'16)



Visiontek Consultancy Services Pvt.Ltd.

(An Enviro Engineering Consulting Cell)



Ref.: VCSPL/16/R-178

Date.: 07.07.2016

DUST FALL MONITORING REPORT FOR THE MONTH OF JUNE-2016

1. Name of Industry : **Katamati Iron Mines (M/s TATA Steel Limited)**
2. Sample collected by : VCSPL Representative in presence of TATA Representative

Sl No.	Parameters	Unit	Analysis Results
			DF-1
1.	Nickel as Ni	%	0.017
2.	Cobalt as Co	%	0.009
3.	Mercury as Hg	%	<0.001
4.	Arsenic as As	%	<0.001
5.	Iron as Fe	%	0.62

Total Dust fall for the month of June-2016=0.76t/km²/month



For Visiontek Consultancy Services Pvt. Ltd.

Annexure-IV: Effective safeguard measures of Air Quality



Mobile Water Sprinkler



Fixed Water Sprinkler



Water Jet System at Unloading Point



Water Mist System in Plant



Wet Drilling



Covered Conveyor

Annexure-V: Ambient Air Quality Report of Katamati Iron Mine (April'16-September'16)

Core Zone

Month	Near Office					Near Plant Site					Near Mining Site					Near Slime Dam				
	PM ₁₀	PM _{2.5}	SO ₂	NO _x	CO	PM ₁₀	PM _{2.5}	SO ₂	NO _x	CO	PM ₁₀	PM _{2.5}	SO ₂	NO _x	CO	PM ₁₀	PM _{2.5}	SO ₂	NO _x	CO
Apr'16	63.09	37.94	5.16	13.26	0.24	61.19	36.71	5.03	12.39	0.24	58.31	33.77	4.59	11.89	0.19	56.93	31.41	4.19	10.76	0.18
May'16	63.36	34.96	5.17	12.73	0.23	60.84	35.26	4.79	11.78	0.22	58.01	32.41	4.27	11.22	0.18	58.18	31.34	4.36	11.04	0.17
Jun'16	55.51	29.34	4.81	11.16	0.20	55.14	29.04	4.76	10.80	0.20	53.33	27.06	4.44	10.80	0.19	55.84	28.85	4.46	10.85	0.15
Jul'16	37.26	17.91	4.00	9.21	0.13	37.34	17.73	4.00	9.17	0.13	39.62	19.27	4.03	9.49	0.14	35.99	17.09	4.00	9.11	0.13
Aug'16	33.29	15.99	4.13	9.50	0.13	31.56	15.40	4.00	9.21	0.11	35.00	16.91	4.20	9.73	0.13	31.67	15.23	4.03	9.14	0.12
Sep'16	34.18	16.29	4.19	9.82	0.13	30.91	14.49	4.00	9.11	0.11	35.68	17.31	4.30	9.92	0.13	32.60	15.43	4.12	9.40	0.12

Buffer Zone

Month	Kankura					Kitabeda					Mirelbera					Balita				
	PM ₁₀	PM _{2.5}	SO ₂	NO _x	CO	PM ₁₀	PM _{2.5}	SO ₂	NO _x	CO	PM ₁	PM _{2.5}	SO ₂	NO _x	CO	PM ₁₀	PM _{2.5}	SO ₂	NO _x	CO
Apr'16	58.00	31.60	4.60	10.80	0.16	46.60	24.65	4.00	10.00	0.14	50.05	26.70	4.00	9.75	0.13	50.15	26.50	4.10	10.50	0.13
May'16	58.05	31.10	4.50	10.50	0.17	47.90	25.25	4.00	9.80	0.14	48.10	24.80	4.00	9.65	0.14	48.10	24.65	4.00	9.75	0.13
Jun'16	49.3	24.25	4.10	10.05	0.14	44.10	21.80	4.00	9.10	0.12	46.00	23.05	4.00	9.25	0.13	47.60	23.65	4.00	9.40	0.14
Jul'16	29.85	13.80	4.00	9.00	0.12	31.70	14.40	4.00	9.00	0.11	34.40	16.55	4.00	9.00	0.12	35.60	17.00	4.00	9.00	0.12
Aug'16	27.15	13.20	4.00	9.00	0.10	28.65	13.95	4.00	9.00	0.10	29.00	13.85	4.00	9.00	0.10	29.40	14.20	4.00	9.00	0.10
Sep'16	27.15	13.20	4.00	9.00	0.10	28.65	13.95	4.00	9.00	0.10	29.00	13.85	4.00	9.00	0.10	29.40	14.20	4.00	9.00	0.10

Unit of measurement for all parameters except CO is $\mu\text{g}/\text{m}^3$. Co is in mg/m^3

Debraj
Lab-in-charge

Annexure-VI: Flow Rate of Balijhor Nallah (April'16-September'16)

Parameters	Apr'16	May'16	Jun'16	Jul'16	Aug'16	Sep'16	Limit
BOD mg/l	1.30	1.25	1.15	1.25	1.60	1.30	20
TSS mg/l	12.05	15.50	14.70	29.70	31.65	51.55	100
Flow Rate Cum/hr	30.00	38.50	35.50	66.00	69.00	80.50	

There is no any industrial effluents discharge from the mine.

Jitendra
Lab-in-charge

Annexure-VII: Rain Water Harvesting Structures



RWH at Balijore camp



RWH at Central camp

Annexure-VIII: Ground Water Quality Report (As per BIS 10500:1991) (April'16-September'16)



Visiontek Consultancy Services Pvt.Ltd.

(An Enviro Engineering Consulting Cell)



ISO 14001:2004
ISO 9001:2008
OHSAS 18001:2008

Ref.: **VCSPL/16/R-522**

Date: **07-07-2016**

GROUND WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF JUNE-2016

1. Name of Industry : **Katamati Iron Mines (M/s TATA Steel Limited)**
2. Sampling location : **GW-1: Talasai Village;
GW-2: Kitabeda Village.**
3. Date of sampling : **30.06.2016**
4. Date of analysis : **01.07.2016 to 05.07.2016**
5. Sample collected by : **VCSPL Representative in presence of TATA Representative**

Sl. No	Parameter	Testing Methods	Unit	Standard as per IS - 10500:1991	Analysis Results	
					GW-1	GW-2
Essential Characteristics						
1	Colour	APHA 2120 B, C	Hazen	5	CL	CL
2	Odour	APHA 2150 B	--	U/O	U/O	U/O
3	Taste	APHA 2160 C	--	Agreeable	AL	AL
4	Turbidity	APHA 2130 B	NTU	5	<2	<2
5	pH Value	APHA 4500H ⁺ B	--	6.5-8.5	7.3	7.4
6	Total Hardness (as CaCO ₃)	APHA 2340 C	mg/l	300	128.0	136.0
7	Iron (as Fe)	APHA 3500Fe, B	mg/l	0.3	0.18	0.2
8	Chloride (as Cl)	APHA 4500Cl B	mg/l	250	28.0	34.0
9	Residual, free Chlorine	APHA 4500Cl, B	mg/l	0.2	ND	ND
Desirable Characteristics						
10	Dissolved Solids	APHA 2540 C	mg/l	500	188.0	205.0
11	Calcium (as Ca)	APHA 3500Ca B	mg/l	75	35.3	37.7
12	Magnesium (as Mg)	APHA 3500Mg B	mg/l	30	9.7	10.2
13	Copper (as Cu)	APHA 3111 B,C	mg/l	0.05	<0.001	<0.001
14	Manganese (as Mn)	APHA 3500Mn B	mg/l	0.1	<0.001	<0.001
15	Sulphate (as SO ₄)	APHA 4500 SO ₄ ²⁻ E	mg/l	200	6.2	5.8
16	Nitrate (as NO ₃)	APHA 4500 NO ₃ E	mg/l	45	2.1	1.8
17	Fluoride (as F)	APHA 4500F C	mg/l	1.0	0.014	0.012
18	Phenolic Compounds (as C ₆ H ₅ OH)	APHA 5530 B,D	mg/l	0.001	<0.001	<0.001
19	Mercury (as Hg)	APHA 3500 Hg	mg/l	0.001	<0.001	<0.001
20	Cadmium (as Cd)	APHA 3111 B,C	mg/l	0.01	<0.001	<0.001
21	Selenium (as Se)	APHA 3114 B	mg/l	0.01	<0.001	<0.001
22	Arsenic (as As)	APHA 3114 B	mg/l	0.05	<0.001	<0.001
23	Cyanide (as CN)	APHA 4500 CN C,D	mg/l	0.05	ND	ND
24	Lead (as Pb)	APHA 3111 B,C	mg/l	0.05	<0.01	<0.01
25	Zinc (as Zn)	APHA 3111 B,C	mg/l	5	<0.05	<0.05
26	Anionic Detergents (as MBAS)	APHA 5540 C	mg/l	0.2	<0.2	<0.2
27	Chromium (as Cr ⁶⁺)	APHA 3500Cr B	mg/l	0.05	<0.05	<0.05
28	Mineral Oil	APHA 5220 B	mg/l	0.01	<0.001	<0.001
29	Alkalinity	APHA 2320 B	mg/l	200	111.0	118.0
30	Aluminium (as Al)	APHA 3500Al B	mg/l	0.03	<0.001	<0.001
31	Boron (as B)	APHA 4500B, B	mg/l	1	<0.001	<0.001
32	Poly Aromatic Hydrocarbon as PAH	APHA 6440 B	µg/l	--	<0.0001	<0.0001
33	Pesticide	APHA 6630 B,C	mg/l	Absent	Absent	Absent
34	Total Coli form	APHA 9221 B	MPN/100 ml	Not more than 10MPN/100 ml	<2	<2

Note: CL : Colourless, AL: Agreeable, U/O : Unobjectionable, ND: Not Detected.



For Visiontek Consultancy Services Pvt. Ltd.

Plot No-108, District Centre, Chandrasekharpur, Bhubaneswar-16, Tel-91-674-2744594, 3250790
Email: visiontekin@gmail.com, visiontekin@yahoo.co.in, visiontek@vcspl.org, Visit us at: www.vcspl.org

"Committed For The Better Environment"

Annexure-VIII: Ground Water Quality Report (As per BIS 10500:1991) (April'16-September'16)...Cont.



Visiontek Consultancy Services Pvt.Ltd.

(An Enviro Engineering Consulting Cell)



ISO 14001:2004
ISO 9001:2008
OHSAS 18001:2007

Ref.: VCSPL/16/R-968

Date: 03.10.2016

GROUND WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF SEPTEMBER-2016

1. Name of Industry : **Katamati Iron Mines (M/s TATA Steel Limited)**
2. Sampling location : **GW-1: Talasai Village;
GW-2: Kitabeda Village.**
3. Date of sampling : **16.09.2016**
4. Date of analysis : **17.09.2016 to 23.09.2016**
5. Sample collected by : **VCSPL Representative in presence of TATA Representative**

Sl. No	Parameter	Testing Methods	Unit	Standard as per IS - 10500:1991	Analysis Results	
					GW-1	GW-2
Essential Characteristics						
1	Colour	APHA 2120 B, C	Hazen	5	CL	CL
2	Odour	APHA 2150 B	--	U/O	U/O	U/O
3	Taste	APHA 2160 C	--	Agreeable	AL	AL
4	Turbidity	APHA 2130 B	NTU	5	<2	<2
5	pH Value	APHA 4500H ⁺ B	--	6.5-8.5	7.3	7.2
6	Total Hardness (as CaCO ₃)	APHA 2340 C	mg/l	300	134.0	132.0
7	Iron (as Fe)	APHA 3500Fe, B	mg/l	0.3	0.2	0.22
8	Chloride (as Cl ⁻)	APHA 4500Cl ⁻ B	mg/l	250	32.0	37.0
9	Residual, free Chlorine	APHA 4500Cl ₂ B	mg/l	0.2	ND	ND
Desirable Characteristics						
10	Dissolved Solids	APHA 2540 C	mg/l	500	206.0	203.0
11	Calcium (as Ca)	APHA 3500Ca B	mg/l	75	38.5	37.7
12	Magnesium (as Mg)	APHA 3500Mg B	mg/l	30	9.2	9.2
13	Copper (as Cu)	APHA 3111 B,C	mg/l	0.05	<0.05	<0.05
14	Manganese (as Mn)	APHA 3500Mn B	mg/l	0.1	<0.005	<0.005
15	Sulphate (as SO ₄)	APHA 4500 SO ₄ ²⁻ E	mg/l	200	6.8	6.2
16	Nitrate (as NO ₃)	APHA 4500 NO ₃ ⁻ E	mg/l	45	2.5	2.2
17	Fluoride (as F)	APHA 4500F C	mg/l	1.0	0.13	0.13
18	Phenolic Compounds (as C ₆ H ₅ OH)	APHA 5530 B,D	mg/l	0.001	<0.001	<0.001
19	Mercury (as Hg)	APHA 3500 Hg	mg/l	0.001	<0.001	<0.001
20	Cadmium (as Cd)	APHA 3111 B,C	mg/l	0.01	<0.001	<0.001
21	Selenium (as Se)	APHA 3114 B	mg/l	0.01	<0.001	<0.001
22	Arsenic (as As)	APHA 3114 B	mg/l	0.05	<0.001	<0.001
23	Cyanide (as CN)	APHA 4500 CN ⁻ C,D	mg/l	0.05	ND	ND
24	Lead (as Pb)	APHA 3111 B,C	mg/l	0.05	<0.01	<0.01
25	Zinc (as Zn)	APHA 3111 B,C	mg/l	5	0.08	0.07
26	Anionic Detergents (as MBAS)	APHA 5540 C	mg/l	0.2	<0.2	<0.2
27	Chromium (as Cr ^{VI})	APHA 3500Cr B	mg/l	0.05	<0.05	<0.05
28	Mineral Oil	APHA 5220 B	mg/l	0.01	<0.01	<0.01
29	Alkalinity	APHA 2320 B	mg/l	200	120.0	121.0
30	Aluminium as(Al)	APHA 3500Al B	mg/l	0.03	<0.001	<0.001
31	Boron (as B)	APHA 4500B, B	mg/l	1	<0.01	<0.01
32	Poly Aromatic Hydrocarbon as PAH	APHA 6440 B	µg/l	--	<0.0001	<0.0001
33	Pesticide	APHA 6630 B,C	mg/l	Absent	Absent	Absent
34	Total Coli form	APHA 9221 B	MPN/100 ml	Not more than 10MPN/100 ml	<2	<2

Note: CL : Colourless, AL: Agreeable, U/O : Unobjectionable, ND: Not Detected.

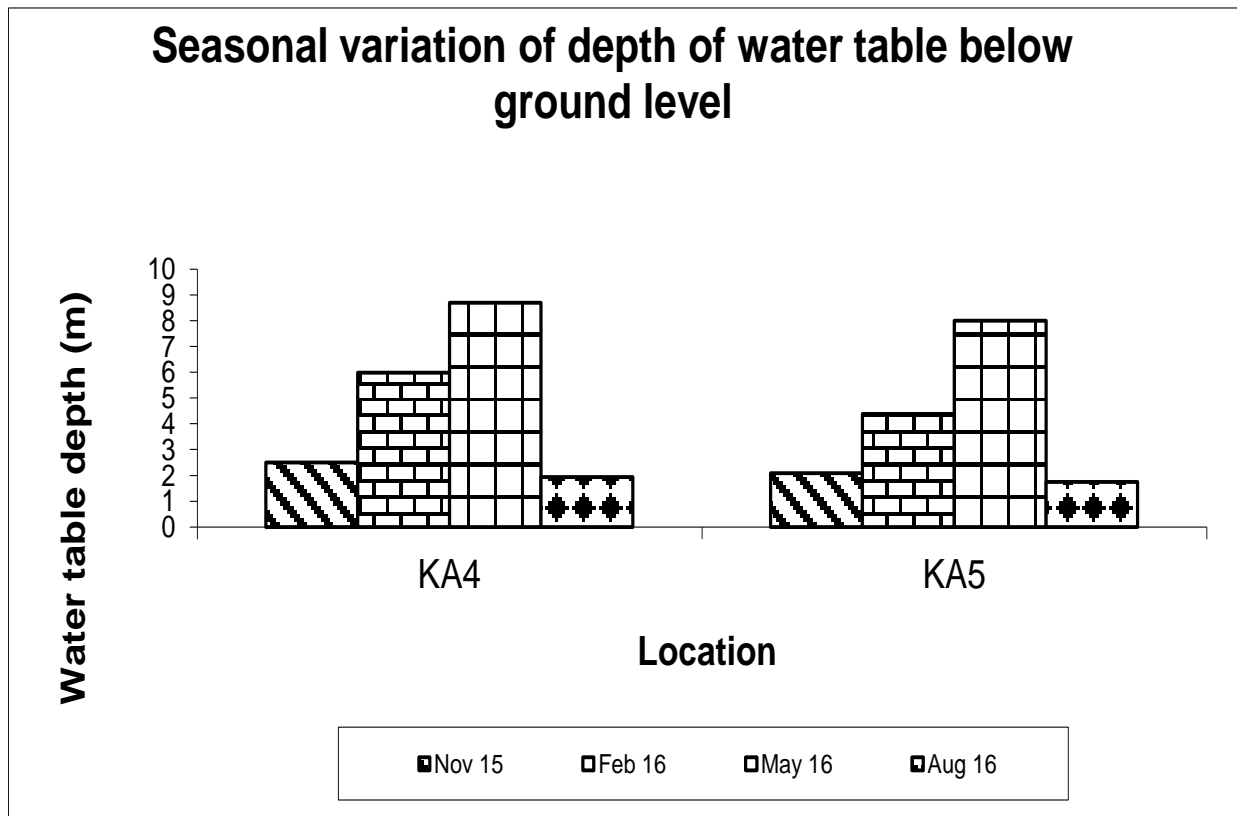
For Visiontek Consultancy Services Pvt. Ltd.



Plot No-108, District Centre, Chandrasekharpur, Bhubaneswar-16, Tel-91-674-44594, 3254500
Email: visiontekin@gmail.com, visiontekin@yahoo.co.in, visiontek@vcspl.org, Visiontek@vcspl.org

"Committed For The Better Environment"

Annexure-IX: Ground Water Level (Katamati Iron Mine) (April'16-September'16)



KA4 – Well at Talasahi, Murga

KA5 – Well at Rabrusai, Mahadevnasa

Dubrota
Lab-in-charge

Annexure-X: Sewage Treatment Plant and Oil & Grease Separation Pit



Sewage Treatment Plant



Oil & Grease Separation Pit

Annexure-XI: Surface Water Quality Report (As per BIS 10500:1991) (Aprli'16-September'16)

**KATAMATI IRON MINES
TATA STEEL LIMITED**


Environmental Monitoring Report

SURFACE WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF APRIL-2016

1. Name of Industry : M/s TATA Steel Limited;
Katamati Iron Mines; Odisha.
2. Sampling location : SW-1: Jojo Spring Water;
SW-2: Jojo Nallah.
3. Date of sampling : 19.04.2016
4. Date of analysis : 20.04.2016 to 26.04.2016
5. 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	
					SW-1	SW-2
1	Dissolved Oxygen (minimum)	APHA 2540 C	mg/l	4	5.4	5.2
2	BOD (3) days at 27°C (max)	APHA 5210 B	mg/l	3	2.0	2.2
3	Total Coli form	APHA 9221 B	MPN/100 ml	5000	120	120
4	pH Value	APHA 4500H ⁺ B	--	6.0-9.0	6.8	6.9
5	Colour (max)	APHA 2120 B, C	Hazen	300	CL	CL
6	Total Dissolved Solids	APHA 2540 C	mg/l	1500	78.0	80.0
7	Copper as Cu (max)	APHA 3111 B,C	mg/l	1.5	<0.001	<0.001
8	Iron as Fe (max)	APHA 3500Fe, B	mg/l	0.5	0.4	0.44
9	Chloride (max)	APHA 4500Cl ⁻ B	mg/l	600	14.0	14.0
10	Sulphates (SO ₄) (max)	APHA 4500 SO ₄ ²⁻ E	mg/l	400	2.3	2.5
11	Nitrate as NO ₃ (max)	APHA 4500 NO ₃ ⁻ E	mg/l	50	1.1	0.9
12	Fluoride as F (max)	APHA 4500F ⁻ C	mg/l	1.5	0.06	0.06
13	Phenolic Compounds as C ₆ H ₅ 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	<0.001	<0.001
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	<0.001	<0.001
17	Cyanide as CN (max)	APHA 4500 CN ⁻ 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 ⁺⁶	APHA 3500Cr B	mg/l	0.05	<0.05	<0.05
21	Anionic Detergents (max)	APHA 5540 C	mg/l	1.0	<0.2	<0.2
22	Mercury as Hg	APHA 3500 Hg	mg/l	--	<0.001	<0.001
23	Manganese as Mn	APHA 3500 Mn B	mg/l	--	<0.005	<0.005

Note:CL: Colourless, ND: Not Detected.


B. K. Mishra, B.Sc. Engg. (Chem)
GOVT. ANALYST
 (GAZETTE No. 834 Dt. 12-04-2013)
 For Visiontek Consultancy Services Pvt. Ltd.

Annexure-XI: Surface Water Quality Report (As per BIS 10500:1991) (Aprli'16-September'16).....cont.



Visiontek Consultancy Services Pvt.Ltd.

(An Enviro Engineering Consulting Cell)



ISO 14001:2004
ISO 9001:2008
OHSAS 18001:2007

Ref.: VCSP/L/16/R-521

Date: 07.07.2016

SURFACE WATER QUALITY ANALYSIS REPORT FOR THE MONTH OF JUNE-2016

1. Name of Industry : **Katamati Iron Mines (M/s TATA Steel Limited)**
2. Sampling location : **SW-1: Jojo Spring Water;
SW-2: Jojo Nallah.**
3. Date of sampling : 20.06.2016
4. Date of analysis : 21.06.2016 to 27.06.2016
5. 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	
					SW-1	SW-2
1	Dissolved Oxygen (minimum)	APHA 2540 C	mg/l	4	6.1	6.2
2	Total Suspended Solids as TSS	APHA 2540 D	mg/l	--	11.0	34.0
3	BOD (3) days at 27°C (max)	APHA 5210 B	mg/l	3	1.8	2.1
4	Chemical Oxygen Demand as COD	APHA 5220-C	mg/l	--	6.0	17.0
5	Total Coli form	APHA 9221 B	MPN/100 ml	5000	120	210
6	pH Value	APHA 4500H ⁺ B	--	6.0-9.0	6.6	6.9
7	Colour (max)	APHA 2120 B, C	Hazen	300	CL	4
8	Total Dissolved Solids	APHA 2540 C	mg/l	1500	82.0	86.0
9	Copper as Cu (max)	APHA 3111 B,C	mg/l	1.5	<0.001	<0.001
10	Iron as Fe (max)	APHA 3500Fe, B	mg/l	0.5	0.44	0.48
11	Chloride (max)	APHA 4500Cl ⁻ B	mg/l	600	14.0	16.0
12	Sulphates (SO ₄) (max)	APHA 4500 SO ₄ ²⁻ E	mg/l	400	2.3	2.4
13	Nitrate as NO ₃ (max)	APHA 4500 NO ₃ ⁻ E	mg/l	50	0.82	1.1
14	Fluoride as F (max)	APHA 4500F ⁻ C	mg/l	1.5	0.042	0.046
15	Phenolic Compounds as C ₆ H ₅ OH (max)	APHA 5530 B,D	mg/l	0.005	<0.001	<0.001
16	Cadmium as Cd (max)	APHA 3111 B,C	mg/l	0.01	<0.001	<0.001
17	Selenium as Se (max)	APHA 3114 B	mg/l	0.05	<0.001	<0.001
18	Arsenic as As	APHA 3114 B	mg/l	0.2	<0.001	<0.001
19	Cyanide as CN (max)	APHA 4500 CN ⁻ C,D	mg/l	0.05	ND	ND
20	Lead as Pb(max)	APHA 3111 B,C	mg/l	0.1	<0.01	<0.01
21	Zinc as Zn(max)	APHA 3111 B,C	mg/l	15	<0.05	<0.05
22	Hexa Chromium as Cr ⁺⁶	APHA 3500Cr B	mg/l	0.05	<0.05	<0.05
23	Anionic Detergents (max)	APHA 5540 C	mg/l	1.0	<0.2	<0.2
24	Mercury as Hg	APHA 3500 Hg	mg/l	--	<0.001	<0.001
25	Manganese as Mn	APHA 3500 Mn B	mg/l	--	<0.005	<0.005

Note: CL: Colourless, ND: Not Detected.

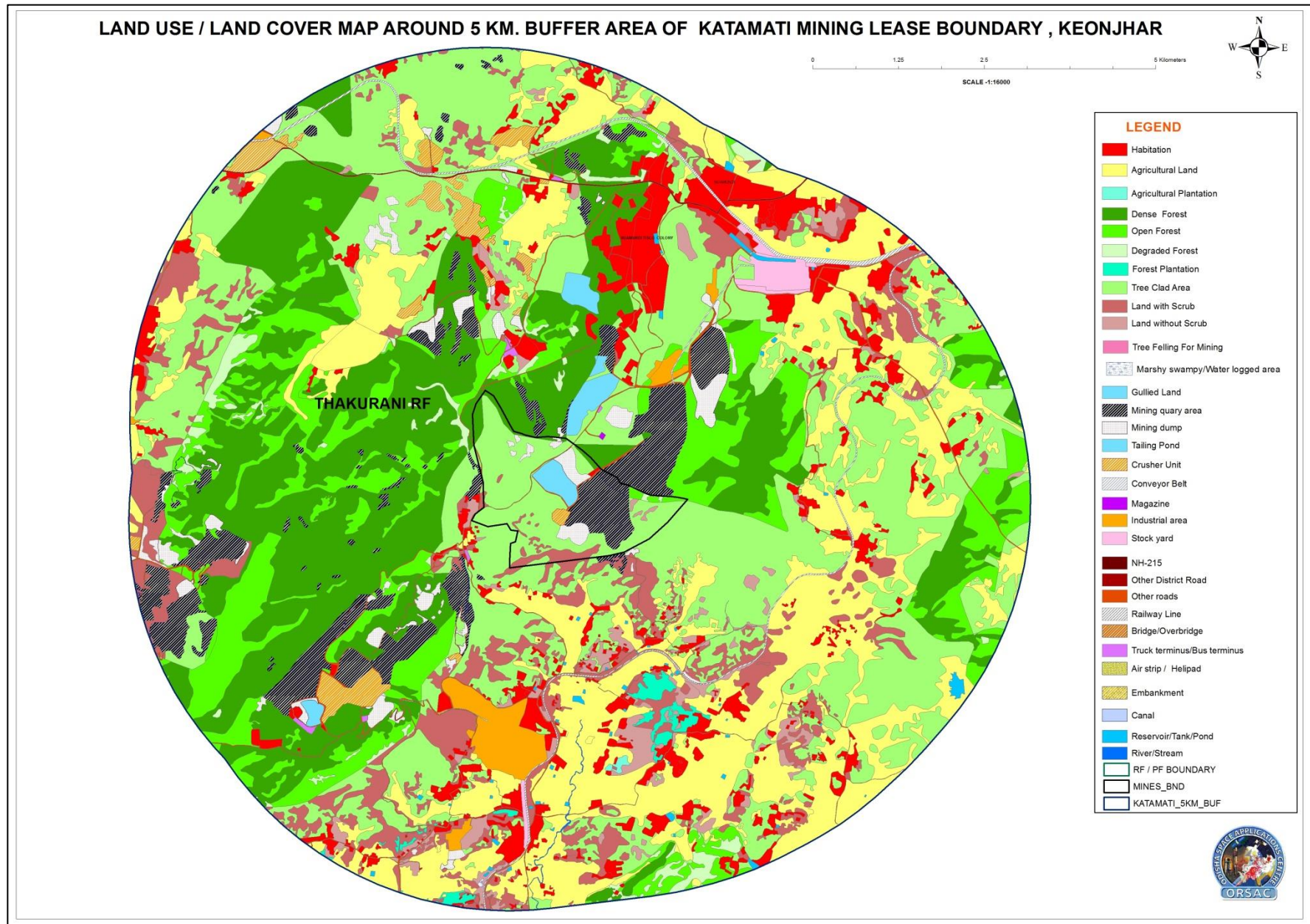


For Visiontek Consultancy Services Pvt. Ltd.

Plot No-108, District Centre, Chandrasekharapur, Bhubaneswar-16, Tel-91-674-2744594, 3250790
Email: visiontekin@gmail.com, visiontekin@yahoo.co.in, visiontek@vcspl.org, Visit us at: www.vcspl.org

"Committed For The Better Environment"

Annexure-XII: Digital processing of Land Use



Annexure-XIII: Noise Pollution Control Measures

Sound Proof Cabins in HEMMs



Acoustic Enclosures of DG sets

Annexure-XIV: Ambient Noise Quality at Katamati (April'16-September'16)

Area	Location	Day Time 8.00 am to 10.00 pm	Limits in dB(A) Leq	Night Time 8.00 am to 10.00 pm	Limits in dB(A) Leq
Residential Area	Hospital Premises	49.87	55.0	36.72	45.0
	JRDTTI	49.82		37.38	
	Manager's Office	51.10		36.25	
	Township	51.30		39.20	
Industrial Area	Mining area	70.40	75.0	61.47	70.0
	Plant area	62.10		53.18	

Jubran
Lab-in-charge

Annexure-XV: Workshop Effluent Quality at Katamati (April'16-September'16)

Parameter	Noamundi Central Workshop		Limit
	Washing Yard	MOR section	
pH	5.89	5.81	5.5 – 9.0
Suspended Solids mg/l	65.33	66.37	100.00
Oil & Grease mg/l	7.60	7.60	10.00

Jubran
Lab-in-charge

Annexure-XVI: Annual Expenditure on Environment Safeguards 2015-16

Sl. No.	Jobs	Expenditure (in lakhs)	
		Capital	Recurring
1	Operation of Mobile Water Sprinkling	0.00	45.00
2	Permanent Water Sprinkler	0.00	14.39
3	Cleaning of Garland Drain & Settling Pit	0.00	6.30
4	Dry Fog System Installation	0.00	15.00
5	Garbage dump at Bottom Bin canteen	20.00	0.00
6	Parking Lot paver block	0.00	0.15
7	Lease line fencing KTM	0.00	1.00
8	Lease pillar KTM	0.00	5.00
9	Septic tank at KTM	0.00	1.50
10	Katamati Toe wall	0.00	1.00
11	Tent for parking at Dhyan Singh gate	0.00	25.00
12	Waste oil pit at Equipment Maintenance	0.00	2.00
13	Shed for storing Oil drum	0.00	3.50
14	Waste oil pit at Old DB swimming pool	0.00	2.00
15	Equipment flooring	0.00	9.00
16	Maintenance of Solid Waste Management Township	0.00	15.00
17	Providing PCC road in camp area	0.00	73.00
18	Water Supply (25 nos): Deep Bore well, wells, tube wells, Pipeline	0.00	6.00
19	Livelihood through promotion of agriculture (600 farmers): Irrigation infrastructure, Support of farm inputs (seeds, agro equipment), Training on agricultural practices	25.04	0.00
20	Enhancing Irrigation facility through construction of irrigation infrastructure: 1. Construction of Check Dam at Thakurani (1 No.) 2. Repair of Check Dam at Kitabeda (1 No.) 3. Construction of masonry canal at daladiri (540)	13.30	20.00
21	Solid Waste management		
22	Operation of Incineration	0.00	16.60
23	Environmental Monitoring (S S Environics)	0.00	2.37
24	Display Board AMC	0.00	9.72
25	Plantation	0.00	0.97
26	Operation & maintenance of water treatment plant (including cost of chemicals, quality testing by third party & stamping of flow meters)	0.00	6.81
27	Operation & maintenance of sewage treatment plant	0.00	35.90
28	Mobile Water Sprinkling Maintenance	0.00	37.75

Sl. No.	Jobs	Expenditure (in lakhs)	
		Capital	Recurring
29	100% Change over from DG set power to OSEB Power at Katamati	0.00	10.00
30	Replacement of 250W HPSV Light with 120W LED Light (100 Nos.)	0.00	12.10
31	Replacement Of Conventional Light Fittings By Led Lights	0.00	26.41
32	Undergrounding Of Oh Lines	0.00	48.65
33	Replacement Of Bare Oh Conductor By Ab Cable	0.00	3.00
34	Provision Of Solar Lights (2nos)	0.00	2.00
35	Provision Of Timers To Control Outdoor Light Timing	0.00	0.60
36	Fixing Of Energy Meter In The Houses To Monitor & Control Energy	0.00	8.11
37	Installation Of Dry Type Transformer In Place Of Oil Cooled Transformer	0.00	0.65
Total =		58.34	466.48

Note: Expenditure for Environment for the Oil Separation Plant, Equipment Maintenance, Plant, Colony, Workshop, Training Center, Parks & Gardens and Horticulture etc. are included in Noamundi Iron Mine because we have common facilities for the above mentioned locations. Similary studies like bio diversity study, Hydrogeological study, vibration study etc. are being done centrally from Noamundi Head Office.