



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

**MD/ENV/275/110/15
1st June 2015**

Ref: Environmental clearance letter No.J-11015/63/2008.IA.II(M), Dated: 26th November'2010

**Sub: Half-yearly compliance status of environmental clearance conditions for the period
October'2014 to March'2015 in respect of Katamati Iron Mine.**

Dear Sir,

With reference to above environmental clearance, we are submitting herewith the compliance status of the stipulated conditions there in, for the period October'2014 to March'2015 in respect of Katamati Iron Mine for your kind perusal.

As required, the soft copy of the report has also been emailed in the ID: mef.or@nic.in.

Thanking you

Yours faithfully

Head (Planning)-OMQ

Encl: As above

Copy to: Addnl. Director(S), MoEFCC, Govt of India, CGO complex, Lodhi Road, New Delhi -110003
: Chairman, CPCB, Paribesh Bhawan, East Arjun Nagar, New Delhi – 110032
: Member Secretary, State Pollution Control Board, Unit – VIII, Bhubaneswar - 751012
: Regional Officer, State Pollution Control Board, College Road, Keonjhar, Orissa.

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COMPLIANCE REPORT PERIOD: OCTOBER'2014 – MARCH'2015

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)

A. Specific Conditions:

- i. 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.

Status of Compliance:

Both Consent to Establish and Consent to Operate has been obtained from State Pollution Control Board, Orissa for production of 8 MTPA (ROM). The Consent to Operate is valid till 31st March 2016.

- ii. 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.

Status of Compliance:

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.

- iii. 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.

Status of Compliance:

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.

- iv. Environmental clearance is subject to obtaining clearance under the Wildlife (Protection) Act, 1972 from the competent authority, as may be applicable to this project.

Status of Compliance:

No specific clearance under the Wildlife (Protection) Act, 1972 is required for the project.

- v. 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.

Status of Compliance:

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.

- vi. 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 the mine lease area during the course of mining operation.

Status of Compliance:

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.

- vii. 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.

Status of Compliance:

Generation of top soil is very minimal. Whatever top soil is generated, it is subsequently used for plantation purpose.

- viii. The sub grade material, if any shall be stacked at the earmarked sites.

Status of Compliance:

There is proper demarcation of area for storage of sub-grade material and during course of mining, these material are stacked there.

- ix. 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°. 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.

Status of Compliance:

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, MoEF, Bhubaneswar and SPCB, Orissa half yearly. Photographs of Plantation on dumps are attached as **Annexure-I.**

- x. 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, Baitarini 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 desilted particularly after monsoon amn 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, Baitarini 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.

Status of Compliance:

Garland drains of total running meterage of 510 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. Two 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 desilted 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 tanks 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. Sump capacity has been designed keeping 50% safety margin over and above peak sudden rainfall (based on previous years data). Photographs of toe wall, garland drain and settling pits are attached as **Annexure-II**.

- xi. 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.

Status of Compliance:

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**.

- xii. 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.

Status of Compliance:

We are monitoring trace metals in dust fall and soil samples by engaging the expertise of IIT, Kharagpur. The results during the period are annexed as **Annexure-III**.

- xiii. 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 phased manner and shall be completed within first five years.

Status of Compliance:

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 March'2015, we have planted 19000 nos. of plants and 15000 grass tufts along roads, vacant places and inactive dump slopes and total plantation was done about 36500 nos. Moreover, vetiver plantation is carried out over 0.4 ha with 20000 slips. The density of plants is about 3724 nos. per hectare. Photographs of Dump Plantation are attached as **Annexure-I.**

- xiv. 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 stabilize 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.

Status of Compliance:

This being the activity at the end of mine life, shall be achieved only after complete excavation of Iron ore as per plan.

- xv. 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.

Status of Compliance:

Regular water sprinkling is being done on the haul roads, loading & unloading points for effective dust suppression. During the period, 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.**

- xvi. 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.

Status of Compliance:

Regular monitoring of the flow rate of Balijore Nallah which is flowing outside of the mining lease area is carried out and record maintained. Flow Rate monitoring result of Balihor nallah is attached as **Annexure-VI.**

- xvii. 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

Status of Compliance:

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, state-of-the art rain water harvesting ponds and ground water recharge structures have been constructed and they are operational. Photographs of Rain water harvesting structure is attached as **Annexure-VII**.

- xviii. 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 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.

Status of Compliance:

Ground Water Quality and Ground Water Level are being monitored periodically with the help of engagement of the experts of IIT, Kharagpur 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, MoEF 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 Noamundi 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.

- xix. Appropriate mitigative measures should be taken to prevent pollution of the Baitarni River in consultation with State Pollution Control Board.

Status of Compliance:

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.

- xx. 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.

Status of Compliance:

Application has already been submitted with Water Resource Department, Govt. of Odisha, for drawl of water and the approval is awaited. However, ground water is not used for mining operations. The present water requirement for the mine for dust suppression is managed from adjacent Noamundi Iron Mine of the Company.

- xxi. Suitable Rain water harvesting measures on long term basis shall be planned and implemented in consultation with the Regional Director, Central Ground Water Board.

Status of Compliance:

Water conservation measures are continued. 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 the mine sites of both Noamundi & Katamati Iron mines, hiring the expertise of KRG Foundation, Chennai and they are now operational. Photographs of Rain water harvesting structure is shown as **Annexure-VII**.

- xxii. 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.

Status of Compliance:

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.

- xxiii. 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.

Status of Compliance:

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.

- xxiv. Drills shall either be operated with Dust extractors or equipped with water injection system.

Status of Compliance:

Wet drilling is in practice. All drills have been provided with dust suppression system. Photograph of wet drilling is shown in **Annexure-IV**.

- xxv. 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.

Status of Compliance:

The mineral handling plant has been dismantled and shall be reconstructed with provision of 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**.

- xxvi. Sewage treatment plant shall be installed for the colony. ETP shall also be provided for workshop and wastewater generated during mining operation.

Status of Compliance:

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**.

- xxvii. 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.

Status of Compliance:

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.

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.

- xxviii. Effective safeguard measure shall be taken to ensure that the RSPM levels in the area are well below the prescribed standards.

Status of Compliance:

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**.

xxix. The height of stack shall be as per the prescribed standards/ guidelines.

Status of Compliance:

There is no dust extraction Stack at present. However, the stack height of the DG sets are more than the prescribed standards.

xxx. 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.

Status of Compliance:

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.

xxxi. Occupational health programme encompassing identification of hazardous, ranking of the risks, plan to handle such risk should be prepared and implemented effectively.

Status of Compliance:

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.

xxxii. 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.

Status of Compliance:

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 or very rarely 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.

xxxiii. 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 temporary structures to be removed after the completion of the project.

Status of Compliance:

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.

- xxxiv. 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.

Status of Compliance:

Digital processing of the entire lease area using remote sensing technique was carried out during 2012 by engagement of the expertise of Ecomen Laboratory Pvt. Ltd., Lucknow. The copy of the land use pattern is attached as **Annexure-XII**.

- xxxv. The critical parameters such as RSPM (Particulate matter with size less than 10 micron i.e., PM10) and NOx 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.

Status of Compliance:

The critical parameters like RSPM (Particulate matter with size less than 10 micron i.e., PM10) & NOx 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**.

- xxxvi. 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.

Status of Compliance:

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.

B. General Conditions:

- i. No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forests.

Status of Compliance:

We are operating as per the approved mining technology and scope of working mentioned in Environmental Clearance granted to us and No change in mining technology and scope of working shall be made and adhered to the condition of MoEF.

- ii. No change in the calendar plan including excavation, quantum of mineral iron ore and waste should be made.

Status of Compliance:

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. The production achieved (in MT) during 2014-15(Till Mar'15) is as given below.

	Plan	Actual
ROM	7300000	3301000
OB, Waste	490000	480200
Sub-Grade	1050000	346500
Total Excavation	8840000	4127700

- iii. 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 10 micron i.e., PM10) 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. The data so recorded should be regularly submitted to the Ministry including its Regional office located at Bhubaneswar and the State Pollution Control Board / Central Pollution Control Board once in six months.

Status of Compliance:

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, Jharkhand. The Ambient Air Quality reports are being submitted to Regional office, MoEF, Bhubaneswar half yearly and to SPCB, Jharkhand monthly. Ambient Air Quality report is attached as **Annexure-V**.

- iv. Data on ambient air quality [RSPM(Particulate matter with size less than 10micron i.e., PM10) and , NOx] should be regularly submitted to the Ministry including its Regional Office at Bhubaneshwar and to the State Pollution Control Board/ Central Pollution Control Board once in six months.

Status of Compliance:

RSPM (Particulate matter with size less than 10micron i.e., PM10) and , NOx in ambient air are being monitored as per standard guidelines and the reports are submitted to Regional office, MoEF, Bhubaneswar and SPCB, Odisha half yearly. Ambient Air Quality report is attached as **Annexure-V**.

- v. 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.

Status of Compliance:

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**.

- vi. 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.

Status of Compliance:

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.

- vii. 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 19th May 1993 and 31st December, 1993 or as amended from time to time. Oil and grease trap and retention ponds should be installed before discharge of workshop effluents.

Status of Compliance:

The common facility for equipment maintenance for both the mines of Noamundi and Katamati Iron Mine, 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**.

- viii. Personnel working in dusty areas should wear protective respiratory devises 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

Status of Compliance:

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.

- ix. 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

Status of Compliance:

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.

- x. 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

Status of Compliance:

Funds allocated for environmental management are spent only for environment related purposes and not diverted to any other purpose. During the year 2014-15 an amount of Rs. 120.84 lakhs (approx) was spent towards environmental protection measures at Katamati Iron Mine. Details of Expenditure are attached as **Annexure-XVI**.

- xi. 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.

Status of Compliance:

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, MoEF, Bhubaneswar for necessary information.

- 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.

Status of Compliance:

We extend full co-operation to the officers of the Regional Office during their visit and furnish the required data, information and monitoring reports.

- xiii. 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.

Status of Compliance:

Six monthly compliance reports are being submitted regularly on the status of implementation of the stipulated environmental safeguards to the MoEF, its Regional Office Bhubaneswar, Central Pollution Control Board Kolkata and State Pollution Control Board Jharkhand.

Further, the six monthly compliance report along with the monitoring results is being uploaded on Tata Steel's website www.tatasteel.com and updated periodically.

- xiv. A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parisad/ Municipal Corporation, Urban Local Body and the Local NGO, if any, from whom suggestions/ representations, if any, were received while processing the proposal. The clearance letter shall also be put on the website of the Company by the proponent.

Status of Compliance:

A copy of Environment Clearance has been sent to the nearby Panchayats & Zila Parisad, Chaibasa. Further, copy of EC letter has also been uploaded on the Tata Steel website www.tatasteelinia.com.

- xv. 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.

Status of Compliance:

Complied from State Pollution Control Board, Jharkhand.

- xvi. The environment statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as 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.

Status of Compliance:

The environmental statement for financial year 2013-14 has been submitted to the State Pollution Control Board on vide letter no. MD/ENV/362/120/13 dated 18.09.2013 and the same has been hosted on Company's website www.tatasteel.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 30th May, 2014.

- xvii. The project authorities should advertise at least in two local newspapers of the District or State in which the project is located and widely circulated, one of which shall be in the vernacular language of the locality concerned, within 7 days of the issue of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and also at web site of the Ministry of Environment and Forests at

<http://envfor.nic.in> and a copy of the same should be forwarded to the Regional Office of this Ministry located at Bhubaneswar.

Status of Compliance:

Details of Environment Clearance with regard to Noamundi Iron Mine were published both in English and Hindi in local newspapers named "The Hindustan Times" and "Dainik Jagran" respectively on 15th June, 2013. The copy of the newspaper advertisement was sent to the Regional Office, MoEF, Bhubaneswar vide our letter no. MD/ENV/245A/101/ 2013, dated. 19th June, 2013.





Sl.No.	Parameters	Unit	Nov - Dec 2014
1	Cu	%	0.031
2	Mn	%	0.023
3	Nickel	%	0.032
4	Cadmium	%	0.009
5	Cobalt	%	0.047
6	Lead	%	0.021
7	Zinc	%	0.025
8	Arsenic	%	0.012
9	Selenium	%	0.016
10	Mercury	%	0.012
11	Iron	%	37.68

Total dust fall during Nov-Dec 2014 = 10.35 t/km²/month

Sl.No.	Parameters	Unit	Jan - Feb 2015
1	Cu	%	0.028
2	Mn	%	0.021
3	Nickel	%	0.023
4	Cadmium	%	0.012
5	Cobalt	%	0.037
6	Lead	%	0.011
7	Zinc	%	0.015
8	Arsenic	%	0.013
9	Selenium	%	0.011
10	Mercury	%	0.014
11	Iron	%	37.12

Total dust fall during Jan - Feb 2015 = 8.68 t/km²/month

R.K.P.
20/3/15

Dr. R. K. PANDA
Professor
Deptt. of Agricultural & Food Engg.
Indian Institute of Technology
Kharagpur - 721302, India



Mobile Water Sprinkling



Stationary Water Sprinkling



Water Jet System at Unloading Point



Water Mist System in Plant



Wet Drilling



Covered Convevor

Ambient Air Quality Report of Noamundi Iron Mine

Annexure-V

Month	Industrial area																			
	Near working Quarry					Near crusher plant					North west of mining lease					On the way to magazine				
	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
Oct'14	51.88	34.25	9.15	9.40	ND	44.13	26.50	8.43	8.68	ND	41.50	24.13	8.15	8.43	ND	43.25	23.34	8.34	8.50	ND
Nov'14	51.25	33.75	9.13	9.43	ND	47.63	30.00	8.76	9.04	ND	41.13	23.50	8.11	8.39	ND	41.63	24.00	8.16	8.44	ND
Dec'14	52.25	35.25	9.23	9.51	ND	49.38	31.75	8.94	9.21	ND	42.13	24.50	8.09	8.35	ND	43.63	25.88	8.36	8.59	ND
Jan'15	60.50	43.15	10.05	10.30	ND	55.13	36.63	9.51	9.78	ND	45.38	27.88	8.54	8.94	ND	46.25	28.38	8.65	8.90	ND
Feb'15	60.88	41.75	10.08	10.29	ND	56.00	38.19	9.59	9.86	ND	45.00	27.13	8.50	8.78	ND	46.38	28.13	8.64	8.88	ND
Mar'15	60.38	42.35	10.04	10.33	ND	55.00	37.63	9.50	9.80	ND	47.00	30.00	8.70	9.00	ND	47.75	27.71	8.83	9.04	ND

Unit of measurement for all parameters except CO is µg/m³. Co is in mg/m³

J. K. Pradhan
Lab-in-charge

Parameters	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Limit
BOD mg/l	2.33	1.73	1.57	1.57	1.50	1.35	20
TSS mg/l	22.63	15.30	13.93	12.90	11.80	12.10	100
Flow Rate Cum/hr	188.00	155.33	149.67	138.00	144.50	147.00	

There is no any industrial effluents discharge from the mine.

Dikroshan
Lab-in-charge




**Ground Water Quality Report at some locations around
KATAMATI IRON MINE
TATA STEEL
(As per BIS 10500: 1991)**

Date of Sampling: 27th November 2014

Sl No.	Parameter	Permissible Limits	OW* Talasai (Murga) (KA4)	OW* Rabrusai (KA5)
1	pH	6.5-8.5	8.13	8.24
2	Chloride, ppm	250	7.58	6.31
3	Iron, ppm	0.3	0.14	0.12
4	Fluoride, ppm	0.6-1.2	0.72	0.76
5	TDS, g/l	500	31.35	40.69
6	EC, ms/m	600	278.42	334.43
7	Sulphate	400	8.44	11.87
8	Nitrate	45	7.61	4.18
9	Calcium, ppm	200	4.12	3.49
10	Magnesium, ppm	30	2.57	1.21
11	Arsenic, ppm	0.05	0.002	0.001
12	Manganese, ppm	0.30	0.012	0.016
13	Zinc, ppm	5	0.011	0.017
14	Chromium, ppm	0.05	0.004	0.003
15	Lead, ppm	0.05	0.004	0.005
16	Copper, ppm	0.05	ND	ND
17	Cadmium, ppm	0.01	0.008	ND
18	Mercury, ppm	0.001	ND	ND
19	Selenium, ppm	0.01	ND	ND
20	Microbial count (CFU/ml) after 24 h	10	Nil	Nil

*OW: Open well

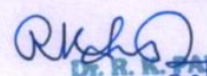

 28/12/14
 Dr. R. K. Singh
 Professor
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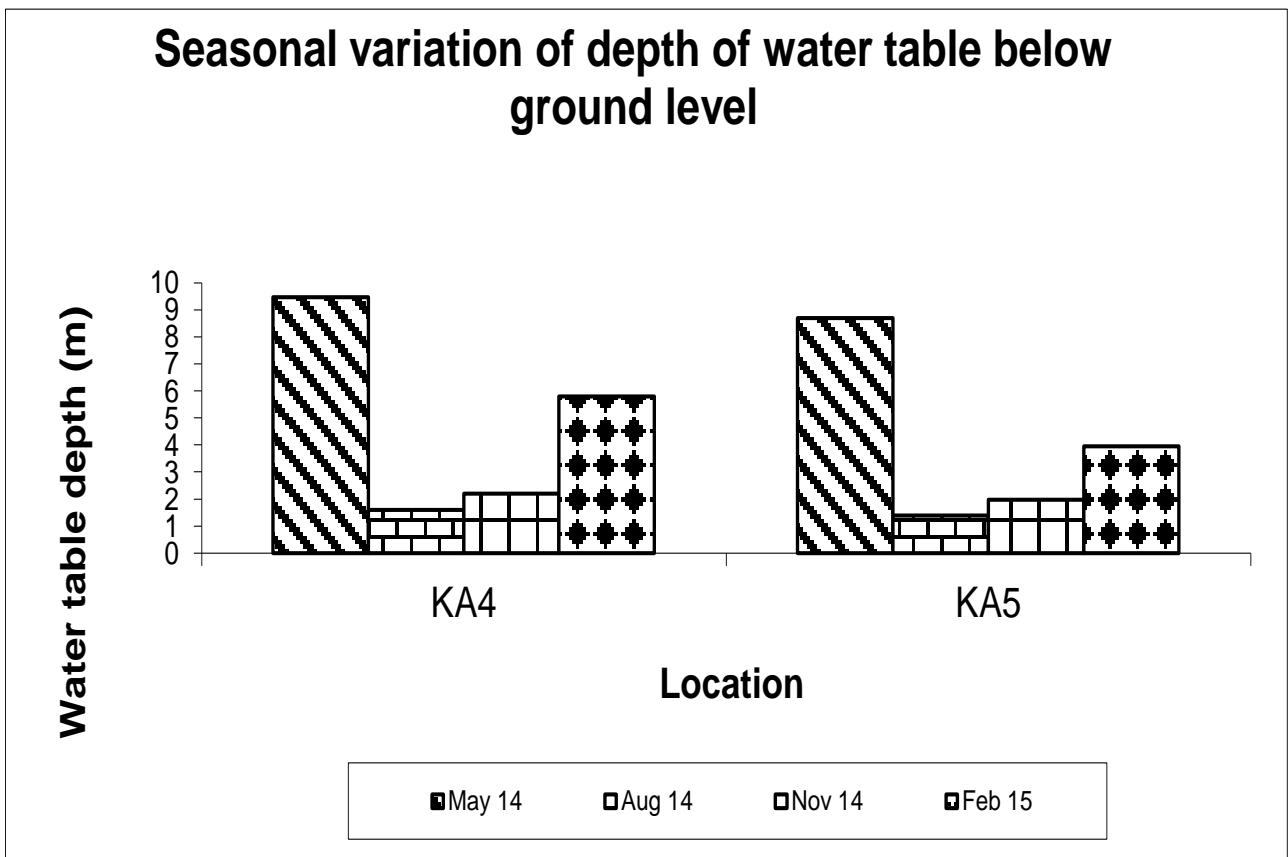
Ground Water Quality Report at some locations around
KATAMATI IRON MINE
TATA STEEL
(As per BIS 10500: 1991)

Date of Sampling: 25th February 2015

Sl No.	Parameter	Permissible Limits	OW* Talasai (Murga) (KA4)	OW* Rabrusai (KA5)
1	pH	6.5-8.5	7.54	7.15
2	Chloride, ppm	250	10.18	9.36
3	Iron, ppm	0.3	0.14	0.06
4	Fluoride, ppm	0.6-1.2	0.77	0.81
5	TDS, g/l	500	33.84	36.26
6	EC, ms/m	600	262.31	308.38
7	Sulphate	400	8.46	11.48
8	Nitrate	45	9.52	4.32
9	Calcium, ppm	200	6.63	5.16
10	Magnesium, ppm	30	2.37	0.94
11	Arsenic, ppm	0.05	0.002	0.001
12	Manganese, ppm	0.30	0.031	0.015
13	Zinc, ppm	5	0.024	0.018
14	Chromium, ppm	0.05	ND	0.002
15	Lead, ppm	0.05	0.001	0.004
16	Copper, ppm	0.05	ND	ND
17	Cadmium, ppm	0.01	0.004	ND
18	Mercury, ppm	0.001	ND	ND
19	Selenium, ppm	0.01	ND	ND
20	Microbial count (CFU/ml) after 24 h	10	Nil	Nil

***OW: Open well ND: Not detected (detection limit of instrument is 0.001 ppm)**


Dr. R. K. JANDA
 Professor
 Deptt. of Agricultural & F.
 Indian Institute of Te
 Kharagpur - 72130.



KA4 - Well at Talasahi, Murga

KA5 - Well at Rabrusai, Mahadevnasa

J. Pradhan
Lab-in-charge



Sewage Treatment Plant



Oil & Grease Separation Pit

**Inland Surface Water Quality Report
Katamati Iron Mine
TATA STEEL LTD
(As per IS 2296-1982)**

Date of Sampling: 27th November 2014

Sl No.	Parameters	Permissible Limits	Murga Nalla
1	pH	6.5-8.5	7.46
2	Chloride, ppm	600	5.78
3	Total Iron, ppm	50	0.74
4	Fluoride, ppm	1.5	0.59
5	TDS, g/l	1500	32.43
6	EC ms/m	No limit prescribed	43.37
7	Sulphate, ppm	400	6.98
8	Nitrate, ppm	50	4.57
9	Calcium, ppm	No limit prescribed	3.12
10	Magnesium, ppm	No limit prescribed	2.23
11	Arsenic, ppm	0.2	0.003
12	Manganese, ppm	No limit prescribed	0.072
13	Zinc, ppm	15	0.046
14	Chromium, ppm	0.05	0.004
15	Lead, ppm	0.1	0.003
16	Copper, ppm	1.5	ND
17	Cadmium, ppm	0.01	0.001
18	Mercury, ppm	0.001	ND
19	Selenium, ppm	0.05	ND
20	Microbial count (CFU/ml) after 24 h	10	NIL


28/12/14

Unit of Agricultural & Food Engg
Indian Institute of Technology
Kharagpur - 721302, India

**Inland Surface Water Quality Report
Katamati Iron Mine
TATA STEEL LTD
(As per IS 2296-1982)**

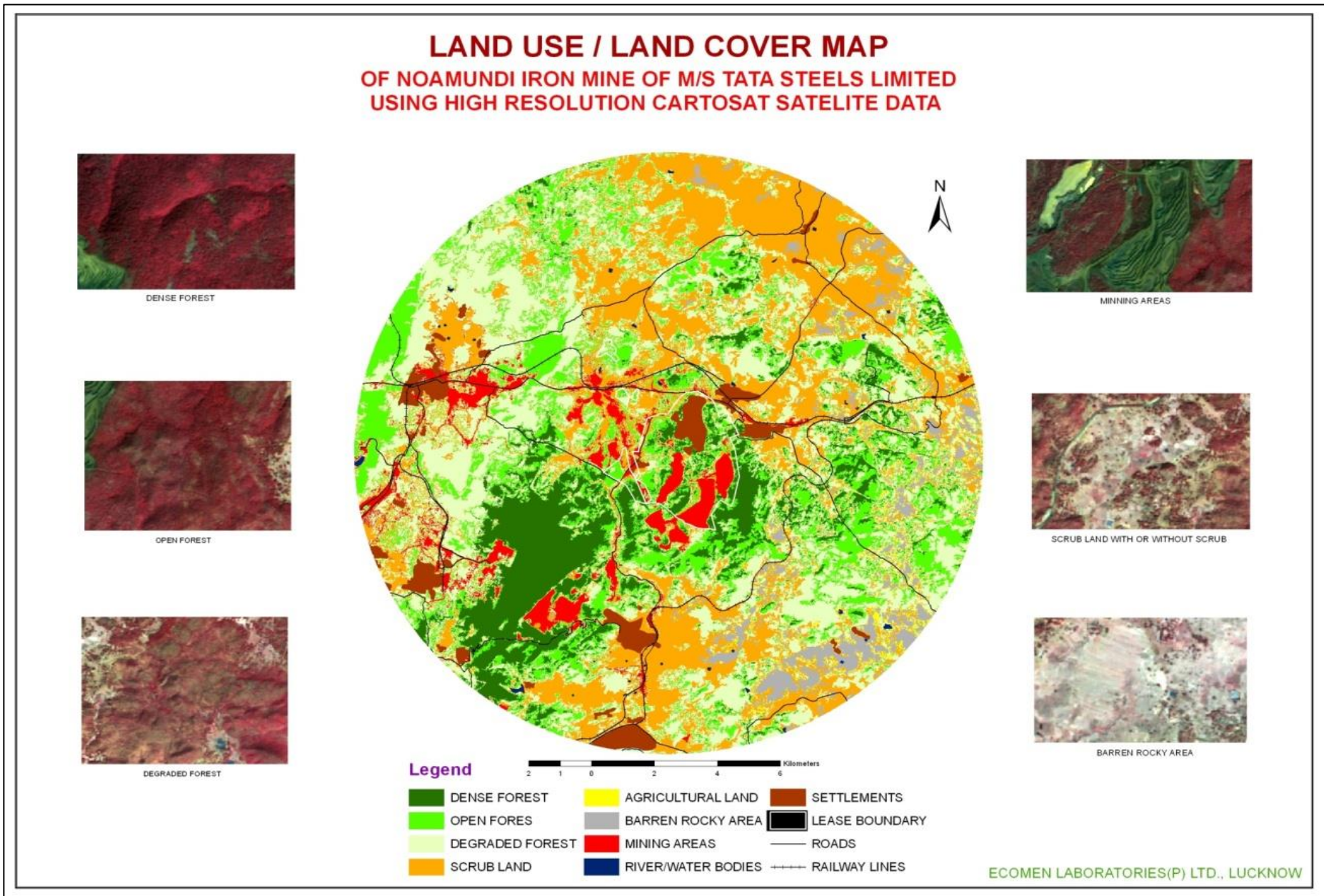
Date of Sampling: 25th February 2015

Sl No.	Parameters	Permissible Limits	Murga Nalla
1	pH	6.5-8.5	6.95
2	Chloride, ppm	600	4.38
3	Total Iron, ppm	50	0.37
4	Fluoride, ppm	1.5	0.68
5	TDS, g/l	1500	32.86
6	EC ms/m	No limit prescribed	40.82
7	Sulphate, ppm	400	44.64
8	Nitrate, ppm	50	3.17
9	Calcium, ppm	No limit prescribed	5.68
10	Magnesium, ppm	No limit prescribed	3.52
11	Arsenic, ppm	0.2	0.001
12	Manganese, ppm	No limit prescribed	0.049
13	Zinc, ppm	15	0.014
14	Chromium, ppm	0.05	0.004
15	Lead, ppm	0.1	0.002
16	Copper, ppm	1.5	ND
17	Cadmium, ppm	0.01	0.001
18	Mercury, ppm	0.001	ND
19	Selenium, ppm	0.05	ND
16	Microbial count (CFU/ml) after 24 h	10	NIL

ND: Not detected (detection limit of instrument is 0.001 ppm)

R.K.P.
20/3/15

Dr. R. K. PANDA
Professor
Dept. of Agricultural & Food
Indian Institute of Technology
Kharagpur - 721302



Sound Proof Cabins in HEMMs



Acoustic Enclosures of DG sets

Ambient Noise Quality at Katamati (Oct'14–Mar'15)

Annexure-XIV

Location		Day Time (6.00 am to 10.00 pm)	Limits in dB(A) Leq	Night Time (10.00 pm to 6.00 am)	Limits in dB(A) Leq
Residential Area	Hospital Premises	52.33	55	41.23	45
	Training Centre	51.43		41.35	
	GM's Office	51.55		40.45	
	Township	53.05		41.67	
Industrial Area	Mining area	61.73	75	52.37	70
	Plant area	63.57		54.6	

Debraj
Lab-in-charge

Workshop Effluent Quality at Katamati (Oct-14–Mar'15)

Annexure-XV

Parameter	Noamundi Central Workshop		Noamundi Equipment Maintenance	Limit
	Washing Yard	MOR section		
pH	6.09	6.09	6.03	5.5 – 9.0
Suspended Solids mg/l	57.85	61.07	59.50	100.00
Oil & Grease mg/l	7.53	7.60	7.59	10.00

Debraj
Lab-in-charge

Sl. No.	Heads	Amount (Rs. in lakhs)
1	Use of dust ban chemical for dust suppression	17.50
2	Maintenance and operation of mobile water sprinkler	30.34
3	Use of Fuel additive	25.00
4	Horticulture and plantation activities	8.00
5	Celebration of MEMC week	1.00
6	Environment Monitoring	8.20
7	Electronic Display Board Installation & Maintenance	1.20
8	Construction & maintenance of garland drains/toe walls	2.50
9	Maintenance of wet drill	8.50
10	Garden Maintenance	2.50
11	Installation of solar lights	2.60
12	World Environment day, World Water Day & Other Awareness Programmes	5.00
13	Bio Diversity Study	5.00
14	Ground vibration study	3.50
Total=		120.84

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.