



स्टील अथॉरिटी ऑफ इण्डिया लिमिटेड
STEEL AUTHORITY OF INDIA LIMITED
रॉ मटेरियल्स डिवीज़न
RAW MATERIALS DIVISION

Ref No: - BOM/ENV/5.1/HD-1704

Date:-17/04/2019

To,

Additional Principal Chief Conservator of Forests (C),
Ministry of Environment, Forest and Climate Change,
Regional Office (EZ),
A/3, Chandersekharpur,
Bhubaneswar – 751023

Sub: Six monthly status of compliance to the conditions stipulated in the Environmental Clearance granted by MoEFCC for 12 MTPA Iron Ore production from 5.10 sq. Miles ML vide letter no. J-11015/418/2008-IA.II(M) dated 21/12/2012 for the period ending OCT'18-MAR'19.

Sir,

Please find enclosed herewith the Six monthly compliance report for the period OCT'18-MAR'19 with respect to the conditions stipulated by GoI, MoEF, New Delhi, in the Environmental Clearance grant order of Bolani Ores Mines for the production of 12 MTPA Iron Ore from 5.10 sq Miles ML vide ministry's letter no. J-11015/418/2008-IA.II(M) dated 21/12/2012.

Thank you,

Yours faithfully,

General Manager
Bolani Ores Mines

अरुण कुमार मिश्रा / Arun Kumar Mishra
महाप्रबंधक (खान) / General Manager (Mines)
सेल - आर एम डी - बोलानी-अयस्क खदान
SAIL-RMD-Bolani Ores Mines
बोलानी-758 037, क्यौझर, ओडीशा

Encl: As above

Copy:

1. Director, IA Division, MoEF&CC, GOI, Indira Paryavaran Bhavan, Aliganj, Jor Bagh Road, New Delhi - 110 003.
2. In-charge, Eastern Zone, CPCB, Southern Conclave, Block 502, 5th & 6th Floors, 1582 Rajdanga Main Road, Kolkata - 700 107 (W. B.)
3. The Member Secretary, State Pollution Control Board, Paribesh Bhawan, A/118, Nilkantha Naga, Unit – VIII, Bhubaneswar – 751 012, Odisha

स्टील अथॉरिटी ऑफ इण्डिया लिमिटेड, रॉ मटेरियल्स डिवीज़न, बोलानी अयस्क खदान, पोस्ट : बोलानी - 758037 जिला - क्यौझर, उडीसा
Steel Authority of India Ltd. Raw Materials Division, Bolani Ores Mines, PO. : Bolani - 758037, Dist : Keonjhar, Odisha
दुराभाष / Telephone : 06767 - 260211 (O) फैक्स / Fax : 06767-260172, Mobile : +91 8986881005
E-mail : rmdbom2016@gmail.com, Website : www.sail.co.in

Six Monthly
COMPLIANCE REPORT
OF
ENVIRONMENTAL CLEARANCE CONDITIONS
(Grant Order no: J-11015/418/2008-IA.II(M) dated 21/12/2012)

OF
BOLANI ORES MINES (5.10 Sq Miles ML)
In Keonjhar District of Orissa

For the Period April'2018-September'2018



STEEL AUTHORITY OF INDIA LIMITED
RAW MATERIALS DIVISION
BOLANI ORES MINES
BOLANI- 758037

<u>Sl. No.</u>	<u>Condition</u>	<u>Compliance Status</u>
(i)	Environmental Clearance is subject to obtaining clearance under the Wildlife (Protection) Act, 1972 from the competent authority, as applicable.	Provision of Wildlife (Protection) ACT 1972 is not attracted to the Project as there are no Wildlife sanctuaries, National Parks or similar places specified in the Act within 10 KM radius of the project.
(ii)	The project proponent shall obtain Consent to establish from the State Pollution Control Board, Orissa and effectively implement all the conditions stipulated there in.	Consent to Establish for expansion of the mine to produce 12 MTPA was granted by Odisha State Pollution Control Board vide No. 23405 dated 21.12.2013. Conditions stipulated in the Consent to Establish are complied. Subsequently, Consent to Operate was granted vide letter No. 3157/IND-I-CON-242 Dt.28.03.2019 from Orissa State Pollution Control Board for the production of 12 MTPA of Iron Ore and is valid till Dt.31-03-2020.
(iii)	Forest Clearance for 73.20 ha of Safety Zone has not been obtained by the project proponent. This environmental clearance subject to the grant of forest clearance for diversion of 73.20 ha of safety zone within one year.	Forest Clearance for 73.12 ha of Safety Zone has been granted by MoEF & CC, vide F. No. 8-17/1997-FC(vol.) dt.12/11/14. A copy of the same was enclosed with six monthly EC compliance report for the period Apr'14 to Sep'14 vide our letter No.BOM/ENV/HD-1401 Dt.14.01.2015.
(iv)	The Company shall submit within 3 months their policy towards Corporate Environment Responsibility which should inter- alia provide for (i) Standard operating process/ process to bring into focus any infringement/ deviation/ violation of the environmental or forest norms/ conditions, (ii) Hierarchical system or Administrative order of the company to deal with the environmental issues and for ensuring compliance with the EC conditions and (iii) System of reporting of non-compliances / violations of environmental norms to the Board of Directors of the company and / or shareholders or stakeholders.	The Policy towards Corporate Environmental Responsibility including details of set up was submitted to Ministry vide our letter no RMD/BOM/E&L/5.1sqMiles/EC/2013/91 dt.18-03-2013. SAIL has always been an environmentally conscious and responsible company. Way back in 1996, it was a pioneer in adopting a Corporate Environmental Policy. In view of the rapid technological advancements in the past two decades and growing stringency of regulatory requirements, SAIL has revised its Environmental Policy and made "Corporate Environmental Vision, Policy and Responsibility", which is under implementation and copy of the same had been attached in EC compliance report for the period of Oct'15 to Mar'16 submitted vide letter no. BOM/ENV/5.1/HD-3600 Dt.30.06.2016.

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(v)	The mining operation shall be restricted to above ground water table and it shall not intersect groundwater table. In case of working below the ground water table, Prior approval of the Ministry of Environment & Forest and Central Ground Water Authority shall be obtained for which a detailed hydrogeological study shall be carried out.	<p>At present, mining operations are restricted to levels above ground water table in all the pits within the leasehold area. The Ground Water Table within the Lease area is at 451m AMSL. Whereas the present working depth at the mines varies from 915m to 485m AMSL. The mines will not be dug deeper than the current depth of 485m AMSL till 2030.</p> <p>Prior approval of the Ministry of Environment & Forest and Central Ground Water Authority will be obtained after conducting a detailed hydrogeological study, prior to working beyond Ultimate Pit Depth of 452 AMSL, if any, during subsequent plan periods as per duly approved Mining Plan.</p>
(vi)	Mitigation measures to control RSPM levels shall continue to be implemented and air quality data will also be collected during operation of the mines. The data so collected shall be analyzed to see the effectiveness of the mitigation measures implemented. Based on the same, additional safeguard measures, as may be required shall be implemented in the project.	<p>Mitigation measures are regularly implemented to control the RSPM levels. In order to reduce the RSPM levels, SAIL-Bolani Ore Mines has completed the implementation of following mitigation measures :</p> <ol style="list-style-type: none"> Dry Fog Dust Suppression system covers the entire Ore Crushing, Primary Stock Pile and Washing Plant circuit including the Primary Feed Hopper. The Project has been taken up at a cost of Rs.2.16 crores. Transportation through covered conveyors: Around 3200 meters of Covered conveyors from feed hopper at mines to product dispatch point. High Pressure Fixed sprinklers installed at feed hopper of 600 TPH Crushing & Screening Plant. Repaired and blacktopped roads inside township, and peripheral villages and Road from Bolani to Karo Bridge within 6.90 sq. m ML 1300 nos. of saplings were planted over an area of 5 ha within the leasehold Sides of road Concreted at a cost of Rs.9.43 lakhs <p>The photographs showing above Mitigation measures are attached as Annexure-III. Regular Monitoring of Fugitive Dust is undertaken. The reports of Fugitive dust monitoring are enclosed as Annexure-I(B).</p>
(vii)	The biological survey shall be repeated during October- December and mid-May month to see the existence of wildlife corridors, if any. Based on the same, necessary Wildlife Conservation	Necessary biological surveys were conducted by expert committees and Wild Life Experts and based on the same, Site Specific Wildlife Conservation Plan has been prepared and approved by the state Forest and Wildlife Department vide order no 4506/1 WL(C)SSP-

<u>Sl. No.</u>	<u>Condition</u>	<u>Compliance Status</u>
	Plan as may be required shall be prepared and implemented in consultation with the state Forest and Wildlife Department.	126/2012 Dt. 23.06.2014 with a total financial outlay of Rs.1676.41 lakhs, is implemented by Bolani Ores Mines, M/s SAIL. The Study revealed no Wildlife corridors within the Mining Lease area.
(viii)	The biological survey shall also be undertaken to identify the trees with orchids, if any Such trees, so identified shall be protected and if need be, these trees may be relocated.	Detailed study of the area for identification of orchids completed by the Consutant, M/s Grow Green Consortium Pvt. Ltd. A Report based on survey including recommendations for preservation of the species is yet to be submitted by the consultant. The same shall be submitted at regional office of MoEF&CC for endorsement.
(ix)	The project proponent shall ensure that no natural water course and/or water resources shall be obstructed due to any mining operations.	No natural water course or water resources have been obstructed due to Mining operations within the Mining Lease Area.
(x)	The top soil, if any, shall temporarily be stored at earmarked site only and should not be kept unutilized for a period more than three years. The topsoil should be used for land reclamation and plantation.	The top soil excavated till date has been utilized for reclamation & rehabilitation of dumps. No, top soil was excavated during Oct'18 to Mar'19. The entire quantity of topsoil excavated during 2018-19 was utilized for plantation and nursery development activities. Top soil generated in future during the expansion of the mine pits to virgin areas, if any, will be stored temporarily at earmarked site and will be used for plantation /dump reclamation/nursery development.
(xi)	The Over Burden (OB) generated during the mining operation shall be stacked at earmarked dump sites(s) only and should not be kept active for long period. In critical areas, use of geo textiles shall be undertaken for stabilization of dump. Monitoring and management of rehabilitated areas should continue until the vegetation becomes self-sustaining. Compliance status should be submitted to the Ministry of Environment & Forest and its Regional Office located at Bhubaneswar on six monthly basis.	Over Burden (OB) generated from the mines is dumped at earmarked sites only; the details are as follows: (i) Over Burden (OB) generated from F-mining Area is dumped as backfilling inside the quarry in the southern part. Plantation of 15,000 trees has been undertaken on 4.0 hecets of this backfilled area. (ii) Over Burden (OB) generated from other mining Areas is dumped on the existing earmarked active OB dumps as per the Mining Plan approved by Indian Bureau of Mines, which are adjacent to the respective quarries. After completion of the dumping, stabilization measures could be undertaken. (iii) The active OB Dumps of D-area, G-Area and Panposh have been provided with Retaining Wall

<u>Sl. No.</u>	<u>Condition</u>	<u>Compliance Status</u>
		<p>and necessary terracing for stability.</p> <p>(iv) The Old OB Dumps of F-Area and D have been rehabilitated by Plantation. Plantation of around 25,000 nos plants have been completed as yet. Gap filling activities are also undertaken by suitable replacement of species with low growth rate.</p> <p>(v) In the identified critical areas such as Fines dump near DH-5 Location and Old Fines Dump near 600 TPH, an area of 11,000 sq meters has been covered with Geo Textiles and Vetiver slips plantation over an area of 5,000 sq. m has been done under the consultancy of IIT Kharagpur over Old Fines Dump for slope stabilization.</p> <p>(vi) Seeds of native grass species of Thysanolaena Maxima and Stylosanthes Hamata have been broadcasted and native grasses have been planted over D-area OB dump slope for stabilization.</p> <p>The photographs of above measures are attached as Annexure-IV. Compliance status in this regard is submitted to the Ministry of Environment, Forest & Climate Change and its Regional Office located at Bhubaneswar in the six monthly compliance reports.</p>
(xii)	<p>Catch drains and siltation ponds of appropriate size shall be constructed to arrest silt and sediment flows from mine working, soil, OB and mineral dumps. The water so collected should be utilized for watering the mine area, roads, green belt development etc.. The drains should be regularly de-silted particularly after monsoon and maintained properly. Garland drain of appropriate size, gradient and length shall be constructed for both mine pit and sump capacity should be designed keeping 50% safety margin over and above peak sudden rainfall (based on 50 Years data) and maximum discharge in the area adjoining the mine site. Sump capacity should also provide adequate settling of slit material. Sedimentation pits should be constructed at the corners of the garland drains and de-silted at regular intervals.</p>	<p>A scheme for minimizing soil erosion and minimizing choking of streams and soil conservation, taking into consideration the rainfall data and max. discharge, has been prepared in consultation with Divisional Forest Officer, Keonjhar and Regional Chief Conservator of Forests, Rourkela for implementation in Phases.</p> <p>As per the scheme, Garland drains of 2030 meters have been constructed all along the OB dumps to prevent flow of runoff directly into the natural stream. 07 Nos. of sedimentation pits have been constructed at the corner of the garland drains to treat runoff water even during peak rainfall and they are de-silted regularly before and after monsoon.</p> <p>During Oct'18 to Mar'19, a Retaining wall and chimneys are provided near FC-1 tunnel.</p> <p>Photograph of Garland drain, settling ponds along toewall and Sedimentation pit are attached as Annexure-V. Water collected in settling ponds is reutilized for watering the plantation.</p>

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(xiii)	Dimension of retaining wall at the toe of dumps and OB benches within the mine to check run-off and siltation should be based on the rainfall data.	Dimensions of retaining walls at the toe of dumps and OB benches within the mine to check run-off and siltation are based on the rainfall data. The details of existing retaining walls around the OB dumps and stockpiles are attached as Annexure-II .
(xiv)	Plantation shall be raised in an area of 33.487 ha including a 7.5m wide green belt in the safety zone around the mining lease by planting the native species around OB dumps, reclaimed area, mine benches, along the roads etc. in consultation with the local DFO/ Agriculture Department. The density of the trees should be around 2500 plants per hectare. Greenbelt shall be developed all along the mine lease areas in a phased manner and shall be completed within first five years.	Till Mar 2019, 2.54 lakh saplings have been planted within mines premises, to reclaim and rehabilitate an area of 102 ha, which includes the said 33.487 ha degraded forest land and 7.5m strip safety zone area, with average density of 2500 (approx.) plants per Hectare, within 5.10 sq. miles ML of BOM. The said area includes Safety Zone, OB dumps, Avenue Plantation and Degraded Forest lands. The cost of plantation amounts to Rs.535.00 lakhs. The photographs of plantation carried out at various locations are attached as Annexure-VI .
(xv)	Effective safeguard measures such as Regular water sprinkling should be carried out in critical areas prone to air pollution and having high levels of particulate matter such as haul road, around crushing and screening plant, loading and unloading point and transfer points. 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 carried out on the haul roads, loading & unloading points for effective dust suppression. Fixed water sprinklers of 750m length are operated at critical areas such as Loading Point of 600 TPH plant and on Panposh Haul road. In addition, two 28 KL and three 09 KL mobile water tankers are sprinkling water regularly for effective dust suppression. Ambient Air Quality is monitored regularly and the results are well within the norms prescribed in the core zone area. The PM ₁₀ daily average values range from 29.64 to 162.24 µg/m ³ and PM _{2.5} daily average values range from 12.25 to 110.19 µg/m ³ . Ambient air quality in and around the mines is given in the Annexure-I(A)
(xvi)	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.	The Rain water Harvesting measures proposed in report of “Technical Feasibility Study on Rain Water Harvesting & Master Plan for Ground Water Recharges” prepared by the consultant, M/s KRG Rainwater Foundation, have been approved by CGWB Bhubaneswar vide their letter no.: 5-22/ CGWA/SER/2018-19-1306 Dt. 26.12.2018. Photographs of the measures undertaken at BOM are enclosed as Annexure-VII .

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(xvii)	Regular monitoring of ground water level and quality should be carried out in and around the mines lease by establishing a network of existing wells and installing new piezometers during the 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 Ministry of Environment and Forests and its Regional Office, Bhubaneswar, Central Ground Water Authority and Regional Director, Central Ground Water Board. If at any stage, it is observed that the groundwater table is getting depleted due to the mining activity; necessary corrective measures shall be carried out.	<p>Regular monitoring of ground water level and quality is carried out in and around 5.10 ML of Bolani Ores Mines from a network of existing wells. The data is collected four times a year as directed and the same is regularly sent to Ministry of Environment, Forest & Climate Change and its Regional Office, Bhubaneswar, Central Ground Water Authority and Regional Director, Central Ground Water Board.</p> <p>The water quality analysis report for the period of Apr'18-Sep'18 indicates no abnormalities or violations of the prescribed standards and is attached as Annexure-I(C).</p>
(xviii)	The project proponent shall obtain necessary prior permission of the competent authorities for drawl of requisite quantity of surface water, if any, required for the project.	<p>Water Drawl agreement for extraction of the 7 cusec (for envisaged level of production) of surface water from Karo River and tributaries has been executed with Executive Engineer, Baitarini Division, Salapada vide agreement no.424 Dt.23.02.2019, with validity of 03 (three) years.</p> <p>Presently the Average consumption is well within the permitted quantity.</p>
(xix)	The safeguard measures as suggested by the Central Ground Water Board vide letter No. 21-4(231)/CGWA/SER/2010-1010 dated 11.06.2010 shall be effectively implemented.	A copy of the said letter has been requested from MoEF New Delhi so that the contents of the above letter could be known for compliance, if any, by BOM. The conditions stipulated in above said order will be complied as applicable to BOM.
(xx)	The project proponent shall practice Suitable rain water harvesting measures on long term basis and work out detailed scheme rain water harvesting in consultation with Central Ground Water Authority and submit a copy of the same to the Ministry of Environment &	The Rainwater Harvesting measures proposed in report of "Technical Feasibility Study on Rain Water Harvesting & Master Plan for Ground Water Recharges" prepared by the consultant, M/s KRG Rainwater Foundation, have been approved by CGWB Bhubaneswar vide their letter no.: 5-22/ CGWA/ SER/2018-19-1306 Dt. 26.12.2018.

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	Forests and its Regional Office, Bhubaneswar.	Bolani Ore Mines has undertaken following water harvesting measures as per prevailing guideline of CGWB for rainwater harvesting: (1) constructions of Masonry and RCC check dams across seasonal and perennial nallahs, (2) constructions of loose boulder check dams (LBCD) across seasonal streams / gully plugs (3) Digging of staggered trenches or Contour Bunds. Photographs of the measures undertaken at BOM are enclosed as Annexure-VII .
(xxi)	Vehicular emissions should be kept under control and regularly monitored. Measures shall be taken for maintenance of vehicles used in mining operations and in transportation of Mineral. The vehicles should be covered with a tarpaulin and shall not be overloaded.	Preventive Maintenance of HEMM & light vehicles is undertaken regularly to keep the vehicular emissions under control. PUC certification exists for all machinery deployed in the mines. Transportation of Mineral from Hill Top to Dispatch point is done by covered conveyor belts. The ore is transported to various Steel Plants, through Railway wagons only.
(xxii)	No Blasting shall be carried out after the sunset. Blasting operation should be carried out only during the day time. Controlled Blasting should be practiced. The mitigative measures for control of ground vibrations and to arrest fly rocks and boulders should be implemented.	Blasting is carried out once in a notified fixed interval (12:00 PM – 02:00 PM) of day only. The following measures are being practiced at the mines to mitigate blasting hazards: (1) Controlled blasting by use of SMS explosives along with “Staggered V” drilling pattern is in practice. (2) Blasting under supervision of qualified persons. (3) Use of NONEL / Delay detonators to control ground vibration (4) Avoiding overcharging of the blast holes & proper stemming to avoid blown out shots. (5) Blasting only for loosening of the strata and avoid fly rocks. (6) Maintaining suitable spacing and burden to avoid misfires/ fly rocks. (7) Restricting number of blast holes at any point of time to control ground vibrations. (8) Avoiding blasting on foggy days, after sunset and at times of high wind velocity.
(xxiii)	Drills shall either by operated with dust extractors or equipped with water injection system.	Water injection and Dust Extraction systems are provided and operational in 4 drill machines for suppression of RSPM. The photograph of wet drilling process is attached in Annexure-IV .
(xxiv)	Mineral handling area shall be provided with adequate number of high efficiency dust extraction system. Loading and unloading areas including all the	Mineral handling areas are provided with water sprinkling system by mobile water sprinklers. Mineral handling plant such as, secondary crushing plant ore processing plant, 600 TPH plant & loading have been

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	transfer point should also have efficient dust control arrangements. These should be properly maintained and operated.	<p>provided with the following dust control measures</p> <ol style="list-style-type: none"> DFDS installed over the entire network of Crushing and Washing Plant areas of BOM Covering of conveyors from Hill top Hopper till dispatch point High pressure dust suppression system at 600 TPH plant. Fixed water sprinkling system covering a length of 750m. <p>Regular maintenance is undertaken for smooth operation of pollution control measures.</p>
(xxv)	Sewage treatment plant should be installed for the colony. ETP should also be provided for the workshop and wastewater generated during mining operation.	<p>Based on the conceptual plan submitted by IIT KGP a detail feasibility report (FR), Technical Specification (TS) for STP of capacity 2.4 MLD Capacity has been prepared by CET, an in-house consultant of SAIL for execution. Implementation period of the job is 24 months with an estimated cost of Rs. 17.56 Cr. The proposal is under tender process.</p> <p>Meanwhile, individual septic tanks followed by soaking pits have been provided in all quarters and office locations.</p> <p>3 nos. of ETPs (Oil and Grease catch traps) have been provided at mechanical workshops and equipment washing junctions, to collect and treat workshop effluent.</p>
(xxvi)	Pre-placement medical examination and periodical medical examination of the workers engaged in the project shall be carried out and records maintained. For the purpose, schedule of health examination of the workers should be drawn and followed accordingly.	<p>All newly appointed workers undergo a comprehensive medical examination (Pre-Employment Medical Examination) and subsequently a Periodical Medical Examination (PME) at regular intervals. All workers undergo a PME every 5 years; however, workers whose age is >45 years the PME is done every 3 years. All contractual workers also undergo medical examination. The findings are maintained in each worker's individual medical record, valid throughout his duration of service. These records are manually maintained and computerized. A three tier health monitoring program is in vogue at Bolani Mines. The mine's hospital has an Occupational Health O.P.D. Centre, which is run by Occupational Health Physician. The mines' hospital is a 60 bedded multi-specialty hospital with facilities to handle major and minor surgeries and casualty department. A 4-bedded ICU and a blood bank are being added.</p>

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(xxvii)	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.	The labourers engaged in the construction activity reside in nearby villages. However, provision has been made, as and when necessary, for the housing of construction labour adjacent to the construction sites in non-forest lands, in the form of temporary structures removed after the completion of the project. Infrastructural facilities available at Bolani such as safe drinking water, medical health care etc. are enjoyed by the workers.
(xxviii)	The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered fauna such as elephant, leopard, sloth bear, wolf, gaur, python etc. Spotted in the study area and contribute towards the cost of implementation of the plan and/ or Regional Wild life Management plan for conservation of flora and fauna so prepared by the State Government. The amount so contributed shall be included in the project cost. A copy of action plan may be submitted to the Ministry and its Regional Office, Bhubaneswar within three months.	<p>The following measures adopted for conservation of Flora and Fauna at the project site is as follows :</p> <p>a. A Site Specific Wild Life Conservation plan has been prepared as per guidelines of Chief Wild life Warden by engaging an expert agency. The plan has been approved by the State Forest and Wildlife Department vide order no 4506/1 WL(C)SSP-126/2012 Dt. 23.06.2014 with a total financial implication of Rs.1676.41 lakhs to Bolani Ores Mines, M/s SAIL which is under implementation.</p> <p>b. The necessary funds towards implementation of Regional Wild life management plan, i.e., an amount of Rs 5,68,22,350 (Five cores sixty eight lakhs and twenty two thousands three hundred fifty only) has been deposited with CAMPA on A/C No.-1585 for Regional Wild Life Management fund for 5.10 Sq. miles Mining Lease (ML) .</p> <p>c. Necessary Infrastructural Supports are provided to local forest departments as and when required for the cause of Wild Life Conservation. G-Mining Pit has been covered by Barbed wire fencing to prevent wildlife from entering the mining premises.</p>
(xxix)	The critical parameters such as RSPM (Particulate matter with size less than 10 micron i.e. PM₁₀ and NO_x in the ambient air within the impact zone, peak particle velocity at 300 m 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	<p>Ambient air quality monitoring is being carried out in core & buffer zone with the assistance of OSPCB Laboratory. The report is being submitted to the Ministry's Regional Office at Bhubaneswar and to the State Pollution Control Board / Central Pollution Control Board periodically inform of six monthly reports. Monitoring Reports are enclosed as Annexure-I.</p> <p>There is no discharge from Mines in this lease. However, the analysis report of TDS, DO, PH and</p>

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	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 Forest, which is available on the website of the Ministry www.envfor.nic.in shall also be referred in this regard for the compliance.	Total Suspended Solids of 12 locations inclusive of the tailing pond seepage in the adjoining lease is regularly submitted in the compliance reports. The monitoring data are uploaded in the website of the company alongwith the six monthly compliance reports and also displayed near main gate in Public domain (easily accessible).
(xxx)	A final mine closure plan along with details of Corpus Fund should Be submitted to the Ministry of Environment & Forest 5 years in Advance of final mine closure for approval.	Final Mine Closure plan along with details of Corpus fund will be submitted to the Ministry 5 years in advance of final mine closure for approval. However, the Progressive Mine Closure Plan (PMCP) is approved by IBM vide their letter no. MSM/FM/17-ORI/BHU/2018-19/1086 Dt. 06.08.2018.
(xxxii)	No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forests and No change in the calendar plan including excavation, quantum of mineral iron ore and waste should be made.	There has been no change in mining method and scope of working as per the elaborations in the approved Mining Scheme / mining plan. Mining will be done as per the approved mining plan. Prior approval will be sought from Ministry of Environment, Forests and Climate Change to alter any mineral excavation process.
(xxxiii)	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. PM ₁₀), and NO _x 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.	Four nos. of Ambient Air quality monitoring locations have been fixed in core zone and buffer zone, in consultation with State Pollution Control Board, where SPM (PM ₁₀ & PM _{2.5}) including other parameters are monitored with the assistance of OSPCB approved laboratory. The Air monitoring reports are enclosed in Annexure-I(A) .
(xxxiiii)	Industrial waste water (workshop and waste water from 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	i. Effluent generated from the beneficiation plant is treated in Thickeners followed by Tailing Ponds. The clear water to the tune of 60% is being recycled and the underflow from thickener is discharged into Tailing Dam.

<u>Sl. No.</u>	<u>Condition</u>	<u>Compliance Status</u>
	from time to time. Oil and grease trap should be installed before discharge of workshop effluents.	<p>ii. 3 nos. of Oil and Grease catch traps have been provided at mechanical workshops and equipment washing junctions to collect and treat workshop effluent.</p> <p>The quality report of tailing pond seepage water and workshop effluent after treatment is given in the Annexure – I(C).</p>
(xxxiv)	Personnel working in dusty areas should wear protective respiratory devices and they should also be provided with adequate training and information on safety and health aspects.	<p>a. Adequate amount of Dust Masks are provided to all working personnel in the mines. The Fugitive Dust emission is within norms suggested in NAAQMS, and due care is being taken to further reduce the RSPM levels and provide a dust free environment for the working personnel.</p> <p>b. In-house training programs, including Refresher Training, Safety Awareness Training, Mock Drill Training etc., are held at Mines Vocational Training Centre (MVTC) on regular basis to augment the awareness of safety and communicate latest technological developments in mining and other allied sectors, among the working personnel.</p> <p>c. Bolani Ores Mines has also implemented Environment Management System (EMS) as per ISO 14001:2015 standard, Quality Management System (QMS) as per ISO 9001:2015 standard and Occupational Health and Safety management system as per ISO 45001:2018(certified by BSI).</p>
(xxxv)	Occupational health surveillance program of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed.	<p>Bolani Ores Mines is certified under the state-of-the-art ISO 45001:2018 for establishing flawless Occupational health and safety management system. Occupational Health Survey is carried out regularly to assess the existing condition and to check the effectiveness of the management measures and to observe any contractions due to exposure to dust and take corrective measures. The findings are maintained in the worker's medical record maintained throughout the duration of his service. Medical tests are carried out at the Bolani Mine Hospital. A three tier health monitoring program is in vogue at Bolani Mines.</p> <p>In case of a person, who is found to be suffering from some work related disorder, he is treated accordingly at the mine's hospital or referred to SAIL's Hospital at Rourkela or to specialized hospitals elsewhere as per the requirement. If deemed necessary, the worker is reassigned elsewhere in the mine either temporarily or permanently. The course of action taken is duly recorded in the worker's medical file.</p>

<u>Sl. No.</u>	<u>Condition</u>	<u>Compliance Status</u>
(xxxvi)	A separate environmental management cell with suitable qualified personnel should be set - up under the control of a Senior Executive, who will report directly to the Head of the Organization.	<p>An Environment Management Section (EMS) is established as a separate section under the Mines Department under direct control of Dy. General Manager (Mines). The details of constitution is as follows :</p> <ol style="list-style-type: none"> 1. Assistant General Manager (Env & Lease) 2. Assistant Manager (Env & Lease) 3. Mining Mate (Env & Lease) <p>Assistant General Manager (Environment & Lease) co-ordinates the day to day activities pertaining to communications related to statutory clearances and compliances of Environment, Forest & Lease Renewal issues and reports to the Dy General Manager (Mining) and Mines Manager who being statutory head regularly reviews the compliances of various Stipulations, Acts and Regulations pertaining to Environmental Matters of Mines and reports to Head of Mines. One (1) Assistant Manager (Environment & Lease) is posted in the EMC who expedites initiation of proposals as per Environmental Management Plan and coordinates field implementation of the jobs. A Mining Mate (Environment & Lease) assists him in the day to day activities. Necessary measures are also being taken up for capacity building of the Environment Management Cell by appointment of required qualified personnel as planned in EMP</p> <p>Further, an Environmental Management System (EMS) has been implemented at Bolani Ore Mines which has been certified as per ISO 14001:2015 Standard. The EMS of BOM covers Mining activities, Maintenance activities, Mineral Beneficiation and all other allied activities. As per the EMS, a senior executive of the organization in the level of DGM(Mech.), I/c CMC & CBRS functions as Management Representative and is responsible for strict implementation.</p>
(xxxvii)	The funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purpose. Year wise expenditure should be reported to the Ministry and its Regional Office located at Bhubaneswar.	<p>The fund earmarked for environmental protection measures is kept in separate account and is not diverted for other purpose. An amount of Rs.143.23 lakhs was spent for environment & forest protection measures during the year 2018-19 against an allocated budget of Rs.140.00 lakhs.</p>

<u>Sl. No.</u>	<u>Condition</u>	<u>Compliance Status</u>
(xxxvii) i)	The project proponent shall submit six monthly report on the status of the 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 Environmental and Forests, its Regional Office, Bhubaneswar, the respective Zonal office of Central Pollution Control Board and 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 Forest, Bhubaneswar, the respective Zonal Officer of Central Pollution Control Board and the State Pollution Control Board.	Six monthly compliance reports on the status of implementation of environmental safeguards are being submitted to MoEF&CC, New Delhi, Regional Office – MoEF&CC, Bhubaneswar, Central Pollution Control Board and State Pollution Control Board. Copy of the compliance report inclusive of Environmental Parameters Monitoring data is being uploaded to the SAIL web site i.e. www.sail.co.in .
(xxxix)	A copy of 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 suggestion/ representation has been received while processing the proposal. The clearance letter shall also be put on the website of the Company by the proponent, The State Pollution Control Board should display a copy of the clearance letter at the Regional Office, District Industry Center and Collector's office/ Tehsildar's office for 30 days.	Copies of clearance letter were distributed amongst local bodies, from whom valuable suggestions/ representation/feedback has been received while processing the proposal.
(xL)	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	Advertisements regarding grant of environmental clearance was published in Odiya daily SAMBADA, Bhubaneswar & Sambalpur Edition on date 27-12-2012 and Business Standard on date 27-12-2012. A copy of the same has been deposited with the authorities at Regional Office of the MoEF, Bhubaneswar.

<u>Sl. No.</u>	<u>Condition</u>	<u>Compliance Status</u>
	project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Boards 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 the this Ministry located Bhubaneswar.	
7	The Ministry or any other competent authority may alter /modify the above conditions or stipulate any further condition in the interest of environment protection.	Agreed to. The conditions will be complied as and when stipulated.
8	Failure to comply with any of the condition mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.	Duly Noted.
9	The above condition will be enforced inter-alia, under the provisions of the Water (prevention & Control of Pollution) Act, 1974, the Air (prevention and control of pollution) Act, 1981, the Environment (protection) Act, 1986 and public liability Insurance Act, 1991 along with their amendments and rules made thereunder.	Noted.
10	Any appeal against this environmental clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days , as prescribed under section-16 of the National Green Tribunal Act 2010	Duly Noted.

ANNEXURE - I(A)

SAIL RMD

🕒 From: 00:00, 01-Oct-2018

🕒 Upto: 00:00, 01-Apr-2019

CISF Colony

Parameter	Average	Average Min	Average Max	Min	Max
PM _{2.5} (µg / m3)	16.98	0.05 (00:00, 30 Dec to 00:00, 31 Dec 2018)	193.03 (00:00, 01 Feb to 00:00, 02 Feb 2019)	0.01 (11:04, 16 Jan 2019)	983.1 (12:48, 04 Feb 2019)
PM ₁₀ (µg / m3)	44.74	0.97 (00:00, 21 Nov to 00:00, 22 Nov 2018)	162.53 (00:00, 11 Mar to 00:00, 12 Mar 2019)	0.01 (23:06, 30 Dec 2018)	997 (03:06, 09 Jan 2019)

AAQMS 2 - Campus Store

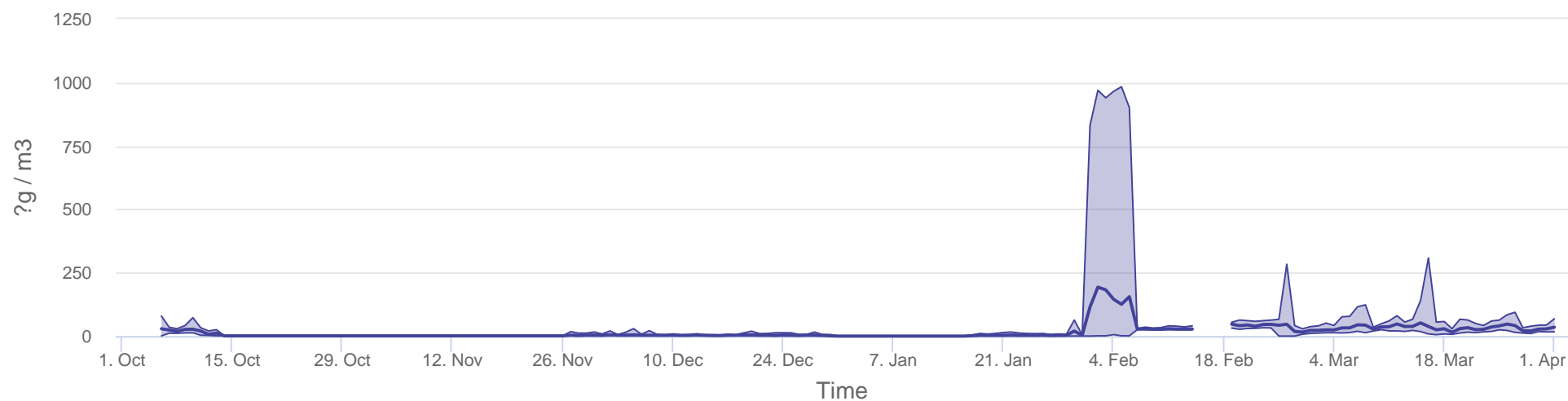
Parameter	Average	Average Min	Average Max	Min	Max
PM _{2.5} (µg / m3)	12.25	7.51 (00:00, 16 Feb to 00:00, 17 Feb 2019)	113.78 (00:00, 25 Oct to 00:00, 26 Oct 2018)	5.04 (12:37, 01 Nov 2018)	161.6 (21:17, 25 Oct 2018)
PM ₁₀ (µg / m3)	29.64	10.41 (00:00, 17 Jan to 00:00, 18 Jan 2019)	525.19 (00:00, 25 Oct to 00:00, 26 Oct 2018)	8.14 (12:17, 01 Nov 2018)	686.7 (21:39, 25 Oct 2018)
NO(µg / m3)	12.41	1.78 (00:00, 11 Nov to 00:00, 12 Nov 2018)	458.67 (00:00, 26 Dec to 00:00, 27 Dec 2018)	0.01 (02:50, 14 Oct 2018)	80526 (18:03, 26 Dec 2018)
NO ₂ (µg / m3)	44.84	1.93 (00:00, 29 Oct to 00:00, 30 Oct 2018)	641.26 (00:00, 26 Dec to 00:00, 27 Dec 2018)	0.07 (13:34, 07 Dec 2018)	84473 (18:31, 26 Dec 2018)

Parameter	Average	Average Min	Average Max	Min	Max
NO _x (µg / m ³)	51.47	4.03 (00:00, 29 Oct to 00:00, 30 Oct 2018)	744.78 (00:00, 26 Dec to 00:00, 27 Dec 2018)	0.74 (09:17, 10 Jan 2019)	93414 (18:31, 26 Dec 2018)

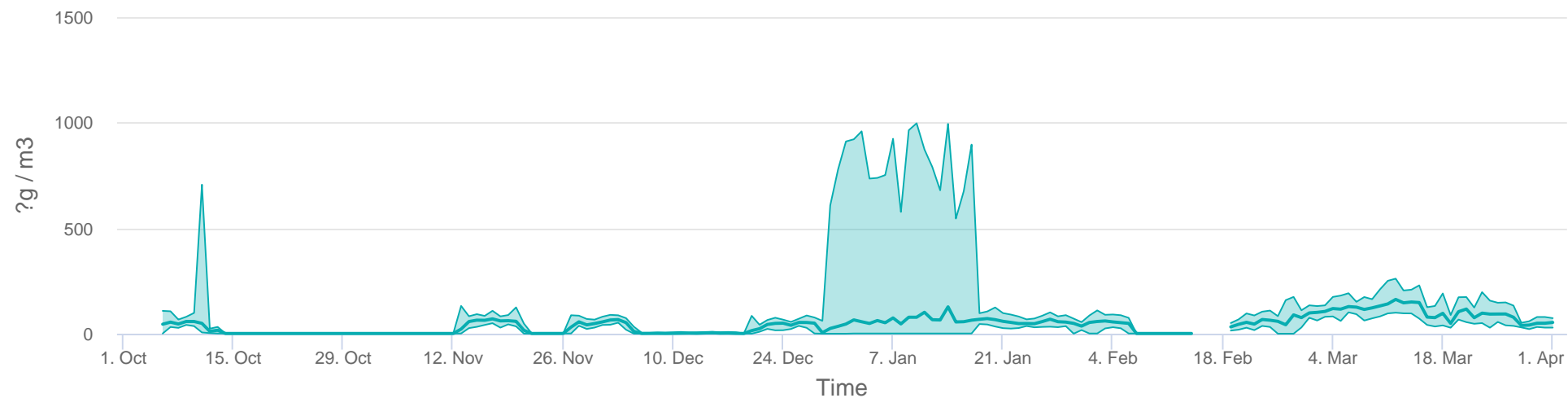
Near Karo Bridge

Parameter	Average	Average Min	Average Max	Min	Max
PM _{2.5} (µg / m ³)	110.19	1.42 (00:00, 29 Nov to 00:00, 30 Nov 2018)	1356.12 (00:00, 02 Jan to 00:00, 03 Jan 2019)	0.68 (11:10, 04 Dec 2018)	20768 (12:50, 02 Jan 2019)
PM ₁₀ (µg / m ³)	162.24	1.47 (00:00, 03 Dec to 00:00, 04 Dec 2018)	359.77 (00:00, 11 Dec to 00:00, 12 Dec 2018)	1.49 (17:10, 30 Nov 2018)	3127 (12:37, 19 Dec 2018)

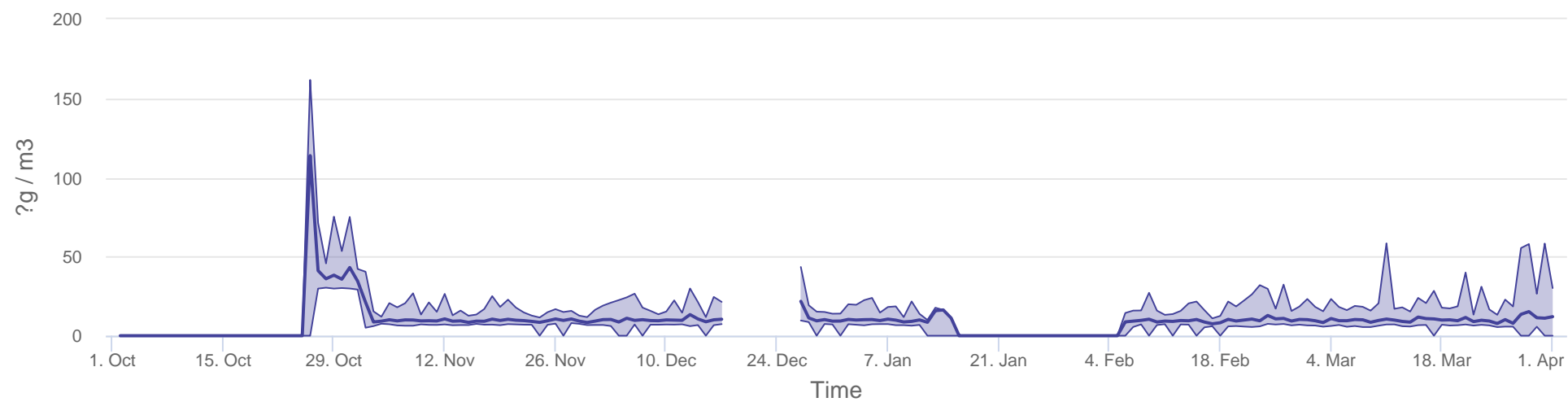
PM2.5 of CISF Colony



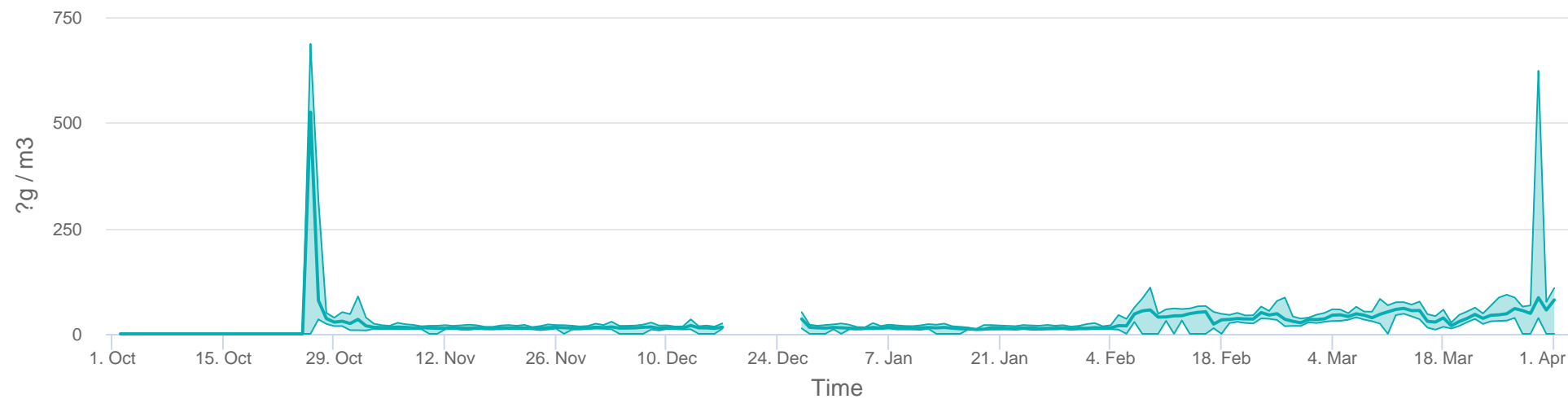
PM10 of CISF Colony



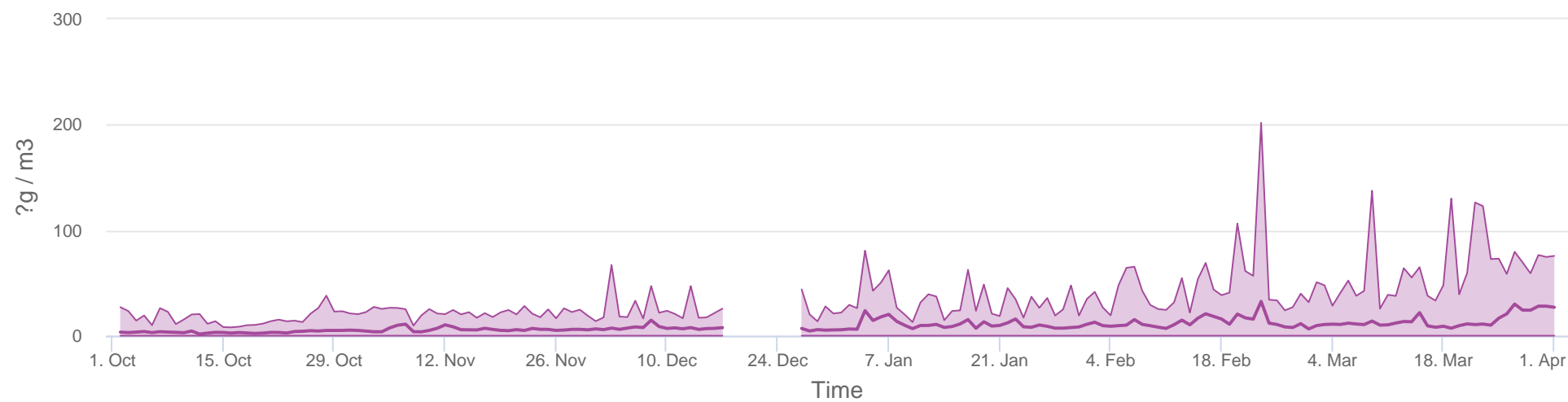
PM2.5 of AAQMS 2 - Campus Store



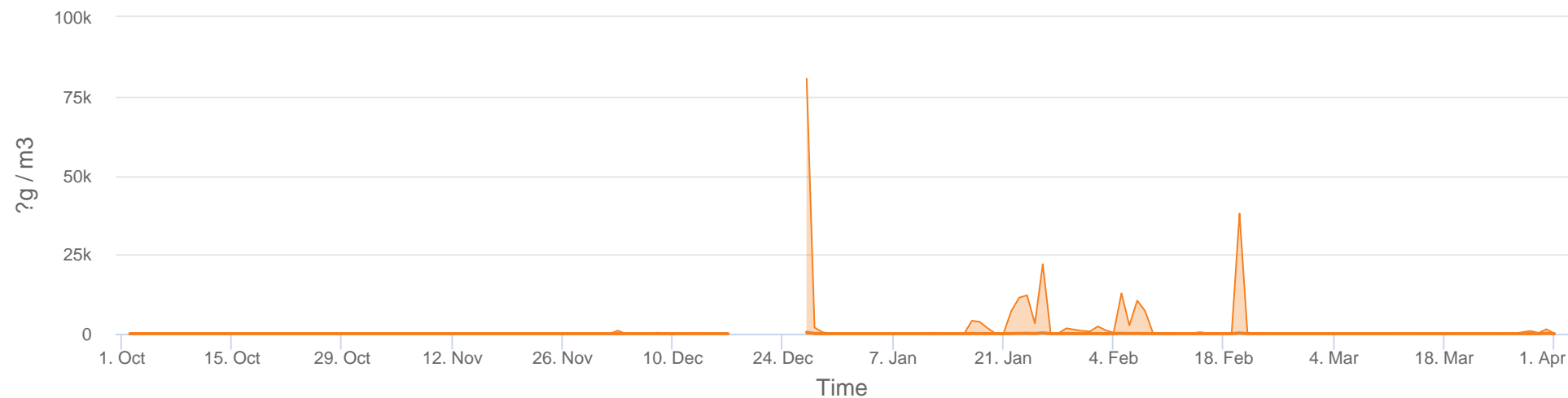
PM10 of AAQMS 2 - Campus Store



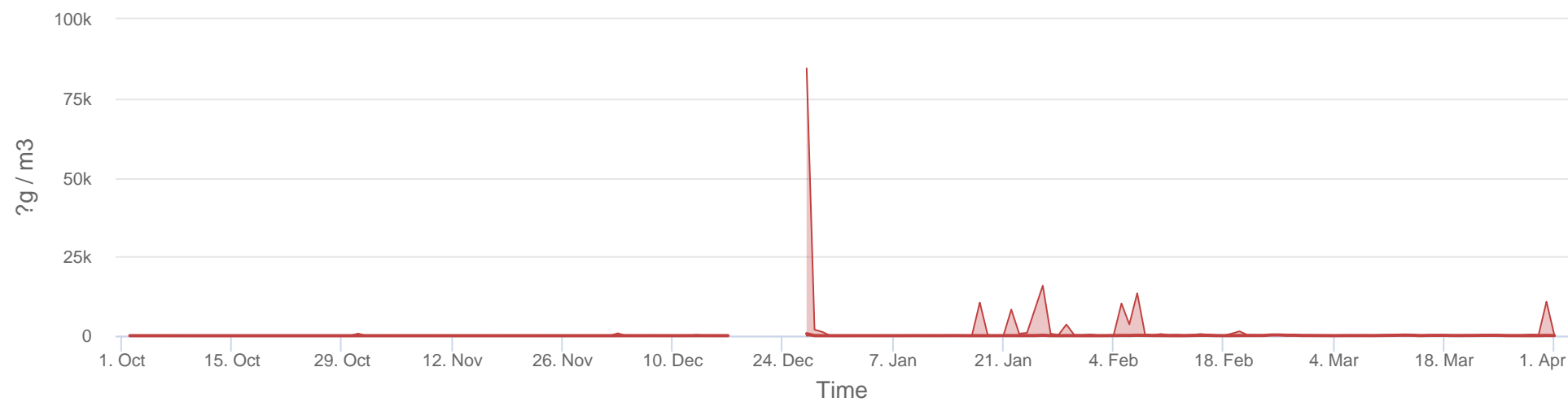
SO2 of AAQMS 2 - Campus Store



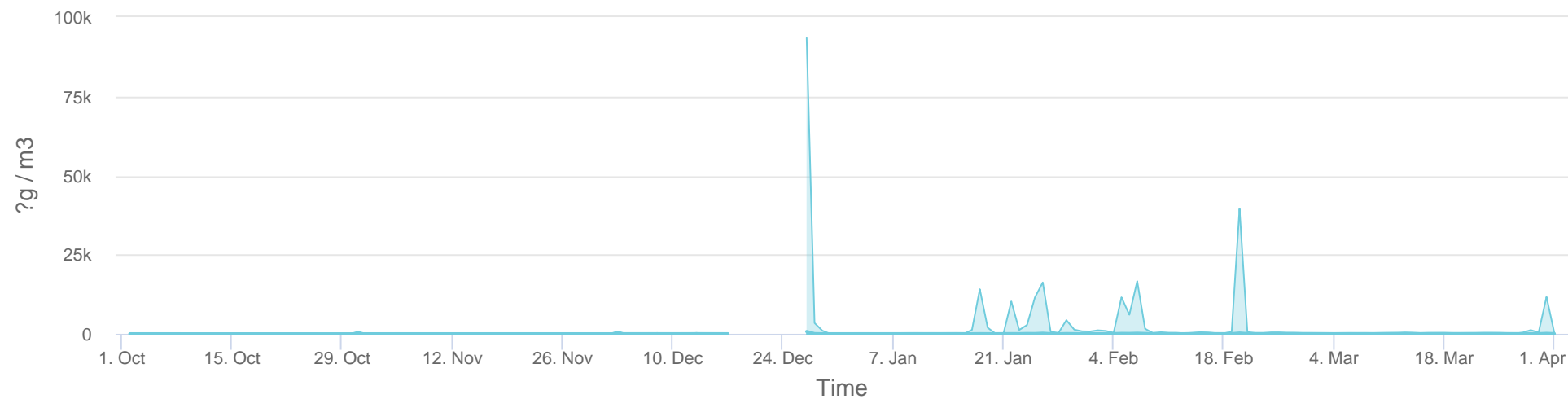
NO of AAQMS 2 - Campus Store



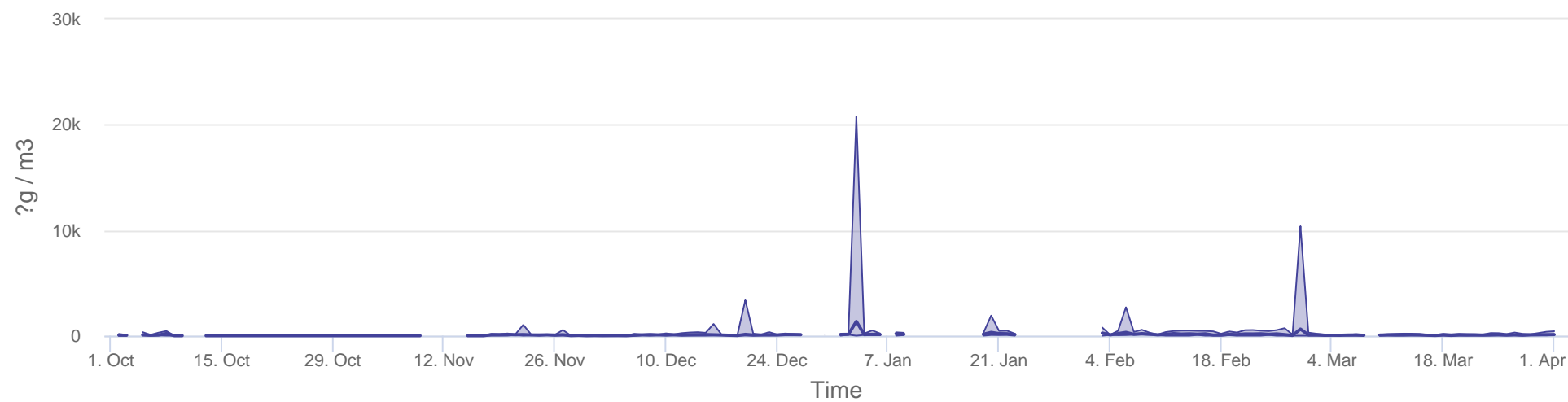
NO2 of AAQMS 2 - Campus Store



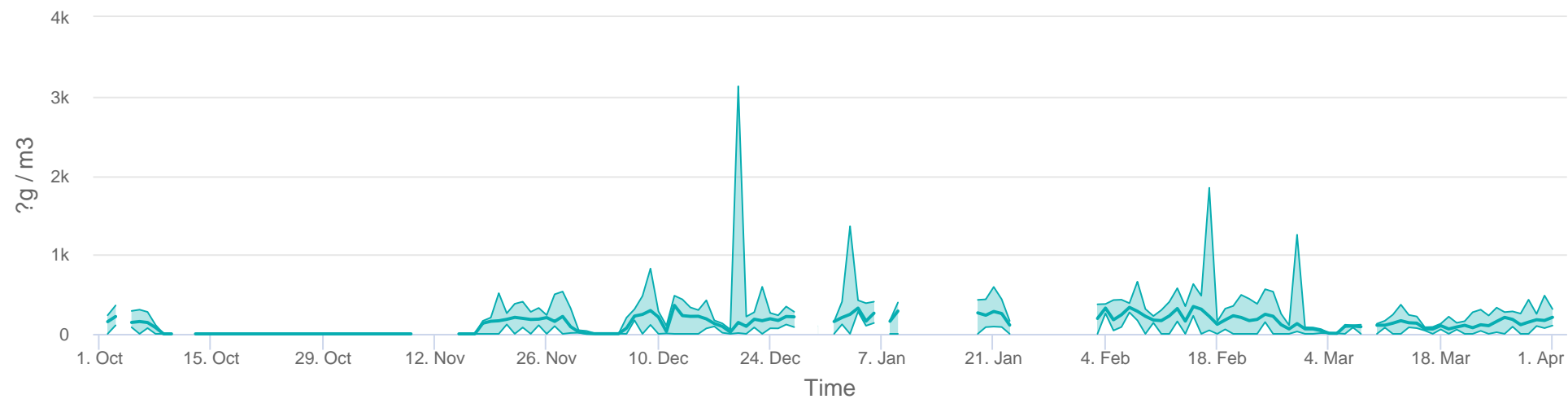
NOx of AAQMS 2 - Campus Store



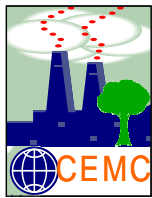
PM2.5 of Near Karo Bridge



PM10 of Near Karo Bridge



ANNEXURE - I(B)



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MoEF&CC, Govt. of India, Recognised Environment Laboratory under Environment (Protection) Act, 1986.

Report no.-CEMC/BIOM/041118/F1

Issued Date-04.11.2018

FUGITIVE EMISSION MONITORING REPORT

Client Name & Address	M/s SAIL Bolani Ores Mines,Barbil,Keonjhar
Work Order No.	CC/W-126/18-19/MJ/B-939 dated-13-08-2018
Reference No.	CEMC-04112018F1
Nature of Sampling	Fugitive Emission
Sampling Location	Panpose Quarry
Sampling By	Mr. Santosh kumar Mohanty
Sampling Duration	01-10-2018 to 31-10-2018

TEST REPORT

Sl. No.	Date	Testing Method	Respirable Suspended Particulate Matter (RSPM) in $\mu\text{g}/\text{m}^3$	Suspended Particulate Matter (SPM) in $\mu\text{g}/\text{m}^3$
1	03.10.2018	Gravimetric	335.4	747.3
2	06.10.2018	Gravimetric	391.2	798.2
3	10.10.2018	Gravimetric	348.6	724.8
4	13.10.2018	Gravimetric	281.4	623.4
5	17.10.2018	Gravimetric	302.8	694.7
6	20.10.2018	Gravimetric	379.2	738.6
7	24.10.2018	Gravimetric	401.9	802.1
8	27.10.2018	Gravimetric	363.5	736.5

Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF-1200 $\mu\text{g}/\text{m}^3$, at a distance of 30mtrs from the Source.

END OF REPORT


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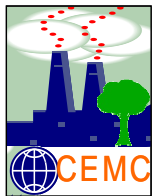
Notes:

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E-mail- ccmc_consultancy@yahoo.co.in, ccmc122@gmail.com, website: www.ccmc.in, Landline: 0674-2360344.

Laboratory At: Plot No. 800/1274, Johal, Pahal, Bhubaneswar-752101,
E-mail: cemclab@yahoo.in, Mobile: 7752014842



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Report no.-CEMC/BIOM/041118/F2

Issued Date-04.11.2018

FUGITIVE EMISSION MONITORING REPORT

Client Name & Address	M/s SAIL Bolani Ores Mines, Barbil, Keonjhar
Work Order No.	CC/W-126/18-19/MJ/B-939 dated-13-08-2018
Reference No.	CEMC-04112018F2
Nature of Sampling	Fugitive Emission
Sampling Location	D Quarry
Sampling By	Mr. Santosh kumar Mohanty
Sampling Duration	01-10-2018 to 31-10-2018

TEST REPORT

Sl. No.	Date	Testing Method	Respirable Suspended Particulate Matter (RSPM) in $\mu\text{g}/\text{m}^3$	Suspended Particulate Matter (SPM) in $\mu\text{g}/\text{m}^3$
1	03.10.2018	Gravimetric	329.4	638.9
2	06.10.2018	Gravimetric	368.7	784.3
3	10.10.2018	Gravimetric	341.3	739.8
4	13.10.2018	Gravimetric	297.6	652.3
5	17.10.2018	Gravimetric	302.8	694.6
6	20.10.2018	Gravimetric	384.1	762.1
7	24.10.2018	Gravimetric	406.3	801.7
8	27.10.2018	Gravimetric	389.4	781.4

Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF-1200 $\mu\text{g}/\text{m}^3$, at a distance of 30mtrs from the Source.

END OF REPORT


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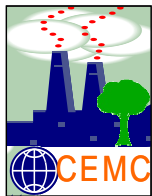
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Report no.-CEMC/BIOM/041118/F3

Issued Date-04.11.2018

FUGITIVE EMISSION MONITORING REPORT

Client Name & Address	M/s SAIL Bolani Ores Mines, Barbil, Keonjhar
Work Order No.	CC/W-126/18-19/MJ/B-939 dated-13-08-2018
Reference No.	CEMC-04112018F3
Nature of Sampling	Fugitive Emission
Sampling Location	F Quarry
Sampling By	Mr. Santosh kumar Mohanty
Sampling Duration	01-10-2018 to 31-10-2018

TEST REPORT

Sl. No.	Date	Testing Method	Respirable Suspended Particulate Matter (RSPM) in $\mu\text{g}/\text{m}^3$	Suspended Particulate Matter (SPM) in $\mu\text{g}/\text{m}^3$
1	03.10.2018	Gravimetric	297.5	771.3
2	06.10.2018	Gravimetric	376.2	811.2
3	10.10.2018	Gravimetric	341.9	751.7
4	13.10.2018	Gravimetric	303.7	635.1
5	17.10.2018	Gravimetric	321.6	698.4
6	20.10.2018	Gravimetric	372.9	764.1
7	24.10.2018	Gravimetric	407.4	812.6
8	27.10.2018	Gravimetric	386.8	788.2

Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF-1200 $\mu\text{g}/\text{m}^3$, at a distance of 30mtrs from the Source.

END OF REPORT

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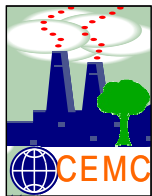
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Report no.-CEMC/BIOM/041118/F4

Issued Date-04.11.2018

FUGITIVE EMISSION MONITORING REPORT

Client Name & Address	M/s SAIL Bolani Ores Mines, Barbil, Keonjhar
Work Order No.	CC/W-126/18-19/MJ/B-939 dated-13-08-2018
Reference No.	CEMC-04112018F4
Nature of Sampling	Fugitive Emission
Sampling Location	G Quarry
Sampling By	Mr. Santosh kumar Mohanty
Sampling Duration	01-10-2018 to 31-10-2018

TEST REPORT

Sl. No.	Date	Testing Method	Respirable Suspended Particulate Matter (RSPM) in $\mu\text{g}/\text{m}^3$	Suspended Particulate Matter (SPM) in $\mu\text{g}/\text{m}^3$
1	03.10.2018	Gravimetric	302.4	752.4
2	06.10.2018	Gravimetric	406.8	798.2
3	10.10.2018	Gravimetric	384.6	714.6
4	13.10.2018	Gravimetric	293.7	617.5
5	17.10.2018	Gravimetric	316.5	698.3
6	20.10.2018	Gravimetric	388.6	734.7
7	24.10.2018	Gravimetric	411.2	813.4
8	27.10.2018	Gravimetric	372.1	737.8

Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF-1200 $\mu\text{g}/\text{m}^3$, at a distance of 30mtrs from the Source.

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Seal of Laboratory

END OF REPORT

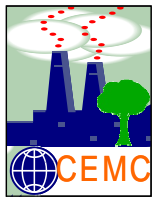
Environmental Studies (EIA & EMP), Monitoring, Forest Diversion Planning, DPR, Wildlife Management Plan, Hazardous & Safety Studies, RS& GIS, Baseline Survey, Hydrological & Geological Studies, Socio-economic Studies, DGPS & ETS Survey.

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Report no.-CEMC/BIOM/041118/F5

Issued Date-04.11.2018

FUGITIVE EMISSION MONITORING REPORT

Client Name & Address	M/s SAIL Bolani Ores Mines,Barbil,Keonjhar
Work Order No.	CC/W-126/18-19/MJ/B-939 dated-13-08-2018
Reference No.	CEMC-04112018F5
Nature of Sampling	Fugitive Emission
Sampling Location	Fines Loading Points
Sampling By	Mr. Santosh kumar Mohanty
Sampling Duration	01-10-2018 to 31-10-2018

TEST REPORT

Sl. No.	Date	Testing Method	Respirable Suspended Particulate Matter (RSPM) in $\mu\text{g}/\text{m}^3$	Suspended Particulate Matter (SPM) in $\mu\text{g}/\text{m}^3$
1	03.10.2018	Gravimetric	246.8	659.3
2	06.10.2018	Gravimetric	393.2	795.2
3	10.10.2018	Gravimetric	365.7	716.8
4	13.10.2018	Gravimetric	261.9	673.7
5	17.10.2018	Gravimetric	295.6	703.6
6	20.10.2018	Gravimetric	359.4	783.4
7	24.10.2018	Gravimetric	402.5	841.2
8	27.10.2018	Gravimetric	375.6	736.5

Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF-1200 $\mu\text{g}/\text{m}^3$, at a distance of 30mtrs from the Source.

END OF REPORT


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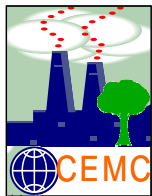
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Laboratory At: Plot No. 800/1274, Johal, Pahal, Bhubaneswar-752101,
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Report no.-CEMC/BIOM/041118/F6

Issued Date-04.11.2018

FUGITIVE EMISSION MONITORING REPORT

Client Name & Address	M/s SAIL Bolani Ores Mines, Barbil, Keonjhar
Work Order No.	CC/W-126/18-19/MJ/B-939 dated-13-08-2018
Reference No.	CEMC-04112018F6
Nature of Sampling	Fugitive Emission
Sampling Location	Near 600 TPH
Sampling By	Mr. Santosh kumar Mohanty
Sampling Duration	01-10-2018 to 31-10-2018

TEST REPORT

Sl. No.	Date	Testing Method	Respirable Suspended Particulate Matter (RSPM) in $\mu\text{g}/\text{m}^3$	Suspended Particulate Matter (SPM) in $\mu\text{g}/\text{m}^3$
1	03.10.2018	Gravimetric	299.5	649.3
2	06.10.2018	Gravimetric	407.2	808.5
3	10.10.2018	Gravimetric	371.7	712.9
4	13.10.2018	Gravimetric	283.6	647.2
5	17.10.2018	Gravimetric	293.2	705.4
6	20.10.2018	Gravimetric	387.4	766.8
7	24.10.2018	Gravimetric	391.8	784.5
8	27.10.2018	Gravimetric	352.9	724.9

Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF-1200 $\mu\text{g}/\text{m}^3$, at a distance of 30mtrs from the Source.

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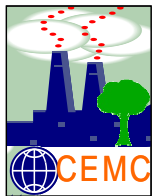
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Report no.-CEMC/BIOM/031218/F1

Issued Date-03.12.2018

FUGITIVE EMISSION MONITORING REPORT

Client Name & Address	M/s SAIL Bolani Ores Mines,Barbil,Keonjhar
Work Order No.	CC/W-126/18-19/MJ/B-939 dated-13-08-2018
Reference No.	CEMC-03122018F1
Nature of Sampling	Fugitive Emission
Sampling Location	Panpose Quarry
Sampling By	Mr. Santosh kumar Mohanty
Sampling Duration	01-11-2018 to 30-11-2018

TEST REPORT

Sl. No.	Date	Testing Method	Respirable Suspended Particulate Matter (RSPM) in $\mu\text{g}/\text{m}^3$	Suspended Particulate Matter (SPM) in $\mu\text{g}/\text{m}^3$
1	02.11.2018	Gravimetric	437.4	983.8
2	05.11.2018	Gravimetric	451.5	896.4
3	09.11.2018	Gravimetric	348.6	918.6
4	12.11.2018	Gravimetric	287.2	677.3
5	16.11.2018	Gravimetric	316.4	754.5
6	19.11.2018	Gravimetric	399.7	798.8
7	23.11.2018	Gravimetric	431.9	816.7
8	26.11.2018	Gravimetric	496.8	942.2

Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF-1200 $\mu\text{g}/\text{m}^3$, at a distance of 30mtrs from the Source.


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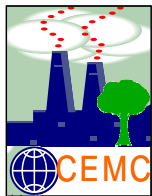
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Report no.-CEMC/BIOM/031218/F2

Issued Date-03.12.2018

FUGITIVE EMISSION MONITORING REPORT

Client Name & Address	M/s SAIL Bolani Ores Mines,Barbil,Keonjhar
Work Order No.	CC/W-126/18-19/MJ/B-939 dated-13-08-2018
Reference No.	CEMC-03122018F2
Nature of Sampling	Fugitive Emission
Sampling Location	D Quarry
Sampling By	Mr. Santosh kumar Mohanty
Sampling Duration	01-11-2018 to 30-11-2018

TEST REPORT

Sl. No.	Date	Testing Method	Respirable Suspended Particulate Matter (RSPM) in $\mu\text{g}/\text{m}^3$	Suspended Particulate Matter (SPM) in $\mu\text{g}/\text{m}^3$
1	02.11.2018	Gravimetric	427.6	846.3
2	05.11.2018	Gravimetric	353.9	792.6
3	09.11.2018	Gravimetric	425.1	854.4
4	12.11.2018	Gravimetric	477.4	916.5
5	16.11.2018	Gravimetric	432.5	891.2
6	19.11.2018	Gravimetric	397.3	789.8
7	23.11.2018	Gravimetric	429.8	862.6
8	26.11.2018	Gravimetric	496.7	921.7

Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF-1200 $\mu\text{g}/\text{m}^3$, at a distance of 30mtrs from the Source.


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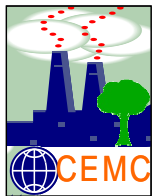
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Report no.-CEMC/BIOM/031218/F3

Issued Date-03.12.2018

FUGITIVE EMISSION MONITORING REPORT

Client Name & Address	M/s SAIL Bolani Ores Mines, Barbil, Keonjhar
Work Order No.	CC/W-126/18-19/MJ/B-939 dated-13-08-2018
Reference No.	CEMC-03122018F3
Nature of Sampling	Fugitive Emission
Sampling Location	F Quarry
Sampling By	Mr. Santosh kumar Mohanty
Sampling Duration	01-11-2018 to 30-11-2018

TEST REPORT

Sl. No.	Date	Testing Method	Respirable Suspended Particulate Matter (RSPM) in $\mu\text{g}/\text{m}^3$	Suspended Particulate Matter (SPM) in $\mu\text{g}/\text{m}^3$
1	02.11.2018	Gravimetric	402.7	798.6
2	05.11.2018	Gravimetric	419.2	845.4
3	09.11.2018	Gravimetric	397.6	825.1
4	12.11.2018	Gravimetric	531.4	923.8
5	16.11.2018	Gravimetric	442.5	846.2
6	19.11.2018	Gravimetric	502.9	912.5
7	23.11.2018	Gravimetric	391.3	784.3
8	26.11.2018	Gravimetric	463.1	835.7

Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF-1200 $\mu\text{g}/\text{m}^3$, at a distance of 30mtrs from the Source.

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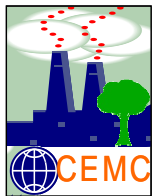
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Report no.-CEMC/BIOM/031218/F4

Issued Date-03.12.2018

FUGITIVE EMISSION MONITORING REPORT

Client Name & Address	M/s SAIL Bolani Ores Mines, Barbil, Keonjhar
Work Order No.	CC/W-126/18-19/MJ/B-939 dated-13-08-2018
Reference No.	CEMC-03122018F4
Nature of Sampling	Fugitive Emission
Sampling Location	G Quarry
Sampling By	Mr. Santosh kumar Mohanty
Sampling Duration	01-11-2018 to 30-11-2018

TEST REPORT

Sl. No.	Date	Testing Method	Respirable Suspended Particulate Matter (RSPM) in $\mu\text{g}/\text{m}^3$	Suspended Particulate Matter (SPM) in $\mu\text{g}/\text{m}^3$
1	02.11.2018	Gravimetric	376.8	788.6
2	05.11.2018	Gravimetric	413.2	837.5
3	09.11.2018	Gravimetric	397.5	826.9
4	12.11.2018	Gravimetric	304.1	605.7
5	16.11.2018	Gravimetric	398.4	841.6
6	19.11.2018	Gravimetric	402.8	792.3
7	23.11.2018	Gravimetric	395.6	872.9
8	26.11.2018	Gravimetric	421.5	893.4

Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF-1200 $\mu\text{g}/\text{m}^3$, at a distance of 30mtrs from the Source.

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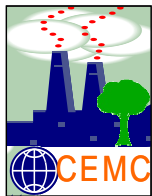
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Report no.-CEMC/BIOM/031218/F5

Issued Date-03.12.2018

FUGITIVE EMISSION MONITORING REPORT

Client Name & Address	M/s SAIL Bolani Ores Mines,Barbil,Keonjhar
Work Order No.	CC/W-126/18-19/MJ/B-939 dated-13-08-2018
Reference No.	CEMC-03122018F5
Nature of Sampling	Fugitive Emission
Sampling Location	Fines Loading Points
Sampling By	Mr. Santosh kumar Mohanty
Sampling Duration	01-11-2018 to 30-11-2018

TEST REPORT

Sl. No.	Date	Testing Method	Respirable Suspended Particulate Matter (RSPM) in $\mu\text{g}/\text{m}^3$	Suspended Particulate Matter (SPM) in $\mu\text{g}/\text{m}^3$
1	02.11.2018	Gravimetric	409.3	832.6
2	05.11.2018	Gravimetric	469.1	937.4
3	09.11.2018	Gravimetric	421.4	882.5
4	12.11.2018	Gravimetric	398.9	906.3
5	16.11.2018	Gravimetric	389.7	891.7
6	19.11.2018	Gravimetric	459.6	946.2
7	23.11.2018	Gravimetric	402.2	892.4
8	26.11.2018	Gravimetric	415.8	914.8

Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF-1200 $\mu\text{g}/\text{m}^3$, at a distance of 30mtrs from the Source.

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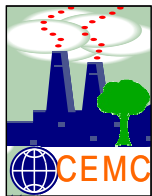
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Report no.-CEMC/BIOM/031218/F6

Issued Date-03.12.2018

FUGITIVE EMISSION MONITORING REPORT

Client Name & Address	M/s SAIL Bolani Ores Mines, Barbil, Keonjhar
Work Order No.	CC/W-126/18-19/MJ/B-939 dated-13-08-2018
Reference No.	CEMC-03122018F6
Nature of Sampling	Fugitive Emission
Sampling Location	Near 600 TPH
Sampling By	Mr. Santosh kumar Mohanty
Sampling Duration	01-11-2018 to 30-11-2018

TEST REPORT

Sl. No.	Date	Testing Method	Respirable Suspended Particulate Matter (RSPM) in $\mu\text{g}/\text{m}^3$	Suspended Particulate Matter (SPM) in $\mu\text{g}/\text{m}^3$
1	02.11.2018	Gravimetric	379.4	784.8
2	05.11.2018	Gravimetric	402.1	819.3
3	09.11.2018	Gravimetric	354.5	796.5
4	12.11.2018	Gravimetric	411.3	807.4
5	16.11.2018	Gravimetric	398.2	795.7
6	19.11.2018	Gravimetric	386.9	788.2
7	23.11.2018	Gravimetric	419.6	841.6
8	26.11.2018	Gravimetric	383.7	796.9

Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF-1200 $\mu\text{g}/\text{m}^3$, at a distance of 30mtrs from the Source.

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Report no.-CEMC/BIOM/060219/F1

Issued Date-06.02.2019

FUGITIVE EMISSION MONITORING REPORT

Client Name & Address	M/s SAIL Bolani Ores Mines, Barbil, Keonjhar
Work Order No.	CC/W-126/18-19/MJ/B-939 dated-13-08-2018
Reference No.	CEMC-06022019F1
Nature of Sampling	Fugitive Emission
Sampling Location	Panpose Quarry
Sampling By	Mr. Santosh kumar Mohanty
Sampling Duration	01-01-2019 to 31-01-2019

TEST REPORT

Sl. No.	Date	Testing Method	Respirable Suspended Particulate Matter (RSPM) in $\mu\text{g}/\text{m}^3$	Suspended Particulate Matter (SPM) in $\mu\text{g}/\text{m}^3$
1	01.01.2019	Gravimetric	348.2	1020.5
2	04.01.2019	Gravimetric	394.4	1048.2
3	08.01.2019	Gravimetric	308.6	978.6
4	11.01.2019	Gravimetric	296.7	946.3
5	15.01.2019	Gravimetric	318.4	986.8
6	18.01.2019	Gravimetric	406.4	1036.4
7	22.01.2019	Gravimetric	418.6	1072.6
8	25.01.2019	Gravimetric	378.2	1014.9
9	29.01.2019	Gravimetric	356.6	998.6

Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF-1200 $\mu\text{g}/\text{m}^3$, at a distance of 30mtrs from the Source.


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Laboratory At: Plot No. 800/1274, Johal, Pahal, Bhubaneswar-752101.

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Report no.-CEMC/BIOM/060219/F2

Issued Date-06.02.2019

FUGITIVE EMISSION MONITORING REPORT

Client Name & Address	M/s SAIL Bolani Ores Mines, Barbil, Keonjhar
Work Order No.	CC/W-126/18-19/MJ/B-939 dated-13-08-2018
Reference No.	CEMC-06022019F2
Nature of Sampling	Fugitive Emission
Sampling Location	D Quarry
Sampling By	Mr. Santosh kumar Mohanty
Sampling Duration	01-01-2019 to 31-01-2019

TEST REPORT

Sl. No.	Date	Testing Method	Respirable Suspended Particulate Matter (RSPM) in $\mu\text{g}/\text{m}^3$	Suspended Particulate Matter (SPM) in $\mu\text{g}/\text{m}^3$
1	01.01.2019	Gravimetric	418.6	942.5
2	04.01.2019	Gravimetric	394.2	896.4
3	08.01.2019	Gravimetric	421.6	924.8
4	11.01.2019	Gravimetric	378.6	968.1
5	15.01.2019	Gravimetric	298.6	908.6
6	18.01.2019	Gravimetric	408.3	965.8
7	22.01.2019	Gravimetric	367.2	873.4
8	25.01.2019	Gravimetric	346.5	896.5
9	29.01.2019	Gravimetric	391.4	967.2

Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF-1200 $\mu\text{g}/\text{m}^3$, at a distance of 30mtrs from the Source.


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Report no.-CEMC/BIOM/060219/F3

Issued Date-06.02.2019

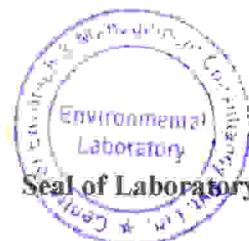
FUGITIVE EMISSION MONITORING REPORT

Client Name & Address	M/s SAIL Bolani Ores Mines, Barbil, Keonjhar
Work Order No.	CC/W-126/18-19/MJ/B-939 dated-13-08-2018
Reference No.	CEMC-06022019F3
Nature of Sampling	Fugitive Emission
Sampling Location	F Quarry
Sampling By	Mr. Santosh kumar Mohanty
Sampling Duration	01-01-2019 to 31-01-2019

TEST REPORT

Sl. No.	Date	Testing Method	Respirable Suspended Particulate Matter (RSPM) in $\mu\text{g}/\text{m}^3$	Suspended Particulate Matter (SPM) in $\mu\text{g}/\text{m}^3$
1	01.01.2019	Gravimetric	394.2	908.6
2	04.01.2019	Gravimetric	408.6	946.2
3	08.01.2019	Gravimetric	364.2	890.8
4	11.01.2019	Gravimetric	328.4	864.8
5	15.01.2019	Gravimetric	376.2	924.1
6	18.01.2019	Gravimetric	400.5	913.4
7	22.01.2019	Gravimetric	337.2	886.8
8	25.01.2019	Gravimetric	328.6	934.1
9	29.01.2019	Gravimetric	298.4	864.5

Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF-1200 $\mu\text{g}/\text{m}^3$, at a distance of 30mtrs from the Source.



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Report no.-CEMC/BIOM/060219/F4

Issued Date-06.02.2019

FUGITIVE EMISSION MONITORING REPORT

Client Name & Address	M/s SAIL Bolani Ores Mines,Barbil,Keonjhar
Work Order No.	CC/W-126/18-19/MJ/B-939 dated-13-08-2018
Reference No.	CEMC-06022019F4
Nature of Sampling	Fugitive Emission
Sampling Location	G Quarry
Sampling By	Mr. Santosh kumar Mohanty
Sampling Duration	01-01-2019 to 31-01-2019

TEST REPORT

SL No.	Date	Testing Method	Respirable Suspended Particulate Matter (RSPM) in $\mu\text{g}/\text{m}^3$	Suspended Particulate Matter (SPM) in $\mu\text{g}/\text{m}^3$
1	01.01.2019	Gravimetric	401.2	942.2
2	04.01.2019	Gravimetric	434.2	968.4
3	08.01.2019	Gravimetric	364.2	905.7
4	11.01.2019	Gravimetric	308.2	889.2
5	15.01.2019	Gravimetric	344.1	928.9
6	18.01.2019	Gravimetric	379.2	994.6
7	22.01.2019	Gravimetric	308.2	907.3
8	25.01.2019	Gravimetric	296.1	827.4
9	29.01.2019	Gravimetric	346.2	889.7

Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF-1200 $\mu\text{g}/\text{m}^3$, at a distance of 30mtrs from the Source.

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Report no.-CEMC/BIOM/060219/F5

Issued Date-06.02.2019

FUGITIVE EMISSION MONITORING REPORT

Client Name & Address	M/s SAIL Bolani Ores Mines,Barbil,Keonjhar
Work Order No.	CC/W-126/18-19/MJ/B-939 dated-13-08-2018
Reference No.	CEMC-06022019F5
Nature of Sampling	Fugitive Emission
Sampling Location	Fines Loading Points
Sampling By	Mr. Santosh kumar Mohanty
Sampling Duration	01-01-2019 to 31-01-2019

TEST REPORT

Sl. No.	Date	Testing Method	Respirable Suspended Particulate Matter (RSPM) in $\mu\text{g}/\text{m}^3$	Suspended Particulate Matter (SPM) in $\mu\text{g}/\text{m}^3$
1	01.01.2019	Gravimetric	388.2	934.1
2	04.01.2019	Gravimetric	342.2	894.2
3	08.01.2019	Gravimetric	308.6	909.6
4	11.01.2019	Gravimetric	372.4	956.5
5	15.01.2019	Gravimetric	364.2	978.2
6	18.01.2019	Gravimetric	334.1	942.4
7	22.01.2019	Gravimetric	384.2	996.1
8	25.01.2019	Gravimetric	404.4	952.1
9	29.01.2019	Gravimetric	334.6	898.6

Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF-1200 $\mu\text{g}/\text{m}^3$, at a distance of 30mtrs from the Source.


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Report no.-CEMC/BIOM/060219/F6

Issued Date-06.02.2019

FUGITIVE EMISSION MONITORING REPORT

Client Name & Address	M/s SAIL Bolani Ores Mines, Barbil, Keonjhar
Work Order No.	CC/W-126/18-19/MJ/B-939 dated-13-08-2018
Reference No.	CEMC-06022019F6
Nature of Sampling	Fugitive Emission
Sampling Location	Near 600 TPH
Sampling By	Mr. Santosh kumar Mohanty
Sampling Duration	01-01-2019 to 31-01-2019

TEST REPORT

Sl. No.	Date	Testing Method	Respirable Suspended Particulate Matter (RSPM) in $\mu\text{g}/\text{m}^3$	Suspended Particulate Matter (SPM) in $\mu\text{g}/\text{m}^3$
1	01.01.2019	Gravimetric	372.5	908.2
2	04.01.2019	Gravimetric	388.6	940.7
3	08.01.2019	Gravimetric	406.1	901.8
4	11.01.2019	Gravimetric	328.4	868.2
5	15.01.2019	Gravimetric	345.1	927.4
6	18.01.2019	Gravimetric	394.6	968.2
7	22.01.2019	Gravimetric	334.5	922.4
8	25.01.2019	Gravimetric	302.8	892.3
9	29.01.2019	Gravimetric	317.6	867.1

Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF-1200 $\mu\text{g}/\text{m}^3$, at a distance of 30mtrs from the Source.

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Report no.-CEMC/BIOM/040319/F1

Issued Date-04.03.2019

FUGITIVE EMISSION MONITORING REPORT

Client Name & Address	M/s SAIL Bolani Ores Mines, Barbil, Keonjhar
Work Order No.	CC/W-126/18-19/MJ/B-939 dated-13-08-2018
Reference No.	CEMC-04032019F1
Nature of Sampling	Fugitive Emission
Sampling Location	Panpose Quarry
Sampling By	Mr. Santosh kumar Mohanty
Sampling Duration	01-02-2019 to 28.02-2019

TEST REPORT

Sl. No.	Date	Testing Method	Respirable Suspended Particulate Matter (RSPM) in $\mu\text{g}/\text{m}^3$	Suspended Particulate Matter (SPM) in $\mu\text{g}/\text{m}^3$
1	01.02.2019	Gravimetric	348.4	1028.2
2	04.02.2019	Gravimetric	373.2	1083.4
3	07.02.2019	Gravimetric	308.4	978.8
4	11.02.2019	Gravimetric	290.5	954.2
5	14.02.2019	Gravimetric	288.1	980.6
6	18.02.2019	Gravimetric	344.2	1056.8
7	22.02.2019	Gravimetric	368.6	1102.4
8	26.02.2019	Gravimetric	286.1	979.9

Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF-1200 $\mu\text{g}/\text{m}^3$, at a distance of 30mtrs from the Source.

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Report no.-CEMC/BIOM/040319/F2

Issued Date-04.03.2019

FUGITIVE EMISSION MONITORING REPORT

Client Name & Address	M/s SAIL Bolani Ores Mines, Barbil, Keonjhar
Work Order No.	CC/W-126/18-19/MJ/B-939 dated-13-08-2018
Reference No.	CEMC-04032019F2
Nature of Sampling	Fugitive Emission
Sampling Location	D Quarry
Sampling By	Mr. Santosh kumar Mohanty
Sampling Duration	01-02-2019 to 28.02-2019

TEST REPORT

Sl. No.	Date	Testing Method	Respirable Suspended Particulate Matter (RSPM) in $\mu\text{g}/\text{m}^3$	Suspended Particulate Matter (SPM) in $\mu\text{g}/\text{m}^3$
1	01.02.2019	Gravimetric	370.1	922.2
2	04.02.2019	Gravimetric	324.2	948.6
3	07.02.2019	Gravimetric	288.4	879.3
4	11.02.2019	Gravimetric	267.5	908.6
5	14.02.2019	Gravimetric	290.5	976.2
6	18.02.2019	Gravimetric	328.6	1020.4
7	22.02.2019	Gravimetric	271.4	950.6
8	26.02.2019	Gravimetric	268.2	898.2

Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF-1200 $\mu\text{g}/\text{m}^3$, at a distance of 30mtrs from the Source.

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Report no.-CEMC/BIOM/040319/F3

Issued Date-04.03.2019

FUGITIVE EMISSION MONITORING REPORT

Client Name & Address	M/s SAIL Bolani Ores Mines, Barbil, Keonjhar
Work Order No.	CC/W-126/18-19/MJ/B-939 dated-13-08-2018
Reference No.	CEMC-04032019F3
Nature of Sampling	Fugitive Emission
Sampling Location	F Quarry
Sampling By	Mr. Santosh kumar Mohanty
Sampling Duration	01-02-2019 to 28.02-2019

TEST REPORT

Sl. No.	Date	Testing Method	Respirable Suspended Particulate Matter (RSPM) in $\mu\text{g}/\text{m}^3$	Suspended Particulate Matter (SPM) in $\mu\text{g}/\text{m}^3$
1	01.02.2019	Gravimetric	276.2	948.8
2	04.02.2019	Gravimetric	316.8	972.1
3	07.02.2019	Gravimetric	248.5	895.2
4	11.02.2019	Gravimetric	279.6	907.4
5	14.02.2019	Gravimetric	301.6	967.4
6	18.02.2019	Gravimetric	256.1	934.6
7	22.02.2019	Gravimetric	228.6	846.1
8	26.02.2019	Gravimetric	246.8	898.4

Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF-1200 $\mu\text{g}/\text{m}^3$, at a distance of 30mtrs from the Source.


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Laboratory At: Plot No. 800/1274, Jhali, Pahal, Bhubaneswar-752101.

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Report no.-CEMC/BIOM/040319/F4

Issued Date-04.03.2019

FUGITIVE EMISSION MONITORING REPORT

Client Name & Address	M/s SAIL Bolani Ores Mines, Barbil, Keonjhar
Work Order No.	CC/W-126/18-19/MJ/B-939 dated-13-08-2018
Reference No.	CEMC-04032019F4
Nature of Sampling	Fugitive Emission
Sampling Location	G Quarry
Sampling By	Mr. Santosh kumar Mohanty
Sampling Duration	01-02-2019 to 28.02-2019

TEST REPORT

Sl. No.	Date	Testing Method	Respirable Suspended Particulate Matter (RSPM) in $\mu\text{g}/\text{m}^3$	Suspended Particulate Matter (SPM) in $\mu\text{g}/\text{m}^3$
1	01.02.2019	Gravimetric	328.2	946.1
2	04.02.2019	Gravimetric	346.1	991.2
3	07.02.2019	Gravimetric	378.9	946.1
4	11.02.2019	Gravimetric	296.4	901.6
5	14.02.2019	Gravimetric	281.2	941.2
6	18.02.2019	Gravimetric	249.6	870.5
7	22.02.2019	Gravimetric	273.8	964.2
8	26.02.2019	Gravimetric	308.6	979.8

Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF-1200 $\mu\text{g}/\text{m}^3$, at a distance of 30mtrs from the Source.

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Environmental Studies (EIA & EMP), Monitoring, Forest Diversion Planning, DPR, Wildlife Management Plan, Hazardous & Safety Studies, RS& GIS, Baseline Survey, Hydrological & Geological Studies, Socio-economic Studies, DGPS & ETS Survey.

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Report no.-CEMC/BIOM/040319/F5

Issued Date-04.03.2019

FUGITIVE EMISSION MONITORING REPORT

Client Name & Address	M/s SAIL Bolani Ores Mines, Barbil, Keonjhar
Work Order No.	CC/W-126/18-19/MJ/B-939 dated-13-08-2018
Reference No.	CEMC-04032019F5
Nature of Sampling	Fugitive Emission
Sampling Location	Fines Loading Points
Sampling By	Mr. Santosh kumar Mohanty
Sampling Duration	01-02-2019 to 28.02-2019

TEST REPORT

Sl. No.	Date	Testing Method	Respirable Suspended Particulate Matter (RSPM) in $\mu\text{g}/\text{m}^3$	Suspended Particulate Matter (SPM) in $\mu\text{g}/\text{m}^3$
1	01.02.2019	Gravimetric	361.2	1065.1
2	04.02.2019	Gravimetric	324.1	976.2
3	07.02.2019	Gravimetric	292.8	928.5
4	11.02.2019	Gravimetric	280.4	948.3
5	14.02.2019	Gravimetric	346.1	1056.8
6	18.02.2019	Gravimetric	279.1	973.5
7	22.02.2019	Gravimetric	264.8	908.6
8	26.02.2019	Gravimetric	299.6	980.4

Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF-1200 $\mu\text{g}/\text{m}^3$, at a distance of 30mtrs from the Source.

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Report no.-CEMC/BIOM/040319/F6

Issued Date-04.03.2019

FUGITIVE EMISSION MONITORING REPORT

Client Name & Address	M/s SAIL Bolani Ores Mines, Barbil, Keonjhar
Work Order No.	CC/W-126/18-19/ML/B-939 dated-13-08-2018
Reference No.	CEMC-04032019F6
Nature of Sampling	Fugitive Emission
Sampling Location	Near 600 TPH
Sampling By	Mr. Santosh kumar Mohanty
Sampling Duration	01-02-2019 to 28.02-2019

TEST REPORT

Sl. No.	Date	Testing Method	Respirable Suspended Particulate Matter (RSPM) in $\mu\text{g}/\text{m}^3$	Suspended Particulate Matter (SPM) in $\mu\text{g}/\text{m}^3$
1	01.02.2019	Gravimetric	301.8	946.2
2	04.02.2019	Gravimetric	276.2	867.2
3	07.02.2019	Gravimetric	237.4	907.6
4	11.02.2019	Gravimetric	380.6	1010.4
5	14.02.2019	Gravimetric	297.6	937.6
6	18.02.2019	Gravimetric	340.2	989.6
7	22.02.2019	Gravimetric	285.6	876.4
8	26.02.2019	Gravimetric	243.4	928.6

Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF-1200 $\mu\text{g}/\text{m}^3$, at a distance of 30mtrs from the Source.


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Environmental Studies (EIA & EMP), Monitoring, Forest Diversion Planning, DPR, Wildlife Management Plan, Hazardous & Safety Studies, RS& GIS, Baseline Survey, Hydrological & Geological Studies, Socio-economic Studies, DGPS & ETS Survey.

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Report no.-CEMC/BIOM/040419/F1

Issued Date-04.04.2019

FUGITIVE EMISSION MONITORING REPORT

Client Name & Address	M/s SAIL Bolani Ores Mines, Barbil, Keonjhar
Work Order No.	CC/W-126/18-19/MJ/B-939 dated-13-08-2018
Reference No.	CEMC-04042019F1
Nature of Sampling	Fugitive Emission
Sampling Location	Panpose Quarry
Sampling By	Mr. Santosh kumar Mohanty
Sampling Duration	01-03-2019 to 31.03-2019

TEST REPORT

Sl. No.	Date	Testing Method	Respirable Suspended Particulate Matter (RSPM) in $\mu\text{g}/\text{m}^3$	Suspended Particulate Matter (SPM) in $\mu\text{g}/\text{m}^3$
1	02.03.2019	Gravimetric	308.6	1082.4
2	05.03.2019	Gravimetric	342.5	1124.5
3	08.03.2019	Gravimetric	296.4	986.4
4	11.03.2019	Gravimetric	248.6	942.1
5	14.03.2019	Gravimetric	318.6	1072.4
6	18.03.2019	Gravimetric	342.6	1056.4
7	21.03.2019	Gravimetric	278.1	986.4
8	25.03.2019	Gravimetric	303.4	979.2
9	28.03.2019	Gravimetric	344.1	1078.1

Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF-1200 $\mu\text{g}/\text{m}^3$, at a distance of 30mtrs from the Source.

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Report no.-CEMC/BIOM/040419/F2

Issued Date-04.04.2019

FUGITIVE EMISSION MONITORING REPORT

Client Name & Address	M/s SAIL Bolani Ores Mines, Barbil, Keonjhar
Work Order No.	CC/W-126/18-19/MJ/B-939 dated-13-08-2018
Reference No.	CEMC-04042019F2
Nature of Sampling	Fugitive Emission
Sampling Location	D Quarry
Sampling By	Mr. Santosh kumar Mohanty
Sampling Duration	01-03-2019 to 31.03-2019

TEST REPORT

Sl. No.	Date	Testing Method	Respirable Suspended Particulate Matter (RSPM) in $\mu\text{g}/\text{m}^3$	Suspended Particulate Matter (SPM) in $\mu\text{g}/\text{m}^3$
1	02.03.2019	Gravimetric	246.2	914.8
2	05.03.2019	Gravimetric	301.5	948.2
3	08.03.2019	Gravimetric	288.6	918.6
4	11.03.2019	Gravimetric	279.1	886.4
5	14.03.2019	Gravimetric	342.4	1048.6
6	18.03.2019	Gravimetric	254.2	898.2
7	21.03.2019	Gravimetric	224.1	870.1
8	25.03.2019	Gravimetric	248.2	896.4
9	28.03.2019	Gravimetric	273.4	940.8

Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF-1200 $\mu\text{g}/\text{m}^3$, at a distance of 30mtrs from the Source.

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Report no.-CEMC/BIOM/040419/F3

Issued Date-04.04.2019

FUGITIVE EMISSION MONITORING REPORT

Client Name & Address	M/s SAIL Bolani Ores Mines, Barbil, Keonjhar
Work Order No.	CC/W-126/18-19/MJ/B-939 dated-13-08-2018
Reference No.	CEMC-04042019F3
Nature of Sampling	Fugitive Emission
Sampling Location	F Quarry
Sampling By	Mr. Santosh kumar Mohanty
Sampling Duration	01-03-2019 to 31.03-2019

TEST REPORT

Sl. No.	Date	Testing Method	Respirable Suspended Particulate Matter (RSPM) in $\mu\text{g}/\text{m}^3$	Suspended Particulate Matter (SPM) in $\mu\text{g}/\text{m}^3$
1	02.03.2019	Gravimetric	215.2	880.1
2	05.03.2019	Gravimetric	256.8	946.4
3	08.03.2019	Gravimetric	207.4	850.1
4	11.03.2019	Gravimetric	270.2	890.5
5	14.03.2019	Gravimetric	224.1	844.2
6	18.03.2019	Gravimetric	261.3	946.2
7	21.03.2019	Gravimetric	204.5	907.1
8	25.03.2019	Gravimetric	196.4	824.5
9	28.03.2019	Gravimetric	230.6	864.2

Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF-1200 $\mu\text{g}/\text{m}^3$, at a distance of 30mtrs from the Source.


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Environmental Studies (EIA & EMP), Monitoring, Forest Diversion Planning, DPR, Wildlife Management Plan, Hazardous & Safety Studies, RS& GIS, Baseline Survey, Hydrological & Geological Studies, Socio-economic Studies, DQPS & ETS Survey.

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Report no.-CEMC/BIOM/040419/F4

Issued Date-04.04.2019

FUGITIVE EMISSION MONITORING REPORT

Client Name & Address	M/s SAIL Bolani Ores Mines, Barbil, Keonjhar
Work Order No.	CC/W-126/18-19/MJ/B-939 dated-13-08-2018
Reference No.	CEMC-04042019F4
Nature of Sampling	Fugitive Emission
Sampling Location	G Quarry
Sampling By	Mr. Santosh kumar Mohanty
Sampling Duration	01-03-2019 to 31.03-2019

TEST REPORT

Sl. No.	Date	Testing Method	Respirable Suspended Particulate Matter (RSPM) in $\mu\text{g}/\text{m}^3$	Suspended Particulate Matter (SPM) in $\mu\text{g}/\text{m}^3$
1	02.03.2019	Gravimetric	272.3	944.5
2	05.03.2019	Gravimetric	268.2	908.6
3	08.03.2019	Gravimetric	304.6	967.2
4	11.03.2019	Gravimetric	254.1	984.5
5	14.03.2019	Gravimetric	228.6	894.1
6	18.03.2019	Gravimetric	210.4	978.2
7	21.03.2019	Gravimetric	252.6	965.2
8	25.03.2019	Gravimetric	207.4	878.1
9	28.03.2019	Gravimetric	280.4	960.5

Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF-1200 $\mu\text{g}/\text{m}^3$, at a distance of 30mtrs from the Source.

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Report no.-CEMC/BIOM/040419/F5

Issued Date-04.04.2019

FUGITIVE EMISSION MONITORING REPORT

Client Name & Address	M/s SAIL Bolani Ores Mines, Barbil, Keonjhar
Work Order No.	CC/W-126/18-19/MJ/B-939 dated-13-08-2018
Reference No.	CEMC-04042019F5
Nature of Sampling	Fugitive Emission
Sampling Location	Fines Loading Points
Sampling By	Mr. Santosh kumar Mohanty
Sampling Duration	01-03-2019 to 31.03-2019

TEST REPORT

Sl. No.	Date	Testing Method	Respirable Suspended Particulate Matter (RSPM) in $\mu\text{g}/\text{m}^3$	Suspended Particulate Matter (SPM) in $\mu\text{g}/\text{m}^3$
1	02.03.2019	Gravimetric	281.4	956.8
2	05.03.2019	Gravimetric	301.6	1048.2
3	08.03.2019	Gravimetric	328.0	1082.4
4	11.03.2019	Gravimetric	308.2	1012.3
5	14.03.2019	Gravimetric	264.5	969.5
6	18.03.2019	Gravimetric	277.4	950.4
7	21.03.2019	Gravimetric	240.1	934.2
8	25.03.2019	Gravimetric	256.8	970.4
9	28.03.2019	Gravimetric	286.2	1038.6

Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF-1200 $\mu\text{g}/\text{m}^3$, at a distance of 30mtrs from the Source.

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END OF REPORT

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Report no.-CEMC/BIOM/040419/F6

Issued Date-04.04.2019

FUGITIVE EMISSION MONITORING REPORT

Client Name & Address	M/s SAIL Bolani Ores Mines, Barbil, Keonjhar
Work Order No.	CC/W-126/18-19/MJ/B-939 dated-13-08-2018
Reference No.	CEMC-04042019F6
Nature of Sampling	Fugitive Emission
Sampling Location	Near 600 TPH
Sampling By	Mr. Santosh Kumar Mohanty
Sampling Duration	01-03-2019 to 31.03-2019

TEST REPORT

Sl. No.	Date	Testing Method	Respirable Suspended Particulate Matter (RSPM) in $\mu\text{g}/\text{m}^3$	Suspended Particulate Matter (SPM) in $\mu\text{g}/\text{m}^3$
1	02.03.2019	Gravimetric	282.2	1028.4
2	05.03.2019	Gravimetric	241.1	968.1
3	08.03.2019	Gravimetric	238.6	918.2
4	11.03.2019	Gravimetric	255.8	977.4
5	14.03.2019	Gravimetric	290.4	1048.2
6	18.03.2019	Gravimetric	273.4	973.4
7	21.03.2019	Gravimetric	246.2	943.1
8	25.03.2019	Gravimetric	237.6	958.4
9	28.03.2019	Gravimetric	268.5	991.4

Standard as per Environment (protection) (3rd amendment) Rules-2012 by MoEF-1200 $\mu\text{g}/\text{m}^3$, at a distance of 30mtrs from the Source.

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END OF REPORT

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ANNEXURE - I(C)



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Report no. - CEMC/BOM/060219/W1

Issued Date-06.02.2019

WATER QUALITY TEST REPORT

Name & Address of the Client	: M/s. SAIL-RMD, Bolani Ores Mines, Barbil
Date of Sampling	: 30.01.2019
Sampling by	: Santhosh Kumar Mohanty
Date of Sample Received	: 31.01.2019
Sample Description	: Surface Water
Sample Location	: Karoriver before entering 6.90 ML Lease
Date of Analysis	: 31.01.2019 to 06.02.2019
Reference No.	: CEMC-06022019W1

ANALYSIS RESULT

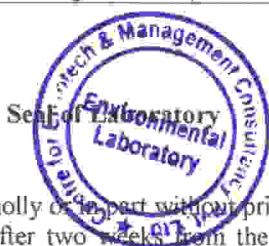
Sl. No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	--	APHA 4500H ⁺ B	7.56
2	Total Suspended Solids	mg/l	APHA 2540 D	12.2
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500Cl ₂ B	ND
5	BOD for 5 days @ 20°C	mg/l	APHA 5210 B	8.8
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	36
7	Arsenic as as	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B,C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B,C	<0.003
11	Hexavalent Chromium as Cr ⁺⁶ Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B,C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B,C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B,C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN ⁻ C,D	ND
16	Fluoride as F	mg/l	APHA 4500F ⁻ C	0.12
17	Sulphide as S	mg/l	APHA 4500 S ²⁻ D	<0.01
18	Phenolic compound as C ₆ H ₅ OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	0.16
20	Total Iron as Fe	mg/l	APHA 3500Fe, B	0.28
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO ₃ ⁻ E	2.6

NB: ND- Not Detectable


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Report no. - CEMC/BOM/060219/W2

Issued Date-06.02.2019

WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. SAIL-RMD, Bolani Ores Mines, Barbil
Date of Sampling : 30.01.2019
Sampling by : Santhosh Kumar Mohanty
Date of Sample Received : 31.01.2019
Sample Description : Surface Water
Sample Location : Jhikaria Nallah Existing 6.90 ML and before joining Karo
Date of Analysis : 31.01.2019 to 06.02.2019
Reference No. : CEMC-06022019W2

ANALYSIS RESULT

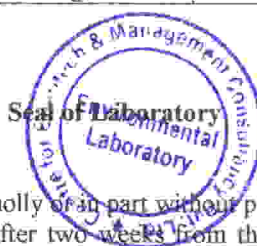
Sl. No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	--	APHA 4500H ⁺ B	7.35
2	Total Suspended Solids	mg/l	APHA 2540 D	15.6
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500Cl ₂ B	ND
5	BOD for 5 days @ 20°C	mg/l	APHA 5210 B	9.2
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	40
7	Arsenic as as	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B,C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B,C	<0.003
11	Hexavalent Chromium as Cr ⁺⁶ , Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B,C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B,C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B,C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN ⁻ C,D	ND
16	Fluoride as F	mg/l	APHA 4500F ⁻ C	0.14
17	Sulphide as S	mg/l	APHA 4500 S ²⁻ D	<0.01
18	Phenolic compound as C ₆ H ₅ OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	0.42
20	Total Iron as Fe	mg/l	APHA 3500Fe, B	0.64
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO ₃ ⁻ E	3.4

NB: ND- Not Detectable


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Report no. - CEMC/BOM/060219/W3

Issued Date-06.02.2019

WATER QUALITY TEST REPORT

Name & Address of the Client	: M/s. SAIL-RMD, Bolani Ores Mines, Barbil
Date of Sampling	: 30.01.2019
Sampling by	: Santhosh Kumar Mohanty
Date of Sample Received	: 31.01.2019
Sample Description	: Surface Water
Sample Location	: Jhikaria Nallah at School Pond existing 5.1 ML
Date of Analysis	: 31.01.2019 to 06.02.2019
Reference No.	: CEMC-06022019W3

ANALYSIS RESULT

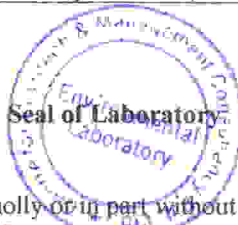
Sl. No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	--	APHA 4500H ⁺ B	7.44
2	Total Suspended Solids	mg/l	APHA 2540 D	10.1
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500Cl ₂ B	ND
5	BOD for 5 days@ 20°C	mg/l	APHA 5210 B	6.4
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	18
7	Arsenic as as	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B,C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B,C	<0.003
11	Hexavalent Chromium as Cr ⁺⁶ Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B,C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B,C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B,C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN ⁻ C,D	ND
16	Fluoride as F	mg/l	APHA 4500F ⁻ C	0.11
17	Sulphide as S	mg/l	APHA 4500 S ²⁻ D	<0.01
18	Phenolic compound as C ₆ H ₅ OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	0.19
20	Total Iron as Fe	mg/l	APHA 3500Fe ₂ B	0.42
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO ₃ ⁻ E	2.2

NB: ND- Not Detectable

Authorized Signatory

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Report no. - CEMC/BOM/060219/W4

Issued Date-06.02.2019

WATER QUALITY TEST REPORT

Name & Address of the Client	: M/s. SAIL-RMD, Bolani Ores Mines, Barbil
Date of Sampling	: 30.01.2019
Sampling by	: Santhosh Kumar Mohanty
Date of Sample Received	: 31.01.2019
Sample Description	: Surface Water
Sample Location	: Karoriver Near Kalimandir
Date of Analysis	: 31.01.2019 to 06.02.2019
Reference No.	: CEMC-06022019W4

ANALYSIS RESULT

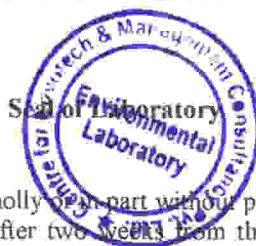
Sl. No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	--	APHA 4500H ⁺ B	7.46
2	Total Suspended Solids	mg/l	APHA 2540 D	18.6
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500Cl ₂ B	ND
5	BOD for 5 days @ 20°C	mg/l	APHA 5210 B	10.6
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	54
7	Arsenic as as	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B,C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B,C	<0.003
11	Hexavalent Chromium as Cr ⁺⁶ , Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B,C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B,C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B,C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN ⁻ C,D	ND
16	Fluoride as F	mg/l	APHA 4500F ⁻ C	0.19
17	Sulphide as S	mg/l	APHA 4500 S ²⁻ D	<0.01
18	Phenolic compound as C ₆ H ₅ OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	0.24
20	Total Iron as Fe	mg/l	APHA 3500Fe, B	0.82
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO ₃ ⁻ E	3.8

NB: ND- Not Detectable

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Report no. - CEMC/BOM/060219/W5

Issued Date-06.02.2019

WATER QUALITY TEST REPORT

Name & Address of the Client	: M/s. SAIL-RMD, Bolani Ores Mines, Barbil
Date of Sampling	: 30.01.2019
Sampling by	: Santhosh Kumar Mohanty
Date of Sample Received	: 31.01.2019
Sample Description	: Surface Water
Sample Location	: Panposh nallah within 5.10 ML
Date of Analysis	: 31.01.2019 to 06.02.2019
Reference No.	: CEMC-06022019W5

ANALYSIS RESULT

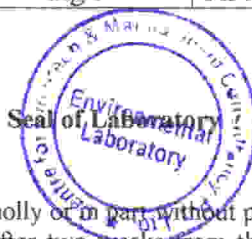
Sl. No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	--	APHA 4500H ⁺ B	7.28
2	Total Suspended Solids	mg/l	APHA 2540 D	6.8
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500Cl ₂ B	ND
5	BOD for 5 days @ 20°C	mg/l	APHA 5210 B	7.6
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	29
7	Arsenic as as	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B,C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B,C	<0.003
11	Hexavalent Chromium as Cr ⁺⁶ Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B,C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B,C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B,C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN ⁻ C,D	ND
16	Fluoride as F	mg/l	APHA 4500F ⁻ C	0.16
17	Sulphide as S	mg/l	APHA 4500 S ²⁻ D	<0.01
18	Phenolic compound as C ₆ H ₅ OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	0.2
20	Total Iron as Fe	mg/l	APHA 3500Fe ₂ B	0.26
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO ₃ ⁻ E	4.2

NB: ND- Not Detectable


Authorized Signatory

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Report no. - CEMC/BOM/060219/W6

Issued Date-06.02.2019

WATER QUALITY TEST REPORT

Name & Address of the Client	: M/s. SAIL-RMD, Bolani Ores Mines, Barbil
Date of Sampling	: 30.01.2019
Sampling by	: Santhosh Kumar Mohanty
Date of Sample Received	: 31.01.2019
Sample Description	: Surface Water
Sample Location	: Limtur Nallah existing 6.90 ML before joining Karo
Date of Analysis	: 31.01.2019 to 06.02.2019
Reference No.	: CEMC-06022019W6

ANALYSIS RESULT

SL No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	--	APHA 4500H ⁺ B	7.24
2	Total Suspended Solids	mg/l	APHA 2540 D	7.6
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500Cl ₂ B	ND
5	BOD for 5 days @ 20°C	mg/l	APHA 5210 B	7.2
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	26
7	Arsenic as as	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B,C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B,C	<0.003
11	Hexavalent Chromium as Cr ⁺⁶ Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B,C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B,C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B,C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN ⁻ C,D	ND
16	Fluoride as F	mg/l	APHA 4500F ⁻ C	0.18
17	Sulphide as S	mg/l	APHA 4500 S ²⁻ D	<0.01
18	Phenolic compound as C ₆ H ₅ OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	0.19
20	Total Iron as Fe	mg/l	APHA 3500Fe, B	0.28
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO ₃ ⁻ E	4.6

NB: ND- Not Detectable

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Seal of Laboratory

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Report no. - CEMC/BOM/060219/W7

Issued Date-06.02.2019

WATER QUALITY TEST REPORT

Name & Address of the Client	: M/s. SAIL-RMD, Bolani Ores Mines, Barbil
Date of Sampling	: 30.01.2019
Sampling by	: Santhosh Kumar Mohanty
Date of Sample Received	: 31.01.2019
Sample Description	: Surface Water
Sample Location	: Karoriver existing from 6.90 ML Lease (after Lintur)
Date of Analysis	: 31.01.2019 to 06.02.2019
Reference No.	: CEMC-06022019W7

ANALYSIS RESULT

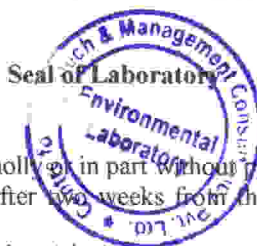
SL No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	--	APHA 4500H ⁺ B	7.28
2	Total Suspended Solids	mg/l	APHA 2540 D	8.6
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500CL B	ND
5	BOD for 5 days@ 20°C	mg/l	APHA 5210 B	6.8
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	21
7	Arsenic as as	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B,C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B,C	<0.003
11	Hexavalent Chromium as Cr ⁶⁺ Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B,C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B,C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B,C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN ⁻ C,D	ND
16	Fluoride as F	mg/l	APHA 4500F ⁻ C	0.14
17	Sulphide as S	mg/l	APHA 4500 S ²⁻ D	<0.01
18	Phenolic compound as C ₆ H ₅ OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	0.18
20	Total Iron as Fe	mg/l	APHA 3500Fe, B	0.34
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO ₃ ⁻ E	4.1

NB: ND- Not Detectable

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Report no. - CEMC/BOM/060219/W8

Issued Date-06.02.2019

WATER QUALITY TEST REPORT

Name & Address of the Client	: M/s. SAIL-RMD, Bolani Ores Mines, Barbil
Date of Sampling	: 30.01.2019
Sampling by	: Santhosh Kumar Mohanty
Date of Sample Received	: 31.01.2019
Sample Description	: Ground Water
Sample Location	: Well Water of Bolani Village
Date of Analysis	: 31.01.2019 to 06.02.2019
Reference No.	: CEMC-06022019W8

ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	--	APHA 4500H ⁺ B	7.18
2	Total Suspended Solids	mg/l	APHA 2540 D	<5
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500CL B	ND
5	BOD for 5 days @ 20°C	mg/l	APHA 5210 B	<2
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	<10
7	Arsenic as as	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B,C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B,C	<0.003
11	Hexavalent Chromium as Cr ⁺⁶ Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B,C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B,C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B,C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN C,D	ND
16	Fluoride as F	mg/l	APHA 4500F C	0.22
17	Sulphide as S	mg/l	APHA 4500 S ²⁻ D	<0.01
18	Phenolic compound as C ₆ H ₅ OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	<0.05
20	Total Iron as Fe	mg/l	APHA 3500Fe, B	0.22
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO ₃ ⁻ E	1.24
22	GW Level	mt.		3.14

NB: ND- Not Detectable

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Report no. - CEMC/BOM/060219/W9

Issued Date-06.02.2019

WATER QUALITY TEST REPORT

Name & Address of the Client	: M/s. SAIL-RMD, Bolani Ores Mines, Barbil
Date of Sampling	: 30.01.2019
Sampling by	: Santhosh Kumar Mohanty
Date of Sample Received	: 31.01.2019
Sample Description	: Ground Water
Sample Location	: Well Water of Balagoda Village
Date of Analysis	: 31.01.2019 to 06.02.2019
Reference No.	: CEMC-06022019W9

ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	-	APHA 4500H ⁺ B	6.92
2	Total Suspended Solids	mg/l	APHA 2540 D	<5
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500Cl ₂ B	ND
5	BOD for 5 days@ 20°C	mg/l	APHA 5210 B	<2
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	<10
7	Arsenic as as	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B,C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B,C	<0.003
11	Hexavalent Chromium as Cr ⁺⁶ , Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B,C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B,C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B,C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN ⁻ C,D	ND
16	Fluoride as F	mg/l	APHA 4500F ⁻ C	0.24
17	Sulphide as S	mg/l	APHA 4500 S ²⁻ D	<0.01
18	Phenolic compound as C ₆ H ₅ OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	<0.05
20	Total Iron as Fe	mg/l	APHA 3500Fe, B	0.26
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO ₃ ⁻ E	1.42
22	GW Level	mt.		6.08

NB: ND- Not Detectable

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Report no. - CEMC/BOM/060219/W10

Issued Date-06.02.2019

WATER QUALITY TEST REPORT

Name & Address of the Client : M/s. SAIL-RMD, Bolani Ores Mines, Barbil
Date of Sampling : 30.01.2019
Sampling by : Santhosh Kumar Mohanty
Date of Sample Received : 31.01.2019
Sample Location : ETP Outlet in CBRS
Date of Analysis : 31.01.2019 to 06.02.2019
Reference No. : CEMC-06022019W10

ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	--	APHA 4500H ⁺ B	7.12
2	Total Suspended Solids	mg/l	APHA 2540 D	8.6
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500Cl ₂ B	ND
5	BOD for 5 days @ 20°C	mg/l	APHA 5210 B	4.8
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	18
7	Arsenic as as	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B ₂ C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B ₂ C	<0.003
11	Hexavalent Chromium as Cr ⁺⁶ , Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B ₂ C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B ₂ C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B ₂ C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN C ₂ D	ND
16	Fluoride as F	mg/l	APHA 4500F C	0.07
17	Sulphide as S	mg/l	APHA 4500 S ²⁻ D	<0.01
18	Phenolic compound as C ₆ H ₅ OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	0.18
20	Total Iron as Fe	mg/l	APHA 3500Fe, B	0.38
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO ₃ ⁻ E	3.2

NB: ND- Not Detectable

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Report no. - CEMC/BOM/060219/W11

Issued Date-06.02.2019

WATER QUALITY TEST REPORT

Name & Address of the Client	: M/s. SAIL-RMD, Bolani Ores Mines, Barbil
Date of Sampling	: 30.01.2019
Sampling by	: Santhosh Kumar Mohanty
Date of Sample Received	: 31.01.2019
Sample Location	: Taling pond Seepage Water
Date of Analysis	: 31.01.2019 to 06.02.2019
Reference No.	: CEMC-06022019W11

ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	--	APHA 4500H ⁺ B	7.48
2	Total Suspended Solids	mg/l	APHA 2540 D	10.8
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500Cl ₂ B	ND
5	BOD for 5 days@ 20°C	mg/l	APHA 5210 B	5.2
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	26
7	Arsenic as as	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B,C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B,C	<0.003
11	Hexavalent Chromium as Cr ⁺⁶ Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B,C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B,C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B,C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN ⁻ C,D	ND
16	Fluoride as F	mg/l	APHA 4500F ⁻ C	0.16
17	Sulphide as S	mg/l	APHA 4500 S ²⁻ D	<0.01
18	Phenolic compound as C ₆ H ₅ OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	0.28
20	Total Iron as Fe	mg/l	APHA 3500Fe ₂ B	0.24
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO ₃ ⁻ E	2.8

NB: ND- Not Detectable

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Report no. - CEMC/BOM/060219/W12

Issued Date-06.02.2019

WATER QUALITY TEST REPORT

Name & Address of the Client	: M/s. SAIL-RMD, Bolani Ores Mines, Barbil
Date of Sampling	: 30.01.2019
Sampling by	: Santhosh Kumar Mohanty
Date of Sample Received	: 31.01.2019
Sample Description	: Drinking Water
Sample Location	: Township Supply Water (Mount GH)
Date of Analysis	: 31.01.2019 to 06.02.2019
Reference No.	: CEMC-06022019W12

ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Method of Testing	Result
1	pH Value @ 25°C	--	APHA 4500H ⁺ B	7.24
2	Total Suspended Solids	mg/l	APHA 2540 D	<5
3	Oil & Grease	mg/l	APHA 5520 B	ND
4	Total Residual Chlorine	mg/l	APHA 4500Cl ₂ B	ND
5	BOD for 5 days @ 20°C	mg/l	APHA 5210 B	<2
6	Chemical Oxygen Demand	mg/l	APHA 5220 C	<10
7	Arsenic as as	mg/l	APHA 3114 B	<0.001
8	Mercury as Hg	mg/l	APHA 3500 Hg	<0.001
9	Lead as Pb	mg/l	APHA 3111 B,C	<0.01
10	Cadmium as Cd	mg/l	APHA 3111 B,C	<0.003
11	Hexavalent Chromium as Cr ⁶⁺ Max.	mg/l	APHA 3500Cr B	<0.05
12	Copper as Cu	mg/l	APHA 3111 B,C	<0.03
13	Zinc as Zn	mg/l	APHA 3111 B,C	<0.05
14	Nickel as Ni	mg/l	APHA 3111 B,C	<0.01
15	Cyanide as CN	mg/l	APHA 4500CN ⁻ C,D	ND
16	Fluoride as F	mg/l	APHA 4500F ⁻ C	<0.05
17	Sulphide as S	mg/l	APHA 4500 S ²⁻ D	<0.01
18	Phenolic compound as C ₆ H ₅ OH, Max.	mg/l	APHA 5530 B,D	ND
19	Manganese as Mn	mg/l	APHA 3500Mn B	<0.05
20	Total Iron as Fe	mg/l	APHA 3500Fe, B	0.29
21	Nitrate Nitrogen as N	mg/l	APHA 4500NO ₃ ⁻ E	1.36

NB: ND- Not Detectable

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ANNEXURE - II

Annexure-II:Particulars of existing Retaining walls

Sl No	Location	Particulars of construction	Dimension (L X B X H) (m)
1	Toe wall around Old OB dump of F-area (D1)	Dry boulder toe wall	L= 200 m, H= 1.5 m, Top width= 1.2pm, Bottom width=1.5m
2	Toe wall around Panposh quarry near Magazine area (D4)	Masonry Retaining wall	L= 180 m, H= 1.5 m, Top width= 0.8m, Bottom width=1.5m
3	Toe wall around OB dump of D-area (D8)	Cemented Retaining wall followed by Garland drain	L= 700 m H= 1.5 m Top width= 1.0 m Bottom width=1.5 m
4	Toe wall around OB dump of G-area (D5)	Dry boulder toe wall followed by Garland drain	L= 450 m H= 1.5 m Top width= 1.0 m Bottom width=1.5 m
5	Toe wall around Fines dump at DH5 Valley (D2)	Masonry Retaining wall followed by Garland drain	L= 250 m H= 1.5 m Top width= 1.0 m Bottom width=1.5 m
6	Toe wall around Old Fines dump near 600 TPH Plant (D3)	Dry Boulder Retaining wall followed by Garland drain	L= 200 m H= 1.5 m Top width= 1.0 m Bottom width=1.5 m
7	Retaining Toe wall Panposh OB Dumps	RCC retaining wall	L= 450 m, H= 2.0 m Top width= 1.5 m Bottom width=2.0 m
8	Retaining Toe wall Panposh Quarry including Dumps	Dry Boulder Retaining wall followed by garland drain	L= 750m, H= 1.5 m Top width= 1.3 m Bottom width=1.8 m
9	Retaining Toe wall around Fines Dumps	Masonry Retaining wall	L= 450m, H= 1.5 m Top width= 1.3 m Bottom width=1.8 m
10	Retaining Wall behind DH-5 and Old fines dump near 600TPH	RRM retaining wall	L= 450m, H= 1.5 m Top width= 1.0 m Bottom width=1.5 m
11	Retaining Boundary wall	Cemented wall	L= 2500m, H= 2.0m width= 10 in
12	Retaining Wall along the broken area and waste dump at G-Area	Dry Boulder Retaining Wall	L= 815m, H= 1.5m Top width= 1.5 m Bottom width=2.0 m
13	Retaining wall near Primary Stockpile	Dry Boulder Retaining Wall	L= 10m, H= 0.75m, width= 2m
14	Retaining wall near New Fines Stockpile	RCC retaining wall	L= 35m, H= 3.0m, width= 0.35m
15	Extension of retaining wall near Panposh area	Dry Boulder Retaining Wall	L= 48m, H= 0.6m, Top width= 0.6 m Bottom width=0.8 m
16	Retaining wall of D-area OB dump	RRM retaining wall	L= 295m, H= 1.5 m Top width= 1.0 m Bottom width=1.5 m

Annexure-II:Particulars of existing Retaining walls

17	Retaining Wall near Fines Loading plant with garland Drain	RRM retaining wall	L= 310 m, H= 1.5 m Top width= 1.0 m Bottom width=1.5 m
18	Retaining wall Near lump Loading Plant	RRM Retaining Wall	L= 100 m, H= 1.5 m Top width= 1.0 m Bottom width=1.5 m

ANNEXURE - III

Annexure-III
PHOTOGRAPHS SHOWING MITIGATION MEASURES FOR COPNTROL OF
RESPIRABLE SUSPENDED PARTICULATE MATTERS (RSPM)



Photograph showing Covered conveyors from feed hopper at Hill top



Imagery showing Covered conveyors from feed hopper at Hill top till Despatch Point



Photograph showing Bag House installed at secondnary Crushing Point



Photograph showing Dry Fog Dust suppression System installed at Feed Hopper at Hill Top Plant



Photograph showing Wet Drilling



Photograph showing Water sprinkling on Haul Road by 28 KL BEML Water Sprinkler

Annexure-III
PHOTOGRAPHS SHOWING MITIGATION MEASURES FOR COPNTROL OF
RESPIRABLE SUSPENDEED PARTICULATE MATTERS (RSPM)

FOR SUPPRESSION OF FUGITIVE DUST AROUND STOCK PILE AREAS AND HAUL ROAD



Photograph showing Fixed water sprinkling system
on Haul Road from Panposh



Photograph showing water sprinkling system on Haul
Road near 600 TPH Plant