

26th May 2019

To
The Additional Principal Chief Conservator of Forests (C),
Ministry of Environment Forests and Climate Change,
4th Floor, E&F Wings, Kendriya Sadan,
Kormangala, Bangalore – 560 034



Respected Sir,

Subject: Submission of Six monthly compliance report towards Environment Clearance for 2nd Half (period- October 2018 to March 2019) for Vedanta Limited Iron Ore Mine (ML: 2677) situated in Chitradurga, Karnataka.

Reference: Environmental Clearance letter no: J-110151/1167/2007-IA.II (M) Dated 05.02.2009 of M/s Vedanta Limited Iron Ore Mine (ML: 2677)

With reference to the above subject, we are herewith submitting six monthly compliance report along with CD version towards Environment Clearance for 2nd Half (period- October 2018 to March 2019) for Vedanta Limited Iron Ore Mine (ML:2677) situated in Chitradurga District, Karnataka.

Thanking you,

Yours Faithfully
For Vedanta Limited

For **VEDANTA LIMITED**


Manager - Mining

Authorized Signatory

Enclosures: Six monthly Compliance Report with Annexures and CD version.

Copy to:

1. The Senior Environmental Officer, KSPCB, Parisara Bhavana, Church Street, Bangalore.
2. The Regional Environmental Officer, KSPCB, Chitradurga.

VEDANTA LIMITED (Formerly known as Sesa Sterlite Ltd. / Sesa Goa Ltd.)
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CIN: L13209GA1965PLC000044

Half Yearly Compliance Report to condition of Environment Clearance issued by

**Ministry of Environment, Forest and Climate Change, Government of India for
Vedanta Limited Iron Ore Mine, (Mining Lease: 2677)**

Letter No. J- 110151/1167/2007-IA.II (M) Dated 05/02/2009

Production : 6.0 MTPA, as per Environment Clearance, however production limit for 2018-19 is 4.51 MTPA

Period: October 2018 to March 2019 (2nd Half)

S No.	Clearance Condition	Compliance Status	Remarks
A.	Specific Conditions		
1	Environment Clearance is subject to final order of the Hon'ble Supreme court of India in the matter of Goa Foundation Vs. Union of India in Writ Petition (Civil) no. 460 of 2004 as may be applicable to this project.	The condition is not applicable.	
2	Environmental clearance is subject to obtaining clearance under the wildlife (Protection) Act, 1972 from the competent Authority	The provisions of Wildlife (protection) Act, 1972 is not applicable as A. Narrain Mines does not fall within 10 km of Eco sensitive Zone. The nearest Eco sensitive zone is Rangayyanadurga Four Horned Antelope Wildlife Sanctuary which is situated in Davangere and Bellary District and is 70 km away from the lease boundary	
3	No two pits shall be simultaneously worked i.e. before the first pit is exhausted and reclamation work completed, no mineral bearing area shall be worked	The lease area is divided into two parts namely South and North Block bifurcated by M/s John Mines of Mr. Praveen Chandra. Exploration has revealed that, there is variation of Quality in two blocks. The south block has higher Fe% content (> 56%Fe) whereas north block having lower Fe % (<56%Fe) which is not feasible to mine by independent operation. From the Mineral Conservation Point, it is essential to work both the block simultaneously in order to optimize / maximize mineral utilization and achieve zero waste from mining. The same is approved by IBM in Mining Plan and by CEC in Reclamation and Rehabilitation Plan.	

4	<p>After exhausting the first mine pit and before starting mining operations in the next pit, reclamation and plantation works in the exhausted pit shall be completed so as to ensure that reclamation, forest cover and vegetation are visible during the first year of mining operations in the next pit. This process will follow till the last pit is exhausted. Adequate rehabilitation of mined pit shall be completed before any new ore bearing area is worked for expansion.</p>	<p>As mentioned above it is not feasible to operate the North and South block independently. The exploitation of ore has been restricted to limited area. After exhausting the ore, the back filling will be carried out and reclamation will be taken up. Exploitation of ore, back filling the pit & reclamation are in sequence until the life of the Mine. However the dumping of overburden waste is carried out in the designated non-mineralized areas within the lease and the finalized portions are taken up for reclamation immediately.</p>	<p>The total plantation carried on the waste dumps for the year 2018-19 is 31970 nos.</p>
5	<p>Adequate buffer zone shall be maintained between two consecutive mineral bearing deposits.</p>	<p>The lease area is divided into two parts namely South and North Block bifurcated by M/s John Mines of Mr. Praveen Chandra. In the mineral conservation point of view we have obtained common boundary permission to exploit maximum mineral. Hence it is not applicable to have any buffer between the two mineral bearing deposits.</p>	
6	<p>Primary survey of flora and fauna shall be carried out and data shall be submitted to the Ministry within six months before start of expansion activity.</p>	<p>Dr. S S Dolli and Dr. B S Janagoudar (University of Agricultural sciences, Dharwad, College of Forestry, Sirsi) were engaged for the detailed study of Flora & Fauna present in the area. According to the studies there is no rare endemic or endangered or threatened (REET) species in the existing flora or fauna within the core area of A Narrain Iron Ore Mine. During the study, a total of about 182 plants (67 Tree, 30 Shrub, 58 Herb, 17 climbers and liana, 10 grass and cyper species) and 97 animals (11 Mammals, 59 Birds, 9 Reptile, 3 Amphibians and 15 Invertebrates were identified.</p> <p>Maintenance of habitats of existing wild life through regular Plantation work and maintenance of existing plantation is a regular phenomenon. Only native species are being used in the plantation programme.</p> <p>In addition, a detailed studies for developing a biodiversity management plan by Forestry College, Sirsi, is under progress details of which will be submitted in the next compliance.</p>	

7	Conservation plan for wildlife shall be prepared in consultation with the chief wild life warden for implementation	<p>The detail plan was prepared and approved by Chief wild life warden. The works taken for the period are as follows:</p> <table border="1" data-bbox="852 293 1608 1143"> <thead> <tr> <th rowspan="2"></th> <th rowspan="2">Particulars</th> <th colspan="2">Achieved from Apr'18 to Mar'19</th> <th colspan="2">Cumulative from 1999 to 2014</th> </tr> <tr> <th>Qty.</th> <th>Cost</th> <th>Qty.</th> <th>Cost</th> </tr> </thead> <tbody> <tr> <td rowspan="2">1</td> <td>Construction of rubble check dams</td> <td>-</td> <td>-</td> <td>7</td> <td>68500</td> </tr> <tr> <td>Water holes & Maint.</td> <td>9</td> <td>56,477</td> <td>12</td> <td>194239</td> </tr> <tr> <td>2</td> <td>Construction & maintenance of masonry check dams including Desilting</td> <td>65419 m³</td> <td>2,988,176</td> <td>6</td> <td>291914</td> </tr> <tr> <td>3</td> <td>Agave plantation in the valley</td> <td>-</td> <td>-</td> <td>1000</td> <td>7000</td> </tr> <tr> <td>4</td> <td>Raising of fruit bearing and shed giving plantations</td> <td>31970</td> <td>7,956,699</td> <td>277600</td> <td>289970</td> </tr> <tr> <td>5</td> <td>Erection of watch towers</td> <td>-</td> <td>-</td> <td>3</td> <td>27767</td> </tr> <tr> <td>6</td> <td>Provision of salt lick blocks</td> <td>-</td> <td>-</td> <td>1</td> <td>5000</td> </tr> <tr> <td>7</td> <td>Watch and ward (person/month)</td> <td>12 persons (6 months)</td> <td>1117134</td> <td>3</td> <td>30,76779</td> </tr> <tr> <td colspan="2">Total Cost in Rs.</td> <td colspan="2">12,118,486</td> <td colspan="2">1,30,34,755</td> </tr> </tbody> </table>		Particulars	Achieved from Apr'18 to Mar'19		Cumulative from 1999 to 2014		Qty.	Cost	Qty.	Cost	1	Construction of rubble check dams	-	-	7	68500	Water holes & Maint.	9	56,477	12	194239	2	Construction & maintenance of masonry check dams including Desilting	65419 m ³	2,988,176	6	291914	3	Agave plantation in the valley	-	-	1000	7000	4	Raising of fruit bearing and shed giving plantations	31970	7,956,699	277600	289970	5	Erection of watch towers	-	-	3	27767	6	Provision of salt lick blocks	-	-	1	5000	7	Watch and ward (person/month)	12 persons (6 months)	1117134	3	30,76779	Total Cost in Rs.		12,118,486		1,30,34,755		In our endeavor to protect Wildlife of the region the company has celebrated World Environment Day 2018 with the theme “Beat the plastic pollution” under which various programmes for spreading awareness were organized. During the celebrations Company organized various awareness and cleanliness drive.
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8	Zero waste mining concept shall be implemented either by putting up pelletisation plant or dispose of 100% low grade ores / fines to prospective buyers.	The Iron ore having +45% Fe consider as Ore, low grade ore of < 52% Fe will be blended with the high grade ore and being made saleable. The siliceous ore of +35% Fe which is less than the threshold value will be stacked separately for future use.																																																																
9	Hydro-geological study of the area shall be reviewed annually.	Prof. Ratnakar Dhakate from NGRI (National Geo- Physical Research Institute, Hyderabad) was engaged to carry out detailed hydrogeological studies of A Narrain Mines in the year 2016-17. According to the studies, sustainable groundwater	The Company has desilted around 65419 m ³ quantity of silt from 7 nearby village ponds.																																																															

		<p>resources in the downstream of watershed covering A Narrain Mines has been assessed through integrated hydrological, hydro-chemical and geophysical investigations. The groundwater level contours drawn for these periods indicate that the groundwater flow direction was from mine towards all the direction. During the groundwater exploration, it was also revealed that aquifers are encountered between the depths of 15 mbgl and 192 mbgl, which is well below our current pit bottom i.e. 807.5 m RL.</p> <p>Report was submitted to regional office in the previous compliance report. The report has recommended desilting of existing check dams, construction of harvesting pits and additional check dams at eight locations around the lease, implementation of which is in progress.</p>	
10	<p>Fugitive dust generation shall be controlled. Fugitive dust emission shall be regularly monitored at locations of nearest human habitation (including schools and other public amenities located nearest to sources of dust generation as applicable) and records submitted to the Ministry.</p>	<p>Fugitive dust generation is controlled by spraying the water on the main hauling road. The company has deployed 23 water tankers for suppressing the dust on Haul roads and its transport route. In the year, 107171.19 KL of water is used for Dust suppression purpose.</p> <p>Green belt has developed all along the lease boundary and tall growing saplings have planted all along the road side which acts as wind barrier.</p> <p>The ambient air quality monitoring is carried out twice a week in core zone as well as in buffer zone and results are regularly submitted to State Pollution Control Board.</p>	<p>Abstract of Air monitoring results are attached as Annexure-I.</p>
11	<p>A 50m barrier of no mining zone all along both the side(s) facing the nallah (if any) passing through the lease area shall be demarcated and thick vegetation of native species raise. Status of implementation shall be submitted to the regional office of the Ministry on half yearly basis.</p>	<p>No nallah is present within the mining lease area.</p>	
12	<p>Need basis assessment for the nearby villages shall be conducted to study economic measures which can help in upliftment of poor section of society.</p>	<p>Company in association with Society for Educational Welfare & Economic Development (SEED) has carried out Baseline Survey and CSR Implementation Plan in 19 Peripheral Villages of the mining Lease in Chitradurga. The baseline survey covered a detailed assessment of Socio-economic profile of the</p>	

	<p>villages, Household Database, Resource mapping (Physical and Substitution), Status of Human Development Indices and Quality of life Indices, Infrastructure requirement and Socio-economic Development Options.</p> <p>Final report of the survey has been received, and CSR Implementation Plan is prepared taking into consideration Village Development (short term & long term), Community and Stakeholder Management and Risk & Grievance Mapping.</p> <p>Moreover, the company has taken several initiatives all of which are directed with prime objective of empowerment of community through various socio-economic developmental initiatives. CSR Details:</p> <p>1. Health and Hygiene:</p> <p>(a) Mobile Health Unit: The company is operating Mobile Health unit in 12 nearby villages having a doctor, a nurse and an attendant. All the services are provided free of cost in these facilities.</p> <p>(b) Medical Campaigns: The company has conducted various medical campaigns include Anaemia Detection Camp, Cancer Awareness and Detection Camp, AIDS Awareness Camp, Dental Check-up Camp, Personal Hygiene Awareness Campaign, Eye Screening Camp etc.</p> <p>(c) Safe Potable drinking water project: The company has signed a MoU with Naandi Foundation and installed Reverse Osmosis (RO) plants in 3 villages which caters benefit to around 1000 families in 11 villages. To address the drought condition of the region, the company has funded in drilling 30 borewells across 24 villages.</p> <p>(d) Construction of Sanitation units for individual families: The Company has constructed sanitation units for 50 families in Megalahalli village under “Total Sanitation Campaign”. Company has also constructed first eco-friendly bio-digester toilet towards a clean and beautiful Karnataka at Sri Anjaneyaswamy High School, in Kadleguddu Village, Karnataka. Bio-digester toilets have been installed in 12 Village</p>	
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	<p>schools which will benefit at unit around 864 students. This initiative helped school to get girl students back to school and reduce girls' dropout from schools.</p> <p>(e) Awareness to adolescent girl child: The company has conducted several awareness sessions on Menstrual Hygiene to more than 800 girl students across 11 village school.</p> <p>2. Education:</p> <p>(a) Evening Study centers: The Company has come up with the Evening Study Centres called 'Sesa Sayankala Kalika Kendra', where the students are provided personalized guidance for doing their homework and preparation for securing good marks in exams. Currently 7 such centres are running at 7 villages and 468 students are being benefited.</p> <p>(b) Summer Camp: 45 days Summer Vacation Camp for the students of class 10th was been organized during the month of May. So far 1750 students have been benefitted through this initiative.</p> <p>(c) Transport facility for school students: Hired 02 Nos. buses for daily transport of the students of 11 village schools.</p> <p>(d) Promoting School Infrastructure: The company has constructed school and anganwadi building and provided books, uniforms, educational materials like map, charts, benches, furniture, sports equipments, LCD projector, photocopy machines etc.</p> <p>(e) Education Aid: The company has provided Notebook and stationary to around 9000 students from 34 schools.</p> <p>(f) Smart Class: The company has contributed to the vision of Digital India by introducing smart class at 7 high schools which caters to more than 1000 students.</p> <p>(g) Scholarship Programme: Under "Beti Bachao, Beti Padhao" scheme, the company has provided scholarships to 73 meritorious girl students from the mining belt to pursue higher education.</p> <p>(h) Advance computer training: The company has operationalized 3 advanced computer training centres which has helped 120 students across 5 villages.</p>	
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		<p>3. Sustainable Livelihood:</p> <p>(a) Alternative Livelihood Opportunities Project (ALOP): the company has formed a committee consisting of 11 members, among these 2 are elderly respected persons, 2 are women SHG members, 2 are progressive farmers, 1 is land less labour, 2 are retired employees and 2 are from project implementing & funding agencies. This committee helps in capacity building of Farmers and Farming land by introducing new and advance technology, demonstrating micro enterprises in food processing etc. some initiatives includes Community based Watershed Development, New crop enterprise introduction – Soybean crop cultivation, Promotion of Vermi compost units, Women entrepreneurial development program, Integrated Farming Systems and Livestock development Established-Artificial Insemination (AI) Centre.</p> <p>(b) Drought Mitigation programme: The company has drilled bore wells in 13 Villages and provided pipeline connection to address the issue at the villages. The company has also De-silted about 9 village ponds, 9 silting ponds and 29 check dams and supplied potable drinking water to the needy people in villages and school children.</p>																													
13	Land use pattern of the nearby villages shall be studied and action plan for abatement and compensation for damage to agricultural land / common property land (if any) in the nearby villages	<p>Land use pattern has been studied by UAS, Dharwad. The data is shown in the following table:</p> <table border="1" data-bbox="873 1052 1587 1333"> <thead> <tr> <th>S No.</th> <th>Land Use Type</th> <th>Area (Ha)</th> <th>(%)age</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Irrigated</td> <td>2797</td> <td>8.9</td> </tr> <tr> <td>2</td> <td>Un Irrigated</td> <td>14561</td> <td>46.4</td> </tr> <tr> <td>3</td> <td>Cultivable Waste Land</td> <td>3738</td> <td>11.9</td> </tr> <tr> <td>4</td> <td>Area N/A for Cultivation</td> <td>2007</td> <td>6.4</td> </tr> <tr> <td>5</td> <td>Forest Area</td> <td>8298</td> <td>26.4</td> </tr> <tr> <td colspan="2">Total</td> <td>31400</td> <td>100</td> </tr> </tbody> </table> <p>Agriculture damages if any are evaluated by appointing agriculture valuator and damages are paid to the concerned</p>	S No.	Land Use Type	Area (Ha)	(%)age	1	Irrigated	2797	8.9	2	Un Irrigated	14561	46.4	3	Cultivable Waste Land	3738	11.9	4	Area N/A for Cultivation	2007	6.4	5	Forest Area	8298	26.4	Total		31400	100	
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		farmers. Apart from this, company has carried out various agriculture development programs in the villages in association with UAS, Dharwad and MYRADA NGO. The same has improved the crop production and thereby increasing the income of the farmers.	
14	Maintenance of village roads through which transportation of ores are undertaken shall be carried out by the company regularly at its own expenses.	<p>The Company has three transport routes out of which 2 of our transport routes pass through nearby villages. The company has taken up several infrastructural development activities in these nearby villages which includes construction of road from Bheemasamudra to Siddapura Village, Medikeripura to Sasaluhalla village, Tanigehalli cross to Medikeripura village, Kumtakadamadagi to Malapanhatti village, Construction of concrete road at Medikeripura, and Bheemasamudra villages.</p> <p>The company has also contributed in Road widening project from Bommenahalli to Malapanhatti village.</p> <p>Black topping of other village roads is also being undertaken on regular basis under the CSR scheme as per the instruction of district administration and requirements for the benefits of villagers.</p> <p>Roads are also regularly cleaned by manual sweeping to remove ore spillage from the transport trucks. A total of 32 workers are engaged for carrying out cleaning activity on daily basis at the junction and speed breakers. Company has also carried out the work of repairing of road at malapanhatti village. Moreover the company has taken up initiative of planting native species along the roadside. A stretch of total 6.2 km from Kadleguddu to Siregere and Medikeripura to Sasalu is planted with 648 saplings along with the installation of tree guard.</p>	
15	Rain water harvesting shall be undertaken to recharge the ground water source.	Company has carried out rain water harvesting in surrounding villages under water shed development programme under the guidance of UAS, Dharwad. Rain water harvesting system is also installed in the office complex and at laboratory site. Also a series of settling ponds and check dams has been constructed along the mining lease which acts as rain water harvesting structures. This year company has carried out desilting of all the	

		29 checkdams and 7 settling pond around the mining lease and also carried out desilting of 9 ponds situated in Kadleguddu, Megalahalli, Tenigehalli, Bheemasamudra, Nellikatte, Bommenahalli, Palya, Haliyuru and Medikeripura villages. This has resulted in a trapping surface runoff and helped in ground water rejuvenation.	
16	Measures for prevention and control of soil erosion and management of silt shall be undertaken.	<p>During the monsoon period, run-off from the waste dumps and other areas are controlled by a series of Check dams and Settling ponds which helps in preventing runoff washout to reach in the natural streams. 4307 meters of retaining walls have been constructed in order to prevent the sliding of the dump materials and protect the soil erosion. 3719 meters of Garland drains are also constructed all along the toe of the dump to properly channelize the runoff water from the dump. The check dams provided with spill way facilities are being de-silted regularly.</p> <p>As part of waste dump stabilization, The non-active waste dump areas are covered with Geotextile and are being stabilized by spreading Grass seeds as a step towards stabilization. This is followed by planting of native species. In the said period a total of 36000 m² of the area is covered from Geotextile on the dumps which are taken up for vegetation by grass seeding and plantation.</p>	
17	Trenches / garland drains shall be constructed at foot of dumps and coco filters installed at regular intervals to arrest silt from being carried to water bodies	As per the approved R&R plan, as much as 29 Check dams, 9 gully plugs and 7 settling ponds are constructed all along the lease boundary. 4307 meters of retaining walls have been constructed in order to prevent the sliding of the dump materials and protect the soil erosion. 3719 meters of Garland drains are also constructed all along the toe of the dump to properly channelize the runoff water from the dump. Coco filters are also installed in the Garland drains to control the silt from the runoff water.	
18	Ground water in the core zone shall be regularly monitored for contamination and depletion due to mining activity and records maintained. The monitoring data shall be submitted to the regional office of the	The mining activity is ben carried out at top of the hill. The pit top& bottom is 930 mts and 807.5 mts from M.S.L. There is no contamination of ground water due to mining activity. However regular monitoring of ground water is carried out and same has been regularly submitted to regional office and Karnataka	Abstract of Water monitoring results are attached as Annexure-II.

	ministry regularly. Further, monitoring points shall be located between the mine and drainage in the direction of flow of ground water shall be set up and records maintained.	Pollution Control Board.	
19	Cultivable waste land shall be identified and fodder farming or other suitable productive use of waste land shall be taken up in phased manner. Status of implementation shall be submitted to the regional office of the ministry	Company in association with UAS, Dharwad had taken a project called ALOP (Alternative Livelihood Opportunities Project) in surrounding villages from 2008 to 2012 with below objective: 1) To build the capacity of farmers and farming condition of soil, water, vegetation and livestock management for improving the productivity and economic returns. 2) To demonstrate improved crop production technologies in farmers field. 3) To demonstrate off farm micro enterprises in food processing and value addition with women groups. 4) To encourage people institutions and facilitate linkages with development departments. Developing the farmers in cultivation and to increase their farm productivity. The outcome of the project are implemented and reviewed on annually.	
20	Monitoring of soil samples for assessment of transformation to acidic state or contamination due to mining activity shall be regularly conducted.	Soil analysis of samples from core zone and buffer zones is carried out and same has been regularly submitted to regional office and Karnataka Pollution Control Board.	Soil Analysis report is enclosed as Annexure-III .
21	Transportation of ore shall be done by covering the trucks with tarpaulin or other suitable mechanism so that no spillage of ore / dust takes place. Transportation shall be done only during day time.	All the transportation trucks carrying ore are covered with Tarpaulin and the same instructions in local language is displayed near security point for all the transportation truck drivers. Transportation of Ore is carried as per the E-auction in day time only.	
22	Occupational health and safety measures for the workers including identification of work related health hazards, training on malaria eradication, HIV, and health effects on exposure to mineral dust shall be carried out. The company shall engage a full time qualified doctor who is trained in occupational health. Periodic monitoring for exposure to respirable mineral dust on the	Company has got an in house Occupational health unit with a fulltime doctor and nurses. All the hazards related to our activities are identified and addressed. Various health related training programs are conducted for the workers. Company has also adopted a formal HIV- AIDS policy. Periodic health checkups are also been conducted for all the employees working in the company. In the said period company has conducted awareness programs	

	workers shall be conducted and records maintained including health records of the workers. Awareness programme for workers on impact of mining on their health and precautionary measures like use of personal equipment's etc. shall be carried out periodically. Review of impact of various health measures undertaken (at interval shall be conducted followed by follow up action wherever required	on HIV-AIDS, Breast Cancer and imparted health awareness training to Self Help Group (SHG) women and adolescent girls of nearby villages. Free eye checkup and dental checkup camps were also organized for nearby community.	
23	Top soil / solid waste shall be stacked properly with proper slope and adequate safeguards and shall be utilized for backfilling for reclamation and rehabilitation of mined out area.	No top soil is available within the mine lease as the entire area is broken up for mining and allied activities. The solid waste is properly stacked as per approved mining plan.	
24	Over burden (OB) shall be stacked at earmarked dump site and shall not be kept active for long period. The maximum height of the dump shall not exceed 30m, each stage shall preferably be of 10m and overall slope of the dump shall not exceed 28°. The OB dump shall be scientifically vegetated with suitable native species to prevent soil erosion and surface runoff. Monitoring and management of rehabilitated areas shall continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the ministry of environment & forests on six monthly basis.	Over burden (OB) is stacked at earmarked dump site as per IBM approved in Mining plan 2017- 2022, by adopting step dumping method on designated non mineralized areas within the lease and overall slope of the dump is not more than 26°. Finalized portions of the dumps are covered with geotextiles and afforestation immediately.	
25	Slope of the mining bench and ultimate pit limit shall be as per the mining scheme approved by Indian Bureau of Mines	The ultimate pit limit and slope of the mining bench is maintained as per the IBM approved mining scheme.	

26	<p>Adequate plantation shall be raised in the ML area, haul roads, OB dump sites etc. Green belt development shall be carried out considering CPCB guidelines including selection of plant species and in consultation with the local DFO/Agriculture department. Herbs and shrubs shall also form a part of afforestation programme besides tree plantation. The density of the trees shall not be less than 2500 plants per ha. The company shall involve local people with the help of self-help group for plantation programme. Details of year wise afforestation programme including rehabilitation of mined out area shall be submitted to the regional office of the ministry area.</p>	<p>Plantation was carried in ML area, outside ML, haul roads, OB dumps under the guidance of RFO & Dy. RFO. The total plantation carried for 2018-19 is 31970 Nos. The total area covered for the year 2018-19 is 6.45 Ha.</p> <table border="1" data-bbox="865 360 1596 771"> <thead> <tr> <th colspan="2">Location</th> <th>No. of saplings</th> <th>Area (Ha)</th> </tr> </thead> <tbody> <tr> <td>Dump-3</td> <td>WML</td> <td>14205</td> <td>2.52</td> </tr> <tr> <td>Dump-1</td> <td>WML</td> <td>10533</td> <td>1.32</td> </tr> <tr> <td>Safety Zone</td> <td>WML</td> <td>930</td> <td>0.33</td> </tr> <tr> <td>ID2</td> <td>OML</td> <td>1052</td> <td>0.43</td> </tr> <tr> <td>ID3</td> <td>OML</td> <td>140</td> <td>0.16</td> </tr> <tr> <td>Railway siding</td> <td>OML</td> <td>560</td> <td>0.48</td> </tr> <tr> <td>Forest Area</td> <td>OML</td> <td>1950</td> <td>1.21</td> </tr> <tr> <td>School premises</td> <td>OML</td> <td>2600</td> <td>-</td> </tr> <tr> <td>Total</td> <td></td> <td>31970</td> <td>6.45</td> </tr> </tbody> </table>	Location		No. of saplings	Area (Ha)	Dump-3	WML	14205	2.52	Dump-1	WML	10533	1.32	Safety Zone	WML	930	0.33	ID2	OML	1052	0.43	ID3	OML	140	0.16	Railway siding	OML	560	0.48	Forest Area	OML	1950	1.21	School premises	OML	2600	-	Total		31970	6.45	
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27	<p>Regular monitoring of ground water level and quality shall be carried out by establishing a network of existing wells and constructing new piezometers during the mining operation. The monitoring shall be carried out four times in a year – pre-monsoon (April-May), monsoon (August), post-monsoon (November) and winter(January) and the data thus collected shall be regularly sent to MoEF, Central ground water Authority and Regional Director, Central Ground water Board</p>	<p>The company regularly monitors the ground water level and quality of nearby 8 tube wells. The mining activity is being carried out at top of the hill. The pit top & bottom is 930 mts and 807.5 mts from M.S.L. which is way above the ground water level and therefore there is no influence on these bore wells due to mining activity. The company uses ground water only for Dust suppression and domestic usage. The monitoring reports are regularly submitted to MoEF, Central ground water Authority and Regional Director, Central Ground water Board</p>	<p>Abstract of Water monitoring results are attached as Annexure-II.</p>																																								
28	<p>Adequate air monitoring stations shall be installed in areas of human habitations near the mine and the results of ambient air quality shall be maintained and regularly submitted to regional office of the ministry</p>	<p>The ambient air quality monitoring is carried out in Core Zone as well as buffer zone. There are 6 monitoring stations in Core Zone and 4 monitoring stations in Buffer zone which is monitored twice in a week for every month. The results of ambient air quality are maintained and same are regularly submitted to regional Office of ministry and Karnataka State</p>	<p>Abstract of Air monitoring results are attached as Annexure-I.</p>																																								

		Pollution Control Board.	
29	The waste water from the mines shall be treated to conform to the prescribe standards before discharging in to the natural stream. The discharged water shall be regularly monitored and report submitted to the ministry of Environment& Forests, Central Pollution Control Board and the state Pollution control board	There is no waste water discharge from the Mine. During monsoon the runoff water is collected in the settling pond. Only the overflow water is allowed into the natural stream. The natural stream water is collected in the village tank for public usage which is monitored and regularly submitted to regional office of ministry and Karnataka Pollution Control Board.	
30	Vehicular emissions shall be kept under control and regularly monitored. Vehicles used for transportation of ores and others shall have valid permissions as prescribed under Central Motor Vehicle Rules, 1989 and its amendments. Transportation of ore shall be done only during day time. The vehicles transporting ores shall be covered with a tarpaulin or other suitable enclosures so that no dust particles/ fine matters escape during the course of transportation. No over loading of ores for transportation shall be committed. The trucks transporting ore shall not pass through wild life sanctuary.	Vehicles used for transporting ore are having the vehicle emission certificates. The copy of test certificate is enclosed with previous compliance report. Over loading of the trucks is not allowed. The trucks transporting the ore are not passing through wild life sanctuary.	
31	Prior permission from the Competent Authority shall be obtained for extraction of ground water, if any	The company uses Groundwater for Dust suppression and other Domestic purposes for which it has three registered bore wells.	
32	Action plan with respect to suggestions/improvements and recommendations made during public consultation/hearing shall be submitted to the ministry and the state Govt. within six months	Action plan with respect to suggestions/improvements and recommendations made during public consultation/hearing have been submitted to the ministry. The following suggestions/ improvements were received during public consultation/ hearing: 1) Employment to local persons, conduct training courses to the unemployed youths and farmers in the field of animal husbandry, Horticultural, agricultural etc to be taken and construction of compound wall with afforestation measures to Hirekandawadi school.	

		<p>Action implemented: Under the livelihood project the farmers are given training to grow fast yield crops and Animal health camps were conducted and compound wall to Hirekandawadi school was constructed and also employments to local persons were given.</p> <p>2) Adopting town villages Bommavanagatihalli and Kadalegudda villages to take up development works.</p> <p>Action implemented: The above two villages were adopted through ALOP project and various socio economic activities have been carried out.</p> <p>3) To donate ambulance facilities to Hireguntur PHC.</p> <p>Action implemented: The ambulance has been donated to the district Govt hospital.</p> <p>4) Afforestation measures all along the roads of Kagalagere with dust preventive measures</p> <p>Action implemented: The plantation all along the either side of the roads is done to control the fly dust. The barricades and speed bumpers are installed to reduce the speed of the vehicle entering the village limit. The roads are cleaned by manual sweeping.</p> <p>5) To take up social development works to Bommenahalli village</p> <p>Action implemented: Developmental works which have taken in Bommenahalli Village are:</p> <ol style="list-style-type: none"> a. Health camp conducted in the village. b. Compound wall for primary school c. Dining hall constructed for primary school d. Safe drinking water project for entire village 	
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		6) To make asphaltting of roads and make necessary arrangement for truck parking at Medikeripura. Action implemented: Necessary arrangement for truck parking was made and roads are well maintained													
33	A final mine closure plan, along with details of Corpus Fund, shall be submitted to the Ministry of Environment & Forests, 5 years in advance of final mine closure for approval.	Will be complied													
B.	General Conditions														
1	No change in mining technology and scope of working shall be made without prior approval of the MoEF	If any changes were made in mining technology and scope of the working, it will be informed to the MOEF.													
2	No change in the calendar plan including excavation, quantum of mineral and waste shall be made	Will be complied													
3	Fugitive dust emissions from all the sources shall be controlled regularly. Water spraying arrangement on haul roads, loading and unloading and at transfer points shall be provided and properly maintained	Fugitive dust emissions from all the sources are controlled regularly by water spraying, covering the waste dumps with Coir mat. Water spraying on haul roads, loading and unloading points and at transfer points are carried out regularly for proper maintenance.													
4	Four ambient air quality - monitoring stations shall be established in the core zone as well as in the buffer zone for RSPM, SPM, SO _x , NO _x monitoring. Location of the stations should be decided based on the metrological data, topographical features and environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the state pollution control Board.	Air quality monitoring is carried out in two zones such as Core Zone and Buffer Zone. 6 nos of ambient air quality monitoring stations in Core Zone are Plant-I, Haulage Road, Loading point, unloading point, BBH Siding and Ore stock yard. 4 nos of Ambient air quality monitoring stations in Buffer Zone are Megalahalli Village, Tanigehalli Village, Medikeripura Village and Konanuru Village. Monitoring is carried out twice a week for every month as per the Consent to Operate. Monitoring reports are submitted to pollution board once in quarter.													
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5	Data on ambient air quality should be regularly submitted to the Ministry, including its Regional Office Bangalore, SPCB / CPCB once in six months	Ambient air quality data is submitted regularly to the ministry, its Regional office Bangalore and KSPCB once in six months.																																	
6	Measures shall be taken for control of noise levels below 85dBA in the work environment. Workers engaged in operations of HEMM, etc., shall be provided with ear plugs/muffs.	Control measures like providing acoustic enclosures to DG sets are done. Staff working in the noise area is provided with ear plugs & ear muffs. All the mining machineries have air conditioned cabins which provides noise and dust free environment to the operator.																																	
7	Industrial waste water (work shop and waste water from the mine) should be properly collected, treated so as to conform to the standards prescribed under GSR 422(E) dated 19 th may, 1993 and 31 st December, 1993 or as amended from time to time. Oil and grease trap shall be installed before discharge of workshop effluents.	Oil & grease traps are provided at workshop where the oil is separated from water and is reused for dust suppression. The treated water is monitored for the parameters such as TSS, Oil & grease, pH etc. and is submitted regularly to Pollution control board.																																	
8	Personal working in the dusty areas shall be provided with protective respiratory devices and they shall also be imparted adequate training and information on safety and health aspects.	Regular trainings are provided in safety and health aspects. Dust mask, Ear plugs and safety goggles are provided for the persons working in dusty areas.																																	
9	Provision shall be made for the housing the laborers within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe	All the laborers are from adjacent villages and are residing there. Hence, no provision of housing is provided in the mines area. The Reverse osmosis water purifier has been installed in the mines and office area for drinking purpose. Monitoring of																																	

	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.	which is carried out on monthly basis.																												
10	A separate Environmental Management Cell with suitable qualified personnel shall be set-up under the control of a senior Executive, who will report directly to the head of the organization	<p>Separate Environmental Management cell has been established with qualified people who are reporting directly to head of the organization. Below are the contact details of the responsible persons-</p> <p>(1) Mr. Krishna Reddy (Head- IOK) MK.Reddy@vedanta.co.in +91-9483211966 (M)</p> <p>(2) Mr. Parthiban Madesh (Head- HSE) Parthiban.madesh@vedanta.co.in +91- 8778042423 (M)</p>	<p>Chief Operating Officer (COO)</p> <p>↓</p> <p>B Sivakumar (Head HSE- IOB)</p> <p>↓</p> <p>Parthiban Madesh (Head HSE-Karnataka)</p> <p>↓</p> <p>Aditya Anchliya (Engineer- Environment)</p>																											
11	The funds earmarked for environmental protection measures shall be kept in separate account and shall not be diverted for other purpose. Year wise expenditure shall be reported to the Ministry.	<p>Year wise expenditure records are maintained separately for Environmental Protection Measures and the same is submitted regularly to regional office and Karnataka State Pollution Control Board. Expenditure for the year 2018-19 is</p> <table border="1" data-bbox="877 911 1577 1235"> <thead> <tr> <th colspan="3">Environment Expenditure for Apr'18 to Mar'19</th> </tr> <tr> <th></th> <th>Description of the cost centers</th> <th>Total (in Rs.)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Dust Suppression</td> <td>34702956</td> </tr> <tr> <td>2</td> <td>Wildlife Protection Scheme</td> <td>72,520</td> </tr> <tr> <td>3</td> <td>Afforestation and Mine Reclamation</td> <td>9,174,161</td> </tr> <tr> <td>4</td> <td>Nursery Development</td> <td>315,492</td> </tr> <tr> <td>5</td> <td>Soil Erosion Control Measures</td> <td>7,835,890</td> </tr> <tr> <td>6</td> <td>Environment Monitoring</td> <td>6,124,839</td> </tr> <tr> <td colspan="2">Total</td> <td>58225858</td> </tr> </tbody> </table>	Environment Expenditure for Apr'18 to Mar'19				Description of the cost centers	Total (in Rs.)	1	Dust Suppression	34702956	2	Wildlife Protection Scheme	72,520	3	Afforestation and Mine Reclamation	9,174,161	4	Nursery Development	315,492	5	Soil Erosion Control Measures	7,835,890	6	Environment Monitoring	6,124,839	Total		58225858	
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12	The project authorities shall inform to the regional office of the ministry located at Bangalore regarding date of financial closures and final approval of the project by the	Complied																												

	concerned authorities and the date of start of land and development work		
13	The regional office of the ministry located at Bangalore shall monitor compliance of the stipulated conditions. The project authorities shall extend full cooperation to the officers of the regional office by furnishing the requisite data/ information/monitoring reports.	The data/ information are being sent to the regional office in the form of compliance reports.	
14	A copy of clearance letter will be marked to concerned panchayat/ local NGO, if any from whom suggestion/ representation has been received while processing the proposal	Complied	
15	State Pollution Control board shall display a copy of the clearance letter at the Regional office, District industry and collector's office/ tehsildars office for 30 days.	Complied	
16	The project authorities shall advertise at least in two local newspapers widely circulated one which shall be in the vernacular language of the locality concerned within 7 days of the issue of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the state Pollution Control Board and also at website of the Ministry of Environment and Forests at http://envfor.nic.in and a copy of the same shall be forwarded to the Regional office of the ministry located in Bangalore	Compiled	Compliances were submitted in the earlier compliance report.

Contact Details

1	Address	Vedanta Limited Iron Ore Mine (ML 2677) Meghalahalli Office Complex, Bheemasamudra Post, Chitradurga (Karnataka)- 577520 Registered Office Vedanta Limited, 1st Floor, 'C' wing, Unit 103, Corporate Avenue, Atul Projects, Chakala, Andheri (East), Mumbai (Maharashtra)- 400093
2	Contact Numbers	(T) +91-8194238100 (F) +91-8194238180
3	Contact details of the responsible persons-	(1) Mr. Krishna Reddy (Director- Iron Ore Karnataka) MK.Reddy@vedanta.co.in +91-9483211966 (M) (2) Mr. Parthiban Madesh (Head- EHS) Parthiban.Madesh@vedanta.co.in +91- 8778042423 (M)
4	GPS Location	Latitude: N 14 13'34.61" Longitude: E 76 12'41.73"
5	Website	www.sesagoaironore.com or www.vedantalimited.com

E-mail : test@mettexlab.com
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Phone : 044-22323163, 42179490, 91
Fax : 044-22311034



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(Approved/Recognized by APEDA, AGMARK, GAFTA, EIC, FSSAI, BIS & MoEF)


(Air Quality Monitoring Wing)

ABSTRACT OF AMBIENT AIR QUALITY MONITORING DATA

Project : Chitradurga Mine Report No : I
Client : M/s.Vedanta Limited Season : Post Monsoon
Month : November - 2018

S.NO	MONTH & YEAR	ZONE	LOCATION	PARAMETERS ($\mu\text{g}/\text{m}^3$)			
				SO ₂	NO ₂	PM ₁₀	PM _{2.5}
I.	November - 2018	Core	Plant-I area (Crushing)	8.6	19.8	63.6	32.8
			Loading point (Mining Working)	6.4	24.1	59.3	31.4
			Unloading Point (Dumping)	7.4	16.4	54.9	29.5
			Haulage Road	5.9	15.2	50.1	24.2
			BBH Siding	4.5	13.7	45.9	22.7
			Ore Stock Yard	10.3	21.4	56.3	31.0
		Buffer	Megalahalli Village	4.9	15.0	48.1	23.0
			Tenigehalli Village	5.2	11.7	39.5	17.4
			Medikeripura Village	7.1	16.2	46.6	22.3
			Konanur	4.7	13.0	40.3	18.1

ANALYZED AND VERIFIED BY:

1. 
S. SRI RENGANATHAN
Technical Manager



2. 
P. KAVITHA
Technical Manager

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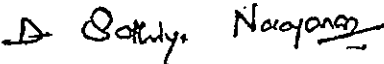
(Air Quality Monitoring Wing)

ABSTRACT OF AMBIENT AIR QUALITY MONITORING DATA

Project : Chitradurga Mine Report No : I
Client : M/s.Vedanta Limited Season : Winter
Month : January - 2019

S.NO	MONTH & YEAR	ZONE	LOCATION	PARAMETERS ($\mu\text{g}/\text{m}^3$)			
				SO ₂	NO ₂	PM ₁₀	PM _{2.5}
1.	January - 2019	Core	Plant-I area (Crushing)	8.5	21.3	70.2	37.3
			Loading point (Mining Working)	6.1	18.3	58.4	28.9
			Unloading Point (Dumping)	8.8	15.4	63.0	30.1
			Haulage Road	4.7	19.2	55.1	26.8
			BBH Siding	4.5	14.7	53.3	25.4
			Ore Stock Yard	8.0	21.0	65.7	35.3
		Buffer	Megalahalli Village	6.9	16.0	55.8	31.7
			Tenigehalli Village	4.3	11.7	47.0	25.6
			Medikeripura Village	4.6	15.7	48.3	26.2
			Konanur	6.7	12.4	43.5	21.2


ANALYZED AND VERIFIED BY:

1. 

Dr. D. SATHYA NARAYANAN
Quality Manager



2.


P. KAVITHA
Technical Manager
Govt. Analyst

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(Air Quality Monitoring Wing)


ABSTRACT OF AMBIENT AIR QUALITY MONITORING DATA

Project : Chitradurga Mine Report No : I
Client : M/s.Vedanta Limited Season : Winter
Month : February - 2019

S.NO	MONTH & YEAR	ZONE	LOCATION	PARAMETERS ($\mu\text{g}/\text{m}^3$)			
				SO ₂	NO ₂	PM ₁₀	PM _{2.5}
I.	February - 2019	Core	Plant-I area (Crushing)	9.8	22.1	72.3	38.8
			Loading point (Mining Working)	7.6	17.8	61.0	31.4
			Unloading Point (Dumping)	10.0	16.4	66.7	34.1
			Haulage Road	7.2	18.7	59.4	28.6
			BBH Siding	5.2	13.1	56.0	26.4
			Ore Stock Yard	7.8	19.0	68.1	35.8
		Buffer	Megalahalli Village	5.9	17.4	52.6	24.4
			Tenigehalli Village	5.1	12.7	44.1	20.3
			Medikeripura Village	6.3	14.8	51.2	23.0
			Konanur	4.8	11.4	45.4	19.7

ANALYZED AND VERIFIED BY:

1.


S. SRI RENGANATHAN
Technical Manager



2.


P. KAVITHA
Technical Manager
Govt. Analyst

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Jothi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032.

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(Air Quality Monitoring Wing)

ABSTRACT OF AMBIENT AIR QUALITY MONITORING DATA

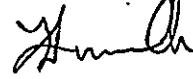
Project : Chitradurga Mine Report No : I
Client : M/s.Vedanta Limited Season : Summer
Month : March - 2019

S.NO	MONTH & YEAR	ZONE	LOCATION	PARAMETERS ($\mu\text{g}/\text{m}^3$)			
				SO ₂	NO ₂	PM ₁₀	PM _{2.5}
I.	March - 2019	Core	Plant-I area (Crushing)	9.0	24.3	67.2	36.9
			Loading point (Mining Working)	6.0	16.1	57.4	32.2
			Unloading Point (Dumping)	8.6	15.2	61.6	33.0
			Haulage Road	6.9	20.4	55.2	29.4
			BBH Siding	4.6	14.0	51.3	28.2
			Ore Stock Yard	8.4	17.0	64.1	36.0
		Buffer	Megalahalli Village	4.8	15.8	48.1	26.2
			Tenigehalli Village	7.0	13.5	39.4	17.2
			Medikeripura Village	5.9	17.7	47.5	25.8
			Konanur	5.0	12.5	43.9	22.3

ANALYZED AND VERIFIED BY:

1. 
S. SRI RENGANATHAN
Technical Manager



2. 
Govt. Analyst
P. KAVITHA
Technical Manager

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Analysis Report for Ground Water Samples

Client: M/s.Vedanta Limited

Report: II A

Project: Chitradurga Mine

Season: Post Monsoon - 2018

Date of Collection: 24.11.2018

S. No	Parameters	Sample Code	GW Q	GWQ	GWQ	GWQ	GWQ	GWQ	GWQ	GWQ	Standard IS : 10500
			-1	-2	-3	-4	-5	-6	-7	-8	
		Time of Sampling Units ↓	09.10 Hrs	11:20 Hrs	10.15 Hrs	09.40 Hrs	09.20 Hrs	12.10 Hrs	11.30 Hrs	12.30 Hrs	
1	pH	-	8.12	7.24	7.84	7.40	7.08	7.23	7.68	7.54	6.5 to 8.5
2	Turbidity	NTU	< 0.5	< 0.5	< 0.5	< 0.5	0.5	< 0.5	< 0.5	< 0.5	5
3	Total Dissolved Solids	mg/l	327	716	818	522	870	672	602	868	2000
4	Total Hardness as CaCO ₃	mg/l	196	378	462	298	470	366	340	490	600
5	Calcium as Ca	mg/l	56	68	112	58	112	62	64	116	200
6	Magnesium as Mg	mg/l	14	51	44	37	46	51	44	49	100
7	Total Alkalinity as CaCO ₃	mg/l	180	324	436	288	392	318	274	410	600
8	Fluoride as F	mg/l	BDL	0.36	0.48	0.36	0.62	0.41	0.24	0.48	1.50
9	Chloride as Cl	mg/l	58	164	182	118	172	176	148	226	1000
10	Sulphate as SO ₄	mg/l	14	22	38	17.4	32	32	11.4	36	400
11	Total Iron as Fe	mg/l	BDL	0.04	BDL	BDL	0.06	0.03	0.03	0.03	1.0
12	Total Suspended Solids	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	-

BDL : Below Detection Limit

Note: Standard IS: 10500 Permissible limits in the absence of alternative Sources

Sample Codes with Location:

GWQ-1: Meghalahalli Village (Tube Well);

GWQ-2: BBH Siding (Tube Well)

GWQ-3: Medikeripura Village (Tube Well);

GWQ-4: Alaghatta Village (Tube Well)

GWQ-5: Bommanagathihalli Village (Tube Well)

GWQ-6: Near Office Canteen (Tube Well)

GWQ-7: Near Mines Canteen (Tube Well)

GWQ-8: Tenighahalli (Tube Well)

Analyzed and Verified By

1, S. [Signature]

2,

[Signature]
P. KAVITHA

Technical Manager

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Analysis Report for Ground Water Samples

Client: M/s.Vedanta Limited

Report: II A

Project: Chitradurga Mine

Season: Post Monsoon - 2018

Date of Collection: 06.12.2018

S. No	Parameters	Sample Code	GWQ -1	GWQ -2	GWQ -3	GWQ -4	GWQ -5	GWQ -6	GWQ -7	GWQ -8	Standard : IS : 10500
		Time of Sampling Units ↓	07.00 Hrs	04.00 Hrs	07.15 Hrs	11.15 Hrs	10.15 Hrs	11.40 Hrs	04.25 Hrs	07.50 Hrs	
1	pH	-	7.92	7.07	7.46	7.76	7.11	7.17	7.87	7.22	6.5 to 8.5
2	Turbidity	NTU	< 0.5	< 0.5	< 0.5	< 0.5	0.5	< 0.5	< 0.5	< 0.5	5
3	Total Dissolved Solids	mg/l	368	678	842	702	782	662	632	876	2000
4	Total Hardness as CaCO ₃	mg/l	216	362	470	326	420	358	352	496	600
5	Calcium as Ca	mg/l	58	64	114	64	108	61	66	118	200
6	Magnesium as Mg	mg/l	17	49	45	40	37	50	45	49	100
7	Total Alkalinity as CaCO ₃	mg/l	198	320	440	308	372	310	284	426	600
8	Fluoride as F	mg/l	BDL	0.32	0.51	0.42	0.52	0.38	0.31	0.51	1.50
9	Chloride as Cl	mg/l	66	157	196	136	166	172	156	236	1000
10	Sulphate as SO ₄	mg/l	18	19	39.2	18.2	29	31	12.2	37.2	400
11	Total Iron as Fe	mg/l	BDL	0.03	BDL	BDL	0.04	0.04	0.04	0.04	1.0
12	Total Suspended Solids	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	-

BDL : Below Detection Limit

Note: Standard IS: 10500 Permissible limits in the absence of alternative Sources

Sample Codes with Location:

GWQ-1: Meghalahalli Village (Tube Well);

GWQ-2: BBH Siding (Tube Well)

GWQ-3: Medikeripura Village (Tube Well);

GWQ-4: Alaghatta Village (Tube Well)

GWQ-5: Bommanagathihalli Village (Tube Well)

GWQ-6: Near Office Canteen (Tube Well)

GWQ-7: Near Mines Canteen (Tube Well)

GWQ-8: Tenighahalli (Tube Well)

Analyzed and Verified By

1, D. Sathya Narayanan
Dr. D. SATHYA NARAYANAN
Quality Manager

P. KAVITHA
Technical Manager
Govt. Analyst

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Analysis Report for Ground Water Samples

Client: M/s.Vedanta Limited

Report: II A

Project: Chitradurga Mine

Season: Winter - 2018

Date of Collection: 23.01.2019 & 24.01.2019

S. No	Parameters	Sample Code	GWQ -1	GWQ -2	GWQ -3	GWQ -4	GWQ -5	GWQ -6	GWQ -7	Standard : IS : 10500
		Time of Sampling Units ↓	11.30 Hrs	10.10 Hrs	07.40 Hrs	11.55 Hrs	12.10 Hrs	10.25 Hrs	09.00 Hrs	
1	pH	-	7.26	7.31	7.29	7.74	7.13	7.82	7.21	6.5 to 8.5
2	Turbidity	NTU	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	5
3	Total Dissolved Solids	mg/l	582	536	831	808	556	542	758	2000
4	Total Hardness as CaCO ₃	mg/l	316	296	462	433	326	310	432	600
5	Calcium as Ca	mg/l	68	53	112	113	58	56	114	200
6	Magnesium as Mg	mg/l	35	39	44	38	44	41	36	100
7	Total Alkalinity as CaCO ₃	mg/l	276	262	421	396	286	272	412	600
8	Fluoride as F	mg/l	0.41	0.31	0.48	0.48	0.36	0.32	0.46	1.50
9	Chloride as Cl	mg/l	84	112	178	178	161	136	216	1000
10	Sulphate as SO ₄	mg/l	22	21	34	31	28	11.4	36.2	400
11	Total Iron as Fe	mg/l	BDL	0.04	BDL	0.05	0.03	0.04	0.05	1.0
12	Total Suspended Solids	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	-

BDL : Below Detection Limit

Note: Standard IS: 10500 Permissible limits in the absence of alternative Sources

Sample Codes with Location:

GWQ-1: Meghalahalli Village (Tube Well);

GWQ-2: BBH Siding (Tube Well)

GWQ-3: Medikeripura Village (Tube Well);

GWQ-4: Bommanagathihalli Village (Tube Well)

GWQ-5: Near Office Canteen (Tube Well)

GWQ-6: Near Mines Canteen (Tube Well)

GWQ-7: Tenighahalli (Tube Well)

Analyzed and Verified By

1. D. Sathya Narayanan

Dr. D. SATHYA NARAYANAN

2. P. KAVITHA
 Technical Manager

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(Approved/Recognized by APEDA, AGMARK, GAFTA, EIC, FSSAI, BIS & MoEF)

Analysis Report for Ground Water Samples

Client: M/s.Vedanta Limited

Report: II A

Project: Chitradurga Mine

Season: Winter - 2019

Date of Collection: 14.02.2019

S. No	Parameters	Sample Code	GWQ -1	GWQ -2	GWQ -3	GWQ -4	GWQ -5	GWQ -6	GWQ -7	Standard : IS : 10500
		Time of Sampling Units ↓	12.36 Hrs	10.30 Hrs	03.37 Hrs	12.40 Hrs	09.20 Hrs	11.15 Hrs	07.40 Hrs	
1	pH	-	7.76	7.86	7.18	7.80	7.32	7.62	7.16	6.5 to 8.5
2	Turbidity	NTU	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	5
3	Total Dissolved Solids	mg/l	546	506	866	756	589	536	812	2000
4	Total Hardness as CaCO ₃	mg/l	286	280	476	420	352	296	461	600
5	Calcium as Ca	mg/l	54	56	116	112	62	51	116	200
6	Magnesium as Mg	mg/l	36	34	45	34	48	40	42	100
7	Total Alkalinity as CaCO ₃	mg/l	278	272	436	384	310	264	427	600
8	Fluoride as F	mg/l	0.36	0.26	0.46	0.41	0.46	0.31	0.48	1.50
9	Chloride as Cl	mg/l	72	108	186	168	178	128	236	1000
10	Sulphate as SO ₄	mg/l	18	18	37	32	26	11.2	37.4	400
11	Total Iron as Fe	mg/l	BDL	BDL	BDL	0.04	0.05	0.03	0.06	1.0
12	Total Suspended Solids	mg/l	BDL	BDL	BDL	BDL	BDL	BDL	BDL	-

BDL : Below Detection Limit

Note: Standard IS: 10500 Permissible limits in the absence of alternative Sources

Sample Codes with Location:

GWQ-1: Meghalahalli Village (Tube Well);

GWQ-2: BBH Siding (Tube Well)

GWQ-3: Medikeripura Village (Tube Well);

GWQ-4: Bommanagathihalli Village (Tube Well)

GWQ-5: Near Office Canteen (Tube Well)

GWQ-6: Near Mines Canteen (Tube Well)

GWQ-7: Tenighahalli (Tube Well)

Analyzed and Verified By

1.
S. SRI RENGANATHAN
Technical Manager



2.
P. KAVITHA
Technical Manager

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(Approved/Recognized by APEDA, AGMARK, GAFTA, EIC, FSSAI, BIS & MoEF)

Analysis Report for Surface Water Samples

Client: M/s.Vedanta Limited

Report: II D

Project: Chitradurga Mine

Season: Post Monsoon-2018

Date of Collection: 11.10.2018 & 12.10.2018

S.No	Parameters	Sample Code	SWQ -10	SWQ -11	SWQ -12	General Standards for Inland Surface Water Schedule -VI(EPA-86)
		Time of Sampling	09:15 Hrs	09:30 Hrs	08:10 Hrs	
		Units ↓				
1	pH	-	7.02	7.12	7.09	5.5 to 9.0
2	Total Suspended Solids	mg/l	72	12	41	100
3	Total Iron as Fe	mg/l	2.22	0.19	1.98	3
4	Oil & Grease	mg/l	4	3	3	10
5	Manganese as Mn	mg/l	1.24	0.61	1.21	2

Sample Collected by: CHENNAI METTEX LAB PVT LTD

ND: Not Detected; BDL: Below Detection Limit

Location of Sampling Stations:

SWQ-10: Meghalahalli Kere (Pond);

SWQ-11: Vehicle Washing Water (After)

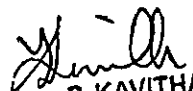
SWQ-12: Medikeri pura(Pond);

Inference: Surface water samples collected on 11.10.2018 & 12.10.2018 was tested for the above parameters and found well within the permissible limits.

Analyzed and Verified By :

1. 
G.S. RADHA
Technical Manager



2. 
P. KAVITHA
Technical Manager

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Analysis Report for Surface Water Samples

Client: M/s.Vedanta Limited

Report: II D

Project: Chitradurga Mine

Season: Post Monsoon-2018

Date of Collection: 24.11.2018

S.No	Parameters	Sample Code	SWQ -11	SWQ -12	SWQ -13	General Standards for Inland Surface Water Schedule -VI(EPA-86)
		Time of Sampling	09.00 Hrs	11.00 Hrs	10.30 Hrs	
		Units ↓	-	-	-	
1	pH	-	7.28	7.31	7.42	5.5 to 9.0
2	Total Suspended Solids	mg/l	86	21	64	100
3	Total Iron as Fe	mg/l	242	0.26	2.21	3
4	Oil & Grease	mg/l	5	3	4	10
5	Manganese as Mn	mg/l	1.51	0.68	1.41	2
Sample Collected by		CHENNAI METTEX LAB PVT LTD				

ND: Not Detected; BDL: Below Detection Limit

Location of Sampling Stations:

SWQ-11: Meghalahalli Kere (Pond);

SWQ-12: Vehicle Washing Water (After)

SWQ-13: Medikeri pura(Pond);

Inference: Surface water samples collected on 24.11.2018 was tested for the above parameters and found well within the permissible limits.

Analyzed and Verified By :

1. 
S. SRI RENGANATHAN
Technical Manager

2. 
P. KAVITHA
Technical Manager

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Analysis Report for Surface Water Samples

Client: M/s.Vedanta Limited

Report: II D

Project: Chitradurga Mine

Season: Winter - 2018

Date of Collection: 23.01.2019 & 24.01.2019

S.No	Parameters	Sample Code	SWQ -10	SWQ -11	SWQ -12	General Standards for Inland Surface Water Schedule -VI(EPA-86)
		Time of Sampling	01.00 Hrs	12.55 Hrs	11.00 Hrs	
		Units ↓	-	-	-	
1	pH	-	7.41	7.68	7.58	5.5 to 9.0
2	Total Suspended Solids	mg/l	72	24	36	100
3	Total Iron as Fe	mg/l	2.18	0.25	1.46	3
4	Oil & Grease	mg/l	3	3	4	10
5	Manganese as Mn	mg/l	1.42	0.68	1.21	2
Sample Collected by		CHENNAI METTEX LAB PVT LTD				

ND: Not Detected; BDL: Below Detection Limit

Location of Sampling Stations:

SWQ-10: Meghalahalli Kere (Pond);

SWQ-11: Vehicle Washing Water (After)

SWQ-12: Medikeri pura(Pond);

Inference: Surface water samples collected on 23.01.2019 & 24.01.2019 was tested for the above parameters and found well within the permissible limits.

Analyzed and Verified By :

1. *D. Sathiy. Narayanan*

Dr. D. SATHIYA NARAYANAN
 Quality Manager



2. *P. Kavitha*
 P. KAVITHA
 Technical Manager

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Analysis Report for Surface Water Samples

Client: M/s.Vedanta Limited

Report: II D

Project: Chitradurga Mine

Season: Winter - 2019

Date of Collection: 14.02.2019

S.No	Parameters	Sample Code	SWQ -10	SWQ -11	SWQ -12	General Standards for Inland Surface Water Schedule -VI(EPA-86)
		Time of Sampling	12.30 Hrs	09.30.Hrs	03.20 Hrs	
		Units ↓				
1	pH	-	7.48	7.20	6.95	5.5 to 9.0
2	Total Suspended Solids	mg/l	76	22	46	100
3	Total Iron as Fe	mg/l	2.26	0.22	1.48	3
4	Oil & Grease	mg/l	4	3	4	10
5	Manganese as Mn	mg/l	1.51	0.56	1.36	2
Sample Collected by		CHENNAI METTEX LAB PVT LTD				

ND: Not Detected; BDL: Below Detection Limit

Location of Sampling Stations:

SWQ-10: Meghalahalli Kere (Pond);


SWQ-11: Vehicle Washing Water (After)

SWQ-12: Medikeri pura(Pond);

Inference: Surface water samples collected on 14.02.2019 was tested for the above parameters and found well within the permissible limits.

Analyzed and Verified By :

1. 
S. SRI RENGANATHAN
Technical Manager

2. 
P. KAVITHA
Governance Manager



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(Approved/Recognized by APEDA, AGMARK, GAFTA, EIC, FSSAI, BIS & MoEF)

ANALYSIS REPORT OF SOIL SAMPLES

Soil Quality Monitoring Wing

Client : M/s. Vedanta Limited

Report No : VIII

Project: Chitradurga Mine

Season: Post Monsoon-2018

Date of Collection: 06.12.2018

S.No.	Parameter	VGS1	VGS2	VGS3	VGS4	VGS5	VGS6
1.	pH (1:2 aqueous solution)	6.72	6.61	6.26	6.90	6.96	7.10
2.	Electrical Conductivity (μ hos/cm)	696	784	810	896	910	926
3.	Organic Carbon %	0.42	0.44	0.48	0.39	0.46	0.39
4.	Phosphours as P, Kg/Hec	28	26	31	28	32	34
5.	Potassium as K, Kg/Hec	3.4	3.2	2.7	2.8	3.1	3.2
6.	Chloride as Cl, mg/100 gm	5.2	4.8	4.0	4.2	4.4	4.6
7.	Iron (Hcl Solubles), %	6.6	6.8	4.6	4.8	5.0	5.4
8.	Water Holding Capacity %	35	34	36	34	36	32
9.	Sand %	15.2	13.1	12.9	13.6	13.9	12.9
10.	Silt %	0.6	0.4	0.7	0.5	0.6	0.4
11.	Clay %	84.2	86.5	86.4	85.9	85.5	86.7
12.	Texture	Clay	Clay	Clay	Clay	Clay	Clay

Sample Collected & analyzed by : CHENNAI METTEX LAB PVT LTD

Location of sampling stations:

- VGS1 - Bomunanagatihalli (Agri land)
- VGS2 - Hirekandewali Village (Agri land)
- VGS3 - Kadlegudu Village (Agri land)
- VGS4 - Alagatta Village (Agri Land)
- VGS5 - Tenegehalli Village (Agri Land)
- VGS6 - Waste dump (With in the lease area)

ANALYZED & VERIFIED BY :

1. *D. Sathya Narayanan*
Dr. D. SATHIYA NARAYANAN
Quality Manager

2. *P. Kavitha*
P. KAVITHA
Technical Assistant

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