ADITYA BIRLA

HINDALCO

HIL/SEM/MoEF/14-15/8

29.04.2014

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Counter No:1,OP-Code:01
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BHUBANESWAR, PIN:751023
From:HINDALCO IND LTD , SEMILIGUDA
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भारतीय डाक
India Post

The Director,
Ministry of Environment and Forests,
Bhubaneswar

The Regional Controller of Mines
Indian Bureau of Mines
Bhubaneswar

The Regional Officer
Odisha State Pollution Control Board
Rayagada

The Divisional Forest Officer
Koraput

Sub: Regarding Compliance to Conditions under Environmental Clearance to Maliparbat Bauxite Mining Project located in village Aligaon, Kakadamba, Tehsil Pottangi, District Koraput, Orissa (Oct'13 to March'14)

Sir,

Maliparbat mine started in 2008 but still now it is not reached its full-fledged capacity due to lack of certain clearances of dispatch of bauxite to our plants located at different states. Our application for dispatching of bauxite to different plants like Belgaum and Muri are still pending at government level which is under process and which will take more time to get sanctioned from Government.

Hence full-fledge scientific mechanized mining will be undertaken, once the permission to dispatch bauxite to the different plants situated at different states is obtained. Moreover we are regularly pursuing with government authority for the same and we also expect soon to obtain the same. At present full-fledged mining is temporarily stopped due to continuous local disturbance. However management is ready to start mining operation at the hill top once the clearance from the district administration is obtained for the same. The other activities like peripheral development and compliances of general and specific conditions of EC along with environmental monitoring, plantation never stopped and it is continuing.

In this regard we are submitting the latest compliance status with our proposed action plan in seriatim.

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Corporate Inentity No. L27020MH1958PLC011238

A. Specific Conditions:

(i) All the conditions stipulated by the State Pollution Control Board in their consent to establish should be effectively implemented.

Submission: Implementation is ongoing.

(ii) Top soil shall be stacked properly with proper slope with adequate measures and should be used for reclamation and rehabilitation of mined out areas.

Submission: **Top soil has been evenly stacked with proper slope at earmarked site with adequate measures. This will be used for reclamation and rehabilitation of mined out areas.**

(iii) The waste generated in the initial period shall be dumped temporarily and backfilled in the mined out area. There shall be no permanent external OB dump in the project area. Concurrent backfilling should start from the fifth year onwards. Monitoring and management of rehabilitated areas should continue until the vegetation becomes self sustaining. Compliance status should be submitted to the Ministry of Environment and Forest on six monthly basis.

Submission: The waste rock generated during the course of mining has been dumped and stacked separately in earmarked areas, concurrent backfilling of waste shall start in due course of time. There will be no permanent external OB dump in the project area. After commencement of backfilling, monitoring and management of rehabilitated area shall be done till vegetation becomes self-sustaining. The compliance status in this regard shall be submitted to Ministry of Environment and Forest on six monthly basis.

(iv) Catch drains and siltation ponds of appropriate size should be constructed to arrest silt and sediment flow from the working pit, soil and mineral dumps. The water so collected should be utilized for watering the mine area, roads, green belt development etc. The drains should regularly desilted particularly after monsoon and maintained properly.

Garland drain (size, gradient and length) shall be constructed for 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 retention period to allow proper settling of silt material. Sedimentation pits should be constructed at the corners of garland drains and desilted at regular intervals.

Submission: Catch drains and siltation ponds of appropriate size are partly constructed to arrest silt and sediment flow from the working pit, soil and mineral dumps, etc.

The water so collected shall be used for watering the mine area, roads, green belt development, etc. We regularly clean the drains particularly after monsoon and maintained properly. Adequate garland drain and sump shall also be constructed in due course of time. Sedimentation pits shall be constructed at corners of garland drains and desilted at regular intervals.

(v) Plantation shall be raised in an area of 90.84 ha including a green belt of adequate width by planting native species around the ML area, roads around void etc. in consultation with the local DFO / Agricultural Department. The density of trees should be around 2000 plants per ha.

Submission: We shall consult the local DFO / Agricultural Department during the development of the green belt of adequate width for dust suppression around the mining area. The density of 2000 plants per ha shall be maintained for the entire area of 90.84 ha covered under plantation. In first phase we are planning to do plantation at two sides of road. Till date we have planted 750 nos. of indigenous species along the mine approach road. Gradually we will extend it to the mine lease boundary.

(vi) The mining operations shall not intersect groundwater table. Prior approval of the Ministry of Environment & Forests and Central Groundwater Authority shall be obtained for mining below water table.

Submission: Mining operations is confined to the plateau top only and do not intersect the groundwater table. We understand that prior approval of the Ministry of Environment and Forests and Central Ground Water Authority shall be needed for mining below water table.

(vii) The project authority should implement suitable conservation measures to augment groundwater resources in the area in consultation with the Regional Director, Central Ground Water Board.

Submission: We shall implement conservation measures to augment ground water resources in the area in consultation with the Regional Director, Central Ground Water Board in due course of time.

(viii) Regular monitoring of ground water level and quality should be carried out by establishing a network of existing wells and constructing new piezometers during the mining operation. The monitoring should 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 may be sent regularly to MoEF, Central Ground Water Authority and Regional Director, Central Ground Water Board.

Submission: A network of existing wells is being used to carry out regular monitoring of ground water level and quality. This is being done four times in a year for four seasons and the data thus collected are submitted periodically to the Ministry of Environment and Forests, Central Ground Water Authority and Regional Director, Central Ground Water Board. The report on monitoring of Ground water quality & Level data for the period of October'13 to March'14 is enclosed as Annexure I.

(ix) Prior permission from the competent authority should be obtained for drawl of water from the surface water bodies i.e. Kundli Nallah.

Submission: The Water Resource Department, Government of Orissa has accorded permission for drawl of water from Kundli Nallah to meet our requirements vide its letter No. Irr-II. WRC-45/06-13366/WR dated 21.04.2006. A water drawl agreement to this effect was signed with the Executive Engineer, Upper Kolab Head Works Division, Kolabnagar, Dist. Koraput on 02.04.2007.Renewal application for permission of drawl of water has been submitted to Addl. Secretary , Dept of Water Resources, Govt. of Orissa.

(x) The project proponent shall undertake monitoring of springs (two main perennial springs on the southern side, two springs on the northern side), in addition to six groundwater-monitoring stations as specified by State Pollution Control Board on long term basis both in terms of quantity and quality of water and records maintained. Six monthly reports should be submitted to the Ministry of Environment and Forests and its Regional Office located at Bhubaneswar.

Submission: The water assessment studies in and around Maliparbat area was carried out by the Ground Water Survey and Investigation Department, Govt of Orissa in pre and post monsoon seasons including quantity and quality of surface and ground water and report was submitted to the SPCB, Orissa.

For continuous monitoring of springs and ground water we have outsourced to M/s S S Environics (India) Pvt. Ltd. as Environment consultant to carry out the monitoring work. The comprehensive six monthly reports are being submitted to MoEF, New Delhi and its Regional Office at Bhubaneswar. The surface water and Stream flow monitoring report for the period of October'13 to March'14 is enclosed as annexure II.

(xi) Vehicular emission 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 should not be overloaded.

Submission: Vehicle emission is under control and we regularly monitoring it. Healthy maintenance practices are being followed to keep vehicular emission under control; the trucks are always covered with tarpaulin and are not overloaded.

(xii) The voids created at the end of mining shall be converted into water body with shallow depths not exceeding 30m. The higher benches of the excavated void/mine pit shall be terraced and plantation done to stabilize the slopes. Peripheral fencing shall be done along the excavated area.

Submission: The void created at the end of mining shall be converted into water bodies, the higher benches of the excavated void / mine pit shall be terraced and plantation will be done to stabilize the slopes. Peripheral fencing shall also be done along the excavated area.

(xiii) The project proponent shall adopt wet drilling.

Submission: We are adopting wet drilling practices regularly.

(xiv) Blasting operation should be carried out only during daytime. Controlled blasting should be practiced. The mitigate measures for control of ground vibrations and to arrest fly rocks and boulders should be implemented.

Submission: Blasting operation is carried out during daytime only. We are implementing mitigate measures to control ground vibrations and arrest fly rocks.

(xv) Consent to operate should be obtained from SPCB prior to start of production from the mine.

Submission: We have the pleasure to mention that the Consent to operate under the Air (Prevention and Control of Pollution) **Act, 1981 and the Water** (Prevention and Control of Pollution) **Act, 1974 has been granted to our project by the State Pollution Control Board, Orissa for the period up to 31.03.2016 vide letter no. 4750/IND-I-CON-5437 dated 14.03.2012.**

(xvi) Sewage treatment plant should be installed for the colony. ETP should also be provided for workshop and waste water generated from mining operations.

Submission: No township at the mining site is proposed and hence the installation of STP is not applicable. Provision of septic tank and soak pit shall be made for a small quantity of sewage that may generate. Oil and Grease trap will be installed for workshop waste water. The treated water will be used for dust suppression and green belt and there will be no discharge.

(xvii) Digital Processing of the entire lease area using remote sensing technique should be done regularly once in three years for monitoring land use pattern and report submitted to MoEF and its Regional Office.

Submission: Digital processing of the lease area using remote sensing technique will be done once in three years for monitoring land use pattern and report of the same shall be submitted to Ministry of Environment and Forests and its Regional Office.

(xviii) A Final Mine Closure Plan along with details of Corpus Fund should be submitted to the Ministry of Environment and Forest 5 years in advance of final Mine Closure for approval.

Submission: Final Mine Closure Plan along with details of Corpus Fund will be submitted to the Ministry of Environment and Forest five years in advance of the final closure for approval.

B. General Conditions:

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

Submission: There will be no change in mining technology and scope of working without prior approval of the Ministry of Environment and Forests.

(ii) No change in the calendar plan including excavation, quantum of mineral bauxite and waste should be made.

Submission: There will be no change in the calendar plan.

(iii) Conservation measures for protection of flora & fauna in core & buffer zone should be drawn up in consultation with the local forest and wildlife departments.

Submission: We shall consult the local forest and wildlife departments to draw conservation measures for protection of flora and fauna in core and buffer zone.

(iv) Four ambient air quality-monitoring stations should be established in the core zone as well as in the buffer zone for RPM, SPM, SO_2, 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.

Submission: Regular monitoring stations are already established. The air monitoring stations are the same from where baseline ambient air quality monitoring was done during pre-project Environmental Impact Assessment studies.

As per the directions of State Pollution Control Board, Orissa, the ambient air quality is being regularly monitored from said stations for RPM, SPM, SO_2, NO_X.

(v) Data on ambient air quality (RPM, SPM, SO_2, NO_X) should be regularly submitted to the Ministry including its Regional Office located at Bhopal and the State Pollution Control Board/ Central Pollution Control Board once in six months.

Submission: The data on air quality for RPM, SPM, SO_2 and NO_X are being submitted periodically to the Ministry of Environment and Forests, its Regional Office at Bhubaneswar and the State Pollution Control Board, Orissa. Ambient Air Quality monitoring averages of October'13 to March'14 is enclosed as annexure-III.

(vi) Fugitive dust emission from all sources should be controlled regularly. Water spraying arrangement on haul roads, loading and unloading and at transfer points should be provided and properly maintained.

Submission: We make all efforts to control fugitive dust emission. Water spraying arrangement on haul roads, loading and unloading and at transfer points are being provided and maintained by us.

(vii) Measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in operations of HEMM, etc. should be provided with ear plugs/ muffs.

Submission: We are taking all measures to control noise level below 85 dBA in work environment additionally we are providing ear plugs/ muffs to the workers engaged in operations of HEMM etc.

(viii) Industrial waste water (workshop & waste water from the mine) should be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19th May, 1993 and 31st December, 1993 or as amended from time to time. Oil and Grease trap should be installed before discharge of workshop effluents.

Submission: All waste water shall be properly collected and treated to conform to the prescribed standard i.e. pH = 5.5–9.0, SS=100mg/l and Oil and Grease = 10mg/l or as amended from time to time. Oil and Grease trap will be installed. The affluent will be used for dust suppression and there will be no discharge.

(ix) Personnel working in dusty areas should wear protective respiratory devices and they should also be provided with adequate training and information on safety and health aspects.

Occupational health surveillance program of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed.

Submission: We are providing protective respiratory devices like dust masks etc. to personnel working in dusty areas. We impart adequate training on safety and health aspects. We are under taking occupational health surveillance program of the workers periodically to observe any contractions due to exposure to dust. Corrective measures will be taken immediately, if required.

(x) A separate environmental management cell with suitable qualified personnel should be set-up under the control of a Senior Executive, who will report directly to the head of the organization.

Submission: An Environment Management cell is in place under the control of AGM-Mines who is also working as Agent/unit head of mines.

(xi) The project authorities should inform to the Regional Office located at Bhubaneswar regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.

Submission: We shall inform date of financial closures and final approval of the project as also the date of start of land development work to the Regional Office of Ministry of Environment and Forest, Bhubaneswar.

(xii) 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.

Submission: Separate account maintained for environmental protection & it's monitoring. It was earmarked at the beginning of the year & shall not be diverted for any other purpose. Our cost estimates for environmental protection and monitoring and statement of the actual expenditure incurred during the year 2013-14 is attached as annexure IV.

(xiii) The Regional Office of the Ministry located at Bhubaneswar shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the regional Office by furnishing the requisite data / information / monitoring reports.

Submission: We note that the Regional Office of the Ministry located at Bhubaneswar will monitor compliance to the stipulated conditions of the environmental clearance accorded by Ministry of Environment and Forests, New Delhi. We humbly submit that all best cooperation will be extended to the officials of the regional office by furnishing requisite data / information / monitoring report etc.

(xiv) A copy of clearance letter will be marked to concerned Panchayat / local NGO, if any, from whom suggestion / representation was received while processing the proposal.

Submission: The requirement under the condition has already been complied with.

(xv) State Pollution Control Board should display a copy of the clearance letter at the Regional Office, District Industry Centre and Collector's Office / Tehsildar's Office for 30 days.

Submission: The requirement under the condition has already been complied with.

(xvi) The project authorities should advertise at least in two local newspapers widely circulated, one of which shall be in the vernacular language of the locality concerned, with in 7 days of the issue of clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and also at web site of the Ministry of Environment and Forests at http://envfor.nic.in and a copy of the same should be forwarded to the Regional Office of this Ministry located at Bhubaneswar.

Submission: The requirement under the condition has already been complied with.

3. The Ministry or any other competent authority may alter / modify the above conditions or stipulate any further condition in the interest of environmental protection.

Submission: We are aware that the Ministry or any other competent authority can alter or modify the above conditions or stipulate any further condition in the interest of environment protection.

4. Failure to comply with any of the following conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.

Submission: We understand that failure to comply with any of the conditions mentioned in the letter according to Environment Clearance can result in withdrawal of the clearance and attract action under the provisions of Environment (Protection) Act, 1986.

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5. The above conditions will be enforced *inter-alia*, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and rules.

Submission: We note the above conditions are enforced inter-alia, under the provisions of Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and rule.

We trust your good self will find the above in order.

Thanking You

Yours faithfully

For Hindalco Industries Limited

JAYANTA BHATTACHARYA

AGM-Mines

Environmental Clearance – Maliparbat Bauxite Mines-Compliance Report *Page 10*

GROUND WATER QUALITY REPORT

Annexure I

Name of the Mine **: Maliparbat Bauxite Mines**
Hindalco Industries Limited
Dist: Koraput, Orissa.

1. Padmapur

Sl. No.	Parametres	Unit	IS-10500 Standards	Dec'13	March'14	**Average**
1	pH	-	6.5-8.5	7.2	7.1	**7.15**
2	Colour	Hazen	5	C.L	C.L	**C.L**
3	Taste	FTN	Agreeable	Agreeable	Agreeable	**Agreeable**
4	Odour		Unobjectable	U/O	U/O	**U/O**
5	Total Dissolved solids	mg/l	500	171	137	**154**
6	Mineral oil	mg/l	0.01	BDL	BDL	**BDL**
7	Residual chlorine as CL_2	mg/l	0.2	ND	ND	**ND**
8	Chloride as Cl	mg/l	250	9.1	10.4	**9.75**
9	Fluoride as F	mg/l	1.0	0.086	0.034	**0.06**
10	Sulfate as SO_4	mg/l	200	12.9	14.2	**13.55**
11	Nitrate as NO_3	mg/l	45	0.71	0.41	**0.56**
12	Cyanide as CN	mg/l	0.05	BDL	BDL	**BDL**
13	Phenols as C_6H_5OH	mg/l	0.001	BDL	BDL	**BDL**
14	Chromium as Cr^{+6}	mg/l	0.05	BDL	BDL	**BDL**
15	Iron as Fe	mg/l	0.3	0.13	0.094	**0.112**
16	Copper as Cu	mg/l	0.05	BDL	BDL	**BDL**
17	Selenium as Se	mg/l	0.01	BDL	BDL	**BDL**
18	Arsenic as As	mg/l	0.05	BDL	BDL	**BDL**
19	Cadmium as Cd	mg/l	0.01	BDL	BDL	**BDL**
20	Boron as B	mg/l	1	BDL	BDL	**BDL**
21	Mercuri as Hg	mg/l	0.001	BDL	BDL	**BDL**
22	Lead as Pb	mg/l	0.05	BDL	BDL	**BDL**
23	Zinc as Zn	mg/l	5	0.19	0.1	**0.15**
24	Total Hardness as $CaCO_3$	mg/l	300	59.0	42.0	**50.50**
25	Calcium as Ca	mg/l	75	9.3	8.9	**9.10**
26	Magnesium as Mg	mg/l	30	6.3	5.8	**6.05**
27	Manganese as Ma	mg/l	0.10	0.035	0.0059	**0.020**
28	Anionic Detergents as MBAS	mg/l	0.2	ND	ND	**ND**
29	Alkalinity	mg/l	200	19	23	**21.00**
30	Aluminium as Al	mg/l	0.03	BDL	BDL	**BDL**
31	Turbidity, NTU	mg/l	5	1.65	<1	**1.65**

BDL- Bellow Detection Level ; ND- Not Detected; U/O- Unobjectable; CL- Colour Less.

2. Aligaon

Sl. No.	Parametres	Unit	IS-10500 Standards	Dec'13	March'14	**Average**
1	pH	-	6.5-8.5	7.0	7.2	**7.1**
2	Colour	Hazen	5	C.L	C.L	**C.L**
3	Taste	FTN	Agreeable	Agreeable	Agreeable	**Agreeable**
4	Odour		Unobjectable	U/O	U/O	**U/O**
5	Total Dissolved solids	mg/l	500	144	158	**151**
6	Mineral oil	mg/l	0.01	BDL	BDL	**BDL**
7	Residual chlorine as CL_2	mg/l	0.2	ND	ND	**ND**
8	Chloride as Cl	mg/l	250	8.4	9.2	**8.8**
9	Fluoride as F	mg/l	1.0	0.077	0.049	**0.063**
10	Sulfate as SO_4	mg/l	200	11.6	15.7	**13.65**
11	Nitrate as NO_3	mg/l	45	0.63	0.58	**0.605**
12	Cyanide as CN	mg/l	0.05	BDL	BDL	**BDL**
13	Phenols as C_6H_5OH	mg/l	0.001	BDL	BDL	**BDL**
14	Chromium as Cr^{+6}	mg/l	0.05	BDL	BDL	**BDL**
15	Iron as Fe	mg/l	0.3	0.1	0.12	**0.11**
16	Copper as Cu	mg/l	0.05	BDL	BDL	**BDL**
17	Selenium as Se	mg/l	0.01	BDL	BDL	**BDL**
18	Arsenic as As	mg/l	0.05	BDL	BDL	**BDL**
19	Cadmium as Cd	mg/l	0.01	BDL	BDL	**BDL**
20	Boron as B	mg/l	1	BDL	BDL	**BDL**
21	Mercuri as Hg	mg/l	0.001	BDL	BDL	**BDL**
22	Lead as Pb	mg/l	0.05	BDL	BDL	**BDL**
23	Zinc as Zn	mg/l	5	0.15	0.16	**0.16**
24	Total Hardness as $CaCO_3$	mg/l	300	48.0	52.0	**50.00**
25	Calcium as Ca	mg/l	75	8.4	9.9	**9.15**
26	Magnesium as Mg	mg/l	30	5.1	6.8	**5.95**
27	Manganese as Ma	mg/l	0.10	0.03	0.01	**0.020**
28	Anionic Detergents as MBAS	mg/l	0.2	ND	ND	**ND**
29	Alkalinity	mg/l	200	24	31	**27.50**
30	Aluminium as Al	mg/l	0.03	BDL	BDL	**BDL**
31	Turbidity, NTU	mg/l	5	1.34	1.29	**1.32**

BDL- Bellow Detection Level ; ND- Not Detected; U/O- Unobjectable; CL- Colour Less.

3. Pakajhola

Sl. No.	Parametres	Unit	IS-10500 Standards	Dec'13	March'14	**Average**
1	pH	-	6.5-8.5	6.9	7.1	**7**
2	Colour	Hazen	5	C.L	C.L	**C.L**
3	Taste	FTN	Agreeable	Agreeable	Agreeable	**Agreeable**
4	Odour		Unobjectable	U/O	U/O	**U/O**
5	Total Dissolved solids	mg/l	500	152	144	**148**
6	Mineral oil	mg/l	0.01	BDL	BDL	**BDL**
7	Residual chlorine as CL_2	mg/l	0.2	ND	ND	**ND**
8	Chloride as Cl	mg/l	250	7.9	9.9	**8.9**
9	Fluoride as F	mg/l	1.0	0.059	0.039	**0.049**
10	Sulfate as SO_4	mg/l	200	10.9	14.7	**12.8**
11	Nitrate as NO_3	mg/l	45	0.56	0.45	**0.505**
12	Cyanide as CN	mg/l	0.05	BDL	BDL	**BDL**
13	Phenols as C_6H_5OH	mg/l	0.001	BDL	BDL	**BDL**
14	Chromium as Cr^{+6}	mg/l	0.05	BDL	BDL	**BDL**
15	Iron as Fe	mg/l	0.3	0.15	0.1	**0.125**
16	Copper as Cu	mg/l	0.05	BDL	BDL	**BDL**
17	Selenium as Se	mg/l	0.01	BDL	BDL	**BDL**
18	Arsenic as As	mg/l	0.05	BDL	BDL	**BDL**
19	Cadmium as Cd	mg/l	0.01	BDL	BDL	**BDL**
20	Boron as B	mg/l	1	BDL	BDL	**BDL**
21	Mercuri as Hg	mg/l	0.001	BDL	BDL	**BDL**
22	Lead as Pb	mg/l	0.05	BDL	BDL	**BDL**
23	Zinc as Zn	mg/l	5	0.12	0.13	**0.13**
24	Total Hardness as $CaCO_3$	mg/l	300	42.0	46.0	**44.00**
25	Calcium as Ca	mg/l	75	8.1	9.2	**8.65**
26	Magnesium as Mg	mg/l	30	4.7	6.1	**5.40**
27	Manganese as Ma	mg/l	0.10	0.024	0.0076	**0.016**
28	Anionic Detergents as MBAS	mg/l	0.2	ND	ND	**ND**
29	Alkalinity	mg/l	200	18	26	**22.00**
30	Aluminium as Al	mg/l	0.03	BDL	BDL	**BDL**
31	Turbidity, NTU	mg/l	5	1.22	1.07	**1.15**

BDL- Bellow Detection Level ; ND- Not Detected; U/O- Unobjectable; CL- Colour Less.

4. Kakariguda

Sl. No.	Parametres	Unit	IS-10500 Standards	Dec'13	March'14	**Average**
1	pH	-	6.5-8.5	7.1	7.2	**7.15**
2	Colour	Hazen	5	C.L	C.L	**C.L**
3	Taste	FTN	Agreeable	Agreeable	Agreeable	**Agreeable**
4	Odour		Unobjectable	U/O	U/O	**U/O**
5	Total Dissolved solids	mg/l	500	131	122	**126.5**
6	Mineral oil	mg/l	0.01	BDL	BDL	**BDL**
7	Residual chlorine as CL_2	mg/l	0.2	ND	ND	**ND**
8	Chloride as Cl	mg/l	250	7.2	9.1	**8.15**
9	Fluoride as F	mg/l	1.0	0.047	0.028	**0.0375**
10	Sulfate as SO_4	mg/l	200	11.6	13.1	**12.35**
11	Nitrate as NO_3	mg/l	45	0.47	0.33	**0.4**
12	Cyanide as CN	mg/l	0.05	BDL	BDL	**BDL**
13	Phenols as C_6H_5OH	mg/l	0.001	BDL	BDL	**BDL**
14	Chromium as Cr^{+6}	mg/l	0.05	BDL	BDL	**BDL**
15	Iron as Fe	mg/l	0.3	0.07	0.082	**0.076**
16	Copper as Cu	mg/l	0.05	BDL	BDL	**BDL**
17	Selenium as Se	mg/l	0.01	BDL	BDL	**BDL**
18	Arsenic as As	mg/l	0.05	BDL	BDL	**BDL**
19	Cadmium as Cd	mg/l	0.01	BDL	BDL	**BDL**
20	Boron as B	mg/l	1	BDL	BDL	**BDL**
21	Mercuri as Hg	mg/l	0.001	BDL	BDL	**BDL**
22	Lead as Pb	mg/l	0.05	BDL	BDL	**BDL**
23	Zinc as Zn	mg/l	5	0.11	0.087	**0.10**
24	Total Hardness as $CaCO_3$	mg/l	300	37.0	32.0	**34.50**
25	Calcium as Ca	mg/l	75	7.4	8.3	**7.85**
26	Magnesium as Mg	mg/l	30	4.4	5.2	**4.80**
27	Manganese as Ma	mg/l	0.10	0.019	0.0035	**0.011**
28	Anionic Detergents as MBAS	mg/l	0.2	ND	ND	**ND**
29	Alkalinity	mg/l	200	26	19	**22.50**
30	Aluminium as Al	mg/l	0.03	BDL	BDL	**BDL**
31	Turbidity, NTU	mg/l	5	1.18	<1	**1.18**

BDL- Bellow Detection Level ; ND- Not Detected; U/O- Unobjectable; CL- Colour Less.

5. Sarishapadar

Sl. No.	Parametres	Unit	IS-10500 Standards	Dec'13	March'14	**Average**
1	pH	-	6.5-8.5	7.3	7.2	**7.25**
2	Colour	Hazen	5	C.L	C.L	**C.L**
3	Taste	FTN	Agreeable	Agreeable	Agreeable	**Agreeable**
4	Odour		Unobjectable	U/O	U/O	**U/O**
5	Total Dissolved solids	mg/l	500	147	156	**151.5**
6	Mineral oil	mg/l	0.01	BDL	BDL	**BDL**
7	Residual chlorine as CL_2	mg/l	0.2	ND	ND	**ND**
8	Chloride as Cl	mg/l	250	8.3	9.7	**9**
9	Fluoride as F	mg/l	1.0	0.036	0.044	**0.04**
10	Sulfate as SO_4	mg/l	200	9.7	15.1	**12.4**
11	Nitrate as NO_3	mg/l	45	0.32	0.52	**0.42**
12	Cyanide as CN	mg/l	0.05	BDL	BDL	**BDL**
13	Phenols as C_6H_5OH	mg/l	0.001	BDL	BDL	**BDL**
14	Chromium as Cr^{+6}	mg/l	0.05	BDL	BDL	**BDL**
15	Iron as Fe	mg/l	0.3	0.12	0.11	**0.115**
16	Copper as Cu	mg/l	0.05	BDL	BDL	**BDL**
17	Selenium as Se	mg/l	0.01	BDL	BDL	**BDL**
18	Arsenic as As	mg/l	0.05	BDL	BDL	**BDL**
19	Cadmium as Cd	mg/l	0.01	BDL	BDL	**BDL**
20	Boron as B	mg/l	1	BDL	BDL	**BDL**
21	Mercuri as Hg	mg/l	0.001	BDL	BDL	**BDL**
22	Lead as Pb	mg/l	0.05	BDL	BDL	**BDL**
23	Zinc as Zn	mg/l	5	0.16	0.15	**0.16**
24	Total Hardness as $CaCO_3$	mg/l	300	34.0	49.0	**41.50**
25	Calcium as Ca	mg/l	75	6.9	9.6	**8.25**
26	Magnesium as Mg	mg/l	30	4.1	6.5	**5.30**
27	Manganese as Ma	mg/l	0.10	0.014	0.0094	**0.012**
28	Anionic Detergents as MBAS	mg/l	0.2	ND	ND	**ND**
29	Alkalinity	mg/l	200	33	27	**30.00**
30	Aluminium as Al	mg/l	0.03	BDL	BDL	**BDL**
31	Turbidity, NTU	mg/l	5	1.08	1.16	**1.12**

BDL- Bellow Detection Level ; ND- Not Detected; U/O- Unobjectable; CL- Colour Less.

6. Kakadamba

Sl. No.	Parametres	Unit	IS-10500 Standards	Dec'13	March'14	**Average**
1	pH	-	6.5-8.5	7.1	7.2	**7.15**
2	Colour	Hazen	5	C.L	C.L	**C.L**
3	Taste	FTN	Agreeable	Agreeable	Agreeable	**Agreeable**
4	Odour		Unobjectable	U/O	U/O	**U/O**
5	Total Dissolved solids	mg/l	500	160	129	**144.5**
6	Mineral oil	mg/l	0.01	BDL	BDL	**BDL**
7	Residual chlorine as CL_2	mg/l	0.2	ND	ND	**ND**
8	Chloride as Cl	mg/l	250	9.4	9.5	**9.45**
9	Fluoride as F	mg/l	1.0	0.071	0.031	**0.051**
10	Sulfate as SO_4	mg/l	200	12.2	13.8	**13**
11	Nitrate as NO_3	mg/l	45	0.63	0.37	**0.5**
12	Cyanide as CN	mg/l	0.05	BDL	BDL	**BDL**
13	Phenols as C_6H_5OH	mg/l	0.001	BDL	BDL	**BDL**
14	Chromium as Cr^{+6}	mg/l	0.05	BDL	BDL	**BDL**
15	Iron as Fe	mg/l	0.3	0.11	0.089	**0.0995**
16	Copper as Cu	mg/l	0.05	BDL	BDL	**BDL**
17	Selenium as Se	mg/l	0.01	BDL	BDL	**BDL**
18	Arsenic as As	mg/l	0.05	BDL	BDL	**BDL**
19	Cadmium as Cd	mg/l	0.01	BDL	BDL	**BDL**
20	Boron as B	mg/l	1	BDL	BDL	**BDL**
21	Mercuri as Hg	mg/l	0.001	BDL	BDL	**BDL**
22	Lead as Pb	mg/l	0.05	BDL	BDL	**BDL**
23	Zinc as Zn	mg/l	5	0.15	0.094	**0.12**
24	Total Hardness as $CaCO_3$	mg/l	300	55.0	38.0	**46.50**
25	Calcium as Ca	mg/l	75	8.4	8.7	**8.55**
26	Magnesium as Mg	mg/l	30	5.5	5.6	**5.55**
27	Manganese as Ma	mg/l	0.10	0.028	0.0047	**0.016**
28	Anionic Detergents as MBAS	mg/l	0.2	ND	ND	**ND**
29	Alkalinity	mg/l	200	18	21	**19.50**
30	Aluminium as Al	mg/l	0.03	BDL	BDL	**BDL**
31	Turbidity, NTU	mg/l	5	1.48	<1	**1.48**

BDL- Bellow Detection Level ; ND- Not Detected; U/O- Unobjectable; CL- Colour Less.

7. Mugunaguda

Sl. No.	Parametres	Unit	IS-10500 Standards	Dec'13	March'14	**Average**
1	pH	-	6.5-8.5	7.1	6.8	**6.95**
2	Colour	Hazen	5	C.L	C.L	**C.L**
3	Taste	FTN	Agreeable	Agreeable	Agreeable	**Agreeable**
4	Odour		Unobjectable	U/O	U/O	**U/O**
5	Total Dissolved solids	mg/l	500	141	161	**151**
6	Mineral oil	mg/l	0.01	BDL	BDL	**BDL**
7	Residual chlorine as CL_2	mg/l	0.2	ND	ND	**ND**
8	Chloride as Cl	mg/l	250	8.8	10.4	**9.6**
9	Fluoride as F	mg/l	1.0	0.04	0.052	**0.046**
10	Sulfate as SO_4	mg/l	200	10.5	16.8	**13.65**
11	Nitrate as NO_3	mg/l	45	0.47	0.62	**0.545**
12	Cyanide as CN	mg/l	0.05	BDL	BDL	**BDL**
13	Phenols as C_6H_5OH	mg/l	0.001	BDL	BDL	**BDL**
14	Chromium as Cr^{+6}	mg/l	0.05	BDL	BDL	**BDL**
15	Iron as Fe	mg/l	0.3	0.074	0.14	**0.107**
16	Copper as Cu	mg/l	0.05	BDL	BDL	**BDL**
17	Selenium as Se	mg/l	0.01	BDL	BDL	**BDL**
18	Arsenic as As	mg/l	0.05	BDL	BDL	**BDL**
19	Cadmium as Cd	mg/l	0.01	BDL	BDL	**BDL**
20	Boron as B	mg/l	1	BDL	BDL	**BDL**
21	Mercuri as Hg	mg/l	0.001	BDL	BDL	**BDL**
22	Lead as Pb	mg/l	0.05	BDL	BDL	**BDL**
23	Zinc as Zn	mg/l	5	0.1	0.19	**0.15**
24	Total Hardness as $CaCO_3$	mg/l	300	39.0	59.0	**49.00**
25	Calcium as Ca	mg/l	75	7.7	10.2	**8.95**
26	Magnesium as Mg	mg/l	30	4.9	7.1	**6.00**
27	Manganese as Ma	mg/l	0.10	0.016	0.011	**0.014**
28	Anionic Detergents as MBAS	mg/l	0.2	ND	ND	**ND**
29	Alkalinity	mg/l	200	21	38	**29.50**
30	Aluminium as Al	mg/l	0.03	BDL	BDL	**BDL**
31	Turbidity, NTU	mg/l	5	1.15	1.37	**1.26**

BDL- Bellow Detection Level ; ND- Not Detected; U/O- Unobjectable; CL- Colour Less.

Annexure II

SURFACE WATER QUALITY REPORT

Name of the Mine **Maliparbat Bauxite Mines**
Hindalco Industries Limited
Dist: Koraput, Orissa.

1. Kakadamba Nala

Sl. No.	Parametres	Unit	IS-2296 Standards (Class-C)	Dec'13	March'14	**Average**
1	pH	-	6.5-8.5	7.3	7.2	**7.25**
2	Color	Hazen	300	18	CL	**18**
3	Total Dissolved solids	mg/l	500	165	137	**151**
4	Oil & Grease	mg/l	0.1	ND	ND	**ND**
5	Dissolved Oxygen	mg/l	4	7.4	7.2	**7.3**
6	BOD,3days at 27^0C	mg/l	3	1.29	1.12	**1.205**
7	Chloride as Cl	mg/l	600	8.9	9.4	**9.15**
8	Fluoride as F	mg/l	1.5	0.14	0.049	**0.095**
9	Sulfate as $SO4^{2-}$	mg/l	400	18.4	14.7	**16.6**
10	Nitrate as NO3	mg/l	50	0.6	0.38	**0.49**
11	Cyanide as CN	mg/l	0.05	BDL	BDL	**BDL**
13	Phenols as C_6H_5OH	mg/l	0.005	BDL	BDL	**BDL**
14	Chromium as Cr^{+6}	mg/l	0.05	BDL	BDL	**BDL**
15	Iron as Fe	mg/l	50	0.42	0.21	**0.315**
16	Copper as Cu	mg/l	1.5	BDL	BDL	**BDL**
17	Arsenic as As	mg/l	0.2	BDL	BDL	**BDL**
18	Cadmium as Cd	mg/l	0.01	BDL	BDL	**BDL**
19	Lead as Pb	mg/l	0.1	BDL	BDL	**BDL**
20	Zinc as Zn	mg/l	15	0.22	0.14	**0.18**
22	Total Coliform	MPN/100 ml	5000	640	490	**565**
23	Anionic detergents	mg/l	1	ND	ND	**ND**
24	Selenium as Se	mg/l	0.05	BDL	BDL	**BDL**

BDL: Bellow Detection Level

ND : Not Detected

2. Pakjhola-Aligaon Main Stream

Sl. No.	Parametres	Unit	IS-2296 Standards (Class-C)	Dec'13	March'14	**Average**
1	pH	-	6.5-8.5	7.2	7.1	**7.15**
2	Color	Hazen	300	21	CL	**21**
3	Total Dissolved solids	mg/l	500	153	149	**151**
4	Oil & Grease	mg/l	0.1	ND	ND	**ND**
5	Dissolved Oxygen	mg/l	4	7.2	7.1	**7.15**
6	BOD,3days at 27^0C	mg/l	3	1.21	1.21	**1.21**
7	Chloride as Cl	mg/l	600	8.3	10.2	**9.25**
8	Fluoride as F	mg/l	1.5	0.11	0.065	**0.0875**
9	Sulfate as $SO4^{2-}$	mg/l	400	16.5	16.2	**16.35**
10	Nitrate as NO3	mg/l	50	0.48	0.5	**0.49**
11	Cyanide as CN	mg/l	0.05	BDL	BDL	**BDL**
13	Phenols as C_6H_5OH	mg/l	0.005	BDL	BDL	**BDL**
14	Chromium as Cr^{+6}	mg/l	0.05	BDL	BDL	**BDL**
15	Iron as Fe	mg/l	50	0.36	0.28	**0.32**
16	Copper as Cu	mg/l	1.5	BDL	BDL	**BDL**
17	Arsenic as As	mg/l	0.2	BDL	BDL	**BDL**
18	Cadmium as Cd	mg/l	0.01	BDL	BDL	**BDL**
19	Lead as Pb	mg/l	0.1	BDL	BDL	**BDL**
20	Zinc as Zn	mg/l	15	0.14	0.19	**0.17**
22	Total Coliform	MPN/100 ml	5000	670	580	**625**
23	Anionic detergents	mg/l	1	ND	ND	**ND**
24	Selenium as Se	mg/l	0.05	BDL	BDL	**BDL**

BDL: Bellow Detection Level **ND :** Not Detected

3. Mugnaguda

Sl. No.	Parametres	Unit	IS-2296 Standards (Class-C)	Dec'13	March'14	**Average**
1	pH	-	6.5-8.5	7.2	6.9	**7.05**
2	Color	Hazen	300	22	CL	**22**
3	Total Dissolved solids	mg/l	500	129	161	**145**
4	Oil & Grease	mg/l	0.1	ND	ND	**ND**
5	Dissolved Oxygen	mg/l	4	7.3	7.0	**7.15**
6	BOD,3days at 27^0C	mg/l	3	1.16	1.28	**1.22**
7	Chloride as Cl	mg/l	600	7.1	10.7	**8.9**
8	Fluoride as F	mg/l	1.5	0.07	0.087	**0.0785**
9	Sulfate as $SO4^{2-}$	mg/l	400	11.9	18.6	**15.25**
10	Nitrate as NO3	mg/l	50	0.26	0.56	**0.41**
11	Cyanide as CN	mg/l	0.05	BDL	BDL	**BDL**
13	Phenols as C_6H_5OH	mg/l	0.005	BDL	BDL	**BDL**
14	Chromium as Cr^{+6}	mg/l	0.05	BDL	BDL	**BDL**
15	Iron as Fe	mg/l	50	0.21	0.33	**0.27**

16	Copper as Cu	mg/l	1.5	BDL	BDL	**BDL**
17	Arsenic as As	mg/l	0.2	BDL	BDL	**BDL**
18	Cadmium as Cd	mg/l	0.01	BDL	BDL	**BDL**
19	Lead as Pb	mg/l	0.1	BDL	BDL	**BDL**
20	Zinc as Zn	mg/l	15	0.16	0.23	**0.20**
22	Total Coliform	MPN/100 ml	5000	590	620	**605**
23	Anionic detergents	mg/l	1	ND	ND	**ND**
24	Selenium as Se	mg/l	0.05	BDL	BDL	**BDL**

BDL: Bellow Detection Level **ND :** Not Detected

4. Mohanpada

Sl. No.	Parametres	Unit	IS-2296 Standards (Class-C)	Dec'13	March'14	**Average**
1	pH	-	6.5-8.5	7.1	7.2	**7.15**
2	Color	Hazen	300	17	CL	**17**
3	Total Dissolved solids	mg/l	500	144	144	**144**
4	Oil & Grease	mg/l	0.1	ND	ND	**ND**
5	Dissolved Oxygen	mg/l	4	7.2	7.1	**7.15**
6	BOD,3days at 27^0C	mg/l	3	1.21	1.17	**1.19**
7	Chloride as Cl	mg/l	600	8	9.7	**8.85**
8	Fluoride as F	mg/l	1.5	0.11	0.058	**0.084**
9	Sulfate as $SO4^{2-}$	mg/l	400	14.5	15.4	**14.95**
10	Nitrate as NO3	mg/l	50	0.4	0.44	**0.42**
11	Cyanide as CN	mg/l	0.05	BDL	BDL	**BDL**
13	Phenols as C_6H_5OH	mg/l	0.005	BDL	BDL	**BDL**
14	Chromium as Cr^{+6}	mg/l	0.05	BDL	BDL	**BDL**
15	Iron as Fe	mg/l	50	0.29	0.25	**0.27**
16	Copper as Cu	mg/l	1.5	BDL	BDL	**BDL**
17	Arsenic as As	mg/l	0.2	BDL	BDL	**BDL**
18	Cadmium as Cd	mg/l	0.01	BDL	BDL	**BDL**
19	Lead as Pb	mg/l	0.1	BDL	BDL	**BDL**
20	Zinc as Zn	mg/l	15	0.12	0.16	**0.14**
22	Total Coliform	MPN/100 ml	5000	660	540	**600**
23	Anionic detergents	mg/l	1	ND	ND	**ND**
24	Selenium as Se	mg/l	0.05	BDL	BDL	**BDL**

BDL: Bellow Detection Level **ND :** Not Detected

5. Kakariguda Nala

Sl. No.	Parametres	Unit	IS-2296 Standards (Class-C)	Dec'13	March'14	**Average**
1	pH	-	6.5-8.5	7.2	7.3	**7.25**
2	Color	Hazen	300	15	CL	**15**
3	Total Dissolved solids	mg/l	500	126	132	**129**
4	Oil & Grease	mg/l	0.1	ND	ND	**ND**
5	Dissolved Oxygen	mg/l	4	7.3	7.3	**7.3**
6	BOD,3days at 27^0C	mg/l	3	1.05	1.00	**1.025**
7	Chloride as Cl	mg/l	600	7.7	9.1	**8.4**
8	Fluoride as F	mg/l	1.5	0.1	0.042	**0.071**
9	Sulfate as $SO4^{2-}$	mg/l	400	12.8	13.9	**13.35**
10	Nitrate as NO3	mg/l	50	0.29	0.31	**0.30**
11	Cyanide as CN	mg/l	0.05	BDL	BDL	**BDL**
13	Phenols as C_6H_5OH	mg/l	0.005	BDL	BDL	**BDL**
14	Chromium as Cr^{+6}	mg/l	0.05	BDL	BDL	**BDL**
15	Iron as Fe	mg/l	50	0.23	0.19	**0.21**
16	Copper as Cu	mg/l	1.5	BDL	BDL	**BDL**
17	Arsenic as As	mg/l	0.2	BDL	BDL	**BDL**
18	Cadmium as Cd	mg/l	0.01	BDL	BDL	**BDL**
19	Lead as Pb	mg/l	0.1	BDL	BDL	**BDL**
20	Zinc as Zn	mg/l	15	0.19	0.11	**0.15**
22	Total Coliform	MPN/100 ml	5000	610	470	**540**
23	Anionic detergents	mg/l	1	ND	ND	**ND**
24	Selenium as Se	mg/l	0.05	BDL	BDL	**BDL**

BDL: Bellow Detection Level **ND :** Not Detected

AMBIENT AIR QUALITY MONITORING Six Months Averages
October 2013- March 2014

Annexure III

1. ML Area

Monthly Average	PM-10 ($\mu g/m^3$)	PM-2.5 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)	CO (mg/m^3)
Oct-13	43.78	25.36	4.20	11.10	0.14
Nov-13	55.56	31.90	4.86	11.89	0.21
Dec-13	57.78	32.97	4.68	11.38	0.16
Jan-14	62.67	35.71	4.87	11.83	0.23
Feb-14	50.75	29.20	4.08	10.86	0.15
Mar-14	58.78	33.10	4.32	11.46	0.19
AVERAGE	**54.88**	**31.37**	**4.50**	**11.42**	**0.18**

2.Doliamba

Monthly Average	PM-10 ($\mu g/m^3$)	PM-2.5 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)	CO (mg/m^3)
Oct-13	39.22	23.12	4.07	10.66	0.13
Nov-13	50.89	29.47	4.58	11.47	0.18
Dec-13	52.89	30.33	4.37	10.96	0.14
Jan-14	56.56	30.56	4.49	11.27	0.20
Feb-14	46.63	27.38	4.04	10.43	0.13
Mar-14	54.89	31.27	4.14	11.08	0.15
AVERAGE	**50.18**	**28.69**	**4.28**	**10.97**	**0.16**

3. Railway Siding

Monthly Average	PM-10 ($\mu g/m^3$)	PM-2.5 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)	CO (mg/m^3)
Oct-13	47.56	27.41	4.42	11.48	0.16
Nov-13	61.11	34.66	5.23	12.32	0.24
Dec-13	63.67	35.20	5.00	11.84	0.20
Jan-14	67.33	38.06	5.27	12.34	0.27
Feb-14	57.00	32.60	4.19	11.25	0.18
Mar-14	62.67	35.71	4.87	11.83	0.23
AVERAGE	**59.89**	**33.94**	**4.83**	**11.85**	**0.21**

4 Kakadamba

Monthly Average	PM-10 ($\mu g/m^3$)	PM-2.5 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)	CO (mg/m^3)
Oct-13	30.22	18.40	4.02	9.59	0.10
Nov-13	37.33	22.19	4.02	10.29	0.13
Dec-13	43.00	25.40	4.00	9.98	0.11
Jan-14	46.78	27.43	4.11	10.23	0.11
Feb-14	36.63	21.86	4.00	9.45	0.11
Mar-14	44.11	25.83	4.00	9.93	0.11
AVERAGE	**39.68**	**23.52**	**4.03**	**9.91**	**0.11**

5 Kakariguda

Monthly Average	PM-10 ($\mu g/m^3$)	PM-2.5 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)	CO (mg/m^3)
Oct-13	32.89	19.66	4.02	9.91	0.11
Nov-13	41.78	24.23	4.11	10.69	0.14
Dec-13	47.00	27.22	4.03	10.37	0.12
Jan-14	50.22	28.60	4.20	10.58	0.12
Feb-14	39.63	23.38	4.00	9.76	0.11
Mar-14	48.11	28.96	4.00	10.30	0.12
AVERAGE	**43.27**	**25.34**	**4.06**	**10.27**	**0.12**

6 Aligaon

Monthly Average	PM-10 ($\mu g/m^3$)	PM-2.5 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)	CO (mg/m^3)
Oct-13	25.78	15.62	4.02	9.20	0.10
Nov-13	29.33	17.81	4.00	9.58	0.11
Dec-13	36.00	21.29	4.00	9.30	0.10
Jan-14	39.44	24.44	4.00	9.49	0.10
Feb-14	29.88	17.68	4.00	9.13	0.10
Mar-14	36.56	21.56	4.00	9.26	0.10
AVERAGE	**32.83**	**19.73**	**4.00**	**9.32**	**0.10**

7 Bhitarikota

Monthly Average	PM-10 ($\mu g/m^3$)	PM-2.5 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)	CO (mg/m^3)
Oct-13	29.11	17.66	4.02	9.38	0.10
Nov-13	33.67	19.70	4.00	9.92	0.12
Dec-13	40.11	23.63	4.00	9.61	0.10
Jan-14	43.22	25.21	4.02	9.86	0.10
Feb-14	33.50	20.09	4.00	9.25	0.10
Mar-14	40.44	23.66	4.00	9.50	0.10
AVERAGE	**36.68**	**21.66**	**4.01**	**9.59**	**0.11**

8 Mohanpada

Monthly Average	PM-10 ($\mu g/m^3$)	PM-2.5 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)	CO (mg/m^3)
Oct-13	36.00	21.79	4.02	10.29	0.12
Nov-13	46.33	26.80	4.33	11.09	0.16
Dec-13	49.78	28.97	4.14	10.67	0.13
Jan-14	53.89	30.69	4.38	10.94	0.14
Feb-14	42.63	24.94	4.00	10.06	0.12
Mar-14	51.56	30.07	4.06	10.72	0.13
AVERAGE	**46.70**	**27.21**	**4.16**	**10.63**	**0.13**

Actual Cost Estimates for Environmental Protection and Monitoring					
					Annexure IV
Sl. No.	**Particulars**	**Unit Cost (Rs)**	**Total Units**	**Total Cost(Rs in Lakhs)**	**Existing/Proposed(E/P)**
	Env. Protection				
(i)	Air Pollution Protection				
1	Truck mounted sprinkler	8,00,000	1	8	E
(ii)	Water & waste water treatment				
1	Silting Tanks/Soak pits	50,000	2	1	Under Progress
2	Septic tanks/Soak pits	25,000	2	1	
(iii)	Noise control				
1	Noise protective equipment such as ear muffs & enclosures	3,00,000	Lumpsum	3	E
V	**Ecological Preservation**				
1	Plantation including provision top soil	Lumpsum		2	Under Progress
	Env. Monitoring				
1***	Monitoring of the Air Quality, Water Quality Includes Surface & Ground, Noise, Soil Test & Meterological Prameters	Lumpsum	Per Year	40	Under Progress
***	Activity is Outsourced to an Agency, M/s SS Environics Pvt. Ltd. who is accrediated by A Class from SPCB, BBSR and equipped with adeqaute laboratory facilities & other accessories.				