



Ref No: HIL/LHD/JP (M)/MoEF/ 955

Date: 25.11.14

To,
Joint Director(S)
MoEF ,GOI, Eastern Regional Office
A/3,Chandrashekharapur,
Bhubaneshwar- 751023 (Orissa)

Sub: Compliance Report of EC conditions for Gurdari (584.19 ha) Bauxite Mining project of M/s Hindalco Industries Limited located in Gumla, Jharkhand for the period April'14 to Sep'14.

Ref: Environmental Clearance letter no J-11015/136/2006-IA II(M) dated 7th February 2007

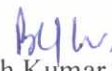
Sir,

With reference to the above, we are submitting herewith the Compliance status report of EC conditions for **Gurdari (584.19 ha) Bauxite Mining** project of M/s Hindalco located in Gumla, Jharkhand for the period **April'14 to Sep'14.**

Hope you will find the same in order.

Thanking You

Yours Sincerely
FOR HINDALCO INDUSTRIES LIMITED


(Bijesh Kumar Jha)
Joint President (Mines)

Enclosure: - As Above

Compliance of conditions laid down in Environmental Clearance

GURDARI BAUXITE MINES

Period : April'14 - Sep'14

J-11015/136/2006-IA.II (M) dated 7.2.2007

| Sl No | Conditions | Compliance Status |
|----------------------------|--|--|
| Specific Conditions | | |
| 1 | All the conditions stipulated by SPCB in their NOC shall be effectively implemented. | Implementations of the stipulated condition are fulfilled. |
| 2 | The environmental clearance is subject to approval of the state land use Department, Government of Jharkhand for diversion of agricultural land for non-agricultural use. | Mining Lease is granted / renewed by the State Govt. after due consideration & cabinet approval on recommendation of D.C and D.C is the competent authority for diversion of agricultural land for non-agricultural use. |
| 3 | The exploration shall be completed within 2.5 years and thereafter the proponent shall come up with a firm proposal for mining, based on the estimated reserves. The reclamation plan, post mine land use and progressive greenbelt development plan shall also be prepared and submitted with the revised proposal. | Mining is in progress. Required exploration is already done. Reserve and resource estimated on the basis of explored bore holes in the area. Revised reclamation plan, post mine land use, green belt development plan submitted and approved by the IBM (Scheme of Mining of Gurdari approved by IBM Nagpur vide letter no-314(3)/2011-MCCM(CZ)/MS-19 dated 19 th Jan 2012). |
| 4 | Mining shall not intersect groundwater. The mine working shall be restricted to ground water table. Prior approval of the Ministry of Environment & Forests and Central Ground Water Authority shall be obtained for mining below water table. | Presently the maximum depth of mining is 20 m bgl. As per the survey, the ground water table is at 45-60 m below ground level. Hence there will be no intersecting of the ground water table due to mining activities. |
| 5 | Top soil shall be stacked properly with proper slope with adequate measures and should be used for reclamation and rehabilitation of mined out areas. | Sequential backfilling and reclamation of the mined out area are being exercised. Topsoil is being spread on backfilled area for reclamation of the area. |
| 6 | The waste generated shall be concurrently backfilled in the mined out area. There shall be no external OB dump. Monitoring and management of rehabilitated areas should continue until the vegetation becomes self-sustaining. Compliance status should be submitted to the Ministry of Environment & Forest on six month basis. | Overburden and waste rock are being used for back filling. Data pertaining to backfilling is enclosed as Annexure |

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| 7 | <p>Catch drains and siltation ponds of appropriate size should be constructed to arrest silt and sediment flows from mine working. The water so collected should be utilized for watering the mine area, roads, green belt development etc. The drains should be regularly desilted particularly after monsoon and maintained properly.</p> <p>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 setting of silt material. Sedimentation pits should be constructed at the corners of the garland drains and desilted at regular intervals.</p> | <p>No run off is being generated from mining activities. However, to collect and manage rainwater during monsoon drains Pit sumps are made, part of mined out area is used as settling tank. Settled water is being used for sprinkling of quarry, roads, green belt development, etc.</p> |
| 8 | <p>Plantation shall be raised in an area of 78.44 ha including a green belt of adequate width by planting the native species around the ML area, roads, reclaimed area etc. in consultation with the local DFO / Agriculture Department. The density of the trees should be around 1500 plants per ha.</p> | <p>In 2014-15, Around 2500 saplings were planted on reclaimed area. Rest to be complied during project period.</p> |
| 9 | <p>The project authority should implement suitable conservation measures to augment ground water resources in the area in consultation with the Regional Director, Central Ground Water Board.</p> | <p>Suitable conservation measures to augment ground water have been taken.</p> |
| 10 | <p>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.</p> | <p>It is being monitored. Monitoring report is enclosed as Annexure.</p> |

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| 11 | Prior permission from the competent authority should be obtained for drawl of water from the surface water bodies. | Rainwater harvested during rainy season is being used for sprinkling on haul roads and raising plantation. Spring water is drawn from the down the hill pockets ponds for drinking purposes. Hence, as per the terms and conditions in Part III, Clause 6 of Mining lease deed, we have obtained permission from the Deputy Commissioner for drawl of water from the surface water bodies. Water cess is also being paid to Jharkhand State Pollution Control Board. |
| 12 | Water monitoring both for quality and quantity shall be carried out at four locations namely one spring and three streams. Six monthly report should be submitted to the Ministry of Environment and Forest and its Regional Office located at Bhubneshwar. | Analysis of water quality is being carried out. Analysis data for period of reporting is enclosed in Annexure . |
| 13 | Vehicular emissions should be kept under control and regularly monitored. Measures shall be taken for maintenance of vehicles used in mining operations and transportation of mineral. The vehicles should be covered with a tarpaulin and shall not be overloaded. | To keep vehicular emissions in control, company vehicles are periodically checked and repaired. All the transporters have been instructed to obtain PUC for their vehicles from the competent authority and submit to the concerned officer for verification. |
| 14 | Drills should either be operated with dust extractors or should be equipped with water injection system. | Wet drilling is done in the drill holes intermittently for dust suppression. |
| 15 | Blasting operation should be carried out only during the daytime. Controlled blasting should be practiced. The mitigative measures for control of ground vibration and to arrest fly rocks and boulders should be implemented. | Blasting at Mines is done at fixed blasting period i.e. 12.00 Noon to 1.00 PM on working days. Mobile mining activities are not being practiced during blasting. All the precautionary and mitigative measures to control ground vibration and to arrest fly rocks is being exercised. |
| 16 | Consent to operate should be obtained from SPCB prior to start of enhanced production from the mine. | There is no proposal for enhancement of production. |
| 17 | Sewage treatment plant should be installed for the colony. ETP should also be provided for workshop and wastewater generated from mining operations. | There is no effluent from mine; hence ETP has not been installed. The sewage water from domestic uses is being collected through individual Septic Tank and Soak Pits. |

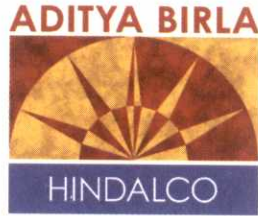
| | | |
|----|--|---|
| 18 | The project proponent should take all precautionary measures during mining operation for conservation and protection of endangered fauna such as Indian Python, <i>Presbytis phayrei</i> , <i>Melurus ursinus</i> etc. Spotted in the study area. Action plan for conservation of flora and fauna shall be prepared and implemented in consultation with the State Forest and Wildlife Department. Necessary allocation of funds for implementation of the conservation plan shall be made and the funds so allocated shall be included in the project cost. Copy of action plan may be submitted to the Ministry and its Regional Office within 3 months. | Action plan for conservation of flora and fauna spotted in the study area was prepared after due consultation with the local DFO and a copy of the same has already been submitted to the DFO for his comments, any suggestion and modification. On receipt of the same after vetting of State Forest Department, the action plan will be submitted to the MoEF |
| 19 | A Final Mine Closure plan along with details of Corpus Fund should be submitted to the Ministry of Environment & Forest 5 years in advance of final mine closure for approval. | Progressive mine Closure Plan along with mining scheme has been prepared and submitted to IBM timely for approval. |

GENERAL CONDITIONS

| Sl No | Conditions | Compliance Status |
|-------|--|--|
| 1 | No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forest | Being duly Complied. Prior approval will be sought for, if any change is proposed. |
| 2 | No change in the calendar plan including excavation, quantum of mineral bauxite and waste should be made. | Excavation of Over Burden and Bauxite is being done as per the approved calendar plan. |
| 3 | Four ambient air quality-monitoring station 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 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. | Monitoring Reports is enclosed as Annexure. |
| 4 | Data on ambient air quality (RPM, SPM, SO ₂ , NO _x) should be regularly submitted to the Ministry including its Regional office located at Bhubneshwar and the State Pollution Control Board / Central pollution Control Board once in six months. | Monitoring Reports for reporting period is enclosed in Annexure. |

| | | |
|----|--|--|
| 5 | Fugitive dust emission from all the sources should be controlled regularly. Water spraying arrangements on haul roads, loading and unloading and at transfer points should be provided and properly maintained. | Two nos. of water tanker have been provided for sprinkling of water on haul roads and active mining areas to arrest fugitive dust. Water spraying at loading, unloading, etc is also being done properly. |
| 6 | Measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in operation of HEMM, etc. should be provided with ear plug / muffs. | Noise monitoring is being done regularly. Workers engaged in operation of HEMMs, etc have also been provided with PPEs such as ear plug and ear muffs. Monitoring of noise level is being conducted at various locations of the work zone area. |
| 7 | Industrial waste water (workshops 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 should be installed before discharge of workshop effluents. | There is no effluent discharge from Mine. Workshop has an Oil Catchment Pit to trap oil and grease. It is being ensured to make it operational and effective as and when required and accordingly the concern department is taking its due care. |
| 8 | Personnel working in dusty areas should wear protective respiratory devices and they should also 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. | Complied. Use of Personal Protective Equipment (PPE) by the individuals is being ensured. All the mine workers are being regularly and periodically sent to our own hospital for health checkup/ Occupational Health check up for any contraction of diseases due to exposure in dusty and noisy areas. Training on safety, health and environmental aspects of mining is being regularly imparted through VT training centre and also through various other training programmes conducted by the State Government, recognized agencies, etc. |
| 9 | 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. | Separate Environmental Management Cell (EMC) has been constituted and is functioning effectively. Copy Enclosed. |
| 10 | The project authorities should inform to the Regional Office located at Bhubneshwar regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work. | Not applicable. The mine is an old and working since 1976. |

| | | |
|----|--|--|
| 11 | 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 Bhubneshwar. | Statement of budgetary provision and actual expenses for the year 2014-15 for environmental protection measure is enclosed. It is once again reiterated that the funds so ear marked shall not be diverted for any other purposes other than it is committed at the beginning of the financial year. (Annexure). |
| 12 | The Regional Office of this Ministry located at Bhubneshwar 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. | Agreed. |
| 13 | 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 .Copy submitted to regional office. |
| 14 | State Pollution Control Board should display a copy of the clearance letter at the Regional office, District Industry Center and Collector's office / Tehsildar's Office for 30 days. | Displayed. |
| 15 | The project authorities should advertise at least in two local newspapers widely circulated, one of which locality concerned, within 7days of the issue of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and also at web site of the Ministry of Environment and Forests at http://envfor.nic.in and a copy of the same should be forwarded to the Regional Office of this Ministry located Bhubneshwar. | Complied. Copies, of the advertisement made in the local newspapers, have already been submitted to the Regional Office Vide letter no HIL/GMO(M)/ENV/140 Dated 23.04.2007. |



Date: 10.11.14

OFFICE ORDER

In connection with the earlier office order dated 30.10.2013 the re constituted team of Environment management cell to ensure compliance of various environmental Acts, regulations & rules at Mines Division, Hindalco, Lohardaga as follows:


The Environment Management Cell will consist of:

1. B. K. Mahapatra, AGM (Quality & Environment), Convenor.

Members:

2. Ajay Kumar Pandey, Manager (Bagru Mines)
3. A Anbarasu, Mines Manager (Serengdag Mines)
4. S P Jha, Mines Manager (Pakhar Mines)
5. Kiran Sankar Singh, Mines Manager (Gurdari)
6. Vidya Sagar Singh, Mines Manager (Kujam)
7. Amar Bharati, Mines Manager (Amtipani)
8. Rajesh Ambastha, Mines Manager (Chiro Kukud & Orsa)
9. Biplab Mukherjee (Asst Manager- Geology)

By order


Bijesh Kumar Jha
Joint President (Mines)

Cc to: - All Mines Manager
All Department head
Notice Board.



BREAK UP THE COST OF ENVIRONMENTAL MEASURES DURING THE YEAR 2014-15

The composite cost during the year 2014-15 for environmental protection & pollution control by Jharkhand Mines division of M/s Hindalco Industries Ltd & M/s Minerals & Minerals Ltd for implementation of the suggested measures in EC at our all the operating mines in the state of Jharkhand-namely Pakhar (115.13 Ha), Pakhar (15.58 Ha), Pakhar (109.507 Ha), Pakhar (8.09 Ha), Pakhar (35.12Ha), Serengdag (140.06 Ha), Serengdag (155.81 Ha), Jalim & Sanai (12.14 Ha), Gurdari (584.19 Ha), Amtipani (190.95 Ha), Kujam I (80.97 Ha) Kujam II (157.38 Ha) and Bagru (75.41 Ha), Hisri New (14.55 Ha), Chiro kukud, Orsa pat(196.36 Ha), Bhusar (65.31 Ha)& Bimarla Bauxite Mines (134.52 Ha).

| Sl No | Description | Budget (in Lakh Rupees) FY 2014-15 | Actual (in Lakh Rupees) FY 2014-2015 (from April'14 to Sep'14) |
|-------|--|---------------------------------------|--|
| 1 | Pollution Control & Environment monitoring | 5.50 | 6.00 |
| 2 | Reclamation/ Back filing & Rehabilitation | 42.50 | 36.00 |
| 3 | Green belt & Plantation | 60.03 | 54.46 |
| 4 | Rural Development | 85.29 | 111.37 |

**Part of OB removed cost.

Convener
Environment Management Cell
Hindalco Industries Limited

PRODUCTION, MINED OUT, BACKFILLED, PRODUCTION AND OVERBURDEN REMOVAL FROM APR-14 TO SEP-14

| Sl | Name of Mines | Mining lease area (Ha) | Mined Out area (in Acres) | Backfilled area (in Acres) | Production (in MT) | Overburden Removal (in Cub.M.) |
|--|-------------------------|------------------------|---------------------------|----------------------------|--------------------|--------------------------------|
| 1 | Shrengdag Bauxite Mines | 155.81 | 7.80 | 4.80 | 105050 | 205180 |
| 2 | Gurdari Bauxite Mines | 584.19 | 22.10 | 11.80 | 168585 | 4024704 |
| 3 | Jalim & Sanai | 12.14 | 0.70 | 0.30 | 5311 | 12450 |
| 4 | Serangdag | 140.07 | 2.00 | 0.50 | 31650 | 30600 |
| 5 | Pakhar Buxite Mines | 115.13 | 3.69 | 1.50 | 137290 | 206568 |
| 6 | Pakhar Buxite Mines | 8.09 | 0.00 | 0.00 | 0.00 | 0.00 |
| 7 | Pakhar Buxite Mines | 38.95 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8 | Kujam-I | 80.87 | 4.15 | 3.46 | 37960 | 51491 |
| 9 | Kujam-II | 157.38 | 13.84 | 12.75 | 104325 | 121798 |
| 10 | Amtipani | 190.95 | 4.03 | 3.26 | 93330 | 52493 |
| 11 | Chiro-Kukud | 152.57 | 3.95 | 6.42 | 17584 | 18797 |
| 12 | Orsa Bauxite Mines | 196.36 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | Hisri New | 14.55 | 1.29 | 0.65 | 54529 | 9471 |
| 14 | Bagru | 75.41 | 0.00 | 0.00 | 0.00 | 0.00 |
| 15 | Bhusar | 65.31 | 0.94 | 1.50 | 82032 | 82626 |
| Minerals & Minerals Limited | | | | | | |
| 16 | Pakhar Buxite Mines | 109.507 | 4.21 | 3.51 | 183605 | 162580 |
| 17 | Pakhar Buxite Mines | 15.58 | 0.30 | 0.20 | 31175 | 98966 |
| 18 | Bimarla Bauxite Mines | 134.526 | 0.00 | 0.00 | 0.00 | 0.00 |

Monitored water level

Fig in meter

| Location (Mines) | Elevation (Mtr) | Well type | Monsoon 2014 | | Post Monsoon 2014 | |
|------------------|-----------------|-----------|--------------|------------|-------------------|------------|
| | | | Inside ML | Outside ML | Inside ML | Outside ML |
| Bagru | 905 | Open Well | | 21.72 | | 24.15 |
| | 910 | Open Well | | 24.30 | | 24.55 |
| | 915 | Open Well | | 29.40 | | 28.44 |
| | 903 | Open Well | | 22.85 | | 33.12 |
| | 909 | Open Well | | 17.55 | | 28.75 |
| | 1000 | Open Well | | 24.90 | | 22.66 |
| Pakhar | 1083 | Hand Pump | 35.35 | | 31.65 | |
| | 1027 | Open Well | | 25.85 | | 28.35 |
| Sherengdag | 1094 | Hand Pump | 41.75 | | 39.54 | |
| | 1081 | Hand Pump | 39.65 | | 31.30 | |
| | 1055 | Hand Pump | 33.05 | | 27.55 | |
| | 1066 | Hand Pump | 27.75 | | 26.25 | |
| | 1045 | Hand Pump | 29.30 | | 27.84 | |
| Gurdari | 1061 | Hand Pump | 28.35 | | 24.90 | |
| | 1059 | Hand Pump | 38.15 | | 36.63 | |
| | 1075 | Hand Pump | 28.22 | | 26.88 | |
| | 1075 | Hand Pump | 28.36 | | 29.30 | |
| Kujam | 1040 | Open Well | | 33.95 | | 21.85 |
| | 1041 | Open Well | | 33.65 | | 24.82 |
| | 1064 | Hand Pump | 31.58 | | 28.65 | |
| | 1052 | Hand Pump | | | | 21.12 |
| Chiro Kukud | 1148 | Hand Pump | 33.45 | | 28.40 | |
| | 1151 | Hand Pump | 37.60 | | 31.80 | |
| | 1084 | Hand Pump | 34.35 | | 36.86 | |

B




Eco Ventures Pvt. Ltd.

Regd. Office: 2/37, Sarvapriya Vihar, Near IIT Gate, New Delhi-110016
Corporate Office: 7/8 Bhaveshwar Bhuvan, Opp Portugese Church, Near Dindayal Upadhyay Garden,
Gokhale Road (North), Dadar (West), Mumbai 400 028. Tel: +91 22 24370520 / 6672.
E: ecoventures.mumbai@gmail.com / ecoventures@eco-ventures.in


Mahabal Enviro Engineers Pvt. Ltd.
At Booty, Near PHED Colony, Behind Pump House, PO – RMCC,
District – Ranchi 834009

NETARHAT PLATEAU- ENVIRONMENTAL MONITORING REPORT

SEPTEMBER 2014


Vijay Pandey
SENIOR EXECUTIVE

For Mahabal Enviro Eng. Pvt. Ltd.


Authorised Signatory





Mahabal Enviro Engineers Pvt. Ltd.

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Hindalco Industries: Environmental Monitoring report

September 2014

| | |
|--|-------------------------------------|
| Report no: SEPT002/2014-15 | Date: 1 st October, 2014 |
| Sample described by customer: AMBIENT AIR QUALITY MONITORING | |
| Client Name: Hindalco Industries Limited | |
| Client Address: Lohardaga | |
| Postal Code: 835203 | |
| State: Jharkhand | |
| Country: India | |
| Sample type: AMBIENT AIR QUALITY MONITORING | |
| Received: 25.09.2014 | |
| Registered: 25.09.2014 | |
| Marks on Sample: Location: Netarhat Plateau- Gurdari Pit Hara Langra Quari | |
| Sample collected on: 25.09.2014 | |
| Test Start/End Date: 25.09.2014/27.09.2014 | |

LOCATION / IDENTIFICATION: Netarhat Plateau- Gurdari Pit Hara Langra Quari

| PARAMETERS | UNIT | LIMIT | METHOD | 27/09/2014 |
|--|-------------------------------------|-------|---------------------------------------|------------|
| Sulphur Dioxide | SO ₂ µg/m ³ | 80 | IS:5182 (Part-2):2001 (Reaff:2006) | 30.2 |
| Nitrogen Dioxide | NO ₂ µg/m ³ | 80 | IS:5182(Part-6):1975 (Reaff:2004) | 45.2 |
| Particulate Matter (size less than 10 µm) | PM ₁₀ µg/m ³ | 100 | IS:5182 (Part 23) | 90.1 |
| Particulate Matter (size less than 2.5 µm) | PM _{2.5} µg/m ³ | 60 | USEPA CFR(40) Appendix-L | 42.5 |
| Carbon Monoxide | CO mg/m ³ | 2 | EPA 600/P-99/001F | 0.35 |

Vijay Pandey
SENIOR EXECUTIVE

For Mahabal Enviro Eng. Pvt. Ltd.

Authorised Signatory



Head Office: Plot No. F-7, Road No. 21, Wagle Estate, Thane West - 400604, Maharashtra, India
(600 m from Hotel Rukhmini Palace Turn Opp Toyota Show Room. Near J B Sawant Bus Stop)
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Mahabal Enviro Engineers Pvt. Ltd.

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Hindalco Industries:Environmental Monitoring report

September 2014

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| Report no: SEPT002/2014-15 | Date: 1 st October,2014 |
| Sample described by customer: AMBIENT AIR QUALITY MONITORING | |
| Client Name: Hindalco Industries Limited | |
| Client Address: Lohardaga | |
| Postal Code: 835203 | |
| State: Jharkhand | |
| Country: India | |
| Sample type: AMBIENT AIR QUALITY MONITORING | |
| Received:25.09.2014 | |
| Registered: 25.09.2014 | |
| Marks on Sample: Location: Netarhat Plateau- Amtipani Workshop | |
| Sample collected on: 25.09.2014 | |
| Test Start/End Date: 25.09.2014/27.09.2014 | |

LOCATION / IDENTIFICATION: Netarhat Plateau- Amtipani Workshop

| PARAMETERS | UNIT | LIMIT | METHOD | 27/09/2014 |
|--|-------------------------------------|-------|---------------------------------------|------------|
| Sulphur Dioxide | SO ₂ µg/m ³ | 80 | IS:5182 (Part-2):2001 (Reaff:2006) | 65.2 |
| Nitrogen Dioxide | NO ₂ µg/m ³ | 80 | IS:5182(Part-6):1975 (Reaff:2004) | 60.1 |
| Particulate Matter (size less than 10 µm) | PM ₁₀ µg/m ³ | 100 | IS:5182 (Part 23) | 83.2 |
| Particulate Matter (size less than 2.5 µm) | PM _{2.5} µg/m ³ | 60 | USEPA CFR(40) Appendix-L | 49.1 |
| Carbon Monoxide | CO mg/m ³ | 2 | EPA 600/P-99/001F | 0.43 |

Vijay Pandey
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For Mahabal Enviro Eng. Pvt. Ltd

Authorised Signatory



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Hindalco Industries:Environmental Monitoring report

September 2014

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|---|------------------------------------|
| Report no: SEPT002/2014-15 | Date: 1 st October,2014 |
| Sample described by customer: AMBIENT AIR QUALITY MONITORING | |
| Client Name: Hindalco Industries Limited | |
| Client Address: Lohardaga | |
| Postal Code: 835203 | |
| State: Jharkhand | |
| Country: India | |
| Sample type: AMBIENT AIR QUALITY MONITORING | |
| Received: 25.09.2014 | |
| Registered: 25.09.2014 | |
| Marks on Sample: Location: Netarhat Plateau- Kujam II Weight Bridge | |
| Sample collected on: 25.09.2014 | |
| Test Start/End Date: 25.09.2014/27.09.2014 | |

| LOCATION / IDENTIFICATION: Netarhat Plateau- Kujam II Weight Bridge | | | | | |
|---|-------------------------------------|-------|---------------------------------------|------------|--|
| PARAMETERS | UNIT | LIMIT | METHOD | 27/09/2014 | |
| Sulphur Dioxide | SO ₂ μg/m ³ | 80 | IS:5182 (Part-2):2001 (Reaff:2006) | 22.5 | |
| Nitrogen Dioxide | NO ₂ μg/m ³ | 80 | IS:5182(Part-6):1975 (Reaff:2004) | 30.5 | |
| Particulate Matter (size less than 10 μm) | PM ₁₀ μg/m ³ | 100 | IS:5182 (Part 23) | 78.5 | |
| Particulate Matter (size less than 2.5 μm) | PM _{2.5} μg/m ³ | 60 | USEPA CFR(40) Appendix-L | 29.8 | |
| Carbon Monoxide | CO mg/m ³ | 2 | EPA 600/P-99/001F | 0.6 | |

Vijay Pandey
SENIOR EXECUTIVE

For Mahabal Enviro Eng. Pvt. Ltd.

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Mahabal Enviro Engineers Pvt. Ltd.

Branch Office:

At Booty, Near PHED Colony, Behind Pump House, PO – RMCC, District – Ranchi 834009,
Mobile No: +91 9431.102.102 / +91 9955.358.262,
E-mail:mahabalranchi@gmail.com

Hindalco Industries:Environmental Monitoring report

September 2014

| | |
|--|------------------------------------|
| Report no: SEPT002/2014-15 | Date: 1 st October,2014 |
| Sample described by customer: AMBIENT AIR QUALITY MONITORING | |
| Client Name: Hindalco Industries Limited | |
| Client Address: Lohardaga | |
| Postal Code: 835203 | |
| State: Jharkhand | |
| Country: India | |
| Sample type: AMBIENT AIR QUALITY MONITORING | |
| Received: 25.09.2014 | |
| Registered: 25.09.2014 | |
| Marks on Sample: Location: Netarhat Plateau- Kujam I | |
| Sample collected on: 25.09.2014 | |
| Test Start/End Date: 25.09.2014/27.09.2014 | |

LOCATION / IDENTIFICATION: Netarhat Plateau- Kujam I

| PARAMETERS | UNIT | LIMIT | METHOD | 27/09/2014 |
|--|-------------------------------------|-------|------------------------------------|------------|
| Sulphur Dioxide | SO ₂ µg/m ³ | 80 | IS:5182 (Part-2):2001 (Reaff:2006) | 25.2 |
| Nitrogen Dioxide | NO ₂ µg/m ³ | 80 | IS:5182(Part-6):1975 (Reaff:2004) | 36.4 |
| Particulate Matter (size less than 10 µm) | PM ₁₀ µg/m ³ | 100 | IS:5182 (Part 23) | 85.2 |
| Particulate Matter (size less than 2.5 µm) | PM _{2.5} µg/m ³ | 60 | USEPA CFR(40) Appendix-L | 45.8 |
| Carbon Monoxide | CO mg/m ³ | 2 | EPA 600/P-99/001F | 0.50 |

Vijay Pandey
SENIOR EXECUTIVE

For Mahabal Enviro Eng. Pvt. Ltd.

Authorised Signatory



Head Office: Plot No. F-7, Road No. 21, Wagle Estate, Thane West - 400604, Maharashtra, India
(600 m from Hotel Rukhmini Palace Turn Opp Toyota Show Room. Near J B Sawant Bus Stop)
Phone: 2582 0658/ 3139/ 1663/ 3154 Fax: 91-22-25823543 thane@mahabal.com



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Hindalco Industries:Environmental Monitoring report

September 2014

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|--|------------------------------------|
| Report no: SEPT002/2014-15 | Date: 1 st October,2014 |
| Sample Description: Measurement of Noise | |
| Client Name: Hindalco Industries Limited | |
| Client Address: Lohardaga | |
| Postal Code: 835203 | |
| State: Jharkhand | |
| Country: India | |
| Sample Description: Measurement of Noise Level. | |
| Sampling Method: Instrumental, Using Sound level Meter | |
| Sampling Done by: Mahabal Enviro. | |
| Test Start: 22.09.2014 | |
| End Date: 23.09.2014 | |

| Location / Identification | Unit | Limit (day) | Result | Limit (night) | Result | Dates |
|-----------------------------------|----------------|-------------|---|---------------|---|------------|
| Month | | | Average of 24 continuous hours in Sep- 14 | | Average of 24 continuous hours in Sep- 14 | |
| Netarhat Plateau Near Gurdari Pit | dB(A) L_{eq} | 75 | 61.0 | 70 | 63.9 | 23/09/2014 |

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Hindalco Industries:Environmental Monitoring report

September 2014

| Report no: SEPT002/2014-15 | | | | Date: 1 st October,2014 | |
|--|--------------------------|--------------------------------|------------------------------------|------------------------------------|--------------------|
| Sample described by customer: SOIL | | | | | |
| Client Name: Hindalco Industries Limited | | | | | |
| Client Address: Lohardaga | | | | | |
| Postal Code: 835203 | | | | | |
| State: Jharkhand | | | | | |
| Country: India | | | | | |
| Sample type: SOIL | | | | | |
| Received:23.09.2014 | | | | | |
| Registered: 23.09.2014 | | | | | |
| Marks on Sample: Location: Netarhat Plateau Near Gurdari Pit | | | | | |
| Sample collected on: 17.09.2014 | | | | | |
| Quantity: 2 kgs | | | | | |
| Test Start/End Date: 23.09.2014/24.09.2014 | | | | | |
| Sample collected by: Mahabal Enviro Engineers Pvt Limited | | | | | |
| S.No | Analysis | | Method | Result | Unit |
| 1. | Colour | -- | -- | Gray | - |
| 2. | Texture | -- | F.A.U.N (2007) | Loamy Sand | - |
| 3. | Bulk Density | -- | By Bulk density Apparatus | 1.9 | gm/cm ³ |
| 4. | Water Holding Capacity | -- | F.A.U.N (2007) | 24.1 | % |
| 5. | pH | -- | F.A.U.N (2007) | 7.2 | - |
| 6. | Electrical Conductivity | -- | F.A.U.N (2007) | 212 | µs/cm |
| 7. | Organic Carbon | -- | | 0.60 | % |
| 8. | Organic Matter | -- | Black & White Wet Digestion Method | 0.90 | % |
| 9. | Available Nitrogen | -- | Soil & Water Book by P.K Gupta | 113.0 | mg/kg |
| 10. | Available Phosphorus | -- | Soil & Water Book by P.K Gupta | 14.2 | mg/kg |
| 11. | Available Potassium | -- | Soil & Water Book by P.K Gupta | 375 | mg/kg |
| 12. | Exchangeable Calcium | Ca | Soil & Water Book by P.K Gupta | 24.5 | meq/100gm |
| 13. | Exchangeable Magnesium | Mg | Soil & Water Book by P.K Gupta | 1.21 | meq/100gm |
| 14. | Exchangeable Sodium | Na | Soil & Water Book by P.K Gupta | 2.26 | meq/100gm |
| 15. | Exchangeable Potassium | K | Soil & Water Book by P.K Gupta | 1.50 | meq/100gm |
| 16. | Total Exchangeable Bases | | Soil & Water Book by P.K Gupta | 30.4 | meq/100gm |
| 17. | Manganese | Mn | USEPA 3052 | 0.55 | mg/kg |
| 18. | Arsenic | As | USEPA 3052 | 2.00 | mg/kg |
| 19. | Silica | SiO ₂ | USEPA 3052 | 52.5 | % |
| 20. | Aluminum | Al ₂ O ₃ | USEPA 3052 | 7.2 | % |
| 21. | Iron | Fe ₂ O ₃ | USEPA 3052 | 5.0 | % |
| 22. | Calcium | CaO | USEPA 3052 | 8.4 | % |
| 23. | Magnesium | MgO | USEPA 3052 | 1.95 | % |
| 24. | Sodium | Na ₂ O | USEPA 3052 | 0.30 | % |
| 25. | Potassium | K ₂ O | USEPA 3052 | 0.28 | % |
| 26. | Sulphate | SO ₄ | USEPA 3052 | 0.79 | % |

For Mahabal Enviro Eng. Pvt. Ltd

Vijay Pandey
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Hindalco Industries:Environmental Monitoring report

September 2014

| | |
|--|------------------------------------|
| Report no: SEPT002/2014-15 | Date: 1 st October,2014 |
| Sample described by customer: DRINKING WATER | |
| Client Name: Hindalco Industries Limited | |
| Client Address: Lohardaga | |
| Postal Code: 835203 | |
| State: Jharkhand | |
| Country: India | |
| Sample type: DRINKING WATER | |
| Received:19.09.2014 | |
| Registered: 19.09.2014 | |
| Marks on Sample: Location: Netarhat Plateau | |
| Sample collected on: 18.09.2014 | |
| Quantity: 5 L X 2 No. PVC Can | |
| Test Start/End Date: 19.09.2014/22.09.2014 | |
| Sample collected by: Mahabal EnviroEngineers Pvt Limited | |

| S.No | Parameters | Unit | Result | Acceptable Limit (IS10500:2012) | Method Reference |
|------|--|-------|-----------|---------------------------------|--|
| 1. | Colour | Hazen | < 1 | 5 Max | APHA 22nd Ed. 2012, 2120-B, 2-6 |
| 2. | Odour | - | Agreeable | Agreeable | IS 3025 (Part 5):1983, Reaffirmed 2006 |
| 3. | Taste | - | Agreeable | Agreeable | IS 3025 (Part 7):1984, Reaffirmed 2006 |
| 4. | Turbidity | NTU | 0.7 | 1 Max | APHA 22nd Ed. 2012, 2130-B, 2-13 |
| 5. | pH | - | 6.9 | 6.5-8.5 | APHA 22nd Ed. 2012, 4500-H+B, 4-92 |
| 6. | Free Chlorides(Residual) | mg/l | <0.05 | 0.2 min | APHA 22nd Ed. 2012, 4500-Cl G, 4-69 |
| 7. | Total Dissolved Solids | mg/l | 89 | 500 Max | IS 3025 (Part 16):1984 Reaffirmed 2006 |
| 8. | Monochloramines | mg/l | <0.05 | - | APHA 22nd Ed. 2012, 4500-ClG, 4-69 |
| 9. | Dichloramines | mg/l | <0.05 | - | APHA 22nd Ed. 2012, 4500-ClG, 4-69 |
| 10. | Total Hardness (as CaCO ₃) | mg/l | 59 | 200 Max | APHA 22nd Ed. 2012, 2340-C, 2-44,45 |
| 11. | Alkalinity Total (as CaCO ₃) | mg/l | 63 | 200 Max | IS 3025 (Part 23):1986 Reaffirmed 2009 |
| 12. | Chloride (as Cl) | mg/l | 7.9 | 250 Max | APHA 22nd Ed. 2012, 4500-Cl-B, 4-72 |
| 13. | Sulphate (as SO ₄) | mg/l | 4.3 | 200 Max | APHA 22nd Ed. 2012, 4500-SO4-E, 4-190 |



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Hindalco Industries:Environmental Monitoring report

September 2014

| S.No | Parameters | Unit | Result | Acceptable Limit (IS 10500:2012) | Method Reference |
|------|--|------|--------|----------------------------------|---|
| 14. | Nitrate (as NO ₃) | mg/l | 1.14 | 45 Max | APHA 22nd Ed. 2012, 4500-NO ₃ -E, 4-125 |
| 15. | Fluoride (as F) | mg/l | 0.20 | 1 Max | APHA 22nd Ed. 2012, 4500-FB& D, 4-84, 4-87 |
| 16. | Boron (as B) | mg/l | 0.19 | 0.5 Max | APHA 22nd Ed. 2012, 4500-BB, 4-25 |
| 17. | Calcium(as Ca) | mg/l | 18.0 | 75 Max | APHA 22nd Ed. 2012, 3500-Ca-B, 3-67 |
| 18. | Magnesium (as Mg) | mg/l | 3.2 | 30 Max | APHA 22nd Ed. 2012, 3500- Mg- B, 3-84 |
| 19. | Ammonical Nitrogen/ Total Ammonia | mg/l | <0.1 | - | APHA 22nd Ed. 2012, 4500 NH ₃ -F, 4-115 |
| 20. | Iron (as Fe) | mg/l | 0.18 | 0.3 Max | APHA 22nd Ed. 2012, 3111-B,3-18 |
| 21. | Manganese (as Mn) | mg/l | N.D | 0.1 Max | APHA 22nd Ed. 2012, 3111-B, 318 |
| 22. | Aluminium (as Al) | mg/l | 0.09 | 0.03 Max | APHA 22nd Ed. 2012, 3500- Al-B, 3-61 |
| 23. | Cadmium (as Cd) | mg/l | N.D | 0.003 Max. | APHA 22nd Ed. 2012, 3111-B,3-18 |
| 24. | Chromium Total (as Cr) | mg/l | N.D | 0.05 Max. | APHA 22nd Ed. 2012, 3111-B,3-18 |
| 25. | Copper (as Cu) | mg/l | N.D | 0.05 Max. | APHA 22nd Ed. 2012, 3111-B,3-18 |
| 26. | Lead (as Pb) | mg/l | N.D | 0.01 Max. | APHA 22nd Ed. 2012, 3111-B,3-18 |
| 27. | Zinc (as Zn) | mg/l | 0.03 | 5 Max. | APHA 22nd Ed. 2012, 3111-B,3-18 |
| 28. | Arsenic (as As) | mg/l | <0.01 | 0.01 Max. | APHA 22nd Ed. 2012, 3114-C,3-38 |
| 29. | Mercury (as Hg) | mg/l | N.D. | 0.001 Max. | APHA 22nd Ed. 2012, 3112-B,3-23 |
| 30. | Selenium (as Se) | mg/l | N.D. | 0.01 Max. | APHA 22nd Ed. 2012, 3114-C, 3-38 |
| 31. | Nickel (as Ni) | mg/l | <0.06 | 0.02 Max. | APHA 22nd Ed. 2012, 3111 B,3-18 |
| 32. | Mineral Oil | mg/l | N.D. | 0.5 Max. | IS 3025 (Part 39): 1991, Reaffirmed 2003, Ed. 2.1 |
| 33. | Cyanide (as CN) | mg/l | N.D. | 0.05 Max. | APHA 22nd Ed. 2012, 4500-CN, C & E, 4-39 & 4-44 |
| 34. | Anionic detergents as MBAS | mg/l | <0.1 | 0.2 Max. | APHA 22nd Ed. 2012, 5540-C, 5-53 |
| 35. | Phenolic compounds (as C ₆ H ₅ OH) | mg/l | N.D | 0.001 Max. | APHA 22nd Ed. 2012, 5530- B & C, 5-47 |
| 36. | Polynuclear aromatic hydrocarbons (PAH) | µg/L | N.D | 0.0001 mg/L Max. | APHA 22nd Ed. 2012, 6440, 6-93 |
| 37. | Polychlorinated Biphenyls (PCBs) | µg/L | N.D | 0.0005 mg/l Max. | USEPA Method 8082 |
| 38. | Sulphide (as S) | mg/l | N.D | - | APHA 22nd Ed. 2012, 4500- S ₂ -C 4-175 & F 4-178 |



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Hindalco Industries:Environmental Monitoring report

September 2014

| S.No | Parameters | Unit | Result | Acceptable Limit (IS 10500:2012) | Method Reference |
|---------------------------------|---------------------|------------|--------|----------------------------------|--|
| Microbiological Analysis | | | | | |
| 1. | Total Coliforms | MPN/100 mL | <1.1 | N.D | APHA 22nd Ed. 2012, 9221-B & C, 9-66, 9-69 |
| 2. | E-Coli | MPN/100 mL | Absent | N.D | APHA 22nd Ed. 2012, 9221-B, C & G, 9-66, 9-69 and 9-76 |
| Pesticides Residues | | | | | |
| 3. | p,p DDT | µg/L | N.D | 1 | US EPA 508-1995 |
| 4. | o,p DDT | µg/L | N.D | 1 | US EPA 508-1995 |
| 5. | p,p DDE | µg/L | N.D | 1 | US EPA 508-1995 |
| 6. | o,p DDE | µg/L | N.D | 1 | US EPA 508-1995 |
| 7. | p,p DDD | µg/L | N.D | 1 | US EPA 508-1995 |
| 8. | o,p DDD | µg/L | N.D | 1 | US EPA 508-1995 |
| 9. | γ-HCH (Lindane) | µg/L | <0.01 | 2 | US EPA 508-1995 |
| 10. | α-HCH | µg/L | <0.01 | 0.01 | US EPA 508-1995 |
| 11. | β-HCH | µg/L | N.D | 0.04 | US EPA 508-1995 |
| 12. | δ - HCH | µg/L | N.D | 0.04 | US EPA 508-1995 |
| 13. | Butachlor | µg/L | N.D | 125 | US EPA 508-1995 |
| 14. | Alachlor | µg/L | N.D | 20 | US EPA 508-1995 |
| 15. | Atrazine | µg/L | N.D | 2 | US EPA 532-2000 |
| 16. | α Endosulfan | µg/L | N.D | 0.4 | US EPA 508-1995 |
| 17. | β Endosulfan | µg/L | N.D | 0.4 | US EPA 508-1995 |
| 18. | Endosulfan Sulphate | µg/L | N.D | 0.4 | US EPA 508-1995 |
| 19. | Ethion | µg/L | N.D | 3 | US EPA 8141A-1994 |
| 20. | Malathion | µg/L | N.D | 190 | US EPA 8141A-1994 |
| 21. | Methyl Parathion | µg/L | N.D | 0.3 | US EPA 8141A-1994 |
| 22. | Monocrotophos | µg/L | N.D | 1 | US EPA 8141A-1994 |
| 23. | Phorate | µg/L | N.D | 2 | US EPA 8141A-1994 |
| 24. | Chlorpyrifos | µg/L | N.D | 30 | US EPA 8141A-1994 |
| 25. | Aldrin | µg/L | N.D | 0.03 | US EPA 508-1995 |
| 26. | Dieldrin | µg/L | N.D | 0.03 | US EPA 508-1995 |

Remarks: N.D- Not Detected

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September 2014

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| Report no: SEPT002/2014-15 | Date: 1 st October, 2014 |
| Sample described by customer: SURFACE WATER | |
| Client Name: Hindalco Industries Limited | |
| Client Address: Lohardaga | |
| Postal Code: 835203 | |
| State: Jharkhand | |
| Country: India | |
| Sample type: SURFACE WATER | |
| Received: 19.09.2014 | |
| Registered: 19.09.2014 | |
| Marks on Sample: Location: Amtipani Mine - Water Harvesting Pond | |
| Sample collected on: 18.09.2014 | |
| Quantity: 5 L X 2 No. PVC Can | |
| Test Start/End Date: 19.09.2014/22.09.2014 | |
| Sample collected by: Mahabal EnviroEngineers Pvt Limited | |

| S.No | Parameters | Unit | Result | Acceptable Limit (IS10500:2012) | Method Reference |
|------|--|-------|-----------|---------------------------------|--|
| 1. | Colour | Hazen | < 1 | 5 Max | APHA 22nd Ed. 2012, 2120-B, 2-6 |
| 2. | Odour | - | Agreeable | Agreeable | IS 3025 (Part 5):1983, Reaffirmed 2006 |
| 3. | Taste | - | Agreeable | Agreeable | IS 3025 (Part 7):1984, Reaffirmed 2006 |
| 4. | Turbidity | NTU | 0.3 | 1 Max | APHA 22nd Ed. 2012, 2130-B, 2-13 |
| 5. | pH | - | 6.9 | 6.5-8.5 | APHA 22nd Ed. 2012, 4500-H+ -B, 4-92 |
| 6. | Free Chlorides(Residual) | mg/l | <0.05 | 0.2 min | APHA 22nd Ed. 2012, 4500-CI G, 4-69 |
| 7. | Total Dissolved Solids | mg/l | 98 | 500 Max | IS 3025 (Part 16):1984 Reaffirmed 2006 |
| 8. | Monochloramines | mg/l | <0.05 | - | APHA 22nd Ed. 2012, 4500-CIG, 4-69 |
| 9. | Dichloramines | mg/l | <0.05 | - | APHA 22nd Ed. 2012, 4500-CIG, 4-69 |
| 10. | Total Hardness (as CaCO ₃) | mg/l | 46 | 200 Max | APHA 22nd Ed. 2012, 2340-C, 2-44,45 |
| 11. | Alkalinity Total (as CaCO ₃) | mg/l | 61.4 | 200 Max | IS 3025 (Part 23):1986 Reaffirmed 2009 |
| 12. | Chloride (as Cl) | mg/l | 7.0 | 250 Max | APHA 22nd Ed. 2012, 4500-CI-B, 4-72 |
| 13. | Sulphate (as SO ₄) | mg/l | 3.9 | 200 Max | APHA 22nd Ed. 2012, 4500-SO4-E, 4-190 |



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September 2014

| S.No | Parameters | Unit | Result | Acceptable Limit (IS 10500:2012) | Method Reference |
|------|--|-------|--------|----------------------------------|--|
| 14. | Nitrate (as NO ₃) | mg/l | 1.1 | 45 Max | APHA 22nd Ed. 2012, 4500-NO ₃ -E, 4-125 |
| 15. | Fluoride (as F) | mg/l | 0.21 | 1 Max | APHA 22nd Ed. 2012, 4500-FB& D, 4-84, 4-87 |
| 16. | Boron (as B) | mg/l | 0.19 | 0.5 Max | APHA 22nd Ed. 2012, 4500-BB, 4-25 |
| 17. | Calcium(as Ca) | mg/l | 15.3 | 75 Max | APHA 22nd Ed. 2012, 3500-Ca-B, 3-67 |
| 18. | Magnesium (as Mg) | mg/l | 3.9 | 30 Max | APHA 22nd Ed. 2012, 3500- Mg- B, 3-84 |
| 19. | Ammonical Nitrogen/ Total Ammonia | mg/l | <0.1 | - | APHA 22nd Ed. 2012, 4500 NH3-F, 4-115 |
| 20. | Iron (as Fe) | mg/l | 0.09 | 0.3 Max | APHA 22nd Ed. 2012, 3111-B,3-18 |
| 21. | Manganese (as Mn) | mg/l | N.D | 0.1 Max | APHA 22nd Ed. 2012, 3111-B, 318 |
| 22. | Aluminium (as Al) | mg/l | 0.06 | 0.03 Max | APHA 22nd Ed. 2012, 3500- Al-B, 3-61 |
| 23. | Cadmium (as Cd) | mg/l | N.D | 0.003 Max. | APHA 22nd Ed. 2012, 3111-B,3-18 |
| 24. | Chromium Total (as Cr) | mg/l | N.D | 0.05 Max. | APHA 22nd Ed. 2012, 3111-B,3-18 |
| 25. | Copper (as Cu) | mg/l | N.D | 0.05 Max. | APHA 22nd Ed. 2012, 3111-B,3-18 |
| 26. | Lead (as Pb) | mg/l | N.D | 0.01 Max. | APHA 22nd Ed. 2012, 3111-B,3-18 |
| 27. | Zinc (as Zn) | mg/l | 0.10 | 5 Max. | APHA 22nd Ed. 2012, 3111-B,3-18 |
| 28. | Arsenic (as As) | mg/l | <0.01 | 0.01 Max. | APHA 22nd Ed. 2012, 3114-C,3-38 |
| 29. | Mercury (as Hg) | mg/l | N.D. | 0.001 Max. | APHA 22nd Ed. 2012, 3112-B,3-23 |
| 30. | Selenium (as Se) | mg/l | N.D. | 0.01 Max. | APHA 22nd Ed. 2012, 3114-C, 3-38 |
| 31. | Nickel (as Ni) | mg/l | <0.06 | 0.02 Max. | APHA 22nd Ed. 2012, 3111 B,3-18 |
| 32. | Mineral Oil | mg/l | N.D. | 0.5 Max. | IS 3025 (Part 39): 1991, Reaffirmed 2003, Ed. 2.1 |
| 33. | Cyanide (as CN) | mg/l | N.D. | 0.05 Max. | APHA 22nd Ed. 2012, 4500-CN, C & E, 4-39 & 4-44 |
| 34. | Anionic detergents as MBAS | mg/l | <0.1 | 0.2 Max. | APHA 22nd Ed. 2012, 5540-C, 5-53 |
| 35. | Phenolic compounds (as C ₆ H ₅ OH) | mg/l | N.D | 0.001 Max. | APHA 22nd Ed. 2012, 5530- B & C, 5-47 |
| 36. | Polynuclear aromatic hydrocarbons (PAH) | µg/L. | N.D | 0.0001 mg/L Max. | APHA 22nd Ed. 2012, 6440, 6-93 |
| 37. | Polychlorinated Biphenyls (PCBs) | µg/L | N.D | 0.0005 mg/l Max. | USEPA Method 8082 |
| 38. | Sulphide (as S) | mg/l | N.D | - | APHA 22nd Ed. 2012, 4500- S2-C 4-175 & F 4-178 |



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Hindalco Industries: Environmental Monitoring report

September 2014

| S.No | Parameters | Unit | Result | Acceptable Limit (IS 10500:2012) | Method Reference |
|---------------------------------|---------------------|----------------|--------|----------------------------------|--|
| Microbiological Analysis | | | | | |
| 1. | Total Coliforms | MPN/ 100 mL | <1.1 | N.D | APHA 22nd Ed. 2012, 9221-B & C, 9-66, 9-69 |
| 2. | E-Coli | MPN/ 100 mL | Absent | N.D | APHA 22nd Ed. 2012, 9221-B, C & G, 9-66, 9-69 and 9-76 |
| Pesticides Residues | | | | | |
| 3. | p,p DDT | µg/L | N.D | 1 | US EPA 508-1995 |
| 4. | o,p DDT | µg/L | N.D | 1 | US EPA 508-1995 |
| 5. | p,p DDE | µg/L | N.D | 1 | US EPA 508-1995 |
| 6. | o,p DDE | µg/L | N.D | 1 | US EPA 508-1995 |
| 7. | p,p DDD | µg/L | N.D | 1 | US EPA 508-1995 |
| 8. | o,p DDD | µg/L | N.D | 1 | US EPA 508-1995 |
| 9. | γ-HCH (Lindane) | µg/L | <0.01 | 2 | US EPA 508-1995 |
| 10. | α-HCH | µg/L | <0.01 | 0.01 | US EPA 508-1995 |
| 11. | β-HCH | µg/L | N.D | 0.04 | US EPA 508-1995 |
| 12. | δ - HCH | µg/L | N.D | 0.04 | US EPA 508-1995 |
| 13. | Butachlor | µg/L | N.D | 125 | US EPA 508-1995 |
| 14. | Alachlor | µg/L | N.D | 20 | US EPA 508-1995 |
| 15. | Atrazine | µg/L | N.D | 2 | US EPA 532-2000 |
| 16. | α Endosulfan | µg/L | N.D | 0.4 | US EPA 508-1995 |
| 17. | β Endosulfan | µg/L | N.D | 0.4 | US EPA 508-1995 |
| 18. | Endosulfan Sulphate | µg/L | N.D | 0.4 | US EPA 508-1995 |
| 19. | Ethion | µg/L | N.D | 3 | US EPA 8141A-1994 |
| 20. | Malathion | µg/L | N.D | 190 | US EPA 8141A -1994 |
| 21. | Methyl Parathion | µg/L | N.D | 0.3 | US EPA 8141A -1994 |
| 22. | Monocrotophos | µg/L | N.D | 1 | US EPA 8141A-1994 |
| 23. | Phorate | µg/L | N.D | 2 | US EPA 8141A -1994 |
| 24. | Chlorpynfos | µg/L | N.D | 30 | US EPA 8141A -1994 |
| 25. | Aldrin | µg/L | N.D | 0.03 | US EPA 508-1995 |
| 26. | Dieldrin | µg/L | N.D | 0.03 | US EPA 508-1995 |
| Remarks: N.D- Not Detected | | | | | |

Conclusion: The Physical & Chemical Analysis report indicates that water is not contaminated.

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Hindalco Industries: Environmental Monitoring report

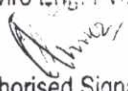
September 2014

| | |
|--|-------------------------------------|
| Report no: SEPT002/2014-15 | Date: 1 st October, 2014 |
| Sample Description: Measurement of Noise | |
| Client Name: Hindalco Industries Limited | |
| Client Address: Lohardaga | |
| Postal Code: 835203 | |
| State: Jharkhand | |
| Country: India | |
| Sample Description: Measurement of Noise Level. | |
| Sampling Method: Instrumental, Using Sound level Meter | |
| Sampling Done by: Mahabal Enviro. | |
| Test Start: 17.09.2014 | |
| End Date: 18.09.2014 | |

| Location / Identification | Unit | Limit (day) | Result | Limit (night) | Result | Dates |
|---------------------------|----------------|-------------|---|---------------|---|------------|
| Month | | | Average of 24 continuous hours in Sep- 14 | | Average of 24 continuous hours in Sep- 14 | |
| Netarhat Plateau | dB(A) L_{eq} | 75 | 55.0 | 70 | 49.0 | 18/09/2014 |


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Hindalco Industries:Environmental Monitoring report

September 2014

| | |
|--|------------------------------------|
| Report no: SEPT002/2014-15 | Date: 1 st October,2014 |
| Sample Description: Measurement of Noise: Spot Noise | |
| Client Name: Hindalco Industries Limited | |
| Client Address: Lohardaga | |
| Postal Code: 835203 | |
| State: Jharkhand | |
| Country: India | |
| Sample Location: Netarhat Plateau- Gurdari Mine pit | |
| Sample Description: Measurement of Noise Level. | |
| Sampling Method: Instrumental, Using Sound level Meter | |
| Sampling Done by: Mahabal Enviro. | |
| Test Start: 18.09.2014 | |
| End Date: 18.09.2014 | |

| Location / Identification | Unit | Limit (day) | Result | Dates |
|---------------------------|----------------|-------------|--------|------------|
| POCKLAN | dB(A) L_{eq} | 75 | 67.9 | 18/09/2014 |
| COMPRESSOR | dB(A) L_{eq} | 75 | 70.6 | 18/09/2014 |
| WAGAN DRILL | dB(A) L_{eq} | 75 | 73.4 | 18/09/2014 |

Note : (i) The value is the L_{eq} of twenty readings taken in location (Day time).

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Hindalco Industries: Environmental Monitoring report

September 2014

| | |
|--|-------------------------------------|
| Report no: SEPT002/2014-15 | Date: 1 st October, 2014 |
| Sample Description: Measurement of Noise: Spot Noise | |
| Client Name: Hindalco Industries Limited | |
| Client Address: Lohardaga | |
| Postal Code: 835203 | |
| State: Jharkhand | |
| Country: India | |
| Sample Location: Netarhat Plateau- Kujam - I Mine pit | |
| Sample Description: Measurement of Noise Level. | |
| Sampling Method: Instrumental, Using Sound level Meter | |
| Sampling Done by: Mahabal Enviro. | |
| Test Start: 18.09.2014 | |
| End Date: 18.09.2014 | |

| Location / Identification | Unit | Limit (day) | Result | Dates |
|---------------------------|-----------|-------------|--------|------------|
| POCKLAN | dB(A) Leq | 75 | 68.2 | 18/09/2014 |
| COMPRESSOR | dB(A) Leq | 75 | 70 | 18/09/2014 |
| WAGAN DRILL | dB(A) Leq | 75 | 73 | 18/09/2014 |

Note : (i) The value is the Leq. of twenty readings taken in location (Day time).

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Hindalco Industries: Environmental Monitoring report

September 2014

| | |
|--|-------------------------------------|
| Report no: SEPT002/2014-15 | Date: 1 st October, 2014 |
| Sample Description: Measurement of Noise: Spot Noise | |
| Client Name: Hindalco Industries Limited | |
| Client Address: Lohardaga | |
| Postal Code: 835203 | |
| State: Jharkhand | |
| Country: India | |
| Sample Location: Netarhat Plateau- Kujam - II Mine pit | |
| Sample Description: Measurement of Noise Level. | |
| Sampling Method: Instrumental, Using Sound level Meter | |
| Sampling Done by: Mahabal Enviro. | |
| Test Start: 18/09/2014 | |
| End Date: 18/09/2014 | |

| Location / Identification | Unit | Limit (day) | Result | Dates |
|---------------------------|-----------|-------------|--------|------------|
| POCKLAN | dB(A) Leq | 75 | 69.7 | 18/09/2014 |
| COMPRESSOR | dB(A) Leq | 75 | 73 | 18/09/2014 |
| WAGAN DRILL | dB(A) Leq | 75 | 72.9 | 18/09/2014 |

Note : (i) The value is the Leq. of twenty readings taken in location (Day time).

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Hindalco Industries:Environmental Monitoring report

September 2014

| | |
|--|------------------------------------|
| Report no: SEPT002/2014-15 | Date: 1 st October,2014 |
| Sample Description: Measurement of Noise: Spot Noise | |
| Client Name: Hindalco Industries Limited | |
| Client Address: Lohardaga | |
| Postal Code: 835203 | |
| State: Jharkhand | |
| Country: India | |
| Sample Location: Netarhat Plateau- Amtipani Mine pit | |
| Sample Description: Measurement of Noise Level. | |
| Sampling Method: Instrumental, Using Sound level Meter | |
| Sampling Done by: Mahabal Enviro. | |
| Test Start: 25.09.2014 | |
| End Date: 25.09.2014 | |

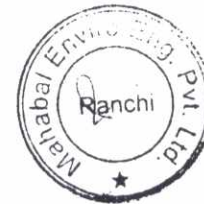
| Location / Identification | Unit | Limit (day) | Result | Dates |
|---------------------------|----------------|-------------|--------|------------|
| POCKLAN | dB(A) L_{eq} | 75 | 67.8 | 18/09/2014 |
| COMPRESSOR | dB(A) L_{eq} | 75 | 71.1 | 18/09/2014 |
| WAGAN DRILL | dB(A) L_{eq} | 75 | 72.5 | 18/09/2014 |

Note : (i) The value is the L_{eq} of twenty readings taken in location (Day time).

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Hindalco Industries: Environmental Monitoring report

September 2014

Report no: SEPT002/2014-15 Date: 1st October, 2014
Sample described by customer: SOIL
Client Name: Hindalco Industries Limited
Client Address: Lohardaga
Postal Code: 835203
State: Jharkhand
Country: India
Sample type: SOIL
Received: 23.09.2014
Registered: 23.09.2014
Marks on Sample: Location: Netarhat Plateau- Kujam & Amtipani
Sample collected on: 17.09.2014
Quantity: 2 kgs
Test Start/End Date: 23.09.2014/24.09.2014
Sample collected by: Mahabal Enviro Engineers Pvt Limited

| S.No | Analysis | Method | Result | Unit |
|------|--------------------------|--|------------|--------------------|
| 1. | Colour | -- | Gray | - |
| 2. | Texture | F.A.U.N (2007) | Loamy Sand | - |
| 3. | Bulk Density | By Bulk density Apparatus | 1.5 | gm/cm ³ |
| 4. | Water Holding Capacity | F.A.U.N (2007) | 21.1 | % |
| 5. | pH | F.A.U.N (2007) | 7.0 | - |
| 6. | Electrical Conductivity | F.A.U.N (2007) | 200 | µS/cm |
| 7. | Organic Carbon | -- | 0.35 | % |
| 8. | Organic Matter | Black & White Wet Digestion Method | 0.85 | % |
| 9. | Available Nitrogen | Soil & Water Book by P.K Gupta | 110.2 | mg/kg |
| 10. | Available Phosphorus | Soil & Water Book by P.K Gupta | 13.5 | mg/kg |
| 11. | Available Potassium | Soil & Water Book by P.K Gupta | 356 | mg/kg |
| 12. | Exchangeable Calcium | Ca Soil & Water Book by P.K Gupta | 23.2 | meq/100gm |
| 13. | Exchangeable Magnesium | Mg Soil & Water Book by P.K Gupta | 1.20 | meq/100gm |
| 14. | Exchangeable Sodium | Na Soil & Water Book by P.K Gupta | 2.30 | meq/100gm |
| 15. | Exchangeable Potassium | K Soil & Water Book by P.K Gupta | 1.51 | meq/100gm |
| 16. | Total Exchangeable Bases | Soil & Water Book by P.K Gupta | 30.1 | meq/100gm |
| 17. | Manganese | Mn USEPA 3052 | 0.53 | mg/kg |
| 18. | Arsenic | As USEPA 3052 | 2.01 | mg/kg |
| 19. | Silica | SiO ₂ USEPA 3052 | 51.2 | % |
| 20. | Aluminum | Al ₂ O ₃ USEPA 3052 | 7.0 | % |
| 21. | Iron | Fe ₂ O ₃ USEPA 3052 | 5.2 | % |
| 22. | Calcium | CaO USEPA 3052 | 8.3 | % |
| 23. | Magnesium | MgO USEPA 3052 | 1.45 | % |
| 24. | Sodium | Na ₂ O USEPA 3052 | 0.20 | % |
| 25. | Potassium | K ₂ O USEPA 3052 | 0.18 | % |
| 26. | Sulphate | SO ₄ USEPA 3052 | 0.89 | % |

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