

Ref No: HIL/LHD/GM (GEO)/MoEF/ 291

Date: 25.11.2018

To,  
The Additional Principal Chief Conservator of Forest (C)  
Ministry of Environment, Forests and Climate Changes  
Regional Office (ECZ), Ranchi-834002.

Sub: **Compliance Report of EC conditions for Orsa (196.36ha) Bauxite Mining project of M/s Hindalco Industries Limited located in Gumla, Jharkhand for the period April'18 to Sept'18.**

Ref: **Environmental Clearance letter no J-11015/241/2006-IA II(M) dated 17<sup>th</sup> May 2007**


Sir,

With reference to the above, we are submitting herewith the Compliance status report of EC conditions for **Orsa (196.36 ha)** Bauxite Mining project of M/s Hindalco located in Gumla, Jharkhand for the period **April'18 to Sept'18.**

Hope you will find the same in order.

Thanking You

Yours Sincerely  
FOR HINDALCO INDUSTRIES LIMITED

  
(Basudev Gangopadhyay)  
GM (Geology)

Enclosure: - As Above

Copy to: Member Secretary, JSPCB, Ranchi  
RO, JSPCB, Ranchi  
CPCB, Zonal Office, Kolkata  
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**Compliance of conditions laid down in Environmental Clearance**

**ORSA BAUXITE MINES**

**Period: April'18- Sep'18**

**J-11015/241/2006-IA.II (M) Dated 17.5.2007**

| <b>Sl No</b>               | <b>Conditions</b>  | <b>Compliance Status</b>   |
|----------------------------|--|--|
| <b>Specific Conditions</b> |  |  |
| 1                          | Environmental Clearance is subject to final order of the Hon'ble Supreme Court of India in the matter OF Goa foundation Vs Union of India in write petition (civil) no 460 of 2004, as may be applicable to this project                             | Noted.   |
| 2.                         | Environmental Clearance is subject to obtaining clearance from Wildlife (Protection) Act '1972 from the competent authority.   | The Mine is not is operation since 20 April 2018 and this matter is subjudice.   |
| 3.                         | All the conditions stipulated by SPCB in their NOC shall be effectively implemented.   | Noted and Agreed. The Mine is not is operation since 20 April 2018.Mine was operational for very limited period of 4-5 month. As on date mine is not operational. Post resumption of mining operation compliance to the said conditions will be implemented.   |
| 4                          | 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.  | The Mine is not in operation since 20 April 2018.Prior to this Mine was operational for very limited period of 4-5 month. The required land acquisition was done with permission of competent authority of State Government i.e. concerned Deputy Commissioner (D.C.) under CNT Act. The land lease agreement was done with raiyat (Land Owner) for 20 years with permission of State Govt with provision of returning the land as per as per the norms set by D.C. .The compensation and facilities are being provided as per norms set in agreement. Thus the provision is taken care off. |
| 5                          | Mining shall not intersect groundwater. The mine working shall be restricted to above ground water table. Prior approval of the Ministry of Environment & Forests and Central Ground Water Authority shall be obtained for mining below water table. | Noted. Mine is not in operation since 20 April 2018.Prior to this Mine was operational for very limited period of 4-5 month during which also it was above ground water level. Post resumption of mining operation compliance to the said conditions will be implemented.  |

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| 6   | The project proponent shall ensure that the mining shall be carried out in small blocks and at a given point of time active mining shall not be more than 2.0 ha.  | Noted. The Mine is not in operation since 20 April 2018. Prior to this Mine was operational for very limited period of 4-5 month. As on date mine is not operational. Post resumption of mining operation compliance to the said conditions will be implemented.  |
| 7.  | The project proponent shall ensure that no natural water course shall be obstructed due to any mining operations.  | Noted. The Mine is not in operation since 20 April 2018. Prior to this Mine was operational for very limited period of 4-5 month and this condition was complied with. As on date mine is not operational. Post resumption of mining operation compliance to the said conditions will be implemented.                                       |
| 8   | Top soil, if any, shall be stacked properly with proper slope with adequate measures and should be used for reclamation and rehabilitation of mined out areas.   | Noted. The Mine is not in operation since 20 April 2018. Prior to this Mine was operational for very limited period of 4-5 month. As on date, mine is not operational. and this condition was complied with. As on date mine is not operational. Post resumption of mining operation compliance to the said conditions will be implemented. |
| 9.  | The overburden generated during the initial year shall be kept as temporary dump. Concurrent backfilling starts from the 2 <sup>nd</sup> year onwards and there shall be no external dump at the end of the mine life.   | The Mine is not in operation since 20 April 2018. Prior to this Mine was operational for very limited period of 4-5 month and this condition was complied with. As on date mine is not operational. Post resumption of mining operation compliance to the said conditions will be implemented.  |
| 10. | The entire excavated area of 155 ha shall be reclaimed, out of which 131 ha land shall be returned to raiyats for agricultural purpose and in 24 ha plantation shall be raised. 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. | The Mine is not in operation since 20 April 2018. Prior to this Mine was operational for very limited period of 4-5 month. As on date mine is not operational. Post resumption of mining operation compliance to the said conditions will be implemented.   |

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| 11 | <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>The Mine is not in operation since 20 April 2018.</p> <p>Prior to this Mine was operational for very limited period of 4-5 month.</p> <p>As on date mine is not operational. Post resumption of mining operation compliance to the said conditions will be implemented.</p> |
| 12 | <p>Dimension of the retaining wall at the OB benches within the mine to check run-off and siltation should be based on rainfall data.</p>  | <p>The Mine is not in operation since 20 April 2018. Prior to this Mine was operational for very limited period of 4-5 month.</p> <p>As on date mine is not operational. Post resumption of mining operation compliance to the said conditions will be implemented.</p>        |
| 13 | <p>Plantation shall be raised in an area of 24.0 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>The Mine is not in operation since 20 April 2018. Prior to this Mine was operational for very limited period of 4-5 month.</p> <p>As on date mine is not operational. Post resumption of mining operation compliance to the said conditions will be implemented.</p>        |
| 14 | <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>The Mine is not in operation since 20 April 2018. Prior to this Mine was operational for very limited period of 4-5 month.</p> <p>As on date mine is not operational. Post resumption of mining operation compliance to the said conditions will be implemented.</p>        |

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| 15 | 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. | The Mine is not in operation since 20 April 2018. Prior to this Mine was operational for very limited period of 4-5 month.<br><br>Monitoring report for potable water is enclosed as Annexure-1  |
| 16 | Prior permission from the competent authority should be obtained for drawl of water from the surface water bodies.   | Noted.<br>As on date, mine is not operational  |
| 17 | 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.  | The Mine is not in operation since 20 April 2018. Mine was operational for very limited period of 4-5 month and this condition was complied with .As on date mine is not operational. Post resumption of mining operation compliance to the said conditions will be implemented.               |
| 18 | Drills should either be operated with dust extractors or should be equipped with water injection system.   | The Mine is not in operation since 20 April 2018. Prior to this Mine was operational for very limited period of 4-5 month and this condition was complied with .As on date mine is not operational. Post resumption of mining operation compliance to the said conditions will be implemented. |
| 19 | 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.   | The Mine is not in operation since 20 April 2018. Prior to this Mine was operational for very limited period of 4-5 month and this condition was complied with .As on date mine is not operational. Post resumption of mining operation compliance to the said conditions will be implemented. |
| 20 | 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. As on date, mine is not operational  |
| 21 | Sewage treatment plant should be installed for the colony. ETP should also be provided for workshop and wastewater generated from mining operations.   | Noted.<br>As on date, mine is not operational  |
| 22 | The project proponent should take all precautionary measures during mining operation for conservation and protection of endangered fauna such as Leopard, Indian Wolf, Indian elephant, Indian small civet, Indian Python, etc.  | The Mine is not in operation since 20 April 2018. Prior to this Mine was operational for very limited period of 4-5 month and this condition was complied with .As on date mine is not operational.  |

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|    | 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. | Post resumption of mining operation compliance to the said conditions will be implemented.  |
| 23 | 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.  | The Mine is not in operation since 20 April 2018. Prior to this Mine was operational for very limited period of 4-5 month and this condition was complied with. As on date mine is not operational. Progressive Mine closure plan and Final mine closure plan (part) has been approved by IBM. FMCP for entire lease will be prepared & submitted in due time. Based on the present resource estimate, and peak rated production capacity mentioned in EC, the tentative balance life is around 6-7 years. However, after completion of further detailed exploration, the resources estimate vis-à-vis balance life of the mine may change based on final resource estimate, EC capacity and cut-off grade at that point of time. |

#### 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   | Agreed & Noted.  |
| 2     | No change in the calendar plan including excavation, quantum of mineral bauxite and waste should be made.   | The Mine is not in operation since 20 April 2018. Prior to this Mine was operational for very limited period of 4-5 month and this condition was complied with. As on date mine is not operational. Post resumption of mining operation compliance to the said conditions will be implemented. Annexure-4. |
| 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 <sub>2</sub> , NO <sub>x</sub> monitoring. Location of the stations should be decided based on the metrological data, | Monitoring Reports of AAQ data is attached as Annexure-1.  |

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|   | topographical features and environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the State Pollution Control Board.   |  |
| 4 | Data on ambient air quality (RPM, SPM, SO <sub>2</sub> , and NO <sub>x</sub> ) 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 is attached as Annexure-1.  |
| 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.  | The Mine is not in operation since 20 April 2018. Prior to this Mine was operational for very limited period of 4-5 month and this condition was complied with. As on date mine is not operational. Post resumption of mining operation compliance to the said conditions will be implemented. |
| 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.  | The Mine is not in operation since 20 April 2018. Prior to this Mine was operational for very limited period of 4-5 month and this condition was complied with. As on date mine is not operational. Post resumption of mining operation compliance to the said conditions will be implemented. |
| 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 <sup>th</sup> May, 1993 and 31 <sup>st</sup> December, 1993 or as amended from time to time. Oil and grease trap should be installed before discharge of workshop effluents.              | There was no generation of waste water from the mine as of now. The compliance to this condition will be adhered to as applicable. As on date, mine is not operational   |
| 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.<br>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. | The Mine is not in operation since 20 April 2018. Prior to this Mine was operational for very limited period of 4-5 month and this condition was complied with. As on date mine is not operational. Post resumption of mining operation compliance to the said conditions will be implemented. |
| 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.   | A suitable environmental management cell has been developed with qualified personnel. Copy enclosed as Annexure- 3.  |

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| 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.  | Provisions related to financial closure not applicable.          |
| 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.  | Cost of Environmental protection measures Annexed as Annexure-2. |
| 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 upon.   |
| 13 | The project proponent shall submit six monthly report on the status of the implementation of the stipulated environmental safeguards to the Ministry of Environment and Forests its Regional Office, Bhubneshwar CPCB and State Pollution Control Board.   | Duly submitted.  |
| 14 | A copy of clearance letter will be marked to concerned Panchayat / local NGO, if any, from whom suggestion / representation has been received while processing the proposal.   | Complied.  |
| 15 | State Pollution Control Board 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.   |
| 16 | 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 <a href="http://envfor.nic.in">http://envfor.nic.in</a> and a copy of the same should be forwarded to the Regional Office of this Ministry located Bhubneshwar. | Already done and copies submitted.                               |





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## **Mahabal Enviro Engineers Pvt. Ltd.**

At Booty, Near PHED Colony, Behind Pump House, PO – RMCC,  
District – Ranchi 834009

### **ORSA & CHIRO PLATEAU- ENVIRONMENTAL MONITORING REPORT**

**APRIL TO JUNE 2018**

**For Mahabal Enviro Engineers Pvt. Ltd.**

**Vijay Pandey**  
**SENIOR EXECUTIVE**





# Mahabal Enviro Engineers Pvt. Ltd.

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Hindalco Industries:

Environmental Monitoring Report

APRIL – JUNE 2018

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| 1         | Chiro Kukad Mines                             |





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Hindalco Industries:

Environmental Monitoring Report

APRIL – JUNE 2018

|   |  |
|---|--|
| <b>Report no:</b> MEEPL/JULY0192/2018-19                            | <b>Date:</b> 14 <sup>th</sup> July, 2018 |
| <b>Sample described by customer:</b> AMBIENT AIR QUALITY MONITORING |  |
| <b>Client Name:</b> Hindalco Industries Limited                     |  |
| <b>Client Address:</b> Lohardaga                                    |  |
| <b>Postal Code:</b> 835203  |  |
| <b>State:</b> Jharkhand   |  |
| <b>Country:</b> India   |  |
| <b>Sample type:</b> AMBIENT AIR QUALITY MONITORING                  |  |
| <b>Marks on Sample:</b> Location: Chiro Kukad Weigh Bridge          |  |
| <b>Sample collected on:</b> 09.06.2018                              |  |

| LOCATION / IDENTIFICATION: ChiroKukad Weigh Bridge |  |                   |                |               |
|--|--|-------------------|----------------|---------------|
| Sl. No.  | PARAMETERS   | UNIT              | Standard Limit | Concentration |
| 01.  | Particulate Matter (size less than 10 µm) PM <sub>10</sub>   | µg/m <sup>3</sup> | 100            | 77.1          |
| 02.  | Particulate Matter (size less than 2.5 µm) PM <sub>2.5</sub> | µg/m <sup>3</sup> | 60             | 38.5          |
| 03.  | Sulphur Dioxide (SO <sub>2</sub> )                           | µg/m <sup>3</sup> | 80             | 4.4           |
| 04.  | Nitrogen Dioxide (NO <sub>2</sub> )                          | µg/m <sup>3</sup> | 80             | 6.8           |
| 05.  | Ammonia (NH <sub>3</sub> )                                   | µg/m <sup>3</sup> | 400            | 8.2           |
| 06.  | Ozone (O <sub>3</sub> )                                      | µg/m <sup>3</sup> | 180            | 12.7          |
| 07.  | Carbon Monoxide (CO)   | mg/m <sup>3</sup> | 02             | 0.37          |
| 08.  | Lead (Pb)  | µg/m <sup>3</sup> | 1.0            | 0.03          |
| 09.  | Nickel (Ni)  | ng/m <sup>3</sup> | 20             | 2.5           |
| 10.  | Arsenic (As)   | ng/m <sup>3</sup> | 06             | 2.0           |
| 11.  | Benzene (C <sub>6</sub> H <sub>6</sub> )                     | µg/m <sup>3</sup> | 05             | 2.1           |
| 12.  | Benzo (a) Pyrene   | µg/m <sup>3</sup> | 01             | 0.40          |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey  
SENIOR EXECUTIVE





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Hindalco Industries:

Environmental Monitoring Report

APRIL – JUNE 2018

|   |  |
|---|--|
| <b>Report no:</b> MEEPL/JULY0193/2018-19                            | <b>Date:</b> 14 <sup>th</sup> July, 2018 |
| <b>Sample described by customer:</b> AMBIENT AIR QUALITY MONITORING |  |
| <b>Client Name:</b> Hindalco Industries Limited                     |  |
| <b>Client Address:</b> Lohardaga                                    |  |
| <b>Postal Code:</b> 835203  |  |
| <b>State:</b> Jharkhand   |  |
| <b>Country:</b> India   |  |
| <b>Sample type:</b> AMBIENT AIR QUALITY MONITORING                  |  |
| <b>Marks on Sample:</b> Location: Kukad Village                     |  |
| <b>Sample collected on:</b> 09.06.2018                              |  |

| LOCATION / IDENTIFICATION: Kukad Village |  |                   |                |               |
|--|--|-------------------|----------------|---------------|
| Sl. No.                                  | PARAMETERS   | UNIT              | Standard Limit | Concentration |
| 01.                                      | Particulate Matter (size less than 10 µm) PM <sub>10</sub>   | µg/m <sup>3</sup> | 100            | 53.0          |
| 02.                                      | Particulate Matter (size less than 2.5 µm) PM <sub>2.5</sub> | µg/m <sup>3</sup> | 60             | 24.3          |
| 03.                                      | Sulphur Dioxide (SO <sub>2</sub> )                           | µg/m <sup>3</sup> | 80             | 3.3           |
| 04.                                      | Nitrogen Dioxide (NO <sub>2</sub> )                          | µg/m <sup>3</sup> | 80             | 6.0           |
| 05.                                      | Ammonia (NH <sub>3</sub> )                                   | µg/m <sup>3</sup> | 400            | 7.3           |
| 06.                                      | Ozone (O <sub>3</sub> )                                      | µg/m <sup>3</sup> | 180            | 12.0          |
| 07.                                      | Carbon Monoxide (CO)   | mg/m <sup>3</sup> | 02             | 0.36          |
| 08.                                      | Lead (Pb)  | µg/m <sup>3</sup> | 1.0            | 0.03          |
| 09.                                      | Nickel (Ni)  | ng/m <sup>3</sup> | 20             | 2.5           |
| 10.                                      | Arsenic (As)   | ng/m <sup>3</sup> | 06             | 2.1           |
| 11.                                      | Benzene (C <sub>6</sub> H <sub>6</sub> )                     | µg/m <sup>3</sup> | 05             | 2.0           |
| 12.                                      | Benzo (a) Pyrene   | µg/m <sup>3</sup> | 01             | 0.34          |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey  
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Hindalco Industries:

Environmental Monitoring Report

APRIL – JUNE 2018

|   |  |
|---|--|
| <b>Report no:</b> MEEPL/JULY0194/2018-19                            | <b>Date:</b> 14 <sup>th</sup> July, 2018 |
| <b>Sample described by customer:</b> AMBIENT AIR QUALITY MONITORING |  |
| <b>Client Name:</b> Hindalco Industries Limited                     |  |
| <b>Client Address:</b> Lohardaga                                    |  |
| <b>Postal Code:</b> 835203  |  |
| <b>State:</b> Jharkhand   |  |
| <b>Country:</b> India   |  |
| <b>Sample type:</b> AMBIENT AIR QUALITY MONITORING                  |  |
| <b>Marks on Sample:</b> Location: Rajendrapur                       |  |
| <b>Sample collected on:</b> 09.06.2018                              |  |

| LOCATION / IDENTIFICATION: Rajendrapur |  |                   |                |               |
|--|--|-------------------|----------------|---------------|
| Sl. No.                                | PARAMETERS   | UNIT              | Standard Limit | Concentration |
| 01.                                    | Particulate Matter (size less than 10 µm) PM <sub>10</sub>   | µg/m <sup>3</sup> | 100            | 61.1          |
| 02.                                    | Particulate Matter (size less than 2.5 µm) PM <sub>2.5</sub> | µg/m <sup>3</sup> | 60             | 30.6          |
| 03.                                    | Sulphur Dioxide (SO <sub>2</sub> )                           | µg/m <sup>3</sup> | 80             | 3.8           |
| 04.                                    | Nitrogen Dioxide (NO <sub>2</sub> )                          | µg/m <sup>3</sup> | 80             | 6.1           |
| 05.                                    | Ammonia (NH <sub>3</sub> )                                   | µg/m <sup>3</sup> | 400            | 8.1           |
| 06.                                    | Ozone (O <sub>3</sub> )                                      | µg/m <sup>3</sup> | 180            | 11.5          |
| 07.                                    | Carbon Monoxide (CO)   | mg/m <sup>3</sup> | 02             | 0.30          |
| 08.                                    | Lead (Pb)  | µg/m <sup>3</sup> | 1.0            | 0.02          |
| 09.                                    | Nickel (Ni)  | ng/m <sup>3</sup> | 20             | 2.1           |
| 10.                                    | Arsenic (As)   | ng/m <sup>3</sup> | 06             | 2.0           |
| 11.                                    | Benzene (C <sub>6</sub> H <sub>6</sub> )                     | µg/m <sup>3</sup> | 05             | 3.0           |
| 12.                                    | Benzo (a) Pyrene   | µg/m <sup>3</sup> | 01             | 0.26          |

For Mahabal Enviro Engineers Pvt. Ltd.

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Hindalco Industries:

Environmental Monitoring Report

APRIL – JUNE 2018

|  |                                   |
|--|-----------------------------------|
| Report no: MEEPL/JULY0195/2018-19                            | Date: 14 <sup>th</sup> July, 2018 |
| 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                  |                                   |
| Marks on Sample: Location: Orsa Village                      |                                   |
| Sample collected on: 09.06.2018                              |                                   |

| LOCATION / IDENTIFICATION: Orsa Village |  |                   |                |               |
|---|--|-------------------|----------------|---------------|
| Sl. No.                                 | PARAMETERS   | UNIT              | Standard Limit | Concentration |
| 01.                                     | Particulate Matter (size less than 10 µm) PM <sub>10</sub>   | µg/m <sup>3</sup> | 100            | 52.8          |
| 02.                                     | Particulate Matter (size less than 2.5 µm) PM <sub>2.5</sub> | µg/m <sup>3</sup> | 60             | 25.3          |
| 03.                                     | Sulphur Dioxide (SO <sub>2</sub> )                           | µg/m <sup>3</sup> | 80             | 3.2           |
| 04.                                     | Nitrogen Dioxide (NO <sub>2</sub> )                          | µg/m <sup>3</sup> | 80             | 5.1           |
| 05.                                     | Ammonia (NH <sub>3</sub> )                                   | µg/m <sup>3</sup> | 400            | 7.5           |
| 06.                                     | Ozone (O <sub>3</sub> )                                      | µg/m <sup>3</sup> | 180            | 11.2          |
| 07.                                     | Carbon Monoxide (CO)   | mg/m <sup>3</sup> | 02             | 0.28          |
| 08.                                     | Lead (Pb)  | µg/m <sup>3</sup> | 1.0            | 0.03          |
| 09.                                     | Nickel (Ni)  | ng/m <sup>3</sup> | 20             | 2.1           |
| 10.                                     | Arsenic (As)   | ng/m <sup>3</sup> | 06             | 2.3           |
| 11.                                     | Benzene (C <sub>6</sub> H <sub>6</sub> )                     | µg/m <sup>3</sup> | 05             | 2.1           |
| 12.                                     | Benzo (a) Pyrene   | µg/m <sup>3</sup> | 01             | 0.33          |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey  
SENIOR EXECUTIVE





# Mahabal Enviro Engineers Pvt. Ltd.

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Hindalco Industries:

Environmental Monitoring Report

APRIL – JUNE 2018

|   |  |
|---|--|
| <b>Report no:</b> MEEPL/JULY0196/2018-19                            | <b>Date:</b> 14 <sup>th</sup> July, 2018 |
| <b>Sample described by customer:</b> AMBIENT AIR QUALITY MONITORING |  |
| <b>Client Name:</b> Hindalco Industries Limited                     |  |
| <b>Client Address:</b> Lohardaga                                    |  |
| <b>Postal Code:</b> 835203  |  |
| <b>State:</b> Jharkhand   |  |
| <b>Country:</b> India   |  |
| <b>Sample type:</b> AMBIENT AIR QUALITY MONITORING                  |  |
| <b>Marks on Sample:</b> Location: Near ChiroKukud Mines Office      |  |
| <b>Sample collected on:</b> 09.06.2018                              |  |

| LOCATION / IDENTIFICATION: Near Chiro Kukud Mines Office |  |                   |                |               |
|--|--|-------------------|----------------|---------------|
| Sl. No.  | PARAMETERS   | UNIT              | Standard Limit | Concentration |
| 01.  | Particulate Matter (size less than 10 µm) PM <sub>10</sub>   | µg/m <sup>3</sup> | 100            | 60.0          |
| 02.  | Particulate Matter (size less than 2.5 µm) PM <sub>2.5</sub> | µg/m <sup>3</sup> | 60             | 29.3          |
| 03.  | Sulphur Dioxide (SO <sub>2</sub> )                           | µg/m <sup>3</sup> | 80             | 3.2           |
| 04.  | Nitrogen Dioxide (NO <sub>2</sub> )                          | µg/m <sup>3</sup> | 80             | 5.3           |
| 05.  | Ammonia (NH <sub>3</sub> )                                   | µg/m <sup>3</sup> | 400            | 7.6           |
| 06.  | Ozone (O <sub>3</sub> )                                      | µg/m <sup>3</sup> | 180            | 11.8          |
| 07.  | Carbon Monoxide (CO)   | mg/m <sup>3</sup> | 02             | 0.30          |
| 08.  | Lead (Pb)  | µg/m <sup>3</sup> | 1.0            | 0.03          |
| 09.  | Nickel (Ni)  | ng/m <sup>3</sup> | 20             | 2.5           |
| 10.  | Arsenic (As)   | ng/m <sup>3</sup> | 06             | 2.0           |
| 11.  | Benzene (C <sub>6</sub> H <sub>6</sub> )                     | µg/m <sup>3</sup> | 05             | 2.2           |
| 12.  | Benzo (a) Pyrene   | µg/m <sup>3</sup> | 01             | 0.30          |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey  
SENIOR EXECUTIVE





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Hindalco Industries:

Environmental Monitoring Report

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|   |  |
|---|--|
| <b>Report no:</b> MEEPL/JULY0197/2018-19                            | <b>Date:</b> 14 <sup>th</sup> July, 2018 |
| <b>Sample described by customer:</b> AMBIENT AIR QUALITY MONITORING |  |
| <b>Client Name:</b> Hindalco Industries Limited                     |  |
| <b>Client Address:</b> Lohardaga                                    |  |
| <b>Postal Code:</b> 835203  |  |
| <b>State:</b> Jharkhand   |  |
| <b>Country:</b> India   |  |
| <b>Sample type:</b> AMBIENT AIR QUALITY MONITORING                  |  |
| <b>Marks on Sample:</b> Location: Near Saraidih Hospital            |  |
| <b>Sample collected on:</b> 09.06.2018                              |  |

| LOCATION / IDENTIFICATION: Near Saraidih Hospital |  |                   |                |               |
|---|--|-------------------|----------------|---------------|
| Sl. No.   | PARAMETERS   | UNIT              | Standard Limit | Concentration |
| 01.   | Particulate Matter (size less than 10 µm) PM <sub>10</sub>   | µg/m <sup>3</sup> | 100            | 55.4          |
| 02.   | Particulate Matter (size less than 2.5 µm) PM <sub>2.5</sub> | µg/m <sup>3</sup> | 60             | 27.0          |
| 03.   | Sulphur Dioxide (SO <sub>2</sub> )                           | µg/m <sup>3</sup> | 80             | 3.5           |
| 04.   | Nitrogen Dioxide (NO <sub>2</sub> )                          | µg/m <sup>3</sup> | 80             | 5.8           |
| 05.   | Ammonia (NH <sub>3</sub> )                                   | µg/m <sup>3</sup> | 400            | 7.2           |
| 06.   | Ozone (O <sub>3</sub> )                                      | µg/m <sup>3</sup> | 180            | 11.6          |
| 07.   | Carbon Monoxide (CO)   | mg/m <sup>3</sup> | 02             | 0.25          |
| 08.   | Lead (Pb)  | µg/m <sup>3</sup> | 1.0            | 0.02          |
| 09.   | Nickel (Ni)  | ng/m <sup>3</sup> | 20             | 2.0           |
| 10.   | Arsenic (As)   | ng/m <sup>3</sup> | 06             | 2.1           |
| 11.   | Benzene (C <sub>6</sub> H <sub>6</sub> )                     | µg/m <sup>3</sup> | 05             | 2.0           |
| 12.   | Benzo (a) Pyrene   | µg/m <sup>3</sup> | 01             | 0.30          |

For Mahabal Enviro Engineers Pvt. Ltd.

**Vijay Pandey**  
SENIOR EXECUTIVE







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Environmental Monitoring Report

APRIL – JUNE 2018

|   |  |
|---|--|
| <b>Report no:</b> MEEPL/JULY0198/2018-19                | <b>Date:</b> 14 <sup>th</sup> July, 2018 |
| Sample described by customer: Measurement of Noise      |  |
| Client Name: <b>Hindalco Industries Limited</b>         |  |
| Client Address: Lohardaga                               |  |
| Postal Code: 835203                                     |  |
| State: Jharkhand  |  |
| Country: India  |  |
| Sample Description: <b>Measurement of Noise</b>         |  |
| Sampling Method: Instrumental, using Sound level Metter |  |
| Data Collection Date: 09.06.2018                        |  |

| Location/Identification | Unit            | Limit (day) | Result | Limit (night) | Result |
|-------------------------|-----------------|-------------|--------|---------------|--------|
| Chiro Kukad Mining Area | dB (A) $L_{eq}$ | 75          | 63.2   | 70            | 50.5   |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey  
SENIOR EXECUTIVE





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Hindalco Industries:

Environmental Monitoring Report

APRIL – JUNE 2018

|  |   |
|--|---|
| <b>Report no: MEEPL/JULY0199/2018-19</b>                       | <b>Date: 14<sup>th</sup> July, 2018</b> |
| <b>Sample described by customer: Measurement of Spot Noise</b> |   |
| Client Name: Hindalco Industries Limited                       |   |
| Client Address: Lohardaga                                      |   |
| Postal Code: 835203  |   |
| State: Jharkhand   |   |
| Country: India   |   |
| Sample Description: Measurement of Spot Noise                  |   |
| Sampling Method: Instrumental, using Sound level Metter        |   |
| Data Collection Date: 09.06.2018                               |   |

| Location/Identification                        | Unit       | Limit (day) | Result |
|--|------------|-------------|--------|
| Chiro Kukad Mines (152.57 ha.)<br>Near Poclain | dB (A) Leq | 75          | 68.2   |

For Mahabal Enviro Engineers Pvt. Ltd.

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SENIOR EXECUTIVE





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APRIL – JUNE 2018

|  |   |
|--|---|
| <b>Report no: MEEPL/JULY0200/2018-19</b>                           | <b>Date: 14<sup>th</sup> July, 2018</b> |
| Sample described by customer : <b>DRINKING WATER-POTABILITY</b>    |   |
| Client Name: <b>Hindalco Industries Limited</b>                    |   |
| Client Address: Lohardaga  |   |
| Postal Code: 835203  |   |
| State: Jharkhand   |   |
| Country: India   |   |
| Sample Type: <b>DRINKING WATER-POTABILITY</b>                      |   |
| Marks on Sample: Location: <b>Chiro Kukad Mines Drinking Water</b> |   |
| Quantity: 5 L X 2 No. PVC Can                                      |   |
| Sample collected on: 09.06.2017                                    |   |

| Sl. No. | Parameters                               | Unit  | Result    | Acceptable Limit (IS 10500:2012) | Method reference                                  |
|---------|--|-------|-----------|----------------------------------|---|
| 1       | Colour                                   | Hazen | <1        | 5 Max                            | APHA 22 <sup>nd</sup> Ed. 2012, 2120-B, 2-6       |
| 2       | Odour                                    | --    | Agreeable | Agreeable                        | IS 3025 (Part 7): 1983, Reaffirmed 2006           |
| 3       | Taste                                    | --    | Agreeable | Agreeable                        | IS 3025 (Part 7): 1983, Reaffirmed 2006           |
| 4       | Turbidity                                | NTU   | 0.32      | 1 Max                            | APHA 22 <sup>nd</sup> Ed. 2012, 2130-B, 2-13      |
| 5       | pH                                       | --    | 7.0       | 6.5-8.5                          | APHA 22 <sup>nd</sup> Ed. 2012, 4500-H+-B, 4-92   |
| 6       | Free Chlorides (Residual)                | mg/l  | <0.5      | 0.2 min                          | APHA 22 <sup>nd</sup> Ed. 2012, 4500-CI-G, 4-69   |
| 7       | Total Dissolved Solids                   | mg/l  | 412       | 500 max                          | IS 3025 (Part 16): 1984, Reaffirmed 2006          |
| 8       | Monochloramines                          | mg/l  | <0.05     | --                               | APHA 22 <sup>nd</sup> Ed. 2012, 4500-CIG, 4-69    |
| 9       | Dichloramines                            | mg/l  | <0.05     | --                               | APHA 22 <sup>nd</sup> Ed. 2012, 4500-CIG, 4-69    |
| 10      | Total hardness (as CaCO <sub>3</sub> )   | mg/l  | 50        | 200 max                          | APHA 22 <sup>nd</sup> Ed. 2012, 4500-CIG, 4-69    |
| 11      | Alkalinity Total (as CaCO <sub>3</sub> ) | mg/l  | 67        | 200 max                          | IS 3025 (Part 237): 1986, Reaffirmed 2009         |
| 12      | Chloride (as Cl)                         | mg/l  | 15.2      | 250 max                          | APHA 22 <sup>nd</sup> Ed. 2012, 4500-CI-b, 4-72   |
| 13      | Sulphate (as SO <sub>4</sub> )           | mg/l  | 11.5      | 200 max                          | APHA 22 <sup>nd</sup> Ed. 2012, 4500-so4-e, 4-190 |





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Hindalco Industries:

Environmental Monitoring Report

APRIL – JUNE 2018

## Continuation Sheet

MEEPL/JULY0200/2018-19

| Sl. No. | Parameters   | Unit | Result | Acceptable Limit (IS 10500:2012) | Method Reference   |
|---------|--|------|--------|----------------------------------|--|
| 14      | Nitrate (as NO <sub>3</sub> )                            | mg/l | 0.82   | 45 max                           | APHA 22 <sup>nd</sup> Ed. 2012, 4500-NO <sub>3</sub> -E, 4-125         |
| 15      | Fluoride (as F)  | mg/l | 0.18   | 1 max                            | APHA 22 <sup>nd</sup> Ed. 2012, 4500-FB & D, 4-84, 4-87                |
| 16      | Boron (as B)   | mg/l | 0.11   | 0.5 max                          | APHA 22 <sup>nd</sup> Ed. 2012, 4500-BB, 4-25                          |
| 17      | Calcium (as Ca)  | mg/l | 13.5   | 75 max                           | APHA 22 <sup>nd</sup> Ed. 2012, 3500-Ca-B, 3-67                        |
| 18      | Magnesium (as Mg)  | mg/l | 1.6    | 30 max                           | APHA 22 <sup>nd</sup> Ed. 2012, 3500-Mg-B, 3-84                        |
| 19      | Ammonical Nitrogen/Total Ammonia                         | mg/l | <0.1   | --                               | APHA 22 <sup>nd</sup> Ed. 2012, 4500-NH <sub>3</sub> -F, 4-115         |
| 20      | Iron (as Fe)   | mg/l | 0.10   | 0.3 max                          | APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18                           |
| 21      | Manganese (as Mn)  | mg/l | N.D    | 0.1 max                          | APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18                           |
| 22      | Aluminium (as Al)  | mg/l | 0.01   | 0.03 max                         | APHA 22 <sup>nd</sup> Ed. 2012, 3500-Al-B, 3-61                        |
| 23      | Cadmium (as Cd)  | mg/l | N.D    | 0.003 max                        | APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18                           |
| 24      | Chromium Total (as Cr)                                   | mg/l | N.D    | 0.05 max                         | APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18                           |
| 25      | Copper (as Cu)   | mg/l | N.D    | 0.05 max                         | APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18                           |
| 26      | Lead (as Pb)   | mg/l | N.D    | 0.01 max                         | APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18                           |
| 27      | Zinc (as Zn)   | mg/l | 0.03   | 5 max                            | APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18                           |
| 28      | Arsenic (as As)  | mg/l | <0.01  | 0.01 max                         | APHA 22 <sup>nd</sup> Ed. 2012, 3114-B, 3-38                           |
| 29      | Selenium (as Se)   | mg/l | N.D    | 0.001 max                        | APHA 22 <sup>nd</sup> Ed. 2012, 3112-B, 3-23                           |
| 30      | Mercury (as hg)  | mg/l | N.D    | 0.01 max                         | APHA 22 <sup>nd</sup> Ed. 2012, 3114-B, 3-38                           |
| 31      | Nickel (as Ni)   | mg/l | <0.01  | 0.02 max                         | APHA 22 <sup>nd</sup> 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 22 <sup>nd</sup> ED. 2012, 4500-CN.C & 4-39 & 4-44                |
| 34      | Anionic detergents as MBAS                               | mg/l | <0.1   | 0.2 max                          | APHA 22 <sup>nd</sup> ED. 2012, 5540-C.C & 5-53                        |
| 35      | Phenolic compounds (as C <sub>6</sub> H <sub>5</sub> OH) | mg/l | N.D    | 0.001 max                        | APHA 22 <sup>nd</sup> ED. 2012, 5530-B & C 5-4753                      |
| 36      | Polynuclear aromatic hydrocarbons (PAH)                  | mg/l | N.D    | 0.0001 max                       | APHA 22 <sup>nd</sup> ED. 2012, 6440, 6-93                             |
| 37      | Polychlorinated Biphenyls (PCBs)                         | mg/l | N.D    | 0.0005 max                       | USEPA Method 8082  |
| 38      | Sulphide (as S)  | mg/l | N.D    | 0.05 max                         | APHA 22 <sup>nd</sup> ED. 2012, 4500-S <sub>2</sub> -C 4-175 & F 4-178 |





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Hindalco Industries:

Environmental Monitoring Report

APRIL – JUNE 2018

## Continuation Sheet

MEEPL/ JULY0200/2018-19

| Sl. No.                         | Parameters          | Unit      | Result | Acceptable Limit (IS 10500:2012) | Method Reference  |
|---------------------------------|---------------------|-----------|--------|----------------------------------|---|
| <b>Microbiological Analysis</b> |                     |           |        |                                  |   |
| 1                               | Total Colliforms    | MPN/100mL | N.D    | <1.1                             | APHA 22 <sup>nd</sup> Ed. 2012, 9221-B & C, 9-66, 9-69 and 9-67 |
| 2                               | E-Coli              | MPN/100mL | N.D    | Absent                           | APHA 22 <sup>nd</sup> Ed. 2012, 9221-B & C, 9-66, 9-69 and 9-76 |
| <b>Pesticides Residues</b>      |                     |           |        |                                  |   |
| 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 (Lindance)    | 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 508-1995   |
| 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                              | Methoyl 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      |                     |           |        |                                  |   |

**Conclusion:** The Physical & Chemical Analysis report indicates that the water is not contaminated and potable.

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey  
SENIOR EXECUTIVE





# Eco Ventures Pvt. Ltd.

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## **Mahabal Enviro Engineers Pvt. Ltd.**

At Booty, Near PHED Colony, Behind Pump House, PO – RMCC,  
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### **ORSA & CHIRO PLATEAU- ENVIRONMENTAL MONITORING REPORT**

**JULY TO SEPTEMBER 2018**

**For Mahabal Enviro Engineers Pvt. Ltd.**

**Vijay Pandey**  
**SENIOR EXECUTIVE**





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Hindalco Industries:

Environmental Monitoring Report

JULY – SEPTEMBER 2018

## CONTENT

|           | LOCATION                      |
|-----------|-------------------------------|
| <b>A.</b> | <b>AMBIENT AIR QUALITY</b>    |
| 1         | Chirokukad Weigh Bridge       |
| 2         | Kukad Village                 |
| 3         | Rajendrapur                   |
| 4         | Orsa Village                  |
| 5         | Near Chiro Kukud Mines Office |
| 6         | Near Saraidih Hospital        |





# Mahabal Enviro Engineers Pvt. Ltd.

## Branch Office:

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Hindalco Industries:

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|   |   |
|---|---|
| <b>Report no:</b> MEEPL/OCT0157/2018-19                             | <b>Date:</b> 10 <sup>th</sup> October, 2018 |
| <b>Sample described by customer:</b> AMBIENT AIR QUALITY MONITORING |   |
| <b>Client Name:</b> Hindalco Industries Limited                     |   |
| <b>Client Address:</b> Lohardaga                                    |   |
| <b>Postal Code:</b> 835203  |   |
| <b>State:</b> Jharkhand   |   |
| <b>Country:</b> India   |   |
| <b>Sample type:</b> AMBIENT AIR QUALITY MONITORING                  |   |
| <b>Marks on Sample:</b> Location: Chiro Kukad Weigh Bridge          |   |
| <b>Sample collected on:</b> 12.09.2018                              |   |

| LOCATION / IDENTIFICATION: ChiroKukad Weigh Bridge |  |                   |                |               |
|--|--|-------------------|----------------|---------------|
| Sl. No.  | PARAMETERS   | UNIT              | Standard Limit | Concentration |
| 01.  | Particulate Matter (size less than 10 µm) PM <sub>10</sub>   | µg/m <sup>3</sup> | 100            | 55            |
| 02.  | Particulate Matter (size less than 2.5 µm) PM <sub>2.5</sub> | µg/m <sup>3</sup> | 60             | 24            |
| 03.  | Sulphur Dioxide (SO <sub>2</sub> )                           | µg/m <sup>3</sup> | 80             | 2.3           |
| 04.  | Nitrogen Dioxide (NO <sub>2</sub> )                          | µg/m <sup>3</sup> | 80             | 2.9           |
| 05.  | Ammonia (NH <sub>3</sub> )                                   | µg/m <sup>3</sup> | 400            | 4.0           |
| 06.  | Ozone (O <sub>3</sub> )                                      | µg/m <sup>3</sup> | 180            | 8.3           |
| 07.  | Carbon Monoxide (CO)   | mg/m <sup>3</sup> | 02             | 0.27          |
| 08.  | Lead (Pb)  | µg/m <sup>3</sup> | 1.0            | 0.03          |
| 09.  | Nickel (Ni)  | ng/m <sup>3</sup> | 20             | 1.7           |
| 10.  | Arsenic (As)   | ng/m <sup>3</sup> | 06             | 2.0           |
| 11.  | Benzene (C <sub>6</sub> H <sub>6</sub> )                     | µg/m <sup>3</sup> | 05             | 2.1           |
| 12.  | Benzo (a) Pyrene   | µg/m <sup>3</sup> | 01             | 0.40          |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey  
SENIOR EXECUTIVE







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|   |   |
|---|---|
| <b>Report no:</b> MEEPL/OCT0158/2018-19                             | <b>Date:</b> 10 <sup>th</sup> October, 2018 |
| <b>Sample described by customer:</b> AMBIENT AIR QUALITY MONITORING |   |
| <b>Client Name:</b> Hindalco Industries Limited                     |   |
| <b>Client Address:</b> Lohardaga                                    |   |
| <b>Postal Code:</b> 835203  |   |
| <b>State:</b> Jharkhand   |   |
| <b>Country:</b> India   |   |
| <b>Sample type:</b> AMBIENT AIR QUALITY MONITORING                  |   |
| <b>Marks on Sample:</b> Location: Kukad Village                     |   |
| <b>Sample collected on:</b> 12.09.2018                              |   |

| LOCATION / IDENTIFICATION: Kukad Village |  |                   |                |               |
|--|--|-------------------|----------------|---------------|
| Sl. No.                                  | PARAMETERS   | UNIT              | Standard Limit | Concentration |
| 01.                                      | Particulate Matter (size less than 10 µm) PM <sub>10</sub>   | µg/m <sup>3</sup> | 100            | 42            |
| 02.                                      | Particulate Matter (size less than 2.5 µm) PM <sub>2.5</sub> | µg/m <sup>3</sup> | 60             | 17            |
| 03.                                      | Sulphur Dioxide (SO <sub>2</sub> )                           | µg/m <sup>3</sup> | 80             | 2.1           |
| 04.                                      | Nitrogen Dioxide (NO <sub>2</sub> )                          | µg/m <sup>3</sup> | 80             | 2.6           |
| 05.                                      | Ammonia (NH <sub>3</sub> )                                   | µg/m <sup>3</sup> | 400            | 3.8           |
| 06.                                      | Ozone (O <sub>3</sub> )                                      | µg/m <sup>3</sup> | 180            | 8.5           |
| 07.                                      | Carbon Monoxide (CO)   | mg/m <sup>3</sup> | 02             | 0.17          |
| 08.                                      | Lead (Pb)  | µg/m <sup>3</sup> | 1.0            | 0.03          |
| 09.                                      | Nickel (Ni)  | ng/m <sup>3</sup> | 20             | 1.8           |
| 10.                                      | Arsenic (As)   | ng/m <sup>3</sup> | 06             | 2.0           |
| 11.                                      | Benzene (C <sub>6</sub> H <sub>6</sub> )                     | µg/m <sup>3</sup> | 05             | 2.0           |
| 12.                                      | Benzo (a) Pyrene   | µg/m <sup>3</sup> | 01             | 0.34          |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey  
SENIOR EXECUTIVE





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Hindalco Industries:

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|   |   |
|---|---|
| <b>Report no:</b> MEEPL/OCT0159/2018-19                             | <b>Date:</b> 10 <sup>th</sup> October, 2018 |
| <b>Sample described by customer:</b> AMBIENT AIR QUALITY MONITORING |   |
| <b>Client Name:</b> Hindalco Industries Limited                     |   |
| <b>Client Address:</b> Lohardaga                                    |   |
| <b>Postal Code:</b> 835203  |   |
| <b>State:</b> Jharkhand   |   |
| <b>Country:</b> India   |   |
| <b>Sample type:</b> AMBIENT AIR QUALITY MONITORING                  |   |
| <b>Marks on Sample:</b> Location: Rajendrapur                       |   |
| <b>Sample collected on:</b> 12.09.2018                              |   |

| LOCATION / IDENTIFICATION: Rajendrapur |  |                   |                |               |
|--|--|-------------------|----------------|---------------|
| Sl. No.                                | PARAMETERS   | UNIT              | Standard Limit | Concentration |
| 01.                                    | Particulate Matter (size less than 10 µm) PM <sub>10</sub>   | µg/m <sup>3</sup> | 100            | 48            |
| 02.                                    | Particulate Matter (size less than 2.5 µm) PM <sub>2.5</sub> | µg/m <sup>3</sup> | 60             | 20            |
| 03.                                    | Sulphur Dioxide (SO <sub>2</sub> )                           | µg/m <sup>3</sup> | 80             | 2.3           |
| 04.                                    | Nitrogen Dioxide (NO <sub>2</sub> )                          | µg/m <sup>3</sup> | 80             | 3.0           |
| 05.                                    | Ammonia (NH <sub>3</sub> )                                   | µg/m <sup>3</sup> | 400            | 3.7           |
| 06.                                    | Ozone (O <sub>3</sub> )                                      | µg/m <sup>3</sup> | 180            | 8.5           |
| 07.                                    | Carbon Monoxide (CO)   | mg/m <sup>3</sup> | 02             | 0.21          |
| 08.                                    | Lead (Pb)  | µg/m <sup>3</sup> | 1.0            | 0.02          |
| 09.                                    | Nickel (Ni)  | ng/m <sup>3</sup> | 20             | 1.8           |
| 10.                                    | Arsenic (As)   | ng/m <sup>3</sup> | 06             | 2.0           |
| 11.                                    | Benzene (C <sub>6</sub> H <sub>6</sub> )                     | µg/m <sup>3</sup> | 05             | 3.0           |
| 12.                                    | Benzo (a) Pyrene   | µg/m <sup>3</sup> | 01             | 0.26          |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey

SENIOR EXECUTIVE





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Hindalco Industries:

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|   |   |
|---|---|
| <b>Report no:</b> MEEPL/OCT0160/2018-19                             | <b>Date:</b> 10 <sup>th</sup> October, 2018 |
| <b>Sample described by customer:</b> AMBIENT AIR QUALITY MONITORING |   |
| <b>Client Name:</b> Hindalco Industries Limited                     |   |
| <b>Client Address:</b> Lohardaga                                    |   |
| <b>Postal Code:</b> 835203  |   |
| <b>State:</b> Jharkhand   |   |
| <b>Country:</b> India   |   |
| <b>Sample type:</b> AMBIENT AIR QUALITY MONITORING                  |   |
| <b>Marks on Sample:</b> Location: Orsa Village                      |   |
| <b>Sample collected on:</b> 12.09.2018                              |   |

| LOCATION / IDENTIFICATION: Orsa Village |  |                   |                |               |
|---|--|-------------------|----------------|---------------|
| Sl. No.                                 | PARAMETERS   | UNIT              | Standard Limit | Concentration |
| 01.                                     | Particulate Matter (size less than 10 µm) PM <sub>10</sub>   | µg/m <sup>3</sup> | 100            | 40            |
| 02.                                     | Particulate Matter (size less than 2.5 µm) PM <sub>2.5</sub> | µg/m <sup>3</sup> | 60             | 19            |
| 03.                                     | Sulphur Dioxide (SO <sub>2</sub> )                           | µg/m <sup>3</sup> | 80             | 2.0           |
| 04.                                     | Nitrogen Dioxide (NO <sub>2</sub> )                          | µg/m <sup>3</sup> | 80             | 3.3           |
| 05.                                     | Ammonia (NH <sub>3</sub> )                                   | µg/m <sup>3</sup> | 400            | 3.9           |
| 06.                                     | Ozone (O <sub>3</sub> )                                      | µg/m <sup>3</sup> | 180            | 9.1           |
| 07.                                     | Carbon Monoxide (CO)   | mg/m <sup>3</sup> | 02             | 0.22          |
| 08.                                     | Lead (Pb)  | µg/m <sup>3</sup> | 1.0            | 0.03          |
| 09.                                     | Nickel (Ni)  | ng/m <sup>3</sup> | 20             | 1.9           |
| 10.                                     | Arsenic (As)   | ng/m <sup>3</sup> | 06             | 2.0           |
| 11.                                     | Benzene (C <sub>6</sub> H <sub>6</sub> )                     | µg/m <sup>3</sup> | 05             | 2.1           |
| 12.                                     | Benzo (a) Pyrene   | µg/m <sup>3</sup> | 01             | 0.33          |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey  
SENIOR EXECUTIVE





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Hindalco Industries:

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|   |   |
|---|---|
| <b>Report no:</b> MEEPL/OCT0161/2018-19                             | <b>Date:</b> 10 <sup>th</sup> October, 2018 |
| <b>Sample described by customer:</b> AMBIENT AIR QUALITY MONITORING |   |
| <b>Client Name:</b> Hindalco Industries Limited                     |   |
| <b>Client Address:</b> Lohardaga                                    |   |
| <b>Postal Code:</b> 835203  |   |
| <b>State:</b> Jharkhand   |   |
| <b>Country:</b> India   |   |
| <b>Sample type:</b> AMBIENT AIR QUALITY MONITORING                  |   |
| <b>Marks on Sample:</b> Location: Near ChiroKukud Mines Office      |   |
| <b>Sample collected on:</b> 12.09.2018                              |   |

| LOCATION / IDENTIFICATION: Near Chiro Kukud Mines Office |  |                   |                |               |
|--|--|-------------------|----------------|---------------|
| Sl. No.  | PARAMETERS   | UNIT              | Standard Limit | Concentration |
| 01.  | Particulate Matter (size less than 10 µm) PM <sub>10</sub>   | µg/m <sup>3</sup> | 100            | 53            |
| 02.  | Particulate Matter (size less than 2.5 µm) PM <sub>2.5</sub> | µg/m <sup>3</sup> | 60             | 27            |
| 03.  | Sulphur Dioxide (SO <sub>2</sub> )                           | µg/m <sup>3</sup> | 80             | 2.8           |
| 04.  | Nitrogen Dioxide (NO <sub>2</sub> )                          | µg/m <sup>3</sup> | 80             | 3.2           |
| 05.  | Ammonia (NH <sub>3</sub> )                                   | µg/m <sup>3</sup> | 400            | 4.2           |
| 06.  | Ozone (O <sub>3</sub> )                                      | µg/m <sup>3</sup> | 180            | 9.7           |
| 07.  | Carbon Monoxide (CO)   | mg/m <sup>3</sup> | 02             | 0.29          |
| 08.  | Lead (Pb)  | µg/m <sup>3</sup> | 1.0            | 0.03          |
| 09.  | Nickel (Ni)  | ng/m <sup>3</sup> | 20             | 1.7           |
| 10.  | Arsenic (As)   | ng/m <sup>3</sup> | 06             | 2.0           |
| 11.  | Benzene (C <sub>6</sub> H <sub>6</sub> )                     | µg/m <sup>3</sup> | 05             | 2.2           |
| 12.  | Benzo (a) Pyrene   | µg/m <sup>3</sup> | 01             | 0.30          |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey  
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Hindalco Industries:

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|   |   |
|---|---|
| <b>Report no:</b> MEEPL/OCT0162/2018-19                             | <b>Date:</b> 10 <sup>th</sup> October, 2018 |
| <b>Sample described by customer:</b> AMBIENT AIR QUALITY MONITORING |   |
| <b>Client Name:</b> Hindalco Industries Limited                     |   |
| <b>Client Address:</b> Lohardaga                                    |   |
| <b>Postal Code:</b> 835203  |   |
| <b>State:</b> Jharkhand   |   |
| <b>Country:</b> India   |   |
| <b>Sample type:</b> AMBIENT AIR QUALITY MONITORING                  |   |
| <b>Marks on Sample:</b> Location: Near Saraidih Hospital            |   |
| <b>Sample collected on:</b> 12.09.2018                              |   |

| LOCATION / IDENTIFICATION: Near Saraidih Hospital |  |                   |                |               |
|---|--|-------------------|----------------|---------------|
| Sl. No.   | PARAMETERS   | UNIT              | Standard Limit | Concentration |
| 01.   | Particulate Matter (size less than 10 µm) PM <sub>10</sub>   | µg/m <sup>3</sup> | 100            | 45            |
| 02.   | Particulate Matter (size less than 2.5 µm) PM <sub>2.5</sub> | µg/m <sup>3</sup> | 60             | 23            |
| 03.   | Sulphur Dioxide (SO <sub>2</sub> )                           | µg/m <sup>3</sup> | 80             | 2.7           |
| 04.   | Nitrogen Dioxide (NO <sub>2</sub> )                          | µg/m <sup>3</sup> | 80             | 3.9           |
| 05.   | Ammonia (NH <sub>3</sub> )                                   | µg/m <sup>3</sup> | 400            | 4.2           |
| 06.   | Ozone (O <sub>3</sub> )                                      | µg/m <sup>3</sup> | 180            | 10.1          |
| 07.   | Carbon Monoxide (CO)   | mg/m <sup>3</sup> | 02             | 0.27          |
| 08.   | Lead (Pb)  | µg/m <sup>3</sup> | 1.0            | 0.02          |
| 09.   | Nickel (Ni)  | ng/m <sup>3</sup> | 20             | 1.9           |
| 10.   | Arsenic (As)   | ng/m <sup>3</sup> | 06             | 2.3           |
| 11.   | Benzene (C <sub>6</sub> H <sub>6</sub> )                     | µg/m <sup>3</sup> | 05             | 2.0           |
| 12.   | Benzo (a) Pyrene   | µg/m <sup>3</sup> | 01             | 0.30          |

For Mahabal Enviro Engineers Pvt. Ltd.

**Vijay Pandey**  
SENIOR EXECUTIVE



Annexure-2

**BREAK UP THE COST OF ENVIRONMENTAL MEASURES DURING April'18 to Sept'18**

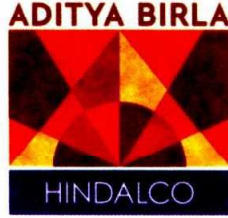
The composite cost during **April'18 to Sept'18** for environmental protection & pollution control by Jharkhand Mines division of M/s Hindalco Industries Ltd & M/s Minerals & Minerals Ltd for implementation of the suggested measures in EC at our all the operating mines in the state of Jharkhand-namely 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).

| SI No | Description   | Budget (in Rupees)<br>FY 2018-19 | Actual (in Rupees)<br>(from April'18 to Sep'2018) |
|-------|---|----------------------------------|---|
| 1     | Pollution Control & Environment monitoring          | 1521000                          | 8,82,300.00                                       |
| 2     | Reclamation/ Back filing & Rehabilitation**         | 29200000                         | 1,49,78,461.39                                    |
| 3     | Green belt, Plantation & Water spraying arrangement | 4500256                          | 25,38,864.95                                      |
| 4     | Rural Development                                   | 26025236                         | 1,32,42,312.42                                    |

\*\*Part of OB removed cost.



(Basudev Gangopadhyay)  
Convenor (Quality & Environment)



Date: 03.04.17

### Office Order

Environmental Cell has been re-constituted at Orsa Bauxite Mines (Area 196.36 Ha) comprising below mentioned team members. The team will ensure compliance of Environment Act, Regulation & Rule in respect of the said mines of Hindalco Industries Limited.

1. Mr. Rajesh Ambastha (Coordinator)
2. Mr. Tapas Gachhayat (Member)
3. Mr. Satyendra Sharma –Foreman (Member)
4. Mr. Narendra Singh –Mining Mate (Member)

Basudev Gangopadhyay  
Convenor (Quality & Environment)

## Annexure-4

| Sl No | Name of the Mines          | Mining lease area (ha) | Production capacity(mt)* | Lease Period *           | Production (MT) | Mined out area (ha) | Back filled area (ha) | Over burden (Cu.M) |
|-------|----------------------------|------------------------|--------------------------|--------------------------|-----------------|---------------------|-----------------------|--------------------|
| 1     | Bagru bauxite Mine         | 75.41                  | 85000                    | 22-01-1974 to 31-03-2030 | nil             | nil                 | nil                   | nil                |
| 2     | Bhusar Bauxite Mine        | 65.31                  | 280000                   | 11-07-1981 to 31-03-2030 | 106353          | 0.168               | 1.711                 | 112376             |
| 3     | Hisri (New) Bauxite Mine   | 14.55                  | 100000                   | 19-07-1981 to 31-03-2030 | 38172           | 0.742               | 0.467                 | 29252              |
| 4     | Kujam - I Bauxite Mine     | 80.87                  | 150000                   | 13-03-2006 to 12-03-2056 | 60550           | 1.64                | 1.37                  | 40287              |
| 5     | Kujam - II Bauxite Mine    | 157.38                 | 300000                   | 24-03-2006 to 23-03-2056 | 114325          | 4.68                | 3.78                  | 122769             |
| 6     | Amtipani Bauxite Mine      | 190.95                 | 150000                   | 13-03-2006 to 12-03-2056 | 83810           | 12                  | 8                     | 96051              |
| 7     | Gurdari Bauxite Mine       | 584.19                 | 325000                   | 23-03-1985 to 22-03-2035 | 173295          | 4.6                 | 8.59                  | 251277             |
| 8     | Shrengdag A Bauxite Mine   | 155.81                 | 260000                   | 16-10-1974 to 31-03-2030 | 108900          | 1.21                | 1.62                  | 162637             |
| 9     | Shrengdag B Bauxite Mine   | 140.07                 | 100000                   | 04-10-1978 to 31-03-2030 | 36100           | 1.21                | 0.72                  | 46930              |
| 10    | Jalim & Sanai Bauxite Mine | 12.14                  | 50000                    | 16-10-1974 to 31-03-2030 | 18600           | 0.36                | 0.12                  | 49104              |
| 11    | Orsapat Bauxite Mine       | 196.36                 | 200000                   | 17-07-1986 to 16-07-2036 | 1470            | 0                   | 0                     | 2185               |



|  |                          |         |        |                                |        |       |      |        |  |
|--|--------------------------|---------|--------|--------------------------------|--------|-------|------|--------|--|
| 12                                     | Chiro Kukud bauxite Mine | 152.57  | 100000 | 29-01-1985<br>to<br>28-01-2035 | 1970   | 0.113 | 0    | 13168  |  |
| 13                                     | Pakhar (8.09)            | 8.09    | 80000  | 16-05-1973<br>to<br>31-03-2030 | nil    | nil   | nil  | nil    |  |
| 14                                     | Pakhar (35.12)           | 35.12   | 200000 | 17-04-1975<br>to<br>31-03-2030 | nil    | nil   | nil  | nil    |  |
| 15                                     | Pakhar (115.13)          | 115.13  | 300000 | 19-07-1996<br>to<br>31-03-2030 | 111995 | 1.01  | 0.65 | 70700  |  |
| <b>Minerals &amp; Minerals Limited</b> |                          |         |        |                                |        |       |      |        |  |
| 16                                     | Pakhar (15.58)           | 15.58   | 60000  | 28-04-1965<br>to<br>31-03-2030 | 27475  | 0.35  | 0.15 | 26250  |  |
| 17                                     | Pakhar (109.507)         | 109.507 | 280000 | 26-07-2008<br>to<br>25-07-2058 | 151240 | 1.05  | 0.5  | 78750  |  |
| 18                                     | Bimarla Bauxite Mine     | 134.526 | 300000 | 18-07-2009<br>to<br>17-07-2059 | 89315  | 3.108 | 1.61 | 203116 |  |

**\*Static information about the mines included in the above table**



**Basudev Gangopadhyay**

**Convenor (Quality & Environment)**