



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

Date: 28.05.2016

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 Pakhar (8.09 ha) Bauxite Mining project of M/s Hindalco Industries Limited located in Lohardaga, Jharkhand for the period Oct'15 to march'16.

Ref: Environmental Clearance letter no J-11015/135/2006-IA II (M) dated 24th January 2007

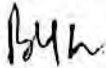
Sir,

With reference to the above, we are submitting herewith the Compliance status report of EC conditions for **Pakhar (8.09 ha)** Bauxite Mining project of M/s Hindalco located in Lohardaga, Jharkhand for the period Oct'15 to March'16.

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

Copy to: Member Secretary, JSPCB, Ranchi
RO, JSPCB, Ranchi
<mef@ori.nic.in>, <mef@nic.in>, <mef.or@nic.in>, mef.or@nic.in

Compliance of conditions laid down in Environmental Clearance

PAKHAR (8.09 ha) BAUXITE MINES

Period: Period: Oct'15-March'16

J-11015/135 /2006-IA.II (M) Dated 24.1.2007

| Sl No | Specific Conditions | Compliance Status |
|--------------|--|--|
| 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 and Cabinet approval on recommendation of DC who is the competent authority to give permission for using the agricultural land for non-agricultural purpose. |
| 3 | 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. | Mining operation could not be carried out in this lease during the financial year 2015-16 due to exhaustion of mineral reserve. Final Mine closure Plan has been approved by Indian Bureau of Mines. We are in the process of implementation of Final Mine closure. |
| 4 | The project proponent shall ensure that no natural watercourse shall be obstructed due to any mining operation. | It is being ensured .No natural water course is obstructed during mining. |
| 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. | Topsoil is being used for backfilling to reclaim and restore the damage area upto the extent possible. Mining operation could not be carried out in this lease during the financial year 2015-16 due to exhaustion of mineral reserve. |
| 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 monthly basis. | Mining operation could not be carried out in this lease during the financial year 2015-16 due to exhaustion of mineral reserve. |

| | | |
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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 generated from mining activities. However to collect & manage rain water during monsoon, part of mined out area is used as settling tank for the runoff. Sediment rain water is being used for watering the mine area, roads, green belt development etc. Mining operation could not be carried out in this lease during the financial year 2015-16 due to exhaustion of mineral reserve.</p> |
| 8 | <p>Plantation shall be raised in an area of 6.35 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 2015-16, About 200 plantation carried out in this lease.</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>A plan is drawn on the basis of discussions with Scientists of State unit office of Central Ground Water Board, Ranchi to implement suitable conservation measures to augment ground water resources in the area and is also submitted to the Regional Director, Central Ground Water Board, Patna, for his further suggestions. Recommendation of CGWB will be implemented to augment the ground water resources of the Pakhar plateau. Mining operation could not be carried out in this lease during the financial year 2015-16 due to exhaustion of mineral reserve.</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</p> | <p>It is being monitored. Monitoring report is enclosed as Annexure</p> |

| | | |
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| | Authority and Regional Director Central Ground Water Board. | |
| 11 | Prior permission from the competent authority should be obtained for drawl of water from the surface water bodies. | As per the terms and conditions in Mining lease deed, we have the liberty to use water. Water cess is being paid on monthly basis to State Pollution Control Board. |
| 12 | 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 & repaired. Mining operation could not be carried out in this lease during the financial year 2015-16 due to exhaustion of mineral reserve. |
| 13 | Drills should either be operated with dust extractors or should be equipped with water injection system. | Wet drilling is being done in the holes intermittently for dust suppression. Mining operation could not be carried out in this lease during the financial year 2015-16 due to exhaustion of mineral reserve. |
| 14 | 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. | Mining operation could not be carried out in this lease during the financial year 2015-16 due to exhaustion of mineral reserve. |
| 15 | Consent to operate should be obtained from SPCB prior to start of enhanced production from the mine. | There is no proposal for production enhancement. |
| 16 | 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 discharge from Mine; hence ETP has not been installed. The sewage water from domestic uses is being collected through individual septic tanks & soak pits. Sludge is collected to an integrated soak pit. Arrangement has been made for Pakhar group of Mines. |
| 17 | The project proponent should take all precautionary measures during mining operation for conservation and protection of endangered fauna such as Indian Python 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 has been prepared based on discussions with D.F.O of the area for implementation and a copy of the same is submitted to the D.F.O, on receipt of any suggestion to our action plan the same will be intimated to MOEF. A copy of Action plan drawn and of letter for submission to DFO is all ready submitted to regional office. |

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| 18 | A Final Mine Closure plan along with details of Corpus Fund should be submitted to the Ministry of Environment & Forest 5 years in advance of final mine closure for approval. | Final Mine closure plan dully approved by Indian Bureau of Mines. |
|----|--|---|

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 adhered to. |
| 2 | No change in the calendar plan including excavation, quantum of mineral bauxite and waste should be made. | Mining has not been carried out in this lease during the financial year 2015-16 due to exhaustion of mineral reserve. |
| 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 locations have been fixed after due consultation of SPCB and regular monitoring is being carried out. Monitoring Reports is enclosed. |
| 4 | Data on ambient air quality (RPM, SPM, SO ₂ , and 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. | Regular monitoring is being carried out. Monitoring Reports 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. | Water tanker have been provided for sprinkling of water on haul roads and are generally being engaged at the places where active mining is in progress to contain fugitive dust. Water spraying at dust prone areas is also being done manually. |
| 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. | Mining operation could not be carried out in this lease during the financial year 2015-16 due to exhaustion of mineral reserve. |

| | | |
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| 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. | Complied. There is no effluent discharge from Mine. Workshop has an Oil Catchment Pit to trap oil and grease. Mining has not been carried out in this lease during the financial year 2015-16 due to exhaustion of mineral reserve. |
| 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. | Mining operation could not be carried out in this lease during the financial year 2015-16 due to exhaustion of mineral reserve. |
| 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. | Mining operation could not be carried out in this lease during the financial year 2015-16 due to exhaustion of mineral reserve. |
| 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. | The mine is running since 1976. Yearly date of financial closure is 31 st March. |
| 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 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 |

| | | |
|----|--|--|
| 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. |



Eco Ventures Pvt. Ltd.

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Mahabal Enviro Engineers Pvt. Ltd.

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

PAKHAR PLATEAU- ENVIRONMENTAL MONITORING REPORT

January to March 2016

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey
SENIOR EXECUTIVE





Mahabal Enviro Engineers Pvt. Ltd.

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Hindalco Industries:Environmental Monitoring report

Jan- Mar 2016

CONTENT

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| 1 | Pakhar Plateau- Pakhar Hindalco Colony |
| 2 | Pakhar Plateau- Pakhar (115.13 ha.) Quarry No. 4 |
| 3 | Pakhar Plateau- Pakhar 109.507 ha. (Minerals & Minerals) Working Pit |
| 4 | Pakhar Plateau Pakhar Mines(15.58 ha, Minerals & Minerals) |
| | NOISE LEVEL |
| 1 | Pakhar HINDALCO Colony |
| 2 | Pakhar Mine (115.13 ha.) Pakhar Plateau |
| 3 | Pakhar Mine (109.507 ha. Minerals & Minerals) Pakhar Plateau |
| 4 | Pakhar Mine (15.58 ha. Minerals & Minerals) Pakhar Plateau |
| | SPOT NOISE LEVEL |
| 1 | Near Poclain at Pakhar Mine (115.13 ha.) |
| 2 | Loading point near Dumper at Pakhar Mines (109.507 ha. Minerals & Minerals) |
| | DRINKING WATER |
| 1 | Canteen Drinking Water of Pakhar Mines |





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Hindalco Industries: Environmental Monitoring report

Jan- Mar 2016

| | |
|--|---|
| Report No: MEEPL/MAR 177/2015-16 | Date: 31st March 2016 |
| 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: Pakhar Plateau- Pakhar Hindalco Colony | |
| Sample collected on: 14.02.2016 | |
| Received: 15.02.2016 | |
| Registered: 15.02.2016 | |
| Test Start/End Date: 16.02.2016/17.02.2016 | |

| LOCATION/IDENTIFICATION: Sherengdag Plateau-Shrengdag Mines 155.81 ha. | | | | | |
|--|-------------------|-------------------|-------|---------------------------------------|---------------|
| PARAMETERS | | UNIT | LIMIT | METHOD | Concentration |
| Sulphur Dioxide | SO ₂ | µg/m ³ | 80 | IS:5182 (Part-2):2001 (Reaff:2006) | 25.1 |
| Nitrogen Dioxide | NO ₂ | µg/m ³ | 80 | IS:5182(Part-6):1975 (Reaff:2004) | 26.5 |
| Particulate Matter (size less than 10 µm) | PM ₁₀ | µg/m ³ | 100 | IS:5182 (Part 23) | 58.0 |
| Particulate Matter (size less than 2.5 µm) | PM _{2.5} | µg/m ³ | 60 | USEPA CFR(40) Appendix-L | 32.1 |
| Carbon Monoxide | CO | mg/m ³ | 2 | EPA 600/P-99/001F | 0.12 |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey

SENIOR EXECUTIVE





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Hindalco Industries: Environmental Monitoring report

Jan- Mar 2016

| | |
|--|---|
| Report No: MEEPL/MAR 178/2015-16 | Date: 31st March 2016 |
| 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: Pakhar Plateau- Pakhar (115.13 ha.) Quarry No. 4 | |
| Sample collected on: 14.02.2016 | |
| Received: 15.02.2016 | |
| Registered: 15.02.2016 | |
| Test Start/End Date: 16.02.2016/17.02.2016 | |

| LOCATION/IDENTIFICATION: Pakhar Plateau- Pakhar (115.13 ha.) Quarry No. 4 | | | | | |
|---|-------------------|-------------------|-------|------------------------------------|---------------|
| PARAMETERS | | UNIT | LIMIT | METHOD | Concentration |
| Sulphur Dioxide | SO ₂ | µg/m ³ | 80 | IS:5182 (Part-2):2001 (Reaff:2006) | 58.2 |
| Nitrogen Dioxide | NO ₂ | µg/m ³ | 80 | IS:5182(Part-6):1975 (Reaff:2004) | 62.5 |
| Particulate Matter (size less than 10 µm) | PM ₁₀ | µg/m ³ | 100 | IS:5182 (Part 23) | 69.8 |
| Particulate Matter (size less than 2.5 µm) | PM _{2.5} | µg/m ³ | 60 | USEPA CFR(40) Appendix-L | 41.2 |
| Carbon Monoxide | CO | mg/m ³ | 2 | EPA 600/P-99/001F | 0.52 |

For Mahabal Enviro Engineers Pvt. Ltd.

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Hindalco Industries: Environmental Monitoring report

Jan- Mar 2016

| | |
|--|---|
| Report No: MEEPL/MAR 179/2015-16 | Date: 31st March 2016 |
| 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: Pakhar Plateau- Pakhar 109.507 ha. (Minerals & Minerals) working Pit | |
| Sample collected on: 14.02.2016 | |
| Received: 15.02.2016 | |
| Registered: 15.02.2016 | |
| Test Start/End Date: 16.02.2016/17.02.2016 | |

| LOCATION/IDENTIFICATION: Pakhar Plateau- Pakhar 109.507 ha. (Minerals & Minerals) working Pit | | | | | |
|---|-------------------|-------------------|-------|---------------------------------------|---------------|
| PARAMETERS | | UNIT | LIMIT | METHOD | Concentration |
| Sulphur Dioxide | SO ₂ | µg/m ³ | 80 | IS:5182 (Part-2):2001 (Reaff:2006) | 29.1 |
| Nitrogen Dioxide | NO ₂ | µg/m ³ | 80 | IS:5182(Part-6):1975 (Reaff:2004) | 42.1 |
| Particulate Matter (size less than 10 µm) | PM ₁₀ | µg/m ³ | 100 | IS:5182 (Part 23) | 72.1 |
| Particulate Matter (size less than 2.5 µm) | PM _{2.5} | µg/m ³ | 60 | USEPA CFR(40) Appendix-L | 43.2 |
| Carbon Monoxide | CO | mg/m ³ | 2 | EPA 600/P-99/001F | 0.21 |

For Mahabal Enviro Engineers Pvt. Ltd.

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Hindalco Industries: Environmental Monitoring report

Jan- Mar 2016

| | |
|---|---|
| Report No: MEEPL/MAR 180/2015-16 | Date: 31st March 2016 |
| 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: Pakhar Plateau Pakhar Mines(15.58 ha, Minerals & Minerals) | |
| Sample collected on: 14.02.2016 | |
| Received: 15.02.2016 | |
| Registered: 15.02.2016 | |
| Test Start/End Date: 16.02.2016/17.02.2016 | |

LOCATION/IDENTIFICATION: Pakhar Plateau Pakhar Mines(15.58 ha, Minerals & Minerals)

| PARAMETERS | | UNIT | LIMIT | METHOD | Concentration |
|--|-------------------|-------------------|-------|---------------------------------------|---------------|
| Sulphur Dioxide | SO ₂ | µg/m ³ | 80 | IS:5182 (Part-2):2001 (Reaff:2006) | 11.2 |
| Nitrogen Dioxide | NO _x | µg/m ³ | 80 | IS:5182 (Part-6):1975(Reaff:2004) | 20.1 |
| Particulate Matter (size less than 10 µm) | PM ₁₀ | µg/m ³ | 100 | IS:5182 (Part-23) | 52.5 |
| Particulate Matter (size less than 2.5 µm) | PM _{2.5} | µg/m ³ | 60 | USEPA CFR (40) Appendix-L | 41.2 |
| Carbon Monoxide | CO | µg/m ³ | 2 | EPA 600/P-99/001F | 0.11 |

For Mahabal Enviro Engineers Pvt. Ltd.

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Hindalco Industries: Environmental Monitoring report

Jan- Mar 2016

| | |
|---|---|
| Report No: MEEPL/MAR 181/2015-16 | Date: 31st March 2016 |
| Sample described by customer: Measurement of Noise | |
| Client Name: Hindalco Industries Limited | |
| Client Address: Lohardaga | |
| Postal Code: 835203 | |
| State: Jharkhand | |
| Country: India | |
| Sample Description: Measurement of Noise | |
| Sampling Method: Instrumental, using Sound level Metter | |
| Data Collection Date: 14.02.2016 | |
| Analyse Date: 14.02.2016 | |

| Location/Identification | Unit | Limit (day) | Result | Limit (night) | Result | Dates |
|-------------------------|-----------------|-------------|--------|---------------|--------|------------|
| Pakhar HINDALCO Colony | dB (A) L_{eq} | 75 | 52.1 | 70 | 43 | 14/02/2016 |

For Mahabal Enviro Engineers Pvt. Ltd.

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Hindalco Industries: Environmental Monitoring report

Jan- Mar 2016

| | |
|---|---|
| Report No: MEEPL/MAR 182/2015-16 | Date: 31st March 2016 |
| Sample described by customer: Measurement of Noise | |
| Client Name: Hindalco Industries Limited | |
| Client Address: Lohardaga | |
| Postal Code: 835203 | |
| State: Jharkhand | |
| Country: India | |
| Sample Description: Measurement of Noise | |
| Sampling Method: Instrumental, using Sound level Metter | |
| Data Collection Date: 14.02.2016 | |
| Analyse Date: 14.02.2016 | |

| Location/Identification | Unit | Limit (day) | Result | Limit (night) | Result | Dates |
|---------------------------|------------|-------------|--------|---------------|--------|------------|
| Pakhar Mines (115.13 ha.) | dB (A) Leq | 75 | 64.0 | 70 | 44.5 | 14/02/2016 |

For Mahabal Enviro Engineers Pvt. Ltd.

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Hindalco Industries: Environmental Monitoring report

Jan- Mar 2016

| | |
|---|---|
| Report No: MEEPL/MAR 183/2015-16 | Date: 31st March 2016 |
| Sample described by customer: Measurement of Noise | |
| Client Name: Hindalco Industries Limited | |
| Client Address: Lohardaga | |
| Postal Code: 835203 | |
| State: Jharkhand | |
| Country: India | |
| Sample Description: Measurement of Noise | |
| Sampling Method: Instrumental, using Sound level Metter | |
| Data Collection Date: 14.02.2016 | |
| Analyse Date: 14.02.2016 | |

| Location/Identification | Unit | Limit (day) | Result | Limit (night) | Result | Dates |
|--|------------|-------------|--------|---------------|--------|------------|
| Pakhar Mine (109.507 ha. of Minerals & Minerals) | dB (A) Leq | 75 | 63.0 | 70 | 41.5 | 14/02/2016 |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey
SENIOR EXECUTIVE



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(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.

Branch Office:

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E-mail: mahabalranchi@gmail.com

Hindalco Industries: Environmental Monitoring report

Jan- Mar 2016

| | |
|---|---|
| Report No: MEEPL/MAR 184/2015-16 | Date: 31st March 2016 |
| Sample described by customer: Measurement of Noise | |
| Client Name: Hindalco Industries Limited | |
| Client Address: Lohardaga | |
| Postal Code: 835203 | |
| State: Jharkhand | |
| Country: India | |
| Sample Description: Measurement of Noise | |
| Sampling Method: Instrumental, using Sound level Metter | |
| Data Collection Date: 14.02.2016 | |
| Analyse Date: 14.02.2016 | |

| Location/Identification | Unit | Limit (day) | Result | Limit (night) | Result | Dates |
|--|------------|-------------|--------|---------------|--------|------------|
| Pakhar Mine (15.58 ha. of minerals & Minerals) | dB (A) Leq | 75 | 58.0 | 70 | 41.2 | 14/02/2016 |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey

SENIOR EXECUTIVE





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Hindalco Industries: Environmental Monitoring report

Jan- Mar 2016

| | |
|---|---|
| Report No: MEEPL/MAR 185/2015-16 | Date: 31st March 2016 |
| Sample described by customer: Measurement of Spot Noise | |
| 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: 14.02.2016 | |
| Analyse Date: 14.02.2016 | |

| Location/Identification | Unit | Limit (day) | Result | Dates |
|---|------------------------|-------------|--------|------------|
| Pakhar Mines (115.13 ha.) Near Poclairn | dB (A) L _{eq} | 75 | 64.0 | 14/02/2016 |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey

SENIOR EXECUTIVE



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Hindalco Industries: Environmental Monitoring report

Jan- Mar 2016

| | |
|---|---|
| Report No: MEEPL/MAR 186/2015-16 | Date: 31st March 2016 |
| Sample described by customer: Measurement of Spot Noise | |
| 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: 14.02.2016 | |
| Analyse Date: 14.02.2016 | |

| Location/Identification | Unit | Limit (day) | Result | Dates |
|--|------------|-------------|--------|------------|
| Pakhar Mines (109.507 ha. Of Minerals & Minerals) Loading point near Dumper | dB (A) Leq | 75 | 70.0 | 14/02/2016 |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey
SENIOR EXECUTIVE





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Hindalco Industries: Environmental Monitoring report

Jan- Mar 2016

| | |
|---|---|
| Report No: MEEPL/MAR 187/2015-16 | Date: 31st March 2016 |
| Sample described by customer : DRINKING WATER-POTABILITY | |
| Client Name: Hindalco Industries Limited | |
| Client Address: Lohardaga | |
| Postal Code: 835203 | |
| State: Jharkhand | |
| Country: India | |
| Sample Type: DRINKING WATER-POTABILITY | |
| Marks on Sample: Location: Canteen Drinking Water of Pakhar Mines | |
| Sample collected on: 14.02.2016 | |
| Quantity: 5 L X 2 No. PVC Can | |
| Received: 15.02.2016 | |
| Registered: 15.02.2016 | |
| Test Start/End Date: 16.02.2016/20.02.2016 | |

| Sl. No. | Parameters | Unit | Result | Acceptable Limit (IS 10500:2012) | Method reference |
|---------|--|-------|-----------|----------------------------------|---|
| 1 | Colour | Hazen | <1 | 5 Max | APHA 22 nd 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 | 0.2 | 1 Max | APHA 22 nd Ed. 2012, 2130-B, 2-13 |
| 5 | pH | -- | 6.2 | 6.5-8.5 | APHA 22 nd Ed. 2012, 4500-H+-B, 4-92 |
| 6 | Free Chlorides (Residual) | mg/l | <0.05 | 0.2 min | APHA 22 nd Ed. 2012, 4500-CI-G, 4-69 |
| 7 | Total Dissolved Solids | mg/l | 72 | 500 max | IS 3025 (Part 16): 1984, Reaffirmed 2006 |
| 8 | Monochloramines | mg/l | <0.05 | -- | APHA 22 nd Ed. 2012, 4500-CIG, 4-69 |
| 9 | Dichloramines | mg/l | <0.05 | -- | APHA 22 nd Ed. 2012, 4500-CIG, 4-69 |
| 10 | Total hardness (as CaCO ₃) | mg/l | 60 | 200 max | APHA 22 nd Ed. 2012, 4500-CIG, 4-69 |
| 11 | Alkalinity Total (as CaCO ₃) | mg/l | 68 | 200 max | IS 3025 (Part 237): 1986, Reaffirmed 2009 |
| 12 | Chloride (as Cl) | mg/l | 15 | 250 max | APHA 22 nd Ed. 2012, 4500-CI-b, 4-72 |
| 13 | Sulphate (as SO ₄) | mg/l | 7 | 200 max | APHA 22 nd Ed. 2012, 4500-so4-e, 4-190 |



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Hindalco Industries: Environmental Monitoring report

Jan- Mar 2016

Continuation Sheet

| Sl. No. | Parameters | Unit | Result | Acceptable Limit (IS 10500:2012) | Method Reference |
|---------|--|------|--------|----------------------------------|--|
| 14 | Nitrate (as NO ₃) | mg/l | 1.5 | 45 max | APHA 22 nd Ed. 2012, 4500-NO ₃ -E, 4-125 |
| 15 | Fluoride (as F) | mg/l | 0.23 | 1 max | APHA 22 nd Ed. 2012, 4500-FB & D, 4-84, 4-87 |
| 16 | Boron (as B) | mg/l | 0.15 | 0.5 max | APHA 22 nd Ed. 2012, 4500-BB, 4-25 |
| Sl. No. | Parameters | Unit | Result | Acceptable Limit (IS 10500:2012) | Method reference |
| 17 | Calcium (as Ca) | mg/l | 24.2 | 75 max | APHA 22 nd Ed. 2012, 3500-Ca-B, 3-67 |
| 18 | Magnesium (as Mg) | mg/l | 3.9 | 30 max | APHA 22 nd Ed. 2012, 3500-Mg-B, 3-84 |
| 19 | Ammonical Nitrogen/Total Ammonia | mg/l | <0.1 | -- | APHA 22 nd Ed. 2012, 4500-NH ₃ -F, 4-115 |
| 20 | Iron (as Fe) | mg/l | 0.10 | 0.3 max | APHA 22 nd Ed. 2012, 3111-B, 3-18 |
| 21 | Manganese (as Mn) | mg/l | N.D | 0.1 max | APHA 22 nd Ed. 2012, 3111-B, 3-18 |
| 22 | Aluminium (as Al) | mg/l | 0.02 | 0.03 max | APHA 22 nd Ed. 2012, 3500-Al-B, 3-61 |
| 23 | Cadmium (as Cd) | mg/l | N.D | 0.003 max | APHA 22 nd Ed. 2012, 3111-B, 3-18 |
| 24 | Chromium Total (as Cr) | mg/l | N.D | 0.05 max | APHA 22 nd Ed. 2012, 3111-B, 3-18 |
| 25 | Copper (as Cu) | mg/l | N.D | 0.05 max | APHA 22 nd Ed. 2012, 3111-B, 3-18 |
| 26 | Lead (as Pb) | mg/l | N.D | 0.01 max | APHA 22 nd Ed. 2012, 3111-B, 3-18 |
| 27 | Zinc (as Zn) | mg/l | 0.03 | 5 max | APHA 22 nd Ed. 2012, 3111-B, 3-18 |
| 28 | Arsenic (as As) | mg/l | <0.01 | 0.01 max | APHA 22 nd Ed. 2012, 3114-B, 3-38 |
| 29 | Selenium (as Se) | mg/l | N.D | 0.001 max | APHA 22 nd Ed. 2012, 3112-B, 3-23 |
| 30 | Mercury (as hg) | mg/l | N.D | 0.01 max | APHA 22 nd Ed. 2012, 3114-B, 3-38 |
| 31 | Nickel (as Ni) | mg/l | <0.06 | 0.02 max | APHA 22 nd 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 nd ED. 2012, 4500-CN.C & 4-39 & 4-44 |
| 34 | Anionic detergents as MBAS | mg/l | <0.1 | 0.2 max | APHA 22 nd ED. 2012, 5540-C.C & 5-53 |
| 35 | Phenolic compounds (as C ₆ H ₅ OH) | mg/l | N.D | 0.001 max | APHA 22 nd ED. 2012, 5530-B & C 5-4753 |
| 36 | Polynuclear aromatic hydrocarbons (PAH) | mg/l | N.D | 0.0001 max | APHA 22 nd ED. 2012, 6440, 6-93 |
| 37 | Polychlorinated Biphenyls (PCBs) | mg/l | N.D | 0.0005max | USEPA Method 8082 |
| 38 | Sulphide (as S) | mg/l | N.D | 0.05 max | APHA 22 nd ED. 2012, 4500-S2-C 4-175 & F 4-178 |





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Hindalco Industries: Environmental Monitoring report

Jan- Mar 2016

Continuation Sheet

| Sl. No. | Parameters | Unit | Result | Acceptable Limit (IS 10500:2012) | Method Reference |
|---------------------------------|---------------------|-----------|--------|----------------------------------|---|
| Microbiological Analysis | | | | | |
| 1 | Total Coliforms | MPN/100mL | <1.1 | N.D | APHA 22 nd Ed. 2012, 9221-B & C, 9-66, 9-69 and 9-67 |
| 2 | E-Coli | MPN/100mL | Absent | N.D | APHA 22 nd Ed. 2012, 9221-B & C, 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 (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 | Б- 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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PAKHAR PLATEAU- ENVIRONMENTAL MONITORING REPORT

OCTOBER - DECEMBER 2015

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey
SENIOR EXECUTIVE





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Hindalco Industries: Environmental Monitoring report

December 2015

| | |
|---|---------------------------------------|
| Report no: : MEEPL/DEC019/2015-16 | Date: 12 th December, 2015 |
| 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: Pakhar Plateau- Pakhar Hindalco Colony Near Weigh Bridge | |
| Sample collected on: 24.11.2015 | |
| Received: 24.11.2015 | |
| Registered: 24.11.2015 | |
| Test Start/End Date: 24.11.2015/28.11.2015 | |

| LOCATION / IDENTIFICATION: Pakhar Plateau- Pakhar Hindalco Colony, Near Weigh Bridge | | | | | |
|--|-------------------|-------------------|-------|---------------------------------------|---------------|
| PARAMETERS | | UNIT | LIMIT | METHOD | Concentration |
| Sulphur Dioxide | SO ₂ | µg/m ³ | 80 | IS:5182 (Part-2):2001 (Reaff:2006) | 28.6 |
| Nitrogen Dioxide | NO ₂ | µg/m ³ | 80 | IS:5182(Part-6):1975 (Reaff:2004) | 34.1 |
| Particulate Matter (size less than 10 µm) | PM ₁₀ | µg/m ³ | 100 | IS:5182 (Part 23) | 63.7 |
| Particulate Matter (size less than 2.5 µm) | PM _{2.5} | µg/m ³ | 60 | USEPA CFR(40) Appendix-L | 38.2 |
| Carbon Monoxide | CO | mg/m ³ | 2 | EPA 600/P-99/001F | 0.16 |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey

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E-mail: mahabalranchi@gmail.com

Hindalco Industries: Environmental Monitoring report

December 2015

| | |
|--|--|
| Report no: : MEEPL/DEC034/2015-16 | Date: 12 th December, 2015 |
| 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: Pakhar Plateau- Pakhar (115.13 ha.) Quarry No. 3 | |
| Sample collected on: 24.11.2015 | |
| Received: 24.11.2015 | |
| Registered: 24.11.2015 | |
| Test Start/End Date: 24.11.2015/28.11.2015 | |

| LOCATION / IDENTIFICATION: Pakhar Plateau- Pakhar (115.13 ha.) Quarry No. 3 | | | | | |
|---|-------------------|-------------------|-------|---------------------------------------|---------------|
| PARAMETERS | | UNIT | LIMIT | METHOD | Concentration |
| Sulphur Dioxide | SO ₂ | µg/m ³ | 80 | IS:5182 (Part-2):2001 (Reaff:2006) | 60.7 |
| Nitrogen Dioxide | NO ₂ | µg/m ³ | 80 | IS:5182(Part-6):1975 (Reaff:2004) | 65.9 |
| Particulate Matter (size less than 10 µm) | PM ₁₀ | µg/m ³ | 100 | IS:5182 (Part 23) | 71.2 |
| Particulate Matter (size less than 2.5 µm) | PM _{2.5} | µg/m ³ | 60 | USEPA CFR(40) Appendix-L | 39.8 |
| Carbon Monoxide | CO | mg/m ³ | 2 | EPA 600/P-99/001F | 0.51 |

For Mahabal Enviro Engineers Pvt. Ltd.

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E-mail: mahabalranchi@gmail.com

Hindalco Industries: Environmental Monitoring report

December 2015

| | |
|---|---------------------------------------|
| Report no: : MEEPL/DEC035/2015-16 | Date: 12 th December, 2015 |
| 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: Pakhar Plateau- Pakhar 109.507 ha. Working Pit | |
| Sample collected on: 24.11.2015 | |
| Received: 24.11.2015 | |
| Registered: 24.11.2015 | |
| Test Start/End Date: 24.11.2015/28.11.2015 | |

| LOCATION / IDENTIFICATION: Pakhar Plateau- Pakhar 109.507 ha. Working Pit | | | | | |
|---|-------------------|-------------------|-------|---------------------------------------|---------------|
| PARAMETERS | | UNIT | LIMIT | METHOD | Concentration |
| Sulphur Dioxide | SO ₂ | µg/m ³ | 80 | IS:5182 (Part-2):2001 (Reaff:2006) | 32.8 |
| Nitrogen Dioxide | NO ₂ | µg/m ³ | 80 | IS:5182(Part-6):1975 (Reaff:2004) | 46.7 |
| Particulate Matter (size less than 10 µm) | PM ₁₀ | µg/m ³ | 100 | IS:5182 (Part 23) | 77.2 |
| Particulate Matter (size less than 2.5 µm) | PM _{2.5} | µg/m ³ | 60 | USEPA CFR(40) Appendix-L | 46.9 |
| Carbon Monoxide | CO | mg/m ³ | 2 | EPA 600/P-99/001F | 0.26 |

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Hindalco Industries: Environmental Monitoring report

December 2015

| | |
|--|--|
| Report no. : MEEPL/DEC036/2015-16 | Date: 12 th December, 2015 |
| 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: Pakhar Plateau- Pakhar Mines (15.58 ha.) | |
| Sample collected on: 24.11.2015 | |
| Received: 24.11.2015 | |
| Registered: 24.11.2015 | |
| Test Start/End Date: 24.11.2015/28.11.2015 | |

| LOCATION / IDENTIFICATION: Pakhar Plateau- Pakhar Mines (15.58 ha.) | | | | | |
|---|-------------------|-------------------|-------|---------------------------------------|---------------|
| PARAMETERS | | UNIT | LIMIT | METHOD | Concentration |
| Sulphur Dioxide | SO ₂ | µg/m ³ | 80 | IS:5182 (Part-2):2001 (Reaff:2006) | 18.2 |
| Nitrogen Dioxide | NO ₂ | µg/m ³ | 80 | IS:5182(Part-6):1975 (Reaff:2004) | 29.7 |
| Particulate Matter (size less than 10 µm) | PM ₁₀ | µg/m ³ | 100 | IS:5182 (Part 23) | 68.6 |
| Particulate Matter (size less than 2.5 µm) | PM _{2.5} | µg/m ³ | 60 | USEPA CFR(40) Appendix-L | 42.6 |
| Carbon Monoxide | CO | mg/m ³ | 2 | EPA 600/P-99/001F | 0.22 |

For Mahabal Enviro Engineers Pvt. Ltd.

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Hindalco Industries: Environmental Monitoring report

December 2015

| | |
|--|---------------------------------------|
| Report no: : MEEPL/DEC037/2015-16 | Date: 12 th December, 2015 |
| 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 | |
| Marks on Sample: Location: PAKHAR MINES OFFICE | |
| Sample collected on: 24.11.2015 | |
| Quantity: 5 L X 2 No. PVC Can | |
| Sample collected by: Mahabal Enviro Engineers Pvt. Limited | |
| Received: 24.11.2015 | |
| Registered: 24.11.2015 | |
| Test Start/End Date: 24.11.2015/02.12.2015 | |

| 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 | - | 6.6 | 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 | 120 | 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 | 46 | 200 Max | APHA 22nd Ed. 2012, 2340-C, 2-44,45 |
| 11. | Alkalinity Total (as CaCO ₃) | mg/l | 61 | 200 Max | IS 3025 (Part 23):1986 Reaffirmed 2009 |
| 12. | Chloride (as Cl) | mg/l | 6.9 | 250 Max | APHA 22nd Ed. 2012, 4500-Cl-B, 4-72 |
| 13. | Sulphate (as SO ₄) | mg/l | 3.8 | 200 Max | APHA 22nd Ed. 2012, 4500-SO4-E, 4-190 |



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| S.No | Parameters | Unit | Result | Acceptable Limit (IS 10500:2012) | Method Reference |
|------|--|------|--------|----------------------------------|--|
| 14. | Nitrate (as NO ₃) | mg/l | 1.2 | 45 Max | APHA 22nd Ed. 2012, 4500-NO ₃ -E, 4-125 |
| 15. | Fluoride (as F) | mg/l | 0.24 | 1 Max | APHA 22nd Ed. 2012, 4500-FB& D, 4-84, 4-87 |
| 16. | Boron (as B) | mg/l | 0.17 | 0.5 Max | APHA 22nd Ed. 2012, 4500-BB, 4-25 |
| 17. | Calcium(as Ca) | mg/l | 15.2 | 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 NH ₃ -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

December 2015

Continuation Sheet

| S.No | Parameters | Unit | Result | Acceptable Limit (IS 10500:2012) | Method Reference |
|-----------------------------------|---------------------|------------|--------|----------------------------------|--|
| Microbiological Analysis | | | | | |
| 1. | Total Colliforms | 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 | | | | | |

Conclusion: The Physical & Chemical Analysis report indicates that water is safe for drinking.

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey
SENIOR EXECUTIVE



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Hindalco Industries: Environmental Monitoring report

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| Report no: : MEEPL/DEC038/2015-16 | | | Date: 12 th December, 2015 | | |
|---|--------------------------|--------------------------------|---------------------------------------|------------|--------------------|
| Sample described by customer: SOIL | | | | | |
| Client Name: Hindalco Industries Limited | | | | | |
| Client Address: Lohardaga | | | | | |
| Postal Code: 835203 | | | | | |
| State: Jharkhand | | | | | |
| Country: India | | | | | |
| Sample type: SOIL | | | | | |
| Marks on Sample: Location: Pakhar Mines (115.13 ha.) | | | | | |
| Sample collected on: 24.11.2015 | | | | | |
| Quantity: 2 kgs | | | | | |
| Sample collected by: Mahabal Enviro Engineers Pvt Limited | | | | | |
| Received: 24.11.2015 | | | | | |
| Registered: 24.11.2015 | | | | | |
| Test Start/End Date: 24.11.2015/02.12.2015 | | | | | |
| 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 | 1.0 | gm/cm ³ |
| 4. | Water Holding Capacity | -- | F.A.U.N (2007) | 23.7 | % |
| 5. | pH | -- | F.A.U.N (2007) | 7.1 | - |
| 6. | Electrical Conductivity | -- | F.A.U.N (2007) | 206 | µs/cm |
| 7. | Organic Carbon | -- | | 0.54 | % |
| 8. | Organic Matter | -- | Black & White Wet Digestion Method | 0.67 | % |
| 9. | Available Nitrogen | -- | Soil & Water Book by P.K Gupta | 110.0 | mg/kg |
| 10. | Available Phosphorus | -- | Soil & Water Book by P.K Gupta | 14.8 | mg/kg |
| 11. | Available Potassium | -- | Soil & Water Book by P.K Gupta | 380 | mg/kg |
| 12. | Exchangeable Calcium | Ca | Soil & Water Book by P.K Gupta | 22.5 | meq/100gm |
| 13. | Exchangeable Magnesium | Mg | Soil & Water Book by P.K Gupta | 1.89 | meq/100gm |
| 14. | Exchangeable Sodium | Na | Soil & Water Book by P.K Gupta | 2.23 | meq/100gm |
| 15. | Exchangeable Potassium | K | Soil & Water Book by P.K Gupta | 1.48 | meq/100gm |
| 16. | Total Exchangeable Bases | | Soil & Water Book by P.K Gupta | 30.5 | meq/100gm |
| 17. | Manganese | Mn | USEPA 3052 | 0.51 | mg/kg |
| 18. | Arsenic | As | USEPA 3052 | 2.30 | mg/kg |
| 19. | Silica | SiO ₂ | USEPA 3052 | 60.0 | % |
| 20. | Aluminum | Al ₂ O ₃ | USEPA 3052 | 6.9 | % |
| 21. | Iron | Fe ₂ O ₃ | USEPA 3052 | 5.0 | % |
| 22. | Calcium | CaO | USEPA 3052 | 8.94 | % |
| 23. | Magnesium | MgO | USEPA 3052 | 1.90 | % |
| 24. | Sodium | Na ₂ O | USEPA 3052 | 0.39 | % |
| 25. | Potassium | K ₂ O | USEPA 3052 | 0.22 | % |
| 26. | Sulphate | SO ₄ | USEPA 3052 | 0.84 | % |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey

SENIOR EXECUTIVE



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Hindalco Industries: Environmental Monitoring report

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| | |
|---|--|
| Report no. : MEEPL/DEC039/2015-16 | Date: 12 th December, 2015 |
| 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 | |
| Marks on Sample: Location: Water Harvesting Pond (Pakhar Mines 115.13 ha.) | |
| Sample collected on: 24.11.2015 | |
| Quantity: 5 L X 2 No. PVC Can | |
| Sample collected by: Mahabal EnviroEngineers Pvt Limited | |
| Received: 24.11.2015 | |
| Registered: 24.11.2015 | |
| Test Start/End Date: 24.11.2015/30.11.2015 | |

| 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 | - | 7.0 | 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 | 99 | 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 | 45 | 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 | 7.1 | 250 Max | APHA 22nd Ed. 2012, 4500-Cl-B, 4-72 |
| 13. | Sulphate (as SO ₄) | mg/l | 4.0 | 200 Max | APHA 22nd Ed. 2012, 4500-SO4-E, 4-190 |



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Continuation Sheet

| S.No | Parameters | Unit | Result | Acceptable Limit (IS 10500:2012) | Method Reference |
|------|--|------|--------|----------------------------------|--|
| 14. | Nitrate (as NO ₃) | mg/l | 1.2 | 45 Max | APHA 22nd Ed. 2012, 4500-NO ₃ -E, 4-125 |
| 15. | Fluoride (as F) | mg/l | 0.23 | 1 Max | APHA 22nd Ed. 2012, 4500-FB& D, 4-84, 4-87 |
| 16. | Boron (as B) | mg/l | 0.18 | 0.5 Max | APHA 22nd Ed. 2012, 4500-BB, 4-25 |
| 17. | Calcium (as Ca) | mg/l | 15.2 | 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 NH ₃ -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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Continuation Sheet

| S.No | Parameters | Unit | Result | Acceptable Limit (IS 10500:2012) | Method Reference |
|-----------------------------------|---------------------|----------------|--------|----------------------------------|---|
| Microbiological Analysis | | | | | |
| 1. | Total Colliforms | 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 | | | | | |

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

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey
SENIOR EXECUTIVE



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Hindalco Industries: Environmental Monitoring report

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| | |
|--|---------------------------------------|
| Report no: MEEPL/DEC040/2015-16 | Date: 12 th December, 2015 |
| 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 Engineers Pvt. Ltd. | |
| Sample Collected on: 24.11.2015 | |

| Location / Identification | Unit | Limit (day) | Result | Limit (night) | Result | Dates |
|-------------------------------------|----------------|-------------|--------|---------------|--------|------------|
| Pakhar Mines 115.13 ha. Working Pit | dB(A) L_{eq} | 75 | 70.2 | 70 | 61.3 | 24.11.2015 |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey
SENIOR EXECUTIVE



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



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

December 2015

| | |
|--|---------------------------------------|
| Report no: MEEPL/DEC041/2015-16 | Date: 12 th December, 2015 |
| Sample Description: Measurement of Noise | |
| 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 Meter | |
| Sampling Done by: Mahabal Enviro Engineers Pvt. Ltd. | |
| Sample Collected on: 21.11.2015 | |

| Location / Identification Spot Noise | Unit | Limit (day) | Result | Dates |
|---|----------------|-------------|--------|------------|
| Near Poelain at at Pakhar Mines 115.13 ha. | dB(A) L_{eq} | 75 | 72.7 | 24.11.2015 |

For Mahabal Enviro Engineers Pvt. Ltd.

Vijay Pandey

SENIOR EXECUTIVE



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PRODUCTION, MINED OUT, BACKFILLED, PRODUCTION AND OVERBURDEN REMOVAL FROM APR-15 TO MAR-16

| Name of Mines | Mining lease area (Ha) | Mined Out area (in Ha) | Backfilled area (in Ha) | Production (in MT) | Overburden Removal (in Cub.M.) |
|--|------------------------|------------------------|-------------------------|--------------------|--------------------------------|
| Shrengdag Bauxite Mines | 155.81 | 6.20 | 10.40 | 259113 | 542332 |
| Gurdari Bauxite Mines | 584.19 | 13.40 | 10.60 | 324590 | 360223 |
| Jalim & Sanai | 12.14 | 0.85 | 0.52 | 45589 | 45147 |
| Serangdag | 140.06 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pakhar Buxite Mines | 115.13 | 3.14 | 4.03 | 297265 | 447110 |
| Pakhar Buxite Mines | 8.09 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pakhar Buxite Mines | 38.95 | 0.00 | 0.00 | 0.00 | 0.00 |
| Kujam-I | 80.87 | 3.78 | 2.17 | 149590 | 215034 |
| Kujam-II | 157.38 | 6.79 | 4.54 | 223025 | 500720 |
| Amtipani | 190.95 | 4.63 | 3.53 | 149880 | 361325 |
| Chiro-Kukud | 152.57 | 2.32 | 4.63 | 94290 | 120248 |
| Orsa Bauxite Mines | 196.36 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hisri New | 14.55 | 0.29 | 0.00 | 64488 | 14237 |
| Bagru | 75.41 | 0.00 | 0.00 | 0.00 | 0.00 |
| Bhusar | 65.31 | 0.00 | 0.00 | 0.00 | 0.00 |
| Minerals & Minerals Limited | | | | | |
| Pakhar Buxite Mines | 109.507 | 3.02 | 3.57 | 277350 | 394970 |
| Pakhar Buxite Mines | 15.58 | 0.00 | 0.00 | 0.00 | 0.00 |
| Bimarla | 134.37 | 2.38 | 1.29 | 43455 | 95056 |





28.05.2016

BREAK UP THE COST OF ENVIRONMENTAL MEASURES DURING THE YEAR 2015-16

The composite cost during the year 2015-16 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) FY 2015-16 | Actual (in Rupees) FY 2015-16 (from April'15 to Sep'2015) | Actual (in Rupees) FY 2015-16 (from April'15 to March'2016) |
|-------|---|----------------------------------|--|--|
| 1 | Pollution Control & Environment monitoring | 15,40,000.00 | 2,62,293.00 | 5,53,564.00 |
| 2 | Reclamation/ Back filing & Rehabilitation** | 3,89,90,000.00 | 1,45,51,281.00 | 2,67,43,576.00 |
| 3 | Green belt, Plantation & Water spraying arrangement | 60,00,000.00 | 28,68,213.00 | 1,08,03,917.00 |
| 4 | Rural Development | 2,33,00,000.00 | 1,04,36,128.00 | 2,19,06,062.00 |

**Part of OB removed cost.

(B.K. Mahapatra)
Convenor (Quality & Environment)

Monitored water level (FY 2015-16)

Fig: in meter

| Location (Mines) | Elevation (Mtr) | Well type | Monsoon (July-Sep) | | Post Monsoon (November) | | Winter (January) | | Pre Monsoon (April-May) | |
|--|-----------------|-----------|--------------------|------------|-------------------------|------------|------------------|------------|-------------------------|------------|
| | | | Inside ML | Outside ML | Inside ML | Outside ML | Inside ML | Outside ML | Inside ML | Outside ML |
| Bagru Plateau (Hisri new, Bagru & Bhusar) | 905 | Open Well | | 21.74 | | 24.13 | | 27.35 | | 29.15 |
| | 910 | Open Well | | 24.32 | | 24.55 | | 26.50 | | 27.40 |
| | 915 | Open Well | | 29.41 | | 28.43 | | 29.95 | | 31.30 |
| Pakhar Gr. Of Mines (115.13,109.507,15.58,8. | 903 | Open Well | | 22.83 | | 33.11 | | 35.10 | | 35.70 |
| | 909 | Open Well | | 17.54 | | 28.74 | | 30.15 | | 30.20 |
| Sherengdag Plateau (Serangdag 155.81 ha, Sherengdag 140.06 Ha, Jalim & Sanai) | 1000 | Open Well | | 24.95 | | 22.69 | | 25.16 | | 25.80 |
| | 1083 | Hand Pump | | 35.36 | | 31.63 | | 34.25 | | 35.40 |
| Gurdari | 1027 | Open Well | | 25.84 | | 28.36 | | 30.15 | | 31.35 |
| | 1094 | Hand Pump | | 41.74 | | 39.55 | | 42.65 | | 42.80 |
| | 1081 | Hand Pump | | 39.65 | | 31.30 | | 41.12 | | 42.10 |
| | 1055 | Hand Pump | | 33.07 | | 27.53 | | 35.55 | | 35.60 |
| | 1066 | Hand Pump | | 27.76 | | 26.27 | | 30.15 | | 30.10 |
| | 1045 | Hand Pump | | 29.32 | | 27.85 | | 29.95 | | 29.90 |
| Kujam I, Kujam II & Amtipani Mines | 1061 | Hand Pump | | 28.36 | | 24.93 | | 25.25 | | 25.90 |
| | 1059 | Hand Pump | | 38.11 | | 36.20 | | 35.15 | | 36.25 |
| | 1075 | Hand Pump | | 27.98 | | 26.82 | | 28.4 | | 29.65 |
| | 1075 | Hand Pump | | 28.37 | | 29.33 | | 30.25 | | 30.15 |
| | 1040 | Open Well | | 33.97 | | 21.88 | | 35.15 | | 36.70 |
| Chiro Kukud | 1041 | Open Well | | 33.66 | | 24.85 | | 36.25 | | 39.40 |
| | 1064 | Hand Pump | | 31.55 | | 28.68 | | 36.15 | | 42.05 |
| | 1052 | Hand Pump | | 22.39 | | 21.12 | | 24.55 | | 23.60 |
| Chiro Kukud | 1148 | Hand Pump | | 33.40 | | 28.39 | | 34.25 | | 37.40 |
| | 1151 | Hand Pump | | 37.62 | | 31.85 | | 36.25 | | 36.05 |
| 1084 | Hand Pump | | 34.25 | | 33.11 | | 35.65 | | 39.40 | |


 (B.K. Mahapatra) -
 Convenor (Quality & Environment)