



Ref No: HIL/LHD/ JP (M)/MoEF/ 954

Date: 25.11.14

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

**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'14 to Sep'14.**

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'14 to Sep'14**.

Hope you will find the same in order.

Thanking You

Yours Sincerely  
FOR HINDALCO INDUSTRIES LIMITED

  
(Bijesh Kumar Jha)  
Joint President (Mines)

Enclosure: - As Above



**1Compliance of conditions laid down in Environmental Clearence**

**ORSA BAUXITE MINES**

**Period : April'14 – Sep'14**

**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 writ petition (civil) no 460 of 2004, as may be applicable to this project	Will be complied.
2.	Environmental Clearance is subject to obtaining clearance from Wildlife (Protection) Act '1972 from the competent authority.	Wild life Management plan has been accepted by Chief Wildlife Warden, Jharkhand vide letter no 75 (vivid)/940 dated 22.10.2008 & is under consideration.
3.	All the conditions stipulated by SPCB in their NOC shall be effectively implemented.	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.	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
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.	As the mining will be carried out at shallow depth, at no point of time mining activities will intersect the ground water table.
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.	Mining will be carried out in small blocks.
7.	The project proponent shall ensure that no natural water course shall be obstructed due to any mining operations.	It will be ensured, Mining is yet to start.
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.	Sequential backfilling and reclamation of the mined out area will be exercised during mining operation. Whenever backfilling will be done to the mined out area, subsoil will be used for backfilling to reclaim and restore the damage area upto

		the extent possible.
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.	Will be complied
10.	The entire excavated area of 155 ha shall be reclaimed ,out of which 131 ha land shall be returned to rayats 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.	Will be complied
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>	Will be complied
12	Dimension of the retaining wall at the OB benches within the mine to check run-off and siltation should be based on rainfall data.	Will be complied
13	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.	Will be implemented parallel to the progress of mining activity. Mining is yet to start.
14	The project authority should implement suitable conservation measures to augment ground water resources in the area in consultation with the	Will be complied

	Regional Director, Central Ground Water Board.	
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.	Will be complied
16	Prior permission from the competent authority should be obtained for drawl of water from the surface water bodies.	Agreed.
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.	Vehicle engaged in mining operation will be regularly checked and repaired to kept vehicular emission under control.
18	Drills should either be operated with dust extractors or should be equipped with water injection system.	Agreed.
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.	Blasting at Mines will be at fixed blasting period of 12.00 Noon to 1.00 PM on working days. All the precautionary and mitigative measures to control ground vibration and to arrest generation of fly rocks will be exercised.
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.
21	Sewage treatment plant should be installed for the colony. ETP should also be provided for workshop and wastewater generated from mining operations.	There will be no effluent discharge from Mine, hence ETP will not be required to install. The sewage water from domestic uses will be treated through septic tanks and soak-pits.
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.	Wildlife Management plan has been accepted by Chief Wildlife Warden, Jharkhand vide letter no 75(vivid)/940 dated 22.10.2008.

	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.	
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.	Progressive Mine closure plan dully approved by Indian Bureau of Mines exists with us. Provision of FMCP will be compiled as per statue.

### 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	Will be complied with.
2	No change in the calendar plan including excavation, quantum of mineral bauxite and waste should be made.	Will be complied with Mining is yet to start.
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, topographical features and environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the State Pollution Control Board.	Will be complied. Mining is yet to start.
4	Data on ambient air quality (RPM, SPM, SO <sub>2</sub> , 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.	Will be complied. Mining is yet to start.

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.	Will be complied.
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.	Will be complied.
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.	Will be complied.
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.	Will be complied.
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.	Complied. (Enclosed Annexure).
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.	Has been informed.
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.	It will be complied with.
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)	Agreed upon.

	of the Regional Office by furnishing the requisite data / information / monitoring reports.	
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.



Date: 10.11.14

**OFFICE ORDER**

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


The Environment Management Cell will consist of:

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

Members:

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

By order

  
Bijesh Kumar Jha  
Joint President (Mines)

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







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

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

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

\*\*Part of OB removed cost.

Convener  
Environment Management Cell  
Hindalco Industries Limited

**HINDALCO INDUSTRIES LIMITED**

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Fax +91 6526 224118

Website [www.hindalco.com](http://www.hindalco.com)

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

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

Monitored water level

Fig in meter

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

B



# Eco Ventures Pvt. Ltd.


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## Mahabal Enviro Engineers Pvt. Ltd.

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

### ORSA & CHIRO - ENVIRONMENTAL MONITORING REPORT

SEPTEMBER 2014

  
Vijay Pandey  
SENIOR EXECUTIVE

For Mahabal Enviro Eng. Pvt. Ltd.

  
Authorised Signatory





# Mahabal Enviro Engineers Pvt. Ltd.

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**Hindalco Industries:Environmental Monitoring report**

**September 2014**

Report no: SEPT003/2014-15				Date: 1 <sup>st</sup> October,2014	
Sample described by customer: SOIL					
Client Name: Hindalco Industries Limited					
Client Address: Lohardaga					
Postal Code: 835203					
State: Jharkhand					
Country: India					
Sample type: SOIL					
Received:21.09.2014					
Registered: 21.09.2014					
Marks on Sample: Location: Chiro Kukad Mines					
Sample collected on: 21.09.2014					
Quantity: 2 kgs					
Test Start/End Date: 21.09.2014/22.09.2014					
Sample collected by: Mahabal Enviro Engineers Pvt Limited					
S.No	Analysis		Method	Result	Unit
1.	Colour	--	--	Gray	-
2.	Texture	--	F.A.U.N (2007)	Loamy Sand	-
3.	Bulk Density	--	By Bulk density Apparatus	1.5	gm/cm <sup>3</sup>
4.	Water Holding Capacity	--	F.A.U.N (2007)	21.2	%
5.	pH	--	F.A.U.N (2007)	7.1	-
6.	Electrical Conductivity	--	F.A.U.N (2007)	195	µs/cm
7.	Organic Carbon	--		0.68	%
8.	Organic Matter	--	Black & White Wet Digestion Method	0.89	%
9.	Available Nitrogen	--	Soil & Water Book by P.K Gupta	113.0	mg/kg
10.	Available Phosphorus	--	Soil & Water Book by P.K Gupta	13.4	mg/kg
11.	Available Potassium	--	Soil & Water Book by P.K Gupta	361	mg/kg
12.	Exchangeable Calcium	Ca	Soil & Water Book by P.K Gupta	23.5	meq/100gm
13.	Exchangeable Magnesium	Mg	Soil & Water Book by P.K Gupta	1.00	meq/100gm
14.	Exchangeable Sodium	Na	Soil & Water Book by P.K Gupta	2.10	meq/100gm
15.	Exchangeable Potassium	K	Soil & Water Book by P.K Gupta	1.52	meq/100gm
16.	Total Exchangeable Bases		Soil & Water Book by P.K Gupta	30.2	meq/100gm
17.	Manganese	Mn	USEPA 3052	0.51	mg/kg
18.	Arsenic	As	USEPA 3052	1.89	mg/kg
19.	Silica	SiO <sub>2</sub>	USEPA 3052	51.20	%
20.	Aluminum	Al <sub>2</sub> O <sub>3</sub>	USEPA 3052	7.10	%
21.	Iron	Fe <sub>2</sub> O <sub>3</sub>	USEPA 3052	5.1	%
22.	Calcium	CaO	USEPA 3052	8.4	%
23.	Magnesium	MgO	USEPA 3052	1.23	%
24.	Sodium	Na <sub>2</sub> O	USEPA 3052	0.52	%
25.	Potassium	K <sub>2</sub> O	USEPA 3052	0.32	%
26.	Sulphate	SO <sub>4</sub>	USEPA 3052	0.80	%

Vijay Pandey  
SENIOR EXECUTIVE

For Mahabal Enviro Eng. Pvt. Ltd

Authorised Signatory



Head Office: Plot No. F-7, Road No. 21, Wagle Estate, Thane West - 400604, Maharashtra, India.  
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**Hindalco Industries: Environmental Monitoring report**

**September 2014**

Report no: SEPT003/2014-15	Date: 1 <sup>st</sup> October, 2014
Sample described by customer: DRINKING WATER	
Client Name: Hindalco Industries Limited	
Client Address: Lohardaga	
Postal Code: 835203	
State: Jharkhand	
Country: India	
Sample type: DRINKING WATER	
Received: 21.09.2014	
Registered: 21.09.2014	
Marks on Sample: Location: Chiro Kukud Mines Drinking Water (Hand Pump)	
Sample collected on: 21.09.2014	
Quantity: 5 L X 2 No. PVC Can	
Test Start/End Date: 21.09.2014/22.09.2014	
Sample collected by: Mahabal Enviro Engineers Pvt Limited	

S.No	Parameters	Unit	Result	Acceptable Limit (IS10500:2012)	Method Reference
1.	Colour	Hazen	< 1	5 Max	APHA 22nd Ed. 2012, 2120-B, 2-6
2.	Odour	-	Agreeable	Agreeable	IS 3025 (Part 5):1983, Reaffirmed 2006
3.	Taste	-	Agreeable	Agreeable	IS 3025 (Part 7):1984, Reaffirmed 2006
4.	Turbidity	NTU	0.7	1 Max	APHA 22nd Ed. 2012, 2130-B, 2-13
5.	pH	-	6.9	6.5-8.5	APHA 22nd Ed. 2012, 4500-H+-B, 4-92
6.	Free Chlorides( Residual)	mg/l	<0.05	0.2 min	APHA 22nd Ed. 2012, 4500-Cl G, 4-69
7.	Total Dissolved Solids	mg/l	89	500 Max	IS 3025 (Part 16):1984 Reaffirmed 2006
8.	Monochloramines	mg/l	<0.05	-	APHA 22nd Ed. 2012, 4500-ClG, 4-69
9.	Dichloramines	mg/l	<0.05	-	APHA 22nd Ed. 2012, 4500-ClG, 4-69
10.	Total Hardness (as CaCO <sub>3</sub> )	mg/l	58	200 Max	APHA 22nd Ed. 2012, 2340-C, 2-44,45
11.	Alkalinity Total (as CaCO <sub>3</sub> )	mg/l	64	200 Max	IS 3025 (Part 23):1986 Reaffirmed 2009
12.	Chloride (as Cl)	mg/l	7.9	250 Max	APHA 22nd Ed. 2012, 4500-Cl-B, 4-72
13.	Sulphate (as SO <sub>4</sub> )	mg/l	4.2	200 Max	APHA 22nd Ed. 2012, 4500-SO4-E, 4-190



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Mobile No: +91 9431.102.102 / +91 9955.358.262,  
E-mail: mahabalranchi@gmail.com

**Hindalco Industries: Environmental Monitoring report**

**September 2014**

S.No	Parameters	Unit	Result	Acceptable Limit (IS 10500:2012)	Method Reference
14.	Nitrate (as NO <sub>3</sub> )	mg/l	1.14	45 Max	APHA 22nd Ed. 2012, 4500-NO <sub>3</sub> -E, 4-125
15.	Fluoride (as F)	mg/l	0.20	1 Max	APHA 22nd Ed. 2012, 4500-FB& D, 4-84, 4-87
16.	Boron (as B)	mg/l	0.19	0.5 Max	APHA 22nd Ed. 2012, 4500-BB, 4-25
17.	Calcium (as Ca)	mg/l	18.2	75 Max	APHA 22nd Ed. 2012, 3500-Ca-B, 3-67
18.	Magnesium (as Mg)	mg/l	3.2	30 Max	APHA 22nd Ed. 2012, 3500-Mg-B, 3-84
19.	Ammonical Nitrogen/ Total Ammonia	mg/l	<0.1	-	APHA 22nd Ed. 2012, 4500-NH <sub>3</sub> -F, 4-115
20.	Iron (as Fe)	mg/l	0.18	0.3 Max	APHA 22nd Ed. 2012, 3111-B, 3-18
21.	Manganese (as Mn)	mg/l	N.D.	0.1 Max	APHA 22nd Ed. 2012, 3111-B, 3-18
22.	Aluminium (as Al)	mg/l	0.09	0.03 Max	APHA 22nd Ed. 2012, 3500-Al-B, 3-61
23.	Cadmium (as Cd)	mg/l	N.D.	0.003 Max.	APHA 22nd Ed. 2012, 3111-B, 3-18
24.	Chromium Total (as Cr)	mg/l	N.D.	0.05 Max.	APHA 22nd Ed. 2012, 3111-B, 3-18
25.	Copper (as Cu)	mg/l	N.D.	0.05 Max.	APHA 22nd Ed. 2012, 3111-B, 3-18
26.	Lead (as Pb)	mg/l	N.D.	0.01 Max.	APHA 22nd Ed. 2012, 3111-B, 3-18
27.	Zinc (as Zn)	mg/l	0.03	5 Max.	APHA 22nd Ed. 2012, 3111-B, 3-18
28.	Arsenic (as As)	mg/l	<0.01	0.01 Max.	APHA 22nd Ed. 2012, 3114-C, 3-38
29.	Mercury (as Hg)	mg/l	N.D.	0.001 Max.	APHA 22nd Ed. 2012, 3112-B, 3-23
30.	Selenium (as Se)	mg/l	N.D.	0.01 Max.	APHA 22nd Ed. 2012, 3114-C, 3-38
31.	Nickel (as Ni)	mg/l	<0.06	0.02 Max.	APHA 22nd Ed. 2012, 3111 B, 3-18
32.	Mineral Oil	mg/l	N.D.	0.5 Max.	IS 3025 (Part 39): 1991, Reaffirmed 2003, Ed. 2.1
33.	Cyanide (as CN)	mg/l	N.D.	0.05 Max.	APHA 22nd Ed. 2012, 4500-CN, C & E, 4-39 & 4-44
34.	Anionic detergents as MBAS	mg/l	<0.1	0.2 Max.	APHA 22nd Ed. 2012, 5540-C, 5-53
35.	Phenolic compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l	N.D.	0.001 Max.	APHA 22nd Ed. 2012, 5530-B & C, 5-47
36.	Polynuclear aromatic hydrocarbons (PAH)	µg/L	N.D.	0.0001 mg/L Max.	APHA 22nd Ed. 2012, 6440, 6-93
37.	Polychlorinated Biphenyls (PCBs)	µg/L	N.D.	0.0005 mg/l Max.	USEPA Method 8082
38.	Sulphide (as S)	mg/l	N.D.	-	APHA 22nd Ed. 2012, 4500-S <sub>2</sub> -C 4-175 & F 4-178



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**Hindalco Industries:Environmental Monitoring report**

**September 2014**

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

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For Mahabal Enviro Eng. Pvt. Ltd.

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**Hindalco Industries: Environmental Monitoring report**

**September 2014**

Report no: SEPT003/2014-15	Date: 1 <sup>st</sup> October, 2014
Sample described by customer: AMBIENT AIR QUALITY MONITORING	
Client Name: Hindalco Industries Limited	
Client Address: Lohardaga	
Postal Code: 835203	
State: Jharkhand	
Country: India	
Sample type: AMBIENT AIR QUALITY MONITORING	
Received: 23.09.2014	
Registered: 23.09.2014	
Marks on Sample: Location: Orsa & Chiro- Chiro Kukud Mine	
Sample collected on: 21.09.2014	
Test Start/End Date: 23.09.2014/25.09.2014	

LOCATION / IDENTIFICATION: Orsa & Chiro- Chiro Kukud Mine					
PARAMETERS		UNIT	LIMIT	METHOD	25/09/2014
Sulphur Dioxide	SO <sub>2</sub>	µg/m <sup>3</sup>	80	IS:5182 (Part-2):2001 (Reaff:2006)	5.5
Nitrogen Dioxide	NO <sub>2</sub>	µg/m <sup>3</sup>	80	IS:5182(Part-6):1975 (Reaff:2004)	10.1
Particulate Matter (size less than 10 µm)	PM <sub>10</sub>	µg/m <sup>3</sup>	100	IS:5182 (Part 23)	78.2
Particulate Matter (size less than 2.5 µm)	PM <sub>2.5</sub>	µg/m <sup>3</sup>	60	USEPA CFR(40) Appendix-L	40.2
Carbon Monoxide	CO	mg/m <sup>3</sup>	2	EPA 600/P-99/001F	0.34

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**Hindalco Industries: Environmental Monitoring report**

**September 2014**

Report no: SEPT003/2014-15	Date: 1 <sup>st</sup> October, 2014
Sample described by customer: AMBIENT AIR QUALITY MONITORING	
Client Name: Hindalco Industries Limited	
Client Address: Lohardaga	
Postal Code: 835203	
State: Jharkhand	
Country: India	
Sample type: AMBIENT AIR QUALITY MONITORING	
Received: 24.09.2014	
Registered: 24.09.2014	
Marks on Sample: Location: Orsa & Chiro- Orsa Village	
Sample collected on: 22.09.2014	
Test Start/End Date: 24.09.2014/26.09.2014	

LOCATION / IDENTIFICATION: Orsa & Chiro- Orsa Village					
PARAMETERS	UNIT	LIMIT	METHOD	26/09/2014	
Sulphur Dioxide	SO <sub>2</sub>	µg/m <sup>3</sup>	80	IS:5182 (Part-2):2001 (Reaff:2006)	12.0
Nitrogen Dioxide	NO <sub>2</sub>	µg/m <sup>3</sup>	80	IS:5182(Part-6):1975 (Reaff:2004)	11.2
Particulate Matter (size less than 10 µm)	PM <sub>10</sub>	µg/m <sup>3</sup>	100	IS:5182 (Part 23)	78.2
Particulate Matter (size less than 2.5 µm)	PM <sub>2.5</sub>	µg/m <sup>3</sup>	60	USEPA CFR(40) Appendix-L	40.1
Carbon Monoxide	CO	mg/m <sup>3</sup>	2	EPA 600/P-99/001F	0.34

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**Hindalco Industries: Environmental Monitoring report**

**September 2014**

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Client Name: Hindalco Industries Limited	
Client Address: Lohardaga	
Postal Code: 835203	
State: Jharkhand	
Country: India	
Sample type: AMBIENT AIR QUALITY MONITORING	
Received: 24.09.2014	
Registered: 24.09.2014	
Marks on Sample: Location: Orsa & Chiro- Amtahi Village (Orsa)	
Sample collected on: 22.09.2014	
Test Start/End Date: 24.09.2014/26.09.2014	

### LOCATION / IDENTIFICATION: Orsa & Chiro- Amtahi Village (Orsa)

PARAMETERS	UNIT	LIMIT	METHOD	26/09/2014
Sulphur Dioxide	SO <sub>2</sub> µg/m <sup>3</sup>	80	IS:5182 (Part-2):2001 (Reaff:2006)	10.2
Nitrogen Dioxide	NO <sub>2</sub> µg/m <sup>3</sup>	80	IS:5182(Part-6):1975 (Reaff:2004)	20.1
Particulate Matter (size less than 10 µm)	PM <sub>10</sub> µg/m <sup>3</sup>	100	IS:5182 (Part 23)	75.8
Particulate Matter (size less than 2.5 µm)	PM <sub>2.5</sub> µg/m <sup>3</sup>	60	USEPA CFR(40) Appendix-L	55.2
Carbon Monoxide	CO mg/m <sup>3</sup>	2	EPA 600/P-99/001F	0.12

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**September 2014**

Report no: SEPT003/2014-15	Date: 1 <sup>st</sup> October,2014
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Client Name: Hindalco Industries Limited	
Client Address: Lohardaga	
Postal Code: 835203	
State: Jharkhand	
Country: India	
Sample type: AMBIENT AIR QUALITY MONITORING	
Received: 23.09.2014	
Registered: 23.09.2014	
Marks on Sample: Location: Orsa & Chiro- Saridih Village	
Sample collected on: 21.09.2014	
Test Start/End Date: 23.09.2014/25.09.2014	

LOCATION / IDENTIFICATION: Orsa & Chiro- Saridih Village					
PARAMETERS		UNIT	LIMIT	METHOD	25/09/2014
Sulphur Dioxide	SO <sub>2</sub>	µg/m <sup>3</sup>	80	IS:5182 (Part-2):2001 (Reaff:2006)	11.5
Nitrogen Dioxide	NO <sub>2</sub>	µg/m <sup>3</sup>	80	IS:5182(Part-6):1975 (Reaff:2004)	10.5
Particulate Matter (size less than 10 µm)	PM <sub>10</sub>	µg/m <sup>3</sup>	100	IS:5182 (Part 23)	81.5
Particulate Matter (size less than 2.5 µm)	PM <sub>2.5</sub>	µg/m <sup>3</sup>	60	USEPA CFR(40) Appendix-L	49.5
Carbon Monoxide	CO	mg/m <sup>3</sup>	2	EPA 600/P-99/001F	0.31

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**Hindalco Industries: Environmental Monitoring report**

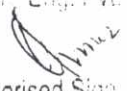
**September 2014**

Report no: SEPT003/2014-15	Date: 1 <sup>st</sup> October, 2014
<b>Sample Description: Measurement of Noise</b>	
Client Name: Hindalco Industries Limited	
Client Address: Lohardaga	
Postal Code: 835203	
State: Jharkhand	
Country: India	
Sample Description: Measurement of Noise Level.	
Sampling Method: Instrumental, Using Sound level Meter	
Sampling Done by: Mahabal Enviro.	
Test Start: 21.09.2014	
End Date: 21.09.2014	

Location / Identification	Unit	Limit (day)	Result	Limit (night)	Result	Dates
Month			Average of 24 continuous hours in Sep- 14		Average of 24 continuous hours in Sep- 14	
Chiro Kukud Mining Area	dB(A) L <sub>eq</sub>	75	62.0	70	61.9	21/09/2014

  
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**Hindalco Industries: Environmental Monitoring report**

**September 2014**

Report no: SEPT003/2014-15	Date: 1 <sup>st</sup> October, 2014
Sample Description: Measurement of Noise: Spot Noise	
Client Name: Hindalco Industries Limited	
Client Address: Lohardaga	
Postal Code: 835203	
State: Jharkhand	
Country: India	
Sample Location: Chiro Kukud Mine Pit	
Sample Description: Measurement of Noise Level.	
Sampling Method: Instrumental, Using Sound level Meter	
Sampling Done by: Mahabal Enviro.	
Test Start: 25.09.2014	
End Date: 25.09.2014	

Location / Identification	Unit	Limit (day)	Result	Dates
POCKLAN	dB(A) $L_{eq}$	75	68	25/09/2014
COMPRESSOR	dB(A) $L_{eq}$	75	71.3	25/09/2014
WAGAN DRILL	dB(A) $L_{eq}$	75	72.9	25/09/2014
DUMPER	dB(A) $L_{eq}$	75	73	25/09/2014

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

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