

ADITYA BIRLA



Ref No: HIL/LHD/ VP (M)/MoEF/ 693

Date: 26.05.14

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 Oct'13 to March'14.**

Ref: **Environmental Clearance letter no J-11015/241/2006-IA II(M) dated 17th 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 **Oct'13 to March'14.**

Hope you will find the same in order.

Thanking You

Yours Sincerely
FOR HINDALCO INDUSTRIES LIMITED

(Bijesh Kumar Jha)
VP (Mines)

Enclosure: - As Above

HINDALCO INDUSTRIES LIMITED

Hindalco Complex
Court Road, Lohardaga-835302
Distt. Lohardaga (Jharkhand)

Telephone +91 6526 224112/224015/223113
Fax +91 6526 224118

Website www.hindalco.com

Compliance of conditions laid down in Environmental Clearance

ORSA BAUXITE MINES

Period : Oct'13 – March'14

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

Sl No	Conditions	Compliance Status
Specific Conditions		
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
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 nd 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
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.	Will be complied. Mining is yet to start.
4	Data on ambient air quality (RPM, SPM, SO ₂ , NO _x) should be regularly submitted to the Ministry including its Regional office located at Bhubneshwar and the State Pollution Control Board / Central pollution Control Board once in six months.	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 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.	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 http://envfor.nic.in and a copy of the same should be forwarded to the Regional Office of this Ministry located Bhubneshwar.	Already done and copies submitted.



BREAK UP THE COST OF ENVIRONMENTAL MEASURES DURING THE YEAR 2013-14

The composite cost during the year 2013-14 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 2013-2014	Actual (in Lakh Rupees) FY 2013-2014 from April'13 to Sep'13	Actual (in Lakh Rupees) FY 2013-2014 from Oct'13 to March'14
1	Pollution Control & Environment monitoring	10.00	6.44	-
2	Reclamation/ Back filing & Rehabilitation	**	153.60	71.50
3	Green belt & Plantation	40.00	30.75	9.50
4	Rural Development	70.00	67.72	85.35

**Part of OB removed cost.


Convener

Environment Management Cell.



Date: 30.10.13

OFFICE ORDER

In connection with the earlier office order dated 12.11.2011 the re constituted team of Environment management cell to ensure compliance of various environmental Acts, regulations & rules at Mines Division, Hindalco, Lohardaga as follows:

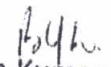
The Environment Management Cell will consist of:

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

Members:

2. Utpal Gupta, Manager (Environment)
3. Biplab Mukherjee (Asst Manager Geology)
4. S. Joshi, Mines Manager (Bagru Mines)
5. A. Anbarasu, Mines Manager (Serengdag A)
6. Ajay Pandey, Mines Manager (Pakhar 109.507 Hect)
7. Kiran Sankar Singh, Mines Manager (Gurdari)
8. Vidya Sagar Singh, Mines Manager (Kujam)
9. Amar Bharati, Mines Manager (Amtipani)
10. S P Jha, Mines Manager (Pakhar)
11. Rajesh Ambastha, Mines Manager (Chiro Kukud & Orsa)

By order


Bijesh Kumar Jha
VP (Mines)

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

PRODUCTION, MINED OUT, BACKFILLED, PRODUCTION AND OVERBURDEN REMOVAL FROM APR-13 TO MAR-14

Name of Mines	Mining lease area (Ha)	Mined Out area (in Acres)	Backfilled area (in Acres)	Production (in MT)	Overburden Removal (in Cub.M.)
Shrengdag Bauxite Mines	155.81	25.95	19.20	253610.00	371290
Gurdari Bauxite Mines	584.19	33.20	25.60	313975.00	487773
Jalim & Sanai	12.14	4.00	2.00	49445.00	30124
Serangdag	140.06	7.96	3.48	99795.00	98371
Pakhar Buxite Mines	115.13	3.71	5.09	296950.00	449483
Pakhar Buxite Mines	8.09	1.70	0.80	68400.00	11380
Kujam-I	80.87	14.12	7.52	149255.00	99902
Kujam-II	157.38	5.41	3.60	149790.00	82386
Amtipani	190.95	16.46	16.03	149665.00	419976
Chiro-Kukud	152.57	2.90	6.18	52929.00	62222
Orsa Bauxite Mines	196.36	0.00	0.00	0.00	0
Hisri New	14.55	1.17	0.00	93813.00	6699
Bagru	75.41	0.94	0.24	56804.00	31935
Bhusar	65.31	2.26	8.32	203532.00	150616
Minerals & Minerals Limited					
Pakhar Buxite Mines	109.507	7.61	6.45	234500.00	210702
Pakhar Buxite Mines	15.58	1.45	1.85	57065.00	174812

Monitored water level

Location (Mines)	Elevation (feet)	Elevation (Mtr)	Well type	Monsoon 2013		Post Monsoon 2013		Winter		Pre Monsoon	
				Inside ML	Outside ML	Inside ML	Outside ML	Inside ML	Outside ML	Inside ML	Outside ML
Bagru	2970	905	Open Well	21.70	24.10	24.10	27.32				29.23
	2985	910	Open Well	24.20	24.50	24.50	26.89				27.19
	3001	915	Open Well	29.30	28.40	28.40	30.14				31.26
	2963	903	Open Well	22.90	33.10	33.10	35.21				35.89
	2983	909	Open Well	17.60	28.70	28.70	29.62				30.18
Pakhar	3279	1000	Open Well	24.90	22.60	22.60	24.51				25.93
	3552	1083	Hand Pump	35.40	31.60	31.60	34.34			35.49	
Sherengdag	3370	1027	Open Well	25.80	28.30	28.30	30.53				31.42
	3587	1094	Hand Pump	41.80	39.58	39.58	42.13			42.56	
	3546	1081	Hand Pump	39.60	31.26	31.26	41.37			41.31	
	3459	1055	Hand Pump	33.10	27.50	27.50	35.31			35.35	
	3495	1066	Hand Pump	27.70	26.13	26.13	29.12			30.25	
Gurdari	3428	1045	Hand Pump	29.34	27.85	27.85	29.64			30.41	
	3481	1061	Hand Pump	28.30	24.87	24.87	25.42			26.79	
	3472	1059	Hand Pump	38.10	36.63	36.63	35.21			35.98	
	3527	1075	Hand Pump	28.20	26.83	26.83	28.49			29.53	
	3526	1075	Hand Pump	28.30	29.32	29.32	30.29			30.05	
Kujam	3412	1040	Open Well	33.90	21.80	21.80	35.21				36.78
	3414	1041	Open Well	33.70	24.80	24.80	36.54				39.52
	3491	1064	Hand Pump	31.50	28.60	28.60	35.91			42.12	
	3450	1052	Hand Pump		21.12	21.12	24.13				23.54
	3765	1148	Hand Pump	33.40	28.35	28.35	34.12			37.26	
Chiro Kukud	3776	1151	Hand Pump	37.60	31.84	31.84	36.67			36.21	
	3556	1084	Hand Pump	34.30	36.85	36.85	35.69			39.19	

B. Chandel



Test Report

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 30/01/2014

Report No : KG14-000222.001

JOE No : KG14-000222

Report Control No : KGR0000046010

Sample Described by Customer as : AMBIENT AIR QUALITY MONITORING

Client Name : Hindalco Industries Limited(Mines Division)
Client Address : Lohardaga,
Postal Code : 835203
State : Jharkhand
Country : India
Sample Type : AMBIENT AIR QUALITY MONITORING
Received : 09/01/2014
Registered : 09/01/2014
Marks on Sample : Location: Kukud pit(Chiro kukud bauxite mines), sampling date : 30.12.2013
Test Start/End Date : 09/01/2014 - 14/01/2014

Analysis	Method	Result	Unit	Requirement/Limit as Per NAAQS	
				Min	Max
Particulate Matter (PM10)	IS:5182 (PART 23)	62.18	ug/m3	-	100
Particulate Matter (PM2.5)	USEPA CFR(40) Appendix-L	22.62	ug/m3	-	60
Nitrogen Dioxide (NO2)	IS:5182 (Part-6):1975 (Reaff.2004)	7.30	ug/m3	-	80
Sulphur Dioxide (SO2)	IS:5182 (Part-2):2001 (Reaff.2006)	<5.00	ug/m3	-	80
Carbon Monoxide (CO)	EPA 600/P-99/001F	<0.10	PPM		

Remark : CO analyzed at site.

Page 1 of 2

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SGS India Pvt. Ltd.

SGS India Pvt Ltd, CS Plot -512(p), Mouza, Hanspukuria, Diamond Harbour Rd, PO-Joka, South 24 Parganas, Kolkata - 700104 Phone: +91 33 85009334/8335, Fax: +91 033-24381022
Regd & Corp. Off: SGS House, 4B, A.S. Marg, Vikhroli (West), Mumbai-400063. Tel: (022) 25798421 to 28 Fax: (022) 25798431 to 35 www.sgs.com

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Test Report

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 30/01/2014

Report No : KG14-000222.001

JOE No : KG14-000222

Report Control No : KGR0000046010

Per pro SGS India Private Ltd


Satya Manna

Section Incharge - ENVI

Authorized Signatory

****End of Report****

Page 2 of 2

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Test Report

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 30/01/2014

Report No : KG14-000222.002

JOE No : KG14-000222

Report Control No : KGR0000046010
Sample Described by Customer as : AMBIENT AIR QUALITY MONITORING

Client Name : Hindalco Industries Limited(Mines Division)
Client Address : Lohardaga,
Postal Code : 835203
State : Jharkhand
Country : India
Sample Type : AMBIENT AIR QUALITY MONITORING
Received : 09/01/2014
Registered : 09/01/2014
Marks on Sample : Location : Kukud Village(Chiro kukud Bauxite Mines), Sampling dt. 30.12.2013
Test Start/End Date : 09/01/2014 - 14/01/2014

Analysis	Method	Result	Unit	Requirement/Limit as Per NAAQS	
				Min	Max
Particulate Matter (PM10)	IS:5182 (PART 23)	63.80	ug/m3	-	100
Particulate Matter (PM2.5)	USEPA CFR(40) Appendix-L	26.20	ug/m3	-	60
Nitrogen Dioxide (NO2)	IS:5182 (Part-6):1975 (Reaff.2004)	<5.00	ug/m3	-	80
Sulphur Dioxide (SO2)	IS:5182 (Part-2):2001 (Reaff.2006)	<5.00	ug/m3	-	80
Carbon Monoxide (CO)	EPA 600/P-99/001F	<0.10	PPM		

Remark : CO analyzed at site.

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Test Report

Report No : KG14-000222.002

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 30/01/2014

JOE No : KG14-000222

Report Control No : KGR0000046010

Per pro SGS India Private Ltd

Satya Manna

Section Incharge - ENVI

Authorized Signatory

****End of Report****

Page 2 of 2

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Test Report

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 30/01/2014

Report No : KG14-000230.001

JOE No : KG14-000230

Report Control No : KGR0000045995
Sample Described by Customer as : FUGITIVE AIR

Client Name : Hindalco Industries Limited(Mines Division)
Client Address : Lohardaga,
Postal Code : 835203
State : Jharkhand
Country : India
Sample Type : FUGITIVE AIR
Received : 09/01/2014
Registered : 10/01/2014
Marks on Sample : Location: Kukud Pit(Chirokukud Bauxite Mine), date : 30.12.2013
Test Start/End Date : 10/01/2014 - 15/01/2014

Analysis	Method	Result	Unit	Requirement/Limit as Per FACTORY ACT. 1948 & BIHAR/JHARKAND FACTORY Min RULE-1950 Max
Suspended Particulate Matter (SPM)	IS:5182 (Part-23):2006	1068.27	ug/m3	10000

Per pro SGS India Private Ltd

Satya Manna
Section Incharge - ENVI
Authorized Signatory

****End of Report****

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Test Report

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 21/01/2014

Report No : KG14-000162.001

JOE No : KG14-000162

Report Control No : KGR0000045139

Sample Described by Customer as : GROUND WATER

Client Name : Hindalco Industries Limited(Mines Division)
Client Address : Lohardaga,
Postal Code : 835203
State : Jharkhand
Country : India
Sample Type : GROUND WATER
Received : 08/01/2014
Registered : 08/01/2014
Marks on Sample : Location:Hand pump (Near Kukud Pit)
- : Chirokukud Bauxite Mines
Quantity : 5.5L app
Sample Collected on : 30.12.2013
Sampling Method : APHA 1060B/9060A
Test Start/End Date : 08/01/2014 - 20/01/2014

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
Colour	IS:3025 (Part-4):1983 (Reaff.2006)	10.0	Hz	5	15
Odour	IS:3025 (Part-5):1983 (Reaff.2006)	Agreeable		Agreeable	Agreeable
Taste	IS:3025 (Part-8):1983 (Reaff.2006)	Agreeable		Agreeable	Agreeable
pH	IS:3025 (Part-11):1983 (Reaff.2006)	7.48		6.5	8.5
<i>Analyzed at site.</i>					
Total Hardness (as CaCO ₃)	IS:3025 (Part-21):1983 (Reaff.2006)	18.60	mg/L	200	600
Iron (as Fe)	IS:3025 (Part-2)	0.07	mg/L	0.3	No relaxation
Fluoride (as F)	IS:3025 (Part-60):2008	0.15	mg/L	1.0	1.5
Residual Free Chlorine	IS:3025 (Part-26):1986 (Reaff.2003)	<0.10	mg/L	0.2	1.0

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Test Report

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 21/01/2014

Report No : KG14-000162.001

JOE No : KG14-000162

Report Control No : KGR0000045139

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
Chloride (as Cl)	IS:3025 (Part-32):1988 (Reaff. 1999)	6.78	mg/L	250	1000
Total Dissolved Solids	IS:3025 (Part-16):1984 (Reaff. 1996)	44.50	mg/L	500	2000
E.coli	IS:1622:1981(Reaff.2003)	Absent	per 100ml		
Coliform bacteria	IS:1622-1981 (Reaffirmation 2003)	Absent	per 100ml		
Calcium (as Ca)	IS:3025 (Part-40):1991 (Reaff.2003)	5.95	mg/L	75	200
Magnesium (as Mg)	IS:3025 (Part-46):1994 (Reaff. 1999)	<1.00	mg/L	30	100
Copper (as Cu)	IS:3025 (Part-2)	0.05	mg/L	0.05	1.5
Manganese (as Mn)	IS:3025 (Part-2)	<0.01	mg/L	0.1	0.3
Sulphate (as SO4)	IS:3025 (Part-24):1986 (Reaff.1998)	<2.00	mg/L	200	400
Nitrate (as NO3)	IS:3025 (Part-34):1988 (Reaff. 1999)	15.86	mg/L	45	No relaxation
Phenolic Compound (as C6H5OH)	IS:3025 (Part-43):1992 (Reaff.2003)	<0.001	mg/L	0.001	0.002
Mercury (as Hg)	IS:3025 (Part-48):1994 (Reaff.1999)	<0.001	mg/L	0.001	No relaxation
Cadmium (as Cd)	IS:3025 (Part-41):1992 (Reaff.2003)	<0.003	mg/L	0.003	No relaxation
Selenium (as Se)	IS:3025 (Part-2)	0.005	mg/L	0.01	No relaxation
Arsenic (as As)	IS:3025 (Part-37):1988 (Reaff. 1999)	<0.005	mg/L	0.01	No relaxation
Cyanide (as CN)	IS:3025 (Part-27):1986 (Reaff.2003)	<0.020	mg/L	0.05	No relaxation
Lead (as Pb)	IS:3025 (Part-47):1994 (Reaff.1999)	<0.005	mg/L	0.01	No relaxation
Zinc (as Zn)	IS:3025 (Part-2)	0.02	mg/L	5	15
Anionic Surface Active Agent (as MBAS)	IS:13428:2005: Annex K	<0.05	mg/L	0.2	1.0
Chromium (as Cr)	IS:3025 (Part-2)	<0.01	mg/L	0.05	No relaxation
Mineral Oil	IS:3025 (Part-39):1991 (Reaff. 2003)	<0.01	mg/L	0.5	No relaxation

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Test Report

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 21/01/2014

Report No : KG14-000162.001

JOE No : KG14-000162

Report Control No : KGR0000045139

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
Total Alkalinity (as CaCO ₃)	IS:3025 (Part-23):1986 (Reaff.2003)	4.56	mg/L	200	600
Aluminium (as Al)	IS:3025 (Part-55):2003	<0.03	mg/L	0.03	0.2
Boron (as B)	IS:3025 (Part-57):2005	<0.05	mg/L	0.5	1.0
Turbidity	IS:3025 (Part-10):1984 (Reaff.2006)	0.40	NTU	1	5

Per pro SGS India Private Ltd

Aniruddha Das

Section Incharge-Microbiology

Authorized Signatory

Per pro SGS India Private Ltd

Satya Manna

Section Incharge - ENVI

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****End of Report****

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Test Report

Print Date : 29/01/2014

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG14-000136.001

JOE No : KG14-000136

Report Control No : KGR0000045880

Sample Described by Customer as : SOIL

Client Name : Hindalco Industries Limited(Mines Division)
Client Address : Lohardaga,
Postal Code : 835203
State : Jharkhand
Country : India
Sample Type : SOIL
Received : 08/01/2014
Registered : 08/01/2014
Marks on Sample : Location:Reclaim Area(Chiro Kukud Bauxite Mines)
Sample Collected on : 30.12.2013
Quantity : 2.5Kg app
Test Start/End Date : 08/01/2014 - 22/01/2014

Analysis	Method	Result	Unit
Conductivity (1:5) Soil Suspension.	F.A.U.N (2007)	9.7	µs/cm
pH (1:2) Soil Suspension	F.A.U.N (2007)	5.33	--
Porosity	F.A.U.N (2007)	58.77	%
Bulk Density	By Bulk Density Apparatus	1.01	gram/ml
Phosphorus (as P)	F.A.U.N (2007)	<20.000	mg/kg
Texture	F.A.U.N (2007)	Sandy clay loam	
Clay	F.A.U.N (2007)	34.4	%
Sand	F.A.U.N (2007)	49.6	%
Silt	F.A.U.N (2007)	16.0	%
Available Chloride (as Cl)	Soil & Agriculture Organization (U.N-2007)	<20.00	mg/kg
Available Nitrogen	Food & Agriculture Organization (U.N-2007)	283.25	mg/kg
Available Potassium (as K)	Soil & Water Book By P.K. Gupta	632.85	mg/kg

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Test Report

Print Date : 29/01/2014

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG14-000136.001

JOE No : KG14-000136

Report Control No : KGR0000045880

Analysis	Method	Result	Unit
Available Magnesium (as Mg)	Soil & Water Book By P.K. Gupta	1157.86	mg/kg
Lead (as Pb)	USEPA 3052	17.58	mg/kg
Chromium (as Cr)	USEPA 3052	71.95	mg/kg
Mercury (as Hg)	USEPA 3052	<1.00	mg/kg
Total Organic Matter	Black & Walkely Wet Digestion Method	0.50	%

Per pro SGS India Private Ltd

Satya Manna

Section Incharge - ENVI

Authorized Signatory

****End of Report****

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TEST REPORT

Report No. : KG17-000180.001- 005

Date : 10.01.2014

JOE No. : KG14-000180

Report Control No:KGR0000044177

SAMPLE DRAWN BY SGS INDIA PRIVATE LTD.

SAMPLE DESCRIPTION : MEASUREMENT OF NOISE LEVEL
NAME OF THE CLIENT : M/S. HINDALCO INDUSTRIES LIMITED
ADDRESS : MINES DIVISION, LOHARDAGA, JHARKHAND, PIN – 835 302
SAMPLING METHOD : INSTRUMENTAL, USING SOUND LEVEL METER
SAMPLING SITE : CHIRO-KUKUD BAUXITE MINES (KUKUD PIT)
PROTOCOL : GENSOP/CALLAB-116
TEST START DATE : 09.01.2014
TEST END DATE : 10.01.2014

SL NO.	SAMPLING LOCATION	DATE & TIME OF SAMPLING	DAY TIME NOISE LEVEL dB (A) Leq	LIMIT IN dB(A) Leq DAY TIME (INDUSTRIAL AREA)
1.	POCKLEN (TATA HITACHI EX200i LC	30.12.2013 (11:05 Hrs)	77	75
2.	COMPRESSOR (IR HP-450)	30.12.2013 (11:14 Hrs)	82	75
3.	WAGON DRILL (ATLAS COPCO LM-100)	30.12.2013 (11:22 Hrs)	83	75
4.	DUMPER (MAN CLA 25.280)	30.12.2013 (11:30 Hrs)	73	75
5.	PAYLODER (TWL 3036)	30.12.2013 (11:38 Hrs)	79	75

****End of Report**

Note: (i) The value is the Leq of twenty readings taken in each location (Day time).
(ii) Day time shall mean from 6:00 am to 10:00 pm

Checked by

per pro SGS India Private Ltd.

Dipankar De Sarkar
Manager (Operations)

Dr. Asish Chakraborty
Manager-Laboratory

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Test Report

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 21/01/2014

Report No : KG14-000166.001

JOE No : KG14-000166

Report Control No : KGR0000045148

Sample Described by Customer as : SURFACE WATER

Client Name : Hindalco Industries Limited(Mines Division)
Client Address : Lohardaga,
Postal Code : 835203
State : Jharkhand
Country : India
Sample Type : SURFACE WATER
Received : 08/01/2014
Registered : 08/01/2014
Marks on Sample : Location:Spring Water(Near Kukud Pit)
- : Chiro Kukud Bauxite Mines
Quantity : 5.5L app
Sample Collected on : 30.12.2013
Sampling Method : APHA 1060B/9060A
Test Start/End Date : 08/01/2014 - 20/01/2014

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
Colour	IS:3025 (Part-4):1983 (Reaff.2006)	10.0	Hz	5	15
Odour	IS:3025 (Part-5):1983 (Reaff.2006)	Agreeable		Agreeable	Agreeable
Taste	IS:3025 (Part-8):1983 (Reaff.2006)	Agreeable		Agreeable	Agreeable
pH	IS:3025 (Part-11):1983 (Reaff.2006)	8.12		6.5	8.5
<i>Analyzed at site.</i>					
Total Hardness (as CaCO ₃)	IS:3025 (Part-21):1983 (Reaff.2006)	11.16	mg/L	200	600
Iron (as Fe)	IS:3025 (Part-2)	0.12	mg/L	0.3	No relaxation
Fluoride (as F)	IS:3025 (Part-60):2008	<0.10	mg/L	1.0	1.5
Residual Free Chlorine	IS:3025 (Part-26):1986 (Reaff.2003)	<0.10	mg/L	0.2	1.0

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Test Report

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 21/01/2014

Report No : KG14-000166.001

JOE No : KG14-000166

Report Control No : KGR0000045148

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
Chloride (as Cl)	IS:3025 (Part-32):1988 (Reaff.1999)	<5.00	mg/L	250	1000
Total Dissolved Solids	IS:3025 (Part-16):1984 (Reaff.1996)	18.90	mg/L	500	2000
E.coli	IS:1622:1981(Reaff.2003)	Absent	per 100ml		
Coliform bacteria	IS:1622-1981 (Reaffirmation 2003)	Absent	per 100ml		
Calcium (as Ca)	IS:3025 (Part-40):1991 (Reaff.2003)	2.23	mg/L	75	200
Magnesium (as Mg)	IS:3025 (Part-46):1994 (Reaff.1999)	1.36	mg/L	30	100
Copper (as Cu)	IS:3025 (Part-2)	0.02	mg/L	0.05	1.5
Manganese (as Mn)	IS:3025 (Part-2)	0.03	mg/L	0.1	0.3
Sulphate (as SO4)	IS:3025 (Part-24):1986 (Reaff.1998)	<2.00	mg/L	200	400
Nitrate (as NO3)	IS:3025 (Part-34):1988 (Reaff.1999)	0.62	mg/L	45	No relaxation
Phenolic Compound (as C6H5OH)	IS:3025 (Part-43):1992 (Reaff.2003)	<0.001	mg/L	0.001	0.002
Mercury (as Hg)	IS:3025 (Part-48):1994 (Reaff.1999)	<0.001	mg/L	0.001	No relaxation
Cadmium (as Cd)	IS:3025 (Part-41):1992 (Reaff.2003)	<0.003	mg/L	0.003	No relaxation
Selenium (as Se)	IS:3025 (Part-2)	<0.005	mg/L	0.01	No relaxation
Arsenic (as As)	IS:3025 (Part-37):1988 (Reaff.1999)	<0.005	mg/L	0.01	No relaxation
Cyanide (as CN)	IS:3025 (Part-27):1986 (Reaff.2003)	<0.020	mg/L	0.05	No relaxation
Lead (as Pb)	IS:3025 (Part-47):1994 (Reaff.1999)	<0.005	mg/L	0.01	No relaxation
Zinc (as Zn)	IS:3025 (Part-2)	0.02	mg/L	5	15
Anionic Surface Active Agent (as MBAS)	IS:13428:2005: Annex K	<0.05	mg/L	0.2	1.0
Chromium (as Cr)	IS:3025 (Part-2)	<0.01	mg/L	0.05	No relaxation
Mineral Oil	IS:3025 (Part-39):1991 (Reaff.2003)	<0.01	mg/L	0.5	No relaxation

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Test Report

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 21/01/2014

Report No : KG14-000166.001

JOE No : KG14-000166

Report Control No : KGR0000045148

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
Total Alkalinity (as CaCO ₃)	IS:3025 (Part-23):1986 (Reaff.2003)	7.60	mg/L	200	600
Aluminium (as Al)	IS:3025 (Part-55):2003	<0.03	mg/L	0.03	0.2
Boron (as B)	IS:3025 (Part-57):2005	<0.05	mg/L	0.5	1.0
Turbidity	IS:3025 (Part-10):1984 (Reaff.2006)	0.23	NTU	1	5

Per pro SGS India Private Ltd

Aniruddha Das

Section Incharge-Microbiology

Authorized Signatory

Per pro SGS India Private Ltd

Satya Manna

Section Incharge - ENVI

Authorized Signatory

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Test Report

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 25/04/2014

Report No : KG14-002519.001

JOE No : KG14-002519

Report Control No : KGR0000054480

Per pro SGS India Private Ltd



Satya Manna

Section Incharge - ENVI

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Test Report

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 25/04/2014

Report No : KG14-002519.002

JOE No : KG14-002519

Report Control No : KGR0000054480

Sample Described by Customer as : AMBIENT AIR QUALITY MONITORING

Client Name : Hindalco Industries Limited(Mines Division)
Client Address : Lohardaga.
Postal Code : 835203
State : Jharkhand
Country : India
Sample Type : AMBIENT AIR QUALITY MONITORING
Received : 16/04/2014
Registered : 16/04/2014
Marks on Sample : Location: Kudag village
Sampling Date : 07.04.2014
Sampling Site : Chiro Kukud Boxied Mines
Test Start/End Date : 16/04/2014 - 24/04/2014

Analysis	Method	Result	Unit	Requirement/Limit as Per NAAQS	
				Min	Max
Particulate Matter (PM10)	IS 5182 (PART 23)	97.59	ug/m3	-	100
Particulate Matter (PM2.5)	USEPA CFR(40) Appendix-L	22.04	ug/m3	-	60
Nitrogen Dioxide (NO2)	IS:5182 (Part-6):1975 (Reaff.2004)	<5.00	ug/m3	-	80
Sulphur Dioxide (SO2)	IS:5182 (Part-2):2001 (Reaff.2006)	<5.00	ug/m3	-	80
Carbon Monoxide (CO)	EPA 600/P-99/001F	<1.00	PPM		

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Satya Manna

Section Incharge - ENVI

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