



Ref No: HIL/LHD/VP (M)/MoEF/417

Date : 22.11.2013

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

**Sub: Compliance Report of EC conditions for Gurdari (584.19 ha) Bauxite Mining project of M/s Hindalco Industries Limited located in Gumla, Jharkhand for the period April' 2013 -Sep' 2013**

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

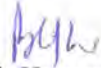
Sir,

With reference to the above, we are submitting herewith the Compliance status report of EC conditions for **Gurdari (584.19 ha) Bauxite Mining project** of M/s Hindalco located in Gumla, Jharkhand for the period **April' 2013 -Sep' 2013**.

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  
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Telephone +91 6526 224112/224015/223113  
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Website [www.hindalco.com](http://www.hindalco.com)

**Compliance of conditions laid down in Environmental Clearance**

**GURDARI BAUXITE MINES**

**Period : April'13 - Sep'13**

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

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



7	<p>Catch drains and siltation ponds of appropriate size should be constructed to arrest silt and sediment flows from mine working. The water so collected should be utilized for watering the mine area, roads, green belt development etc. The drains should be regularly desilted particularly after monsoon and maintained properly.</p> <p>Garland drain (size, gradient and length) shall be constructed for mine pit and sump capacity should be designed keeping 50% safety margin over and above peak sudden rainfall (based on 50 years data) and maximum discharge in the area adjoining the mine site. Sump capacity should also provide adequate retention period to allow proper setting of silt material. Sedimentation pits should be constructed at the corners of the garland drains and desilted at regular intervals.</p>	<p>No run off is being generated from mining activities. However, to collect and manage rainwater during monsoon drains Pit sumps are made, part of mined out area is used as settling tank. Settled water is being used for sprinkling of quarry, roads, green belt development, etc.</p>
8	<p>Plantation shall be raised in an area of 78.44 ha including a green belt of adequate width by planting the native species around the ML area, roads, reclaimed area etc. in consultation with the local DFO / Agriculture Department. The density of the trees should be around 1500 plants per ha.</p>	<p>In 2013-14, we have planted 2000 saplings on 3.5 acre reclaimed area. Rest to be complied during project period.</p>
9	<p>The project authority should implement suitable conservation measures to augment ground water resources in the area in consultation with the Regional Director, Central Ground Water Board.</p>	<p>Suitable conservation measures to augment ground water have been taken.</p>
10	<p>Regular monitoring of ground water level and quality should be carried out by establishing a network of existing wells and constructing new piezometers during the mining operation. The monitoring should be carried out four times in a year – pre-monsoon (April-May), monsoon (August), post-monsoon (November) and winter (January) and the data thus collected may be sent regularly to MOEF, Central Ground water Authority and Regional Director Central Ground Water Board.</p>	<p>It is being monitored. Monitoring report is enclosed as <b>Annexure</b></p>

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



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

### 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 Complied. Prior approval will be sought for, if any change is proposed.
2	No change in the calendar plan including excavation, quantum of mineral bauxite and waste should be made.	Excavation of Over Burden and Bauxite is being done as per the approved calendar plan.
3	Four ambient air quality-monitoring station should be established in the core zone as well as in the buffer zone for RPM, SPM, SO <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.	Monitoring Reports is enclosed as <b>Annexure.</b>
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.	Monitoring Reports for reporting period is enclosed in <b>Annexure.</b>



5	Fugitive dust emission from all the sources should be controlled regularly. Water spraying arrangements on haul roads, loading and unloading and at transfer points should be provided and properly maintained.	Two nos. of water tanker have been provided for sprinkling of water on haul roads and active mining areas to arrest fugitive dust. Water spraying at loading, unloading, etc is also being done properly.
6	Measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in operation of HEMM, etc. should be provided with ear plug / muffs.	Noise monitoring is being done regularly. Workers engaged in operation of HEMMs, etc have also been provided with PPEs such as ear plug and ear muffs. Monitoring of noise level is being conducted at various locations of the work zone area.
7	Industrial waste water (workshops and waste water from the mine) Should be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19 <sup>th</sup> May, 1993 and 31 <sup>st</sup> December,1993 or as amended from time to time. Oil and grease trap should be installed before discharge of workshop effluents.	There is no effluent discharge from Mine. Workshop has an Oil Catchment Pit to trap oil and grease. It is being ensured to make it operational and effective as and when required and accordingly the concern department is taking its due care.
8	Personnel working in dusty areas should wear protective respiratory devices and they should also provided with adequate training and information on safety and health aspects. Occupational health surveillance program of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed.	Complied. Use of Personal Protective Equipment (PPE) by the individuals is being ensured. All the mine workers are being regularly and periodically sent to our own hospital for health checkup/ Occupational Health check up for any contraction of diseases due to exposure in dusty and noisy areas.  Training on safety, health and environmental aspects of mining is being regularly imparted through VT training centre and also through various other training programmes conducted by the State Government, recognized agencies, etc.
9	A separate environmental management cell with suitable qualified personnel should be set-up under the control of a Senior Executive, who will report directly to the Head of the Organization.	Separate Environmental Management Cell (EMC) has been constituted and is functioning effectively. Copy Enclosed.
10	The project authorities should inform to the Regional Office located at Bhubneshwar regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.	Not applicable. The mine is an old and working since 1976.

11	The funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purpose. Year wise expenditure should be reported to the Ministry and its Regional Office located at Bhubneshwar.	Statement of budgetary provision and actual expenses for the year 2013-14 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.	Complied.
13	A copy of clearance letter will be marked to concerned Panchayat / local NGO, if any, from whom suggestion / representation has been received while processing the proposal.	Complied .Copy submitted to regional office.
14	State Pollution Control Board should display a copy of the clearance letter at the Regional office, District Industry Center and Collector's office / Tehsildar's Office for 30 days.	Agreed.
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 <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.	Complied. Copies, of the advertisement made in the local newspapers, have already been submitted to the Regional Office Vide letter no HIL/GMO(M)/ENV/140 Dated 23.04.2007.





## Test Report

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 18/06/2013

Report No : KG13-004489.001

JOE No : KG13-004489

Report Control No : KGR0000023743  
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 : 12/06/2013  
 Registered : 13/06/2013  
 Marks on Sample : Location : Gurdari Pit, date : 31.05.2013  
 Sampling Site : Gurdari/Kujam-II/Amtipani/Kujam-I Bauxite Mines(Netarhat Plateau)  
 Test Start/End Date : 13/06/2013 - 18/06/2013

Analysis	Method	Result	Unit	Requirement/Limit as Per NAAQS	
				Min	Max
Particulate Matter (PM10)	IS:5182 (PART 23)	20	ug/m3	-	100
Particulate Matter (PM2.5)	USEPA CFR(40) Appendix-L	12.25	ug/m3	-	60
Oxides of Nitrogen (NOx)	IS:5182 (Part-6):1975 (Reaff 2004)	9.02	ug/m3	-	80
Sulphur Dioxide (SO2)	IS:5182 (Part-2):2001 (Reaff.2006)	<5.00	ug/m3	-	80
Carbon Monoxide	By NDIR Spectroscopy.	<1.00	mg/m3		

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Satya Manna

Section Incharge - ENVI

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\*\*\*\*End of Report\*\*\*\*

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## Test Report

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 18/06/2013

Report No : KG13-004489.002

JOE No : KG13-004489

Sample Described by Customer as : AMBIENT AIR QUALITY MONITORING  
Report Control No : KGR0000023743

Client Name : Hindalco Industries Limited(Mines Division)  
Client Address : Lohardaga,  
Postal Code : 835203  
State : Jharkhand  
Country : India  
Sample Type : AMBIENT AIR QUALITY MONITORING  
Received : 12/06/2013  
Registered : 13/06/2013  
Marks on Sample : Location : Amtipani Workshop, date : 31.05.2013  
Sampling Site : Gurdari/Kujam-I/Amtipani/Kujam-I Bauxite Mines(Netarhat Plateau)  
Test Start/End Date : 13/06/2013 - 18/06/2013

Analysis	Method	Result	Unit	Requirement/Limit as Per NAAQS	
				Min	Max
Particulate Matter (PM10)	IS:5182 (PART 23)	29	ug/m3	-	100
Particulate Matter (PM2.5)	USEPA CFR(40) Appendix-L	22.33	ug/m3	-	60
Oxides of Nitrogen (NOx)	IS:5182 (Part-6).1975 (Reaff.2004)	8.25	ug/m3	-	80
Sulphur Dioxide (SO2)	IS:5182 (Part-2):2001 (Reaff.2006)	<5.00	ug/m3	-	80
Carbon Monoxide	By NDIR Spectroscopy.	<1.00	mg/m3		

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## Test Report

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 18/06/2013

Report No : KG13-004489.003

JOE No : KG13-004489

Report Control No : KGR0000023743  
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 : 12/06/2013  
Registered : 13/06/2013  
Marks on Sample : Location : Kujam II, Weight Bridge, date : 01.06.2013  
Sampling Site : Gurdari/Kujam-II/Amtipani/Kujam-I Bauxite Mines(Netarhat Plateau)  
Test Start/End Date : 13/06/2013 - 18/06/2013

Analysis	Method	Result	Unit	Requirement/Limit as Per NAAQS	
				Min	Max
Particulate Matter (PM10)	IS:5182 (PART 23)	27	ug/m3	-	100
Particulate Matter (PM2.5)	USEPA CFR(40) Appendix-L	11.36	ug/m3	-	60
Oxides of Nitrogen (NOx)	IS:5182 (Part-6):1975 (Reaff.2004)	8.01	ug/m3	-	80
Sulphur Dioxide (SO2)	IS:5182 (Part-2):2001 (Reaff.2006)	<5.00	ug/m3	-	80
Carbon Monoxide	By NDIR Spectroscopy.	<1.00	mg/m3		

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## Test Report

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 18/06/2013

Report No : KG13-004489.004

JOE No : KG13-004489

Report Control No : KGR0000023743  
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 : 12/06/2013  
Registered : 13/06/2013  
Marks on Sample : Location :Kujam-I, chatam Village, date : 01.06.2013  
Sampling Site : Gurdari/Kujam-II/Amtipani/Kujam-I Bauxite Mines(Netarhat Plateau)  
Test Start/End Date : 13/06/2013 - 18/06/2013

Analysis	Method	Result	Unit	Requirement/Limit as Per NAAQS	
				Min	Max
Particulate Matter (PM10 )	IS:5182 (PART 23)	92	ug/m3	-	100
Particulate Matter (PM2.5)	USEPA CFR(40) Appendix-L	27.82	ug/m3	-	60
Oxides of Nitrogen (NOx)	IS:5182 (Part-6):1975 (Reaff.2004)	6.43	ug/m3	-	80
Sulphur Dioxide (SO2)	IS:5182 (Part-2):2001 (Reaff.2006)	<5.00	ug/m3	-	80
Carbon Monoxide	By NDIR Spectroscopy.	<1.00	mg/m3		

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## Test Report

Print Date : 28/10/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-004449.001

JOE No : KG13-004449

Report Control No : KGR0000037656

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 : 12/06/2013  
 Registered : 12/06/2013  
 Marks on Sample : Location :Kujam\_Navatoli 2  
 Quantity : 5.5L app  
 Sample Collected on : 07.06.2013, time : 10.00 am  
 Test Start/End Date : 12/06/2013 - 20/06/2013

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)	7.2		6.5	8.5
Total Hardness (as CaCO <sub>3</sub> )	IS:3025 (Part-21):1983 (Reaff.2006)	37.37	mg/L	200	500
Iron (as Fe)	IS:3025 (Part-2):	0.62	mg/L	0.3	No relaxation
Fluoride (as F)	IS:3025 (Part-60):2008	0.25	mg/L	1.0	1.5
Residual Free Chlorine	IS:3025 (Part-26):1986 (Reaff.2003)	<0.10	mg/L	0.2	1.0
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)	62.00	mg/L	500	2000
E.coli	IS:1622:1981(Reaff.2003)	Absent	per 100ml		Absent/100m
Coliform bacteria	IS:1622-1981 (Reaffirmation 2003)	Absent	per 100ml		Absent/100m
Calcium (as Ca)	IS:3025 (Part-40):1991 (Reaff.2003)	11.31	mg/L	75	200

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## Test Report

Print Date : 28/10/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-004449.001

JOE No : KG13-004449

Report Control No : KGR0000037656

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
Magnesium (as Mg)	IS:3025 (Part-46):1994 (Reaff.1999)	2.21	mg/L	30	100
Copper (as Cu)	IS:3025 (Part-2)	<0.01	mg/L	0.05	1.5
Manganese (as Mn)	IS:3025 (Part-2)	0.01	mg/L	0.1	0.3
Sulphate (as SO <sub>4</sub> )	IS:3025 (Part-24):1986 (Reaff.1998)	<2.00	mg/L	200	400
Nitrate (as NO <sub>3</sub> )	IS:3025 (Part-34):1988 (Reaff.1999)	4.70	mg/L	45	No relaxation
Phenolic Compound (as C <sub>6</sub> H <sub>5</sub> OH)	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)	0.05	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
Total Alkalinity (as CaCO <sub>3</sub> )	IS:3025 (Part-23):1986 (Reaff.2003)	43.82	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)	6.75	NTU	1	5

Remark : \*Analyzed at site.

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## Test Report

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 28/10/2013

Report No : KG13-004449.001

JOE No : KG13-004449

Report Control No : KGR000037656

Per pro SGS India Private Ltd

Satya Manna

Section Incharge - ENVI

Authorized Signatory

\*\*\*\*End of Report\*\*\*\*

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## Test Report

Print Date : 28/10/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-004449.002

JOE No : KG13-004449

Report Control No : KGR0000037658

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 : 12/06/2013  
 Registered : 12/06/2013  
 Marks on Sample : Location : Gurdari-Navatoli  
 Quantity : 5.5L app  
 Sample Collected on : 07.06.2013, time : 11.00 am  
 Test Start/End Date : 12/06/2013 - 20/06/2013

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
Colour	IS:3025 (Part-4):1983 (Reaff.2006)	15.0	H <sub>z</sub>	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)	7.1 *		6.5	8.5
Total Hardness (as CaCO <sub>3</sub> )	IS:3025 (Part-21):1983 (Reaff.2006)	17.17	mg/L	200	600
Iron (as Fe)	IS:3025 (Part-2)	1.66	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
Chloride (as Cl)	IS:3025 (Part-32):1988 (Reaff.1999)	5.35	mg/L	250	1000
Total Dissolved Solids	IS:3025 (Part-16):1984 (Reaff.1996)	38.00	mg/L	500	2000
E.coli	IS 1622:1981(Reaff.2003)	Absent	per 100ml		Absent/100m 
Coliform bacteria	IS:1622-1981 (Reaffirmation 2003)	Absent	per 100ml		Absent/100m 
Calcium (as Ca)	IS:3025 (Part-40):1991 (Reaff.2003)	4.44	mg/L	75	200 

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## Test Report

Print Date : 28/10/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-004449.002

JOE No : KG13-004449

Report Control No : KGR0000037658

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
Magnesium (as Mg)	IS:3025 (Part-46):1994 (Reaff.1999)	1.47	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)	0.04	mg/L	0.1	0.3
Sulphate (as SO <sub>4</sub> )	IS:3025 (Part-24):1986 (Reaff.1998)	<2.00	mg/L	200	400
Nitrate (as NO <sub>3</sub> )	IS:3025 (Part-34):1988 (Reaff.1999)	2.15	mg/L	45	No relaxation
Phenolic Compound (as C <sub>6</sub> H <sub>5</sub> OH)	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)	0.05	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
Total Alkalinity (as CaCO <sub>3</sub> )	IS:3025 (Part-23):1986 (Reaff.2003)	25.78	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)	21.50	NTU	1	5

Remark : \*Analyzed at site.

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## Test Report

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 28/10/2013

Report No : KG13-004449.002

JOE No : KG13-004449

Report Control No : KGR0000037658

Per pro SGS India Private Ltd

Satya Manna

Section Incharge - ENVI

Authorized Signatory

\*\*\*\*End of Report\*\*\*\*

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## Test Report

Print Date : 28/10/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-004449.003

JOE No : KG13-004449

Report Control No : KGR0000037660

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 : 12/06/2013  
 Registered : 12/06/2013  
 Marks on Sample : Location:Gurdari Sagatali  
 Quantity : 5.5L app  
 Sample Collected on : 07.06.2013, time : 11.30 am  
 Test Start/End Date : 12/06/2013 - 20/06/2013

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
Colour	IS:3025 (Part-4):1983 (Reaff.2006)	5.0	Hz	5	15
Odour	IS:3025 (Part-5):1983 (Reaff.2006)	Agreeable		Agreeable	Agreeable
Taste	IS:3025 (Part-5):1983 (Reaff.2006)	Agreeable		Agreeable	Agreeable
pH	IS:3025 (Part-11):1983 (Reaff.2006)	7.2		6.5	8.5
Total Hardness (as CaCO <sub>3</sub> )	IS:3025 (Part-21):1983 (Reaff.2006)	95.95	mg/L	200	600
Iron (as Fe)	IS:3025 (Part-2)	0.78	mg/L	0.3	No relaxation
Fluoride (as F)	IS:3025 (Part-60):2008	0.11	mg/L	1.0	1.5
Residual Free Chlorine	IS:3025 (Part-26):1986 (Reaff.2003)	<0.10	mg/L	0.2	1.0
Chloride (as Cl)	IS:3025 (Part-32):1988 (Reaff.1999)	6.42	mg/L	250	1000
Total Dissolved Solids	IS:3025 (Part-16):1984 (Reaff.1996)	118.00	mg/L	500	2000
E.coli	IS:1622:1981(Reaff.2003)	Absent	per 100ml		Absent/100ml
Coliform bacteria	IS:1622-1981 (Reaffirmation 2003)	Absent	per 100ml		Absent/100ml
Calcium (as Ca)	IS:3025 (Part-40):1991 (Reaff.2003)	20.20	mg/L	75	200

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## Test Report

Print Date : 28/10/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-004449.003

JOE No : KG13-004449

Report Control No : KGR0000037660

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
Magnesium (as Mg)	IS:3025 (Part-46):1994 (Reaff.1999)	11.04	mg/L	30	100
Copper (as Cu)	IS:3025 (Part-2)	<0.01	mg/L	0.05	1.5
Manganese (as Mn)	IS:3025 (Part-2)	<0.01	mg/L	0.1	0.3
Sulphate (as SO <sub>4</sub> )	IS:3025 (Part-24):1986 (Reaff.1998)	<2.00	mg/L	200	400
Nitrate (as NO <sub>3</sub> )	IS:3025 (Part-34):1988 (Reaff.1999)	<0.50	mg/L	45	No relaxation
Phenolic Compound (as C <sub>6</sub> H <sub>5</sub> OH)	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
Total Alkalinity (as CaCO <sub>3</sub> )	IS:3025 (Part-23):1986 (Reaff.2003)	103.10	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)	5.75	NTU	1	5

Remark : \*Analyzed at site.

### Page 2 of 3

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## Test Report

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 28/10/2013

Report No : KG13-004449.003

JOE No : KG13-004449

Report Control No : KGR0000037660

Per pro SGS India Private Ltd

Satya Manna

Section Incharge - ENVI

Authorized Signatory

\*\*\*\*End of Report\*\*\*\*

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## Test Report

Print Date : 28/10/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-004449.004

JOE No : KG13-004449

Report Control No : KGR0000037662

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 : 12/06/2013  
 Registered : 12/06/2013  
 Marks on Sample : Location: Gurdari-Deepatoli  
 Quantity : 5.5L app  
 Sample Collected on : 07.06.2013, time : 1.30pm  
 Test Start/End Date : 12/06/2013 - 20/06/2013

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)	7.3 *		6.5	8.5
Total Hardness (as CaCO <sub>3</sub> )	IS:3025 (Part-21):1983 (Reaff.2006)	26.26	mg/L	200	600
Iron (as Fe)	IS:3025 (Part-2)	5.12	mg/L	0.3	No relaxation
Fluoride (as F)	IS:3025 (Part-60):2008	0.24	mg/L	1.0	1.5
Residual Free Chlorine	IS:3025 (Part-26):1986 (Reaff.2003)	<0.10	mg/L	0.2	1.0
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)	42.00	mg/L	500	2000
E.coli	IS:1622:1981(Reaff.2003)	Absent	per 100ml		Absent/100m
Coliform bacteria	IS:1622-1381 (Reaffirmation 2003)	Absent	per 100ml		Absent/100m
Calcium (as Ca)	IS:3025 (Part-40):1991 (Reaff.2003)	5.66	mg/L	75	200

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## Test Report

Print Date : 28/10/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-004449.004

JOE No : KG13-004449

Report Control No : KGR0000037662

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
Magnesium (as Mg)	IS:3025 (Part-46):1994 (Reaff.1999)	2.95	mg/L	30	100
Copper (as Cu)	IS:3025 (Part-2)	<0.01	mg/L	0.05	1.5
Manganese (as Mn)	IS:3025 (Part-2)	0.03	mg/L	0.1	0.3
Sulphate (as SO <sub>4</sub> )	IS:3025 (Part-24):1986 (Reaff.1998)	<2.00	mg/L	200	400
Nitrate (as NO <sub>3</sub> )	IS:3025 (Part-34):1988 (Reaff.1999)	0.68	mg/L	45	No relaxation
Phenolic Compound (as C <sub>6</sub> H <sub>5</sub> OH)	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)	0.04	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
Total Alkalinity (as CaCO <sub>3</sub> )	IS:3025 (Part-23):1986 (Reaff.2003)	30.93	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)	145.00	NTU	1	5

Remark : \*Analyzed at site.

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## Test Report

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 28/10/2013

Report No : KG13-004449.004

JOE No : KG13-004449

Report Control No : KGR0000037662

Per pro SGS India Private Ltd

Satya Manna

Section Incharge - ENVI

Authorized Signatory

\*\*\*\*End of Report\*\*\*\*

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## Test Report

Print Date : 28/10/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-004449.005

JOE No : KG13-004449

Report Control No : KGR0000037664

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 : 12/06/2013  
 Registered : 12/06/2013  
 Marks on Sample : Location : Gurdari Hindalco Office  
 Quantity : 5.5L app  
 Sample Collected on : 07.06.2013, time : 1.00pm  
 Test Start/End Date : 12/06/2013 - 20/06/2013

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
Colour	IS:3025 (Part-4):1983 (Reaff.2006)	5.0	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)	7.2 *		6.5	8.5
Total Hardness (as CaCO <sub>3</sub> )	IS:3025 (Part-21):1983 (Reaff.2006)	40.40	mg/L	200	600
Iron (as Fe)	IS:3025 (Part-2)	0.25	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
Chloride (as Cl)	IS:3025 (Part-32):1988 (Reaff.1999)	9.63	mg/L	250	1000
Total Dissolved Solids	IS:3025 (Part-16):1984 (Reaff.1996)	66.00	mg/L	500	2000
E.coli	IS:1622:1981(Reaff.2003)	Absent	per 100ml		Absent/100m
Coliform bacteria	IS:1622-1981 (Reaffirmation 2003)	Absent	per 100ml		Absent/100m
Calcium (as Ca)	IS:3025 (Part-40):1991 (Reaff.2003)	8.89	mg/L	75	200

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# Test Report

Print Date : 28/10/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-004449.005

JOE No : KG13-004449

Report Control No : KGR0000037664

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
Magnesium (as Mg)	IS:3025 (Part-46):1994 (Reaff.1999)	4.42	mg/L	30	100
Copper (as Cu)	IS:3025 (Part-2)	0.16	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)	12.03	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)	0.26	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
Total Alkalinity (as CaCO3)	IS:3025 (Part-23):1986 (Reaff.2003)	30.93	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)	1.75	NTU	1	5

Remark : \*Analyzed at site.

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## Test Report

Print Date : 28/10/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-004449.005

JOE No : KG13-004449

Report Control No : KGR0000037664

Per pro SGS India Private Ltd

Satya Manna

Section Incharge - ENVI

Authorized Signatory

\*\*\*\*End of Report\*\*\*\*

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**TEST REPORT**

Report No. : **KG13-004503.003**

Date : **13.06.2013**

Job No. : 43111-1450

Report Control No. : KGR000302317

**SAMPLE DRAWN BY SGS INDIA PVT. LTD.**

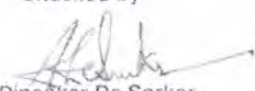
<b>SAMPLE DESCRIPTION</b>	<b>MEASUREMENT OF NOISE LEVEL</b>
<b>COMPANY NAME</b>	<b>M/S. HINDALCO INDUSTRIES LIMITED (MINES DIVISION)</b>
<b>ADDRESS</b>	<b>MINES DIVISION, LOHARDAGA, JHARKHAND, PIN – 835 302</b>
<b>SAMPLING SITE</b>	<b>GURDARI/KUJAM-II/AMTIPANI/KUJAM-II/BAUXITE MINES(NETERRHAT PLATLAU)</b>
<b>PROTOCOL</b>	<b>IS-9989/IS:7194</b>
<b>DATE OF SAMPLING</b>	<b>31.05.2013 TO 01.06.2013</b>
<b>TEST START DATE</b>	<b>13.06.2013</b>
<b>TEST END DATE</b>	<b>13.06.2013</b>

LOCATION	RESULT		LIMIT IN dB(A) Leq (INDUSTRIAL AREA)	
	Day Time (Leq) in dB(A)	Night time (Leq) in dB(A)	Day Time	Night time
MINE LEASE AREA (NEAR GURDARI OFFICE)	58	50	75	70

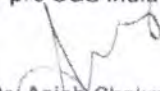
\*\*\*\*\*End of Report\*\*\*\*\*

Note: (i) The value is the Leq of One Hundred Seventy readings taken in day time and seventy reading taken in night time.  
(ii) Day time shall mean from 6:00 am to 10:00 pm  
(iii) Night time shall mean from 10:00 pm to 6:00 am

Checked by

  
**Dipankar De Sarkar**  
**Manager (Operations)**

per pro SGS India Private Ltd

  
**Dr. Asish Chakraborty**  
**Manager-Laboratory**

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TEST REPORT

Report No. KG13-004499.006-007

Date 13.06.2013

Doc No. 413-01498

Report Control No. KGR000023175

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 - 835 301  
 SAMPLING METHOD : INSTRUMENTAL, USING SOUND LEVEL METER  
 SAMPLING SITE : GURDARI/KUJAM-II/KUJAM-I/AMTIPANI BAUXITE MINES(NETERHAT-PLATEAU)  
 PROTOCOL : IS:9989 IS:7194  
 TEST START DATE : 13.06.2013  
 TEST END DATE : 13.06.2013

SL. NO.	SAMPLING LOCATION	DATE & TIME OF SAMPLING	DAY TIME NOISE LEVEL dB (A) Leq	LIMIT AS PER WEST FACTORIES ACT dB(A) Leq 8 Hrs. Exposure
1	POCKLEN	31.05.2013 (14:30 Hrs)	82	85
2	DUMPER	31.05.2013 (14:45 Hrs)	80	85

Note: (a) The value is the Leq of twenty readings taken in each location (Day time).  
 (b) Day time shall mean from 0:00 am to 10:00 pm.

\*\*\*End of Report\*\*\*

Checked by

Dipankar De Sarkar  
Manager (Operations)

per pro SGS India Private Ltd.

  
Dr. Asish Chakraborty  
Manager Laboratory

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## Test Report

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 07/10/2013

Report No : KG13-007323.001

JOE No : KG13-007323

Sample Described by Customer as : AMBIENT AIR QUALITY MONITORING  
Report Control No : KGR0000035823

Client Name : Hindalco Industries Limited(Mines Division)  
Client Address : Lohardaga,  
Postal Code : 835203  
State : Jharkhand  
Country : India  
Sample Type : AMBIENT AIR QUALITY MONITORING  
Received : 30/09/2013  
Registered : 30/09/2013  
Marks on Sample : Location : Gurdari Pit, date : 13.09.2013  
Sampling Site : Gurdari  
Test Start/End Date : 30/09/2013 - 07/10/2013

Analysis	Method	Result	Unit	Requirement/Limit as Per NAAQS	
				Min	Max
Particulate Matter (PM10)	IS:5182 (PART 23)	15	ug/m3	-	100
Particulate Matter (PM2.5)	USEPA CFR(40) Appendix-L	10.61	ug/m3	-	80
Oxides of Nitrogen (NOx)	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	EPA 600/P-99/001F	<1.00	mg/m3		

Per pro SGS India Private Ltd

Satya Manna  
Section Incharge - ENVI  
Authorized Signatory

\*\*\*\*End of Report\*\*\*\*

Page 1 of 1

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# Test Report

Print Date : 07/10/2013

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Report No : KG13-007323.002

JOE No : KG13-007323

Report Control No : KGR0000035823

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 : 30/09/2013  
 Registered : 30/09/2013  
 Marks on Sample : Location : Amplipani Workshop, date : 13.09.2013  
 Sampling Site : Gurdari  
 Test Start/End Date : 30/09/2013 - 07/10/2013

Analysis	Method	Result	Unit	Requirement/Limit as Per NAAQS	
				Min	Max
Particulate Matter (PM10 )	IS:5182 (PART 23)	9	ug/m3	-	100
Particulate Matter (PM2.5)	USEPA CFR(40) Appendix-L	5.88	ug/m3	-	60
Oxides of Nitrogen (NOx)	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	EPA 600/P-99/001F	<1.00	mg/m3	-	-

Per pro SGS India Private Ltd

Satya Manna

Section Incharge - ENVI

Authorized Signatory

\*\*\*\*End of Report\*\*\*\*

Page 1 of 1

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## Test Report

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 07/10/2013

Report No : KG13-007323.003

JOE No : KG13-007323

Report Control No : KGR0000035823

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 : 30/09/2013  
Registered : 30/09/2013  
Marks on Sample : Location : Kujam -II, Weight Bridge, date : 14.09.2013  
Sampling Site : Gurdari  
Test Start/End Date : 30/09/2013 - 07/10/2013

Analysis	Method	Result	Unit	Requirement/Limit as Per NAAQS	
				Min	Max
Particulate Matter (PM10)	IS:5182 (PART 23)	18	ug/m3	-	100
Particulate Matter (PM2.5)	USEPA CFR(40) Appendix-L	13.94	ug/m3	-	60
Oxides of Nitrogen (NOx)	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	EPA 600/P-99/001F	<1.00	mg/m3		

Per pro SGS India Private Ltd

Satya Manna

Section Incharge - ENVI

Authorized Signatory

\*\*\*\*End of Report\*\*\*\*

Page 1 of 1

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## Test Report

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 07/10/2013

Report No : KG13-007323.004

JOE No : KG13-007323

Report Control No : KGR0000035823

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 : 30/09/2013  
Registered : 30/09/2013  
Marks on Sample : Location : Kujam -I, Chatam Village, date : 14.09.2013  
Sampling Site : Gurdan  
Test Start/End Date : 30/09/2013 - 07/10/2013

Analysis	Method	Result	Unit	Requirement/Limit as Per NAAQS	
				Min	Max
Particulate Matter (PM10 )	IS:5182 (PART 23)	10	ug/m3	-	100
Particulate Matter (PM2.5)	USEPA CFR(40) Appendix-L	6.91	ug/m3	-	60
Oxides of Nitrogen (NOx)	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	EPA 600/P-99/001F	<1.00	mg/m3		

Per pro SGS India Private Ltd

Satya Manna

Section Incharge - ENVI

Authorized Signatory

\*\*\*\*End of Report\*\*\*\*

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झारखण्ड राज्य प्रदूषण नियंत्रण पर्वद  
**JHARKHAND STATE POLLUTION CONTROL BOARD**  
[ CONSTITUTED UNDER SECTION 4 OF THE WATER (PREVENTION & CONTROL OF POLLUTION ACT, 1974 )  
T.A.DIVISION BUILDING (GROUND FLOOR),HEC COMPLEX, DHURWA, RANCHI-834004.  
Phone No:-0651- 2400852, 2400851, Fax No:- 2400850.

Ref.No- PC/RNC/58/07-

Date.....

**CONSENT TO OPERATE**

With reference to the application dated 28.08.2012 of G.M. (Operation), M/s Hindalo Industries Ltd; Court Road, I/C Gurdari Bauxite Mines-584.19 Ha, P.O+Dist- Gumla for consent under section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974 and that under section 21 of the Air (Prevention & Control of Pollution) Act,1981, he (they) is (are) granted consent to bring into use his(their) new/altered/existing outlet(s) for discharge of trade effluent and (or) domestic sewage and to operate his (their) industrial plant to produce maximum 3,25,000 TPA of Bauxite At – Gurdari , P.O + Dist- Gumla for the period from 01.01.2013 to 31.12.2013 with the following conditions :

1. That, he(they) shall not make any alteration, addition, deletion or modification in the mines without the prior clearance from the Board.
2. That, he(they) shall abide by the obligations provided under section 24, 31 and 33A of the Water (Prevention & Control of Pollution) Act, 1974 and shall extend co-operation to the Board in performing its functions entrusted under section 20, 21, 23, 30 and 32 of the Act.
3. That, he(they) shall comply with the requirements of the Water (Prevention & Control of Pollution) Cess Act, 1977 read with the Water (Prevention & Control of Pollution) Cess Rules, 1978.
4. That, he(they) shall abide by the obligations provided under section 22, 23 and 31A of the Air (Prevention & Control of Pollution) Act, 1981 and shall extend co-operation to the Board in performing its functions entrusted under sections 24, 25 and 26 of the Act.
5. That, he(they) shall abide by the obligations provided under sections 5, 7, 8 and 9 of the Environment (Protection) Act, 1986 and shall extend co-operation in performing the functions entrusted under section 3, 10 and 11 of the Act.
6. That, he(they) shall abide by the applicable provisions of the Environment (Protection) Rules, 1986, the Hazardous Wastes (Management, Handling & Transboundary Movement) Rules, 2008; the Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989; the Bio-medical Waste (Management & Handling) Rules, 1998; the Municipal Solid Wastes (Management & Handling) Rules, 2000 and the Batteries (Management & Handling) Rules, 2001.
7. That, he(they) shall maintain the quality of discharge and (or) emission and (or) noise level of environmental pollutants in conformity with the standards as laid under Rule 3 of the Environment (Protection) Rules, 1986.
8. That, he(they) shall monitor his(their) effluent(s), emission(s) and the ambient air, noise level regularly and shall submit the report to the Board in compliance of the condition laid in paragraph 7.



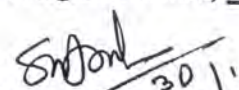
9. That, he(they) shall establish well equipped environmental laboratory with the facilities of system(s) of continuous monitoring of effluent(s), emission(s) ambient water quality(ies), ambient air quality(ies) and ambient noise level(s) and transferring them (monitoring results) to his(their) website(s) and to the e-mail address(es) of the key persons of Jharkhand State Pollution Control Board, Zonal Office, Kolkata and Ministry of Environment & Forests, Regional Office, Bhubaneswar with simultaneous displaying at prominent locations in front of his(their)premises. [\*Unit(s) of medium and large scale under 17 categories of polluting industries of category A of EIA Notification, 2006.]
10. That, he(they) shall submit the environmental statement every year by 30<sup>th</sup> September and shall harvest all rain water precipitating in the premises and do three tier tree plantation in the premises as air barrier.
11. That, he(they) shall submit application for consent under section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974 and that under section 21 of the Air (Prevention & Control of Pollution) Act, 1981 again 120 days before the expiration of the consent order **31.12.2013** or within 120 days from the date of receipt of the order, whichever is earlier.
12. *That, unit shall submit quality report of Ambient Air Quality and Ground Water Quality every quarter of the year.*
13. *That, unit shall submit the status of compliance Environmental Clearance every quarter to the Board.*
14. *That, unit) shall reclaim the mined out area in phased manner as per EIA/EMP report.*
15. *That, the unit shall implement harvest rain water of the mine and recharge it to the ground by the method of Central Ground Water Board Guideline that fits most to the mine.*
16. *That, the unit shall make arrangement to control the fugitive emissions occurring during the mining activities and plying of vehicles on haul as well as transport roads.*
17. *That, the unit shall ensure that no transport vehicle should ply on road without covering the materials.*
18. *That, the proponent shall submit compliance report of Environmental Clearance dated 07.02.2007 and submit photographs in compliance of special condition No. VII and IX of the same.*

Sd/-  
(Sanjay Kumar Sinha)  
**MEMBER SECRETARY**

Memo no. PC/RNC/58/07- 16-335

Ranchi, Dated .....30/1/15

Copy forwarded to:- **G.M. (Operation), M/S Hindalco Industries Ltd; (I/C Gurdari Bauxite Mines-584.19 Ha.), Court Road, P.O+Dist- Lohardaga/ Deputy Commissioner, Gumla/ D.F.O, Ranchi West Forest Division, Lohardaga/ D.M.O, Gumla/ Regional Officer, Regional Office, Ranchi** for information & necessary action.

  
(Sanjay Kumar Sinha)  
**MEMBER SECRETARY**



ADITYA BIRLA



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

The composite cost during the year 2013-14 (April to Sep) for environmental protection & pollution control by Jharkhand Mines division of M/s Hindalco Industries Ltd & M/s Minerals & Minerals Ltd for implementation 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, Chiro kukud, Orsa pat, Bhuser & Bimarla Bauxite Mines.

Sl No	Description	Budget (in Lakh Rs.) FY 2013-2014	Actual (in Lakh Rs.) FY 2013-2014 from April to Sep'13
1	Pollution Control & Environment monitoring	10.00	6.44
2	Reclamation/ Back filing & Rehabilitation	**	153.60
3	Green belt & Plantation	40.00	30.75
4	Rural Development	70.00	67.72

\*\*Part of OB removed cost.

Convener

Environment Management Cell.

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



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:

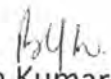
The Environment Management Cell will consist of:

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 SEP-13**

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	12.9	10.4	122730.00	176390
Gurdari Bauxite Mines	584.19	17.5	17.0	160515.00	280160
Jalim & Sanai	12.14	1.50	2.64	34760.00	23984
Serangdag	140.06	3.23	1.82	49625.00	39219
Pakhar Buxite Mines	115.13	1.50	2.90	161470.00	220120
Pakhar Buxite Mines	8.09	1.95	1.60	48570.00	23675
Kujam-I	80.87	5.96	6.54	71920.00	56720
Kujam-II	157.38	2.47	8.47	109580.00	26906
Amtipani	190.95	7.12	7.23	94155.00	85884
Chiro-Kukud	152.57	3.50	2.50	27939.00	25795
Orsa Bauxite Mines	196.36	0.00	0.00	0.00	0.00
Hisri New	14.55	0.47	0.00	92649.00	5021
Bagru	75.41	0.38	0.10	54180.00	3384
<b>Minerals &amp; Minerals Limited</b>					
Pakhar Buxite Mines	109.507	1.97	4.19	55920.00	55805
Pakhar Buxite Mines	15.58	1.10	1.50	25360.00	26712

Monitored Ground water level

Location (Mines)	Elevation (feet)	Elevation (Mtr)	Well type	Monsoon 2013		Post Monsoon 2013	
				Inside ML	Outside ML	Inside ML	Outside ML
Bagru	2970	905.4878049	Open Well		21.70		24.10
	2985	910.0609756	Open Well		24.20		24.50
	3001	914.9390244	Open Well		29.30		28.40
	2963	903.3536585	Open Well		22.90		33.10
	2983	909.4512195	Open Well		17.60		28.70
	3279	999.695122	Open Well		24.90		22.60
Pakhar	3552	1082.926829	Hand Pump	35.40		31.60	
Sherengdag	3370	1027.439024	Open Well		25.80		28.30
	3587	1093.597561	Hand Pump	41.80		39.58	
	3546	1081.097561	Hand Pump	39.60		31.26	
	3459	1054.573171	Hand Pump	33.10		27.50	
	3495	1065.54878	Hand Pump	27.70		26.13	
	3428	1045.121951	Hand Pump	29.34		27.85	
Gurdari	3481	1061.280488	Hand Pump	28.30		24.87	
	3472	1058.536585	Hand Pump	38.10		36.63	
	3527	1075.304878	Hand Pump	28.20		26.83	
	3526	1075	Hand Pump	28.30		29.32	
	3412	1040.243902	Open Well		33.90		21.80
	3414	1040.853659	Open Well		33.70		24.80
Kujam	3491	1064.329268	Hand Pump	31.50		28.60	
	3450	1051.829268	Hand Pump				21.12
	3765	1147.865854	Hand Pump	33.40		28.35	
Chiro Kukud	3776	1151.219512	Hand Pump	37.60		31.84	
	3556	1084.146341	Hand Pump	34.30		36.85	