

Ref No: HIL/LHD/ VP (M)/MoEF/ 123

Date: 22.05.13

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

**Sub: Compliance Report of EC conditions for Pakhar (35.12 ha) Bauxite Mining project of M/s Hindalco Industries Limited located in Lohardaga, Jharkhand for the period Oct' 2012 - March' 2013.**

**Ref: Environmental Clearance letter no J-11015/137/2006-IA II (M) dated 5<sup>th</sup> April 2007**


Sir,

With reference to the above, we are submitting herewith the Compliance status report of EC conditions for **Pakhar (35.12 ha)** Bauxite Mining project of M/s Hindalco Industries Limited located in Lohardaga, Jharkhand for the period **Oct' 2012 - March' 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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Website [www.hindalco.com](http://www.hindalco.com)

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

**PAKHAR (35.12 Ha)BAUXITE MINES**

**Period : Oct'12 –March'13**

**J-11015/137/2006-IA II (M) dated 5<sup>th</sup> April 2007**

<b>Sl No</b>	<b>Conditions</b>	<b>Compliance Status</b>
Specific Conditions		
1	All the conditions stipulated by SPCB in their NOC shall be effectively implemented.	Complied. <b>Mining operations closed w.e.f 08.06.2009</b>
2	The environmental clearance is subject to approval of the state land use Department, Government of Jharkhand for diversion of agricultural land for non-agricultural use.	Complied.
3.	Environmental clearance is subject to grant of forestry clearance, Necessary forestry clearance under the Forest (Conservation) Act, 1980 for an area of 3.45ha forestland shall be obtained before starting mining operation in that area.	<b>Mining operations closed w.e.f 08.06.2009</b>
4	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.	<b>Mining operations closed w.e.f 08.06.2009.</b>
5	The project proponent shall ensure that no natural watercourse shall be obstructed due to any mining operation.	Complied
6	Top soil shall be stacked properly with proper slope with adequate measures and should be used for reclamation and rehabilitation of mined out areas.	<b>Mining operations closed w.e.f 08.06.2009</b>
7	The waste generated shall be concurrently backfilled in the mined out area. There shall be no external OB dump. Monitoring and management of rehabilitated areas should continue until the vegetation becomes self-sustaining. Compliance status should be submitted to the Ministry of Environment & Forest on six monthly basis.	<b>Mining operations closed w.e.f 08.06.2009</b>

8	<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><b>Mining operations closed w.e.f 08.06.2009</b></p>
9	<p>Plantation shall be raised in an area of 24.83ha 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>Already 8 ha area has been planted in and around the mine/Plateau area.</p>
10	<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><b>Mining operations closed w.e.f 08.06.2009</b></p>
11	<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><b>Mining operations closed w.e.f 08.06.2009</b></p>
12	<p>Prior permission from the competent authority should be obtained for drawl of water from the surface water bodies.</p>	<p><b>Mining operations closed w.e.f 08.06.2009</b></p>
13	<p>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.</p>	<p><b>Mining operations closed w.e.f 08.06.2009</b></p>
14	<p>Drills should either be operated with dust extractors or should be equipped with water injection system.</p>	<p><b>Mining operations closed w.e.f 08.06.2009</b></p>

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.	<b>Mining operations closed w.e.f 08.06.2009.</b>
16	Consent to operate should be obtained from SPCB prior to start of enhanced production from the mine.	<b>Mining operations closed w.e.f 08.06.2009</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.
18	The project proponent should take all precautionary measures during mining operation for conservation and protection of endangered fauna such as Indian Python etc. Spotted in the study area. Action plan for conservation of flora and fauna shall be prepared and implemented in consultation with the State Forest and Wildlife Department. Necessary allocation of funds for implementation of the conservation plan shall be made and the funds so allocated shall be included in the project cost. Copy of action plan may be submitted to the Ministry and its Regional Office within 3 months.	<b>Mining operations closed w.e.f 08.06.2009</b>
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.	Final Mine Closure plan (FMCP) submitted at IBM for approval.

### **GENERAL CONDITIONS**

<b>Sl No</b>	<b>Conditions</b>	<b>Compliance Status</b>
1	No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forest	<b>Mining operations closed w.e.f 08.06.2009</b>
2	No change in the calendar plan including excavation, quantum of mineral bauxite and waste should be made.	<b>Mining operations closed w.e.f 08.06.2009</b>
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.	<b>Mining operations closed w.e.f 08.06.2009</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.	<b>. Mining operations closed w.e.f 08.06.2009</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.	<b>Mining operations closed w.e.f 08.06.2009</b>
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.	<b>Mining operations closed w.e.f 08.06.2009.</b>
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.	<b>Mining operations closed w.e.f 08.06.2009</b>
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.	<b>Mining operations closed w.e.f 08.06.2009</b>
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. (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.	Not applicable.
11	The funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other	Statement of budgetary provision and actual expenses for environmental protection measure is enclosed. It is once again

	purpose. Year wise expenditure should be reported to the Ministry and its Regional Office located at Bhubneshwar.	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.	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, Bhubaneshwar, Central Pollution Control Board and State Pollution Control Board.	Complied.
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.	Not applicable.
16	The project authorities should advertise at least in two local newspapers widely circulated, one of which locality concerned, within 7days of the issue of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and also at web site of the Ministry of Environment and Forests at <a href="http://envfor.nic.in">http://envfor.nic.in</a> and a copy of the same should be forwarded to the Regional Office of this Ministry located Bhubneshwar.	Complied. Copies, of the advertisement made in the local newspapers, have already been submitted to the Regional Office during our six monthly report bearing letter no HIL/GMO(M)/ENV/142dated 23.05.2007.



# Test Report

Report No : KG13-001949.001

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 18/03/2013

JOE No : KG13-001949

Report Control No : KGR0000012045  
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 : 12/03/2013  
Registered : 12/03/2013  
Marks on Sample : Location : Mine Lease Area, date : 05.03.2013  
Sampling Site : Pakhar(8.09)/Pakhar(15.58)/Pakhar(115.13)/Pakhar(109.507) Bauxite Mines(Pe  
Test Start/End Date : 12/03/2013 - 18/03/2013

Analysis	Method	Result	Unit	Requirement/Limit as Per NAAQS	
				Min	Max
Particulate Matter (PM10)	IS:5182 (Part-23):2006	73	ug/m3	-	100
Particulate Matter (PM2.5)	USEPA CFR(40) Appendix-L	36.41	ug/m3	-	60
Oxides of Nitrogen (NOx)	IS:5182 (Part-6):1975 (Reaff.2004)	7.62	ug/m3	-	80
Sulphur Dioxide (SO2)	IS:5182 (Part-2):2001 (Reaff.2006)	<5.00	ug/m3	-	80
Carbon Monoxide	By NDIR Spectroscopy.	<0.10	PPM		

Remark : CO Analyzed at site.

## Page 1 of 2

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## Test Report

Report No : KG13-001949.001

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 18/03/2013

JOE No : KG13-001949

Report Control No : KGR0000012045

Per pro SGS India Private Ltd

Satya Manna

Section Incharge - ENVI

Authorized Signatory

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

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# Test Report

Report No : KG13-001949.002

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 18/03/2013

JOE No : KG13-001949

Sample Described by Customer as : AMBIENT AIR QUALITY MONITORING

Report Control No : KGR0000012045

Client Name : Hindalco Industries Limited(Mines Division)  
 Client Address : Lohardaga,  
 Postal Code : 835203  
 State : Jharkhand  
 Country : India  
 Sample Type : AMBIENT AIR QUALITY MONITORING  
 Received : 12/03/2013  
 Registered : 12/03/2013  
 Marks on Sample : Location : Kekrang Village, date : 05.03.2013  
 Sampling Site : Pakhar(8.09)/Pakhar(15.58)/Pakhar(115.13)/Pakhar(109.507) Bauxite Mines(Pa  
 Test Start/End Date : 12/03/2013 - 18/03/2013

Analysis	Method	Result	Unit	Requirement/Limit as Per NAAQS	
				Min	Max
Particulate Matter (PM10)	IS:5182 (Part-23):2006	66	ug/m3	-	100
Particulate Matter (PM2.5)	USEPA CFR(40) Appendix-L	27.35	ug/m3	-	60
Oxides of Nitrogen (NOx)	IS:5182 (Part-6):1975 (Reaff.2004)	10.57	ug/m3	-	80
Sulphur Dioxide (SO2)	IS:5182 (Part-2):2001 (Reaff.2006)	<5.00	ug/m3	-	80
Carbon Monoxide	By NDIR Spectroscopy.	<0.10	PPM		

Remark : CO Analyzed at site.

### Page 1 of 2

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## Test Report

Report No : KG13-001949.002

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 18/03/2013

JOE No : KG13-001949

Report Control No : KGR0000012045

Per pro SGS India Private Ltd

Satya Manna

Section Incharge - ENVI

Authorized Signatory

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

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# Test Report

Report No : KG13-001949.003

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 18/03/2013

JOE No : KG13-001949

Sample Described by Customer as : **Report Control No : KGR0000012045**  
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 : 12/03/2013  
 Registered : 12/03/2013  
 Marks on Sample : Location : Semardih Village, date : 06.03.2013  
 Sampling Site : Pakhar(8.09)/Pakhar(15.58)/Pakhar(115.13)/Pakhar(109.507) Bauxite Mines(Pe  
 Test Start/End Date : 12/03/2013 - 18/03/2013

Analysis	Method	Result	Unit	Requirement/Limit as Per NAAQS	
				Min	Max
Particulate Matter (PM10 )	IS:5182 (Part-23 ):2006	78	ug/m3	-	100
Particulate Matter (PM2.5)	USEPA CFR(40) Appendix-L	32.60	ug/m3	-	60
Oxides of Nitrogen (NOx)	IS:5182 (Part-6):1975 (Reaff.2004)	5.47	ug/m3	-	80
Sulphur Dioxide (SO2)	IS:5182 (Part-2):2001 (Reaff.2006)	<5.00	ug/m3	-	80
Carbon Monoxide	By NDIR Spectroscopy.	<0.10	PPM		

Remark : CO Analyzed at site.

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## Test Report

Report No : KG13-001949.003

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 18/03/2013

JOE No : KG13-001949

Report Control No : KGR0000012045

Per pro SGS India Private Ltd

Satya Manna

Section Incharge - ENVI

Authorized Signatory

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

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# Test Report

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 18/03/2013

Report No : KG13-001949.004

JOE No : KG13-001949

Report Control No : KGR0000012045  
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 : 12/03/2013  
 Registered : 12/03/2013  
 Marks on Sample : Location : Patratoli Village, date : 14.02.2013  
 Sampling Site : Pakhar(8.09)/Pakhar(15.58)/Pakhar(115.13)/Pakhar(109.507) Bauxite Mines(Pa  
 Test Start/End Date : 12/03/2013 - 18/03/2013

Analysis	Method	Result	Unit	Requirement/Limit as Per NAAQS	
				Min	Max
Particulate Matter (PM10 )	IS:5182 (Part-23 ):2006	54	ug/m3	-	100
Particulate Matter (PM2.5)	USEPA CFR(40) Appendix-L	24.35	ug/m3	-	60
Oxides of Nitrogen (NOx)	IS:5182 (Part-6):1975 (Reaff.2004)	6.48	ug/m3	-	80
Sulphur Dioxide (SO2)	IS:5182 (Part-2):2001 (Reaff.2006)	16.89	ug/m3	-	80
Carbon Monoxide	By NDIR Spectroscopy.	<0.10	PPM		

Remark : CO Analyzed at site.

### Page 1 of 2

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## Test Report

Report No : KG13-001949.004

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 18/03/2013

JOE No : KG13-001949

Report Control No : KGR0000012045

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 COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 22/03/2013

Report No : KG13-001953.001

JOE No : KG13-001953

Sample Described by Customer as : SOIL(COMPOSITE) Report Control No : KGR0000012696

Client Name : Hindalco Industries Limited(Mines Division)  
 Client Address : Lohardaga,  
 Postal Code : 835203  
 State : Jharkhand  
 Country : India  
 Sample Type : SOIL(COMPOSITE)  
 Received : 12/03/2013  
 Registered : 12/03/2013  
 Marks on Sample : Location:Quarry No. 96.25 Reclaimed Area  
 Sampling Site : Pakhar(8.09)/(15.58)/(115.13)/(109.507) Bauxite Mines(Pakhar plateau)  
 Sample Collected : 05.03.2013  
 Quantity : 2.5Kg app  
 Test Start/End Date : 12/03/2013 - 21/03/2013

Analysis	Method	Result	Limit of Reporting (LOR)	Unit
Conductivity (1:5) Soil Suspension. ( 1 : 2 aqueous solution )	F.A.U.N (2007)	30.6	1.00	µs/cm
pH (1:2) Soil Suspension ( 1 : 2 aqueous solution )	F.A.U.N (2007)	6	0.50	--
Porosity	F.A.U.N (2007)	48.89	-	%
Bulk Density	By Bulk Density Apparatus	1.17	0.10	gram/ml
Phosphorus (as P)	F.A.U.N (2007)	<20.000	20.00	mg/kg
Texture	F.A.U.N (2007)	Clay loam	-	
Clay	F.A.U.N (2007)	39.3	5.00	%
Sand	F.A.U.N (2007)	33.2	1.00	%
Silt	F.A.U.N (2007)	27.5	1.00	%
Available Chloride (as Cl)	Soil & Agriculture Organization (U.N-2007)	<20.00	20.00	mg/kg
Available Nitrogen	Food & Agriculture Organization (U.N-2007)	358.16	20.00	mg/kg

Page 1 of 2

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## Test Report

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 22/03/2013

Report No : KG13-001953.001

JOE No : KG13-001953

Analysis	Method	Result	Limit of Reporting (LOR)	Unit
Available Potassium (as K)	Soil & Water Book By P.K. Gupta	1618.76	1.00	mg/kg
Available Magnesium (as Mg)	Soil & Water Book By P.K. Gupta	2195.32	1.00	mg/kg
Lead (as Pb)	USEPA 3052	10.36	2.00	mg/kg
Chromium (as Cr)	USEPA 3052	54.80	2.00	mg/kg
Mercury (as Hg)	USEPA 3052	<1.00	1.00	mg/kg
Total Organic Matter	Black & Walkely Wet Digestion Method	0.88	0.01	%

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 COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 22/03/2013

Report No : KG13-001953.002

JOE No : KG13-001953

Sample Described by Customer as : SOIL(COMPOSITE) Report Control No : KGR0000012696

Client Name : Hindalco Industries Limited(Mines Division)  
 Client Address : Lohardaga,  
 Postal Code : 835203  
 State : Jharkhand  
 Country : India  
 Sample Type : SOIL(COMPOSITE)  
 Received : 12/03/2013  
 Registered : 12/03/2013  
 Marks on Sample : Location:Quarry No. 270.59 Mineral 8 Minard Reclaimed area  
 Sampling Site : Pakhar(8.09)/(15.58)/(115.13)/(109.507) Bauxite Mines(Pakhar plateau)  
 Sample Collected : 05.03.2013  
 Quantity : 2.5Kg app  
 Test Start/End Date : 12/03/2013 - 21/03/2013

Analysis	Method	Result	Limit of Reporting (LOR)	Unit
Conductivity (1:5) Soil Suspension. ( 1 : 2 aqueous solution )	F.A.U.N (2007)	30.8	1.00	µs/cm
pH (1:2) Soil Suspension ( 1 : 2 aqueous solution )	F.A.U.N (2007)	6	0.50	-
Porosity	F.A.U.N (2007)	51.2	-	%
Bulk Density	By Bulk Density Apparatus	1.02	0.10	gram/ml
Phosphorus (as P)	F.A.U.N (2007)	<20.000	20.00	mg/kg
Texture	F.A.U.N (2007)	Clay loam	-	-
Clay	F.A.U.N (2007)	29.3	5.00	%
Sand	F.A.U.N (2007)	43.2	1.00	%
Silt	F.A.U.N (2007)	27.5	1.00	%
Available Chloride (as Cl)	Soil & Agriculture Organization (U.N-2007)	<20.00	20.00	mg/kg
Available Nitrogen	Food & Agriculture Organization (U.N-2007)	302.31	20.00	mg/kg

Page 1 of 2

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## Test Report

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 22/03/2013

Report No : KG13-001953.002

JOE No : KG13-001953

Report Control No : KGR0000012696

Analysis	Method	Result	Limit of Reporting (LOR)	Unit
Available Potassium (as K)	Soil & Water Book By P.K. Gupta	2522.06	1.00	mg/kg
Available Magnesium (as Mg)	Soil & Water Book By P.K. Gupta	3216.67	1.00	mg/kg
Lead (as Pb)	USEPA 3052	16.23	2.00	mg/kg
Chromium (as Cr)	USEPA 3052	48.84	2.00	mg/kg
Mercury (as Hg)	USEPA 3052	<1.00	1.00	mg/kg
Total Organic Matter	Black & Walkely Wet Digestion Method	0.63	0.01	%

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

Print Date : 02/04/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-002087.004

JOE No : KG13-002087

Report Control No : KGR0000013912

Sample Described by Customer as : SPRING WATER

Client Name : Hindalco Industries Limited(Mines Division)  
 Client Address : Lohardaga,  
 Postal Code : 835203  
 State : Jharkhand  
 Country : India  
 Sample Type : SPRING WATER  
 Received : 18/03/2013  
 Registered : 18/03/2013  
 Marks on Sample : Location: Pakhar Bangla Path  
 Quantity : 5.5L app  
 Sample Collected : 10.03.2013, time : 10.30 am  
 Test Start/End Date : 18/03/2013 - 01/04/2013

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)	7.10*		6.5	8.5
Total Hardness (as CaCO <sub>3</sub> )	IS:3025 (Part-21):1983 (Reaff.2006)	4.04	mg/L	200	600
Iron (as Fe)	IS:3025 (Part-2)	0.28	mg/L	0.3	No relaxation
Fluoride (as F)	IS:3025 (Part-60):2008	0.30	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)	5.03	mg/L	250	1000
Total Dissolved Solids	IS:3025 (Part-16):1984 (Reaff.1996)	12.60	mg/L	500	2000
E.coli	IS:1622:1981(Reaff.2003)	Absent	per 100ml		Absent/100ml

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# Test Report

Print Date : 02/04/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-002087.004

JOE No : KG13-002087

Report Control No : KGR0000013912

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
Magnesium (as Mg)	IS:3025 (Part-46):1994 (Reaff.1999)	<1.00	mg/L	30	100
Calcium (as Ca)	IS:3025 (Part-40):1991 (Reaff.2003)	1.21	mg/L	75	200
Copper (as Cu)	IS:3025 (Part-2)	<0.01	mg/L	0.05	1.5
Manganese (as Mn)	IS:3025 (Part-2)	0.02	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)	1.80	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)	0.024	mg/L	0.01	No relaxation
Zinc (as Zn)	IS:3025 (Part-2)	<0.01	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)	5.24	mg/L	200	600
Aluminium (as Al)	IS:3025 (Part-55):2003	0.05	mg/L	0.03	0.2
Boron (as B)	IS:3025 (Part-57):2005	0.06	mg/L	0.5	1.0
Turbidity	IS:3025 (Part-10):1984 (Reaff.2006)	2.26	NTU	1	5
Coliform bacteria	IS:1622-1981 (Reaffirmation 2003)	Present	per 100ml		

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## Test Report

Print Date : 02/04/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-002087.004

JOE No : KG13-002087

Analysis	Method	Report Control No : KGR0000013912	Result	Unit	Requirement/Limit As per IS:10500:2012	Acceptable	Permissible
Remark : *Analyzed at site.							

Per pro SGS India Private Lt

Asish Chakraborty  
Laboratory Manager  
Authorized Signatory

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

### Page 3 of 3

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# Test Report

Print Date : 02/04/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-002087.005

JOE No : KG13-002087

Report Control No : KGR0000013912

Sample Described by Customer as : SPRING WATER

Client Name : Hindalco Industries Limited(Mines Division)  
 Client Address : Lohardaga,  
 Postal Code : 835203  
 State : Jharkhand  
 Country : India  
 Sample Type : SPRING WATER  
 Received : 18/03/2013  
 Registered : 18/03/2013  
 Marks on Sample : Location: Pakhar Sarnapath  
 Quantity : 5.5L app  
 Sample Collected : 10.03.2013, time : 11.00 am  
 Test Start/End Date : 18/03/2013 - 01/04/2013

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)	7.10*		6.5	8.5
Total Hardness (as CaCO <sub>3</sub> )	IS:3025 (Part-21):1983 (Reaff.2006)	5.05	mg/L	200	600
Iron (as Fe)	IS:3025 (Part-2)	0.09	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)	5.75	mg/L	250	1000
Total Dissolved Solids	IS:3025 (Part-16):1984 (Reaff.1996)	15.60	mg/L	500	2000
E.coli	IS:1622:1981(Reaff.2003)	Absent	per 100ml		Absent/100ml

Page 1 of 3

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# Test Report

Print Date : 02/04/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-002087.005

JOE No : KG13-002087

Report Control No : KGR0000013912

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
Magnesium (as Mg)	IS:3025 (Part-46):1994 (Reaff.1999)	<1.00	mg/L	30	100
Calcium (as Ca)	IS:3025 (Part-40):1991 (Reaff.2003)	1.62	mg/L	75	200
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 SO4)	IS:3025 (Part-24):1986 (Reaff.1998)	<2.00	mg/L	200	400
Nitrate (as NO3)	IS:3025 (Part-34):1988 (Reaff.1999)	2.80	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)	0.021	mg/L	0.01	No relaxation
Zinc (as Zn)	IS:3025 (Part-2)	0.01	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)	5.52	mg/L	200	600
Aluminium (as Al)	IS:3025 (Part-55):2003	0.04	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)	3.35	NTU	1	5
Coliform bacteria	IS:1622-1981 (Reaffirmation 2003)	Present	per 100ml		

Page 2 of 3

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# Test Report

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 02/04/2013

Report No : KG13-002087.005

JOE No : KG13-002087

Analysis	Method	Report Control No : KGR0000013912	Result	Unit	Requirement/Limit	
					As per IS:10500:2012	Acceptable Permissible
Remark : *Analyzed at site.						

Per pro SGS India Private Lt

**Asish Chakraborty**  
Laboratory Manager  
Authorized Signatory

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

### Page 3 of 3

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# Test Report

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 02/04/2013

Report No : KG13-002087.006

JOE No : KG13-002087

Report Control No : KGR0000013912

Sample Described by Customer as : SPRING WATER

Client Name : Hindalco Industries Limited(Mines Division)  
 Client Address : Lohardaga,  
 Postal Code : 835203  
 State : Jharkhand  
 Country : India  
 Sample Type : SPRING WATER  
 Received : 18/03/2013  
 Registered : 18/03/2013  
 Marks on Sample : Location: Pakhar  
 Quantity : 5.5L app  
 Sample Collected : 10.03.2013, time : 12.00 pm  
 Test Start/End Date : 18/03/2013 - 01/04/2013

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-6):1983 (Reaff.2006)	Agreeable		Agreeable	Agreeable
pH	IS:3025 (Part-11):1983 (Reaff.2006)	7.00*		6.5	8.5
Total Hardness (as CaCO <sub>3</sub> )	IS:3025 (Part-21):1983 (Reaff.2006)	2.52	mg/L	200	600
Iron (as Fe)	IS:3025 (Part-2)	0.23	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)	<5.00	mg/L	250	1000
Total Dissolved Solids	IS:3025 (Part-16):1984 (Reaff.1996)	9.00	mg/L	500	2000
E.coli	IS:1622:1981(Reaff 2003)	Absent	per 100ml		Absent/100ml

Page 1 of 3

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# Test Report

Print Date : 02/04/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-002087.006

JOE No : KG13-002087

Report Control No : KGR0000013912

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
Magnesium (as Mg)	IS:3025 (Part-46):1994 (Reaff.1999)	<1.00	mg/L	30	100
Calcium (as Ca)	IS:3025 (Part-40):1991 (Reaff.2003)	<1.00	mg/L	75	200
Copper (as Cu)	IS:3025 (Part-2)	<0.01	mg/L	0.05	1.5
Manganese (as Mn)	IS:3025 (Part-2)	0.02	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)	3.78	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)	0.018	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 CaCO3)	IS:3025 (Part-23):1986 (Reaff.2003)	4.96	mg/L	200	500
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)	0.97	NTU	1	5
Coliform bacteria	IS:1622-1981 (Reaffirmation 2003)	Present	per 100ml		

Page 2 of 3

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# Test Report

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 02/04/2013

Report No : KG13-002087.006

JOE No : KG13-002087

Analysis	Method	Report Control No : KGR0000013912	Result	Unit	Requirement/Limit
					As per IS:10500:2012
					Acceptable Permissible

Remark : \*Analyzed at site.

Per pro SGS India Private Lt

**Asish Chakraborty**  
**Laboratory Manager**  
**Authorized Signatory**

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

### Page 3 of 3

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# Test Report

Print Date : 02/04/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-002087.007

JOE No : KG13-002087

Report Control No : KGR0000013912

Sample Described by Customer as : SPRING WATER

Client Name : Hindalco Industries Limited(Mines Division)  
 Client Address : Lohardaga,  
 Postal Code : 835203  
 State : Jharkhand  
 Country : India  
 Sample Type : SPRING WATER  
 Received : 18/03/2013  
 Registered : 18/03/2013  
 Marks on Sample : Location: Pakhar Domurpath  
 Quantity : 5.5L app  
 Sample Collected : 10.03.2013, time : 1.30 pm  
 Test Start/End Date : 18/03/2013 - 01/04/2013

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)	7.30*		6.5	8.5
Total Hardness (as CaCO <sub>3</sub> )	IS:3025 (Part-21):1983 (Reaff.2006)	1.52	mg/L	200	600
Iron (as Fe)	IS:3025 (Part-2)	<0.05	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)	<5.00	mg/L	250	1000
Total Dissolved Solids	IS:3025 (Part-16):1984 (Reaff.1996)	9.60	mg/L	500	2000
E.coli	IS:1622:1981(Reaff.2003)	Absent	per 100ml		Absent/100ml

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# Test Report

Print Date : 02/04/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-002087.007

JOE No : KG13-002087

Report Control No : KGR0000013912

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
Magnesium (as Mg)	IS:3025 (Part-46):1994 (Reaff.1999)	<1.00	mg/L	30	100
Calcium (as Ca)	IS:3025 (Part-40):1991 (Reaff.2003)	<1.00	mg/L	75	200
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 SO4)	IS:3025 (Part-24):1986 (Reaff.1998)	<2.00	mg/L	200	400
Nitrate (as NO3)	IS:3025 (Part-34):1988 (Reaff.1999)	1.13	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)	0.018	mg/L	0.01	No relaxation
Zinc (as Zn)	IS:3025 (Part-2)	<0.01	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)	2.76	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)	0.94	NTU	1	5
Coliform bacteria	IS:1622-1981 (Reaffirmation 2003)	Present	per 100ml		

Page 2 of 3

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# Test Report

Print Date : 02/04/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-002087.007

JOE No : KG13-002087

Report Control No : KGR0000013912

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	Acceptable	Permissible
Remark : *Analyzed at site.						

Per pro SGS India Private Li

*Asish Chakraborty*

**Asish Chakraborty**  
**Laboratory Manager**  
**Authorized Signatory**

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

WARNING: The sample(s) to which the findings recorded herein (the "Findings") relate was(were) drawn and / or provided by the Client or by a third party acting at the Client's direction. The Findings constitute no warranty of the sample's representativeness of any goods and strictly relate to the sample(s). The Company accepts no liability with regard to the origin or source from which the sample(s) is/are said to be extracted.

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Regd & Corp. Off : SGS House, 4B, A-5 Marg, Vikhroli (West), Mumbai-400083. Tel : (022) 25788421 to 28 Fax : (022) 25788431 to 35 www.sgs.com



# Test Report

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 01/04/2013

Report No : KG13-002092.006

JOE No : KG13-002092

Report Control No : KGR0000013682

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 : 18/03/2013  
 Registered : 18/03/2013  
 Marks on Sample : Location: Pakhar-Sarnapath  
 Quantity : 5.5L app  
 Sample Collected : 10.03.2013, time : 12.00 pm  
 Test Start/End Date : 18/03/2013 - 01/04/2013

Analysis	Method	Result	Unit	Requirement/Limit	
				As per IS:10500:2012	Acceptable Permissible
Colour	IS:3025 (Part-4):1983 (Reaff.2006)	20.0	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)	7.30*		6.5	8.5
Total Hardness (as CaCO <sub>3</sub> )	IS:3025 (Part-21):1983 (Reaff.2006)	9.09	mg/L	200	600
Iron (as Fe)	IS:3025 (Part-2)	0.17	mg/L	0.3	No relaxation
Fluoride (as F)	IS:3025 (Part-60):2008	0.18	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)	19.00	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)	2.42	mg/L	75	200
Magnesium (as Mg)	IS:3025 (Part-46):1994 (Reaff.1999)	<1.00	mg/L	30	100

Page 1 of 3

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# Test Report

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 01/04/2013

Report No : KG13-002092.006

JOE No : KG13-002092

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
Copper (as Cu)	IS:3025 (Part-2)	0.07	mg/L	0.05	1.5
Manganese (as Mn)	IS:3025 (Part-2)	0.08	mg/L	0.1	0.3
Sulphate (as SO4)	IS:3025 (Part-24):1988 (Reaff.1998)	<2.00	mg/L	200	400
Nitrate (as NO3)	IS:3025 (Part-34):1988 (Reaff.1999)	2.25	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):1988 (Reaff.2003)	<0.020	mg/L	0.05	No relaxation
Lead (as Pb)	IS:3025 (Part-47):1994 (Reaff.1999)	0.021	mg/L	0.01	No relaxation
Zinc (as Zn)	IS:3025 (Part-2)	0.82	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):1988 (Reaff.2003)	12.13	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	0.09	mg/L	0.5	1.0
Turbidity	IS:3025 (Part-10):1984 (Reaff.2006)	1.82	NTU	1	5

Page 2 of 3

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## Test Report

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 01/04/2013

Report No : KG13-002092.006

JOE No : KG13-002092

Report Control No : KGR0000013682

Per pro SGS India Private Lt

Asish Chakraborty  
Laboratory Manager  
Authorized Signatory

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

Page 3 of 3

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TEST REPORT

Report No. : CA:GL:3120015187 DATE : 17/10/2012

JOE No. : 1212806597

Report Control No.:3125016169

SAMPLE DRAWN BY SGS INDIA PRIVATE LIMITED

SAMPLE IDENTIFIED AS : AMBIENT AIR QUALITY MONITORING
CUSTOMER NAME HINDALCO INDUSTRIES LIMITED (MINES DIVISION)
ADDRESS LOHARDAGA, JHARKHAND
CITY 835302
COUNTRY INDIA
SAMPLING METHOD N.A.
SAMPLE DESCRIPTION AMBIENT AIR QUALITY MONITORING

MARK/LOCATION SITE:PAKHAR(8 09)/PAKHAR(15.58)/PAKHAR(115 13)/PAKHAR(109 507) BAUXITE
MINES(PAKHAR PLATEAU)
LOCATION:MINE LEASE AREA(COREZONE)
DATE:23.09.12 TO 24.09.12

SAMPLE RECD ON 11/10/2012
TEST START DATE 11/10/2012
TEST END DATE 17/10/2012

Table with 5 columns: TESTS, PROTOCOL, RESULT, REQUIREMENT/LIMIT (As per CPCB RESIDENTIAL AREA MIN, MAX). Rows include CARBON MONOXIDE (CO), OXIDES OF NITROGEN (NOx), PARTICULATE MATTER(10), PARTICULATE MATTER(2.5), and SULPHUR DIOXIDE (SO2).

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

per pro SGS India Private Ltd.

Signature of Asish Chakraborty, Manager Laboratory

Signature of A. R. Datta, Chemist

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TEST REPORT

Report No. : CA:GL:3120015188

DATE : 17/10/2012

JOE No. : 1212806597

Report Control No.:3125016170

SAMPLE DRAWN BY SGS INDIA PRIVATE LIMITED

SAMPLE IDENTIFIED AS : AMBIENT AIR QUALITY MONITORING
CUSTOMER NAME HINDALCO INDUSTRIES LIMITED (MINES DIVISION)
ADDRESS LOHARDAGA, JHARKHAND
CITY 835302
COUNTRY INDIA
SAMPLING METHOD N.A.
SAMPLE DESCRIPTION AMBIENT AIR QUALITY MONITORING

MARK/LOCATION SITE:PAKHAR(8.09)/PAKHAR(15.58)/PAKHAR(115.13)/PAKHAR(109.507) BAUXITE MINES(PAKHAR PLATEAU)
LOCATION:KEKRANG VILLAGE(BUFFER ZONE)
DATE:23.09.12 TO 24.09.12

SAMPLE RECD ON 11/10/2012
TEST START DATE 11/10/2012
TEST END DATE 17/10/2012

Table with 5 columns: TESTS, PROTOCOL, RESULT, REQUIREMENT/LIMIT (As per CPCB RESIDENTIAL AREA MIN, MAX). Rows include CARBON MONOXIDE (CO), OXIDES OF NITROGEN (NOx), PARTICULATE MATTER(10), PARTICULATE MATTER(2.5), and SULPHUR DIOXIDE (SO2).

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

per pro SGS India Private Ltd.

Signature of Asish Chakraborty, Manager Laboratory, Chemist cum QAF

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TEST REPORT

Report No. : CA:GL:3120015189 DATE : 17/10/2012

JOE No. : 1212806597

Report Control No.:3125016171

SAMPLE DRAWN BY SGS INDIA PRIVATE LIMITED

SAMPLE IDENTIFIED AS : AMBIENT AIR QUALITY MONITORING
CUSTOMER NAME HINDALCO INDUSTRIES LIMITED (MINES DIVISION)
ADDRESS LOHARDAGA, JHARKHAND
CITY 835302
COUNTRY INDIA
SAMPLING METHOD N.A.
SAMPLE DESCRIPTION AMBIENT AIR QUALITY MONITORING

MARK/LOCATION SITE:PAKHAR(8.09)/PAKHAR(15.58)/PAKHAR(115.13)/PAKHAR(109.507) BAUXITE MINES(PAKHAR PLATEAU)
LOCATION:SEMARDEH VILLAGE(BUFFER ZONE)
DATE:24.09.12 TO 25.09.12

SAMPLE RECD ON 11/10/2012
TEST START DATE 11/10/2012
TEST END DATE 17/10/2012

Table with 5 columns: TESTS, PROTOCOL, RESULT, REQUIREMENT/LIMIT (As per CPCB RESIDENTIAL AREA MIN, MAX). Rows include CARBON MONOXIDE (CO), OXIDES OF NITROGEN (NOx), PARTICULATE MATTER(10), PARTICULATE MATTER(2.5), and SULPHUR DIOXIDE (SO2).

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

per pro SGS India Private Ltd.

Signature of Asish Chakraborty, Manager Laboratory

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TEST REPORT

Report No. : CA:GL:3120015190 DATE : 17/10/2012

JOE No. : 1212806597

Report Control No. 3125016172

SAMPLE IDENTIFIED AS : AMBIENT AIR QUALITY MONITORING
CUSTOMER NAME HINDALCO INDUSTRIES LIMITED (MINES DIVISION)
ADDRESS LOHARDAGA, JHARKHAND
CITY 835302
COUNTRY INDIA
SAMPLING METHOD N.A.
SAMPLE DESCRIPTION AMBIENT AIR QUALITY MONITORING

MARK/LOCATION SITE: PAKHAR(8.09)/PAKHAR(15.58)/PAKHAR(115.13)/PAKHAR(109.507) BAUXITE MINES(PAKHAR PLATEAU)
LOCATION: PATRATOLI VILLAGE(BUFFER ZONE)
DATE: 24.09.12 TO 25.09.12

SAMPLE RECD ON 11/10/2012
TEST START DATE 11/10/2012
TEST END DATE 17/10/2012

Table with 5 columns: TESTS, PROTOCOL, RESULT, REQUIREMENT/LIMIT (As per CPCB RESIDENTIAL AREA MIN, MAX). Rows include CARBON MONOXIDE (CO), OXIDES OF NITROGEN (NOx), PARTICULATE MATTER(10), PARTICULATE MATTER(2.5), and SULPHUR DIOXIDE (SO2).

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

per pro SGS India Private Ltd.

Signature of Asish Chakraborty, Manager Laboratory

Signature of A. K. Dutta, Specialist cum QA

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TEST REPORT

Report No. : CA:GL:3120011479

DATE : 10/08/2012

JOE No. : 1212805062

Control No. :3125012285

**SAMPLE COLLECTED BY SGS**

SAMPLE IDENTIFIED AS : SPRING WATER

COMPANY NAME HINDALCO INDUSTRIES LIMITED (MINES DIVISION)

ADDRESS LOHARDAGA, JHARKHAND  
CITY 835302

SAMPLING METHOD APHA 1060B

SAMPLE DESCRIPTION SPRING WATER

SAMPLE CONDITION IN PLASTIC BOTTLE

SAMPLE QTY. 7L APP

\*\*ARKS ON SAMPLE PAKHAR

COLLECTED ON 01.08.2012, TIME : 11.30 AM

REGISTERED ON 02/08/2012

TEST START DATE 02/08/2012

TEST END DATE 10/08/2012

TESTS	PROTOCOL	RESULT	REQUIREMENT/LIMIT	
			Desirable	Permissible
ALKALINITY (as CaCO <sub>3</sub> )	IS 3025:PART 23 :1986(Reaff.1998)	<5.0 mg/l	200mg/l	600mg/l
ALUMINIUM (as Al)	IS 3025 : Part 55 : 2003	<0.02 mg/l	0.03mg/l	0.2mg/l
ANIONIC DETERGENTS (as MBAS)	ANNEX. K of IS 13428: 2005	<0.05 mg/l	0.2mg/l	1mg/l
ARSENIC (as As)	IS 3025:PART 37:1988(Reaff.1999)BY ICPOES	<0.005 mg/l	0.01mg/l	No Relax.
BORON	Annex.H OF IS:13428:2005	<0.05 mg/l	1.0mg/l	5.0mg/l
CADMIUM (as Cd)	IS 3025:PART 41 :1992(Reaff.1998)BY ICPOES	<0.005 mg/l	0.01mg/l	No Relax.

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TEST REPORT

Report No. : CA:GL:3120011479

DATE : 10/08/2012

JOE No. : 1212805062

Control No.:3125012285

TESTS	PROTOCOL	RESULT	REQUIREMENT/LIMIT	
			Desirable	Permissible
CALCIUM (as Ca)	IS 3025:PART 40 :1991(Reaff.2003)	<1.0 mg/l	75mg/l	200mg/l
CHLORIDE ( as Cl)	Clause 2 of IS 3025 Part 32:1988(Reaff. 1999)	<2.0 mg/l	250mg/l	1000mg/l
CHROMIUM (Cr6+)	IS 3025:PART 52:2003	<0.01 mg/l	0.05mg/l	No Relax.
COLOUR ( HAZEN UNITS)	IS 3025:PART 4 :1983(Reaff.2002)	5	5.0	25
COPPER	IS 3025: PART 42:1992(Reaff. 2003) BY ICPOES	<0.01 mg/l	0.05mg/l	1.5mg/l
CYANIDE ( as CN)	IS 3025:PART 27 :1986(Reaff.1998)	<0.02 mg/l	0.05mg/l	No Relax.
E.coli	IS 1622:1981(Reaff.2003)	Absent/100ml		ABS/100ml
FLUORIDE	IS:3025(PART 60):2008	<0.10 mg/l	1.0mg/l	1.5mg/l
IRON ( as Fe)	IS 3025:PART 53:2003 (BY ICPOES)	<0.05 mg/l	0.3mg/l	1 mg/l
LEAD (as Pb)	IS 3025:PART 47:1994(Reaff.2003) BY ICPOES	<0.005 mg/l	0.05mg/l	No Relax.
MAGNESIUM ( as Mg)	IS 3025:PART 46 :1994(Reaff.1999)	<1.0 mg/l	30mg/l	100mg/l
MANGANESE	IS:3025(PART 59) 2006	<0.01 mg/l	0.1mg/l	0.3mg/l
MERCURY (as Hg)	IS 3025:PART 48 :1994(Reaff.1999)BY ICPOES	<0.001 mg/l	0.001mg/l	No Relax.

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**TEST REPORT**

**Report No. : CA:GL:3120011479**

**DATE : 10/08/2012**

JOE No. : 1212805062

Control No. : 3125012285

TESTS	PROTOCOL	RESULT	REQUIREMENT/LIMIT	
			Desirable	Permissible
MINERAL OIL	CLAUSE 6 OF IS 3025:PART 39:1991(Reaff. 2003)	BDL(DL-0.01 mg/l)	0.01mg/l	0.03mg/l
NITRATE	IS 3025:PART 34 :1988(Reaff. 1999)	6.23 mg/l	45mg/l	No Relax.
ODOUR	IS 3025:PART 5:1983(Reaff.2002)	Unobjectionable	Unobject.	Unobject.
pH	IS 3025:PART 11:1983(Reaff.2002)	7.2 *	6.5-8.5	No Relax.
PHENOLIC COMPOUNDS (as C6H5OH)	IS 3025(Part 43)1992(Reaff 2005)	<0.001 mg/l	0.001mg/l	0.002mg/l
RESIDUAL FREE CHLORINE	GEN/SOP/CALLAB-13 3	<0.10 mg/l *	0.2mg/l	..
SELENIUM	IS 3025:PART 56:2003 (BY ICPOES)	<0.005 mg/l	0.01mg/l	No Relax.
SULPHATE	CLAUSE 4 OF IS 3025:PART 24:1986(Reaff. 2003)	<2.0 mg/l	200mg/l	400mg/l
TASTE	IS 3025:PART 7 :1984(Reaff.2002)	Agreeable	Agreeable	
Total Coliforms	IS 1622:1981(Reaff.2003)	10.0 MPN/100ml		10/100 ml
TOTAL DISSOLVED SOLIDS	IS 3025:PART 16:1984(Reaff.2002)	13 mg/l	500mg/l	2000mg/l
TOTAL HARDNESS (as CaCO3)	IS 3025:PART 21 :1983(Reaff.2002)	<1.0 mg/l	300mg/l	600mg/l
TURBIDITY( in NTU )	IS 3025:PART 10 :1984(Reaff.2002)	0.33	5.0NTU	10NTU

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TEST REPORT

Report No. : CA:GL:3120011479

DATE : 10/08/2012

JOE No. : 1212805062

Control No.:3125012285

TESTS	PROTOCOL	RESULT	REQUIREMENT/LIMIT	
			Desirable	Permissible
			As per IS 10500:1991(REAFF 1993)	
ZINC (as Zn)	IS 3025 Part 49:1991(Reaff.2003) BY ICPOES	<0.01 mg/l	5mg/l	15mg/l

\* Analyzed at site.

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

per pro SGS India Private Ltd.

*F. A. Ghosh*  
Dr. Nemai Ghosh  
Manager Laboratory

*A. M. Datta*  
Quality Control

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ADITYA BIRLA



**BREAK UP THE COST OF ENVIRONMENTAL MEASURES DURING THE YEAR 2012-13**

The composite cost during the year 2012-13 (April to March) for environmental protection & pollution control by Jharkhand Mines division of Hindalco Industries 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.

Sl No	Description	Budget (in Lakh Rs.)	Actual (in Lakh Rs.) FY 2012-2013
1	Pollution Control & Environment monitoring	7.50	11.32
2	Reclamation/ Back filing & Rehabilitation	**	46.60
3	Green belt & Plantation	25.00	88.09
4	Rural Development	65.00	81.50

\*\*part of OB removed cost.

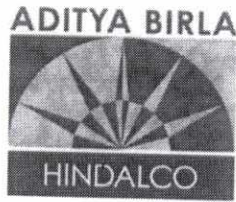
  
Convener

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:20.03.13

**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, Manager (Bagru Mines)
5. A. Anbarasu, Mines Manager (Serengdag A)
6. Ajay Pandey, Mines Manager (Pakhar)
7. Kiran Sankar Singh, Mines Manager (Gurdari)
8. Vidya Sagar Singh, Mines Manager (Serengdag B)
9. Ashish Upadhyay, Mines Manager (Kujam I & II)
10. Amar Bharati, Mines Manager (Amtipani)
11. Monaj Kumar Singh, Mines Manager (Pakhar 109.507 Ha)
12. Rajesh Ambastha, Mines Manager (Chiro Kukud & Orsa)

By order

  
Bijesh Kumar Jha  
VP (Mines)

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