

ADITYA BIRLA



HINDALCO

Ref No: HIL/LHD/VP (M)/MoEF/ 476

Date: 22.11.2013

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

Sub: Compliance Report of EC conditions for Hisri New (14.55 ha) Bauxite Mining project of M/s Hindalco Industries Limited located in Lohardaga District of Jharkhand for the period April' 2013 -Sep' 2013.

Ref: Environmental Clearance letter no J-11015/531/2007-IA II (M) dated 17th June 2011

Sir,

With reference to the above, we are submitting herewith the Compliance status report of EC conditions for **Hisri New (14.55 ha) Bauxite Mining project of M/s Hindalco Industries Limited**, located in Lohardaga District of Jharkhand for the period **April' 2013 -Sep' 2013**

Hope you will find the same in order.

Thanking You

Yours Sincerely
FOR M/s **Hindalco Industries Limited**,

byw
(Bijesh Kumar Jha)
VP (Mines)

Enclosure: - As Above

HINDALCO INDUSTRIES LIMITED

Hindalco Complex
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Distt. Lohardaga (Jharkhand)

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

Website www.hindalco.com

Compliance of conditions laid down in Environmental Clearance

HISRI (NEW) BAUXITE MINES(14.55 Ha)

Period :April'13 – Sep'13

Environmental Clearance letter no J-11015/531/2007-IA II (M) dated 17th June 2011

Sl No	Conditions	Compliance Status
Specific Conditions		
1	The project proponent shall obtain Consent to Establish and Consent to Operate from the Jharkhand State Pollution Control Board and effectively implement all the conditions stipulated therein.	Consent to Establish & Consent to operate obtained from Jharkhand State Pollution Control Board. Consent to operate is valid up to 31.12.13. Copy enclosed.
2	The environmental clearance is subject to forestry clearance.	Forest clearance obtained.
3	The environmental clearance is subject to approval of the state land use Department, Government of Jharkhand for diversion of agricultural land for non-agricultural use.	Mining Lease is granted/ renewed by the State Govt. after due consideration and Cabinet approval on recommendation of DC who is the competent authority to give permission for using the agricultural land for non-agricultural purpose.
4	The mining operation shall be restricted to above ground water table and it should not intersect the ground water table. In case of working below ground water table, prior approval of the Ministry of Environment & Forests and Central Ground Water Authority shall be obtained, for which a detailed hydro – geological study shall be carried out.	Depth of mining will be 15-20 mtr bgl (maximum). Ground water table level is 40-50 mtr bgl. Thus there is no chance to intersect ground water table during mining operation. Working zone will be restricted to above ground water table.
5	The Project proponent shall ensure that no natural watercourse shall be obstructed due to any mining operations. The first order streams and the seasonal nallahs originating from the mining lease area shall be protected.	It is being ensured. No natural water course has been obstructed.
6	The top soil, if any shall temporarily be stored at earmarked site (s) only and it should not be kept unutilized for long. The topsoil shall be used for land reclamation and plantation.	Sequential backfilling and reclamation of the mined out area are being exercised. Topsoil is being spread on backfilled area for reclamation of the area.
7	The solid waste generated during the mining operation shall be backfilled and there shall be no external overburden dump left at the end of the mine life. The entire excavated area of 12.19 ha. shall be backfilled and reclaimed by plantation. The backfilling should be carried out in such a manner that it is restored to the normal ground level. Monitoring and management of	Overburden and waste rock are being used for back filling. Data pertaining to backfilling is enclosed as Annexure.

	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.	
8	<p>Catch drains and siltation ponds of appropriate size should be constructed around the working pit, sub-grade dump, soil and mineral dumps to arrest flow of silt and sediment directly into the agricultural fields, the Kisco Nadi, the Sukri Nadi, the Chungahat nallah, the Barki nallah and other water bodies. 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, settling tanks and check dams of appropriate size, gradient and length shall be constructed for both around the minepit and sub grade dump to prevent run off of water and flow sediments directly into the agricultural fields, the Kisco Nadi, the Sukri Nadi, the Chungahat nallah, the Barki nallah and other water bodies 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>	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.
9	Dimension of the retaining wall at the toe of the sub-grade, dump and OB benches within the mine to check run-off and siltation should be based on the rain fall data.	Complied
10	Plantation shall be raised in an area of 12.7 ha including a 7.5 m. wide green belt in the safety zone around the mining lease by planting the native species around ML area, backfilled and reclaimed area, around water body, roads etc. in consultation with the local DFO / Agriculture Department. At least 1500 trees per year shall be planted with a tree density of 1000 trees per hectare. Greenbelt shall be developed all along the mine lease area in a phased manner and shall be completed within first five years.	Being carried out progressively. During FY 2013-14 –around 1000 saplings planted in this mine.

11	Effective safe guard measures, such as regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels to particulate matter such as around loading and unloading point and all transfer points. Extensive water sprinkling shall be carried out on haul roads. It should be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard.	Complied
12	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.	System is already in place.
13	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 periodic monitoring [(at least four times in a year – pre-monsoon (April-May), monsoon (August), post-monsoon (November) and winter (January) once in each season)] shall be carried out in consultation with the State Ground Water Board/ Central Ground water Authority and the data thus collected may be sent regularly to the Ministry of Environment and Forests and its Regional office Bhubneshwar, The Central Ground Water Authority and the Regional Director, Central Ground Water Board. If at any stage, it is observed that the ground water table is getting depleted due to the mining activity, necessary corrective measures shall be carried out.	It is being monitored.
14	Monitoring to the springs shall be carried out for the quality and quantity of water regularly so as to ensure that there is no adverse impact on the same due to the project. Records in this regards shall be maintained.	Complied.
15.	It shall be ensured that there is no change in the hydrology of the area due to the project.	Complied.
16.	The project proponent shall obtain necessary prior permission of the competent authorities for drawl of requisite quantity of water (surface water and ground water) required for the project.	Complied. Water cess is being paid to State Pollution Control Board regularly.
17.	Suitable rain water harvesting measures on long term basis shall be planned and implemented in consultation with the Regional Director, Central Ground Water Board.	Complied.

18.	Appropriate mitigative measures shall be taken to prevent pollution of the Kisco Nadi, the Sukri Nadi and other rivers in the buffer zone of the mine, in consultation with the State Pollution Control Board.	Complied.
19	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 from mine face to the Beneficiation plant.. The vehicles should be covered with a tarpaulin and shall not be overloaded.	Regular maintenance of vehicles are undertaken to minimize vehicular emission. Care is taken on regular basis to arrest spillage/fugitive dust emission. At most care is taken to cover bauxite loaded trucks with Tarpaulin and overloading is avoided.
20	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.	Being complied with.
21	Drills shall either be operated with dust extractors or equipped with water injection system.	Being complied with.
22	Mineral handling area shall be provided with adequate number of high efficiency dust extraction system. Loading and unloading areas including all the transfer points should also have efficient dust control arrangements. These should be properly maintained and operated.	Complied.
23	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 likely hood of effluent from mine, hence ETP is not required. The sewage water for working population is planned to be collected through Septic Tank/Soak Pit and treated in Sewage Treatment Plant already existing in adjoining Bagru ML.
24	The project authorities should undertake sample survey to generate data on pre-project community health status within a radius of 1 Km. from proposed mine.	Agreed. Being getting done through medical camp.
25	Pre-placement medical examination and periodical medical examination of the workers engaged in the project shall be carried out and records maintained. For the purpose, schedule of health examination of the workers should be drawn and followed accordingly.	System is already in place
26.	Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc.	System is already in place.

	The housing may be in the form of the temporary structures to be removed after the completion of the project.	
27	The critical parameters such as RSPM (Particulate matter with size less than 10 µm (i.e. PM ₁₀ , PM _{2.5}) and NO _x in the ambient air within the impact zone, peak particle velocity at 300 m. distance or within the nearest habitation, whichever is closer shall be monitored periodically. Further, quality of discharge water shall also be monitored [(TDS, DO, PH and Total Suspended Solids (TSS))], The monitored data shall be uploaded on the website of the Company as well as displayed on a display board at the project site at a suitable location near the main gate of the Company in Public domain. The Circular no. J-20012/1/2006-IA.II(M) dated 27.05.2009 issued by Ministry of Environment and Forests, which is available on the website of the Ministry www.envfor.nic.in shall also be referred in this regard for its compliance.	Being carried out.
28	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 with us. FMCP is submitted to IBM for approval.

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 & Forests.	Complied.
2	No change in the calendar plan including excavation, quantum of mineral bauxite and waste should be made.	Complied.
3	Conservation measures for protection of flora and fauna in the core & buffer zone should be drawn up in consultation with the local forest and wildlife department.	Complied.
4	Four ambient air quality-monitoring station should be established in the core zone as well as in the buffer zone for RSPM (Particulate matter with size less than 10 µm (i.e. PM ₁₀) PM _{2.5}) & NO _x monitoring. Location of the stations should be decided based on the metrological data, topographical features and	Being carried out. Enclosed as Annexure.

	environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the State Pollution Control Board.	
5	Data on ambient air quality RSPM (Particulate matter with size less than 10 μm i.e. PM_{10}) & NO_x should be regularly submitted to the Ministry including its Regional office located at Bhubneshwar and the State Pollution Control Board / Central pollution Control Board once in six months.	Being carried out. Enclosed as Annexure.
6	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.	Being carried out.
7	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.	Compiled.
8	Industrial waste water (workshops and waste water from the mine) Should be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19 th May, 1993 and 31 st December, 1993 or as amended from time to time. Oil and grease trap should be installed before discharge of workshop effluents.	Being carried out.
9	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.	Being carried out.
10	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 as Annexure.
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	The fund earmarked for environmental protection measures is being kept in separate account. Year wise expenditure is being reported to the Ministry and its

	reported to the Ministry and its Regional Office located at Bhubneshwar.	Regional Office located at Bhubneshwar.
12	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.	Complied. Date of Financial closure is 31 st March.
13	The Regional Office of this Ministry located at Bhubneshwar shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information / monitoring reports.	Agreed.
14	The project proponent shall submit six monthly report on the status of the compliance of the stipulated environmental Clearance conditions including results of monitoring data (both in hard copies as well as by e-mail) to the Ministry of Environment and Forests, its Regional Officer, Bhubaneshwar, the respective Zonal office of Central Pollution Control Board the State Pollution Control Board. The proponent shall upload the status of compliance of the Environmental Clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the Ministry of Environment and Forests, Bhubneshwar, the respective Zonal Office of Central Pollution Control Board and State Pollution Control Board.	Being complied
15	A copy of clearance letter shall be sent by the proponent to concerned Panchyat, Zila Parisad/ Municipal Corporation, Urban Local Body and the Local NGO, if any, from whom suggestions/ representations, if any, were received while processing the proposal. The clearance letter shall also be put on the website of the Company by the proponent.	Complied.
16	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.	Complied.

17	<p>The environmental statement for each financial year ending 31st March in Form – V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of the compliance of environmental clearance conditions and shall also be sent to the Regional Office of the Ministry of Environment and Forests, Bhubneshwar by e-mail.</p>	Complied.
18.	<p>The Company shall submit within 3 month their policy towards Corporate Environment Responsibility which should inter-alia address (i) Standard operating process/ procedure to bring into focus any infringements/ deviation/ violation of environmental or forest norms/ conditions, (ii) Hierarchical system or Administrative order of the Company to deal with environmental issues and ensuring compliance with environmental issues and ensuring compliance with Environment Clearance conditions and (iii) System of reporting of non compliance / violation of environmental norms to the Board of Directors of the Company and / or stakeholders or shareholders.</p>	Already Submitted.
19	<p>The project authorities should advertise at least in two local newspapers widely circulated, one of which locality concerned, within 7days of the issue of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and also at web site of the Ministry of Environment and Forests at http://envfor.nic.in and a copy of the same should be forwarded to the Regional Office of this Ministry located at Bhubneshwar.</p>	Complied and informed.



Test Report

Print Date : 17/06/2013

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Report No : KG13-004483.001

JOE No : KG13-004483

Report Control No : KGR0000023584

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 : 12/06/2013
 Marks on Sample : Location : Colony Bagru Lease Area, date : 27.5.2013
 Sampling Site : Bagru/Bhusar/Hisri Old/Hisri New Bauzite Mines(bagruplateau)
 Test Start/End Date : 12/06/2013 - 17/06/2013

Analysis	Method	Result	Unit	Requirement/Limit as Per NAAQS	
				Min	Max
Particulate Matter (PM10)	IS:5182 (PART 23)	41	ug/m3	-	100
Particulate Matter (PM2.5)	USEPA CFR(40) Appendix-L	33.56	ug/m3	-	60
Oxides of Nitrogen (NOx)	IS:5182 (Part-6):1975 (Reaff.2004)	9.57	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****

Page 1 of 1

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Test Report

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 17/06/2013

Report No : KG13-004483.002

JOE No : KG13-004483

Report Control No : KGR0000023584

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 : 12/06/2013
 Marks on Sample : Location : Hisri Pit(Core Zone) date : 27.5.2013
 Sampling Site : Bagru/Bhusar/Hisri Old/Hisri New Bauzite Mines(bagruplateau)
 Test Start/End Date : 12/06/2013 - 17/06/2013

Analysis	Method	Result	Unit	Requirement/Limit as Per NAAQS	
				Min	Max
Particulate Matter (PM10)	IS:5182 (PART 23)	89	ug/m3	-	100
Particulate Matter (PM2.5)	USEPA CFR(40) Appendix-L	28.21	ug/m3	-	60
Oxides of Nitrogen (NOx)	IS:5182 (Part-6):1975 (Reaff.2004)	9.75	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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Test Report

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 17/06/2013

Report No : KG13-004483.003

JOE No : KG13-004483

Report Control No : KGR0000023584
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 : 12/06/2013
 Marks on Sample : Location : Bhusar Area, date : 28.5.2013
 Sampling Site : Bagru/Bhusar/Hisri Old/Hisri New Bauzite Mines(bagruplateau)
 Test Start/End Date : 12/06/2013 - 17/06/2013

Analysis	Method	Result	Unit	Requirement/Limit as Per NAAQS	
				Min	Max
Particulate Matter (PM10)	IS:5182 (PART 23)	50	ug/m3	-	100
Particulate Matter (PM2.5)	USEPA CFR(40) Appendix-L	12.96	ug/m3	-	60
Oxides of Nitrogen (NOx)	IS:5182 (Part-6):1975 (Reaff.2004)	9.59	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 : 17/06/2013

Report No : KG13-004483.004

JOE No : KG13-004483

Report Control No : KGR0000023584

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 : 12/06/2013
 Marks on Sample : Location : In & Around Bagru(Kekrang), date : 28.5.2013
 Sampling Site : Bagru/Bhusar/Hisri Old/Hisri New Bauzite Mines(bagruplateau)
 Test Start/End Date : 12/06/2013 - 17/06/2013

Analysis	Method	Result	Unit	Requirement/Limit as Per NAAQS	
				Min	Max
Particulate Matter (PM10)	IS:5182 (PART 23)	40	ug/m3	-	100
Particulate Matter (PM2.5)	USEPA CFR(40) Appendix-L	10.36	ug/m3	-	60
Oxides of Nitrogen (NOx)	IS 5182 (Part-6):1975 (Reaff.2004)	9.79	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 COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 24/06/2013

Report No : KG13-004480.001-R1

JOE No : KG13-004480

Report Control No : KGR0000024350
Sample Described by Customer as : EFFLUENT

Client Name : Hindalco Industries Limited(Mines Division)
 Client Address : Lohardaga,
 Postal Code : 835203
 State : Jharkhand
 Country : India
 Sample Type : EFFLUENT
 Received : 12/06/2013
 Registered : 12/06/2013
 Marks on Sample : Location : STP Outlet
 Sample Collected on : 09.06.2013
 Sampling Site : Bagru/Bhusar/Hisri New/Hisri Old Bauxite Mines(Bagru plateau)
 Quantity : 4L app
 Test Start/End Date : 12/06/2013 - 18/06/2013

This Report/Certificate cancels and supersedes the Report/Certificate No KG13-004480.001-R00 dated 6/24/2013 (MM/DD/YYYY) issued by SGS India

Analysis	Method	Result	Unit	Requirement/Limit as Per	
				Min	Max
pH	APHA 21st. EDN.:2005-4500-B	7.12*		5.5	9.0
Total Suspended Solids	APHA 21st. EDN.:2005-2540 D	4.76	mg/L		100mg/l
BOD @ 27 deg C for 3 days	IS:3025 (Part-4):1993 (Reaff.2003)	7.88	mg/L		30mg/l
Oil & Grease	APHA 21st. EDN.:2005-5520 B	<2.00	mg/L		10mg/l
Aluminium (as Al)	APHA 21st. EDN.:2005-3120 B	<0.05	mg/L		N/A
Calcium (as Ca)	APHA 21st. EDN.:2005-3120 B	17.29	mg/L		N/A
Iron (as Fe)	APHA 21st. EDN.:2005-3120 B	0.47	mg/L		N/A

Remark : * Analyzed at site.

Page 1 of 2

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Test Report

Report No : KG13-004480.001-R1

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 24/06/2013

JOE No : KG13-004480

Report Control No : KGR0000024350

This Report/Certificate cancels and supersedes the Report/Certificate No KG13-004480.001-R00 dated 6/24/2013 (MM/DD/YYYY) issued by SGS India

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 : 24/06/2013

Report No : KG13-004480.002-R1

JOE No : KG13-004480

Sample Described by Customer as : EFFLUENT
Report Control No : KGR0000024350

Client Name : Hindalco Industries Limited(Mines Division)
Client Address : Lohardaga,
Postal Code : 835203
State : Jharkhand
Country : India
Sample Type : EFFLUENT
Received : 12/06/2013
Registered : 12/06/2013
Marks on Sample : Location :Maintenance Garage
Sample Collected on : 09.06.2013
Sampling Site : Bagru/Bhusar/Hisri New/Hisri Old Bauxite Mines(Bagru plateau)
Quantity : 4L app
Test Start/End Date : 12/06/2013 - 18/06/2013

This Report/Certificate cancels and supersedes the Report/Certificate No KG13-004480.002-R00 dated 6/24/2013
(MM/DD/YYYY) issued by SGS India

Analysis	Method	Result	Unit	Requirement/Limit as Per	
				Min	Max
pH	APHA 21st. EDN.:2005-4500-B	7.36*		5.5	9.0
Total Suspended Solids	APHA 21st. EDN.:2005-2540 D	7.76	mg/L		100mg/l
BOD @ 27 deg C for 3 days	IS:3025 (Part-44):1993 (Reaff.2003)	5.70	mg/L		30mg/l
Oil & Grease	APHA 21st. EDN.:2005-5520 B	2.06	mg/L		10mg/l
Aluminium (as Al)	APHA 21st. EDN.:2005-3120 B	0.10	mg/L		N/A
Calcium (as Ca)	APHA 21st. EDN.:2005-3120 B	5.23	mg/L		N/A
Iron (as Fe)	APHA 21st. EDN.:2005-3120 B	0.68	mg/L		N/A

Remark : * Analyzed at site.

Page 1 of 2

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Test Report

Report No : KG13-004480.002-R1

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 24/06/2013

JOE No : KG13-004480

Report Control No : KGR0000024350

This Report/Certificate cancels and supersedes the Report/Certificate No KG13-004480.002-R00 dated 6/24/2013 (MM/DD/YYYY) issued by SGS India

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 : 28/10/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-004449.007

JOE No : KG13-004449

Report Control No : KGR0000037668

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 : Bagru-Colony Borewell
 Quantity : 5.5L app
 Sample Collected on : 9.6.2013, time : 2.30 pm
 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)	7.1 *		6.5	8.5
Total Hardness (as CaCO ₃)	IS:3025 (Part-21):1983 (Reaff.2006)	202.00	mg/L	200	600
Iron (as Fe)	IS:3025 (Part-2):1983	<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)	6.78	mg/L	250	1000
Total Dissolved Solids	IS:3025 (Part-16):1984 (Reaff.1996)	246.00	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)	54.54	mg/L	75	200

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Test Report

Print Date : 28/10/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-004449.007

JOE No : KG13-004449

Report Control No : KGR0000037668

Analysis	Method	Result	Unit	Requirement/Limit As per IS:10500:2012	
				Acceptable	Permissible
Magnesium (as Mg)	IS:3025 (Part-46):1994 (Reaff.1999)	15.95	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)	<0.01	mg/L	0.1	0.3
Sulphate (as SO ₄)	IS:3025 (Part-24):1986 (Reaff.1998)	<2.00	mg/L	200	400
Nitrate (as NO ₃)	IS:3025 (Part-34):1988 (Reaff.1999)	<0.50	mg/L	45	No relaxation
Phenolic Compound (as C ₆ H ₅ 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)	0.11	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 ₃)	IS:3025 (Part-23):1986 (Reaff.2003)	216.51	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)	<0.02	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 : KG13-004449.007

JOE No : KG13-004449

Report Control No : KGR0000037668

Per pro SGS India Private Ltd

Satya Manna

Section Incharge - ENVI

Authorized Signatory

****End of Report****

Page 3 of 3

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TEST REPORT

Report No. - KG13-004503.001

Date : 13.06.2013

Job No. - KG13-0450

Report Control No. - KGH0000023172

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

SAMPLE DESCRIPTION	MEASUREMENT OF NOISE LEVEL
COMPANY NAME	M/S. HINDALCO INDUSTRIES LIMITED (MINES DIVISION)
ADDRESS	MINES DIVISION, LOHARDAGA, JHARKHAND, PIN - 835 302
SAMPLING SITE	BAGRU/BHUSAR/HISRI OLD/HISRI NEW BAUXITE MINES (BAGRU PLATEAU)
PHOTOCOL	IS:9089/IS:7194
DATE OF SAMPLING	27.05.2013 TO 28.05.2012
TEST START DATE	13.06.2013
TEST END DATE	13.06.2013

LOCATION	RESULT		LIMIT IN dB(A) Leq (INDUSTRIAL AREA)	
	Day Time (L _{eq}) in dB(A)	Night time (L _{eq}) in dB(A)	Day Time	Night time
MINE LEASL AREA (NEAR OFFICE)	56	45	75	70

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. : KG13-004499.001-002	Date : 13.06.2013
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Job No. : KG13-0344-	Report Control No. : KGR0000123175
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SAMPLE DRAWN BY SGS INDIA PRIVATE LTD.

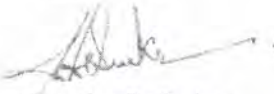
SAMPLE DESCRIPTION	MEASUREMENT OF NOISE LEVEL
NAME OF THE CLIENT	M/S. HINDALCO INDUSTRIES LIMITED
ADDRESS	MINES DIVISION, LOHARDAGA, JHARKHAND, PIN - 835 302
SAMPLING METHOD	INSTRUMENTAL, USING SOUND LEVEL METER
SAMPLING SITE	BAGRU/BHUSAR/HISRI NEW/ HISRI OLD BAUXITE MINES (BAGRU PLATEAU)
PROTOCOL	IS:9989;IS:7194
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) L _{eq} 8 Hrs. Exposure
1	POCKLEN (Tata Hitach - 210)	27.05.2013 (12:30 Hrs)	80	85
2	DUMPER (Tata 2528K)	27.05.2013 (12:40 Hrs)	82	85

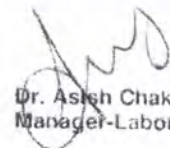
****End of Report****

Note: (i) The value is the Leq of twenty readings taken in each location (Day time).
(ii) Day time shall mean from 6.00 am to 10.00 pm.

Checked by


Dipankar De Sarkar
Manager (Operations)

per pro SGS India Private Ltd.


Dr. Ashish Chakraborty
Manager-Laboratory

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Test Report

Print Date : 28/10/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-004451.005

JOE No : KG13-004451

Report Control No : KGR0000037718

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 : 12/06/2013
 Registered : 12/06/2013
 Marks on Sample : Location : Bagru Dongipani
 Quantity : 5.5L app
 Sample Collected on : 09.06.2013, time : 9.00pm
 Test Start/End Date : 12/06/2013 - 24/06/2013

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)	7.0 *		6.5	8.5
Total Hardness (as CaCO ₃)	IS:3025 (Part-21):1983 (Reaff.2006)	4.54	mg/L	200	600
Iron (as Fe)	IS:3025 (Part-2)	0.07	mg/L	0.3	No relaxation
Fluoride (as F)	IS:3025 (Part-60):2008	<0.10	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)	14.00	mg/L	500	2000
E.coli	IS:1622:1981(Reaff.2003)	Absent	per 100ml		
Coliform bacteria	IS:1622:1981 (Reaffirmation 2003)	Present	per 100ml		
Calcium (as Ca)	IS:3025 (Part-40):1991 (Reaff.2003)	1.21	mg/L	75	200

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Test Report

Print Date : 28/10/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-004451.005

JOE No : KG13-004451

Report Control No : KGR0000037718

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
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 ₄)	IS:3025 (Part-24):1986 (Reaff.1998)	<2.00	mg/L	200	400
Nitrate (as NO ₃)	IS:3025 (Part-34):1988 (Reaff.1999)	0.81	mg/L	45	No relaxation
Phenolic Compound (as C ₆ H ₅ 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)	<0.01	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 CaCO ₃)	IS:3025 (Part-23):1986 (Reaff.2003)	8.25	mg/L	200	600
Aluminium (as Al)	IS:3025 (Part-55):2003	0.06	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)	24.50	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 : KG13-004451.005

JOE No : KG13-004451

Report Control No : KGR0000037718

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 : KG13-004451.007

JOE No : KG13-004451

Report Control No : KGR0000037720

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 : 12/06/2013
 Registered : 12/06/2013
 Marks on Sample : Location: Bagru Churuliya
 Quantity : 5.5L app
 Sample Collected on : 9.6.2013, time :4.00 pm
 Test Start/End Date : 12/06/2013 - 24/06/2013

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 ₃)	IS:3025 (Part-21):1983 (Reaff.2006)	4.54	mg/L	200	600
Iron (as Fe)	IS:3025 (Part-2)	0.19	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)	<5.00	mg/L	250	1000
Total Dissolved Solids	IS:3025 (Part-16):1984 (Reaff.1996)	14.80	mg/L	500	2000
E.coli	IS:1622:1981(Reaff.2003)	Absent	per 100ml		
Coliform bacteria	IS:1622:1981 (Reaffirmation 2003)	Present	per 100ml		
Calcium (as Ca)	IS:3025 (Part-40):1991 (Reaff.2003)	1.41	mg/L	75	200

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Test Report

Print Date : 28/10/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-004451.007

JOE No : KG13-004451

Report Control No : KGR0000037720

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
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 ₄)	IS:3025 (Part-24):1986 (Reaff.1998)	2.28	mg/L	200	400
Nitrate (as NO ₃)	IS:3025 (Part-34):1988 (Reaff.1999)	0.75	mg/L	45	No relaxation
Phenolic Compound (as C ₆ H ₅ 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)	<0.01	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 CaCO ₃)	IS:3025 (Part-23):1986 (Reaff.2003)	7.99	mg/L	200	600
Aluminium (as Al)	IS:3025 (Part-55):2003	0.19	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)	42.50	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 : KG13-004451.007

JOE No : KG13-004451

Report Control No : KGR0000037720

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 : KG13-004451.006

JOE No : KG13-004451

Report Control No : KGR0000037731

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 : 12/06/2013
 Registered : 12/06/2013
 Marks on Sample : Location: Bagru Bandhy
 Quantity : 5.5L app
 Sample Collected on : 09.06.2013, time : 3.30pm
 Test Start/End Date : 12/06/2013 - 24/06/2013

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)	7.1 *		6.5	8.5
Total Hardness (as CaCO ₃)	IS:3025 (Part-21):1983 (Reaff.2006)	5.05	mg/L	200	600
Iron (as Fe)	IS:3025 (Part-2)	0.10	mg/L	0.3	No relaxation
Fluoride (as F)	IS:3025 (Part-60):2008	0.17	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)	14.60	mg/L	500	2000
E.coli	IS:1622:1981(Reaff.2003)	Absent	per 100ml		
Coliform bacteria	IS:1622:1981 (Reaffirmation 2003)	Present	per 100ml		
Calcium (as Ca)	IS:3025 (Part-40):1991 (Reaff.2003)	1.41	mg/L	75	200

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Test Report

Print Date : 28/10/2013

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Report No : KG13-004451.006

JOE No : KG13-004451

Report Control No : KGR0000037731

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
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 ₄)	IS:3025 (Part-24):1986 (Reaff.1998)	<2.00	mg/L	200	400
Nitrate (as NO ₃)	IS:3025 (Part-34):1988 (Reaff.1999)	0.98	mg/L	45	No relaxation
Phenolic Compound (as C ₆ H ₅ 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)	<0.01	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 CaCO ₃)	IS:3025 (Part-23):1986 (Reaff.2003)	7.73	mg/L	200	600
Aluminium (as Al)	IS:3025 (Part-55):2003	0.09	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)	18.50	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 : KG13-004451.006

JOE No : KG13-004451

Report Control No : KGR0000037731

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Section Incharge - ENVI

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Test Report

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 08/10/2013

Report No : KG13-007326.001

JOE No : KG13-007326

Report Control No : KGR0000035844
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 : Bagru Colony (Hindalco Office), date : 21.09.2013
Sampling Site : Bagru Bauxite Mines
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)	12	ug/m3	-	100
Particulate Matter (PM2.5)	USEPA CFR(40) Appendix-L	6.82	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		

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Test Report

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 08/10/2013

Report No : KG13-007326.002

JOE No : KG13-007326

Report Control No : KGR0000035844

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 : Hisri Pit(Core Zone), date : 21.09.2013
 Sampling Site : Bagru Bauxite Mines
 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)	55	ug/m3	-	100
Particulate Matter (PM2.5)	USEPA CFR(40) Appendix-L	16.50	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	-	-

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Test Report

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 08/10/2013

Report No : KG13-007326.003

JOE No : KG13-007326

Report Control No : KGR0000035844

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 : Bhusar Area(Opposite at garage), date : 22.09.2013
 Sampling Site : Bagru Bauxite Mines
 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)	41	ug/m3	-	100
Particulate Matter (PM2.5)	USEPA CFR(40) Appendix-L	19.20	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		

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Test Report

SAMPLE DRAWN BY SGS INDIA PVT. LTD.

Print Date : 08/10/2013

Report No : KG13-007326.004

JOE No : KG13-007326

Report Control No : KGR0000035844

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 : Kekrang Village, date : 22.09.2013
Sampling Site : Bagru Bauxite Mines
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)	20	ug/m3	-	100
Particulate Matter (PM2.5)	USEPA CFR(40) Appendix-L	7.56	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		

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Test Report

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 30/10/2013

Report No : KG13-007339.001

JOE No : KG13-007339

Sample Described by Customer as : EFFLUENT
Report Control No : KGR0000037997

Client Name : Hindalco Industries Limited(Mines Division)
 Client Address : Lohardaga,
 Postal Code : 835203
 State : Jharkhand
 Country : India
 Sample Type : EFFLUENT
 Received : 30/09/2013
 Registered : 30/09/2013
 Marks on Sample : Location : STP Outlet
 Sample Collected on : 23.9.2013
 Sampling Site : Bagru Bauxite Mines(Bagru Plateau)
 Quantity : 4L app
 Test Start/End Date : 30/09/2013 - 07/10/2013

Analysis	Method	Result	Unit	Requirement/Limit as Per	
				CPCB DIS. LAND FOR IRREGATION	
				Min	Max
pH	APHA 22nd. EDN.:2012-4500-B	7.64*		5.5	9.0
Total Suspended Soilds	APHA 22 nd EDN.:2012-2540 D	5.40	mg/L		200mg/l
BOD @ 27 deg C for 3 days	IS:3025 (Part-44):1993 (Reaff.2003)	2.82	mg/L		100mg/l
Oil & Grease	APHA 22 nd. EDN.:2012-5520 B	<2.00	mg/L		10mg/l
Total Dissolved Soilds (TDS)	APHA 22 nd. EDN.:2012-2540 C	287.60	mg/L		N/A
Aluminium (as Al)	APHA 22nd. EDN.:2012-3120 B	<0.05	mg/L		N/A
Calcium (as Ca)	APHA 22nd. EDN.:2012-3120 B	26.99	mg/L		N/A
Iron (as Fe)	APHA 22nd. EDN.:2012-3120 B	0.21	mg/L		N/A

Remark : * Analyzed at site.

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Test Report

Report No : KG13-007339.001

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 30/10/2013

JOE No : KG13-007339

Report Control No : KGR0000037997

Per pro SGS India Private Ltd

Satya Manna

Section Incharge - ENVI

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Test Report

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 30/10/2013

Report No : KG13-007339.002

JOE No : KG13-007339

Report Control No : KGR0000037997

Sample Described by Customer as : EFFLUENT

Client Name : Hindalco Industries Limited(Mines Division)
Client Address : Lohardaga,
Postal Code : 835203
State : Jharkhand
Country : India
Sample Type : EFFLUENT
Received : 30/09/2013
Registered : 30/09/2013
Marks on Sample : Location :Maintenance Garage
Sample Collected on : 23.9.2013
Sampling Site : Bagru Bauxite Mines(Bagru Plateau)
Quantity : 4L app
Test Start/End Date : 30/09/2013 - 07/10/2013

Analysis	Method	Result	Unit	Requirement/Limit as Per	
				CPCB DIS. LAND FOR IRREGATION	
				Min	Max
pH	APHA 22nd. EDN.:2012-4500-B	8.02*		5.5	9.0
Total Suspended Soilds	APHA 22 nd EDN.:2012-2540 D	10.00	mg/L		200mg/l
BOD @ 27 deg C for 3 days	IS:3025 (Part-44):1993 (Reaff.2003)	5.38	mg/L		100mg/l
Oil & Grease	APHA 22 nd. EDN.:2012-5520 B	3.20	mg/L		10mg/l
Total Dissolved Soilds (TDS)	APHA 22 nd. EDN.:2012-2540 C	107.60	mg/L		N/A
Aluminium (as Al)	APHA 22nd. EDN.:2012-3120 B	0.11	mg/L		N/A
Calcium (as Ca)	APHA 22nd. EDN.:2012-3120 B	12.99	mg/L		N/A
Iron (as Fe)	APHA 22nd. EDN.:2012-3120 B	2.55	mg/L		N/A

Remark : * Analyzed at site.

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Test Report

Report No : KG13-007339.002

SAMPLE COLLECTED BY SGS INDIA PVT. LTD.

Print Date : 30/10/2013

JOE No : KG13-007339

Report Control No : KGR0000037997

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**TEST REPORT**

REPORT NO.:KG13-007331.001

Date : 05.10.2013

JOE NO : KG13-007331

Report Control No. KGR0000035607

SAMPLE DRAWN BY SGS INDIA PRIVATE LTD.

Sample described as : FLUE GAS

Name of the Industry : M/s. HINDALCO INDUSTRIES LIMITED

Address : Mines Division, Lohardaga, Jharkhand, PIN – 835 302

Date & time of sampling: 22.09.2013 (10:05 – 10:35 Hrs)

Sampling Site : Bagru/ Bauxite Mines

Location : DG Set (250 KVA)

A. General Information about stack :

1. Stack connected to : DG Set (250 KVA)
2. Emission due to : Burning of H.S.D
3. Material of construction of Stack : M S
4. Shape of Stack : Circular
5. Whether stack is provided with permanent platform & ladder : Yes
6. Capacity : 250 KVA
7. Running Load : 105 KVA

B. Physical characteristics of stack :

1. Height of the stack (a) from ground level : 7.0 M
2. Diameter of the stack at sampling point : 0.2032 M
3. Height of the sampling point from GL : 6.25 M

C. Analysis/Characteristic of Stack :

1. Fuel used : H.S.D

2. Fuel Consumption: 30 Lt/Hr.

D. PARAMETERS	PROTOCOL	RESULTS	Limit as per MOEF G.S.R.448(E)
1. Temperature of emission (°C)	IS 11255 Part : 3 1985 (Reaff.2008)	337	...
2. Barometric pressure (mm of Hg)	IS 11255 Part : 3 1985 (Reaff.2008)	692	...
3. Velocity of gas (m/sec.)	IS 11255 Part : 3 1985 (Reaff.2008)	9.76	...
4. Quantity of gas flow (Nm ³ /hr.)	IS 11255 Part : 3 1985 (Reaff.2008)	496	...
5. Concentration of Carbon dioxide (% v/v)	IS 11255 Part : 3 1985 (Reaff.2008)	6.2	...
6. Concentration of Sulphur dioxide (mg/Nm ³)	USEPA – 6C	68	...
7. Concentration of Nitrogen dioxide (gm/kw-h)	USEPA – 7E	0.64	9.2
8. Concentration of Oxygen (% v/v)	IS 11255 Part : 3 1985 (Reaff.2008)	13.8	...
9. Concentration of Particulate Matters(gm/kw-h)	IS 11255 Part : 1 1985 (Reaff.2003)	0.10	0.3

E. Pollution control device

Details of pollution control devices attached with the stack : Nil

F. Remarks : Nil

End of Report

Checked by

per pro SGS India Private Ltd.

Dipankar De Sarkar
Manager (Operations)Dr. Asish Chakraborty
Manager-Laboratory

Page 1 of 1

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Ref.No- PC/RNC/170/08-

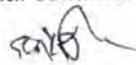
Date.....

CONSENT TO OPERATE

With reference to the application dated 28.08.2012 of G.M. (Operation), M/s Hindalco Industries Ltd; Court Road, I/C Hisri New Bauxite Mines-14.55 Ha, P.O+Dist- Lohardaga 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 1,00,000 TPA of Bauxite At – Hisri New, P.O + Dist- Lohardaga 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.

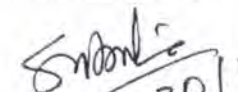
9. That, he(they) shall establish well equipped environmental laboratory with the facilities of system(s) of continuous monitoring of effluent(s), emission(s) ambient water quality(ies), ambient air quality(ies) and ambient noise level(s) and transferring them (monitoring results) to his(their) website(s) 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 30th 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 17.06.2011 and submit photographs in compliance of special condition No. ~~VII and IX~~ of the same.

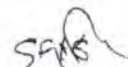

Sd/-
(Sanjay Kumar Sinha)
MEMBER SECRETARY

Memo no. PC/RNC/170/08-16540

Ranchi, Dated31.1.13

Copy forwarded to:- **G.M. (Operation), M/S Hindalco Industries Ltd; (I/C Hisri New Bauxite Mines- 14.55 Ha.), Court Road, P.O+Dist- Lohardaga/ Deputy Commissioner, Lohardaga/ D.F.O, Ranchi West Forest Division, Lohardaga/ D.M.O, Lohardaga/ 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, Bhusar & 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.



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:

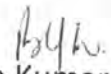
The Environment Management Cell will consist of:

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
Minerals & Minerals Limited					
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	
	3370	1027.439024	Open Well		25.80		28.30
Sherengdag	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
Kujam	3414	1040.853659	Open Well		33.70		24.80
	3491	1064.329268	Hand Pump	31.50		28.60	
	3450	1051.829268	Hand Pump	33.40		28.35	21.12
Chiro Kukud	3765	1147.865854	Hand Pump	37.60		31.84	
	3776	1151.219512	Hand Pump	34.30		36.85	
	3556	1084.146341	Hand Pump				