ADITYA BIRLA
HINDALCO

Ref No: HIL/LHD/JP (M)/MoEF/ 0435 Date: 26.11.2015

To,
The Additional Principal Chief Conservator of Forest (C)
Ministry of Environment, Forests and Climate Changes
Regional Office (ECZ), Ranchi-834002.

Sub: **Compliance Report of EC conditions for Bagru (75.41ha) Bauxite Mining project of M/s Hindalco Industries Limited located in Lohardaga District of Jharkhand for the period April'15 to Sep'15.**

Ref: **Environmental Clearance letter no J-11015/585/2007-IA II (M) dated 18th Sept 2011**

Sir,

With reference to the above, we are submitting herewith the Compliance status report of EC conditions for **Bagru (75.41ha)** Bauxite Mining project of **M/s Hindalco Industries Limited**, located in Lohardaga District of Jharkhand for the period **April'15 to Sep'15.**

Hope you will find the same in order.

Thanking You

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

(Bijesh Kumar Jha)
Joint President (Mines)

Enclosure: - As Above

Copy to: Regional Office, MoEF, Ranchi

HINDALCO INDUSTRIES LIMITED
Mines Division, Court Road
PO & Distt. Lohardaga (Jharkhand)
PIN - 835 302, India
Tel. +91 6526 224112/224015/223113
Fax +91 6526 224118

Regd. Office
Century Bhawan, 3rd Floor
Dr. Annie Besant Road, Worli, Mumbai,400 030, India
Tel.+91 22 66626666

Website www.hindalco.com
Email hindalco@adityabirla.com
Corporate Identity No. L27020MH1958PLC011238

Compliance of conditions laid down in Environmental Clearance
BAGRU BAUXITE MINES (75.41 Ha)
Period: April'15-September'15

MoEF Environment Clearance ref. no. : J – 11015/585/2007 – IA.II (M) dated 04 Feb'2011

Sl No	Conditions	Compliance Status
Specific Conditions		
1	All the conditions stipulated by the State Pollution Control Board in their NOC should be effectively implemented.	Implementations of the stipulated conditions are fulfilled.
2	The environmental clearance is subject to grant of forestry clearance for diversion of 19.56 ha forestland.	This provision has been taken care of during land acquisition with permission of competent authority i.e. concerned Deputy Commissioner (D.C.) and consent of Raiyat (Land Owner) for 20 years period and the land so acquired will be returned as per the norms set by D.C. in land purchased agreement.
3	The mining operation shall be restricted to above ground water table and it should not intersect groundwater table. In case of working below ground water table, prior approval of the Ministry of Environment & Forest and Central Ground Water Authority shall be obtained for which a detailed hydro-geological study shall be carried out.	Being complied. Mining is restricted to above ground water table.
4	The project proponent shall ensure that no natural water course and/or water resources shall be obstructed due to any mining operations.	No natural water course and/or water resources are obstructed due to any mining operations.
5	Top soil should be temporarily stacked with proper slope at earmarked site(s) only with adequate measures and it should not be kept unutilized for a period of more than 3 years. The top soil shall be used for land reclamation and rehabilitation of mined out areas.	Sequential backfilling and reclamation of the mined out area are being exercised. Topsoil is being spread on backfilled area for reclamation. Topsoil is stacked only temporarily if required.
6	The entire waste generated shall be backfilled and there shall be no external over burden dump left at the end of the mine life. The entire backfilled area shall be reclaimed by plantation. The backfilling should be carried out in such a manner that it is restored to the normal ground level. Monitoring and	Overburden and waste rock are being used for back filling. Data pertaining to backfilling is enclosed as Annexure. Around 4500 saplings have been planted during the FY2015-16 in the Bagru plateau.

	management of rehabilitated areas should continue until the vegetation becomes self-sustaining. Compliance status should be submitted to the Ministry of Environment & Forest and its Regional Office, Bhubneshwar on six monthly basis.	
7	The void left unfilled in an area of 1.76 ha shall be converted into water body. The higher benches of excavated void/mining pit shall be traced and plantation done to stabilize the slopes. The slopes of higher benches shall be made gentler for easy accessibility by local people to use the water body. Peripheral fencing shall be carried out along the excavated area.	The void left unfilled area converted into water body. The higher benches of excavated void/mining pit are traced and plantation is being done to stabilize the slopes.
8	Catch drains and siltation ponds of appropriate size shall be constructed around the working pit, sub-grade dump, and mineral dumps to arrest flow of silt and sediment directly into Chanpi Nallah, Sukri Nadi and others water bodies. The water so collected should be utilized for watering the mine area, roads, green belt development etc. The drains should be regulary desilted, particularly after monsoon, and maintained properly. Garland drains settling tanks and check dams of appropriate size, gradient and length shall be constructed for both around the mine pit and sub-grade dump to prevent run off of water and flow sediments directly into Chanpi Nallah,Sukri Nadi and other water bodies and sump capacity should be designed keeping 50% safety margin over and above peak sudden rainfall(based on 50 years date) and maximum discharge in the area adjoin the mine site. Sump capacity should also provide adequate retention period to allow proper settling of silt material. Sedimentation pits should be constructed at the corners of the garland drains and desilted at regular intervals.	No run off is being generated from mining activities. However, to collect and manage rainwater during monsoon rains, 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 sub grade dump and OB benches within the mine to check run-off and siltation should be based on the rain fall data.	The dimensions of the retaining wall of OB dumps are based on the average rain fall.

10	Plantation shall be raise in an area of 50.11 ha including a 7.5m 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.	Being carried out progressively. Around 4500 saplings have been planted during the FY2015-16 in the Bagru plateau.
11	Effective safeguard measures, such as regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of particulate matter such as around crushing and screening plant, loading and unloading point and all transfer points. Extensive water sprinkling shall be carried out on haul roads. It should be ensured that the AAQ parameters conform to the norms prescribed by the central Pollution Control Board in this regard.	Being complied with. Regular water sprinkling is being carried out loading and unloading point and all transfer points. Extensive water sprinkling is also being carried out on haul roads and tankers are deployed for these job. AAQ parameters reported within limit.
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 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,its Regional Office,Bhubneshwar; Central Ground Water Authority and Central Ground Water Board.	This is being monitored in all season. (Annexed)
14	The project authority shall obtain necessary prior approval of the competent authority for drawal of requisite quantity of water (surface water and ground water) for the project.	Rainwater harvested during rainy season is being used for sprinkling on haul roads and raising plantation. As per the terms and conditions in Mining lease deed, we have the liberty to use water. Water cess is being paid to State Pollution Control Board on monthly basis.

15	Vehicular emissions should be kept under control and regularly monitored. Measures shall be taken for maintenance of vehicles used in mining operations and in transportation of mineral. 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/ dust emission. At most care is taken to cover bauxite loaded trucks with Tarpaulin and overloading is avoided.
16	Blasting operation should be carried out only during the daytime. Controlled blasting should be practiced. The mitigative measures for control of ground vibrations and to arrest fly rocks and boulders should be implemented	Being complied with. The mine is adopted control Blasting practice and Blasting is only being carried during specified day time.
17	Drills should either be operated with dust extractors or should be equipped with water injection system	Wet drilling is done in the drill holes intermittently for dust suppression by pumping water.
18	Sewage treatment plant should be installed for the colony. ETP should also be provided for workshop and wastewater generated from mining operations.	The sewage water from domestic uses is collected and treated in Sewage Treatment Plant. No effluent is generated and hence, ETP is not required.
19	Consent to operate should be obtained from SPCB prior to start of production of mine.	Mines is discontinued since Sep'2014 due to second renewal case as per directive by DMO. All procedure for getting the lease renewal has been done & very shortly mine will be operative.
20	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. The housing may be in the form of temporary structures to be removed after the completion of the project	Since the mining operation is very old. System is already in place.
21	The critical parameters such as RSPM(Particulate matter with size less than 10micron (i.e., $PM_{10,}$, $PM_{2.5}$) and NO_X in the ambient air within the impact zone, peak particle velocity at 300m distance or within the nearest habitation, whichever is closed shall be monitored periodically. Further, quantity of discharged water shall also be monitored [TDS,DO, PH and 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	Being carried out. Monitoring report attached as annexure.

	public domain. The Circular No. J-20012/1/2006-IA.II(M) dated 27.05.2009 issued by Ministry of Environment and Forest, which is available on the website of the Ministry www.envfor.nic.in shall also be referred in this regard for its compliance.	
22	A Final Mine Closure Plan along with details of Corpus Fund should be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval.	Progressive mine Closure Plan along with mining scheme has been approved by IBM. FMCP (part) also has been approved by IBM. Final Mine closure plan (FMCP) for total lease area will be prepared in due time.

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.	Being adhered to.
2	No change in the calendar plan including excavation, quantum of mineral bauxite and waste should be made	Excavation of OB and Bauxite is being done as per the approved mining plan/scheme and obtained EC capacity. Mines is discontinued since Sep'2014 due to second renewal case as per directive by DMO.
3	Conservation measures for protection of flora and fauna in the core and buffer zone should be drawn up in consultation with the local forest and wild life department.	Suitable conservation measures are being undertaken.
4	Four ambient air quality-monitoring stations should be established in the core zone as well as in the buffer zone for RPM, SPM, SO2, NOx monitoring. Location of the stations should be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the State Pollution Control Board.	Ambient air monitoring stations established and monitoring is being undertaken in consultation with State Pollution Control Board. Monitoring report annexed.
5	Data on ambient air quality (RPM, SPM, SO2, NOx) should be regularly submitted to the Ministry including its Regional office located at Bhopal and	Monitoring report annexed.

	the State Pollution Control Board / Central Pollution Control Board once in six months.	
6	Fugitive dust emissions from all the sources should be controlled regularly. Water spraying arrangement on haul roads, loading and unloading and at transfer points should be provided and properly maintained.	Dedicated mobile water tanker(s) has/have been provided for sprinkling of water on haul roads and are generally being engaged at the places where active mining is in progress to control fugitive dust.
7	Measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in operations of HEMM, etc. should be provided with ear plugs / muffs.	Measures are being taken for control of noise levels below 85 dBA in the work environment PPEs are provided to workers.
8	Industrial waste water (workshop and waste water from the mine) should be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19th May, 1993 and 31st December, 1993 or as amended from time to time. Oil and grease trap should be installed before discharge of workshop effluents.	Is being suitably done as per statute.
9	Personnel working in dusty areas should wear protective respiratory devices and they should also be 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.	PPE's provided. Periodic training on safety & occupational health is being imparted to workers and health checks up conducted.
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	Already formed and informed. Vide annexure
11	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.	Progressive mine Closure Plan along with mining scheme has been approved by IBM. FMCP (part) also has been approved by IBM. Final Mine closure plan (FMCP) for total lease area will be prepared in due time. Date of land development work had been intimated.
12	The funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purpose. Year wise	Fund for environment protection is earmarked. (Vide annexure for fund taken together for the

8 January

	expenditure should be reported to the Ministry and its Regional Office located at Bhubneshwar.	mines division.)
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.	Being complied with.
14	The project proponent shall submit six monthly reports on the status of compliance of the stipulated environmental clearance conditions including results of monitored data (both in hard copies as well as by e mail) to the Ministry of Environment and Forests, its Regional office Bhunaneshwar, 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 Forest, Bhubaneshwar, the respective zonal office of Central Pollution Control Board and the State Pollution Control Board.	Six monthly reports on the status of compliance of the stipulated environmental clearance conditions including results of monitored data (both in hard copies as well as by e mail) are being submitted to the Ministry of Environment and Forests, its Regional office Bhunaneshwar, the respective Zonal office of Central Pollution Control Board the State Pollution Control Board and uploaded in company's website.
15	A copy of clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parisad / Municipal corporation, urban local body and the local NGO, if any, from whom and 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.	A copy of clearance letter has been sent to concerned Panchayat, Zila Parisad / Municipal corporation, urban local body and the local NGO.
16	State Pollution Control Board should display a copy of the clearance letter at the Regional office, District Industry Centre and Collector's office/ Tehsildar's Office for 30 days.	Displayed.
17	The environment 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	Submitted.

	the Environment (Protection)Rules,1986 , as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the Regional Office of the Ministry of Environment and Forests, Bhubaneswar by e-mail.	
18	The project authorities should advertise at least in two local newspapers widely circulated, one of which shall be in the vernacular language of the locality concerned, within 7 days 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 **httD:/ /envfor.nic.in** and a copy of the same should be forwarded to the Regional Office of this Ministry located Bhubneshwar.	Already done (Documents already submitted).

GEMS PROJECTS PVT.LTD.
In Association with M/s MAHARASTRA ENVIRO POWER LTD, Nagpur
(NABL ACCREDITED LABORATORY)

M/S HINDALCO INDUSTRIES LIMITED

MINES DIVISION, DIST.-LOHARDAGA, JHARKHAND

REPORT

OF

ENVIRONMENTAL MONITORING DATA OF BAGRU PLATEAU

FOR

(JULY TO SEPTEMBER QUARTER-2015)

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CONTENT

	LOCATION
	AMBIENT AIR QUALITY
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2	Hisri Pit Bagru Plateau
3	Bhusar Mine Pit Bagru Plateau
4	Entrance Gate Bagru Mine
	NOISE LEVEL
1	Bagru Plateau near office & workshop
	DRINKING WATER
1	Tap Water-Bagru Plateau near office.
	SURFACE WATER QUALITY
1	Bagru Mines water harvesting pond
2	Bhusar Mines water harvesting pond
	EFFLUENT WATER ANALYSIS
1	STP Outlet (Bagru Mines)
	STACK MONITORING OF DG SETS (FLUE GAS)
1	Bagru Mines Office-Bagru Plateau

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Report No: SEPT001/2015-16 Date: 3rd October 2015

Sample described by customer: **AMBIENT AIR QUALITY MONITORING**

Client Name: **Hindalco Industries Limited**
Client Address: Lohardaga
Postal Code: 835203
State: Jharkhand
Country: India
Sample Type: **AMBIENT AIR QUALITY MONITORING**
Received: 29.09.2015
Registered: 29.09.2015
Marks on Sample: Location: **Bagru Plateau- Office (Near Colony)**
Sample collected on:29.09.2015
Test Start/End Date: 29.09.2015/30.09.2015

LOCATION/IDENTIFICATION: **Bagru Plateau- Office (Near Colony)**

PARAMETERS		UNIT	LIMIT	METHOD	Concentration
Sulphur Dioxide	SO_2	$\mu g/m^3$	80	IS:5182 (Part-2):2001 (Reaff:2006)	13.00
Nitrogen Dioxide	NO_x	$\mu g/m^3$	80	IS:5182 (Part-6):1975(Reaff:2004)	16.00
Particulate Matter (size less than 10 µm)	PM_{10}	$\mu g/m^3$	100	IS:5182 (Part-23)	70.5
Particulate Matter (size less than 2.5 µm)	$PM_{2.5}$	$\mu g/m^3$	60	USEPA CFR (40) Appendix-L	35.7
Carbon Monoxide	CO	$\mu g/m^3$	2	EPA 600/P-99/001F	0.13

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Report No: SEPT001/2015-16 Date: 3rd October 2015

Sample described by customer: **AMBIENT AIR QUALITY MONITORING**

Client Name: **Hindalco Industries Limited**
Client Address: Lohardaga
~~Postal Code: 835203~~
State: Jharkhand
Country: India
Sample Type: **AMBIENT AIR QUALITY MONITORING**
Received: 29.09.2015
Registered: 29.09.2015
Marks on Sample: Location: **Hisri Pit Bagru Plateau**
Sample collected on:29.09.2015
Test Start/End Date: 29.09.2015/30.09.2015

LOCATION/IDENTIFICATION: **Hisri Pit Bagru Plateau**

PARAMETERS		UNIT	LIMIT	METHOD	Concentration
Sulphur Dioxide	SO_2	$\mu g/m^3$	80	IS:5182 (Part-2):2001 (Reaff:2006)	10.00
Nitrogen Dioxide	NO_x	$\mu g/m^3$	80	IS:5182 (Part-6):1975(Reaff:2004)	12.00
Particulate Matter (size less than 10 µm)	PM_{10}	$\mu g/m^3$	100	IS:5182 (Part-23)	60.3
Particulate Matter (size less than 2.5 µm)	$PM_{2.5}$	$\mu g/m^3$	60	USEPA CFR (40) Appendix-L	32.8
Carbon Monoxide	CO	$\mu g/m^3$	2	EPA 600/P-99/001F	0.10

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Report No: SEPT001/2015-16 Date: 3rd October 2015

Sample described by customer: **AMBIENT AIR QUALITY MONITORING**

Client Name: **Hindalco Industries Limited**
Client Address: Lohardaga
~~Postal Code: 835303~~
State: Jharkhand
Country: India
Sample Type: **AMBIENT AIR QUALITY MONITORING**
Received: 29.09.2015
Registered: 29.09.2015
Marks on Sample: Location: **Bhusar Mine Pit Bagru Plateau**
Sample collected on:29.09.2015
Test Start/End Date: 29.09.2015/30.09.2015

LOCATION/IDENTIFICATION: **Bhusar Mine Pit Bagru Plateau**

PARAMETERS		UNIT	LIMIT	METHOD	Concentration
Sulphur Dioxide	SO_2	$\mu g/m^3$	80	IS:5182 (Part-2):2001 (Reaff:2006)	11.50
Nitrogen Dioxide	NOx	$\mu g/m^3$	80	IS:5182 (Part-6):1975(Reaff:2004)	14.50
Particulate Matter (size less than 10 µm)	PM_{10}	$\mu g/m^3$	100	IS:5182 (Part-23)	62.5
Particulate Matter (size less than 2.5 µm)	$PM_{2.5}$	$\mu g/m^3$	60	USEPA CFR (40) Appendix-L	33.9
Carbon Monoxide	CO	$\mu g/m^3$	2	EPA 600/P-99/001F	0.12

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Report No: SEPT001/2015-16 Date: 3rd October 2015

Sample described by customer: **AMBIENT AIR QUALITY MONITORING**

Client Name: **Hindalco Industries Limited**
Client Address: Lohardaga
Postal Code: 835203
State: Jharkhand
Country: India
Sample Type: **AMBIENT AIR QUALITY MONITORING**
Received: 29.09.2015
Registered: 29.09.2015
Marks on Sample: Location: **Entrance Gate Bagru Mine**
Sample collected on:29.09.2015
Test Start/End Date: 29.09.2015/30.09.2015

LOCATION/IDENTIFICATION: **Entrance Gate Bagru Mine**

PARAMETERS		UNIT	LIMIT	METHOD	Concentration
Sulphur Dioxide	SO_2	$\mu g/m^3$	80	IS:5182 (Part-2):2001 (Reaff:2006)	8.50
Nitrogen Dioxide	NOx	$\mu g/m^3$	80	IS:5182 (Part-6):1975(Reaff:2004)	12.50
Particulate Matter (size less than 10 µm)	PM_{10}	$\mu g/m^3$	100	IS:5182 (Part-23)	70.0
Particulate Matter (size less than 2.5 µm)	$PM_{2.5}$	$\mu g/m^3$	60	USEPA CFR (40) Appendix-L	35.5
Carbon Monoxide	CO	$\mu g/m^3$	2	EPA 600/P-99/001F	0.15

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Report No: SEPT001/2015-16 Date: 3rd October 2015

Sample described by customer: Measurement of Noise

Client Name: **Hindalco Industries Limited**
Client Address: Lohardaga
Postal Code: 835203
State: Jharkhand
Country: India
Sample Description: **Measurement of Noise**
Sampling Method: Instrumental, using Sound level Metter
Test Start: 28.09.2015
End Date: 29.09.2015

Location/Identification	Unit	Limit (day)	Result	Limit (night)	Result)	Dates
Month			Average of 16 continuous hours in Sep-15		Average of 8 continuous hours in Sep-15	
Bagru Plateau near office & workshop	dB (A) L_{eq}	75	51.3	70	40.8	29/09/2015

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Report No: SEPT001/2015-16 Date: 3rd October 2015

Sample described by customer : **DRINKING WATER**

Client Name: **Hindalco Industries Limited**
Client Address: Lohardaga
Postal Code: 835203
State: Jharkhand
Country: India

Sample Type: **DRINKING WATER**
Received: 29.09.2015
Registered: 29.09.2015
Marks on Sample: Location: **Tap Water-Bagru Plateau near office.**
Sample collected on:29.09.2015
Quantity: 5 L X 2 No. PVC Can
Test Start/End Date: 29.09.2015/02.10.2015
Sample collected by: **M/S GEMS PROJECT PVT LTD.**

Sl. No.	Parameters	Unit	Result	Acceptable Limit (IS 10500:2012)	Method reference
1	Colour	Hazen	<1	5 Max	APHA 22nd Ed. 2012, 2120-B, 2-6
2	Odour	--	Agreeable	Agreeable	IS 3025 (Part 7): 1983, Reaffirmed 2006
3	Taste	--	Agreeable	Agreeable	IS 3025 (Part 7): 1983, Reaffirmed 2006
4	Turbidity	NTU	0.5	1 Max	APHA 22nd Ed. 2012, 2130-B, 2-13
5	pH	--	7.3	6.5-8.5	APHA 22nd Ed. 2012, 4500-H+-B, 4-92
6	Free Chlorides (Residual)	mg/l	<0.05	0.2 min	APHA 22nd Ed. 2012, 4500-Cl-G, 4-69
7	Total Dissolved Solids	mg/l	90	500 max	IS 3025 (Part 16): 1984, Reaffirmed 2006
8	Monochloramines	mg/l	<0.05	--	APHA 22nd Ed. 2012, 4500-CIG, 4-69
9	Dichioramines	mg/l	<0.05	--	APHA 22nd Ed. 2012, 4500-CIG, 4-69
10	Total hardness (as CaCO3)	mg/l	65	200 max	APHA 22nd Ed. 2012, 4500-CIG, 4-69
11	Alkalinirty Total (as CaCO3)	mg/l	70	200 max	IS 3025 (Part 237): 1986, Reaffirmed 2009
12	Chloride (as Cl)	mg/l	9.0	250 max	APHA 22nd Ed. 2012, 4500-Cl-b, 4-72
13	Sulphate (as SO4)	mg/l	5.0	200 max	APHA 22nd Ed. 2012, 4500-so4-e, 4-190
14	Nitrate (as NO3)	mg/l	1.10	45 max	APHA 22nd Ed. 2012, 4500-NO3-E, 4-125
15	Fluoride (as F)	mg/l	0.25	1 max	APHA 22nd Ed. 2012, 4500-FB & D, 4-84, 4-87
16	Boron (as B)	mg/l	0.20	0.5 max	APHA 22nd Ed. 2012, 4500-BB, 4-25
17	Calcium (as Ca)	mg/l	19.0	75 max	APHA 22nd Ed. 2012, 3500-Ca-B, 3-67

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18	Magnesium (as Mg)	mg/l	3.5	30 max	APHA 22nd Ed. 2012, 3500-Mg-B, 3-84
19	Ammonical Nitrogen/Total Ammonia	mg/l	<0.1	--	APHA 22nd Ed. 2012, 4500-NH3-F, 4-115
20	Iron (as Fe)	mg/l	0.15	0.3 max	APHA 22nd Ed. 2012, 3111-B, 3-18
21	Manganese (as Mn)	mg/l	N.D	0.1 max	APHA 22nd Ed. 2012, 3111-B, 3-18
22	Aluminium (as Al)	mg/l	0.10	0.03 max	APHA 22nd Ed. 2012, 3500-Al-B, 3-61
23	Cadmium (as Cd)	mg/l	N.D	0.003 max	APHA 22nd Ed. 2012, 3111-B, 3-18
24	Chromium Total (as Cr)	mg/l	N.D	0.05 max	APHA 22nd Ed. 2012, 3111-B, 3-18
25	Copper (as Cu)	mg/l	N.D	0.05 max	APHA 22nd Ed. 2012, 3111-B, 3-18
26	Lead (as Pb)	mg/l	N.D	0.01 max	APHA 22nd Ed. 2012, 3111-B, 3-18
27	Zinc (as Zn)	mg/l	0.05	5 max	APHA 22nd Ed. 2012, 3111-B, 3-18
28	Arsenic (as As)	mg/l	<0.01	0.01 max	APHA 22nd Ed. 2012, 3114-B, 3-18
29	Selenium (as Se)	mg/l	N.D	0.001 max	APHA 22nd Ed. 2012, 3112-B, 3-18
30	Mercury (as hg)	mg/l	N.D	0.01 max	APHA 22nd Ed. 2012, 3114-B, 3-18
31	Nickel (as Ni)	mg/l	<0.05	0.02 max	APHA 22nd Ed. 2012, 3111-B, 3-18
32	Mineral Oil	mg/l	N.D	0.5 max	IS 3025 (Part 39): 1991, Reaffirmed 2003: ed. 2.1
33	Cyanide (as CN)	mg/l	N.D	0.05 max	APHA 22nd ED. 2012, 4500-CN.C & 4-39 & 4-44
34	Anionic detergents as MBAS	mg/l	<0.1	0.2 max	APHA 22nd ED. 2012, 5540-C.C & 5-53
35	Phenolic compounds (as C6H5OH)	mg/l	N.D	0.001 max	APHA 22nd ED. 2012, 5530-B & C 5-4753
36	Polynuclear aromatic hydrocarbons (PAH)	mg/l	N.D	0.0001 max	APHA 22nd ED. 2012, 6440, 6-93
37	Polychlorinated Biphenyls (PCBs)	mg/l	N.D	0.0005 max	USEPA Method 8082
38	Sulphide (as S)	mg/l	N.D	0.05 max	APHA 22nd ED. 2012, 4500-S2-C 4- 175 & F 4-178

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Sl. No.	Parameters	Unit	Result	Acceptable Limit (IS 10500:2012)	Method Reference
Microbiological Analysis					
1	Total Colliforms	MPN/100mL	<1.1	N.D	APHA 22nd Ed. 2012, 9221-B & C, 9-66, 9-69 and 9-67
2	E-Coli	MPN/100mL	Absent	N.D	APHA 22nd Ed. 2012, 9221-B & C, 9-66, 9-69 and 9-76
Pesticides Residues					
3	p.p DDT	µg/L	N.D	1	US EPA 508-1995
4	o.p DDT	µg/L	N.D	1	US EPA 508-1995
5	p.p DDE	µg/L	N.D	1	US EPA 508-1995
6	o.p DDE	µg/L	N.D	1	US EPA 508-1995
7	p.p DDD	µg/L	N.D	1	US EPA 508-1995
8	o.p DDD	µg/L	N.D	1	US EPA 508-1995
9	γ-HCH (Lindance)	µg/L	<0.01	2	US EPA 508-1995
10	α –HCH	µg/L	<0.01	0.01	US EPA 508-1995
11	β–HCH	µg/L	N.D	0.04	US EPA 508-1995
12	δ- HCH	µg/L	N.D	0.04	US EPA 508-1995
13	Butachlor	µg/L	N.D	125	US EPA 508-1995
14	Alachlor	µg/L	N.D	20	US EPA 508-1995
15	Atrazine	µg/L	N.D	2	US EPA 508-1995
16	α Endosulfan	µg/L	N.D	0.4	US EPA 508-1995
17	β Endosulfan	µg/L	N.D	0.4	US EPA 508-1995
18	Endosulfan Sulphate	µg/L	N.D	0.4	US EPA 508-1995
19	Ethion	µg/L	N.D	3	US EPA 8141A-1994
20	Malathion	µg/L	N.D	190	US EPA 8141A-1994
21	Methoyl Parathion	µg/L	N.D	0.3	US EPA 8141A-1994
22	Monocrotophos	µg/L	N.D	1	US EPA 8141A-1994
23	Phorate	µg/L	N.D	2	US EPA 8141A-1994
24	Chlorpyrifos	µg/L	N.D	30	US EPA 8141A-1994
25	Aldrin	µg/L	N.D	0.03	US EPA 508-1995
26	Dieldrin	µg/L	N.D	0.03	US EPA 508-1995
Remarks: N.D- Not Detected					

Note: Water tested and found to suitable for drinking purpose

GEMS PROJECTS PVT.LTD.

In Association with M/s MAHARASTRA ENVIRO POWER LTD, Nagpur
(NABL ACCREDITED LABORATORY)

Report No: SEPT001/2015-16 Date: 3rd October 2015

Sample described by customer : **SURFACE WATER**

Client Name: **Hindalco Industries Limited**
Client Address: Lohardaga
Postal Code: 835203
State: Jharkhand
Country: India

Sample Type: **SURFACE WATER**
Received: 29.09.2015
Registered: 29.09.2015
Marks on Sample: Location: **Bagru Mines water harvesting pond**
Sample collected on:29.09.2015
Quantity: 5 L X 2 No. PVC Can
Test Start/End Date: 29.09.2015/02.10.2015
Sample collected by: **M/S GEMS PROJECT PVT LTD.**

Sl. No.	Parameters	Unit	Result	Acceptable Limit (IS 10500:2012)	Method reference
1	Colour	Hazen	<1	5 Max	APHA 22nd Ed. 2012, 2120-B, 2-6
2	Odour	--	Agreeable	Agreeable	IS 3025 (Part 7): 1983, Reaffirmed 2006
3	Taste	--	Agreeable	Agreeable	IS 3025 (Part 7): 1983, Reaffirmed 2006
4	Turbidity	NTU	0.5	1 Max	APHA 22nd Ed. 2012, 2130-B, 2-13
5	pH	--	7.4	6.5-8.5	APHA 22nd Ed. 2012, 4500-H+-B, 4-92
6	Free Chlorides (Residual)	mg/l	<0.05	0.2 min	APHA 22nd Ed. 2012, 4500-Cl-G, 4-69
7	Total Dissolved Solids	mg/l	98	500 max	IS 3025 (Part 16): 1984, Reaffirmed 2006
8	Monochloramines	mg/l	<0.05	--	APHA 22nd Ed. 2012, 4500-ClG, 4-69
9	Dichioramines	mg/l	<0.05	--	APHA 22nd Ed. 2012, 4500-ClG, 4-69
10	Total hardness (as CaCO3)	mg/l	65	200 max	APHA 22nd Ed. 2012, 4500-ClG, 4-69
11	Alkalinirty Total (as CaCO3)	mg/l	74	200 max	IS 3025 (Part 237): 1986, Reaffirmed 2009
12	Chloride (as Cl)	mg/l	15.0	250 max	APHA 22nd Ed. 2012, 4500-Cl-b, 4-72
13	Sulphate (as SO4)	mg/l	8.0	200 max	APHA 22nd Ed. 2012, 4500-so4-e, 4-190
14	Nitrate (as NO3)	mg/l	1.30	45 max	APHA 22nd Ed. 2012, 4500-NO3-E, 4-125
15	Fluoride (as F)	mg/l	0.30	1 max	APHA 22nd Ed. 2012, 4500-FB & D, 4-84, 4-87
16	Boron (as B)	mg/l	0.17	0.5 max	APHA 22nd Ed. 2012, 4500-BB, 4-25
17	Calcium (as Ca)	mg/l	26.0	75 max	APHA 22nd Ed. 2012, 3500-Ca-B, 3-67

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18	Magnesium (as Mg)	mg/l	5.0	30 max	APHA 22nd Ed. 2012, 3500-Mg-B, 3-84
19	Ammonical Nitrogen/Total Ammonia	mg/l	<0.1	--	APHA 22nd Ed. 2012, 4500-NH3-F, 4-115
20	Iron (as Fe)	mg/l	0.15	0.3 max	APHA 22nd Ed. 2012, 3111-B, 3-18
21	Manganese (as Mn)	mg/l	N.D	0.1 max	APHA 22nd Ed. 2012, 3111-B, 3-18
22	Aluminium (as Al)	mg/l	0.13	0.03 max	APHA 22nd Ed. 2012, 3500-Al-B, 3-61
23	Cadmium (as Cd)	mg/l	N.D	0.003 max	APHA 22nd Ed. 2012, 3111-B, 3-18
24	Chromium Total (as Cr)	mg/l	N.D	0.05 max	APHA 22nd Ed. 2012, 3111-B, 3-18
25	Copper (as Cu)	mg/l	N.D	0.05 max	APHA 22nd Ed. 2012, 3111-B, 3-18
26	Lead (as Pb)	mg/l	N.D	0.01 max	APHA 22nd Ed. 2012, 3111-B, 3-18
27	Zinc (as Zn)	mg/l	0.03	5 max	APHA 22nd Ed. 2012, 3111-B, 3-18
28	Arsenic (as As)	mg/l	<0.01	0.01 max	APHA 22nd Ed. 2012, 3114-B, 3-18
29	Selenium (as Se)	mg/l	N.D	0.001 max	APHA 22nd Ed. 2012, 3112-B, 3-18
30	Mercury (as hg)	mg/l	N.D	0.01 max	APHA 22nd Ed. 2012, 3114-B, 3-18
31	Nickel (as Ni)	mg/l	<0.05	0.02 max	APHA 22nd Ed. 2012, 3111-B, 3-18
32	Mineral Oil	mg/l	N.D	0.5 max	IS 3025 (Part 39): 1991, Reaffirmed 2003: ed. 2.1
33	Cyanide (as CN)	mg/l	N.D	0.05 max	APHA 22nd ED. 2012, 4500-CN.C & 4-39 & 4-44
34	Anionic detergents as MBAS	mg/l	<0.1	0.2 max	APHA 22nd ED. 2012, 5540-C.C & 5-53
35	Phenolic compounds (as C6H5OH)	mg/l	N.D	0.001 max	APHA 22nd ED. 2012, 5530-B & C 5-4753
36	Polynuclear aromatic hydrocarbons (PAH)	mg/l	N.D	0.0001 max	APHA 22nd ED. 2012, 6440, 6-93
37	Polychlorinated Biphenyls (PCBs)	mg/l	N.D	0.0005 max	USEPA Method 8082
38	Sulphide (as S)	mg/l	N.D	0.05 max	APHA 22nd ED. 2012, 4500-S2-C 4- 175 & F 4-178

Sl. No.	Parameters	Unit	Result	Acceptable Limit (IS 10500:2012)	Method Reference
Microbiological Analysis					
1	Total Colliforms	MPN/100mL	<1.1	N.D	APHA 22nd Ed. 2012, 9221-B & C, 9-66, 9-69 and 9-67
2	E-Coli	MPN/100mL	Absent	N.D	APHA 22nd Ed. 2012, 9221-B & C, 9-66, 9-69 and 9-76
Pesticides Residues					
3	p.p DDT	µg/L	N.D	1	US EPA 508-1995
4	o.p DDT	µg/L	N.D	1	US EPA 508-1995
5	p.p DDE	µg/L	N.D	1	US EPA 508-1995
6	o.p DDE	µg/L	N.D	1	US EPA 508-1995
7	p.p DDD	µg/L	N.D	1	US EPA 508-1995
8	o.p DDD	µg/L	N.D	1	US EPA 508-1995
9	γ-HCH (Lindance)	µg/L	<0.01	2	US EPA 508-1995
10	α –HCH	µg/L	<0.01	0.01	US EPA 508-1995
11	β–HCH	µg/L	N.D	0.04	US EPA 508-1995
12	δ- HCH	µg/L	N.D	0.04	US EPA 508-1995
13	Butachlor	µg/L	N.D	125	US EPA 508-1995
14	Alachlor	µg/L	N.D	20	US EPA 508-1995
15	Atrazine	µg/L	N.D	2	US EPA 508-1995
16	α Endosulfan	µg/L	N.D	0.4	US EPA 508-1995
17	β Endosulfan	µg/L	N.D	0.4	US EPA 508-1995
18	Endosulfan Sulphate	µg/L	N.D	0.4	US EPA 508-1995
19	Ethion	µg/L	N.D	3	US EPA 8141A-1994
20	Malathion	µg/L	N.D	190	US EPA 8141A-1994
21	Methoyl Parathion	µg/L	N.D	0.3	US EPA 8141A-1994
22	Monocrotophos	µg/L	N.D	1	US EPA 8141A-1994
23	Phorate	µg/L	N.D	2	US EPA 8141A-1994
24	Chlorpyrifos	µg/L	N.D	30	US EPA 8141A-1994
25	Aldrin	µg/L	N.D	0.03	US EPA 508-1995
26	Dieldrin	µg/L	N.D	0.03	US EPA 508-1995
Remarks: N.D- Not Detected					

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GEMS PROJECTS PVT.LTD.

In Association with M/s MAHARASTRA ENVIRO POWER LTD, Nagpur
(NABL ACCREDITED LABORATORY)

Report No: SEPT001/2015-16 Date: 3rd October 2015

Sample described by customer : **SURFACE WATER**

Client Name: **Hindalco Industries Limited**
Client Address: Lohardaga
~~Postal Code: 833208~~
State: Jharkhand
Country: India
Sample Type: **SURFACE WATER**
Received: 29.09.2015
Registered: 29.09.2015
Marks on Sample: Location: **Bhusar Mines water harvesting pond**
Sample collected on:29.09.2015
Quantity: 5 L X 2 No. PVC Can
Test Start/End Date: 29.09.2015/02.10.2015
Sample collected by: **M/S GEMS PROJECT PVT LTD.**

Sl. No.	Parameters	Unit	Result	Acceptable Limit (IS 10500:2012)	Method reference
1	Colour	Hazen	<1	5 Max	APHA 22nd Ed. 2012, 2120-B, 2-6
2	Odour	--	Agreeable	Agreeable	IS 3025 (Part 7): 1983, Reaffirmed 2006
3	Taste	--	Agreeable	Agreeable	IS 3025 (Part 7): 1983, Reaffirmed 2006
4	Turbidity	NTU	0.4	1 Max	APHA 22nd Ed. 2012, 2130-B, 2-13
5	pH	--	7.4	6.5-8.5	APHA 22nd Ed. 2012, 4500-H+-B, 4-92
6	Free Chlorides (Residual)	mg/l	<0.05	0.2 min	APHA 22nd Ed. 2012, 4500-Cl-G, 4-69
7	Total Dissolved Solids	mg/l	94	500 max	IS 3025 (Part 16): 1984, Reaffirmed 2006
8	Monochloramines	mg/l	<0.05	--	APHA 22nd Ed. 2012, 4500-ClG, 4-69
9	Dichioramines	mg/l	<0.05	--	APHA 22nd Ed. 2012, 4500-ClG, 4-69
10	Total hardness (as CaCO3)	mg/l	63	200 max	APHA 22nd Ed. 2012, 4500-ClG, 4-69
11	Alkalinirty Total (as CaCO3)	mg/l	67	200 max	IS 3025 (Part 237): 1986, Reaffirmed 2009
12	Chloride (as Cl)	mg/l	17.0	250 max	APHA 22nd Ed. 2012, 4500-Cl-b, 4-72
13	Sulphate (as SO4)	mg/l	9.0	200 max	APHA 22nd Ed. 2012, 4500-so4-e, 4-190
14	Nitrate (as NO3)	mg/l	1.40	45 max	APHA 22nd Ed. 2012, 4500-NO3-E, 4-125
15	Fluoride (as F)	mg/l	0.20	1 max	APHA 22nd Ed. 2012, 4500-FB & D, 4-84, 4-87
16	Boron (as B)	mg/l	0.15	0.5 max	APHA 22nd Ed. 2012, 4500-BB, 4-25

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17	Calcium (as Ca)	mg/l	25.0	75 max	APHA 22nd Ed. 2012, 3500-Ca-B, 3-67
18	Magnesium (as Mg)	mg/l	3.0	30 max	APHA 22nd Ed. 2012, 3500-Mg-B, 3-84
19	Ammonical Nitrogen/Total Ammonia	mg/l	<0.1	--	APHA 22nd Ed. 2012, 4500-NH3-F, 4-115
20	Iron (as Fe)	mg/l	0.07	0.3 max	APHA 22nd Ed. 2012, 3111-B, 3-18
21	Manganese (as Mn)	mg/l	N.D	0.1 max	APHA 22nd Ed. 2012, 3111-B, 3-18
22	Aluminium (as Al)	mg/l	0.15	0.03 max	APHA 22nd Ed. 2012, 3500-Al-B, 3-61
23	Cadmium (as Cd)	mg/l	N.D	0.003 max	APHA 22nd Ed. 2012, 3111-B, 3-18
24	Chromium Total (as Cr)	mg/l	N.D	0.05 max	APHA 22nd Ed. 2012, 3111-B, 3-18
25	Copper (as Cu)	mg/l	N.D	0.05 max	APHA 22nd Ed. 2012, 3111-B, 3-18
26	Lead (as Pb)	mg/l	N.D	0.01 max	APHA 22nd Ed. 2012, 3111-B, 3-18
27	Zinc (as Zn)	mg/l	0.06	5 max	APHA 22nd Ed. 2012, 3111-B, 3-18
28	Arsenic (as As)	mg/l	<0.01	0.01 max	APHA 22nd Ed. 2012, 3114-B, 3-18
29	Selenium (as Se)	mg/l	N.D	0.001 max	APHA 22nd Ed. 2012, 3112-B, 3-18
30	Mercury (as hg)	mg/l	N.D	0.01 max	APHA 22nd Ed. 2012, 3114-B, 3-18
31	Nickel (as Ni)	mg/l	<0.05	0.02 max	APHA 22nd Ed. 2012, 3111-B, 3-18
32	Mineral Oil	mg/l	N.D	0.5 max	IS 3025 (Part 39): 1991, Reaffirmed 2003: ed. 2.1
33	Cyanide (as CN)	mg/l	N.D	0.05 max	APHA 22nd ED. 2012, 4500-CN.C & 4-39 & 4-44
34	Anionic detergents as MBAS	mg/l	<0.1	0.2 max	APHA 22nd ED. 2012, 5540-C.C & 5-53
35	Phenolic compounds (as C6H5OH)	mg/l	N.D	0.001 max	APHA 22nd ED. 2012, 5530-B & C 5-4753
36	Polynuclear aromatic hydrocarbons (PAH)	mg/l	N.D	0.0001 max	APHA 22nd ED. 2012, 6440, 6-93
37	Polychlorinated Biphenyls (PCBs)	mg/l	N.D	0.0005 max	USEPA Method 8082
38	Sulphide (as S)	mg/l	N.D	0.05 max	APHA 22nd ED. 2012, 4500-S2-C 4- 175 & F 4-178

Sl. No.	Parameters	Unit	Result	Acceptable Limit	Method Reference
				(IS 10500:2012)	
Microbiological Analysis					
1	Total Colliforms	MPN/100mL	<1.1	N.D	APHA 22nd Ed. 2012, 9221-B & C, 9-66, 9-69 and 9-67
2	E-Coli	MPN/100mL	Absent	N.D	APHA 22nd Ed. 2012, 9221-B & C, 9-66, 9-69 and 9-76
Pesticides Residues					
3	p.p DDT	µg/L	N.D	1	US EPA 508-1995
4	o.p DDT	µg/L	N.D	1	US EPA 508-1995
5	p.p DDE	µg/L	N.D	1	US EPA 508-1995
6	o.p DDE	µg/L	N.D	1	US EPA 508-1995
7	p.p DDD	µg/L	N.D	1	US EPA 508-1995
8	o.p DDD	µg/L	N.D	1	US EPA 508-1995
9	γ-HCH (Lindance)	µg/L	<0.01	2	US EPA 508-1995
10	α –HCH	µg/L	<0.01	0.01	US EPA 508-1995
11	β–HCH	µg/L	N.D	0.04	US EPA 508-1995
12	δ- HCH	µg/L	N.D	0.04	US EPA 508-1995
13	Butachlor	µg/L	N.D	125	US EPA 508-1995
14	Alachlor	µg/L	N.D	20	US EPA 508-1995
15	Atrazine	µg/L	N.D	2	US EPA 508-1995
16	α Endosulfan	µg/L	N.D	0.4	US EPA 508-1995
17	β Endosulfan	µg/L	N.D	0.4	US EPA 508-1995
18	Endosulfan Sulphate	µg/L	N.D	0.4	US EPA 508-1995
19	Ethion	µg/L	N.D	3	US EPA 8141A-1994
20	Malathion	µg/L	N.D	190	US EPA 8141A-1994
21	Methoyl Parathion	µg/L	N.D	0.3	US EPA 8141A-1994
22	Monocrotophos	µg/L	N.D	1	US EPA 8141A-1994
23	Phorate	µg/L	N.D	2	US EPA 8141A-1994
24	Chlorpyrifos	µg/L	N.D	30	US EPA 8141A-1994
25	Aldrin	µg/L	N.D	0.03	US EPA 508-1995
26	Dieldrin	µg/L	N.D	0.03	US EPA 508-1995
Remarks: N.D- Not Detected					

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GEMS PROJECTS PVT.LTD.

In Association with M/s MAHARASTRA ENVIRO POWER LTD, Nagpur
(NABL ACCREDITED LABORATORY)

Report No: SEPT001/2015-16 Date: 3rd October 2015

Sample described by customer: **STP Outlet (Bagru Mines)**

Client Name: **Hindalco Industries Limited**

Client Address: Lohardaga

Postal Code: 835203

State: Jharkhand

Country: India

Sample Type: **Effluent**

Received: 29.09.2015

Registered: 29.09.2015

Marks on Sample: Location: **STP Outlet (Bagru Mines)**

Sample collected on:29.09.2014

Quantity: 4 liters

Test Start/End Date: 29.09.2015/02.10.2015

Sample collected by: **M/S GEMS PROJECT PVT LTD**

Sl. No.	Analysis	Method	Result	Unit	Limits
1	pH	APHA 22nd Ed. 2012, 4500-H+-B,4-92	7.8	mg/l	5.5-9.0
2	Total Suspended Solids	APHA 22nd EDN: 2012-2540	20.0	mg/l	100
3	BOD @ 27°C	IS 3025 (Part 44): 1993, RA2003, Amd.1	11.0	mg/l	30
4	COD	IS 3025 (Part 58): 1993, RA2006, Amd.1	33.0	mg/l	250
5	Oil & Grease	IS 3025(PART 39): 1991 RA 2003,Ed 2.1	<5.0	mg/l	10
6	Total Dissolved Solids	APHA 22NO EDN 2012-2540	80.0	mg/l	2100
7	Aluminum (as Al)	APHA 22nd EDN 2012-3120B	1.7	mg/l	3
8	Calclum (as Ca)	APHA 22nd EDN 2012-3120B	7.0	mg/l	75
9	Iron (as Fe)	APHA 22nd EDN 2012-3120B	1.5	mg/l	3
10	Temperature		14.5	°C	Shall not exceed 5°C above the receiving water temperature

GEMS PROJECTS PVT. LTD. RANCHI

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GEMS PROJECTS PVT.LTD.

In Association with M/s MAHARASTRA ENVIRO POWER LTD, Nagpur
(NABL ACCREDITED LABORATORY)

Report no: SEPT001/2015-16 Date: 3rd October, 2015

SAMPLE DRAWN BY M/S GEMS PROJECT PVT LTD

Sample described as: **FLUE GAS**

Name of the Industry: **M/S HINDALCO INDUSTRIES LIMITED**

Address: Mines Division, Lohardaga, Jharkhand, Pin-835302

Date & time of Sampling: 28.09.2015 (11.00-11.30 Hrs)

Sampling Site: **Bagru Mines Office-Bagru Plateau**

A. General Information about Stack

- Stack connected to: DG-Set (250 KVA)
- Emission due to Burning of H.S.D
- Material OF construction: M.S
- Shape of Stack: Circular
- Whether stack is provided with permanent platform & ladder: Yes
- Capacity. 250 KVA

B. Physical characteristics of stack

- Height of the stack (a) from ground level: 7.0
- Diameter of the Stack at Sampling point: 0.2030
- Height of the sampling point from GL. 6.25

C. Analysis/Characteristic of Stock

- Fuel used: H.S.D
- Fuel Consumption: 30 lt/hr

D. Analysis Report

Sl. No.	PARAMETERS	PROTOCOL	RESULTS	Limits as per MoEF G.S.R.448(E)
1	Temperature of Emission (^{0}C)	IS 11255 Part: 3 1985 (Realf 2008)	300	---
2	Barometric pressure (mm of Hg)	IS 11255 Part: 3 1985 (Realf 2008)	660	---
3	Velocity of Gas (m/Sec)	IS 11255 Part: 3 1985 (Realf 2008)	10.5	---
4	Quantity of Gas flow (Nm^3/hr)	IS 11255 Part: 3 1985 (Realf 2008)	500	---
5	Concentration of CO2 (% v/v)	IS 11255 Part: 3 1985 (Realf 2008)	4.5	5.0
6	Concentration of CO (gm/kw-h)	IS 11255 Part: 3 1985 (Realf 2008)	0.25	--
7	Concentration of SO2 (mg/Nm3)	USEPA-6C	45	--
8	Concentration of NO2 (gm/kw-h)	USEPA-7E	0.55	9.2
9	Concentration of Particulate Matters (gm/kw-h)	IS 11255 Part: 3 1985 (Realf 2003)	0.13	0.3

E. Pollution Control Device

Details of pollution control devices attached with the stack: Nil

F. Remarks: Nil

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Eco Ventures Pvt. Ltd.
Regd. Office: 2/37, Sarvapriya Vihar, Near IIT Gate, New Delhi-110016
Corporate Office: 7/8 Bhaveshwar Bhuvan, Opp Porthugese Church, Near Dindayal Upadhyay Garden, Gokhale Road (North), Dadar (West), Mumbai 400 028. Tel: +91 22 24370520 / 6672.
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Mahabal Enviro Engineers Pvt. Ltd.

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

BAGRU PLATEAU- ENVIRONMENTAL MONITORING REPORT

JUNE 2015

Vijay Pandey
SENIOR EXECUTIVE

Mahabal Enviro Engineers Pvt. Ltd.

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Hindalco Industries:Environmental Monitoring report **June 2015**

Report no: : JUNE014/2015-16 **Date:** 17th June, 2015

Sample described by customer: AMBIENT AIR QUALITY MONITORING

Client Name: Hindalco Industries Limited
Client Address: Lohardaga
Postal Code: 835203
State: Jharkhand
Country: India
Sample type: AMBIENT AIR QUALITY MONITORING
Marks on Sample: Location: Bagru Plateau-Bagru Colony near Office
Sample collected on: 19.05.2015
Received:28.05.2015
Registered: 28.05.2015
Test Start/End Date: 15.06.2015/17.06.2015

LOCATION / IDENTIFICATION: Bagru Plateau- Bagru Colony Near Office

PARAMETERS		UNIT	LIMIT	METHOD	19/05/2015
Sulphur Dioxide	SO_2	$\mu g/m^3$	80	IS:5182 (Part-2):2001 (Reaff:2006)	**19.8**
Nitrogen Dioxide	NO_2	$\mu g/m^3$	80	IS:5182(Part-6):1975 (Reaff:2004)	**18.83**
Particulate Matter (size less than 10 µm)	PM_{10}	$\mu g/m^3$	100	IS:5182 (Part 23)	**71.38**
Particulate Matter (size less than 2.5 µm)	$PM_{2.5}$	$\mu g/m^3$	60	USEPA CFR(40) Appendix-L	**41.62**
Carbon Monoxide	CO	mg/m^3	2	EPA 600/P-99/001F	**0.19**

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Report no: : JUNE015/2015-16 **Date:** 17th June, 2015

Sample described by customer: AMBIENT AIR QUALITY MONITORING

Client Name: Hindalco Industries Limited
Client Address: Lohardaga
Postal Code: 835203
State: Jharkhand
Country: India
Sample type: AMBIENT AIR QUALITY MONITORING
Marks on Sample: Location: Bagru Plateau- Hisri Pit Bagru Plateau
Sample collected on: 19.05.2015
Received:28.05.2015
Registered: 28.05.2015
Test Start/End Date: 15.06.2015/17.06.2015

LOCATION / IDENTIFICATION: Bagru Plateau- Hisri Pit Bagru Plateau

PARAMETERS		UNIT	LIMIT	METHOD	19/05/2015
Sulphur Dioxide	SO_2	$\mu g/m^3$	80	IS:5182 (Part-2):2001 (Reaff:2006)	**20.6**
Nitrogen Dioxide	NO_2	$\mu g/m^3$	80	IS:5182(Part-6):1975 (Reaff:2004)	**18.5**
Particulate Matter (size less than 10 µm)	PM_{10}	$\mu g/m^3$	100	IS:5182 (Part 23)	**76.6**
Particulate Matter (size less than 2.5 µm)	$PM_{2.5}$	$\mu g/m^3$	60	USEPA CFR(40) Appendix-L	**47.4**
Carbon Monoxide	CO	mg/m^3	2	EPA 600/P-99/001F	**0.12**

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Report no: : JUNE016/2015-16 **Date:** 17th June, 2015

Sample described by customer: AMBIENT AIR QUALITY MONITORING

Client Name: Hindalco Industries Limited
Client Address: Lohardaga
Postal Code: 835203
State: Jharkhand
Country: India
Sample type: AMBIENT AIR QUALITY MONITORING
Marks on Sample: Location: Bagru Plateau- Bhusar Mine Pit Bagru Plateau
Sample collected on: 19.05.2015
Received:28.05.2015
Registered: 28.05.2015
Test Start/End Date: 15.06.2015/17.06.2015

LOCATION / IDENTIFICATION: Bagru Plateau- Bhusar Mine Pit Bagru Plateau

PARAMETERS		UNIT	LIMIT	METHOD	19/05/2015
Sulphur Dioxide	SO_2	$\mu g/m^3$	80	IS:5182 (Part-2):2001 (Reaff:2006)	**26.1**
Nitrogen Dioxide	NO_2	$\mu g/m^3$	80	IS:5182(Part-6):1975 (Reaff:2004)	**60.5**
Particulate Matter (size less than 10 µm)	PM_{10}	$\mu g/m^3$	100	IS:5182 (Part 23)	**71.9**
Particulate Matter (size less than 2.5 µm)	$PM_{2.5}$	$\mu g/m^3$	60	USEPA CFR(40) Appendix-L	**46.2**
Carbon Monoxide	CO	mg/m^3	2	EPA 600/P-99/001F	**0.51**

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Report no: : JUNE017/2015-16 **Date:** 17th June, 2015

Sample described by customer: AMBIENT AIR QUALITY MONITORING

Client Name: Hindalco Industries Limited
Client Address: Lohardaga
Postal Code: 835203
State: Jharkhand
Country: India
Sample type: AMBIENT AIR QUALITY MONITORING
Marks on Sample: Location: Bagru Plateau- Kekrang Village Bagru Plateau
Sample collected on: 19.05.2015
Received:28.05.2015
Registered: 28.05.2015
Test Start/End Date: 15.06.2015/17.06.2015

LOCATION / IDENTIFICATION: Bagru Plateau- Kekrang Village Bagru Plateau

PARAMETERS		UNIT	LIMIT	METHOD	19/05/2015
Sulphur Dioxide	SO_2	µg/m³	80	IS:5182 (Part-2):2001 (Reaff:2006)	**25.3**
Nitrogen Dioxide	NO_2	µg/m³	80	IS:5182(Part-6):1975 (Reaff:2004)	**21.1**
Particulate Matter (size less than 10 µm)	PM_{10}	µg/m³	100	IS:5182 (Part 23)	**79.4**
Particulate Matter (size less than 2.5 µm)	$PM_{2.5}$	µg/m³	60	USEPA CFR(40) Appendix-L	**49.6**
Carbon Monoxide	CO	mg/m³	2	EPA 600/P-99/001F	**0.43**

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Report no: : JUNE018/2015-16 **Date:** 18th June, 2015

SAMPLE DRAWN BY MAHABAL ENVIRO ENGINEERS PVT 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: 19.05.2015 (11.00-11.30 Hrs)
Sampling Site: Bagru Mines Office-Bagru Plateau

A. General Information about Stack

- Stack connected to: DG-Set (250 KVA)
- Emission due to: Burning of H.S.D
- Material of construction: M.S
- Shape of Stack: Circular
- Whether stack is provided with permanent platform & ladder: Yes
- Capacity: 250 KVA
- Running Load : 90 KVA

B. Physical characteristics of stack

- **Height of the stack (a) from ground level: 7.0**
- **Diameter of the Stack at sampling point:** 0.2030
- **Height of the sampling point from GL:** 6.25

C. Analysis/Characteristic of Stack

- **Fuel used:** H.S.D
- **Fuel Consumption:** 30 lt/hr

D. Analysis Report

S.No	PARAMETERS	PROTOCOL	RESULTS	Limits as per MoEF G.S.R.448(E)
1.	Temperature of Emission (°C)	IS 11255 Part:3 1985 (Realf 2008)	299	--
2.	Barometric pressure (mm of Hg)	IS 11255 Part:3 1985 (Realf 2008)	645	--
3.	Velocity of Gas (m/sec)	IS 11255 Part:3 1985 (Realf 2008)	10.3	--
4.	Quantity of Gas flow (Nm^3/hr)	IS 11255 Part:3 1985 (Realf 2008)	494	--
5.	Concentration of CO_2 (% v/v)	IS 11255 Part:3 1985 (Realf 2008)	4.37	5.0
6.	Concentration of CO (gm/kw-h)	IS 11255 Part:3 1985 (Realf 2008)	0.32	--
7.	Concentration of SO_2 (mg/Nm^3)	USEPA-6C	48	--
8.	Concentration of NO_2 (gm/kw-h)	USEPA-7E	0.51	9.2
9.	Concentration of Particulate Matters (gm/kw-h)	IS 11255 Part 3: 1985 (Realf 2003)	0.07	0.3

E. Pollution Control Device
Details of pollution control devices attached with the stack: Nil

F. Remarks: Nil

Vijay Pandey
SENIOR EXECUTIVE

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Report no: : JUNE019/2015-16 **Date:** 18th June, 2015

Sample described by customer: EFFLUENT

Client Name: Hindalco Industries Limited
Client Address: Lohardaga
Postal Code: 835203
State: Jharkhand
Country: India
Sample Type: Effluent
Sample Location : STP Outlet (Bagru Mines)
Sample collected on: 19.05.2015
Quantity: 4 litres
Sample collected by: Mahabal EnviroEngineers Pvt Limited
Received:28.05.2015
Registered: 28.05.2015
Test Start/End Date: 15.06.2015/17.06.2015

S.No	Analysis	Method	Result	Unit	Limits
1.	pH	APHA 22nd Ed. 2012, 4500-H+-B, 4-92	7.9	--	5.5-9.0
2.	Total Suspended Solids	APHA 22nd EDN:2012-2540	18.9	mg/l	100
3.	BOD @ 27°C	IS 3025 (Part 44): 1993, RA2003, Amd.1	14.4	mg/l	30
4.	Oil & Grease	IS 3025(Part 39): 1991, RA 2003, Ed.2.1	< 5.0	mg/l	10
5.	Total Dissolved Solids	APHA 22nd EDN 2012-2540	24.8	mg/l	2100
6.	Aluminum(as Al)	APHA 22nd EDN 2012-3120B	1.4	mg/l	3
7.	Calcium (as Ca)	APHA 22nd EDN 2012-3120B	5.25	mg/l	75
8.	Iron (as Fe)	APHA 22nd EDN 2012-3120B	1.2	mg/l	3
9.	Temperature	-	30	°C	shall not exceed 5°C above the receiving water temperature

Vijay Pandey
SENIOR EXECUTIVE

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Report no: : JUNE020/2015-16 **Date:** 18th June, 2015

Sample described by customer: EFFLUENT

Client Name: Hindalco Industries Limited
Client Address: Lohardaga
Postal Code: 835203
State: Jharkhand
Country: India
Sample Type: Effluent
Sample: Location: Maintenance Garage Bagru Mines
Sample collected on: 19.05.2015
Quantity: 4 litres
Sample collected by: Mahabal EnviroEngineers Pvt Limited
Received:28.05.2015
Registered: 28.05.2015
Test Start/End Date: 15.06.2015/17.06.2015

S.No	Analysis	Method	Result	Unit	Limits
1.	**pH**	APHA 22nd Ed. 2012, 4500-H+-B, 4-92	**7.4**	--	5.5-9.0
2.	**Total Suspended Solids**	APHA 22nd EDN:2012-2540	**17.9**	mg/l	100
3.	**BOD @ 27°C**	IS 3025 (Part 44): 1993, RA2003, Amd.1	**13.9**	mg/l	30
4.	**Oil & Grease**	IS 3025(Part 39): 1991, RA 2003, Ed.2.1	**< 5.0**	mg/l	10
5.	**Total Dissolved Solids**	APHA 22nd EDN 2012-2540	**20.5**	mg/l	2100
6.	**Aluminum(as Al)**	APHA 22nd EDN 2012-3120B	**1.18**	mg/l	3
7.	**Calcium (as Ca)**	APHA 22nd EDN 2012-3120B	**6.5**	mg/l	75
8.	**Iron (as Fe)**	APHA 22nd EDN 2012-3120B	**1.07**	mg/l	3
9.	**Temperature**	-	**30**	°C	shall not exceed 5°C above the receiving water temperature

Vijay Pandey
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Report no: : JUNE021/2015-16 **Date:** 18th June, 2015

Sample described by customer: SOIL

Client Name: Hindalco Industries Limited
Client Address: Lohardaga
Postal Code: 835203
State: Jharkhand
Country: India
Sample type: SOIL
Marks on Sample: Location: Bagru Mines
Sample collected on: 20.05.2015
Quantity: 2 kgs
Sample collected by: Mahabal Enviro Engineers Pvt Limited
Received: 28.05.2015
Registered: 28.05.2015
Test Start/End Date: 15.06.2015/17.06.2015

S.No	Analysis		Method	Result	Unit
1.	Colour	--	--	Gray	-
2.	Texture	--	F.A.U.N (2007)	Loamy Sand	-
3.	Bulk Density	--	By Bulk density Apparatus	1.00	gm/cm3
4.	Water Holding Capacity	--	F.A.U.N (2007)	28.5	%
5.	pH	--	F.A.U.N (2007)	6.58	-
6.	Electrical Conductivity	--	F.A.U.N (2007)	200.0	µs/cm
7.	Organic Carbon	--		0.55	%
8.	Organic Matter	--	Black & White Wet Digestion Method	0.79	%
9.	Available Nitrogen	--	Soil & Water Book by P.K Gupta	111.5	mg/kg
10.	Available Phosphorus	--	Soil & Water Book by P.K Gupta	16.5	mg/kg
11.	Available Potassium	--	Soil & Water Book by P.K Gupta	381	mg/kg
12.	Exchangeable Calcium	Ca	Soil & Water Book by P.K Gupta	27.20	meq/100gm
13.	Exchangeable Magnesium	Mg	Soil & Water Book by P.K Gupta	1.38	meq/100gm
14	Exchangeable Sodium	Na	Soil & Water Book by P.K Gupta	2.20	meq/100gm
15.	Exchangeable Potassium	K	Soil & Water Book by P.K Gupta	1.40	meq/100gm
16	Total Exchangeable Bases		Soil & Water Book by P.K Gupta	31.50	meq/100gm
17	Manganese	Mn	USEPA 3052	0.40	mg/kg
18	Arsenic	As	USEPA 3052	2.0	mg/kg
19	Silica	SiO_2	USEPA 3052	54.5	%
20.	Aluminum	Al_2O_3	USEPA 3052	6.5	%
21.	Iron	Fe_2O_3	USEPA 3052	5.00	%
22.	Calcium	CaO	USEPA 3052	8.90	%
23.	Magnesium	MgO	USEPA 3052	1.83	%
24.	Sodium	Na_2O	USEPA 3052	0.270	%
25.	Potassium	K_2O	USEPA 3052	0.230	%
26.	Sulphate	SO_4	USEPA 3052	0.69	%

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Hindalco Industries:Environmental Monitoring report June 2015

Report no: : JUNE022/2015-16 **Date:** 18th June, 2015

Sample described by customer: SURFACE WATER

Client Name: Hindalco Industries Limited
Client Address: Lohardaga
Postal Code: 835203
State: Jharkhand
Country: India
Sample type: SURFACE WATER
Marks on Sample: Location: Bagru Colony
Sample collected on: 19.05.2015
Quantity: 5 L X 2 No. PVC Can
Sample collected by: Mahabal EnviroEngineers Pvt Limited
Received:28.05.2015
Registered: 28.05.2015
Test Start/End Date: 15.06.2015/17.06.2015

S.No	Parameters	Unit	Result	Acceptable Limit (IS10500:2012)	Method Reference
1.	Colour	Hazen	< 1	5 Max	APHA 22nd Ed. 2012, 2120-B, 2-6
2.	Odour	-	Agreeable	Agreeable	IS 3025 (Part 5):1983, Reaffirmed 2006
3.	Taste	-	Agreeable	Agreeable	IS 3025 (Part 7):1984, Reaffirmed 2006
4.	Turbidity	NTU	0.3	1 Max	APHA 22nd Ed. 2012, 2130-B, 2-13
5.	pH	-	6.9	6.5-8.5	APHA 22nd Ed. 2012, 4500-H+-B, 4-92
6.	Free Chlorides(Residual)	mg/l	<0.05	0.2 min	APHA 22nd Ed. 2012, 4500-Cl G, 4-69
7	Total Dissolved Solids	mg/l	100	500 Max	IS 3025 (Part 16):1984 Reaffirmed 2006
8.	Monochloramines	mg/l	<0.05	-	APHA 22nd Ed. 2012, 4500-ClG, 4-69
9.	Dichloramines	mg/l	<0.05	-	APHA 22nd Ed. 2012, 4500-ClG, 4-69
10.	Total Hardness (as $CaCO_3$)	mg/l	52	200 Max	APHA 22nd Ed. 2012, 2340-C, 2-44,45
11.	Alkalinity Total (as $CaCO_3$)	mg/l	60	200 Max	IS 3025 (Part 23):1986 Reaffirmed 2009
12.	Chloride (as Cl)	mg/l	7.8	250 Max	APHA 22nd Ed. 2012, 4500-Cl-B, 4-72
13.	Sulphate (as SO_4)	mg/l	4.2	200 Max	APHA 22nd Ed. 2012, 4500-SO4-E, 4-190

Mahabal Enviro Engineers Pvt. Ltd.

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Continuation Sheet

S.No	Parameters	Unit	Result	Acceptable Limit (IS 10500:2012)	Method Reference
14.	Nitrate (as NO3)	mg/l	1.14	45 Max	APHA 22nd Ed. 2012, 4500-NO_3-E, 4-125
15.	Fluoride (as F)	mg/l	0.19	1 Max	APHA 22nd Ed. 2012, 4500-FB& D, 4-84, 4-87
16.	Boron (as B)	mg/l	0.15	0.5 Max	APHA 22nd Ed. 2012, 4500-BB, 4-25
17.	Calcium(as Ca)	mg/l	16.5	75 Max	APHA 22nd Ed. 2012, 3500-Ca-B, 3-67
18.	Magnesium (as Mg)	mg/l	3.3	30 Max	APHA 22nd Ed. 2012, 3500- Mg- B, 3-84
19.	Ammonical Nitrogen/ Total Ammonia	mg/l	<0.1	-	APHA 22nd Ed. 2012, 4500 NH3-F, 4-115
20.	Iron (as Fe)	mg/l	0.11	0.3 Max	APHA 22nd Ed. 2012, 3111-B,3-18
21.	Manganese (as Mn)	mg/l	N.D	0.1 Max	APHA 22nd Ed. 2012, 3111-B, 318
22.	Aluminium (as Al)	mg/l	0.06	0.03 Max	APHA 22nd Ed. 2012, 3500- Al-B, 3-61
23.	Cadmium (as Cd)	mg/l	N.D	0.003 Max.	APHA 22nd Ed. 2012, 3111-B,3-18
24.	Chromium Total (as Cr)	mg/l	N.D	0.05 Max.	APHA 22nd Ed. 2012, 3111-B,3-18
25.	Copper (as Cu)	mg/l	N.D	0.05 Max.	APHA 22nd Ed. 2012, 3111-B,3-18
26.	Lead (as Pb)	mg/l	N.D	0.01 Max.	APHA 22nd Ed. 2012, 3111-B,3-18
27.	Zinc (as Zn)	mg/l	0.08	5 Max.	APHA 22nd Ed. 2012, 3111-B,3-18
28.	Arsenic (as As)	mg/l	<0.01	0.01 Max.	APHA 22nd Ed. 2012, 3114-C,3-38
29.	Mercury (as Hg)	mg/l	N.D.	0.001 Max.	APHA 22nd Ed. 2012, 3112-B,3-23
30.	Selenium (as Se)	mg/l	N.D.	0.01 Max.	APHA 22nd Ed. 2012, 3114-C, 3-38
31.	Nickel (as Ni)	mg/l	<0.06	0.02 Max.	APHA 22nd Ed. 2012, 3111 B,3-18
32.	Mineral Oil	mg/l	N.D.	0.5 Max.	IS 3025 (Part 39): 1991, Reaffirmed 2003, Ed. 2.1
33.	Cyanide (as CN)	mg/l	N.D.	0.05 Max.	APHA 22nd Ed. 2012, 4500-CN, C & E, 4-39 & 4-44
34.	Anionic detergents as MBAS	mg/l	<0.1	0.2 Max.	APHA 22nd Ed. 2012, 5540-C, 5-53
35.	Phenolic compounds (as C_6H_5OH)	mg/l	N.D	0.001 Max.	APHA 22nd Ed. 2012, 5530- B & C, 5-47
36.	Polynuclear aromatic hydrocarbons (PAH)	µg/L	N.D	0.0001 mg/L Max.	APHA 22nd Ed. 2012, 6440, 6-93
37.	Polychlorinated Biphenyls (PCBs)	µg/L	N.D	0.0005 mg/l Max.	USEPA Method 8082
38.	Sulphide (as S)	mg/l	N.D	-	APHA 22nd Ed. 2012, 4500– S2-C 4-175 & F 4-178

Mahabal Enviro Engineers Pvt. Ltd.

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Continuation Sheet

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

Conclusion: The Physical & Chemical Analysis report indicates that water is not contaminated.

Vijay Pandey
SENIOR EXECUTIVE

ADITYA BIRLA

HINDALCO

Date:26.11.2015

OFFICE ORDER

In connection with the earlier office order dated 10.11.2014 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, DGM (Quality & Environment), Convenor.

Members:

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

By order

Bijesh Kumar Jha
Joint President (Mines)

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

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BREAK UP THE COST OF ENVIRONMENTAL MEASURES DURING THE YEAR 2015-16

The composite cost during the year 2015-16 for environmental protection & pollution control by Jharkhand Mines division of M/s Hindalco Industries Ltd & M/s Minerals & Minerals Ltd for implementation of the suggested measures in EC at our all the operating mines in the state of Jharkhand-namely Pakhar (115,13 Ha), Pakhar (15.58 Ha), Pakhar (109.507 Ha),*Pakhar (8.09 Ha),Pakhar (35.12Ha)*, Serengdag (140.06 Ha), Serengdag (155.81 Ha), Jalim & Sanai (12.14 Ha), Gurdari (584.19 Ha), Amtipani (190.95 Ha), Kujam I (80.97 Ha) Kujam II (157.38 Ha) and Bagru (75.41 Ha), Hisri New (14.55 Ha), Chiro kukud, *Orsa pat(196.36 Ha)*, Bhusar (65.31 Ha)& *Bimarla Bauxite Mines (134.52 Ha)*.

Sl No	Description	Budget (in Rupees) FY 2015-16	Actual (in Rupees) FY 2015-16 (from April to Sep'2015)
1	Pollution Control & Environment monitoring	**15,40,000/-**	**2,62,293/-**
2	Reclamation/ Back filing & Rehabilitation	**3,89,90,000/-**	**1,45,51,281/-**
3	Green belt & Plantation	**60,00,000/-**	**28,68,213/-**
4	Rural Development	**1,64,71,000/-**	**1,04,36,128/-**

**Part of OB removed cost.

Convener
Environment Management Cell
Hindalco Industries Limited

PRODUCTION, MINED OUT, BACKFILLED, PRODUCTION AND OVERBURDEN REMOVAL FROM APR-15 TO SEP-15

NAME OF THE MINES	MINING LEASE AREA (IN HA)	MINED OUT AREA (HA)	BACK FILLED AREA (HA)	PRODUCTION (In MT)	OVERBURDEN (In Cu.M)
Shrengdag Bauxite Mines	155.81	4.04	3.50	140103.00	428240.00
Gurdari Bauxite Mines	584.19	5.66	4.92	175340.00	273881.00
Jalim & Sanai	12.14	0.50	0.05	23569.00	16500.00
Serangdag	140.06	0.00	0.00	0.00	0.00
Pakhar Buxite Mines	115.13	1.43	1.90	104145.00	143361.70
Pakhar Buxite Mines	8.09	0.00	0.00	0.00	0.00
Kujam-I	80.87	1.54	0.47	84970.00	82735.79
Kujam-II	157.38	3.46	1.26	77365.00	215398.22
Amtipani	190.95	2.27	1.53	89045.00	121267.01
Chiro-Kukud	152.57	1.28	2.97	51890.00	80377.18
Orsa Bauxite Mines	196.36	0.00	0.00	0.00	0.00
Hisri New	14.55	0.00	0.00	0.00	0.00
Bhusar	65.31	0.00	0.00	0.00	0.00
Bagru	75.41	0.00	0.00	0.00	0.00
Minerals & Minerals Limited					
Pakhar Buxite Mines	109.51	1.40	1.62	157280.00	137012.31
Pakhar Buxite Mines	15.58	0.00	0.00	0.00	0.00
Bimarla Bauxite Mines	134.53	0.00	0.00	0.00	0.00

Convener
Environment Management Cell
Hindalco Industries Limited

Monitored water level (FY 2015-16)

Fig in meter

Location (Mines)	Elevation (Mtr)	Well type	Monsoon (July-Sep)		Post Monsoon (November)		Winter (January)		Pre Monsoon (April-May)	
			Inside ML	Outside ML	Inside ML	Outside ML	Inside ML	Outside ML	Inside ML	Outside ML
Bagru	905	Open Well		21.74		24.13				
	910	Open Well		24.32		24.55				
	915	Open Well		29.41		28.43				
	903	Open Well		22.83		33.11				
	909	Open Well		17.54		28.74				
	1000	Open Well		24.95		22.69				
Pakhar	1083	Hand Pump	35.36		31.63					
Sherengdag	1027	Open Well		25.84		28.36				
	1094	Hand Pump	41.74		39.55					
	1081	Hand Pump	39.65		31.30					
	1055	Hand Pump	33.07		27.53					
	1066	Hand Pump	27.76		26.27					
Gurdari	1045	Hand Pump	29.32		27.85					
	1061	Hand Pump	28.36		24.93					
	1059	Hand Pump	38.11		36.20					
	1075	Hand Pump	27.98		26.82					
	1075	Hand Pump	28.37		29.33					
Kujam	1040	Open Well		33.97		21.88				
	1041	Open Well		33.66		24.85				
	1064	Hand Pump	31.55		28.68					
	1052	Hand Pump	22.39			21.12				
Chiro Kukud	1148	Hand Pump	33.40		28.39					
	1151	Hand Pump	37.62		31.85					
	1084	Hand Pump	34.25		33.11					

Convenor
(Quality & Environment)