ADITYA BIRLA

HINDALCO

Ref No: HIL/LHD/JP (M)/MoEF/0447 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 Pakhar (8.09 ha) Bauxite Mining project of M/s Hindalco Industries Limited located in Lohardaga, Jharkhand for the period April'15 to Sep'15.**

Ref: **Environmental Clearance letter no J-11015/135/2006-IA II (M) dated 24th January 2007**

Sir,

With reference to the above, we are submitting herewith the Compliance status report of EC conditions for **Pakhar (8.09 ha)** Bauxite Mining project of M/s Hindalco located in Lohardaga, Jharkhand for the period **April'15 to Sep'15.**

Hope you will find the same in order.

Thanking You

Yours Sincerely
FOR 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 Clearence

PAKHAR (8.09 ha) BAUXITE MINES

Period: April'15-September'15

J-11015/135 /2006-IA.II (M) Dated 24.1.2007

Sl No	Specific Conditions	Compliance Status
1	All the conditions stipulated by SPCB in their NOC shall be effectively implemented.	Implementations of the stipulated condition are fulfilled.
2	The environmental clearance is subject to approval of the state land use Department, Government of Jharkhand for diversion of agricultural land for non-agricultural use.	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.
3	Mining shall not intersect groundwater. The mine working shall be restricted to ground water table. Prior approval of the Ministry of Environment & Forests and Central Ground Water Authority shall be obtained for mining below water table.	Shallow depth mining is being done & the ground water table levels much below the working depth. Hence, there will be no intersecting of the ground water table due to mining activities.
4	The project proponent shall ensure that no natural watercourse shall be obstructed due to any mining operation.	It is being ensured .No natural water course is obstructed during mining.
5	Top soil shall be stacked properly with proper slope with adequate measures and should be used for reclamation and rehabilitation of mined out areas.	Sequential backfilling and reclamation of the mined out area are being practiced during mining operation. Whenever backfilling will be done to the mined out area, Topsoil will be used for backfilling to reclaim and restore the damage area upto the extent possible.
6	The waste generated shall be concurrently backfilled in the mined out area. There shall be no external OB dump. Monitoring and management of rehabilitated areas should continue until the vegetation becomes self-sustaining. Compliance status should be submitted to the Ministry of Environment & Forest on six monthly basis.	Sequential backfilling and reclamation of the mined out area are being exercised during mining operation. Yearly backfill data is being submitted.(enclosed Annexure)

7	Catch drains and siltation ponds of appropriate size should be constructed to arrest silt and sediment flows from mine working. The water so collected should be utilized for watering the mine area, roads, green belt development etc. The drains should be regularly desilted particularly after monsoon and maintained properly. Garland drain (size, gradient and length) shall be constructed for mine pit and sump capacity should be designed keeping 50% safety margin over and above peak sudden rainfall (based on 50 years data) and maximum discharge in the area adjoining the mine site. Sump capacity should also provide adequate retention period to allow proper setting of silt material. Sedimentation pits should be constructed at the corners of the garland drains and desilted at regular intervals.	No run-off is generated from mining activities. However to collect & manage rain water during monsoon, part of mined out area is used as settling tank for the runoff. Sediment rain water is being used for watering the mine area, roads, green belt development etc.
8	Plantation shall be raised in an area of 6.35 ha including a green belt of adequate width by planting the native species around the ML area, roads, reclaimed area etc. in consultation with the local DFO / Agriculture Department. The density of the trees should be around 1500 plants per ha.	In 2015-16, About 200 plantation carried out in this lease. Rest to be complied during project period.
9	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.	A plan is drawn on the basis of discussions with Scientists of State unit office of Central Ground Water Board, Ranchi to implement suitable conservation measures to augment ground water resources in the area and is also submitted to the Regional Director, Central Ground Water Board, Patna, for his further suggestions. Recommendation of CGWB will be implemented to augment the ground water resources of the area. Copy of letter already submitted.
10	Regular monitoring of ground water level and quality should be carried out by establishing a network of existing wells and constructing new piezometers during the mining operation. The monitoring should be carried out four times in a year – pre-monsoon (April-May), monsoon (August), post-monsoon (November) and winter (January) and the data thus collected may be sent regularly to MOEF, Central Ground water Authority and Regional Director Central Ground Water Board.	It is being monitored. Monitoring report is enclosed as **Annexure**

11	Prior permission from the competent authority should be obtained for drawl of water from the surface water bodies.	As per the terms and conditions in Mining lease deed, we have the liberty to use water. Water cess is being paid on monthly basis to State Pollution Control Board.
12	Vehicular emissions should be kept under control and regularly monitored. Measures shall be taken for maintenance of vehicles used in mining operations and transportation of mineral. The vehicles should be covered with a tarpaulin and shall not be overloaded.	To keep vehicular emissions in control, company vehicles are periodically checked & repaired. All transporters have been instructed to obtain PUC certificate for their vehicles
13	Drills should either be operated with dust extractors or should be equipped with water injection system.	Wet drilling is being done in the holes intermittently for dust suppression.
14	Blasting operation should be carried out only during the daytime. Controlled blasting should be practiced. The mitigative measures for control of ground vibration and to arrest fly rocks and boulders should be implemented.	Blasting at Mines is done at fixed blasting period of 12.00 Noon to 1.00 PM on working days. Mobile mining activities are stopped during blasting. All the precautionary and mitigative measures to control ground vibration and to arrest generation of fly rocks are being implemented.
15	Consent to operate should be obtained from SPCB prior to start of enhanced production from the mine.	There is no proposal for production enhancement.
16	Sewage treatment plant should be installed for the colony. ETP should also be provided for workshop and wastewater generated from mining operations.	There is no effluent discharge from Mine; hence ETP has not been installed. The sewage water from domestic uses is being collected through individual septic tanks & soak pits. Sludge is collected to an integrated soak pit.
17	The project proponent should take all precautionary measures during mining operation for conservation and protection of endangered fauna such as Indian Python etc. Spotted in the study area. Action plan for conservation of flora and fauna shall be prepared and implemented in consultation with the State Forest and Wildlife Department. Necessary allocation of funds for implementation of the conservation plan shall be made and the funds so allocated shall be included in the project cost. Copy of action plan may be submitted to the Ministry and its Regional Office within 3 months.	Action plan for conservation of flora and fauna spotted in the study area has been prepared based on discussions with D.F.O of the area for implementation and a copy of the same is submitted to the D.F.O, on receipt of any suggestion to our action plan the same will be intimated to MOEF. A copy of Action plan drawn and of letter for submission to DFO is all ready submitted to regional office.
18	A Final Mine Closure plan along with details of Corpus Fund should be submitted to the Ministry of Environment & Forest 5 years in advance of final mine closure for approval.	Final Mine closure plan dully approved by Indian Bureau of Mines.

GENERAL CONDITIONS

Sl No	Conditions	Compliance Status
1	No change in mining technology and scope of working should be made without prior approval of the Ministry of Environment & Forest	Being adhered to.
2	No change in the calendar plan including excavation, quantum of mineral bauxite and waste should be made.	Excavation of Over Burden and Bauxite is being done as per the approved calendar plan. Details of excavation, quantum of mineral, OB, etc have been furnished for the financial year 2015-16 and copy enclosed.
3	Four ambient air quality-monitoring station should be established in the core zone as well as in the buffer zone for RPM, SPM, SO_2, NO_X monitoring. Location of the stations should be decided based on the metrological data, topographical features and environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the State Pollution Control Board.	Monitoring locations have been fixed after due consultation of SPCB and regular monitoring is being carried out. Monitoring Reports is enclosed.
4	Data on ambient air quality (RPM, SPM, SO_2, and NOx) 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.	Regular monitoring is being carried out. Monitoring Reports is enclosed in **Annexure**
5	Fugitive dust emission from all the sources should be controlled regularly. Water spraying arrangements on haul roads, loading and unloading and at transfer points should be provided and properly maintained.	Water tanker 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 contain fugitive dust. Water spraying at dust prone areas is also being done manually.
6	Measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in operation of HEMM, etc. should be provided with ear plug / muffs.	Noise monitoring is being done at various locations of the work zone area and monitoring report is being submitted at MoEF. Workers engaged in operation of HEMMs, etc have also been provided with PPEs such as ear plug and ear muffs.

7	Industrial waste water (workshops and waste water from the mine) Should be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 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.	Complied. There is no effluent discharge from Mine. Workshop has an Oil Catchment Pit to trap oil and grease.
8	Personnel working in dusty areas should wear protective respiratory devices and they should also provided with adequate training and information on safety and health aspects. Occupational health surveillance program of the workers should be undertaken periodically to observe any contractions due to exposure to dust and take corrective measures, if needed.	Complied. Use of Personal Protective Equipment (PPE) by the individuals is being ensured. All the mine workers are being regularly and periodically health checkup for any contraction of diseases due to exposure in dusty and noisy areas. Training on safety, health and environmental aspects of mining is being regularly imparted through VT centre and also through various other training programmes conducted by the State Government, recognized agencies, etc
9	A separate environmental management cell with suitable qualified personnel should be set-up under the control of a Senior Executive, who will report directly to the Head of the Organization.	Separate Environmental Management Cell (EMC) has been constituted and is functioning effectively. Copy enclosed as Annexure
10	The project authorities should inform to the Regional Office located at Bhubneshwar regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.	The mine is running since 1976. Yearly date of financial closure is 31st March.
11	The funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purpose. Year wise expenditure should be reported to the Ministry and its Regional Office located at Bhubneshwar.	Statement of budgetary provision and actual expenses for environmental protection measure is enclosed. It is once again reiterated that the funds so ear marked shall not be diverted for any other purposes other than it is committed at the beginning of the financial year. (Annexure).
12	The Regional Office of this Ministry located at Bhubneshwar shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information / monitoring reports.	Agreed.

13	A copy of clearance letter will be marked to concerned Panchayat / local NGO, if any, from whom suggestion / representation has been received while processing the proposal.	Complied
14	State Pollution Control Board should display a copy of the clearance letter at the Regional office, District Industry Center and Collector's office / Tehsildar's Office for 30 days.	Displayed.
15	The project authorities should advertise at least in two local newspapers widely circulated, one of which locality concerned, within 7days of the issue of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and also at web site of the Ministry of Environment and Forests at http:/ /envfor.nic.in and a copy of the same should be forwarded to the Regional Office of this Ministry located Bhubneshwar.	Complied. Copies, of the advertisement made in the local newspapers, have already been submitted to the Regional Office.

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(NABL ACCREDITED LABORATORY)

M/S HINDALCO INDUSTRIES LIMITED

MINES DIVISION, DIST.-LOHARDAGA, JHARKHAND

REPORT

OF

ENVIRONMENTAL MONITORING DATA OF PAKHAR PLATEAU

FOR

(JULY TO SEPTEMBER QUARTER-2015)

1236/2 Lajpat Nagar, Near Lala Lajpat Rai School, Pundag, Argora, Ranchi, Jharkhand- 834004
Phone: 0651 – 2902588/2246412 Fax: 0651 – 2242513 Mobile - +91-9431115961, +91-9934307900
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CONTENT

	LOCATION
	AMBIENT AIR QUALITY
1	Pakhar Plateau- Pakhar Hindalco Colony
2	Pakhar Plateau- Pakhar (115.13 ha.) Quarry No. 4
3	Pakhar Plateau- Pakhar 109.507 ha. (Minerals & Minerals) Working Pit
4	Pakhar Plateau Pakhar Mines(15.58 ha, Minerals & Minerals)
	NOISE LEVEL
1	Pakhar HINDALCO Colony
2	Pakhar Mine (115.13 ha.) Pakhar Plateau
3	Pakhar Mine (109.507 ha. Minerals & Minerals) Pakhar Plateau
4	Pakhar Mine (15.58 ha. Minerals & Minerals) Pakhar Plateau
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1	Canteen Drinking Water of Pakhar Mines
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1	Pakhar Mines (115.13 ha.). Rain Water harvesting Pond
	SOIL QUALITY
1	Pakhar Mines (115.13 ha.)
2	Pakhar Mines (109.507 ha. Of Minerals and Minerals)
	STACK MONITORING OF DG SETS (FLUE GAS)
1	Pakhar Mines Office-Pakhar Plateau

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

Report No: SEPT004/2015-16 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: 26.09.2015
Registered: 26.09.2015
Marks on Sample: Location: **Pakhar Plateau- Pakhar Hindalco Colony**
Sample collected on:26.09.2015
Test Start/End Date: 26.09.2015/27.09.2015

LOCATION/IDENTIFICATION: **Pakhar Plateau- Pakhar Hindalco Colony**

PARAMETERS		UNIT	LIMIT	METHOD	Concentration
Sulphur Dioxide	SO_2	$\mu g/m^3$	80	IS:5182 (Part-2):2001 (Reaff:2006)	16.00
Nitrogen Dioxide	NO_x	$\mu g/m^3$	80	IS:5182 (Part-6): 1975(Reaff:2004)	19.50
Particulate Matter (size less than 10 µm)	PM_{10}	$\mu g/m^3$	100	IS:5182 (Part-23)	54.3
Particulate Matter (size less than 2.5 µm)	$PM_{2.5}$	$\mu g/m^3$	60	USEPA CFR (40) Appendix-L	32.6
Carbon Monoxide	CO	$\mu g/m^3$	2	EPA 600/P-99/001F	0.15

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Report No: SEPT004/2015-16 Date: 3rd October 2015

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Client Name: **Hindalco Industries Limited**
Client Address: Lohardaga
Postal Code: 835203
State: Jharkhand
Country: India
Sample Type: **AMBIENT AIR QUALITY MONITORING**
Received: 26.09.2015
Registered: 26.09.2015
Marks on Sample: Location: **Pakhar Plateau- Pakhar (115.13 ha.) Quarry No. 4**
Sample collected on: 26.09.2015
Test Start/End Date: 26.09.2015/27.09.2015

LOCATION/IDENTIFICATION: **Pakhar Plateau- Pakhar (115.13 ha.) Quarry No. 4**

PARAMETERS		UNIT	LIMIT	METHOD	Concentration
Sulphur Dioxide	SO_2	$\mu g/m^3$	80	IS:5182 (Part-2):2001 (Reaff:2006)	55.50
Nitrogen Dioxide	NO_x	$\mu g/m^3$	80	IS:5182 (Part-6):1975(Reaff:2004)	65.80
Particulate Matter (size less than 10 µm)	PM_{10}	$\mu g/m^3$	100	IS:5182 (Part-23)	65.8
Particulate Matter (size less than 2.5 µm)	$PM_{2.5}$	$\mu g/m^3$	60	USEPA CFR (40) Appendix-L	33.7
Carbon Monoxide	CO	$\mu g/m^3$	2	EPA 600/P-99/001F	0.55

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Report No: SEPT004/2015-16 Date: 3rd October 2015

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Client Name: **Hindalco Industries Limited**
Client Address: Lohardaga
Postal Code: 835203
State: Jharkhand
Country: India
Sample Type: **AMBIENT AIR QUALITY MONITORING**
Received: 26.09.2015
Registered: 26.09.2015
Marks on Sample: Location: **Pakhar Plateau- Pakhar 109.507 ha. (Minerals & Minerals) working Pit**
Sample collected on:26.09.2015
Test Start/End Date: 26.09.2015/27.09.2015

LOCATION/IDENTIFICATION: **Pakhar Plateau- Pakhar 109.507 ha. (Minerals & Minerals) working Pit**

PARAMETERS		UNIT	LIMIT	METHOD	Concentration
Sulphur Dioxide	SO_2	$\mu g/m^3$	80	IS:5182 (Part-2):2001 (Reaff:2006)	26.50
Nitrogen Dioxide	NOx	$\mu g/m^3$	80	IS:5182 (Part-6):1975(Reaff:2004)	39.00
Particulate Matter (size less than10 µm)	PM_{10}	$\mu g/m^3$	100	IS:5182 (Part-23)	68.3
Particulate Matter (size less than 2.5 µm)	$PM_{2.5}$	$\mu g/m^3$	60	USEPA CFR (40) Appendix-L	41.7
Carbon Monoxide	CO	$\mu g/m^3$	2	EPA 600/P-99/001F	0.09

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Report No: SEPT004/2015-16 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: 26.09.2015
Registered: 26.09.2015
Marks on Sample: Location: **Pakhar Plateau Pakhar Mines(15.58 ha, Minerals & Minerals)**
Sample collected on:26.09.2015
Test Start/End Date: 26.09.2015/27.09.2015

LOCATION/IDENTIFICATION: **Pakhar Plateau Pakhar Mines(15.58 ha, Minerals & Minerals)**

PARAMETERS		UNIT	LIMIT	METHOD	Concentration
Sulphur Dioxide	SO_2	$\mu g/m^3$	80	IS:5182 (Part-2):2001 (Reaff:2006)	12.50
Nitrogen Dioxide	NOx	$\mu g/m^3$	80	IS:5182 (Part-6):1975(Reaff:2004)	19.00
Particulate Matter (size less than 10 µm)	PM_{10}	$\mu g/m^3$	100	IS:5182 (Part-23)	59.6
Particulate Matter (size less than 2.5 µm)	$PM_{2.5}$	$\mu g/m^3$	60	USEPA CFR (40) Appendix-L	29.5
Carbon Monoxide	CO	$\mu g/m^3$	2	EPA 600/P-99/001F	0.12

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Report No: SEPT004/2015-16 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: 25.09.2015
End Date: 26.09.2015

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	
Pakhar HINDALCO Colony	dB (A) L_{eq}	75	58.7	70	48.6	26/09/2015

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Report No: SEPT004/2015-16 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: 25.09.2015
End Date: 26.09.2015

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	
Pakhar Mine (115.13 ha.)	dB (A) L_{eq}	75	71.3	70	52.3	26/09/2015

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Report No: SEPT004/2015-16 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: 25.09.2015
End Date: 26.09.2015

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	
Pakhar Mine (109.507 ha. of Minerals & Minerals)	dB (A) L_{eq}	75	69.3	70	48.3	26/09/2015

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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: 25.09.2015
End Date: 26.09.2015

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	
Pakhar Mine (15.58 ha. of minerals & Minerals)	dB (A) L_{eq}	75	61.2	70	45.6	26/09/2015

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(NABL ACCREDITED LABORATORY)

Report No: SEPT004/2015-16 Date: 3rd October 2015

Sample described by customer: **Measurement of Spot Noise**

Client Name: **Hindalco Industries Limited**
Client Address: Lohardaga
Postal Code: 835203
State: Jharkhand
Country: India
Sample Description: **Measurement of Spot Noise**
Sampling Method: Instrumental, using Sound level Metter
Test Start: 26.09.2015
End Date: 26.09.2015

Location/Identification	Unit	Limit (day)	Result	Dates
Pakhar Mine (115.13 ha.)				
Near Poclain	dB (A) L_{eq}	75	68.5	26/09/2015

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

Report No: SEPT004/2015-16 Date: 3rd October 2015

Sample described by customer: **Measurement of Spot Noise**

Client Name: **Hindalco Industries Limited**
Client Address: Lohardaga
Postal Code: 835203
State: Jharkhand
Country: India
Sample Description: **Measurement of Spot Noise**
Sampling Method: Instrumental, using Sound level Metter
Test Start: 26.09.2015
End Date: 26.09.2015

Location/Identification	Unit	Limit (day)	Result	Dates
Pakhar Mine (109.507 ha. Of Minerals & Minerals)				
Loading point near Dumper	dB (A) L_{eq}	75	72.3	26/09/2015

1236/2 Lajpat Nagar, Near Lala Lajpat Rai School, Pundag, Argora, Ranchi, Jharkhand- 834004
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In Association with M/s MAHARASTRA ENVIRO POWER LTD, Nagpur
(NABL ACCREDITED LABORATORY)

Report No: SEPT004/2015-16 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: 25.09.2015
Registered: 25.09.2015
Marks on Sample: Location: **Canteen Drinking Water of Pakhar Mines**
Sample collected on:25.09.2015
Quantity: 5 L X 2 No. PVC Can
Test Start/End Date: 25.09.2015/29.09.2015
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	--	7.2	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	95	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	60	200 max	APHA 22nd Ed. 2012, 4500-ClG, 4-69
11	Alkalinirty Total (as CaCO3)	mg/l	68	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	7.0	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	0.20	1 max	APHA 22nd Ed. 2012, 4500-FB & D, 4-84, 4-87
16	Boron (as B)	mg/l	0.10	0.5 max	APHA 22nd Ed. 2012, 4500-BB, 4-25

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Sl. No.	Parameters	Unit	Result	Acceptable Limit (IS 10500:2012)	Method reference
17	Calcium (as Ca)	mg/l	20.0	75 max	APHA 22nd Ed. 2012, 3500-Ca-B, 3-67
18	Magnesium (as Mg)	mg/l	4.5	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	0.18	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	0.01	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					

Note: Water tested and found to suitable for drinking purpose

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

Report No: SEPT004/2015-16 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: 25.09.2015
Registered: 25.09.2015
Marks on Sample: Location: **Pakhar Mines (115.13 ha.). Water harvesting Pond**
Sample collected on:25.09.2015
Quantity: 5 L X 2 No. PVC Can
Test Start/End Date: 25.09.2015/29.09.2015
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	0.45	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	105	500 max	IS 3025 (Part 16): 1984, Reaffirmed 2006
8	Monochloramines	mg/l	<0.05	--	APHA 22nd Ed. 2012, 4500-CIG, 4-69
9	Dichloramines	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	74	200 max	IS 3025 (Part 237): 1986, Reaffirmed 2009
12	Chloride (as Cl)	mg/l	14.0	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	1.50	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	0.10	0.5 max	APHA 22nd Ed. 2012, 4500-BB, 4-25
17	Calcium (as Ca)	mg/l	20.0	75 max	APHA 22nd Ed. 2012, 3500-Ca-B, 3-67

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Sl. No.	Parameters	Unit	Result	Acceptable Limit (IS 10500:2012)	Method reference
18	Magnesium (as Mg)	mg/l	3.8	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	0.08	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	0.05	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

RANCHI

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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(NABL ACCREDITED LABORATORY)

Report No: SEPTOO4/2015-16 Date: 3rd October 2015

Sample described by customer : **SOIL**

Client Name: **Hindalco Industries Limited**
Client Address: Lohardaga
Postal Code: 835203
State: Jharkhand
Country: India
Sample Type: **SOIL**
Received: 25.09.2015
Registered: 25.09.2015
Marks on Sample: Location: **Pakhar Mines (115.13 ha.)**
Sample collected on:25.09.2015
Quantity: 2KGS
Test Start/End Date: 25.09.2015/26.09.2015
Sample collected by: **M/S GEMS PROJECT PVT LTD**

Sl. No.	Analysis		Method	Result	Unit
1	Colour	--	--	Gray	
2	Texture	--	F.A.U.N (2007)	Loamy Sand	
3	Bulk density	--	By Bulk density Apparatus	1.13	gm/cm3
4	Water Holding Capacity	--	F.A.U.N (2007)	31.0	%
5	pH	--	F.A.U.N (2007)	6.60	--
6	Electrical Conductivity	--	F.A.U.N (2007)	195.0	µs/cm
7	Organic Carbon	--		0.65	%
8	Organic matter	--	Black & White Wet Digestion method	1.15	%
9	Available Nitrogen	--		105.0	mg/kg
10	Available Phosphorus	--		17.0	mg/kg
11	Available Potassium	--		340	mg/kg
12	Exchangeable calcium			25.00	meq/100gm
13	Exchangeable Magnesium			1.40	meq/100gm
14	Exchangeable Sodium			2.40	meq/100gm
15	Exchangeable Potassium			1.60	meq/100gm
16	Total Exchangeable bases		USEPA 3052	35.00	meq/100gm
17	Manganese		USEPA 3052	0.40	mg/kg
18	Arsenic		USEPA 3052	2.4	mg/kg
19	Silica		USEPA 3052	55.0	%
20	Aluminum		USEPA 3052	8.0	%
21	Iron		USEPA 3052	5.00	%
22	Calcium		USEPA 3052	8.00	%
23	Magnesium		USEPA 3052	2.30	%
24	Sodium		USEPA 3052	0.20	%
25	Potassium		USEPA 3052	0.20	%
26	Sulphate		USEPA 3052	0.60	%

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Report No: SEPT004/2015-16 Date: 3rd October 2015

Sample described by customer : **SOIL**

Client Name: **Hindalco Industries Limited**
Client Address: Lohardaga
Postal Code: 835203
State: Jharkhand
Country: India
Sample Type: SOIL
Received: 25.09.2015
Registered: 25.09.2015
Marks on Sample: Location: **Pakhar Mines (109.507 ha. Of Minerals and Minerals)**
Sample collected on:25.09.2015
Quantity: 2KGS
Test Start/End Date: 25.09.2015/26.09.2015
Sample collected by: **M/S GEMS PROJECT PVT LTD**

Sl. No.	Analysis		Method	Result	Unit
1	Colour	--	--	Gray	
2	Texture	--	F.A.U.N (2007)	Loamy Sand	
3	Bulk density	--	By Bulk density Apparatus	1.10	gm/cm3
4	Water Holding Capacity	--	F.A.U.N (2007)	31.5	%
5	pH	--	F.A.U.N (2007)	6.70	--
6	Electrical Conductivity	--	F.A.U.N (2007)	210.0	µs/cm
7	Organic Carbon	--		0.63	%
8	Organic matter	--	Black & White Wet Digestion method	1.10	%
9	Available Nitrogen	--		98.0	mg/kg
10	Available Phosphorus	--		17.0	mg/kg
11	Available Potassium	--		350	mg/kg
12	Exchangeable calcium			25.00	meq/100gm
13	Exchangeable Magnesium			1.50	meq/100gm
14	Exchangeable Sodium			2.60	meq/100gm
15	Exchangeable Potassium			1.80	meq/100gm
16	Total Exchangeable bases		USEPA 3052	35.00	meq/100gm
17	Manganese		USEPA 3052	0.70	mg/kg
18	Arsenic		USEPA 3052	2.1	mg/kg
19	Silica		USEPA 3052	54.0	%
20	Aluminum		USEPA 3052	7.5	%
21	Iron		USEPA 3052	5.50	%
22	Calcium		USEPA 3052	8.50	%
23	Magnesium		USEPA 3052	2.70	%
24	Sodium		USEPA 3052	0.60	%
25	Potassium		USEPA 3052	0.30	%
26	Sulphate		USEPA 3052	0.65	%

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Report no: SEPT004/2015-16 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: 25.09.2015 (11.30-12.00 Hrs)
Sampling Site: **Pakhar Mines Office-Pakhar 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)	290	---
2	Barometric pressure (mm of Hg)	IS 11255 Part: 3 1985 (Realf 2008)	655	---
3	Velocity of Gas (m/Sec)	IS 11255 Part: 3 1985 (Realf 2008)	10.0	---
4	Quantity of Gas flow (Nm^3/hr)	IS 11255 Part: 3 1985 (Realf 2008)	495	---
5	Concentration of CO2 (% v/v)	IS 11255 Part: 3 1985 (Realf 2008)	4.2	5.0
6	Concentration of CO (gm/kw-h)	IS 11255 Part: 3 1985 (Realf 2008)	0.20	--
7	Concentration of SO2 (mg/Nm3)	USEPA-6C	40	--
8	Concentration of NO2 (gm/kw-h)	USEPA-7E	0.60	9.2
9	Concentration of Particulate Matters (gm/kw-h)	IS 11255 Part: 3 1985 (Realf 2003)	0.15	0.3

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

F. Remarks: Nil

GEMS PROJECTS PVT. LTD. RANCHI

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
E: ecoventures.mumbai@gmail.com /ecoventures@eco-ventures.in

Mahabal Enviro Engineers Pvt. Ltd.

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

PAKHAR PLATEAU- ENVIRONMENTAL MONITORING REPORT

JUNE 2015

Vijay Pandey
SENIOR EXECUTIVE

Mahabal Enviro Engineers Pvt. Ltd.

Branch Office:
At Booty, Near PHED Colony, Behind Pump House, PO – RMCC, District – Ranchi 834009,
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E-mail:mahabalranchi@gmail.com

Report no: : JUNE023/2015-16 **Date:** 20th 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: Pakhar Plateau- Pakhar Hindalco Colony
Sample collected on: 20.05.2015
Received:28.05.2015
Registered: 28.05.2015
Test Start/End Date: 17.06.2015/19.06.2015

LOCATION / IDENTIFICATION: Pakhar Plateau- Pakhar Hindalco Colony

PARAMETERS		UNIT	LIMIT	METHOD	20/05/2015
Sulphur Dioxide	SO_2	$\mu g/m^3$	80	IS:5182 (Part-2):2001 (Reaff:2006)	28.6
Nitrogen Dioxide	NO_2	$\mu g/m^3$	80	IS:5182(Part-6):1975 (Reaff:2004)	32.1
Particulate Matter (size less than 10 µm)	PM_{10}	$\mu g/m^3$	100	IS:5182 (Part 23)	52.2
Particulate Matter (size less than 2.5 µm)	$PM_{2.5}$	$\mu g/m^3$	60	USEPA CFR(40) Appendix-L	28.9
Carbon Monoxide	CO	mg/m^3	2	EPA 600/P-99/001F	0.16

Vijay Pandey
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E-mail:mahabalranchi@gmail.com

Report no: : JUNE024/2015-16 **Date:** 20th 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: Pakhar Plateau- Pakhar 115.13 Pit
Sample collected on: 20.05.2015
Received:28.05.2015
Registered: 28.05.2015
Test Start/End Date: 17.06.2015/19.06.2015

LOCATION / IDENTIFICATION: Pakhar Plateau- Pakhar 115.13 Pit

PARAMETERS		UNIT	LIMIT	METHOD	20/05/2015
Sulphur Dioxide	SO_2	µg/m³	80	IS:5182 (Part-2):2001 (Reaff:2006)	68.4
Nitrogen Dioxide	NO_2	µg/m³	80	IS:5182(Part-6):1975 (Reaff:2004)	69.9
Particulate Matter (size less than 10 µm)	PM_{10}	µg/m³	100	IS:5182 (Part 23)	63.4
Particulate Matter (size less than 2.5 µm)	$PM_{2.5}$	µg/m³	60	USEPA CFR(40) Appendix-L	37.9
Carbon Monoxide	CO	mg/m³	2	EPA 600/P-99/001F	0.57

Vijay Pandey
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Report no: : JUNE025/2015-16 **Date:** 20th 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: Pakhar Plateau- Pakhar 109.507 Dumarpat Village
Sample collected on: 20.05.2015
Received:28.05.2015
Registered: 28.05.2015
Test Start/End Date: 17.06.2015/19.06.2015

LOCATION / IDENTIFICATION: Pakhar Plateau- Pakhar 109.507 Dumarpat Village

PARAMETERS		UNIT	LIMIT	METHOD	20/05/2015
Sulphur Dioxide	SO_2	$\mu g/m^3$	80	IS:5182 (Part-2):2001 (Reaff:2006)	36.7
Nitrogen Dioxide	NO_2	$\mu g/m^3$	80	IS:5182(Part-6):1975 (Reaff:2004)	51.9
Particulate Matter (size less than 10 µm)	PM_{10}	$\mu g/m^3$	100	IS:5182 (Part 23)	77.8
Particulate Matter (size less than 2.5 µm)	$PM_{2.5}$	$\mu g/m^3$	60	USEPA CFR(40) Appendix-L	45.4
Carbon Monoxide	CO	mg/m^3	2	EPA 600/P-99/001F	0.67

Vijay Pandey
SENIOR EXECUTIVE

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Mobile No: +91 9431.102.102 / +91 9955.368.262,
E-mail:mahabalranchi@gmail.com

Report no: : JUNE026/2015-16 **Date:** 20th 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: Pakhar Plateau- Pakhar 84.38 Pokhrapat
Sample collected on: 20.05.2015
Received:28.05.2015
Registered: 28.05.2015
Test Start/End Date: 17.06.2015/19.06.2015

LOCATION / IDENTIFICATION: Pakhar Plateau- Pakhar 84.38 Pokhrapat

PARAMETERS		UNIT	LIMIT	METHOD	20/05/2015
Sulphur Dioxide	SO_2	µg/m³	80	IS:5182 (Part-2):2001 (Reaff:2006)	48.9
Nitrogen Dioxide	NO_2	µg/m³	80	IS:5182(Part-6):1975 (Reaff:2004)	55.2
Particulate Matter (size less than 10 µm)	PM_{10}	µg/m³	100	IS:5182 (Part 23)	57.1
Particulate Matter (size less than 2.5 µm)	$PM_{2.5}$	µg/m³	60	USEPA CFR(40) Appendix-L	41.2
Carbon Monoxide	CO	mg/m³	2	EPA 600/P-99/001F	0.51

Vijay Pandey
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Report no: : JUNE027/2015-16 **Date:** 20th 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: Pakhar 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: 17.06.2015/19.06.2015

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	1.0	gm/cm3
4.	Water Holding Capacity	--	F.A.U.N (2007)	23.5	%
5.	pH	--	F.A.U.N (2007)	6.9	-
6.	Electrical Conductivity	--	F.A.U.N (2007)	20.5	µs/cm
7.	Organic Carbon	--		0.53	%
8.	Organic Matter	--	Black & White Wet Digestion Method	0.68	%
9.	Available Nitrogen	--	Soil & Water Book by P.K Gupta	112.0	mg/kg
10.	Available Phosphorus	--	Soil & Water Book by P.K Gupta	14.9	mg/kg
11.	Available Potassium	--	Soil & Water Book by P.K Gupta	379	mg/kg
12.	Exchangeable Calcium	Ca	Soil & Water Book by P.K Gupta	22.5	meq/100gm
13.	Exchangeable Magnesium	Mg	Soil & Water Book by P.K Gupta	1.89	meq/100gm
14	Exchangeable Sodium	Na	Soil & Water Book by P.K Gupta	2.23	meq/100gm
15.	Exchangeable Potassium	K	Soil & Water Book by P.K Gupta	1.48	meq/100gm
16	Total Exchangeable Bases		Soil & Water Book by P.K Gupta	30.5	meq/100gm
17	Manganese	Mn	USEPA 3052	0.50	mg/kg
18	Arsenic	As	USEPA 3052	2.30	mg/kg
19	Silica	SiO_2	USEPA 3052	60.0	%
20.	Aluminum	Al_2O_3	USEPA 3052	6.9	%
21.	Iron	Fe_2O_3	USEPA 3052	5.0	%
22.	Calcium	CaO	USEPA 3052	8.94	%
23.	Magnesium	MgO	USEPA 3052	1.90	%
24.	Sodium	Na_2O	USEPA 3052	0.38	%
25.	Potassium	K_2O	USEPA 3052	0.22	%
26.	Sulphate	SO_4	USEPA 3052	0.84	%

Vijay Pandey
SENIOR EXECUTIVE

Mahabal Enviro Engineers Pvt. Ltd.

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E-mail:mahabalranchi@gmail.com

Report no: : JUNE028/2015-16 **Date:** 20th 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: Water Harvesting Pond (Pakhar Mines)
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	-	7.0	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	97	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	45	200 Max	APHA 22nd Ed. 2012, 2340-C, 2-44,45
11.	Alkalinity Total (as $CaCO_3$)	mg/l	63	200 Max	IS 3025 (Part 23):1986 Reaffirmed 2009
12.	Chloride (as Cl)	mg/l	7.0	250 Max	APHA 22nd Ed. 2012, 4500-Cl-B, 4-72
13.	Sulphate (as SO_4)	mg/l	3.9	200 Max	APHA 22nd Ed. 2012, 4500-SO4-E, 4-190

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Continuation Sheet

S.No	Parameters	Unit	Result	Acceptable Limit (IS 10500:2012)	Method Reference
14.	Nitrate (as NO3)	mg/l	1.1	45 Max	APHA 22nd Ed. 2012, 4500-NO_3-E, 4-125
15.	Fluoride (as F)	mg/l	0.23	1 Max	APHA 22nd Ed. 2012, 4500-FB& D, 4-84, 4-87
16.	Boron (as B)	mg/l	0.18	0.5 Max	APHA 22nd Ed. 2012, 4500-BB, 4-25
17.	Calcium(as Ca)	mg/l	15.2	75 Max	APHA 22nd Ed. 2012, 3500-Ca-B, 3-67
18.	Magnesium (as Mg)	mg/l	3.9	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	0.09	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	0.10	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

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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.

HINDALCO INDUSTRIES LIMITED
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Corporate Identity No. L27020MH1958PLC011238

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

The composite cost during the year 2014-15 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)