

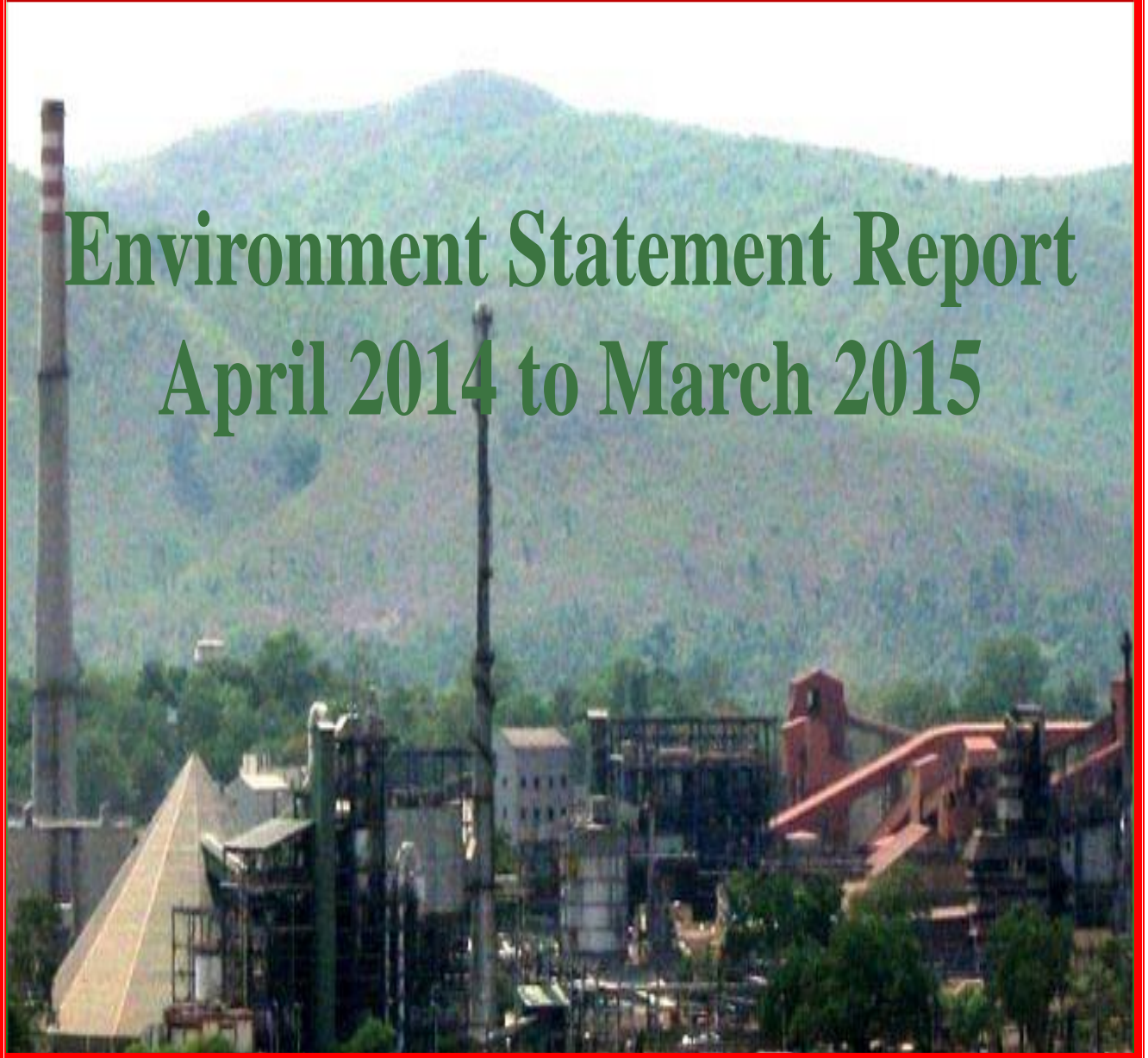
ADITYA BIRLA



HINDALCO

HINDALCO INDUSTRIES LTD., MURI, RANCHI

Environment Statement Report April 2014 to March 2015



HINDALCO-INDUSTRIES LIMITED

(UNIT: MURI WORKS)

**VILLAGE - CHOTTA MURI, TEHSIL- SILLI,
DISTRICT - RANCHI - 835101 (JHARKHAND)**

FORM – V

(See Rule 14)

Environmental Statement for the financial year ending the 31st March 2015

Part – A

- i) Name and address of the owner / occupier of the industry, operation or process
Sudip Bhattacharyya
Joint President – Works
Hindalco Industries Limited
Post – Chotamuri – 835101
Dist – Ranchi – (Jharkhand)
- ii) Industry category
Primary – (STC Code)
Secondary – (SIC Code)
PRIMARY
- iii) Production capacity – Units
575 KTPA
- iv) Year of Establishment
Operation started from 1948
- v) Date of the last environmental Statement submitted
24.09.2014

Part – B

Water and Raw Material Consumption

(1) Water consumption m³/day

Process : 4642
Cooling : 1560
Domestic : 1048

Name of Products		Process water consumption per day (m ³ /day)	
		During the previous financial year 2013-14)	During the current financial year (2014-15)
1	Alumina	5527	5652

2. Raw Material consumption (2014-15) :

Name of Raw Materials*		Name of Product	Consumption of raw material per unit of output	
			During the previous financial year (2013 – 14)	During the current financial year (2014 – 15)
A	Bauxite (as is t/t)	Alumina / Alumina Tri – hydrate	3.27	3.17
B	Caustic Soda (kg/t) (as Na ₂ CO ₃)		154.5	155.5
C	Coal (t / t)		1.13	1.09
D	Diesel (Lit / t)		0.47	0.47
E	Furnace Oil (lit / t)		74.2	75.3
F	Starch (Kg / t)			
G	Lime (Kg / t)		68.00	60.02
H	Filter Cloth (m ² / t)		0.012	0.015
I	Synfloc (Kg / t)		0.920	1.044
j	Crystal Growth Modifier (Kg / t)		0.025	0.008
k	Defoamer (Kg / t)		0.070	0.062
l	Tray Flocculent (Kg / t)		0.000	0.000

- Industry may use codes if disclosing details of raw material would violate contractual obligations, otherwise all industries have to name the raw materials used.

Part – C

Pollution discharged to environment / unit of output (2014 – 2015)

(Parameter as specified in the consent issued)

Pollutants		Concentrations of pollutants in discharges (mass / volume)	Percentage of variation from prescribed standards with reasons
(a) Water		Mg / litre	Within stipulated limit
i.	Suspended Solids	26.3	Within prescribed standards
ii.	COD	157.0	Within prescribed standards
iii.	Fluorides (as F)	1.97	Within prescribed standards
iv.	Aluminium (as Al)	0.07	--
v.	Iron (as Fe)	0.68	Within prescribed standards
vi.	Mercury (as Hg)	<0.001	Within prescribed standards
vii.	Silica (as SiO ₂)	21.8	--
viii.	Vanadium (as V)	<0.1	Within prescribed standards
ix.	Lead (as Pb)	<0.05	Within prescribed standards
x	BOD	5.6	Within prescribed standards

Pollutants		Quantity of Pollutants discharged (mass/day)	Concentration of Pollutants discharge (mass / volume)	Percentage of variation from prescribed standards with reasons
(a) Air		Kg / day	Mg / Nm ³	Within stipulated limit
Particulate Matter				
i.	Alumina Calciner # 1	Not in operation	Not in operation	-
ii.	Alumina Calciner # 2	Dismantled	Dismantled	-
iii.	New Alumina Calciner # 3	94.00	30	Within prescribed standards
iv.	CFBC Boiler # 1	245.00	73	Within prescribed standards
v.	CFBC Boiler # 2	257.00	77	Within prescribed standards
vi.	CFBC Boiler # 3	253.00	88	Within prescribed standards

Part - D

Hazardous Wastes

(as specified under Hazardous Wastes (Management & Handling & Trans boundary Movement Rules 1989 / 2008)

Hazard waste is not generated either from process or from pollution control facilities. However, the following miscellaneous items unrelated to manufacturing process are recycled / sent to authorized recyclers / re-processors.

Hazardous Wastes Miscellaneous	Total Quantity (Kg)	
	During the previous financial year (2013-14)	During the current financial year (2014-15)
1. Lead acid battery	Nil	Nil
2. Used oil/ Spent oil /waste oils	5.240 KI	3.690 KI
3. Waste containing oils (lubricant drum)	25 Nos	18Nos
4. Discarded Asbestos	519 kg	507 kg
5. Discarded containers	Nil	Nil
6. Lead Acid Battery	Nil	318

Part - E

Solid Wastes

Solid Wastes	Total Quantity (ton)	
	During the previous financial year (2013-14)	During the current financial year (2014-15)
a. From Process *** Fly ash from Power Plant	116209	519320
b. From Pollution control facilities Red Mud	755921	119381
c. 1. Quantity re-cycled or reutilized with the unit. 2. Sold. 3. Disposed.	Nil	Nil

Fly ash generated is being given to brick manufacturing industries & entrepreneurs. Further, excess flyash generated is being backfilled in abandoned coal mines at CCL Rajrappa colliery.

Part - F

Please specify the characteristics (in terms of composition and quantum) of hazardous as well as solid wastes and indicate disposal practice adopted for both these categories of wastes.

Solid Waste :

Residue left after digestion of Bauxite, called "Red Mud" is filtered under vacuum by Drum Filters up to a mud consistency of around 60 – 75 % solids. The Red Mud is transported by dumpers / trucks in batches to red mud pond by a process called DMS (Dry Mud Stacking). We have established Filter press project – Reduce caustic consumption with mud and foot print with increased solids. We have taken imitate to utilization of Red Mud in Cement application. We have dispatched aprox. 9635.1MT Red Mud dispatch to ACC cement Chaibasa in year 2014-15.

Characteristics of Red Mud (2014-15)

% SiO ₂	-	9.50
% Fe ₂ O ₃	-	38.50
% TiO ₂	-	14.80
% Al ₂ O ₃	-	16.20
% Na ₂ O	-	7.10

- a) Fly ash generated is being given to brick manufacturing industries & entrepreneurs. Further, excess fly ash generated is being backfilled in abandoned coal mines at CCL Rajrappa colliery.

Part – G

Impact of the pollution abatement measures taken on conservation of natural resources and on the cost of production.

- a) Expenditure of Rs 72 lacs for use of DM plant PSF backwash water for gardening in rehabilitated area by doing plantation over abandoned Red Mud Pond as a replacement to fresh water.
- b) Canteen effluent treatment plant at an expenditure of Rs.7.95 Lac in 2014-15. The unit is in regular service. Quality of treated water is within the stipulated limits. Treated water is used in horticulture and sprinkling on road for dust suppression through mobile tankers. SSTP (Sewage and Sullage treatment plant) for the colony has been commissioned at an expenditure of around Rs. 100 lacs. The unit is functioning smoothly and quality of treated water obtained is within the stipulated limits. Using the treated sewage in horticulture and in dust suppression has eliminated the consumption of fresh water and also reduced the amount of cess payment.
- c) Resource conservation in each area of plant operation viz. water conservation, electrical energy conservation, reduction in specific consumption of various raw materials used in process is a key focus in day-to-day operations.
- d) Capex for installation 3 -phase rectifiers in one of ESPs- Rs. 30 Lacs. Maintenance of ESPs- Rs. 2.68 Lacs in year 2014-15
- e) Conservation of Top Solid & Rehabilitation of abandoned mines, The fly ash generated by the CFBC boilers is being utilized to make bricks and do civil construction job. The private agencies and local entrepreneurs are taking the ash generated for use in road construction, brick making and land filling etc. which is being supplied free of cost as per the guidelines issued by MoEF. Seeing the present need and demand for fly ash bricks we have installed our own brick making unit. The ash generated is also being backfilled in de-coaled mine pit at CCL, Rajarappa. Total 3,200 tree sapling were planted by Hindalco, Muri, Jharkhand dumping site near Rajrappa in oct.2013, total investment approximate Rs. 38 lack for greenery maintenance and development in 2014-15. The sapling of trees as bamboo, Sheesam, Mango, Guava, Gambhar and Neem Planted.
- f) Expenditure of Rs 40 lacs for use of PSF from Water treatment plant backwash water for gardening purpose as a replacement to fresh water.
- g) Expenditure of Rs 19 lacs for utilisation of Red Mud Pond water in washer as replacement of fresh water.

Part – H

Additional measures / investment proposal for environmental protection including abatement of pollution, prevention of pollution.

- a) Plant has undergone expansion of Alumina Refinery capacity from nominal 125000 MT to nominal 57500 MT annual production capacity. Latest energy efficient technologies were adopted both for process and pollution control. More than Rs.25 crore has been invested for Pollution Control measures.

- b) The plantation programme and green belt in company's premises linked with brown field expansion of Muri Alumina Refinery has been undertaken and being carried out in phase. Greenery development includes red mud pond dyke and factory boundaries / peripheries. Plantation in and around plant and colony as well as stretches of roadside and old abandoned panel is carried out in full swing. Around 12000 saplings (2007) and 35000 (2008) different varieties of plant species were planted with the assistance of Self Help Groups (SHG) under Community Development Programme. The investment incurred in this programme is Rs.15 Lacs. In this 2014 to 2015 total cost total investment Rs. 38.85 Lacs for Greenery maintenance & development inside & outside of plant approximately. In this year 2014-15, we have planted approximately 3000. trees Ashok, Jammun, Neem, Babool, Sisham, survival rate is 95% as measured . Approx 500 saplings of rose has also been planted on RMP 2. This year 2013-14 we have planted 2397 No's of trees as Gumohar Sheesham and Ashok trees. Total investment Rs. 19.8 lack for Greenery maintenance & development inside & outside of plant.
- c) TERI (a reputed agency in the filed in plantation & sustainable development) was engaged to do plantation over the abandoned Red Mud Pond. TERI has completed the entire plantation work of 5 acres. Balance 25 acres of the abandoned red mud pond have also been covered with plantation in the year 2008-09. Total investment in the TERI project – Rs.35 Lacs + Balance for 25 acres almost 15 lacs = 50 lacs.
- d) The electro static precipitator in New CFBC boilers are commissioned along with online continuous emission monitoring system (supplied by Teledyne Instruments U.S.A) in the month of July 07. The electro static precipitator in New Alumina (CFBC) calciner are commissioned along with online continuous emission monitoring system (supplied by Forbes Marshall) in the month of Mar. 08. Total expenditure cost for the project is Rs.20 crores.
- e) A process ETP has been installed and commissioned at an expenditure cost of Rs.5 crores in Jan. 2009 to treat the effluent water. The water after being treated is being discharged as per norms stipulated by the Board. Te water is presently being treated and reused in the process. A new scheme to re-use the treated water in process is installed and commissioned at an expenditure cost of Rs.40 lacs in the month of Oct. 09. This is a major steps towards water conservation which saves almost fresh water intake by 120 M³ / hr and the revenue saving of Rs.10.3 lacs. This year 2014-15 total cost for ETP Maint. & operation aprox. 15 lacs.
- f) Geo coir grass matt covering is being applied to the slopes / dykes of Red Mud Pond No.2 to protect the slopes / dyke from soil erosion and to arrest any seepage from the ponds at an expenditure of Rs.30 lacs.
- g) The slopes / dykes of Red Mud Pond No.3 are given a slope of 1:2.5 by earth filling to protect the slopes / dykes from erosion and to give stability to the slope / dykes. We have planned to execute a new technology called controlled modular column (CMC) in RMP area which will increase its life and will eliminate the requirement of new Red Mud pond for next 10 years. This technology is recommended by CBRI, Roorkee after a series of studies and soil analysis of the existing area in last one year considering all environment aspects. As explained above about the new CMC technology, in addition to that CBRI had also suggested to build a **Gabion and Reinforce soil wall** all around the existing embankment to increase the width of the embankment and hence the strength in a environment friendly manner done with an expenditure cost of Rs.50 crores.
- h) Seeing the acute shortage / crisis of water in the river in our area we have planned to initiate a lot of water saving projects for conservation of water and reduction of fresh water intake from river source for our process needs.

- i. Use of DM plant ACF and DMF back wash clear water for plantation in abandoned Red Mud Pond No.2 replacing fresh water at an expenditure of Rs.72 lacs
 - ii. Use of Boiler blow down as replacement of fresh water for Cooling Tower make up at an expenditure of Rs.12 lacs.
 - iii. Condensate polishing unit for input of condensate from process for cooling tower make up by replacing fresh water at an expenditure of Rs.63 lacs.
 - iv. Water sprinkling system in the plant for gardening purpose and water spraying on the road by mobile tanker at the cost of Rs 9.6 lacs in 2014-15.
- i) Expenditure of Rs 63 lacs for condensate management and utilization of condensate as a replacement to fresh water.

Part - I

Any other particulars for improving the quality of the environment.

- a) Local villagers are being trained on various methods of farming, vermicompost manufacture and other activities to develop greenery.
- b) We have setup separate Environment cell in this year 2013-14 total expenditure Rs.19 lacs & reduction of expenditure for Environment monitoring approximately Rs.2.08 lacs. Total expenditure Rs. 2.0 lack for Environment monitoring and Hydrological study in 2014-15.
- c) We have STP capacity 400 m³/day. The treated water is being reused for gardening and dust suppression. The total incurred for stp maintenance in this year 2013-14 Rs.7.54 lacs.
- d) The total incurred for stp maintenance in this year 2014-15 Rs.7.95 lacs. Estimated cost Rs. 24 lacs for Online Effluent Water Quality Monitoring Systems installation at our plant location ETP & SSTP. Total Expenditure for Horticulture purpose Approx. Rs.19 lacs in year 2014-15.
- e) Various community development programmes on water conservation / rain water harvesting to keep water clean and use it by construction of wells, tube wells and small dams for agriculture purpose are being imparted. Doctors visit the nearby villages and give medical treatment and train persons on the safe use of water. People are being made aware day by day and are being educated on different water conservation steps.
- f) Villagers are being made aware of the different kind of environmental developments and protection knows how.
- g) Tree plantation within the company premises is being carried out regularly. Greenery exists all around. Total no of plants surviving as on date is 35500 (approx.) During the year 2007 more than 12000 saplings have been planted around the dyke of red mud pond and over the abandoned red mud pond. Till Aug. 2008 more than 30000 plants and different variety of plant species have been planted all along the periphery of plant, colony and abandoned red mud pond. In the year 2011-12 we have planted approx 3000.

In this 2014 to 2015 total cost total investment Rs. 38.85 Lacs for Greenery maintenance & development inside & outside of plant approximately. This year we have planted approximately 3000. trees Ashok, Jammun, Neem, Babool, Sisham, survival rate is 95% as measured but the year 2013-14 we have planted 2397 No's of trees as Gumohar Sheesham and Ashok trees. Total investment Rs. 19.8 lack for Greenery maintenance & development inside & outside of plant We have planted approx 5200 saplings of plant 2012 to 2013 of Ashok, Saagwaan, Gamhar, Chatni, Neem, Babool,

Sisham, Pipal, and Banyan in and around the factory premises. This year 2013-14 April and June.13 we have planted 2300 saplings of plant of sheesham Ashok and Gulmohar trees. The survival rate is 95% as measured 2012-14. Approx 500 saplings of rose in RMP#2 in year 2014-15.

- h) House Keeping in plant is done and maintained regularly
- i) Dust Suppression System in abandoned Red Mud Pond has been revamped during the year 2002 to control dusting from the abandoned pond. Additional dust suppression arrangement has been installed at the expenditure of Rs.10 lacs. Additional measures are being taken to make the system more effective. This year 2013-14 total expenditure of Rs.2.5 lacs. for maintenance of Dust Suppression System in abandoned Red Mud Pond. The Estimate Expenditure for implementation of the scheme to control air pollution- DSS System Rs.1.5 lakh approx in 2014-15.
- j) Dust Suppression System in Fly Ash dumping area sprinkling at Rajruppa site- Rs. 7.30 Lacs. Levelling and plantation over ash dumping site- Rs. 10.16 Lacs in year 2014-15
- k) Effective 3rd May 01 the unit has been certified for Environment Management System ISO – 14001 by internationally reputed certifying organization Det Norske Veritas (DNV).
- l) EIA study has been carried out for ground water quality around red mud pond area at an expenditure of Rs.15 lacs by National Geo-physical Research Institute, Hyderabad. Ground water quality was found satisfactory. Quality of ground water was found within the desired standards. The same is being repeated for the next two years.
- m) Hydrology study has been done by SGS Pvt Ltd, Gurgaon in this year 2013-14 for water quality test the total expenditure of Rs 7.2 lacs Hydrology study has been done by SGS Pvt Ltd, Gurgaon in year 2012-13 total expenditure of Rs 7.2 lacs.
- n) To strengthen the presently adopted preventive measures by the company, considering the proximity of the RMP to the river Subarnarekha a study was constituted through IIT, Kharagpur to evaluate the present dyke strength and recommended the measures if any to reinforce the dyke facing riverside. IIT Kharagpur has opined that the dykes can withstand the Red Mud dump height up to 20 mtrs. From the Dyke level.
- o) S.K. Mitra and Associates, Kolkata a reputed civil and structural engineering consultant was awarded the job for carrying out the study of Red Mud Pond Dykes towards the river side. Field job and soil investigation has been completed and report has been submitted. The investigation reveals there is no threat to the dyke on the river side.
- p) Dust Suppression System in the New Bauxite Handling area has been commissioned during the Project Expansion Activities to improve the entire work place and ambient air quality.
- q) EIA study has been carried out on the impact of leaching due to storage of Fly Ash on the surface and Mine Voids of the Dumping Area of Rajruppa for ground water quality, Air quality, Soil quality and Bio-Magnification study around Fly Ash dumping area at an expenditure of Rs.15 lacs by Indian School of Mines, Dhanbad. AAQ, Ground water quality was found satisfactory. The Noise levels in the study area well below the permissible limit as per the Noise Pollution (Regulation and Control) Rules, 2000. Total estimated cost for Environment monitoring and hydrological study study Rs. 2.0 lacs in year 2014-15.

