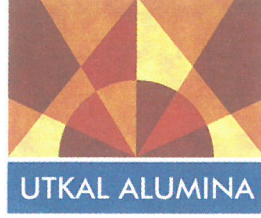


ADITYA BIRLA



UAIL/ENV/2023-24/21

September 26, 2023

To,

The Member Secretary  
State Pollution Control Board  
Paribesh Bhawan, A/118  
Nilkantha Nagar, Unit-VIII  
Bhubaneswar-751001

Subject: Submission of Environmental Statement for the financial year ending 31st March 2023 with respect to Utkal Alumina International Limited.

Dear Sir,

We are enclosing herewith the **Environmental Statement** for the financial year ending 31<sup>st</sup> March 2023 in the prescribed FORM-V with respect to **Utkal Alumina International Ltd, Doraguda, Kucheipadar, Rayagada, Odisha**, as per the Rule 14 of the Environment Protection Act, 1986 and Rules made thereof.

This is for your kind information and necessary record please.

Thanking you

Yours faithfully,

For **UTKAL ALUMINA INTERNATIONAL LIMITED.**

Mazharullah Beig  
Unit Head & President

Encl: As above

Copy to:

- i) Addl PCCF, GOI, MoEF, Eastern Region Office, Bhubaneswar, Odisha.
- ii) The member Secretary, CPCB, New Delhi
- iii) Regional Officer, SPCB, Rayagada, Odisha

**UTKAL ALUMINA INTERNATIONAL LIMITED**

Plant & Off.: Doraguda, Po: Kucheipadar, Dist.: Rayagada- 765015, Odisha, India  
Regd. Office: J-6, Jaydev Vihar, Bhubaneswar - 751013, Odisha, India

CIN No.: U13203OR1993PLC003416  
Ph.: 06865287040, Fax : 06865287100  
Ph.: 0674 2360581/540, Fax : 0674 2360321

Website: [www.hindalco.com](http://www.hindalco.com)  
Email: [utkal.alumina@adityabirla.com](mailto:utkal.alumina@adityabirla.com)

ENVIRONMENTAL STATEMENT FORM-V (See rule 14)			
Environmental Statement for the financial year ending with 31st March, 2023			
PART-A			
i. Name and address of the owner/ Occupier of the industry operation or process		Mr. S. K. Mishra, Utkal Alumina International Limited Doraguda, Post: Kucheipadar- 765 015, Rayagada	
ii. Industry category		Primary	
iii. Production capacity			
	Alumina Refinery	2.37 MTPA	
	CPP	3 x 30 MW	
iv. Year of establishment		May, 2013	
v. Date of the last environmental statement submitted		29th September 2022	
PART- B			
Water and Raw Material Consumption:			
Water consumption in m3/d			
Process:	8729		
Cooling:	3133		
Domestic	2703		
Sl No.	Name of Products	Process water consumption per unit of output	
		During the previous financial year 2021-22	During the current financial year 2022-23
1	Calcined Alumina Power Generation	1.34 KL per ton. of Hydrate Production expressed as Alumina. (Process water includes both refinery and power plant cooling and excluding domestic consumption)	1.44 KL per ton. of Hydrate Production expressed as Alumina. (Process water includes both refinery and power plant cooling and excluding domestic consumption)
Raw material consumption			
Name of raw materials	Name of Products	Consumption of Raw material per unit of Output	
		During the previous financial year 2021-22	During the previous financial year 2022-23
Bauxite Ore T/T	Calcined Alumina	2.95	2.94
Caustic Soda Kg/T		46.86	44.90
Lime Kg /T		19.19	17.81
Coal Kg /T		430	463.44
Fuel Oil- HFO			
For Calciner kg/T		69.75	67.94
For Boiler L/T		0.18	0.31
Synthetic Flocculent (Kg/T) of Hydrate Production as Alumina		0.432	0.404
* Specific Consumption are reported per MT of Hydrate as Al2O3 produced.			
PART-C			
Pollution discharged to environment/unit of output			
Pollutants	Quantity of Pollutants discharged (mass/day)	Concentration of Pollutants discharged (mass/volume)	Percentage of variation from prescribed standards with reasons.
(A)Water:			
Water	No Discharge	No Discharge	Not applicable since Zero Discharge.
(B) Air Particulate Matter (PM)			
Boiler Stack	726.1 Kg/Day	CPP: 42.21 mg/Nm3	Well within the PCB prescribed standards 50 mg/Nm3
Calciner Stack	258.9 Kg/Day	Calciner: 21.92 mg/Nm3	Well within the PCB prescribed standards 50 mg/Nm3
Ambient Air		PM10 (µg/m3): 56.39	Well within the NAAQS 60 µg/m3
		PM2.5(µg/m3): 31.08	Well within the NAAQS of 40 µg/m3
(Parameter as specified in the consent issued)			
PART D			
HAZARDOUS WASTES			
Hazardous Wastes	Total Quantity KG		
	During the previous financial year 2021-22	During the current financial year (2022-23)	



**HAZARDOUS WASTES: Authorization No. IND-IV-HW-931/9663/14-07-2021**

<b>(a) Generation From process</b>		
Used oil (Stream 5.1)	54.99 KL	65.31 KL
Contaminated cotton rags of other cleaning materials (Stream 33.2)	1960 KG	200 Kg
Spent ion exchange resin (Stream 35.2)	0	0
Empty barrels contaminated with HW (Stream 33.1)	4280 KG	4556 KG
Sludge containing oil during cleaning of oil storage tanks (Stream 3.2 & 3.3)	Nil	0
vi)Wastes or residues containing oil (Stream 5.2)	Nil	0
<b>(b) From pollution control facilities</b>		
	Nil	0
<b>(1) Recycled/Sold Quantity</b>		
Used oil (Stream 5.1)	58.67 KL	75.91 KL
Contaminated cotton rags of other cleaning materials (Stream 33.2)	Nil	0
Spent ion exchange resin (Stream 35.2)	Nil	0
Empty barrels contaminated with HW (Stream 33.1)	7002 KG	6022 KG
Sludge containing oil during cleaning of oil storage tanks (Stream 3.2 & 3.3)	Nil	0
vi)Wastes or residues containing oil (Stream 5.2)	Nil	0
<b>(2) From pollution control facilities</b>		
	Nil	0

As specified under Hazardous and Other Wastes (Management & Transboundary Movement) Rules, 2016.

**PART - E  
SOLID WASTES.**

Solid Wastes	Total Quantity	
	During the previous financial year 2021-22	During the current financial year (2022-23)
<b>a. From process</b>		
Red mud	2408045 T as dry basis	2810647 T as dry basis
Lime grit	7943 MT	10553 MT
<b>b. From Pollution Control</b>		
ESP Dust (Fly ash)	273666 MT	345096 MT
Bottom ash	48294 MT	60899 MT
Quantity recycled or re- utilized within the unit.	NIL	NIL
Quantity used for filling of low lying area		
ESP Dust (Fly ash)	64266 MT	107557 MT
Bottom ash	48294 MT	60899 MT
<b>Sold (supply to brick unit &amp; Cement industry)</b>		
Lime grit	7908 MT	10481 MT
ESP Dust (Fly ash)	24332 MT (BMU)	27330 MT (BMU)
	144924 MT (Cement)	129446 MT (Cement)
Red Mud	60603 MT as dry basis	59252 MT as dry basis
<b>c. Disposed to Pond</b>		
Red Mud	2347442 MT as dry basis	2756268 MT as dry basis
ESP Dust	40141 MT	80761 MT
Lime grit	NIL	0

**PART - F**

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

**1. Red mud:** It is the residue generated during manufacture of alumina having the leachable caustic content in disposed liquor < 10 gpl expressed as Na2CO3 in slurry condition with water and solids. The water is being removed by pressure filter and in semi-dry condition (>78% Solids) disposed in impervious pond known as the Red Mud Pond. The entire Red Mud Pond is divided into 4 pans, such as Pond A, Pond B, Pond C & Pond D. Out of these, Ponds-A & B are meant for Mud Storage, Pond C is meant for collection of Supernatant Liquor (SNL) from the pressure filter and mud storage ponds A & B. Pond D is meant for freshwater emergency storage. At present Pond A/B (Mud Storage) and Pond C (SNL) are in operation. The 1/3rd of the Pond-A Mud Storage Dam (Wet Zone) is lined with Clay along with 1.5 mm thick single layer HDPE liner. The other 2/3rd of the Pond-A Mud Storage Dam (Dry Zone) is lined with clay liner. The Pond-C (SNL pond) and Pond-B are fully lined with Clay along with 1.5 mm thick single layer HDPE liner. Pond-D is also lined with clay & 1.5mm HDPE liner & is currently having fresh water in it. The construction of Red Mud Pond is as per the design approved by SPCB; Odisha vide letter No.19306/1ND-IV-HW-931 dated 30.08.2012. Currently, Pond-A has been converted for dry Red Mud Storage only.

Typical characteristics of Red Mud

Red mud is alkaline in nature and is having pH of about 11 to 12.5. The typical chemical composition of the red mud is as given below.

LOI (%)	6.93	TiO2 (%)	3.94
TA (%)	13.54	CaO (%)	1.84
THA (%)	4.33	Na2O (%)	2.78
T-SiO2 (%)	6.35	P2O5 (%)	0.22
Fe2O3 (%)	61.35	V2O5 (%)	0.11



The Mud Storage Dam also has a leachate drain under the HDPE Liner and connected to the lowest point outside the dyke in a collection pipe and the leachate water is being pumped back to the Pond -C for storage. The water and SNL so collected in Pond C is recycled and reused completely in the refinery for mud washing. During FY2022-23, total of 2810647 MT (as dry basis) Red Mud was generated and stored in the Pond-A & B. Total decanted water (2466693 m3) was recycled back to the process.

Red Mud Utilization Plan: Some red mud utilization plan are as below: -

i) **Road Construction with Red Mud:** - Hindalco requested NHAH authorities for a road patch near to the Utkal plant site for carrying out pilot studies by CSIR-CRRI on design, construction, supervision, and pavement performance evaluation of road proposed to be constructed by using red mud. Accordingly, NHAH has allotted a 500-meter patch near to the Utkal plant at Koraput for development of six-lane Kaliagura – Baunsagar section of NH-130- CD road which is proposed from 249+000 to 293+000 under the Raipur-Visakhapatnam economic corridor in the state of Odisha.

ii) **Carbon sequestration via Flue Gas Injection and improvements in pH of Red Mud.** A scientific study for red mud neutralization by utilizing the acidic components of flue gas is ongoing on a field scale at Utkal Alumina International Limited (UAIL), Odisha. The study is being conducted in collaboration with IIT Bombay under the supervision of Prof. D N Singh within the scope of carbon capture utilization and storage in industrial by-products.

iii) **Red Mud Brick Pilot project:** - WoW, with the support of Utkal Alumina, took up the challenge to look into the possibility of utilizing Bauxite Residue in production of bricks or blocks or any other product which could be utilized in the construction industry. The process developed by WoW along with a leading polymer manufacturer has been termed as "Polymer Activated Concrete (PAC)". In the said process, Fly Ash/Bottom Ash and Bauxite Residue are bound together using polymer and Cement as binder.

2. **Ash:** It is being generated from coal fired boilers of CPP. The fly ash is being collected by ESPs and stored in ash silos and supplied to brick manufacturing units, Cement Industry and used for filling low lying areas and balance quantity was disposed in impervious ash pond by using high concentration slurry disposal (HCSD) technology (35:65- water & solids) to save water. 100% Bottom ash was used in low lying area for land development followed by mass plantation.

We have developed local entrepreneurship to establish fly ash brick manufacturing units in coordination with Regional Industrial Centre, Rayagada and now 20 nos. of brick manufacturing units are established. At the time of commission of the CPP in the year 2013, there was a single brick manufacturing unit and the ash supply to brick units was 8760 MT (5%) in FY 2014-15 and in FY 2022-23, it has gone up to 27330 MT (17%). Efforts are being taken continuously for 100% ash utilization. Ash utilization for the period of the FY2022-23 is 80.1%. 169437 MT (27330 and 129446) Fly Ash supplied to Brick Manufacturing Unit, Odisha & M/S ACC Cement, Karnataka.

Typical characteristics of Fly Ash

PARAMETERS:

CaO (%)	3.93	Fe2O3 (%)	3.481
MgO (%)	0.798	SiO2 (%)	55.619
UBC (%)	2.19	P2O5 (%)	0.431
Na2O (%)	0.671	TiO2 (%)	1.74
K2O (%)	0.536	SO3 (%)	0.195
Al2O3	29.692	MnO	0.05

3. **Lime grit:** It is being generated during the preparation of Milk of Lime from quick lime. Out of total quantity 10553 MT of lime grit generated during the FY 2022-23, about 10481 MT (99%) was sold to brick manufacturing units.

Typical characteristics of Lime Grit

PARAMETERS:

Available CaO %: 20-21  
Moisture % : 23-24

4. Batteries: 5.640 MT of Batteries was sent through Buy Back System.

5. E-Waste: 2.27 MT of e-waste was channelized to e-waste recyclers

6. Dispatched of Used Filter Cloth (56.2 MT) and Scraped Refractory generated during Calciner APS (171.81 MT) to Ambuja Cement and Aditya Minerals, Katni Respectively

#### Hazardous Waste

7. Separate Hazardous waste storage shed has been constructed with spill containment pit facility for storage of Hazardous waste. The shed consists of internal drainage system to collect spillage of oil if any during handling of the used oil. The shed is provided with fire extinguishers and fenced to restrict unauthorized entry. All the hazardous waste is being collected and stored in the HW storage shed. The used oil was sold to authorized recyclers/re-processors as per Hazardous and Other Wastes (management and Transboundary Movement) Rules, 2016. The major Hazardous waste generated during the year 2022-23 was used oil of 65.31 KL

#### PART - G

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

1. Disposal of red mud through pressure filters & ash by HCSD technology on impervious ponds has saved water consumption due to water recycle from the impervious ponds. The impervious surface of the ponds also protects from ground water contamination. Red Mud Filtration has helped in reducing water consumption as well as recovery of Alumina from Bauxite, thereby reducing Bauxite consumption & enhancing production capacity. This semi-dry disposal of Red Mud helps to reduce the land usage by improving the pond life.

2. Lime grit is being supplied to ash brick manufacturing units, thereby saving natural resources

3. Utilization of ash has saved natural resources like land and topsoil. High Performance Milling System (HPS) is installed to improve coal milling system. This HPS enhance to minimize the Rejection loss and reduce the coal dust emission there by conserving natural resources.

4. Wastewater is being collected and reused by adopting "ZERO" discharge principle (ZLD) to reduce freshwater consumption thereby conserving natural resources. Our Fresh Water consumption is 1.21 KL/MT of Hydrate production.

5. 14 % Energy reduction (Since inception) from 8.91Gj/T to 7.69 Gj/T.

6. One of the lowest specific energy consumptions at 7.69 Gj/t among the world benchmark for 2.37 MM TPA capacity.

7. Alumina dust from Bag filters and ESPs of Calciner is collected and being recycled to cooling cyclone which further reduces the FO consumption as it doesn't require preheating of alumina.

8. Installation of new Calciner from M/S FL Smidth with improved Fuel efficiency. 7% reduction in HFO specific Consumption by reducing skin temp.

9. Rainwater from Refinery is being collected in Guard Pond through a separate storm water drain and process water is collected in another separate caustic drain in caustic pond. The 10. E-Waste /Discarded batteries to recycle under EPR, Buy-Back-System and sale to Authorized Recycler.

11. A 400 Ltr. Capacity Composter Bin called Aerobin for Food Waste is in operation at Nuapada Guest House Canteen.

12. As a water conservation measure, six No. of Ekam Zerodur. waterless Urinals were installed as pilot project at washrooms of CPP and CCR.

13. Water Task Force has been formed to conceptualize the ZLD of Refinery & Power Plant, Planning for Monsoon & Dry season, focus on reduction in freshwater consumption, Strom water management & Model water balance & necessary action to freeze it



14. Waste Task Force has been formed to Value for waste or waste to wealth, Ex. Circular Economy, Effort to deal with waste management, Plastic waste & E-waste are also to be effectively handled like Hazardous Waste and Waste Inventories. Used filter clothes, used rubber bushes etc. being sent to cement plants to utilize their heat value thereby reducing fuel consumption in cement manufacturing.
15. A cross functional Air Task Force team has been formed to implement global best practices to minimize air emissions, training to the operation, maintenance, and monitoring teams to update the know-how, maintenance, and calibration of air quality monitoring equipment, to check their efficacy for better management of air quality so as to attenuate its adverse impact on environment and human health,
16. An Energy management team is dedicatedly working for improving energy efficiency across the unit to comply with the BEE PAT requirements and benchmark the unit with the best in terms of specific energy consumption. Energy Audit is being carried out annually to find out energy loss if any, and its corrective & preventive measures being implemented to improve the machine level energy efficiency supported by cloud-based energy monitoring system.
17. For ODS phase out, we have prepared a plan for complete phase out of ODS in FY26. In FY 2022-23, we have spent 1.6 Cr for replacement of old AC/Chiller/HVAC with R-22 gas.

**PART - H**

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

1. Flue Gas Desulphurization (FGD): Provision for installation of Flue Gas Desulphurization (FGD) is under progress to control SOX emissions below 600 mg/Nm<sup>3</sup> as per the MoEF&CC notification.
2. Blending of different mix of coal to optimize solid waste generation (ash) and thermal NOX is being done.
3. Water sprinkling arrangements were made at Red Mud Pond -A to control fugitive dust emissions during the summer season.
4. Sewage Treatment Plants (STPs) have been provided at Plant as well as townships for treatment of domestic wastewater. Treated water is being used for gardening and horticulture activities.
5. An environmental cell has been established for monitoring and implementation of safeguard measures for environmental parameters.
6. A network of drainage system has been provided to collect storm water and diverted to guard pond and reused in process.
7. The floors of process areas (caustic area) are made impervious and have been provided with drainage system with provision of sumps at various locations to collect the storm water as well as process water and connected to caustic pond for complete recirculation in process to reduce freshwater consumption and avoid ground water pollution.
8. All raw-material stack yards were made impervious to check leachate to ground.
9. An in-house nursery spreading over an area of five acres having capacity of 2.0 lakh saplings and Seed Collection from Local Forest to developed indigenous Species. Development of Saplings at our in-house nursery for Afforestation program. 75000 No's of sapling developed for green belt development activities
10. Greenbelts have been developed in & around plant peripheral & infrastructural areas, roadsides and vacant areas covering an area of around 30 hectares by planting 76500 nos. of sapling during the year 2022-23. Till date 331 Ha Green Belt Achieved, which is 31 % of the total land.
11. State of the Art technology, Red Mud Filtration (RMF) unit is in continuous operation. This unit helps in reducing the caustic soda content in the red mud and increases 75-80% solids instead of 55-60%, which is being then disposed through the HCSD technology. This semi-dry disposal improves the life of the Red Mud Pond as well as reduce the risk of ground water contamination and the dyke failure due to earth movement as in case of wet ponding. The semi-dry cake of the red mud is easier to handle and is proven for its utilization in Cement kilns as a raw material resource.
12. Vacuum cleaner system has been provided for improvement in housekeeping & dust free working environment in operation area.
13. Operation of a 5 MW solar power plant to generate renewable power and in-house utilization, thereby conserving natural resources and environment.
14. Separate drainage system with Settling Pond provision for both Bauxite and Coal Yard is place.
15. Covered shed for Bauxite stacking yard completed
16. Observation of Van Mahotsav Week (1st July to 7th July), 2022 to spread awareness of forest conservation and to save environment. Target sapling is around 3000.

**PART - I**

**Any other particulars for improving the quality of the environment**

1. UAIL is accredited for ISO 9001:2015, ISO 14001:2015 and ISO 45001:2018 with the IMS certification valid till 2024.
2. Utkal is accredited for ISO 50001 :2018 of Energy Management System by M/S. Lloyd's Register.
3. Environmental information w.r.t Air, Water, Haz, Wastes & Haz. Chemical are displayed at the main gate for public review.
4. Six numbers of rainwater harvesting, and ground water recharge pits were developed in the Nuapada Township. Rooftop Rainwater from the Township buildings is captured from the roof catchments. The water so collected is getting filtered through the filtration tank before being allowed for ground water recharge. In addition to the ground water recharging, this initiative also helps in complying with the EC and CTO conditions for Rainwater Harvesting.



5. Our unit operates on a ZLD philosophy. All the Alkaline Wastewater generated from different operational areas of the refinery is being collected in a special designed RCC lined caustic pond and being reused in the same process. A separate guard pond is in operation to collect the surface runoff and utilization of the collected water in the process. pH meters have been installed at different locations of the input drainage network leading to the Guard Pond to monitor and control the quality of the runoff. In order to continuously monitor the quality of the water at the outlet of the Guard Pond, flow meter, IP Camera and pH meters have been installed and connected to the central DCS. Both the 'P camera and the Flow meter have also been connected to OSPCB & CPCB
6. Air Pollution control devices such as ESPs, dry fog system, bag filters, Vacuum Cleaner and wet scrubbers have been installed at all suggested locations to control any dust emission.
7. Wagon tippler & dry fog system have been provided for coal unloading and closed conveying system has been provided for coal transport. All the bauxite conveying systems have been covered with water sprinkling system at transfer points.
8. High jet water spraying system have been provided at bauxite and coal stockpile areas to check fugitive emission.
9. Water sprinkling is being done on roads regularly to suppress fugitive dust emission.
10. As a responsible corporate, continuous emission monitoring system (CEMS) has been installed with RT-DAS facility to transmit the real time data to OSPCB & CPCB.
11. Four Nos. of Continuous Ambient Air Quality Monitoring Stations (CAAQMS) have been installed and the real time AAQ data is being transmitted to OSPCB server through RT-DAS.
12. A Sustainability team has been engaged to support best practices in utilizing wastes, water conservation measures, cleaner technology, and emission abatement method etc. Group level reporting of environmental data has been carried out by adopting international standards & systems such as GRI-G4 through online compliance Manager Tool, BRC, KPI etc. This is being also assured by a Third-party data assurance organization and published as the sustainability report every year.
13. Utkal received Safety innovation Award from The Institution of Engineers (India)-2022
14. Utkal Alumina International Ltd conferred with CII-HSE Excellence Awards 2022-23



