

ENVIRONMENTAL STATEMENT FORM-V
(See rule 14)

Environmental Statement for the financial year ending with 31st March 2021

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 : Units
Alumina Refinery – 1.7 MTPA (Calcined Alumina)
CPP - 3×30= 90 MW
- iv. Year of establishment : May 2013
- v. Date of the last environmental statement submitted. : 21st September 2020

PART- B

Water and Raw Material Consumption:

1. Water consumption in m3/d

Process: 5455.53

Cooling: 696.15

Domestic: 2417.48

Sl. No.	Name of Products	Process water consumption per unit of output	
		During the previous financial year 2019-20	During the current financial year 2020-21
1	Calcined Alumina & Power Generation	1.45 KL per ton. of Hydrate Production expressed as Alumina. (Process water includes both refinery and power plant cooling and excluding domestic consumption)	1.19 KL per ton. of Hydrate Production expressed as Alumina. (Process water includes both refinery and power plant cooling and excluding domestic consumption)



2. Raw material consumption

Name of raw materials*	Name of Products	(Consumption of raw material per unit of output *)	
		During the previous financial year 2019-20	During the current financial year 2020-21
Bauxite Ore(T/T)	Calcined Alumina	3.18	3.03
Caustic Soda (Kg/T)		50.69	44.45
Lime (Kg/T)		23.62	21.92
Coal (Kg/T)		437.30	442.73
Fuel Oil- HFO			
For Calciner (kg/T)		69.93	70.48
For Boiler(L/T)		0.160	0.057
Synthetic Flocculent (Kg/T) of Hydrate Production as Alumina		0.455	0.440

* Specific Consumption are reported per MT of Hydrate as Al₂O₃ produced.

PART-C

Pollution discharged to environment/unit of output
(Parameter as specified in the consent issued)

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)			
Calciner Stack	103.8 Kg/Day	Calciner: 17.67 mg/Nm ³	Well within the PCB prescribed standards 50 mg/Nm ³
Boiler Stack	737.8 Kg/Day	CPP: 43.34 mg/Nm ³	Well within the PCB prescribed standards 50 mg/Nm ³
Ambient Air		PM10(µg/m ³): 52.80	Well within the NAAQS 60 µg/m ³
		PM2.5(µg/m ³): 29.00	Well within the NAAQS of 40 µg/m ³



PART D

HAZARDOUS WASTES

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

Hazardous Wastes	Total Quantity (KG)	
	During the previous financial year (2019-20)	During the current financial year (2020-21)
HAZARDOUS WASTES: Authorization No. IND-IV-HW-931/9663/14-07-2021		
(a) Generation From process		
(i) Used oil (Stream 5.1)	32.50 KL	34.65 KL
ii) Contaminated cotton rags of other cleaning materials (Stream 33.2)	30 KG	1561 KG
iii) Spent ion exchange resin (Stream 35.2)	Nil	5625 KG
iv) Empty barrels contaminated with HW (Stream 33.1)	Nil	6354 KG
v) Sludge containing oil during cleaning of oil storage tanks (Stream 3.2 & 3.3)	14.29 MT	Nil
vi) Wastes or residues containing oil (Stream 5.2)	Nil	Nil
(b) From pollution control facilities	Nil	Nil
(a) Recycled/Sold Quantity		
(i) Used oil (Stream 5.1)	32.13 KL	27.33 KL
ii) Contaminated cotton rags of other cleaning materials (Stream 33.2)	Nil	Nil
iii) Spent ion exchange resin (Stream 35.2)	Nil	5625 KG
iv) Empty barrels contaminated with HW (Stream 33.1)	Nil	6354 KG
v) Sludge containing oil during cleaning of oil storage tanks (Stream 3.2 & 3.3)	14.29 MT	Nil
vi) Wastes or residues containing oil (Stream 5.2)	Nil	Nil
(b) From pollution control facilities	Nil	Nil



PART - E

SOLID WASTES:

Solid Wastes	Total Quantity	
	During the Previous financial year (2019-20)	During the current financial year (2020-21)
a. From process Red mud Lime grit	2232705 T as dry basis 14473 MT	2055236 T as dry basis 10823 MT
b. From Pollution Control Facility ESP Dust (Fly ash) Bottom ash	216077 MT 38141 MT	230168 MT 40617 MT
1. Quantity recycled or re-utilized within the unit. Lime grit ESP Dust (Fly ash) Bottom ash	NIL 189822 MT 38141 MT	NIL 184272 MT 40617 MT
2. Sold (supply to brick unit & Cement Industry) Lime grit ESP dust	8955 MT 33192 MT	10589 MT 34290 MT 3858 MT (Cement)
3. Disposed Red mud ESP Dust Lime grit	2232705 MT as dry basis 26256 MT 5518 MT	2055236 MT as dry basis 7748 MT 230 MT

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.

Solid Waste:

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 40:60% 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 parts, 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 (Mud Storage) and Pond C (SNL) are in operation. Pond B is under construction. 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) is 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/IND-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.

PARAMETERS									
LOI (%)	TA (%)	THA (%)	T-SiO ₂ (%)	Fe ₂ O ₃ (%)	TiO ₂ (%)	CaO (%)	Na ₂ O (%)	P ₂ O ₅ (%)	V ₂ O ₅ (%)
6.93	13.54	4.33	6.35	61.31	3.94	1.84	2.78	0.22	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 FY2020-21, total of 2055236 MT (as dry basis) Red Mud was generated and stored in the Pond-A. Total decanted water (2466693 m³) was recycled back to the process.

Red Mud Utilization Plan:

R&D scheme has been developed with various research laboratories like IIT, IMMT, NML, and Cement Industries for its productive utilization in road construction applications, cement production and mine backfilling.

Status of Pilot Study for Red Mud utilization in mine void backfilling:

This is to further update about the progress made in the pilot project till date. The project is moving ahead with synchronization of regulatory clearances from State Pollution Control Board and other authorities.

1. Approval of revised Mining and Progressive Mine Closure Plan incorporating the red mud pilot project has been obtained from Indian Bureau of Mines, Regional Office, Bhubaneswar.
2. Consent to Establish (CTE) has been granted by Odisha State Pollution Control Board.
3. The application for Consent to Operate (CTO) has been submitted online.
4. Geotechnical tests on red mud and embankment fill material have been completed and relevant data has been shared to NEERI for embankment designing. The CRRI is designing the slope stability of embankment on behalf of NEERI.
5. NEERI team has visited the project site on September-20 and discussed with UAIL team about the way forward. They have conducted baseline data collection exercise for the final project report.
6. NEERI has shared the BOQ for the project and orders are being placed to execute the project on basis of the same. SOP for transportation of red mud from storage area of refinery to the pilot project site in the mines has been developed and vetted by NEERI.
7. Air Pollution Control measures in form of mobile water sprinkling arrangements, vehicle mounted misting canons at fine handling areas, wheel washing facility for trucks, Tarpaulin tying platform are being undertaken through necessary purchase orders being issued by UAIL in consultation with NEERI & IIT. The Civil work is underway for installation of above equipment's.
8. Draft monitoring plan and risk mitigation plan have been devised in consultation with NEERI and the final versions will be carried out during and post-pilot phases of the project.



9. HDPE liner for the containment system has been brought to the mines and other material/equipment are being shifted day by day as per the scheduled actions during CTE.

UAIL (Hindalco) is committed to implement this pilot project which will be able to achieve a remarkable utilization of bulk wastes like Bauxite residue (Red Mud) and will create a significant step towards sustainability of alumina refineries in our country.

Seven lakh MT of Red Mud & one lakh MT of Fly Ash used in Dyke Construction of RMP POND "B".

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 ash manufacturing unit and the ash supply to brick units was 8760 MT (5%) in FY 2014-15 and in FY 2020-21, it has gone up to 34290 MT (15%). Efforts are being taken continuously for 100% ash utilization. Ash utilization for the period of the FY2020-21 is 97%. 7061 MT (3203 and 3858) Fly Ash supplied to Brick Manufacturing Unit, Odisha & M/s ACC Cement, Karnataka. 206306 MT of legacy Ash used in Ash Pond dyke height raising. We have sent a shipment of 3.0 tones Bottom Ash and 4.0 tones Red Mud to CRRI in Delhi for utilize Red Mud in road construction by researching on its suitability to replace Raw Material in Road.

Typical characteristics of Fly Ash

PARAMETERS											
CaO (%)	MgO (%)	UBC (%)	Na ₂ O (%)	K ₂ O (%)	Al ₂ O ₃ (%)	Fe ₂ O ₃ (%)	SiO ₂ (%)	P ₂ O ₅ (%)	TiO ₂ (%)	SO ₃ (%)	MnO (%)
3.93	0.798	2.19	0.671	0.536	29.692	3.481	55.619	0.431	1.740	0.195	0.05

3. Lime grit: It is being generated during the preparation of Milk of Lime from quick lime. Out of total quantity 13491 MT of lime grit generated during the FY 2020-21, about 10589 MT (78%) was sold to brick manufacturing units.

Typical characteristics of Lime Grit

PARAMETERS	
Available CaO (%)	Moisture (%)
21.28	25.09

4. Batteries: 2.41 MT of Batteries was sent through Buy Back System.
5. E-Waste: 2.77 MT of e-waste was channelized to e-waste recyclers.
6. Dispatched of Used Filter Cloth (52.58 MT) and Scraped Refractory generated during Calciner APS (71.0 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/reprocessors as per Hazardous and Other Wastes (management and Transboundary Movement) Rules, 2016. The major Hazardous waste generated during the year 20-21 was used oil of 34.65 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. By this our Fresh Water consumption has come down and specific water consumption has been reduced from 1.45 to 1.19 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 2.0 MMTPA 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. New upcoming 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 in caustic pond. The entire water is completely reused in the process to reduce freshwater consumption. The storm water collected in the guard pond during the monsoon season is being allowed to discharge after meeting the prescribed norms as per the condition stipulated in consent to operate. Separate drainage system for storm water and process water has been provided. Storm water is being collected in Guard Pond. Process water including precipitated water of process area is being collected in caustic pond. The entire water of caustic pond is completely reused in the process to reduce freshwater consumption. The Storm water collected in the guard pond during monsoon season is being allowed to discharge after treatment as per the condition stipulated in consent to operate.
10. E-Waste /Discarded batteries to recycle under EPR, Buy-Back-System and sale to Authorized Recycler.
11. A pilot study of 400 Ltr. Capacity Composter Bin called Aerobin for Food Waste was installed at Nuapada Guest House Canteen.



12. As a water conservation measure, six No. of Ekam Zerodor, 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, Storm 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.

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 bring down SO_x emissions below 600 mg/Nm³ as per the MoEFCC Notification. Online application was submitted to SPCB for CTE for installation of FGD at CPP.
2. Blending of different mix of coal to optimize solid waste generation (ash) and thermal NO_x 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. 50000 No's of sapling developed for green belt development activities
10. Hybrid Road Trail at Utkal, Subgrade –Red Mud and Cement & Top Course –Red Mud + Fly Ash + Binder under progress.



11. Greenbelts have been developed in & around plant peripheral & infrastructural areas, roadsides and vacant areas covering an area of around 20 hectares by planting 43164 nos. of sapling during the year 2020-21. Till date 323.84 Ha Green Belt Achieved, which is 30.28 % of the total land. Target to plant 50, 000 sapling in each year, which is 20 Ha Annually.
12. 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.
13. Vacuum cleaner system has been provided for improvement in housekeeping & dust free working environment in operation area.
14. Operation of a 5 MW solar power plant to generate renewable power and in-house utilization, thereby conserving natural resources and environment.
15. Separate drainage system with Settling Pond provision for both Bauxite and Coal Yard is place.
16. Covered shed for Bauxite stacking yard under progress.
17. Observation of Van Mahotsav Week (1st July to 7th July), 2021 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 IP camera and the Flow meter have also been connected to OSPCB & CPCB servers through RT-DAS and data is being transmitted on real time basis.



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. Awareness to people on waste plastic: an initiative like "GIVE PLASTIC WASTE, GET ATTRACTIVE GIFTS" was declared.
14. Utkal Alumina awarded in Challenger Category for the "Certificate of Merit" in Sustainability from M/s Frost & Sullivan & TERI Sustainability 4.0 Award.
15. Replacement of 70 W conventional well glass luminaries with 39 W LED luminaires.
16. Golden Peacock Award 2020 for CSR project "Project WADI".
17. Won Gold Medal and 2nd Runner Apex Award in Indian Green Manufacturing Challenge 2020-21.

-- 0 --

