



UAIL/ENV/2019-20/20

Date: 21.09.2019

The Member Secretary
State Pollution Control Board
Paribesh Bhawan, A/118,
Nilkantha Nagar, Unit- VIII,
Bhubaneswar- 751 001, Odisha.

Sub: Submission of Environmental Statement for the financial year ending 31st March, 2020 with respect to Utkal Alumina International Ltd., Doraguda.

Dear Sir,

We are enclosing herewith the **Environmental Statement** for the financial year ending 31st March, 2020 in the prescribed FORM-V with respect to **Utkal Alumina International Limited**. 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 records please.

Thanking you,

Yours faithfully,
For Utkal Alumina International Ltd.


(N. Nagesh)

Unit Head & President (Factory Manager)

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
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ENVIRONMENTAL STATEMENT FORM-V
(See rule 14)

Environmental Statement for the financial year ending with 31st March, 2020.

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 MW
- iv. Year of establishment : May, 2013
- v. Date of the last environmental statement submitted. : 27th September 2019.

PART- B

Water and Raw Material Consumption:

i. Water consumption in m3/d

Process: 5954.35

Cooling: 709.50

Domestic: 1990.22

Sl. No.	Name of Products	Process water consumption per unit of output	
		During the previous financial year 2018-19	During the current financial year 2019-20
1	Calcined Alumina & Power Generation	1.52 KL per Tons of Hydrate Production expressed as Alumina. (Process water includes both refinery and power plant cooling and excluding domestic consumption)	1.45 KL per Tons of Hydrate Production expressed as Alumina. (Process water includes both refinery and power plant cooling and excluding domestic consumption)



ii. Raw material consumption

Name of raw materials.	Name of Products	(Consumption of raw material per unit of output *)	
		During the previous financial year 2018-19	During the current financial year 2019-20
Bauxite Ore(T/T)	Calcined Alumina	3.18	3.18
Caustic Soda(Kg/T)		47.70	50.69
Lime(Kg/T)		23.23	23.62
Coal(Kg/T)		431.22	437.30
Fuel Oil- HFO			
For Calciner (kg/T)		70.92	69.93
For Boiler (L/T)		0.069	0.160
Synthetic Flocculent(Kg/T) of Hydrate Production as Alumina		0.515	0.455

* 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 no discharge.
(B) Air Particulate Matter(PM)			
Calciner Stack	61.8 Kg/Day	Calciner : 9.2 mg/Nm ³	Well within the PCB prescribed standards 50 mg/Nm ³
Boiler Stack	613 Kg/Day	CPP : 36.7 mg/Nm ³	Well within the PCB prescribed standards 50 mg/Nm ³
Ambient Air		PM ₁₀ (µg/m ³): 56.39	Well within the NAAQS of 60 µg/m ³
		PM _{2.5} (µg/m ³): 31.79	Well within the NAAQS of 40 µg/m ³



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PART D

HAZARDOUS WASTES

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

Hazardous Wastes	Total Quantity	
	During the previous financial year (2018-19)	During the current financial year (2019-20)
HAZARDOUS WASTES: Authorization No. IND-IV-HW-931/12762/17-08-2016		
(A) Generation From process		
(i) Used oil (Stream 5.1)	34.634 KL	32.50 KL
ii) Contaminated cotton rags of other cleaning materials (Stream 33.2)	90 KG	30 KG
iii) Spent ion exchange resin (Stream 35.2)	Nil	Nil
iv) Empty barrels contaminated with HW (Stream 33.1)	Nil	Nil
v) Sludge containing oil during cleaning of oil storage tanks(Stream 3.2 & 3.3)	Nil	14.29 MT
vi)Wastes or residues containing oil(Stream 5.2)	6.426 MT	Nil
(b) From pollution control facilities	Nil	Nil
(B) Recycled/Sold Quantity		
(i) Used oil (Stream 5.1)	34.05 KL	32.13 KL
ii) Contaminated cotton rags of other cleaning materials (Stream 33.2)	Nil	Nil
iii) Spent ion exchange resin (Stream 35.2)	Nil	Nil
iv) Empty barrels contaminated with HW (Stream 33.1)	Nil	Nil
v) Sludge containing oil during cleaning of oil storage tanks(Stream 3.2 & 3.3)	Nil	14.29 MT
vi)Wastes or residues containing oil(Stream 5.2)	16.93 MT	Nil
(B) From pollution control facilities	Nil	Nil



PART- E

SOLID WASTES:

Solid Wastes	Total Quantity	
	During the previous financial year (2018-19)	During the current financial year (2019-20)
a. From process Red mud Lime grit	2081845 T as dry basis 12869 MT	2232705 T as dry basis 14473 MT
b. From Pollution Control Facility Fly ash Bottom ash	164708 MT 29066 MT	216077 MT 38141 MT
c. 1. Quantity recycled or re-utilized within the unit. Lime grit Fly ash Bottom ash 2. Sold (supply to brick unit) Lime grit Fly Ash 3. Disposed Red mud Fly Ash Lime grit	NIL 143282 MT 29066 MT 7185 MT 21426 MT 2078176 MT as dry basis 16168 MT 5684 MT	NIL 189822 MT 38141 MT 8955 MT 33192 MT 2232705 MT as dry basis 26256 MT 5518 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 about 5 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) & run-off water from the mud storage ponds A & B. Pond D is meant for fresh water emergency storage. At present Pond A (Mud Storage), Pond C (SNL) and Pond D are in operation. Pond B is under construction. 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. 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

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3. Lime grit: It is being generated during the preparation of Milk of Lime from quick lime. Total 14473 MT of lime grit was generated during the FY 2019-20 and about 8955 MT (62%) was sold to brick manufacturing units. Rest amount was disposed in Red Mud pond A.

Typical characteristics of Lime Grit

PARAMETERS		
Available CaO (%)	Moisture (%)	Silica (%)
20.1	19.2	6.2

4. Batteries: 0.290 MT of Batteries was disposed through Buy Back System.
5. E-Waste: 5.960 MT of e-waste was channelized to e-waste recyclers.

Hazardous Waste

5. 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 Tran's boundary Movement) Rules, 2016. The major Hazardous waste generated during FY 19-20 was Used Oil amounting to 32.50 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 top soil. High Performance Milling System (HPS) is installed to improve coal milling system. This HPS enhances to minimize the Rejection loss and reduce the coal dust emission there by conserving natural resources.
4. Waste water is being collected and reused by adopting "ZERO" discharge principle to reduce fresh water consumption thereby conserving natural resources. By this our Fresh Water consumption has come down and specific water consumption has been reduced from 1.52 to 1.45 KL/MT of Alumina Hydrate Production.
5. 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.
6. 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 areas is being collected in caustic pond. The entire water of caustic pond is completely reused in the process to reduce fresh water 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.



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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. 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 (%)
8.10	13.58	5.14	4.88	61.33	4.09	1.14	3.60	0.17	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 FY 19-20, total of 2232705 MT (as dry basis) Red Mud was generated and stored in the Pond-A. Total decanted water (2559674 m³) was recycled back to the process.

The following initiations were taken for utilization of Red Mud:

Sl.No.	Institution/Organization	Purpose
1	Rajshree Cement	Supplied for cement Manufacture
2	Balaje Cement	
3	ACC, Bargarh	
4	Hyderabad Industries Ltd.	For Paver blocks & tiles
5	IIMMT, BBSR	Iron recovery
6	IIT, Mumbai	Rural Road construction

- In addition to this, we will undertake a pilot study to use red mud for mine back filling at our Captive Bauxite mines. Permission from IBM, Nagpur, has been obtained vide letter number No R-11013/1/MISC/MP-SOM (EZ)/2017-CCOM-VoL-I dated 18.12.2019 following a detailed study by IIT, Mumbai and NEERI, Nagpur. Clearance from MoEF & CC obtained vide their letter number F.No.22-24/2018-IA.III dated 05.06.2020. CTE applied to SPCB, Odisha for their approval vide our letter No. UAIL/MINES/SPCB/115/2000 dated 11.05.2020. 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 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 for low lying land filling followed by mass plantation. During the FY 2019-20, out of total generated 216077 of fly ash, 189822 MT was used for land development and supply to brick manufacturing units.

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



7. E-Waste /Discarded batteries to recycle under EPR, Buy-Back-System and sale to Authorized Recycler.
8. Water Task Force has been formed to conceptualize the ZLD of a Refinery & Power Plant, Planning for Monsoon & Dry season, Focus on reduction in fresh water consumption, Storm water management & Model water balance & necessary action to freeze it.
9. 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.
10. 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.
11. 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):** (i) Conceptual engineering completed (ii) M/s. Tata Consulting Engineers Ltd (TCE) is appointed as engineering consultant (iii) Basic engineering completed (iv) Feasibility & draft DPR has been submitted by TCE for review. (v) Technical specification for placement of order has been finalized and Notice to Issue Tender (NIT) done. Bidding under progress.
2. Blending of different mix of coal in order to optimize solid waste generation (ash) and thermal NOx is being done.
3. Biodiversity study is being carried out in coordination with **International Union for Conservation of Nature (IUCN)** which is a membership Union uniquely composed of government, civil society organizations & industries. IUCN has already carried out the Biodiversity survey for four seasons. Biodiversity Management Plan shall be prepared basing upon post the surveys and monitored data & the recommendations will be implemented in a phased manner.
4. A **Poly-crack unit** is proposed to be installed in the next year to treat Municipal Solid Wastes including plastic waste generated from the plant, township & peripheral areas.
5. Water sprinkling arrangements are in place at active red mud stacking Pond -A to suppress fugitive emissions during dry seasons.
6. Sewage Treatment Plants (STPs) have been provided at Plant as well as townships for treatment of domestic waste water. 100% treated water is being used for gardening and horticulture activities.
7. An environmental cell has been established for monitoring and implementation of safe guard measures for the protection of environment.
8. A network of storm water drainage system has been provided at ash pond, RMP and in and outside the plant premises.
9. The floors of process areas (caustic area) are made impervious and have been provided with sumps at various locations to collect the spilled process water if any and pump back to process.



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Process water collection drainage system has been provided and connected to caustic pond for complete recirculation in process to reduce fresh water consumption and prevention of ground water contamination.

10. All raw-material stack yards were made impervious to check leachate to ground.
11. An in-house nursery has been developed in an area of 5 acres to facilitate plantation, landscaping and green belt development activities.
12. Greenbelts have been developed preferring indigenous species, around peripheral & infrastructural areas, road sides and vacant areas covering an area of around 327 hectares including 20 ha during the year 2018-19.
13. A Red Mud Filtration (RMF) unit with State of the Art technology, is in continuous operation. This unit helps in reducing the caustic soda content in the red mud and increases solids to 75-80% instead of 55-60%, 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 resource.
14. Installation of Vermicomposting pit for Horticulture waste utilization in composting.
15. Adoption of Vacuum cleaning system, road sweepers etc. in housekeeping for dust free work environment in operational areas.
16. Operation of a 5 MW Solar Power Plant to generate renewable power and in-house utilization, thereby conserving natural resources and environment.

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 2021.
2. Revamping of the Existing Sewage Treatment Plant (STP) had been done to meet the effluent parameter at the outlet of the STP.
3. Remote calibration facility has been provided for CPP as per CPCB guidelines.
4. One display board has been provided at main gate to display environmental monitoring parameters.
5. Six numbers of rain water harvesting and ground water recharge pits were developed in the Nuapada Township. Rooftop Rain Water 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 Rain Water Harvesting.
6. Our unit operates on a ZLD philosophy. All the Alkaline Waste water 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.
7. Air pollution control devices such as ESPs, dry fog system, bag filters and wet scrubbers have been installed at all suggested locations to control any dust emission.



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8. 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.
9. High jet water spraying system have been provided at bauxite and coal stock pile areas to check fugitive emission.
10. Water sprinkling is being done on roads regularly to suppress fugitive dust emission.
11. All approach roads have been black-topped to reduce fugitive dust emissions.
12. 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.
13. 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.
14. Continual plantation program is ensured by establishing a permanent nursery and engaging full time work force with all types of tools & tackles. A lush greenbelt has been developed along the arterial road, internal roads, ore stacking yard, railway corridor, townships, infrastructural facilities, along perimeter of the plant etc. Greenbelt development along the LDC is initiated and will be improved in a phased manner.
15. A Sustainability Team has been engaged to support best practices in utilizing wastes, water conservation measures, cleaner technology and emission abatement methods 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.
16. Utkal Alumina won the “**Challengers Award**” under Mega Large Business of process sector companies from **Frost & Sullivan/TERI Sustainability Award 2020**. Most likely this could be the first Refinery unit in India to win this Award.





