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VLL/HSE/ENV/2025/1786

29th September 2025

To,
The Member Secretary,
Paribesh Bhawan, A/118,
Nilakantha Nagar, Unit-VIII,
Bhubaneswar –751012,
Odisha.

Sub: Submission of Environmental Statement for the year ending 31st March 2025 of Vedanta Limited, Lanjigarh, Kalahandi.

Dear Sir,

We are herewith furnishing the **Environmental Statement** as per Environment (Protection) Act, 1986 (Rule 14), for the financial year 2024-25 (ending 31st March 2025) in the prescribed format, **Form V**.

This is for your kind information and record.

Thanking you.

Yours faithfully,
*For **Vedanta Limited, Lanjigarh***

Harshvardhan Pande
(Head- HSE & S)

Vedanta Limited Lanjigarh, Pin:766027

Encl: As above (Form V)

CC: The Regional Officer, SPC Board, 1st Lane, Kasturi Nagar, Rayagada - 765001, Odisha

Vedanta Limited
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[FORM-V]
(See rule 14)
Environmental Statement for the financial year ending the 31st March 2025
PART-A

1	Name and address of the owner/occupier of the industry, operation or process	Pranab Kumar Bhattacharyya Chief Executive Officer, Alumina Business Vedanta Limited, Lanjigarh, Kalahandi, Odisha.
2	Industry Category Primary – (STC Code) Secondary – (SIC Code)	Primary
3	Production Capacity	4 MMTPA (Calcined Alumina), 155 MW CPP
4	Year of Establishment	2004
5	Date of the last environmental Statement submitted	28th September 2024

Part-B
Water and Raw material Consumption

1. Water consumption M^3/day

Process	6643.19
Boiler feed	4134.27
Domestic	2102.28

Name of the Products	Process water consumption (Process + Industrial drinking water) per unit of product output (M^3/T)	
	During the previous financial year (2023-24)	During the current financial year (2024-25)
Calcined Alumina	1.70	1.62

2. Raw material Consumption

Name of the raw material	Name of the Products	(Consumption of raw material per unit of output*)	
		During the previous financial year (23-24)	During the current financial year (24-25)
Bauxite (T/T)	Calcined Alumina	2.67	2.65
Caustic Soda (Kg/T)		83.16	74.57
Lime (Kg/T)		35.55	30.91
Fuel Oil (Kg/T)		69.44	68.47
LDO (Kg/T)		0.079	0.314
HSD (KL/T)		0.00099	0.0013
Energy (Hydrate), (KWh/T)		196.82	212.36
Energy (Calcined) (KWh/T)		30.49	33.13
Steam (T/T)		1.74	1.93

*Specific Consumptions are reported per MT of Hydrate as Al_2O_3 produced.

Vedanta Limited Lanjigarh, Pin:766027

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 in discharges (Mass/volume)			Percentage of variation from prescribed standards with reasons
		Parameters	Average Results (monthly)	Max. permissible Norms of SPC Board	
(A)Water: Sewage Treatment Plant (STP): Installed and being operated STP of capacity 360 KLD for plant. The STP is being operated under strict supervision and the treated water is being used for horticulture, gardening & for sprinkling purposes					
Domestic Effluent from Plant STP	NIL	pH TSS (mg/l) BOD (mg/l) COD (mg/l) Oil & Grease (mg/l)	7.9 37.4 4.7 15.2 0.0	5.5 – 9.0 100 30 250 10	Variation: 0

Pollutants	Quantity of pollutants discharged (mass/day)	Concentrations of pollutants discharges (Mass/volume)	Standard mg/ Nm^3	Percentage of variation from prescribed standards with reasons
B. Air Particulate Matter (PM)				
Flue gas from Calciner Stack	0.130 MTPD	Calciner: 28.32 mg/ Nm^3	100	Variation: 0
Flue gas from Boiler Stack	0.139 MTPD	CPP: 23.47 mg/ Nm^3	50	Variation: 0*

Vedanta Limited ★ Lanjigarh, Pin:766027 ★

PART-D
HAZARDOUS WASTES
(As specified under Hazardous and Other Wastes [Management and Transboundary Movement] rules, 2016)

Hazardous wastes	Total quantity	
	During the previous financial year (23 -24)	During the current financial year (24 -25)
A. Generation From Process: 1. Used / Spent Oil 2. Waste / Residues Containing Oil 3 Empty barrels/ Containers/ Liners/ Contaminated with hazardous chemicals/ wastes 4. Spent Ion Exchange Resin Containing Toxic Metals 5. Sludge contaminated with oil 6. Mercury/ Mercury Compounds 7. Vanadium sludge/ Compounds 8. Unused Copper Cable	1. 76.52MT 2. 2.60 MT 3. 565 nos. 4. 9 MT 5. 0 MT 6. 0 MT 7. 0 MT 8. 0 MT	1. 73.26 MT 2. 2.18 MT 3. 226 nos. 4. 0 MT 5. 0 MT 6. 0 MT 7. 0 MT 8. 473.02 MT
B. Recycled/Sold quantity 1. Used / Spent Oil 2. Waste / Residues Containing Oil 3. Empty barrels/ Containers/ Liners/ Contaminated with hazardous chemicals/ wastes 4. Spent Ion Exchange Resin Containing Toxic Metals 5. Sludge contaminated with oil 6. Mercury/ Mercury Compounds 7. Vanadium sludge/ Compounds 8. Unused Copper Cable	1. 82.44 MT 2. 1.89 MT 3. 531 nos. (11.03 MT) 4. 9 MT 5. 0MT 6. 0 MT 7. 0 MT 8. 0 MT	1. 73.26 MT 2. 2.89 MT 3. 261 nos. (4.92 MT) 4. 0 MT 5. 0MT 6. 0 MT 7. 0 MT 8. 473.02
B. From pollution control facilities	0	0

Vedanta Limited ★ Lanjigarh, Pin:766027 ★

* Discarded containers quantity in numbers shall be converted to MT at the time of disposal and to be reported accordingly.

PART-E
Solid Wastes

	Total quantity (MT)	
	During the previous financial year (23 -24)	During the current financial year (24 -25)
A. Generation from Process 1. Red Mud (dry) 2. Fly ash 3. Lime grit	1. 24,20,999 2. 3,86,802.8 3. 10,767.6	1. 29,26,414 2. 5,56,619.6 3. 8,427.4
B. From pollution control facilities (Effluent Sludge)	0	0
C. 1. Quantity recycled or re-utilized with the unit 2. Sold 3. Disposed	1. Fly Ash: 1,13,412.1 Red Mud: 1,06,134 Lime Grit: 2,693.15 2. Fly Ash: 4,37,186.4 Red Mud: 2,960.2 Lime Grit: 10,564.3 3. 0	1. Fly Ash: 1,68,075.5 Red Mud: 36,704 Lime Grit: 0 2. Fly Ash: 3,94,762.8 Red Mud: 26,692.4 Lime Grit: 8,625 3. 0

- Fly ash is being disposed of using High Concentration Slurry Disposal (HCSD) technology to Ash Pond.
- Fly Ash is also being utilized in brick manufacturing and NHAI projects.
- Total ash utilization recorded as 101.12% for the year 2024-25.
- Lime grit is being supplied to brick manufacturing units.
- Sludge generated from sewage treatment plants are being used as manure for development of landscaping areas.
- As a waste management initiative, red mud is utilized in Bauxite Residue Disposal Area (BRDA) internal road construction in stacking area.
- Red mud is also dispatched to Cement industries for further utilization.

Vedanta Limited ★ Lanjigarh,Pin:766027 ★

PART-F

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

The table outlines the details pertaining to the characterization and disposal practices adopted at our site for hazardous waste as well as solid waste.

Name of Wastes	Characterization	Disposal Practices
a. Hazardous waste Used Oil	Combustible liquid, Carcinogenic, Eco-toxic	Storage in containers on impervious floor under well ventilated covered shed followed by sale to actual users having valid authorization from SPCB, Odisha
Wastes / Residues Containing Oil	Combustible solid, Eco-toxic	Storage in impervious pits/ containers on impervious floor under well ventilated covered shed followed disposal in the Authorized HW incinerator/ Common Hazardous Waste Treatment Storage Disposal Facility (CHWTSDF)
Empty barrels/ Containers/ Liners/ Contaminated with hazardous chemicals/ wastes	Eco-toxic	Storage on impervious floor under well ventilated covered shed followed by captive use / disposal through original supplier / actual users authorized by SPCB, Odisha
Spent Ion Exchange Resin Containing Toxic Metals	Flammable solid, Eco-toxic	Storage on impervious floor under well ventilated covered shed followed by co-incineration in CPP / cement kilns after obtaining authorization from SPCB / disposal in CHWTSDF
Sludge contaminated with oil	Flammable semi- solid, Eco-toxic	Storage in impervious pits/ containers on impervious floor under well ventilated covered shed followed disposal in the Authorized HW incinerator/ CHWTSDF
Mercury/ Mercury Compounds	Carcinogenic, Eco-toxic	Storage in containers on impervious floor under well ventilated covered shed followed by sale to actual users having valid authorization from SPCB, Odisha / disposal in CHWTSDF
Vanadium Sludge	Carcinogenic, Eco-toxic	Storage in containers on impervious floor under well ventilated covered shed followed by sale to actual users having valid authorization from SPCB, Odisha / disposal in CHWTSDF
Unused Copper cable	Eco- toxic	Storage on impervious concrete

Vedanta Limited Lanjigarh, Pin:766027

		platform under well-ventilated covered shed followed by In house Recycling/disposal through Actual users authorized by SPCB , Odisha.
Name of Wastes	**Characterization**	**Disposal Practices**
b. Solid Waste Red Mud	Al_2O_3- 19.34 % Fe_2O_3- 48.88 % SiO_2- 9.98 % TiO_2- 4.79 % CaO- 1.69 % Na_2O- 4.57 % L.O.I (Loss on Ignition)- 9.82 %	After processing through Red mud filtration unit, dry red mud cake is stacked in Red mud pond from where it is transported through rail to cement industry.
Fly ash	SiO_2- 62.67 % Al_2O_3- 28.51 % Fe_2O_3- 3.69 % CaO- 0.476% TiO_2- 2.03% MgO-0.408% P_2O_5-0.355% Na_2O- 0.095% K_2O-1.13%	Stored in Fly ash pond. Dry ash is collected by brick manufacturers from Ash silos inside the plant and ash pond. The Ash is being supplied to NHAI for further utilization.
Lime grit	CaO > 13.40 %	Sold to brick manufacturers.

Part-G

(Impact of pollution abatement measures taken for conservation of Natural resources and on the cost of production)

- Zero Discharge concept is being implemented for reduction of water consumption to achieve world benchmark figures and to reduce cost of production.
- The Red Mud Filtration unit is under operation eliminating the wet disposal of red mud & generating dry red mud cake. Caustic present in the red mud slurry is being recovered in this unit leading to overall caustic consumption reduction, ultimately resulting in low cost of production.
- Rainwater harvesting structures for recharging ground water are installed in the township having capacity of one lakh m3/annum.
- To utilize the full volume of Caustic Pond and Storm Water Pond, desilting was carried-out as a part of monsoon management.
- Cross functional water management team has been formed to look after the water management inside the refinery, focusing on reduction in water consumption, to explore water conservation projects and to minimize the water losses in process.
- Water committee is formed in the Refinery by involvement of different senior & junior officials from departments to identify & lead Water Saving projects.
- Energy committee is formed in the Refinery by involvement of different senior & junior officials from departments to identify & lead Energy Saving projects.

Vedanta Limited ★ Lanjigarh, Pin:766027 ★

- World Environment Day was observed on June 5, 2025, with immense enthusiasm and relevant participation from Vedanta employees, associate partner employees, and their families residing in Vedanta Township, where a total of 400 saplings were planted on the west side of the RMF area. Various contests such as Spot Quiz, poster competitions, and slogan competitions were arranged for Vedanta employees and partner associates. Poster and quiz contests for school children were also held. World Environment Day was marked by a series of activities throughout the week.
- As a unique initiative on World Environment Day 2025, CEO Alumina Business announced the Ban on Single Use Plastic across the township and plant.
- World Earth Day 2025 was observed by organizing Poster Making and speech competition amongst the children of SSD School followed by the Awareness campaign in Goipeta Village.
- International Forest Day and World Water Day were observed on 21st March 2025 and 22nd March 2025. Visual awareness generation session and Fancy-dress competition was organized amongst the kids in Township. Following it an Awareness session was also conducted in Local community.
- The site had conferred with prestigious awards like:

- Kalinga Environment Excellence Award.
- FAME National Award 2024 for "Environment Excellence".
- 16th Exceed Environment award and conference 2024.
- CII National award for energy management.
- Water Optimization 2024 Award "Best Water Efficient unit <500 MW".
- CEE 3rd National Power-Gen Environment Excellence Summit & Awards 2024 "Fly Ash utilization Plant of the year".
- CEE 3rd National Power-Gen Environment Excellence Summit & Awards 2024 "CGPP Plant of the year".
- Grow Care Awards for Environment Excellence

Part-H

(Additional measures/investment proposal for environmental protection including abatement of Pollution)

- All the Electrostatic Precipitators (ESP) attached to all the Coal fired boilers are being operated continuously for emission reduction. Fabric filters installed in ESPs of three boilers to achieve the PM emission limit below 50mg/Nm3.
- Mobile water tankers have been provisioned & being operated to suppress the dust generated due to vehicular movement.
- 6 numbers of Continuous Ambient Air Quality monitoring Station (CAAQMS) have been installed for ambient air quality monitoring and is connected to OSPCB server through RTDAS.
- Installation of online pH meter at CWP Spillway and hook up with OSPCB server for real time data transmission.
- Truck mounted Vacuum cleaning system has been provided at Bauxite handling area for reduction in dust emission.

Vedanta Limited Lanjigarh, Pin:766027

- For this year 2024-25, 15080 nos. of saplings have been planted as a part of gap filling activity for density make-up. The total area covered under green belt development is 278.216 Ha with plantation of 542922 nos of saplings and replacement with 363811 nos of saplings as gap filling till date under green belt development as per MoEF guidelines.
- To sensitize the employees & local stakeholders World Environment Day, International Forest Day, World Water Day and World Earth Day were celebrated in & around the surrounding areas of the refinery.
- Total lime grit which is generated inside the refinery is being supplied to brick manufacturing units.
- For the year 2024-25, 101.12 % of ash has been utilized in various avenues like brick manufacturing, NHAI road construction etc.
- Agreement signed with Bhawanipatna Municipality for disposal of Non-hazardous Solid Wastes.
- Bag filters installed in Bauxite crusher house for arresting dust emissions.
- Water sprinklers and Dry fogging dust suppression system are installed at Coal yard for reducing the fugitive dust emissions in the area.
- Dust suppression by sprinkling water by tanker is being carried out in and around the ash pond.
- Plantation drive has been initiated to reduce the fugitive emission of fly ash in the peripheral area of ash pond.
- Stability Analysis of all the tailing dams and water bodies like Ash Pond, Red mud Pond, Process Water Lake, Caustic Pond and Raw water reservoir is done by IIT Madras.
- Installation of piezometer, survey monument and inclinometers at Bauxite Residue Disposal Area -BRDA (RMP) and Ash Pond dykes to observe the dyke stability.
- Dust suppression through sprinkling is being operated regularly at BRDA.
- We have engaged Geo Theota as the Engineering on Record for the tailing Dams of Vedanta Lanjigarh which carried out the dam Safety inspection, Dam Safety Review, Dam break assessment and water balance for the site. It is also submitting the monthly report to the team.
- Two nos. of truck mounted mist cannons are being used apart from 3 nos. of water tanker sprinklers for dust suppression
- Wick drain technology which is one of the first of its kind in India designed by M/s Golder Associates for evacuation of water present in the existing slurry area of Red Mud Pond. This improved the consolidation of wet slurry present from earlier years & benefited in storage of dry red mud in that area. An area of 93000 sqm in existing BRDA East cell was taken up under the wick drain project.
- Gabion wall was installed at the East Cell to utilize the space effectively without compromising the structural stability of the Red mud Pond.
- Monsoon Risk assessment done, preparedness plan prepared & actions are tracked.
- Process Water Lake restoration job done including the dyke strengthening and desilting for the bed equilibrium.

Part-I

(Any other particulars for improving the quality of the environment)

The following measures were taken for environmental protection and abatement of pollution.

- Dry Fog system is being operated continuously to control dust emissions at the crushers & at different transfer points at Bauxite Handling area. Water spraying arrangements at stockpiles have been provided and being operated. All conveyer belts have been provided with Hood covering. Two nos of fixed mist cannons have been installed in bauxite stockpile areas for dust suppression.
- At Coal Handling plant, Dry Fog system on the conveyer system and sprinkling system are being operated continuously for dust suppression.
- Wet scrubber system is being operated to control lime dust in lime handling area.
- Dust extraction systems with bag filters are being operated to control fugitive emissions from transfer points, conveyers and silo of alumina handling area
- Several initiatives have been taken for energy and water conservation as mentioned previously resulting in the recertification of ISO - 14001 (Environmental Management System) & ISO - 50001 (Energy Management System).
- Regular ground water quality monitoring is being done from 10 nos of observation wells including 3 around ash pond, 4 at red mud pond, 2 at process water Lake and 1 at dirty water pond.
- 131 no's numbers of fly ash units in the nearby villages of our refinery are developed to supply fly ash for free of cost.
- Drinking water monitoring from 9 locations is being carried out on half yearly basis.
- To ensure transparency and disclose environmental parameters to all stakeholders, emissions from the stacks of the Power plant and Calciner are connected to the SPCB and CPCB server via a Real Time Data Acquisition System (RTDAS)
- A baseline study on the diversity of habitat, flora, and fauna was conducted by engaging a third party to manage and enhance the biodiversity of Lanjigarh. A comprehensive biodiversity management plan has been developed with consideration for the ecological sustainability of the region.
- Wind defenders installed on the dry Red Mud stacking area around 1,90,000 m3 that helped in reducing the dust emissions from the stacking area.
- 60000 m2 area Grass planting completed at BRDA.
- Auto Wheel washing system installed at the BRDA exit.
- Solar plant of 480 KW is installed in the site & Township.
- Co-firing of 948 MT of Biomass in CGPP.

Vedanta Limited ★ Lanjigarh, Pin:766027 ★