

VL/OPCB/002/2022-208
September 23, 2022

The Member Secretary
State Pollution Control Board, Odisha
Parivesh Bhawan,
A/118, Nilakantha Nagar,
Unit-VIII
Bhubaneswar – 751 012

Sub.: **Submission of Environment Statement for 2021-22 of Smelter & CPP of Vedanta Limited, Jharsuguda**

Ref.: Rule 14 of the Environment (Protection) Rules, 1986

Dear Sir,

This has reference to the captioned subject and the cited reference. Please find the Environment Statement of Smelter & CPP of Vedanta Limited, Jharsuguda for 2021-22 duly filled in Form- V.

Thanking you,

Yours faithfully,



Ashok Kumar Mishra
Head-Env. Compliance & Strategy

Encl.: Environment Statement in Form-V

Copy to: The Regional Officer, State Pollution Control Board, Odisha, Jharsuguda

VEDANTA LIMITED, JHARSUGUDA

Vill : Bhurkamunda, P. O. : Kalimandir, Dist. : Jharsuguda (Odisha) : 768202
T +91-664 566 6000 F +91-664 566 6267 www.vedantalimited.com

REGISTERED OFFICE: Vedanta Limited, 1st Floor, 'C' wing, Unit 103, Corporate Avenue, Atul Projects, Chakala, Andheri (East), Mumbai 400093, Maharashtra, India.
CIN: L13209MH1965PLC291394

Sensitivity: Internal (C3)



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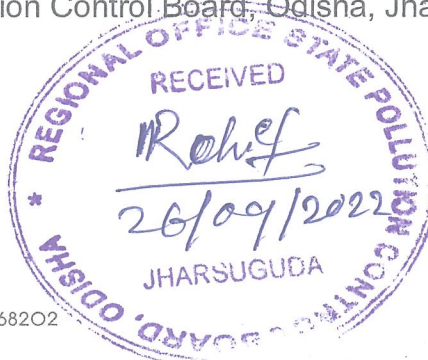
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FORM – V
(See Rule 14)

Environmental Statement for the financial year ending the 31st March 2022

PART- A

- i Name and address of the occupier of the industry operation or process : Mr. Sunil Duggal
Whole Time Director
Vedanta Limited, Smelter & CPP
Bhurkamunda
Jharsuguda – 768 202
- ii Industry Category Primary (STC Code) : -
Secondary – (SIC Code)
- iii Production Capacity (Units) : 17.5 LTPA Aluminium
: 1215 MW (9 x135 MW) Captive Power Plant
- iv Year of Establishment : 2008
- v Date of the last Environmental Statement submitted : 18th September 2021

PART – B

Water and Raw Material Consumption

(1) Water Consumption m³/Day

Process	: 861 m ³ /day
Cooling & Boiler Feed	: 52291 m ³ /Day
Domestic	: 722 m ³ /Day

Name of Product	Process Water Consumption per Unit of Product Output	
	During the previous year (2020-21)	During the current year (2021-22)
Aluminium Metal	Nil	Nil
CPP 1215 MW	1.94	1.99

(2) Raw Material Consumption

Name of Product	Name of Raw Materials	Unit	Consumption of Raw Material Per unit output	
			During the previous financial year (2020-21)	During the current financial year (2021-22)
Aluminum Metal				
	Alumina	MT/MT Al.	1.880	1.732
	Calcined Petroleum Coke	MT/MT Al.	0.387	0.372
	Coal Tar Pitch	MT/MT Al.	0.078	0.085
	Aluminium Fluoride	MT/MT Al.	0.016	0.015
	Cryolite#	MT/MT Al.	0.002	0.0015
	Furnace Oil	KL/MT Al.	0.02	0.02
Electricity (Captive Power)	Coal	MT/MWH	0.794 (at GCV 3089 Kcal/kg)	0.827 (at GCV 2973 Kcal/kg)
	LDO	KL/MWH	0.000124	0.000181

Includes cryolite for starting of up pots

*Industry may use Codes if disclosing details of raw material would violate contractual obligations, other wise all industries have to name the raw materials used.

PART – C

Pollution Discharged To Environment /Unit of Output (Parameters as specified in the consent issued)

Pollutants	Units & Parameters		Quantity of pollutants discharged (mass/day)	Concentration of pollutants in discharges (mass/volume)	% of variation from prescribed standards with reasons
a) Water*			Nil	NA	NA
b) Air	UOM		Kg/Day	Mg/Nm3	Within the prescribed limits
	CPP Unit - 1	PM	576.08	36.08	
		SOx	18488.08	1161.67	
		NOx	5039.17	316.58	
	CPP Unit - 2	PM	669.75	43.42	
		SOx	17038.75	1104.75	
		NOx	4321.67	280.50	
	CPP Unit - 3	PM	600.75	38.75	
		SOx	14211.92	914.50	
		NOx	4930.17	317.25	
	CPP Unit - 4	PM	628.92	40.42	
		SOx	17873.83	1151.17	
		NOx	4647.83	299.25	
	CPP Unit - 5	PM	636.00	40.92	
		SOx	23461.75	968.83	
		NOx	3510.42	224.58	
	CPP Unit - 6	PM	647.92	41.17	
		SOx	15744.92	997.00	
		NOx	5445.00	345.67	
	CPP Unit - 7	PM	631.17	39.75	
		SOx	22469.58	1420.33	
		NOx	5428.00	342.33	
	CPP Unit - 8	PM	660.33	40.56	
		SOx	18102.33	1109.00	
		NOx	7441.67	462.11	
	CPP Unit - 9	PM	697.17	44.08	
		SOx	14970.75	947.42	
		NOx	5808.92	367.25	
	Pot Room FTP	PM	126.95	2.65	
		Total Fluoride	31.10	0.67	
	Bake Oven FTP	PM	21.63	4.23	
		Total Fluoride	18.13	3.74	

*No effluent is discharged outside the company premises

PART-D

Hazardous Waste

{As specified under Hazardous Wastes (Management, Handling & Transboundary Movement) Rules 2016}

(a) From Process:

Sl. No.	Hazardous Wastes	Total Quantity	
		Previous financial year (2020-21)	Current financial year (2021-22)
1.	Used oil	65.509 MT	22.803 MT
2.	Waste containing oil	27.823 MT	29.451 MT
3.	Cathode Residue (Spent Pot Lining)	36320.00 MT	39916.450 MT
4.	Tar containing Wastes	Generation: 1.0 Recycle: NIL	Generation: 2.645 MT Recycle: 3.645 MT
5.	Flue gas dust (Carbon plant, Anode baking plant)	Nil	Nil
6.	Aluminium Dross (Alloys)	14370.403 MT	20193.410 MT
7.	House Keeping waste from pot room, carbon plant, cast house, ladle repairing, stem repairing etc.	Generation: 1505.545 MT Recycle: 1019.515 MT	Generation: 1956.257 MT Recycle: 997.987 MT
8.	Rejected AlF ₃ Bags	Generation:9732 Nos. Incineration:8360 Nos.	Generation:9826 Nos. Incineration:7625 Nos.
9.	Asbestos waste (Ladle cleaning and other units)	Nil	Nil
10.	Coke dust	Generation: 1686.200 MT Recycle: 1663.720 MT	Generation: 1720.350 MT Recycle: 1720.350 MT
11.	Spent Resin	0.918 MT	1.17 MT
12.	Green Anode Ridge waste	Generation: NIL Recycle: NIL	Generation: NIL Recycle: NIL
13.	Green anode cooling decantation sludge	NIL	NIL
14.	Shot blasting dust	6104.00 MT	7198.50 MT
15.	Drain Cleaning sludge	Generation: 264.572 MT Recycle: 221.572 MT	Generation: 381.733 MT Recycle: 76.733 MT
16.	Ladle cleaning residue	Generation:19,683.32 MT Recycle: 20,042.790 MT	Generation:22,143.260 MT Recycle: 22,440.320 MT
17.	Spent Anode	Generation: 1,82,063.948 MT Recycle: 1,80,408.515 MT Sold: 1177.300 MT	Generation: 1,85,561.410 MT Recycle: 1,82,914.959 MT Sold: 2357.420 MT

(b) From Pollution Control facilities:

Sl. No.	Hazardous Wastes	Total Quantity	
		Previous financial year (2020-21)	Current financial year (2021-22)
1.	ETP sludge	135.36 MT	64.00 MT
2.	Rejected filter bags	19142 Nos.	34534 Nos.

PART – E

Solid Wastes *

(a) From Process & (b) From Pollution Control facilities

Sl. No.	Solid Wastes	Total Quantity	
		Previous financial year (2020-21)	Current financial year (2021-22)
1.	Ash (Fly ash + Bottom ash)	32,50,416 MT	35,04,163 MT

(c)

(1) Quantity recycled or re-utilised within the unit:

Sl. No.	Solid Wastes	Total Quantity	
		Previous financial year (2020-21)	Current financial year (2021-22)
1.	Ash (Fly ash + Bottom ash)	10,30,940.300 MT (Inside) 29,80,931.030 MT (Outside in brick, cement, road, quarry filling, low lying filling,	1,21,121.580 MT (Inside) 40,99,058.455 MT (Outside in brick, cement, road, quarry filling, low lying filling,
2.	Tar containing waste	NIL	NIL
3.	House Keeping waste from pot room, carbon plant, cast house, ladle repairing, stem repairing etc.	1019.515 MT	997.987 MT
4.	Rejected AlF3 Bags	NIL	NIL
5.	Coke dust	1663.720 MT	1720.350 MT
6.	Green Anode Ridge waste	NIL	NIL
7.	Spent Anode	1,80,408.515 MT (Recycled)	1,82,914.959 MT (Recycled)

(2) Sold:

Sl. No.	Solid Wastes	Total Quantity	
		Previous financial year (2020-21)	Current financial year (2021-22)
1.	Discarded containers / liners	991 Nos. (Sent along with used oil)	804 Nos. (Sent along with used oil)
2.	Aluminium Dross	9887.740 MT	25652.560 MT
3.	Spent Anode	1177.300 MT	2357.420 MT

(3) Disposed:

Sl. No.	Solid Wastes	Total Quantity	
		Previous financial year (2020-21)	Current financial year (2021-22)
1.	Ash (Fly ash + Bottom ash)	NIL	NIL
2.	Waste refractory /Lining (Cast house, Bake oven, including furnace)	NIL	NIL
3.	Induction Furnace Slag	NIL	NIL
4.	Drain Cleaning sludge	NIL	293.34 MT
5.	Cathode Residue (Spent Pot Lining)	11212.52 MT (To authorized reprocessor)	31230.16 MT (To authorized reprocessor)

PART – F

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

Characteristics of Solid Wastes

(a) Aluminium Dross

Parameter	Unit	Value
Aluminium Metal	%	5-13
Iron	%	0.5-1
Alumina	%	75-90
Carbide & Nitrides	%	2-3
Fluoride	%	0.01-0.1

(b) Spent Pot Lining

Parameter	Unit	Value
pH	-	10
Carbon	%	45-50
Aluminium	%	0.40-0.50
Silica	%	1.0-1.5
Iron	%	0.5-1.0
Sodium	%	15-20
Fluoride	%	10-12
Aluminium Carbide & Nitride	%	5-6
Cyanide	%	0.01-0.025
Others	%	10-15

(c) Fly Ash

Parameter	Unit	Value
Aluminium	mg/kg	6538
Calcium	mg/kg	2899
Chromium as Cr	mg/kg	28.20
Magnesium	mg/kg	517
Manganese as Mn	mg/kg	96.74
Molybdenum as Mo	mg/kg	46.08
Nickel as Ni	mg/kg	8.69
Phosphates as P ₂ O ₅	%	0.91
Potassium	mg/kg	360
Silicon dioxide as SiO ₂	%	55.71
Sodium	mg/kg	77.48
Titanium as TiO ₂	mg/kg	516
Total Sulphur as SO ₃	%	0.09
Unburnt Carbon	%	1.26

Disposal Practice of Solid Wastes:

(a) Disposal Practice of Hazardous Wastes

Sl. No.	Waste Description	Disposal Practice
1	Waste containing oil	Incineration in HW incinerator
2	Cathode residues including pot lining wastes	Co-processing in cement kilns/authorized power plant/sale to authorized recycler/reprocessor
3	Tar containing wastes	In house recycling
4	Flue gas dust	Recycle in Bake oven /disposal in SLF/ CHWTSDF
5	ETP Sludge	disposal in SLF/ CHWTSDF
6	Aluminium Dross	Authorized re-processors having approval of SPCB/ CPCB/In-house recycling
7	Housekeeping waste	Disposal in SLF/CHWTSDF/ Recycle
8	Rejected Filter bags (FTP)	Incineration in HW incinerator/ disposal in SLF/CHWTSDF
9	Rejected AlF ₃ bags	Disposal to original suppliers/HW incinerator
10	Asbestos waste (Ladle cleaning and other units)	Disposal in SLF/CHWTSDF
11	Coke dust	Recycled in GAP/SLF/CHWTSDF
12	Spent Resin	HW incinerator/SLF/TSDF
13	Green Anode Ridge Waste	Recycled in GAP/SLF/TSDF
14	Green Anode cooling Decantation tank sludge	Disposal in SLF/CHWTSDF
15	Shot Blasting dust	Disposal in SLF/CHWTSDF
16	Drain cleaning Sludge	Disposal in SLF/CHWTSDF
17	Ladle cleaning residues	Disposal in SLF/CHWTSDF
18	Spent Anode	Recycle/Authorized re-processors

(b) Disposal Practice of Non-hazardous Wastes

Sl. No.	Waste Description	Disposal Practice
1.	Ash (Fly Ash + Bottom Ash)	Disposal in ash pond through HCSD system/ Utilization in filling up of low lying area, Cement & Brick Manufacturing and quarry filling

PART – G

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

(A) Water Conservation Programs

- Revamping of Fire service water lines in Smelter Plant has been undertaken.
- Rainwater is utilized by installation of Lift Pump in SWPH Reservoir.
- Float valve installed in Sintex tanks to control overflow of water.
- Cooling Tower operational efficiency has been increased.

(B) Energy Conservation Initiatives

- Light automation thereby resulting in saving of 0.105 million kWh
- Installation of LED light in place of conventional light – 1.025 million kWh
- 100% Graphitized Cathode Implementation in Pot lines – 7.93 million kWh
- Process optimization of A group – 0.80 million kWh
- Ball Mill Running Hour Optimization – 0.80 million kWh
- Replacement of Non-ES pots by 100% graphitized cathodes – 309.816 million kWh
- Rectification of all air ingress points in FTP and operation optimization – 5.12 million kWh
- Optimization of voltage at lighting transformers – 0.1877 million kWh
- Increased pulsating interval for bag filter cleaning based on pressure drop across bag filter at Green Anode Plant – 0.232 million kWh
- Cooler Rotor Motor - Energy Efficient Motor Installation – 0.15 million kWh
- Energy Efficient Motor Installation – Screw Conveyor – 0.048 million kWh
- 2 nos. of RPH CT Fan VFD installed – 0.140 million kWh
- Old pump replaced with Energy efficient pump at RPH-01 – 0.133 million kWh
- Reduced discharge pressure of cooling water system from 6.5 to 4 kg/cm² at CH-2 – 0.21 million kWh

PART – H

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

(A) Additional Measures:

Air Pollution Control:

- Plantation of 392072 saplings done to increase the green cover.
- Newly designed telescopic chutes (3 nos.) installed at bath tanker loading points thereby lowering fugitive emissions of bath in Smelter 2 Rodding plant.
- Commissioning and operation of scoop bath handling system done which reduced fugitive emissions of bath dust while bath bin tilting operation (earlier manual tilting) in Smelter 2 Rodding plant.
- Sp. Hazardous waste generation (shot blasting dust) reduced from 8.68 kg/anode to 7.46 kg/anode
- Revamping of bath and butt handling dedusting units and dust conveying system (PDCS) done in Smelter 2 Rodding plant.
- Belt conveyor revamped to control spillages in Smelter 2 Rodding plant.
- PDCS installed at TP 7 area in Smelter 2 GAP.
- All Dedusting systems were made DP based in Smelter 2 GAP.
- Dust suppression system installed in track hopper to control fugitive emissions.
- Sprinkler system installed at truck tippler area.
- Mist cannon mounted water sprinkling trucks deployed at site to control fugitive emissions.
- DS line and fire hydrant line installed at Coal Handling Plant yards.
- Fly ash telescopic chute installed to reduce dust emission during fly ash bulker loading.

Water Pollution Control:

- Firefighting line leakages arrested at GAP-1, Potline propellia-2, AHS-2 area and Bake Oven area.
- Firefighting pipeline was made overground at potline backside & AHS boundary wall side and PMO to ETP area, RPH-1 front area, Hencon to cast house CT backside area
- Cooling tower basin sludge removal and fills replaced to increase efficiency.
- Drains cleaned and covering done in the surrounding of GAP building.
- Anode cooling basin cleaned.
- Firefighting line leakage arrested at GAP, Rodding, Cast house#3 area
- Potable water tank leakage arrested at AHS
- Potable line leakage arrested at Potline MCC-41, BRS-5 & Pet coke area
- Magnetic type float valve installed in Sintex tank
- Sintex tank cleaning throughout Plant-1 & 2.
- Wastewater recovered & used for AHP ash slurry discharge to reduce freshwater consumption (pump installation in compressor side drain)

Solid Waste Management:

- Achieved around 120.43% ash utilization in various avenues such as highway projects, cement plants, brick manufacturing etc.
- We have started ash shifting through railway rakes to various cement plants.

(B) Investment Proposals:

- Installation of RO of 200 m³/hr & MEE of 4.5 m³/hr in Smelter 1.
- Installation of wind barrier at Railway siding.
- Installation of mist canon to control fugitive emissions at raw material handling locations.
- Revamping of Smelter 1 FTP.
- Revamping of Smelter 2 STP.
- Revamping of CPP STP.

PART – I

Any other particulars for improving the quality of the environment

- Implemented Integrated Management System (IMS) across Smelter and CPP for better quality, pollution control and improve health of people working in the plant.
- World Environment Day Celebration to build up Environmental awareness among employees and community.
- Distribution of tree sapling in community for developing greenery