



Letter No: HILS/HKD/21-22/ 18

25th September 2021

To,

**The Member Secretary
State Pollution Control Board, Odisha
"Paribesh Bhawan"
A/118, Nilakantha Nagar
Unit – VIII, BHUBANESWAR – 751012**

Sub: Environmental Statement for the financial year 2020-2021

Dear Sir,

Please find enclosed herewith the Annual Environmental Statement in Form V with respect to our Aluminium Smelter at Hirakud for the financial year **2020-2021**.

This is for your kind information.

Thanking you,

Yours truly,


**Debasish Mallik
Plant Head –Smelter Hirakud**

Copy to the:

- (i) Director, Eastern Regional Office, MoEF&CC, Bhubaneswar – 751023
- (ii) Regional Director, CPCB, Kolkata-700107
- (iii) Regional Officer, SPCB, Sambalpur - 768 002

Hindalco Industries Limited

Hirakud Complex, Hirakud - 768 016, District: Sambalpur, Odisha, India

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Registered Office: Ahura Centre, 1st Floor, B-Wing, Mahakali Caves Road, Andheri (East), Mumbai-400 093, India

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Corporate ID No.: L27020MH1958PLC011238

“FORM-V”
(See Rule – 14)

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

PART- A

01. Name and Address of the owner / Occupier
Of the Industry, Operation or process : Mr. Debasish Mallik
Plant Head- Smelter
Hindalco Industries Limited,
Hirakud Smelter
P. O: HIRAKUD – 768016
Dist.: Sambalpur (ODISHA)
02. Industry category
Primary - (STC code) : 684. 1
Secondary - (SIC code) : 3720
03. Production Capacity - Units : 2.16 LTPA (as per CTO)
154126.386 MT (2020-21)
04. Year of Establishment : 1959
05. Date of the last Environmental Statement
Submitted : 29th September 2020.

PART- B

Water and Raw Material Consumption

01. **Water Consumption** : (m³)
2020-2021
- Process** : Nil
Cooling : 350400.87
Domestic : 166057

Name of the Products	Water consumption per unit of product	
	During the Previous Financial year 2019-2020	During the current Financial Year 2020 – 2021
Aluminium Metal	2.05 m ³ per ton of aluminium	2.28 m ³ per ton of aluminium

02. Raw Material Consumption:

Name of the Raw Materials	Name of the Products	Consumption of the Raw materials per unit of Output (Kg/Ton)	
		During the previous Financial Year 2019- 2020	During the Current Financial Year 2020- 2021
Alumina	Aluminium Metal	1906.917	1902.7
Aluminium Fluoride		20.97	19.02
Calcium Fluoride (Spar)		0.075	0.05
Prebaked Anode (Gross)		558.70	566.57
Net Carbon		439.48	444.07

PART- C

**Pollution Discharged to Environment / Unit of output.
(Parameters as specified in the Consent Order)**

Pollutants	Quantity of Pollutants discharged (mass / day)		Concentrations of Pollutants in discharges (mass/ volume)		Percentage of Variation from prescribed standards with reasons.
(a) Water	No Discharge of untreated effluent to outside the plant premises		No Discharge of untreated effluent to outside the plant premises		All the Plant effluents /sewage water being treated & recycled in Plant ETP/STP to maintain the ZLD status. The treated water is being reused for cooling and gardening purposes.
(b) Air	Total Fluoride (Kg/ MT. Al.)		SPM (mg/ Nm3)		Prescribed limiting Standards as per CTO
	Stack (FTP)	Pot room Fugitive	Stack (FTP)	Pot room Fugitive	Stack (FTP) Total F- 0.3 Kg/ MT. Al Fugitive Total F - 0.4 Kg/ MT. Al. Stack (FTP)/ Fugitive SPM - 100 mg/ NM3
*Annual avg.	0.06	0.31	8.38	9.32	

B.S.D.

PART- D

Hazardous Wastes Management

[as specified under Hazardous & Other Wastes (Management and Transboundary Movement) Rules, 2016]

Hazardous Wastes	Total Generation quantity		Total Disposal quantity	Total Storage quantity
	During the Previous Financial Year 2019-20	During the current Financial Year 2020-21	During the current Financial Year 2020-21	During the end of Financial Year 2020-21
Used oil	11.65 KL	5.941 KL	11.55 KL	0.394 KL
Waste containing oil	0.039 MT	0.029 MT	0.0 MT	3.87 MT
Spent Pot Lining (Cathode residues)	2659.569 MT	2442.62 MT	2286.3 (Carbon) & 2999.82 (Non-Carbon to TSDF)	40773.67 MT
Aluminium Dross	3974 MT	4438 MT	1311 (Sold to 3rd party) & 3303 (In-house reprocessing)	246.0 MT
Aluminium Dross Residue	2296 MT	2694 MT	2737.0 MT	4.0 MT
Pot Duct Cleaning Waste	8.5 MT	0.0 MT	0	0.0
Rejected lining of furnace (refractory)	0.0 MT	0.0 MT	0	112.76 MT
Rejected Refractory of furnace	0.0 MT	0.0 MT	0	2.0 MT
Shot Blasting Dust (containing Fluoride)	44.2 MT	59.24 MT	59.24 MT	0.0
Ladle cleaning residue	16.88 MT	14.84 MT	0.0 MT	0
Rejected filter Bags (FTP)	14.24 MT	11.48 MT	8.510 MT (own SLF)	2.97 MT
Asbestos waste	0.0 MT	0.0 MT	0.0	0.4 MT
Rejected AlF3 Bags	0.008 MT	0.014 MT	0.0	0
Fluoride contaminated waste (spilled waste from potline)	30.58 MT	26.92 MT	0.0	0
Drain cleaning sludge	2.08 MT	1.73 MT	0.0	1.73 MT
Floor sweeping & housekeeping waste	41.88 MT	373.7 MT	372.35 MT	1.35 MT
Tar containing waste	0.0 MT	0.0 MT	0.0 MT	0
ETP sludge	2.944 MT	3.38 MT	3.46 MT (own SLF)	2.223 MT
Used Anode butts	19182.83 MT	18863.98 MT	18879.60 MT	10.99 MT
Discarded container/Liners used for Hazardous chemicals	Nil	Nil	0	0

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(b) From Pollution Control Facilities

i) Water Pollution Control System adopted by our unit

- Total no's of ETP with RO system installation 250KLD, 350 KLD and One 50KLD
- Total no's of STP installation 1×100KLD, 1×500KLD,1×300KLD, 1×400KLD
- We are maintaining to zero discharge concept during non-monsoon seasons.
- Online effluent water monitoring system has been connected to OSPCB and CPCB server.

(ii) Air Pollution Control System adopted by our unit

- 4nos of FTP and 5nos of stack has been connected to all pot room for fume collection.
- All stack emission and ambient monitoring data has been connected to OSPCB and CPCB server.
- Installation & commissioning of spectrometer (Laser diode gas Analyzer using optical radiation to monitor HF concentration in two paths) at 235KA and another 8path has been installed at 85 KA.

(iii) Hazardous Waste Management Practice

- 11 no's of over ground SPL shed established for storing SPL
- Own SLF (Secured land fill)-5300m³
- Own in-house recovery of aluminium dross plant in consent with OSPCB.
- Used anode butts supplied to Aditya Aluminium for reuse in green anode making
- Our other hazardous wastes are being disposed to CHWTSDF/recyclers/reprocessing units as per the hazardous waste authorization order and manifest is being maintained.

**PART- E
Solid Wastes**

Solid waste	Total Generation quantity (MT)		Total Disposal (Sold) quantity (MT)
	During the Previous Financial Year 2019-20	During the current Financial Year 2020-21	During the current Financial Year 2020-21
(a) From Process			
Scrap Cast iron	86.47	118.420	118.420
Scrap Collector bar	932.30	476.600	476.600
M.S Scrap	763.69	658.720	658.720
Scrap Cast Steel rod	614.52	267.240	267.240
Scrap Steel-Al clad	18	3.15	3.15
MS Strip	64.30	58.85	58.85

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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.

Disposal of Hazardous Wastes:

Hazardous Wastes	Physical Form	Composition	Storage Description	Disposal Practice
Used oil	Liquid	Not Applicable	Stored in designated place.	Sold to authorized recyclers
Waste containing oil	Solid	Not Applicable	Stored in designated place.	Disposed as per authorization
Spent Pot Lining (Cathode residues)	Lumps	See Annex-I	Stored in covered sheds on concrete floors.	Segregation of carbon and refractory portion on impervious concreted platform under well ventilated covered shed and shall be stored separately in ear marked area under shed/supply and or sale of carbon portion to authorized actual user and disposal of refractory portion to CHWTSDF/any other actual user authorized by SPCB, Odisha
Aluminium Dross	Lumps	See Annex-II	Stored in covered sheds on concrete floors.	In-house recycling and disposed to SPCB authorized re-processors.
Aluminium Dross Residue	Solid Powder	See Annex-II	Stored in covered sheds on concrete floors.	Disposed to CHWTSDF/ supply to authorized recycler.
Pot Duct Cleaning Waste	Solid Powder	See Annex-IV	Stored in covered sheds.	Recycled inside the Pot
Rejected lining of furnace (refractory)	Solid Hard Lumps	See Annex-V	Stored in covered sheds.	Disposed to CHWTSDF
Rejected Refractory of furnace	Solid Hard Lumps	See Annex-V	Stored in covered sheds.	Disposed to CHWTSDF
Shot Blasting Dust(containing Fluoride)	Solid Granular	-	Stored in covered sheds	Disposed to CHWTSDF
Ladle cleaning residue	Solid Powder & Lumps	See Annex-VI	Stored in covered sheds.	Recycled inside the Pot
Rejected filter Bags (FTP)	Solid Pieces	See Annex-VII	Stored in covered sheds.	Incinerated in the pots.
Asbestos waste	Solid	See Annex-VIII	Not generated	To be disposed at CHWTSDF
Rejected AlF ₃ Bags	Solid	See Annex-IX	Stored in covered sheds.	Incinerated in the pots.
Fluoride contaminated waste (spilled waste from potline)	Solid	Not Applicable	Stored in covered sheds.	Recycled inside the Pot
Drain cleaning sludge	Solid Powder	See Annex-X	Stored in covered sheds.	Disposed to CHWTSDF
Floor sweeping &	Solid	See Annex-XI	Stored in covered	Disposed to CHWTSDF

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housekeeping waste	Powder		sheds.	
Tar containing waste	Solid	See Annex-XII	Not generated	To be disposed to CHWTSDF
ETP sludge	Solid Powder	See Annex-XIII	Stored in covered sheds on concrete floors.	Disposed to CHWTSDF
Used Anode butts	Lumps	See Annex-III	Stored in covered sheds on concrete floors.	Supplied to Aditya aluminium, Lapanga for recycling/sold to actual users
Discarded container/Liners used for Hazardous chemicals	Solid Plastic	Not Applicable	Stored in covered sheds.	Supplied to authorized recyclers

PART- G

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

A Impact of pollution control measures:

- i) All the HSS pots have been converted to PFPB and dry scrubbers (FTP –1, FTP-2, FTP-3 & FTP-4) are being operated for all the pots. Due to this conversion and up-gradation of the smelter the fluoride and other emissions have been reduced to a large extent.
- ii) The operation of FTPs (dry scrubbers) apart from reducing and controlling fluoride emission to the atmosphere to a greater extent, has achieved recycling of fluoride thereby reducing fluoride consumption leading to resource conservation.
- iii) Closed loop cooling towers are operational all the time for casting plant, continuous casting plant, rodding plant, rectifiers, compressors, and other equipment thereby reducing the chances of water contamination.
- iv) Three nos. of Effluent Treatment Plant (ETP)-250KLD, 350KLD & 50KLD one no. each have been installed for treating fluoride with a conventional fluoride treatment followed by double stage Reverse Osmosis & Four nos. STP (500KLD, 100KLD, 400KLD, 300KLD STP) has been installed for plant & colony sewage treatment. The treated water is being completely recycled inside plant. This has further reduced the specific water consumption.
- v) The spent pot lining (SPL) is stored under covered shed on concrete floor. The carbon portion is being sent to M/s Green energy Pvt Ltd. (more than 100% disposal) and the refractory portion stored under the covered shed.
- vi) The used oil generated is either used as lubricant or sold to CPCB/SPCB authorized party with maintaining Manifest.
- vii) The used batteries are properly stored on concrete floor under a designated shed to avoid contamination to environment and are being sold to authorized dealers / returned on buy back policy.

B.S.D.

- viii) The unit has installed Dross reprocessing plant where 100% dross is being recycled.

B Total Environmental expenditure:

Sr No	Head of expenses	During the Previous financial Year 2019- 2020 (Lac)	During the current financial Year 2020- 2021 (Lac)
1	Capex Expenditure	171.5	760.7
2	Revenue Expenditure	2921.5	2603.6
3	Total expenditure	3093.03	3364.3

PART- H

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

1. The upgradation of 250 KLD ETP to 350 KLD at CPP side is completed.
2. 100 KLD (approx.) STP installation in colony is planned.
3. DPR of three sites under Contaminated Sites Management is under progress
4. Installation of two online cameras as specified by OSPCB under progress.

PART- I

Any other particulars for improving the quality of the Environment.



(Authorized Signatory)



CHEMICAL COMPOSITION

TYPICAL COMPOSITION OF Cathode residue (Spent pot lining)

<u>Parameters</u>	<u>Values (%)</u>
pH	10
Carbon	45 - 50
Aluminium	0.4 - 0.5
Silica	1.0 - 1.5
Iron	0.5 - 1.0
Sodium	15 - 20
Fluoride	10 - 12
Aluminium carbide & nitride	5.0 - 6.0
Cyanide	0.01- 0. 025
Others	10 - 15

TYPICAL COMPOSITION OF DROSS

<u>Parameters</u>	<u>Values (%)</u>
Alumina	40 - 60
Aluminium	20 - 25
Carbides	5 - 8
Nitrides	0.01 – 0.05
Iron	0.5 – 1.0

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TYPICAL COMPOSITION OF ANODE BUTT

<u>Parameters</u>	<u>Values (%)</u>
Chromium	0.04 - 0.06
Molybdenum	0.139 - 0.233
Vanadium	3.19 - 3.27
Fluoride	0.161 - 0.361
Chloride	0.263 - 0.379
Iron	7.0 -16.0
Manganese	0.069 - 0.132
Nitrate (NO ₃ ⁻)	0.204 - 0.432
Sulphur (S)	2.43 - 3.53

TYPICAL COMPOSITION OF POT DUCT CLENGING WASTE

<u>Parameters</u>	<u>Values (%)</u>
pH	5.90
Cobalt	0.0006
Nickel	0.0458
Copper	0.0183
Lead	0.0056
Fluoride	7.0 - 8.0
Zinc	0.0031

P. S. D.

**TYPICAL COMPOSITION OF REJECTED LINING OF FURNACE
(REFRACTORY)**

<u>Parameters</u>	<u>Values (%)</u>
pH	7.11
Chromium	0.064
Molybdenum	0.209
Vanadium	0.273
Fluoride	2.86
Chloride	0.069
Iron	0.182
Manganese	0.064
Nitrate (NO ₃ ⁻)	0.017
Sulphur (S)	0.029
Silicon	3.18

TYPICAL COMPOSITION OF LADDLE CLEANING RESIDUE

<u>Parameters</u>	<u>Values (mg/Lit & mg/Kg)</u>
pH	7.25
Ammonia as N	< 1 mg/Lit
Fluoride	< 1 mg/Lit
Nitrate Nitrogen	< 1 mg/Lit
Arsenic	< 0.1 mg/Kg
Cadmium	< 0.5 mg/Kg
Chromium(Total)	15.57 mg/Kg
Hexavalent Chromium	< 5.0 mg/Kg
Lead (Total)	< 10.0 mg/Kg
Nickel (Total)	9.26 mg/Kg
Zinc (Total)	29.34 mg/Kg
Copper (Total)	13.24 mg/Kg

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TYPICAL COMPOSITION OF REJECTED FILTER BAG

<u>Parameters</u>	<u>Values (mg/Lit & mg/Kg)</u>
Ammonia as N	< 1 mg/Lit
Fluoride	< 1 mg/Lit
Nitrate Nitrogen	< 1 mg/Lit
Arsenic	< 0.1 mg/Kg
Cadmium	< 0.5 mg/Kg
Chromium(Total)	15.57 mg/Kg
Hexavalent Chromium	< 5.0 mg/Kg
Lead (Total)	< 10.0 mg/Kg
Nickel (Total)	9.26 mg/Kg
Zinc (Total)	29.34 mg/Kg
Copper (Total)	13.24 mg/Kg

TYPICAL COMPOSITION OF ASBESTOS WASTE

<u>Parameters</u>	<u>Values (%)</u>
pH	9.47
Nickel	0.0017
Copper	0.0005
Lead	0.0015
Fluoride	0.0210

P.S.

TYPICAL COMPOSITION OF REJECTED AlF₃ Bags

<u>Parameters</u>	<u>Values (%)</u>
pH	6.21
Copper	0.0014
Fluoride	3.50

TYPICAL COMPOSITION OF DRAIN CLEANING SLUDGE

<u>Parameters</u>	<u>Values (%)</u>
pH	6.60
Nickel	0.0060
Copper	0.0066
Lead	0.0020
Fluoride	0.630
Zinc	0.026

TYPICAL COMPOSITION OF FLOOR SWEEPING WASTE

<u>Parameters</u>	<u>Values (%)</u>
pH	6.32
Nickel	0.0004
Copper	0.0010
Fluoride	0.1450
Zinc	0.0003

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TYPICAL COMPOSITION OF TAR CONTAINING WASTE

<u>Parameters</u>	<u>Values (%)</u>
pH	9.21
Nickel	0.0052
Copper	0.1260
Lead	0.0179
Fluoride	0.0560
Zinc	0.0155
Vanadium	0.0013
Zinc	0.0155
Chromium	0.0045
Cadmium	0.0001

TYPICAL COMPOSITION OF ETP SLUDGE

<u>Parameters</u>	<u>Values (%)</u>
Calcium Fluoride	1.42
Barium	0.00334
Calcium	0.99
Cobalt	0.0006
Chromium	0.0005
Copper	0.0012
Iron	0.24
Potassium	0.0218
Magnesium	0.35
Manganese	0.0123
Sodium	0.0939
Nickel	0.0048
Zinc	0.0169
Phosphorus	0.0729
Titanium	0.0040

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DETAILS OF DISPOSAL (2020-21)

ANNEXURE – XIV

Hazardous Waste disposal in (2020-21)

Serial No:	Type of hazardous waste	Disposal of hazardous waste in MT per Annum (2020-21)
i	Used oil (in KL/Annum)	11.55
ii	Waste containing oil	0
iii	Spent Pot Lining (Cathode residues)	2286.3 (Carbon) & 2999.82 (Non-Carbon to TSDF)
iv	Aluminium Dross	1311 (Sold to 3 rd party) & 3303 (In-house reprocessing)
v	Aluminium Dross (Residue)	2737.00
vi	Pot Duct Cleaning Waste	0.0
vii	Rejected lining of furnace (refractory)	0.0
viii	Rejected Refractory of furnace	0.0
ix	Shot Blasting Dust (Containing Fluoride)	59.24
x	Ladle cleaning residue	0.0
xi	Rejected filter Bags (FTP)	8.510
xii	Asbestos waste	0.0
xiii	Rejected AlF3 Bags	0.0
xiv	Fluoride contaminated waste (spilled waste from potline)	0.0
xv	Drain cleaning sludge	0.0
xvi	Floor sweeping & housekeeping waste	372.35
xvii	ETP sludge	3.46
xviii	Used Anode butts	18879.60
xix	Discarded container/Liners used for Hazardous chemicals	0.0

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