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balco
BHARAT ALUMINIUM COMPANY LIMITED
P.O. - BALCO Nagar, Korba, CG
India - 495684

BALCO /ENVT/A-01/2024/338

28th September 2024

To,
The Member Secretary,
Head Office, Chhattisgarh Environment Conservation Board,
Paryavas Bhawan, North Block, Sector-19,
Atal Nagar RAIPUR (C.G.).

Sub: Environment Statement of Smelter Plant 3.25 LTPA & 2.7 LTPA and its Fabrication Including NCRM and Hi-Tech Rolling Mill, Import of CP coke and Dross Processing Unit, Alumina, Finished Goods and CP Coke Railway Sidings, BALCO for the financial year 2023-24.

Dear Sir,

With reference to the captioned subject, we are enclosing the Environment Statement of Smelter Plant 3.25 LTPA & 2.7 LTPA and its Fabrication Including NCRM and Hi-Tech Rolling Mill, Import of CP coke and Dross Processing Unit, Alumina, Finished Goods and CP Coke Railway Sidings, BALCO for the financial year 2023-2024 in the prescribed Form - V under Rule 14 of the Environment (Protection) Rules, 1986 and the relevant provisions of the Environment (Protection) Act, 1986.

Thanking you,

Yours truly,

RK Singh
Dy. CEO- Metal

Encls: a/a

Copy to:
1. Regional Officer, CECB, Korba

FORM- V

(See Rule-14)

ENVIRONMENTAL STATEMENT FOR THE FINANCIAL YEAR 2023-24

PART – A

1.	Name & address of the owner/ occupier of the industry operation or process	:	**Mr. Rajesh Kumar** **CEO & Whole Time Director (BALCO)** BHARAT ALUMINIUM COMPANY LIMITED, KORBA – 495684 (Chhattisgarh) (Aluminum Smelter of 3.25 LTPA & 2.7 LTPA and its Fabrication Including NCRM and Hi-Tech Rolling Mill, Import of CP coke and Dross Processing Unit. Alumina, Finished Goods and CP Coke Railway Sidings)
2.	Industry category primary (STC Code) /Secondary (STC Code)	:	Primary
3.	Production Capacity	:	5.95 LTPA (Five Lakh Ninety-Five Thousand) TPA of Hot Metal and its fabricated products including Hitech Rolling mill & NCRM.
4.	Year of establishment	:	Plant I – Nov 1973 Smelter 2.7 LTPA – Jan 2005 Smelter 3.25 LTPA – Feb 2013 NCRM: June 2003 HTRM: Jan 2010
5.	Date of last Environment Statement Submitted	:	28th September 2023

PART – B
WATER AND RAW MATERIAL CONSUMPTION

i) Water Consumption in m^3/day: -[1]

Process, Cooling	104.35
Domestic (Plant)	706.39
Other	0.00

[1] *Excludes water consumption in Township.

Name of product	WATER CONSUMPTION PER UNIT OF PRODUCT OUTPUT	
	During the financial year 2022-23 (m^3/MT)	During the financial year 2023-24 (m^3/MT)
Aluminium	**0.59***	**0.52***

* Water consumption based on water used for per metric ton production.

ii) Raw Material Consumption:

Name of raw Materials	Name of Product	CONSUMPTION OF RAW MATERIAL PER UNIT (Kg/T)	
		FY 2022-23	FY 2023-24
Sp. Alumina Consumption*	Aluminium & Its fabricated Products	1932.72	1931.40
Sp. Aluminium Fluoride Consumption *		19.52	17.74
Sp. CP Coke Consumption*		379.18	367.98
Sp. Pitch Consumption*		84.84	82.12
Sp. HFO Consumption #		37.013	12.129
Sp. LSHS Consumption#		0.039	24.933
Sp. Alloying Metal Consumption#		12.078	13.703

*** Per unit of hot metal produced, # Per unit of finished goods produced**

PART – C

Pollution discharged to environment/ unit output

Water: *Zero discharge condition maintained.*

Air: *Monitoring results for major pollutants are attached as Annexure-I*

PART- D

HAZARDOUS WASTE

As specified under Hazardous and other Waste (Management and Transboundary Movement) Rules 2016

A. From Process

Hazardous Waste	TOTAL QUANTITY GENERATED (MT)	
	FY 2022-23	FY 2023-24
Spent Pot Lining	11752	10712.000
Used Oil/Spent Oil	27.79	47.110
Wastes containing oil	2.4	2.086
Flammable chemical waste (Lab)	0.117	0.016
Used Anode Butts	73385.452	75282.499
Drosses and waste from treatment of salt sludge	6963.70	8225.775
Flue gas dust & other particulates	3277.50	3146.500
Discarded Asbestos	22.50	23.950
Empty barrels/ containers/liners (Contaminated)	72.81	82.115
Oil & Grease skimming	Nil	Nil
Glasswool	Nil	Nil
Spent ion exchange resin containing toxic metals	Nil	Nil

B. From Pollution Control Devices

Hazardous Waste	Quantity (MT) in FY 2022-23	Quantity (MT) in FY 2023-24
Chemical sludge from wastewater treatment	0.64	0.700
Rejected filter bags	49.50	47.930

PART- E
SOLID WASTE

A. From Process

Hazardous Waste	TOTAL QUANTITY GENERATED (MT)	
	FY 2022-23	FY 2023-24
Spent Pot Lining	11752	10712.000
Wastes containing oil	2.4	2.086
Used Anode Butts	73385.452	75282.499
Drosses and waste from treatment of salt sludge	6963.70	8225.775
Flue gas dust & other particulates	3277.50	3146.500
Discarded Asbestos	22.50	23.950
Empty barrels/ containers/liners (Contaminated)	72.81	82.115
Oil & Grease skimming	Nil	Nil
Glasswool	Nil	Nil
Spent ion exchange resin containing toxic metals	Nil	Nil

B. From Pollution Control Devices

Hazardous Waste	FY 2022-23	FY 2023-24
Chemical Sludge from wastewater treatment	0.64	0.700
Rejected Filter bags	49.50	47.930

C. 1. Quantity Recycled or Re-Utilized within the unit:

Hazardous Waste	FY 2022-23	FY 2023-24
Used anode butts	73810.993	75046.959

2. Sold:

Hazardous Waste	FY 2023-24
Spent Pot Lining	20305.940
Drosses and waste from treatment of salt sludge	11353.830
Used anode butts	1396.360
Used/spent/waste Oil - (5.1)	44.938
Empty barrels /containers /liners contaminated with hazardous chemical /waste-(33.1)	126.608

3. **Disposed:**

Hazardous Waste	FY 2022-23	FY 2023-24
Discarded Asbestos	77.24	23.950

PART- F

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

Characterization:

A. Aluminium Dross:

Parameter	Unit	Value
Aluminium metal	%	5-15
Iron	%	0.5-1
Alumina	%	75 – 90
Carbide & Nitrate	%	2-3
Fluoride	%	0.01- 0.1

B. Spent Pot Lining:

Parameter	Unit	Value
Carbon	%	45-50
Aluminium	%	0.4-0.5
Silica	%	1-1.5
Iron	%	0.5-1
Sodium	%	15-20
Fluoride	%	10-12
Al Carbide & Nitride	%	5-6
Cyanide	%	0.01-0.025
Others	**%**	**1—15**

Disposal Practice of Hazardous and Solid Waste:

S.No	Waste Description	Disposal Practice
1	Wastes containing oil	Captive Incineration in cast house furnaces/ Sale to authorized recyclers
2	Spent Pot Lining	(i) Disposal through captive SLF/ Sale to authorized re-processor for detoxification/ Co-processing in cement plant/other residues of cathode will be sale to authorized recyclers/ reprocessor/ Coprocessing in Cement Plant/SLF. (ii) Utilization of Spent Pot Lining (SPL) stored in Captive Secured Land Fill (SLF) and Sale to authorized reprocessor for detoxification/ Coprocessing in Cement Plant
3	Used Anode Butts	Recycle and reuse in green anode plant for anode making/ captive SLF/ Sale to authorized recycler
4	Drosses and waste from treatment of salt sludge	Metal recovery in cast house/sale to authorized utilizers/Disposal of residues to authorized utilizers
5	Flue gas dust & other particulate	Reuse in GAP for anode making/ disposal in captive SLF/ Sale to authorized utilizers/TSDF
6	Discarded Asbestos	Sale to authorized recyclers/ disposal in captive SLF/TSDF
7	Empty barrels/ containers/liners (Contaminated)	Sale to authorized recyclers
8	Oil & Grease skimming	Disposal in captive SLF/ Sale to authorized Recyclers
9	Glasswool	Disposal in captive SLF/TSDF
10	Rejected Filter bags	Captive incineration in pots
11	Spent ion exchange resin containing toxic metals	Utilization for energy recovery in boiler for steam or power generation as per SOP issued by CPCB
12	Chemical sludge from wastewater treatment	Disposal through captive SLF/co-processing in cement plant

PART- G

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

Smelter 3.25 LTPA and smelter 2.7 LTPA are designed with Point-Feeder Pre-Baked technology, which is much superior to the Soderberg technology. The Smelters are designed with Dry Scrubbing and

Fume Treatment Plants wherein the fluorides from collected gases are removed. These measures have ensured that the air pollutants are much below the desired norms. Effluent treatment plant with RO system has been established for treatment and recycling of water leading to conservation/reduction of natural resources. Replacement of HFO with LSHS to reduce SOx emission and adoption of EV forklifts in place of diesel forklifts leading to GHG emission reduction.

PART- H

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

Expenditure / investment for environmental protection, for the year 2023-24 for both Smelters 2.7 LTPA & its fabrication including Hitech Rolling Mill & NCRM and Smelter 3.25 LTPA was approx. Rs. 50.56 Cr. (Capex Rs. 2.24 Cr. & Opex Rs. 48.32 Cr.) which includes Capital investment in Environment protection, operation and maintenance of air pollution control equipment, water pollution control equipment, horticulture, housekeeping, waste management, monitoring, and other expenses.

The details of expenditure in various environmental measures are as under-

Expenditure incurred for various Environmental measures 2023-24		
S. No.	**Project Description**	**Amount (Cr)**
A.	**Capital Expenditure (Capex)**	
1	Roof top lazer based HF analysers for gaseous fluoride monitoring at roof vent	1.48
2	Fugitive emission monitoring system (Cassette Method) for total fluoride monitoring at roof vent	0.76
	Sub Total	**2.24**
B.	**Operational Expenditure (Opex)**	
1	FTP and other air pollution control equipment - operation and maintenance cost for Metal area	13.56
2	Water and other utilities pollution control equipment - operation and maintenance cost	0.58
3	Horticulture cost	1.22
4	Waste management and housekeeping cost	31.56
5	Environment Monitoring/ calibration/ AMC and upkeep of equipment's	0.83
6	Others including statutory fee, awareness, awards, studies, consultancies etc.	0.57
	Sub Total	**48.32**
Total		**50.56**

PART – I

Any other particulars for improving the quality of the environment

- Tree plantation is carried out every year in and around the BALCO Complex as well as in the Balco Township. During the year 2023-24 we have carried out plantation of 85,111 saplings at various places in and around BALCO Plant premises.
- BALCO Smelters are certified with the Environment Management System (ISO 14001:2015) certificate.
- BALCO Smelters are certified with the Energy Management System (ISO 50001:2018) certificate.
- Environment Day, Ozone Day, Earth Day being celebrated to awareness stakeholders and employees of BALCO for protection of Environment.

FY 2023-24															
Smelter 2.7 LTPA	**Parameter**	**Norms**	**Unit**	**Apr'23**	**May'23**	**Jun'23**	**Jul'23**	**Aug'23**	**Sep'23**	**Oct'23**	**Nov'23**	**Dec'23**	**Jan'24**	**Feb'24**	**Mar'24**
FTP 1	PM	50.00	(mg/Nm3)	3.32	2.56	3.06	3.23	3.53	2.17	2.98	2.37	4.38	3.92	2.28	2.29
	Particulate Fluoride	0.65	(mg/Nm3)	0.04	0.04	0.04	0.04	0.06	0.05	0.05	0.06	0.05	0.04	0.03	0.04
FTP 2	PM	50.00	(mg/Nm3)	2.91	3.26	2.72	2.35	2.29	2.45	2.28	2.68	3.33	4.70	1.93	2.59
	Particulate Fluoride	0.65	(mg/Nm3)	0.03	0.05	0.04	0.05	0.03	0.03	0.03	0.03	0.04	0.04	0.05	0.06
FTP 3	PM	50.00	(mg/Nm3)	4.00	2.95	3.17	2.54	2.42	2.73	2.73	2.91	2.80	2.90	2.15	2.01
	Particulate Fluoride	0.65	(mg/Nm3)	0.04	0.03	0.05	0.06	0.09	0.07	0.05	0.05	0.05	0.03	0.03	0.04
FTP 4	PM	50.00	(mg/Nm3)	2.79	3.10	2.90	3.32	3.25	1.92	3.04	3.51	2.93	4.06	2.78	2.36
	Particulate Fluoride	0.65	(mg/Nm3)	0.05	0.03	0.03	0.05	0.06	0.04	0.05	0.04	0.03	0.01	0.02	0.05
Smelter 3.25 LTPA	**Parameter**	**Norms**	**Unit**	**Apr'23**	**May'23**	**Jun'23**	**Jul'23**	**Aug'23**	**Sep'23**	**Oct'23**	**Nov'23**	**Dec'23**	**Jan'24**	**Feb'24**	**Mar'24**
FTP 1	PM	50.00	(mg/Nm3)	2.85	2.68	3.51	2.29	2.52	2.05	3.06	1.96	2.24	2.08	2.02	2.93
	Particulate Fluoride	0.65	(mg/Nm3)	0.04	0.05	0.05	0.02	0.04	0.04	0.06	0.04	0.03	0.02	0.04	0.05
FTP 2	PM	50.00	(mg/Nm3)	2.33	2.24	2.90	3.59	3.16	2.97	2.47	2.87	4.78	2.34	2.23	2.56
	Particulate Fluoride	0.65	(mg/Nm3)	0.05	0.05	0.04	0.03	0.04	0.03	0.04	0.03	0.05	0.03	0.04	0.04
Bake Oven	**Parameter**	**Norms**	**Unit**	**Apr'23**	**May'23**	**Jun'23**	**Jul'23**	**Aug'23**	**Sep'23**	**Oct'23**	**Nov'23**	**Dec'23**	**Jan'24**	**Feb'24**	**Mar'24**
FTP 1	PM	50.00	(mg/Nm3)	36.90	25.70	27.70	23.60	10.70	27.20	11.20	21.80	15.70	14.50	9.60	16.20
	Particulate Fluoride	0.65	(mg/Nm3)	0.09	0.07	0.05	0.07	0.05	0.04	0.04	0.06	0.04	0.06	0.06	0.05
FTP 2	PM	50.00	(mg/Nm3)	0.07	0.07	0.04	0.04	0.04	0.03	0.05	0.06	0.03	0.04	0.04	0.03
	Particulate Fluoride	0.65	(mg/Nm3)	0.38	0.40	0.26	0.31	0.22	0.18	0.31	0.31	0.18	0.21	0.27	0.29
GAP 1	**Parameter**	**Norms**	**Unit**	**Apr'23**	**May'23**	**Jun'23**	**Jul'23**	**Aug'23**	**Sep'23**	**Oct'23**	**Nov'23**	**Dec'23**	**Jan'24**	**Feb'24**	**Mar'24**
D6	PM	50.00	(mg/Nm3)	24.70	21.30	25.40	27.10	28.10	18.40	12.30	USD	11.20	24.80	19.80	11.50
D7	PM	50.00	(mg/Nm3)	32.10	24.60	17.40	26.30	24.90	12.90	10.40	USD	35.20	13.40	26.80	14.90
D8	PM	50.00	(mg/Nm3)	17.90	14.70	14.70	20.20	18.50	7.70	9.90	USD	27.90	22.90	13.40	13.40
D9	PM	50.00	(mg/Nm3)	38.40	16.80	23.60	25.80	22.30	22.90	11.70	USD	32.40	14.10	USD	18.30
GAP 2	**Parameter**	**Norms**	**Unit**	**Apr'23**	**May'23**	**Jun'23**	**Jul'23**	**Aug'23**	**Sep'23**	**Oct'23**	**Nov'23**	**Dec'23**	**Jan'24**	**Feb'24**	**Mar'24**
D6	PM	50.00	(mg/Nm3)	21.40	18.60	24.10	23.40	22.10	24.60	15.20	USD	23.60	20.10	14.10	18.60
D7	PM	50.00	(mg/Nm3)	18.60	20.10	14.10	28.40	18.60	15.90	11.70	USD	36.90	25.00	24.20	18.40
D8	PM	50.00	(mg/Nm3)	16.20	14.20	19.30	18.70	19.80	13.30	13.70	USD	14.50	24.40	10.20	17.40
D9	PM	50.00	(mg/Nm3)	20.60	12.90	USD	USD	26.20	26.10	16.70	USD	20.10	24.40	17.10	19.00