

HZL/DSC/ENV/ES/2024/1

Date 21.09.2024

To,

✓ **The Member Secretary**  
**Rajasthan State Pollution Control Board**  
**4, Institutional Area**  
**Jhalana Doongri**  
**Jaipur-302004**

**File No. M-53****Sub:** Environmental Statement for the year 2023-24 for Zinc Smelter, Dariba, Rajsamand.**Ref:** F(HDF)/Rajsamand(Railmagra)/6461(1)/2020-2021/4691-4693 dated 22.01.2021

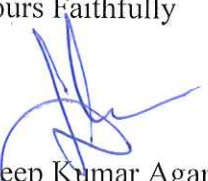
Sir,

With reference to above subject please find enclosed herewith the Environmental Statement for the financial year 2023-24 for Zinc Smelter, Dariba, Rajsamand.

Thanking You,

For Hindustan Zinc Limited

Yours Faithfully



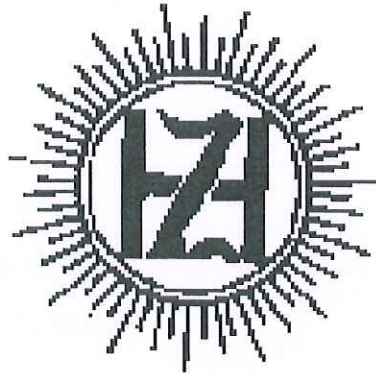
(Deep Kumar Agarwal)  
Deputy SBU Director  
Dariba Smelter Complex

Cc:

1. Regional Officer, RSPCB  
Old excise office building,  
Kalalwati, Rajnagar, Rajsamand  
Pin code : 313324
2. The Deputy Director (S)/Scientist – C  
Ministry of Environment Forest and Climate Changes,  
Integrated Regional Office, A-209 & 218, Aranya Bhawan,  
Jhalana Institutional Area, Jaipur – 302004.
3. O/C



**Hindustan Zinc Limited  
Dariba Smelter Complex**



**ENVIRONMENTAL STATEMENT FOR ZINC  
SMELTER  
(FINANCIAL YEAR ENDING MARCH 31<sup>ST</sup> 2024)**

**PREPARED & SUBMITTED BY**

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**Zinc Smelter  
Dariba Smelter Complex  
Hindustan Zinc Limited  
P.O. - Dariba, District – Rajasmand  
Rajasthan - 313211**

**Form V**  
**Environment Statement**  
**For the Financial Year ending the 31<sup>st</sup> March 2024**  
**Part A**

- (i) Name and address of the owner/occupier of the industry operation or process : Arun Misra  
CEO  
M/s. Hindustan Zinc Limited  
Dariba Smelter Complex  
Hindustan Zinc Limited,  
P.O.- Dariba, Tehsil- Relmagra  
Dist. - Rajsamand  
Rajasthan – 313 211
- (ii) Industry category : Red/ Large
- Primary – (STC Code) : AAACH7354KST006
- Secondary- (SIC Code) : Not Applicable
- (iii) Production Capacity :

***Zinc Smelter***

SHG Zinc Cathode/Ingot (Special High Grade) : 250,000 TPA

CGG (Continuous Galvizing Grade) Zinc : 40,000 TPA

***By-Products (in TPA)***

Cadmium metal / Sponge (equivalent metal) : 800 TPA

Calomel : 44 TPA

Copper as Copper cement/sulphate/concentrate (equivalent metal) : 500 TPA

Lead Silver Compound/Low Grade Lead Concentrate : 40000 TPA

Sulphuric Acid : 612000 TPA

Year of Establishment : 2010

- (iv) Date of Last Environmental Statement Submitted : 22.09.2023

## PART -B

## WATER AND RAW MATERIAL CONSUMPTION

(1) Water consumption (m<sup>3</sup> /d)\*

Boiler/Cooling	:	3591
Domestic	:	233
Industrial Process	:	1933

\* Daily water consumption for Zinc Plant (2, 50,000 TPA) including STP water

Name of Product		Process water consumption per unit of product output(cum/MT)	
		During the previous financial year	During the current financial year
		(1)	(2)
SHG Zinc Cathode/Ingot	With STP water	7.20	8.08
	Fresh Water (without STP water)	0.38	0.47

## (2) Raw material consumption

Name of raw material	Name of products	Consumption of raw material per unit of output MT	
		During the previous financial year	During the current financial year
Zinc concentrate	SHG Zinc Cathode/ Ingot	1.93	1.94
Calcine		1.71	1.72
Aluminum Metal		0.0015	0.0013
Zinc dross and Zinc bearing waste		0.028	0.022
Calcine from outside DZS		NIL	NIL

## 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
<b>a) Water</b>	Not Applicable as Zero Discharge is maintained.		
pH			
TDS			
DO			
Suspended Solids			
Oil and Grease			
Chromium as hexavalent			
Manganese			
Nickel			
Copper			
Zinc			
Cadmium			
Lead			
Mercury			
Cyanide			
<b>b) Air</b>			
	<b>Zinc Plant</b>		
Particulate matter	12.24 Kg/day	31.81 mg/Nm <sup>3</sup>	-36.38
SO <sub>2</sub> R-1	1152.4 Kg/day	412.6 mg/Nm <sup>3</sup>	-56.56
Acid Mist	97.1 Kg/day	34.91 mg/Nm <sup>3</sup>	-30.18
SO <sub>2</sub> R-2	950.4 Kg/day	371.93 mg/Nm <sup>3</sup>	-60.86
Acid Mist	77.6 Kg/day	30.8 mg/Nm <sup>3</sup>	-38.4



## PART-D

## HAZARDOUS WASTES

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

As DSC is having common Hazardous waste authorization, which includes Zinc, Lead and CPP, so mentioned hazardous waste generation is for complete DSC location.

Hazardous Waste	Total Quantity Generation (Kg.)	
	During the previous financial year	During the current financial Year
<b>(a) From process</b>		
- Jarosite	177821000	189786000
- Purification Cake	4198000	3921040
- Anode Mud	1183000	1132000
- Cooler Cake	2518580	2947270
- Cobalt Cake	---	---
- Used /spent Oil	54090	38620
- Spent Catalyst (V2O5)	26810	29440
- Chemical Sludge (Salts)	1506660	1233900
- Discarded Containers/barrels/liners used for hazardous waste/Chemicals	134 Nos	148 Nos
- Flue Gas Cleaning Residue	--	--
- Spent ion exchange resin containing Toxic metal	--	--
- Oil soaked filter	--	--
- Waste/residues containing oil	--	2980
- Process Residue	18305360	19947640
<b>(b) From pollution control facilities</b>		
- Non-ferrous sludge from ETP and scrubbers (ETP Cake)	13961820	14005430

### PART-E SOLID WASTE

DSC has a common storage facility for storage of Scrap, which includes Zinc, Lead and CPP, so mentioned waste generated is for completed DSC location.

Solid Waste	Total Quantity Generation (Kg.)	
	During the previous financial year	During the current financial Year
<b>(a) From process</b>		
<i>Metal Scrap</i>	1599594	753820
<i>Wooden Scrap</i>	140355	98388
<i>Plastic Waste</i>	37800	7640

### PART-F

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

#### Details of Hazardous Wastes & Its Disposal Method

Sr. No.	Name of waste	Quantity (MT)	Chemical Characteristics (%)	Mode of Treatment / Disposal
1	Jarosite	189786.0	Zn: 2.5 -5 Pb: 5-7 Fe: 25-31	Stabilization with lime & cement as Jarofix using patented Jarofix Technology (M/s Canadian Electrolytic Zinc), followed by disposal in Jarofix yard.
2	Non-ferrous sludge from ETP and scrubbers (ETP Cake)	14005.43	Zn: 1- 8 Cu: 0.01 – 0.02 Pb: 0.2 – 0.5	Disposal in captive SLF after stabilization.
3	Cooler Cake	2947.27	Zn: 0.5-1.5 Balance Gypsum	Disposal in captive SLF after stabilization.
4	Purification Cake	3921.04	Zn: 20 - 35 Cd: 8-10 Cu: 3-12	Sale to authorized recyclers registered with CPCB/ MoEF.
5	Anode Mud	1132	Mn: 30-45 Zn: 0.3 - 1 Pb: 5-8	Reuse/sale to authorized recyclers registered with CPCB/ MoEF and surplus disposal to captive SLF.
6	Used Oil/Spent	38.62	--	Reuse/sale to authorized recyclers



	Oil			registered with CPCB/ MoEF.
7	Chemical Sludge (Salts)	1233.9	Sodium Salts (Na <sub>2</sub> SO <sub>4</sub> .10H <sub>2</sub> O etc)	Disposal in SLF
8	Spent Catalyst (V <sub>2</sub> O <sub>5</sub> )	29.44	V <sub>2</sub> O <sub>5</sub>	Disposal in SLF
9	Discarded Containers/barrels/liners used for hazardous waste/Chemicals	148 Nos.	--	Disposal in SLF
10	Cobalt Cake	--	--	No Generation
11	Flue Gas Cleaning Residue	--	--	No Generation
12	Spent ion exchange resin containing Toxic metal	--	--	No Generation
13	Oil soaked filter	--	--	Incineration in TSDF
14	Waste/residues containing oil	2.98	--	Sale to registered recycler
15	Process Residue	19947.64	--	Reuse/sale to authorized recyclers registered with CPCB/ MoEF.
16	Fly Ash	92109.48	75053.14	Provided to Cement Manufacturers
			17055.84	Backfilling in mines
17	Bottom Ash	11856.56	11856.56	Provided to Brick manufactures
16	Metal Scrap	753.820	--	Sent to recyclers
17	Wooden Scrap	98.388	--	Sent to recyclers
18	Plastic Waste	7.64	--	Sent to recyclers

## PART-G

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

Our aim is to preserve the long- term health of the natural environment affected by our operations. We set and achieve targets that promote efficient use of resources and include the reduction and prevention pollution.

#### **Air Environment**

##### **Control of SO<sub>2</sub> Emissions in Acid Plant**

During operation of the smelter complex, the main emission source is SO<sub>2</sub> from stack attached to Sulphuric Acid Plant. SO<sub>2</sub> emission is restricted to 1.5 kg/tone of acid and acid mist is controlled below 50 mg/Nm<sup>3</sup> which conform to the stipulated regulatory norms. Adequate stack height (100-m.) has been provided. DCDA process is used for better SO<sub>2</sub> conversion and absorption efficiency. Candle Filter system and De-mister pad are installed in the Acid Plant to control Acid Mist.

##### **Control of Particulate Matter Emission**

Bag filters have been provided in calcine handling and Zinc dust plant. The PM emissions are controlled below 50 mg/Nm<sup>3</sup>.

Water sprinkling at transfer points and storage is deployed. The concentrate has inbuilt moisture content of around 7-8% which keep this powdery material in wet conditions avoiding any significant emissions. Conveyors are covered, with water sprinkling at junction of transfer points.

#### **Water Environment**

We have a long-term approach to water management that aims to improve our performance, recognize the significance of water and contribute to sustainable water management. We understand its importance and adopt best practices for making the judicious use of water and conserve it.

Effluent generated from the Dariba Smelter complex is treated in Effluent Treatment Plant (ETP) of capacity 9000 m<sup>3</sup>/day along with 8850 m<sup>3</sup>/day capacity of RO plant

The effluents generated from gas cleaning plant, sulphuric acid plant, anode and cathode washing, DM plant, cooling towers and power plant are treated to neutralize the acidity and to precipitate and remove metallic elements.

Treated water is reused/ recycled in processes. Multiple Effect Evaporator (MEE) and Solar Evaporation Ponds have been provided to treat RO reject water to ensure Zero Effluent Discharge from the plant premises.



Sewage collected from the plant is collected and treated in 500KLD Sewage Treatment Plant(STP). Sewage collected from residential colony is treated in Sewage Treatment Plant (STP) established in the colony itself.

Storm water ponds of adequate capacity have been constructed inside the plant premises for storing the drain water for further treatment in the ETP. It is used in the monsoon in conserving the rain water for further use in the plant.

### **Waste Management**

We focus on a '4R' waste strategy - Reduce, Recycle, Reuse and Reclaim and 'Eco-friendly' disposal of process residues. The solid wastes generated from the Zinc smelter, are given in 'Part F' of the environmental statement.

A well designed Secured Landfill (SLF) with double composite liner system and Jarofix Yard with single composite liner system has been constructed in the plant premises for the proper disposal of the waste for preventing the deterioration of the land and water environment.

### **Noise**

In the Smelter, noise is generated from waste heat recovery boiler, fans, compressors and blowers. All equipments in the Smelter have been designed /operated to have a noise level in line with the regulatory requirements. Necessary acoustic enclosures have been provided to limit noise levels within the norms.

## **PART-H**

### **Additional measures/investment proposal for environment protection including abatement of pollution /prevention of pollution.**

#### **Green belt Development**

Implementation of afforestation program is of paramount importance for Dariba Smelter Complex. In the financial years 2009-2021, 266240 nos. of saplings have been planted successfully .Drip irrigation facility has been provided to all the plant saplings.

The various plant species grown at Dariba Smelter Complex include; Neem (*Azadirachta indica*), Amaltas (*Cassia fistula*), Shisum (*Dalbergia Shishoo*), Ficus Religiosa, Terminalia Arjuna, Karanj (*Pongamia pinnata*) and Gulmoher (*Delonix regia*), Sheesham, Pipal, Arjun, Bakan Neem etc. While selecting the plant species for green belt, following points have been taken into consideration:

- Dust capturing efficiency;
- Plant's growth;
- Canopy cover; and
- Origin of plant
- Arid Climatic conditions

**PART-I**

**Any other particular for improving the quality of the environment.**

**Environmental Monitoring**

Regular monitoring of important and crucial environmental parameters is of immense importance to assess the status of environment during plants operation. With the knowledge of baseline conditions, the monitoring program can serve as an indicator for any deterioration in environmental conditions due to operation of the plants and suitable preventive steps could be taken in time to safeguard the environment. Monitoring is as important as that of control of pollution since the efficiency of control measures can only be determined by monitoring. A full-fledged environmental laboratory has been set up for regular monitoring of environmental parameters, inside and outside the plant.

The environmental attributes being monitored are as given below:

- Air Pollution and Meteorological Aspects
- Water and Waste water Quality
- Noise Levels
- Soil Quality

As per CPCB guidelines we have also installed online emission monitoring and effluent quality monitoring system. Real time data is being transmitted to CPCB and RPCB server.