ENVIRONMENTAL AUDIT REPORT

2023 - 24

HINDALCO INDUSTRIES LTD.

Plot No.: 2, 10,11, 43, At & PO Dahej, Lakhigam,
GIDC Estate Dahej,Tal: Vagra, Dist: Bharuch

ISO 9001 : 2008

Audited By :

DEPARTMENT OF CHEMICAL ENGINEERING

FACULTY OF TECHNOLOGY
DHARMSINH DESAI UNIVERSITY
COLLEGE ROAD, NADIAD-387 001 (GUJARAT)

Gujarat Pollution Control Board
Paryavaran Bhavan, Sector-10-A,
Gandhinagar - 382 010
Fax: (079) 23222784, (079) 23232161.

ENVIRONMENTAL AUDIT
FOR
M/s. HINDALCO INDUSTRIES LTD., DAHEJ
(Period from 1st April 2023 to 31st March 2024)

A GENERAL

1.	Name of the Industry	:	**M/s. Hindalco Industries Ltd.**
2.	Location	:	At & PO. Dahej, Lakhigam Taluka - Vagra, Dist. : Bharuch - 392130
3.	Registered Office Address	:	Hindalco Industries Ltd. Century Bhavan, Dr. Annie Besant Road, Mumbai-400 025
4.	Month & Year of Establishment	:	February 1995
5.	(a) No. of workers employed. (b) Male/Female	: :	Male: - 1495 Female: - 51 Total: - 1546
6.	(a) No. of electrical connections with service Numbers. (b) Total Connected Load (c) Electrical consumption per ton of product manufactured. (d) Percentage enhancement in energy saving as compared to previous year	: : :	(a) One number of H.T connection Service N0. 39123 (b) 76228 KW **(c) Refer Annexure - I** **(d) Refer Annexure - I**
7.	No. of D.G. Set & their capacity	:	Two DG sets, 2.5 MW capacity each. (Only for emergency use)
8.	Name/Residential address of all Director/Partners	:	**Refer Annexure - II**
9.	Telephone Nos. (Residential & Industrial) Fax No. E-mail of Industry E-mail of Partners/Directors	: : : :	Tel No. 02641-256004/5/6 , 02641-2510009 Fax No: - 02641-251002, 251003 Tel: - 0141 2225047 **Refer Annexure - II**
10.	No. of Shifts & Timings	:	1st Shift- 06:00 to 14:00 hrs. 2nd Shift- 14:00 to 22:00 hrs. 3rd Shift- 22:00 to 06:00 hrs. General Shift-08:30 to 17:45 hrs. 08:30 to 13:00 hrs. (On Saturdays)

11.	Name & Address of the in charge of Environment/Safety Division /Cell/Unit	:	**For Environmental Management:** Ms. Sanghamitra Mishra (HOD Environment) Address: Hindalco Industries Limited. Unit: Birla Copper, At & PO Dahej, Lakhigam, Taluka: Vagra,Dist.: Bharuch-392 130. Tel.No.02641-256004,256005,256009,251009, Fax No. 02641-251002, 251003
12.	No. days during which production activities were in operation during the Audit period covered	:	**Refer Annexure – III**
13.	Has the industry obtained ISO 9000/ISO14000/OSHAS 18000/Any other EM accreditation/Certificate or recognition?		Industry is accredited with ISO: 9001:2015 for its Quality Management System, ISO: 14000:2015 for its Environmental Management System and OHSAS: 18001:2018 for Occupational Health and Safety.
14.	Whether the industry has adopted cleaner production / cleaner technology / CDM?		Cleaner production technology is adopted in Scrubbers of Smelter-1 and Smelter-3.

B PRODUCTION DETAILS

1.	Name of products & capacity with yield/purity per day	:	**Refer Annexure – IV**
2.	Name of all by products and its quantity per day	:	**Refer Annexure – IV**
3.	Date of commencement of production for each product. Whether production is as per consented quantity	:	**Refer Annexure – IV**
4.	All raw materials required per kg of the product(s)	:	**A Refer Annexure – V**
5.	Whether the manufacturing process is continuous or batch wise. Indicate the batch capacity. If the process is in batch operation, No. of batches/month along with the duration of the completion of each batch.	:	Manufacturing process is continuous.
6.	Detailed manufacturing process with Schematic Flow Diagram, list of unit operation & processes and with all chemical reactions, along with the time required (in hrs.) for completion for each unit operation/process and the total time for completion the entire batch, Mass Balance in respect of the quantity of the quantity of water, input	:	**Refer Annexure – VI**

of raw materials and waste generation.
(Attach separate sheet)

C WATER

1.	The quantity of water consumed per day as well as per ton of product manufactured (Attach Water Balance Diagram) * over last three years	:	**Refer Annexure – VII**
2.	The quantity of wastewater (trade effluent) generated per ton of each product per day, as well as per batch * over last three years	:	**Refer Annexure – VIII**
3.	The particulars of effluent treatment plant (Attach separate sheets)		**Refer Annexure – IX**
i)	Name & size of the each of ETP unit	:	**Refer Annexure – IX**
ii)	The capacity of the ETP	:	ETP has capacity to treat 320m^3/hr. (Max) effluent.
iii)	Flow Diagram & Hydraulic Diagram of ETP to be submitted.		**Refer Annexure – IX**
iv)	Whether lighting arrangement around ETP is provided	:	Yes, adequate lighting arrangement is provided around ETP
v)	Whether separate energy meter is installed for effluent treatment plant. If yes, readings of the meter for consumption every month.	:	Yes, a separate energy meter is installed for Effluent Treatment Plant. **Refer Annexure – X**
vi)	Whether flow meters are provided at the inlet & outlet of the ETP. Please indicate the type of Flow meter	:	Magnetic Flow meter is installed at the outlet of ETP.
4.	The method of disposal of Final treated effluent and the point of disposal.	:	The treated effluent conforming to standards as per norms specified by GPCB is utilized for Greenbelt Development, for lime slurry preparation, for makeup in slag granulation and remaining treated effluent is discharged into the deep sea at the point recommended by National Institute of Oceanography (NIO) and approved by GPCB i.e. in the Gulf of Khambhat through a submarine pipeline having diffuser system at a point Lat. 21°42'00", Long. 72°30'35"
5.	The quality of trade effluent at the inlet and outlet of ETP and at various stages of treatment (Attach separate sheets)	:	**Refer Annexure – XI**
6.	The quantity and quality of sewage and its method of treatment & disposal	:	**Refer Annexure – XII**

(Attach separate sheets)

a. As per Norms
b. Total pollution load*

7. The open area available for disposal of the effluent : Not Applicable

8. Whether the quality of treated effluent meets the specified norms. If No, the extent of deviation and reason thereof : Yes

9. Improvement in effluent quality and quantity since previous environmental Audit based on performance evaluation of effluent management systems. If yes provide details (Attach separate sheet) : No

10. Retrofitting undertaking to improve performance of ETP. If yes, provide details : No

11. Major problems encountered during operation of Effluent treatment facilities, if any and reasons thereof. : Not any

12. The details about the operator/ chemist responsible for operation and maintenance of effluent treatment plant : **Refer Annexure – XIII**
    (i) Name of Operators/ Employees
    (ii) Qualification and Experience of each Operator/Employee whether trained in such operation or not.
    (iii) Salary of Operators/ Employees

13. The current status of consent under the Water Act-1974. : **Refer Annexure – XIV**

D AIR

1. No. of flue gas stacks, their height (from ground level) nature and consumption of fuel. : **Refer Annexure – XV**

2. The details pertaining to the Stack Monitoring facilities. : **Refer Annexure – XV**

3. Number of process stacks, their height (from ground level) source, expected pollutants and the details pertaining to the provisions of Stack Monitoring : **Refer Annexure – XVI**

facilities.

4.	The quality of emission from each flue gas stack and the process stack and the extent of deviation from them.	:	**Refer Annexure – XVII**
5.	The ambient air quality within the factory premises, along with the number of ambient air quality monitoring stations outside the industry	:	**Refer Annexure – XVIII**
6.	The status of consent under the Air Act-1981.	:	**Refer Annexure – XIV**
7.	The details of air pollution control measures for all process and flue gas stacks	:	**Refer Annexure – XIX**
8.	Improvements in emission quality since the previous Environmental Audit based on performance evaluation of air pollution management system if yes provide details. (Attach separate sheet)	:	All parameters are under norms.
9.	Retrofitting is undertaken to improve Emission quality if yes provide details.	:	No
10.	Major problems encountered during operation of control device if any and reasons thereof.	:	No

E HAZARDOUS (SOLID) WASTE

1.	The quantity, sources, and composition of Hazardous waste/Solid waste from each process. Sources over the last three years. (Total Sludge generation per ton of product) Whether it is as per the consented quantity.	:	**Refer Annexure – XX**
2.	a. The method of storage, treatment, and disposal of Hazardous/Solid Waste. The details should include the area of storage and disposal and whether storage and disposal system is covered and made impervious (pucca). The quantity of Hazardous waste sends to TSDF. Please also indicate how the quantity of Hazardous/Solid shall be reduced in next three months. b. The data/information about	:	**Refer Annexure – XX**

leachate generation quantity and characteristic and treatment facility.

3. The status of authorization under the EPA-86 for solid waste. : **Refer Annexure – XIV**

4. Plan, If any to reduce hazardous waste generation or its recycling. :
   1) Already sending Hazardous waste -Dore slag, Copper converting slag, Liberator cake and Dust & Lumpy for recycling
   2) We are putting all effort for diversion of land filling waste to Reuse/Recycle/Recover/Co processing

F SITE PLAN

1. The site plan showing the location of effluent treatment plant, final point of disposal of effluent, sampling point, drainage line, stacks, solid waste storage; disposal area and green belt (its width). : **Refer Annexure – XXI**

G RESOURCE RECOVERY

(i) The details regarding resource recovery including treated effluent for recycle/reuse from environmental pollution control system including effluent treatment plant. :

i. In Copper smelter plant, concentrate dust is generated in FSF & Converter and it is recovered with help of ESPs installed. The recovered dust contains Copper; hence it is recycled along with raw material.
ii. Cu-As precipitates generated from Refinery plant are mainly containing Copper and it is completely recycled to Smelter plant for recovery of same

(ii) The details regarding resource recovery/byproduct recovery from manufacturing process by using cleaner production technology.

i. The Copper Smelter plant is based on the clean production technology of Flash Smelting Furnace, where in copper concentrate is smelted in highly energy efficient manner.
ii. During the Smelting operation of copper concentrate heat generated due to exothermic reaction is completely recovered with help of Waste Heat Recovery Boilers and steam generated is used to produce power from it.
iii. Similarly, the technology for converting the Sulfur dioxide generated from smelting plant is based on the Monsanto Enviro chem technology of USA, which is world renewed for its conversion of SO_2 into Sulfuric acid. With this technology emission of SO_2 from final tail gas stack remains within the norms.

: iv. Conversion of SO_2 to SO_3 during the manufacture of Sulfuric acid is an exothermic reaction; heat of reaction is recovered with help of Waste Heat Recovery boilers of Sulfuric acid plant, which is an energy conservation measure.

: v. Conservation of water through recycling of treated industrial & domestic water for other use.

H HEALTH

1. Whether any hazard is involved in the manufacturing or from the work environment. Yes/No If yes, provide details thereof.	:	Yes, hazardous chemicals such as Sulfuric acid, IPA, F.O. and Liquid Natural Gas, etc. are used. All precautions taken care by us as per the statutory norms are followed in handling these chemicals.
2. Whether industry has Pre-employment & periodical medical examination facilities. Yes/No. If yes, provide details thereof.	:	Yes **Refer Annexure - XXII**
3. Whether health records are maintained regarding adverse effect on the health of workers. Yes/NO If yes, provide details thereof.	:	Yes **Refer Annexure - XXIII**
4. Whether industry has appointed a factory medical officer. Yes/No If yes, full time or part time. Include the details about the Name, Address and Qualification of the Factory Medical Officer.	:	Following are the full-time doctors of the company. **Dr. Deepak Dara (CMO)** Birla Copper Township, Dahej - 392 130 **Dr. Babita Dara**, Birla Copper Township, Dahej - 392 130 **Dr. Alok B Patel** Birla Copper Township, Dahej - 392 130
5. Details of Medical Facilities available. Please tick (√) correct column. Dispensary / Ambulance / Hospital / First Aid Box.	:	Dispensary (√) / Ambulance (√) / Hospital (√) / First Aid Box. (√)
6. Whether sanitary facilities like Closets, Urinal, bathrooms are provided and satisfactory.	:	Satisfactory

I ACCIDENTS

1. The details of accidents in the factory and remedial measures taken.	:	**Refer Annexure - XXIV**

J SAFETY MEASURES

1. General Environment of the factory. Please tick (✓) the appropriate column :

A	House Keeping	: Good (√)
B	Dustiness	: Medium (√)
C	Lighting	: Good (√)
D	Ventilation	: Good (√)

2. Whether the following protective appliance are provided to all the persons: If yes, How Many? :

A	Goggles	: Yes
B	Gloves (Rubber + Cotton)	: Yes
C	Gumboot	: Yes
D	Helmet	: Yes
E	Skin Cream	: Yes
F	Soap	: Yes
G	Ear Plugs	: Yes
H	Face Masks	: Yes
I	Clothing	: Yes

3. The details of facilities for Disaster Management/ Gas Leakage. : On-site Emergency Plan is provided for the existing plants for Disaster Management/Gas Leakage and is updated periodically.

4. Whether on site/off site emergency plan is prepared and is being implemented/upgraded regularly; Please gives details. : On-site Emergency Plan has been prepared and is updated.
Refer Annexure – XXV

5. Weather records of occupational hazardous are maintained? : Yes, it is a part of OHSAS 18001:2018

6. Preventive measures adopted to minimize occupational hazard. : Please see onsite emergency plan.

K REMEDIAL MEASURES

1. The details of sources; monitoring and measures taken for control of noise pollution in and around the industrial premises. : **Refer Annexure – XXVI**

2. The measures taken for prevention treatment and control of odor nuisance in and around the industrial premises. : The employees are provided with necessary PPE.

3. The details in respect of cases/complaints under the Water Act-1974, the Air Act-1981 & the EPA-1986. : No complaints,
Refer Annexure – XXVII

4. The Compliance report with respect to all the conditions of NOC/Consent (Under all the Acts). : **Refer Annexure – XXVIII**

5. Incidents of spillages, leakages etc. and remedial measures thereof. :

6. Whether insurance policy obtained under PLI Act Yes/No. If yes, provide details : **Yes**
Refer Annexure – XXIX

L WATER CESS

1. The details regarding payment of the Water Cess for the previous and the Current Year. : **Not applicable**

M The Name and Address of consultant engaged by the Company / Industry. : M/s Greenleaf Envirotech Pvt Ltd., SURAT

N It is declared that all the information submitted in & with respect to this format by us is correct and for any lapse regarding incorrect information or not giving complete information we are responsible for that.

Sr.	Name & Signature of the recognized person of the Industry/Organization/ Institute/CETP/TSDF with stamp	Signature
1.	**Mr. Jayesh Pawar (JP)** Head- Copper Vertical	
2.	**Mr. Anand Pawar (VP)** Head-HR	
3.	**Mr. Pankaj Jain (VP)** Head O&M CPP & Facilities	
4.	**Mr. Jayesh Patel (VP)** Head O&M Copper Vertical	
5.	**Mr. Linu Panchaman (VP)** Head O&M – Products	
6.	**Mr. Krishanu Mahapatra (VP)** Head – Quality, Laboratory, Environment & Technical Services	
7.	**Ms. Sanghamitra Mishra (GM)** Head – Environment	

Sr.	Name of all the member of Audit Team (Department of Chemical Engg.)	Signature
1.	**Dr. M. S. Rao** Chemical Engineer	
2.	**Mrs. Jigna K. Pandya** Environmental Engineer	
3.	**Mr. Bhavesh Desai** Chemist	
4.	**Mr. Pratik Amin** Microbiologist	

The Environment Management System Adequacy Efficacy: Attached Certificate

Dharmsinh Desai University (Guj.) INDIA College Road, Nadiad

THE ADEQUACY CERTIFICATE OF ENVIRONMENT MANAGEMENT SYSTEM

M/s Dharmsinh Desai University, Department of Chemical Engineering is recognized by the GPCB, Gandhinagar under the Environmental Audit Scheme introduced by the Hon'ble High Court Gujarat, vide its Orders dated. 20/12/96 & 13/3/97 and modified vide Order dtd. 16/9/99 as and Environmental Auditor for the purpose of the auditing, having carried out Environmental Audit of

a) M/S : **Hindalco Industries Ltd. Unit: Birla Copper, Dahej**

b) Located at : Lakhigam, At &PO. Dahej, Tal; Vagara Dist: Bharuch

c) Manufacturing products as under:

Sr. No.	Name of product	Consent Quantity
Product (TPA)		
1.	Cathode copper	500000
2.	Sulfuric Acid (98.4 %)	1470000
3.	Oxygen (Tech.)	780000
4.	Gold	26
5.	Silver	200
6.	CC Rod	484000
7.	Phosphoric Acid	360000
8.	DAP/NPK Fertilizer	872000
9.	Electric Power (MW)	145.6
By product (TPM)		
10.	Selenium	60
11.	PGM Concentrate	0.0508
12.	Granulated Sludge	65500
13.	Phospho Gypsum	150000
14.	Hydro Fluosilic acid	5580
15.	Aluminum Fluoride	500

Having completed the Environmental Audit period on personal monitoring, and audit report, prepared as per the direction of Hon'ble High Court in Environmental Audit Scheme, it is certified that the Environmental Management System (EMS) provided by this industry for the products manufactured and capacity as stated above is adequate and efficient to achieve the quality of effluents (Air + Wastewater + Solid Waste) as specified in Consent/Notifications by GPCB, Gandhinagar for the following quantity of waste generation.

a) Liquid effluent : **5759 m^3/day** Industrial (with R.O. Reject: 4785 m^3/day, Domestic: **974 m^3/day**

b) Solid Waste :

Sr. No.	Type of Waste	Schedule	Quantity (TPA)
1.	ETP waste sludge & scrubber waste	35.3/I	175095 TPA
2.	Arsenic bearing sludge (As-Cu precipitate)	7.3/I	270.80 TPA
3.	Used oil	5.1/I	50 KL/Yr
4.	Spent electrolyte solution	8.1/I	52560 KL/Yr
5.	Residue/ Dust from SAP	17.1/I	12 TPA
6.	Spent Catalyst	10/IV	160 KL/Year
7.	Used empty drums	33.1/I	200 TPA
8.	Flue Gas Cleaning residue	35.1/I	864 TPA
9.	Spent resin from DM Plant	35.2/I	7.5 KL/Yr
10.	Selenium &Selenium compound	A-8/II	6 TPA
11.	Silver compound	A9/III	6 TPA
12.	Inorganic Acid	B15/II	66960 TPA
13.	Dust & Lumpy	4/IV	35000 TPA
14.	Copper Converting or C-Slag	6/IV	6000 TPA
15.	Liberator cake	4/IV	3000 TPA
16.	Copper Revert	4/IV	72000 TPA
17.	Dore Slag (Slags from copper processing for further processing or refining)	6/IV	2500 TPA
18.	Lead Anode/ Cathode	17/IV	80 TPA
19.	Cotton waste used (Contaminated cotton rags or other cleaning materials)	33.2/I	15 TPA
20.	Used Insulation	A2050	100 TPA
21.	Discarded PPE (Rubber)	B3040 Part B /III	5 TPA
22.	Used membrane/ Filter cloth and bags	35.1/I	20 TPA
23.	SWRO plant sludge	35.3/I	9490 TPA
24.	Thermal plant or Evaporator sludge	35.3/I	17520 TPA

c) Air Emission (Flue gas stack as well as process stacks) : Adequate/~~not adequate~~ efficacious/~~not efficacious~~ (Refer Annexure – XVII)

This certificate is valid for the audit period only. However, it is subject to automatic cancellation in case of any change in product profile/capacity, quality & quantity of effluents (Air + Water + Solid) and efficiency of EMS equipment. This certificate forms part of the Environmental Audit report.

Date: 25-06-2024
Place: Nadiad

Name & Address of the Auditor:
Dharmsinh Desai University,
Department of Chemical Engineering
College Road,
Nadiad – 387 001 (Gujarat)

Signature of the Authorized Person

Coordinator
Environmental Consultancy Cell

Dharmsinh Desai University (Guj.) INDIA College Road, Nadiad