



ज़ावर माईन्स
पिन कोड - 313901
जिला - उदयपुर (राज.)

HINDUSTAN ZINC LIMITED
हिन्दुस्तान जिंक लिमिटेड
Telephone - (0294) 2723400

Zawar Mines
PIN Code – 313901
Dist - Udaipur (Raj.)

Ref.: - HZL/ZM/ENV/2021/422

Date – 21.09.2021

By Registered

The Member Secretary
Rajasthan State Pollution Control Board
4- Institutional Area, Jhalana Dungri
JAIPUR-302004 (Raj)

Sub.: Environmental Statement for the year 2020-21 for Zawar Group of Mines

Ref: F(Mines)/Udaipur(Sarada)/53(1)/2016-2017/4491-4495 dated 12/01/2021
F(CPM)/Udaipur(Sarada)/2(I)/2017-2018/10088-10090 Dated 21/03/2018
F (HDF)/Udaipur (Sarada)/1(1)/2020-2021/4885-4887 dated 29/01/2021
Environment Clearance vide No – J-11015/259/2012-IA-II(M) dated 16/10/2020

Sir

Please find attached herewith the **Environmental Statement** for the year **2020-21** for **Zawar Group of Mines**

Thanking you

Yours Sincerely

Kishore Kumar S
(Director –Zawar, SBU)

Encl.: As above

- CC: 1. The Director, Ministry of Environment and Forests, Regional Office (Central Region), Kendriya Bhawan, 5th Floor, Sector "H", Aliganj, Lucknow – 226024,(U.P.)
2. The Regional Officer, Rajasthan State Pollution Control Board, F-470, Near UCCI Building, Madri Industrial Area, Udaipur- 313003 (Raj.).
→ 3. Office Copy (Env. Cell)

FORM – V(See Rule-14)**ENVIRONMENTAL STATEMENT FOR FINANCIAL YEAR ENDING ON 31st MARCH, 2021****PART – A**

1	Name and Address of the Owner / Occupier of the Industry / Operation and Process	Sh. Arun Mishra CEO & Whole Time Director Hindustan Zinc Limited, Yashad Bhawan, Udaipur-313001 (Raj)
2	Name and address of unit head	Sh. Kishore Kumar S Director, Zawar Mine SBU Hindustan Zinc Limited, Tehsil- Sarada, Dist- Udaipur- 313901 (Raj)
3	Industry category Primary (STC code) Secondary (STC code)	Red/Large Mining of lead-zinc minerals and ore processing NA
4	Production capacity	4.8 Mtpa of ore production & Its beneficiation
5	Year of establishment	Prior to 1950
6	Date of last environmental statement submitted	14.09.2020

PART – B**(i) Fresh water consumption (Average)**

Parameters	m ³ /day	
	2019-20	2020-21
Year	2019-20	2020-21
Process	3687.59	1991.82
Domestic	2227.36	3798.98

Name of product	Process fresh water consumption per unit of product output	
	2019-20	2020-21
Lead - Zinc concentrate	0.17 m ³ /MT*	0.28 m ³ /MT*

Our product output is lead - zinc concentrate. Whereas water consumption shown as cubic meter per ton of ore treatment in beneficiation plant

(ii) Raw material consumption

Name of product	Name of raw material	Consumption of raw material per unit of output (gm/MT) *	
		2019-20	2020-21
Lead & Zinc Concentrate	Copper Sulphate	132.31	133.00
	MIBC + Frothosol	32.30	32.96
	Xanthate	27.52	29.98
	Sodium Cyanide	7.50	3.71
	Lime	0.535	1.04

*Raw material consumption is shown as grams per tonne of ore treatment

Production	2019-20 (MT)	2020-21 (MT)
Ore treatment	3292729	3945313
Total Concentrate	231255.2	273240

PART – C**POLLUTION DISCHARGED TO ENVIRONMENT/UNIT OF OUTPUT
(Parameters as specified in the consent issued)**

SN	Pollutants	Quantity of pollutants discharged	Concentration of pollutants in discharge (mass/volume)	% age of variation from prescribed standards and reason
a	Water	Zero discharge status	No Discharge	Zero discharge is maintained as per the consent granted by the RSPCB.
b	Air dust emission from stack (SPM)			

Mochia Crusher	38.2kg/day	50.33 mg/Nm ³	66.44 % lesser than standard
Balaria Crusher	38.9 kg/day	50.20 mg/Nm ³	66.53 % lesser than standard
DE-2 (Mill-2)	21.6 kg/day	48.22 mg/Nm ³	67.85 % lesser than standard
DG- Set	-	57.35 mg/Nm ³	23.53 % lesser than standard

**PART – D
HAZARDOUS WASTE**

[As specified under Hazardous Waste (Management, Handling & Transboundary Movement) Rules 2008]

Hazardous waste	Total quantity during the year (MT)	
	2019-20	2020-21
a. From Process		
Decontaminated drums sold	495 Nos. & 2.1 MT	436 Nos. & 1.72 MT
Oil Sludge	0	
Used Oil sold	ZM-184.93 MT ZM CPP- 0 MT	ZM- 335.47 MT ZM CPP- 5.17 MT
Scrap lead acid batteries sold	4 MT	5.23 MT
b. From pollution control facility		
	Nil	Nil

**PART – E
SOLID WASTE**

SN		Total quantity during the year	
		2019-20	2020-21
a	From process (Tailings)*	3061474 MT	3672073 MT
b	From pollution control facility **	Nil	Nil
c	1-Quantity recycled or reutilized	Nil	Nil
	2-Solid	Nil	Nil
	3-Disposed***		
	Oil Sludge	0	0
	Used Oil sold	ZM-184.93 MT ZM CPP- 0 MT	ZM- 335.47MT ZM CPP- 5.17 MT
	Scrap lead acid batteries sold	4 MT	5.23 MT

* Tailing is a major waste material generated from beneficiation plant.

** All the dust slurry transported to process plant and utilized.

*** Used/Spent oil & Scrap lead acid batteries sold to registered parties with MoEF / CPCB.

PART – F (Format)

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

- i. **Solid Waste-** The Solid Waste in form of tailings (Non-Hazardous) generated from beneficiation plant is- **3672073 MT** having following mineralogical composition

Particular	% Content
Total Lead	0.14 %
Total Zinc	0.20 %
Total Iron	3.5% - 4%
Insoluble	30 % - 35%
Cadmium	0.0085 %

Tailing is pumped to Dry tailing plant where water is separated from tailings and dry tailing cake having moisture around 15 to 18% is disposed in Tailing storage facility. Water thus separated is 100% recycled in beneficiation plant.

Installed hydro fill plant and paste fill plant to backfill the tailing in mine void.

Waste rock- Total generation – **1032264 MT**

The waste rock does not contain any minerals and are inactive rocks. This waste is dumped in open stopes of mines and also used in strengthening and height rising of tailing storage facility.

- ii. **Used oil**- Used oil is recovered from the different machinery and heavy earth movers. Used oil is stored in drums and kept in the specified area for disposal to registered re-refiners with MoEF/CPCB
- iii. **Discarded Containers and bags**- Discarded containers of chemicals are stored in the earmarked place, decontamination before disposal to TSDF.

PART – G

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

Wet Tailing of beneficiation plant is being processed in Dry Tailing Plant to produce dry tailing of 15-18% moisture content, which is stacked in Tailing Storage facility. Water is reclaimed from Dry Tailing plant and is pumped back to beneficiation plant for reuse. Water requirement is met out by our captive Tidi Dam. The water requirement for process plant is meet out by 80% reclaimed water of tailing storage facility thereby reducing fresh water consumption.



Dry Tailing Plant



Dry Tailing



Tailing Storage Overview



Tailing Embankment Drain

PART – H

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

The following works were completed to improve the working environment.

- Installed Hydrofill and pastefill plant to backfill tailings in mine void



Hydro Fill Plant



Paste Fill Plant

- Wet drilling operations continued.
- Transportation of concentrates in tarpaulin covered trucks.



Tarpaulin covered truck

- De-dusting systems at both the secondary crushers at Beneficiation Plant (Mochia & Balaria crushers).
- Installation of water sprinklers at Baroi and Mochia Mine Stockpile.
- Installation of water spray nozzles at Coarse Ore Stockpiles and other transfer points at Beneficiation Plant.



Mochia Coarse Ore Stockpile



Balaria Coarse Ore Stockpile

Unit is certified for ISO-9001:2015(QMS), ISO-14001:2015 (EMS), ISO-45001:2018 and SA-8000:2014 (Social Accountability)

Any other particulars for improving the quality of the environment:

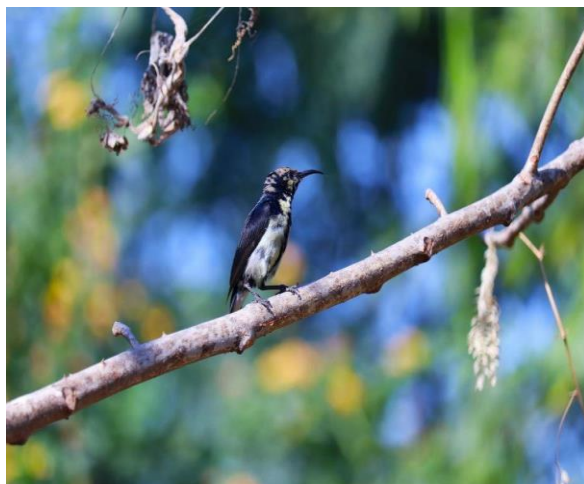
- 1. Air pollution control:** Dust extraction systems are in place for the crushers. Water sprinkling on ore while transportation and prior to crushing. Monitoring twice a month of ambient air at 8 locations and stack emission from stacks of crushing section for suspended particulate matter.
- 2. Water pollution control:**
 - a. Quality of mine water and ground water in and around the mine complex is being monitored regularly.
 - b. Wet Tailing of beneficiation plant is being processed in Dry Tailing Plant to produce dry tailing of 15-18 % moisture content, which is stacked in Tailing Storage facility. Water is reclaimed from Dry Tailing plant and is pumped back to beneficiation plant for reuse.
 - c. Reclaim water reservoir of 2,000 m³ capacity is used to prevent processed water from mixing to natural water source.
- 3. Noise and Vibration control:** Sound level for mining equipment's, beneficiation plant is regularly monitored. Use of blasting software for blast design and improvement in fragmentation. Ground vibrations are monitored on regular basis.
- 4 Plantation:** Land acquired for mining activity is 483.23 hectares, out of this 170.85 is having plantation. As part of Forest Compliance, preparatory work was started for carrying plantation in RDF-1 and RDF-2 scheme.

5 Expenditure: Year wise expenditure are reported to MoEF and its Regional Office at Lucknow. Total expenses during 2020-21 is **Rs. 4,88,75,903.**

6. Environmental awareness:

Several environment awareness activities are organized by Zawar Mines Environment Team. Plantation drive Conducted at various locations of Zawar Mines: Balaria Mines, Mochia Mines, Baroi Mines, Zawarmala Mines, Mill Office, VTC. Also, Various competitions were organised by Environment team- Posters, slogan and Nature Photography.

Also, conducted training programs on Environment rules and regulations, waste management and other environment management aspects.



7 Water Conservation Measures: By deploying various water conservation measures Zawar Mines maintains Zero Effluent Discharge status. Following activities are being practiced and will be continued for monitoring and maintain zero discharge:

- Recycling of mine water for mining and beneficiation process.
- Wet Tailing of beneficiation plant is being processed in Dry Tailing Plant to produce dry tailing of 15-18 % moisture content, which is stacked in Tailing Storage facility. Water is reclaimed from Dry Tailing plant and is pumped back to beneficiation plant for reuse.
- Sewage Treatment Plants (300 KLD & 150 KLD) for domestic waste water. Treated water is recycled in Beneficiation plant, surface exploration drilling, plantation etc.
- 2,000 m³ Reservoir to collect and recycle the water.
- Zero discharge is being maintained.
- Regular monitoring of ground water. High Rate Thickener installed to improve water recovery.



Recycling arrangement (storage cum pumping arrangement)



High Rate Thickener



Recycling Water Pump House



2,000 m³ Capacity Water Reservoir



Sewage Treatment Plant

8 World Environment Day Celebration: World Environment Day was celebrated on **5th June 2020**. Various competitions were organized, and prizes were distributed to the winners. Plantation was also done by participants at designated site.

AMBIENT AIR QUALITY AT ZAWAR GROUP OF MINES

PM₁₀ IN AMBIENT AIR ZAWAR GROUP OF MINES (µg/m³) Limit for PM₁₀=100						
Month	Mill Office	Mochia Mine	Balaria Mine	Admin Block	Zawarmala Mine	Baroi Mine
Jun-20	63.9	51.3	47.8	64.7	52.3	57.1
Jul-20	62.8	47.8	45	62.5	51.3	48.4
Aug-20	61.2	50.2	54.2	61.5	45.9	54.2
Sep-20	78.7	58	58.9	71.3	63	68.7
Oct-20	65.9	60.1	53.2	76.5	56.2	55.3
Nov-20	63.2	58.3	54.8	75.1	54.7	68
Dec-20	88.73	75.08	81.08	68.83	71.03	75.19
Jan-21	66.92	74.74	74.53	73.20	72.93	76.26
Feb-21	73.56	75.69	78.91	79.24	82.41	83.83
Mar-21	75.90	74.90	71.76	71.97	72.95	78.80

PM_{2.5} IN AMBIENT AIR ZAWAR GROUP OF MINES (µg/m³) Limit for PM_{2.5}=60						
Month	Mill Office	Mochia Mine	Balaria Mine	Admin Block	Zawarmala Mine	Baroi Mine
Jun-20	38.5	30.5	29.4	37.5	31.1	35.2
Jul-20	35.5	28.2	27.1	36.1	30.8	28.1
Aug-20	37.8	31.6	33.7	38.5	27.3	33.9
Sep-20	46.5	34.5	36.3	43	38.4	40.1
Oct-20	40.3	37.2	32.5	76.5	34.5	33.3
Nov-20	38.6	35.9	33	44.3	33.2	40.1
Dec-20	29.39	34.54	44.39	27.48	40.78	34.09
Jan-21	34.90	35.22	36.44	34.19	38.7	35.50
Feb-21	29.69	33.24	47.94	41.62	34.77	27.95
Mar-21	35.07	33.21	32.67	33.96	29.74	34.77

SO₂ IN AMBIENT AIR ZAWAR GROUP OF MINES (µg/m³) Limit for SO_X=80						
Month	Mill Office	Mochia Mine	Balaria Mine	Admin Block	Zawarmala Mine	Baroi Mine
Jun-20	9.0	6.9	6.1	9.6	6.7	7.3
Jul-20	8.9	6	6	9.5	6.6	6.9
Aug-20	10.5	6.5	7.3	8.5	6	7.6
Sep-20	12.2	7.7	7.9	11.5	8.5	8.6
Oct-20	12.8	8.6	6.5	46.5	7.3	7.3
Nov-20	8.6	7.8	6.9	11.6	6.7	7.9
Dec-20	3.49	3.42	4.87	3.41	3.46	3.84
Jan-21	3.27	2.81	2.56	3.59	2.86	3.21
Feb-21	2.71	2.72	5.62	2.68	3.51	2.25
Mar-21	2.63	2.53	2.54	2.96	3.13	2.76

NO_X IN AMBIENT AIR ZAWAR GROUP OF MINES (µg/m³) Limit for NO_X=80						
Month	Mill Office	Mochia Mine	Balaria Mine	Admin Block	Zawarmala Mine	Baroi Mine
Jun-20	17.0	12.0	9.1	15.5	10.9	11.7
Jul-20	17	10.4	8.2	15	10	10.8
Aug-20	22	9.9	13.8	16.9	8.7	13
Sep-20	25	15	14.5	23.0	16.6	17
Oct-20	27	17	10.3	23.0	12.0	14.0
Nov-20	17.0	14.0	13.0	23.0	10.8	15.0
Dec-20	11.0	16.26	15.24	16.01	16.03	14.11
Jan-21	11.2	11.71	12.67	11.93	10.54	12.74
Feb-21	11.84	11.69	12.96	11.05	13.57	14.05
Mar-21	14.29	10.70	10.87	10.94	11.72	12.78

CO IN AMBIENT AIR ZAWAR GROUP OF MINES (µg/m³) Limit for CO=2000						
Month	Mill Office	Mochia Mine	Balaria Mine	Admin Block	Zawarmala Mine	Baroi Mine
Jun-20	859	744.5	630	916.5	744.5	802
Jul-20	802	687	573	802	687	573
Aug-20	802	687	687	802	573	802
Sep-20	1031	802	802	1031	916	916
Oct-20	1031	916	687	916	687	802
Nov-20	802	802	687	916	687	802
Dec-20	290	310	310	340	280	340
Jan-21	380	300	320	370	290	270
Feb-21	330	340	320	290	360	340
Mar-21	300	300	270	290	270	360

Pb IN AMBIENT AIR ZAWAR GROUP OF MINES ($\mu\text{g}/\text{m}^3$) Limit for Pb=1						
Month	Mill Office	Mochia Mine	Balaria Mine	Admin Block	Zawarmala Mine	Baroi Mine
Jun-20	0.4	0.2	0.1	0.4	0.1	0.2
Jul-20	0.33	<0.10	<0.10	0.36	0.11	<0.10
Aug-20	0.22	<0.10	0.18	0.39	<0.10	0.17
Sep-20	0.47	0.25	0.22	0.35	0.26	0.29
Oct-20	0.38	0.25	<0.10	0.36	<0.1	0.18
Nov-20	0.32	0.27	0.24	0.48	0.16	0.37
Dec-20	0.14	0.19	0.16	0.14	0.14	0.15
Jan-21	0.28	0.13	0.26	0.23	0.21	0.25
Feb-21	0.10	0.12	0.22	0.11	0.21	0.13
Mar-21	0.12	0.25	0.11	0.21	0.26	0.24

STACK MONITORING AT ZAWAR GROUP OF MINES

All units are in mg/Nm^3

Month	Mochia Crusher Stack	Balaria Crusher Stack	DE - 2 (Mill - 2)	D.G. Set Stack			
				SPM	NO _x	CO	NMHC
Parameters	SPM	SPM	SPM	SPM	NO_x	CO	NMHC
Prescribed Limits by RSPCB	150	150	150	75	710	150	100
Jun-20	51.4	54.05	55.5	-	-	-	-
Jul-20	49.8	44.2	45.1	-	-	-	-
Aug-20	61.2	54.9	49.3	-	-	-	-
Sep-20	50.8	42.2	38.5	69.1	440	78	73
Oct-20	49.3	60.1	37.5	-	-	-	-
Nov-20	67.3	58.9	53.2	-	-	-	-
Dec-20	47.97	64.26	68.91	-	-	-	-
Jan-21	18.15	12.82	26.87	-	-	-	-
Feb-21	48.80	35.62	25.84	-	-	-	-
Mar-21	34.28	33.12	20.71	39.56	415	122	72

Ground Water wells quality at Zawar Group of Mines

June-20 (Except pH all values are in $\text{mg}/\text{lt.}$)								
S.No.	Parameters	IS : 10500:2012		Zawarmata Hand pump	Zawarmata Well	Naka Well	Mahadev ki NaI Well	Tiger Well
		Acceptable	Permissible					
1	pH	6.5-8.5	No Relaxation	7.33	7.40	7.67	7.49	7.22
2	Chlorides	250	1000	79.98	101.97	87.98	81.97	67.98
3	TSS	-	-	<5.0	<5.0	<5.0	8	<5.0
4	Zinc	5	15	0.11	<0.01	<0.01	0.05	<0.01
5	Lead	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
6	Iron	0.3	No Relaxation	0.03	<0.01	<0.01	0.03	0.02
7	Copper	0.05	1.5	<0.01	<0.01	<0.01	<0.01	<0.01
8	Cadmium	0.003	No Relaxation	<0.003	<0.003	<0.003	<0.003	<0.003
9	Cyanides	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
10	Nickel	0.02	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
11	Cobalt	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
12	Chromium	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01

Jul-20 (Except pH all values are in mg/l.)								
S.No.	Parameters	IS : 10500:2012		Zawarmata Hand pump	Zawarmata Well	Naka Well	Mahadev ki Nal Well	Tiger Well
		Acceptable	Permissible					
1	pH	6.5-8.5	No Relaxation	7.12	6.73	7.41	7.18	7.61
2	Chlorides	250	1000	69.98	97.97	63.98	73.98	75.98
3	TSS	-	-	<5.0	<5.0	<5.0	<5.0	<5.0
4	Zinc	5	15	0.22	<0.01	<0.01	<0.01	<0.01
5	Lead	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
6	Iron	0.3	No Relaxation	0.08	0.04	<0.01	<0.01	<0.01
7	Copper	0.05	1.5	<0.01	<0.01	<0.01	<0.01	<0.01
8	Cadmium	0.003	No Relaxation	<0.003	<0.003	<0.003	<0.003	<0.003
9	Cyanides	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
10	Nickel	0.02	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
11	Cobalt	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
12	Chromium	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01

Sep-20 (Except pH all values are in mg/l.)								
S.No.	Parameters (IS : 10500:2012		Zawarmata Hand pump	Zawarmata Well	Naka Well	Mahadev ki Nal Well	Tiger Well
		Acceptable	Permissible					
1	pH	6.5-8.5	No Relaxation	7.21	7.43	7.70	7.75	7.69
2	Chlorides	250	1000	113.96	91.97	59.98	51.98	53.98
3	TSS	-	-	<5	<5	<5	<5	<5
4	Zinc	5	15	0.94	<0.01	0.03	<0.01	<0.01
5	Lead	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
6	Iron	0.3	No Relaxation	0.03	0.04	<0.01	<0.01	<0.01
7	Copper	0.05	1.5	<0.01	<0.01	<0.01	<0.01	<0.01
8	Cadmium	0.003	No Relaxation	<0.003	<0.003	<0.003	<0.003	<0.003
9	Cyanides	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
10	Nickel	0.02	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
11	Cobalt	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
12	Chromium	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01

Oct-20 (Except pH all values are in mg/l.)								
S.No.	Parameters	IS : 10500:2012		Zawarmata Hand pump	Zawarmata Well	Naka Well	Mahadev ki Nal Well	Tiger Well
		Acceptable	Permissible					
1	pH	6.5-8.5	No Relaxation	7.08	7.35	7.72	7.09	7.59
2	Chlorides	250	1000	99.70	93.97	61.98	75.98	61.99
3	TSS	-	-	<5.0	<5.0	<5.0	<5.0	<5.0
4	Zinc	5	15	1.03	<0.01	0.05	<0.01	<0.01
5	Lead	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
6	Iron	0.3	No Relaxation	0.05	0.07	<0.01	<0.01	<0.01
7	Copper	0.05	1.5	<0.01	<0.01	<0.01	<0.01	<0.01
8	Cadmium	0.003	No Relaxation	<0.003	<0.003	<0.003	<0.003	<0.003
9	Cyanides	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
10	Nickel	0.02	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
11	Cobalt	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
12	Chromium	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01

Dec-20 (Except pH all values are in mg/lt.)								
S.No.	Parameters	IS : 10500:2012		Zawarmata Hand pump	Zawarmata Well	Naka Well	Mahadev ki Nal Well	Tiger Well
		Acceptable	Permissible					
1	pH	6.5-8.5	No Relaxation	7.30	7.54	7.89	7.20	7.30
2	Chlorides	250	1000	114.15	109.19	79.41	109.19	153.85
3	TSS	-	-	7	6	4	5	4
4	Zinc	5	15	0.19	<0.01	<0.01	<0.01	<0.01
5	Lead	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
6	Iron	0.3	No Relaxation	0.02	<0.01	<0.01	<0.01	<0.01
7	Copper	0.05	1.5	<0.01	<0.01	<0.01	<0.01	<0.01
8	Cadmium	0.003	No Relaxation	<0.001	<0.001	<0.001	<0.001	<0.001
9	Cyanides	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
10	Nickel	0.02	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
11	Cobalt	-	-	<0.01	<0.01	<0.01	<0.01	<0.01
12	Chromium	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01

Jan-21 (Except pH all values are in mg/lt.)								
S.No.	Parameters	IS : 10500:2012		Zawarmata Hand pump	Zawarmata Well	Naka Well	Mahadev ki Nal Well	Tiger Well
		Acceptable	Permissible					
1	pH	6.5-8.5	No Relaxation	7.70	7.44	7.92	7.36	7.07
2	Chlorides	250	1000	88.91	107.63	84.23	98.27	154.42
3	TSS	-	-	6.0	8.0	4.0	4.0	6.0
4	Zinc	5	15	0.18	<0.01	0.02	0.01	0.12
5	Lead	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
6	Iron	0.3	No Relaxation	0.05	<0.01	<0.01	<0.01	<0.01
7	Copper	0.05	1.5	<0.01	<0.01	<0.01	<0.01	<0.01
8	Cadmium	0.003	No Relaxation	<0.001	0.001	0.001	<0.001	0.001
9	Cyanides	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
10	Nickel	0.02	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
11	Cobalt	-	-	<0.01	<0.01	<0.01	<0.01	<0.01
12	Chromium	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01

Mar-21 (Except pH all values are in mg/lt.)								
S.No.	Parameters	IS : 10500:2012		Zawarmata Hand pump	Zawarmata Well	Naka Well	Mahadev ki Nal Well	Tiger Well
		Acceptable	Permissible					
1	pH	6.5-8.5	No Relaxation	7.47	7.16	7.51	7.25	7.18
2	Chlorides	250	1000	61.75	80.76	61.75	71.25	61.75
3	TSS	-	-	11	27	5	7	9
4	Zinc	5	15	0.10	<0.01	0.02	0.07	0.21
5	Lead	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
6	Iron	0.3	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
7	Copper	0.05	1.5	<0.01	<0.01	<0.01	0.33	<0.01
8	Cadmium	0.003	No Relaxation	<0.001	<0.001	<0.001	<0.001	<0.001
9	Cyanides	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
10	Nickel	0.02	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
11	Cobalt	-	-	<0.01	<0.01	<0.01	<0.01	<0.01
12	Chromium	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01

Piezometer Well Water Quality at Zawar Group of Mines

June -20 (Except pH all values are in mg/lit)

S.No.	Parameters	IS: 10500:2012		Near Bridge (Vala Patel House) (Pz - 01)	Near In front of Old Tailing Dam (Pz - 02)	Near Tailing Dam Pump House (Pz - 03)	Near Magazine Area (Pz - 04)	Near Below Tailing Pipe Lines (Pz - 05)	Near Way to Tailing Dam Road (Pz - 06)
		Acceptable	Permissible						
1	pH	6.5-8.5	No Relaxation	6.81	6.71	7.18	7.06	6.97	7.16
2	Chlorides	250	1000	19.99	75.98	109.97	49.98	59.98	59.98
3	Zinc	5	15	<0.01	0.11	<0.01	<0.01	<0.01	<0.01
4	Lead	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
5	Iron	0.3	No Relaxation	0.06	0.02	<0.01	<0.01	<0.01	0.03
6	Copper	0.05	1.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
7	Cadmium	0.003	No Relaxation	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
8	Nickel	0.02	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
9	Chromium	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Jul-20 (Except pH all values are in mg/lit)

S.No.	Parameters	IS : 10500:2012		Near Bridge (Vala Patel House) (Pz - 01)	Near In front of Old Tailing Dam (Pz - 02)	Near Tailing Dam Pump House (Pz - 03)	Near Magazine Area (Pz - 04)	Near Below Tailing Pipe Lines (Pz - 05)	Near Way to Tailing Dam Road (Pz - 06)
		Acceptable	Permissible						
1	pH	6.5-8.5	No Relaxation	6.78	6.42	7.29	7.47	7.84	7.32
2	Chlorides	250	1000	17.99	63.98	103.97	83.97	39.99	53.98
3	Zinc	5	15	<0.01	0.03	<0.01	<0.01	<0.01	<0.01
4	Lead	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
5	Iron	0.3	No Relaxation	0.07	<0.01	<0.01	<0.01	<0.01	0.11
6	Copper	0.05	1.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
7	Cadmium	0.003	No Relaxation	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
8	Nickel	0.02	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
9	Chromium	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Aug-20 (Except pH all values are in mg/lit)									
S.No.	Parameters	IS: 10500:2012		Near Bridge (Vala Patel House) (Pz - 01)	Near In front of Old Tailing Dam (Pz - 02)	Near Tailing Dam Pump House(Pz - 03)	Near Magazine Area(Pz - 04)	Near Below Tailing Pipe Lines(Pz - 05)	Near Way to Tailing Dam Road(Pz - 06)
		Acceptable	Permissible						
1	pH	6.5-8.5	No Relaxation	7.44	6.73	7.78	6.98	7.78	7.52
2	Chlorides	250	1000	7.99	63.98	99.97	69.98	43.98	51.98
3	Zinc	5	15	<0.01	0.06	<0.01	<0.01	<0.01	<0.01
4	Lead	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
5	Iron	0.3	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	0.03
6	Copper	0.05	1.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
7	Cadmium	0.003	No Relaxation	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
8	Nickel	0.02	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
9	Chromium	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Sep-20 (Except pH all values are in mg/lit)									
S.No.	Parameters	IS: 10500:2012		Near Bridge (Vala Patel House) (Pz - 01)	Near In front of Old Tailing Dam (Pz - 02)	Near Tailing Dam Pump House (Pz - 03)	Near Magazine Area (Pz - 04)	Near Below Tailing Pipe Lines (Pz - 05)	Near Way to Tailing Dam Road (Pz - 06)
		Acceptable	Permissible						
1	pH	6.5-8.5	No Relaxation	7.23	6.68	7.41	7.12	7.37	6.72
2	Chlorides	250	1000	57.98	39.99	79.98	63.98	49.98	43.98
3	Zinc	5	15	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
4	Lead	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
5	Iron	0.3	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
6	Copper	0.05	1.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
7	Cadmium	0.003	No Relaxation	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
8	Nickel	0.02	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
9	Chromium	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Dec-20 (Except pH all values are in mg/ltr)									
S.No.	Parameters	IS : 10500:2012		Near Bridge (Vala Patel House) (Pz - 01)	Near In front of Old Tailing Dam (Pz - 02)	Near Tailing Dam Pump House (Pz - 03)	Near Magazine Area (Pz - 04)	Near Below Tailing Pipe Lines (Pz - 05)	Near Way to Tailing Dam Road (Pz - 06)
		Acceptable	Permissible						
1	pH	6.5-8.5	No Relaxation	7.76	7.19	7.00	7.06	7.49	7.55
2	Chlorides	250	1000	33.75	74.45	94.30	84.37	59.56	63.53
3	Zinc	5	15	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
4	Lead	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
5	Iron	0.3	No Relaxation	0.07	<0.01	0.02	0.03	0.03	0.15
6	Copper	0.05	1.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
7	Cadmium	0.003	No Relaxation	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
8	Nickel	0.02	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
9	Chromium	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Mar-21 (Except pH all values are in mg/ltr)									
S.No.	Parameters	IS: 10500:2012		Near Bridge (Vala Patel House) (Pz - 01)	Near In front of Old Tailing Dam (Pz - 02)	Near Tailing Dam Pump House(Pz - 03)	Near Magazine Area(Pz - 04)	Near Below Tailing Pipe Lines(Pz - 05)	Near Way to Tailing Dam Road(Pz - 06)
		Acceptable	Permissible						
1	pH	6.5-8.5	No Relaxation	7.44	7.03	7.24	7.28	7.36	7.26
2	Chlorides	250	1000	38.0	194.76	77.90	157.95	47.50	57.0
3	Zinc	5	15	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
4	Lead	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
5	Iron	0.3	No Relaxation	<0.01	0.02	<0.01	<0.01	<0.01	0.03
6	Copper	0.05	1.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
7	Cadmium	0.003	No Relaxation	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
8	Nickel	0.02	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
9	Chromium	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Ground Water Level Monitoring at Zawar Group of Mines

S.No.	Piezometers	Jun -20 (m)	Jul- 20 (m)	Aug - 20 (m)	Sep-20 (m)	Oct-20 (m)
1.	Near Bridge (Vala Patel House) (Pz - 01)	2.31	2.05	0.89	0.33	1.60
2.	Near In front of Old Tailing Dam (Pz - 02)	7.97	7.33	4.62	5.52	6.35
3.	Near Tailing Dam Pump House (Pz - 03)	2.81	2.94	2.25	2.13	2.28
4.	Near Magazine Area (Pz - 04)	6.89	5.63	6.18	3.68	6.37
5.	Near Below Tailing Pipe Lines (Pz - 05)	5.74	4.50	1.83	1.69	2.23
6.	Near Way to Tailing Dam Road (Pz - 06)	3.73	2.10	1.45	1.20	1.54

S.No.	Piezometers	Nov-20 (m)	Dec-20 (m)	Jan - 21 (m)	Feb-21 (m)	Mar-21 (m)
1.	Near Bridge (Vala Patel House) (Pz - 01)	1.51	1.82	2.23	2.55	2.80
2.	Near In front of Old Tailing Dam (Pz - 02)	7.10	6.91	7.47	7.38	7.52
3.	Near Tailing Dam Pump House (Pz - 03)	2.61	2.65	2.98	2.74	2.82
4.	Near Magazine Area (Pz - 04)	6.59	6.87	7.36	7.48	7.53
5.	Near Below Tailing Pipe Lines (Pz - 05)	2.38	2.93	3.17	3.06	3.18
6.	Near Way to Tailing Dam Road (Pz - 06)	1.95	2.01	3.45	2.10	2.62

S.No.	Wells in the area	Jun -20 (m)	Jul - 20 (m)	Aug- 20 (m)	Sep-20 (m)	Oct- 20 (m)
1.	Zawarmata Well	7.49	3.55	2.46	2.40	2.65
2.	Mahadev ki Nal Well	3.23	2.99	1.59	0.40	0.61

S.No.	Wells in the area	Nov -20 (m)	Dec - 20 (m)	Jan- 21 (m)	Feb-21 (m)	Mar- 21 (m)
1.	Zawarmata Well	3.08	3.82	4.22	4.25	4.87
2.	Mahadev ki Nal Well	1.05	1.36	1.69	2.30	3.14

ANALYSIS OF MINE WATER AT ZAWAR GROUP OF MINES

1.Mochia Mine Water Report

Parameters	Effluent Standards as per IS:2490	July-20	Dec-20	Jan-21
pH	5.5-9.0	7.45	7.12	7.50
Chlorides	1000	115.96	184	231.92
Hardness	-	956	250	230
Total Solids	2200	1750	955	959
Total D.S.	2100	1745	940	948
Total S.S.	100	<5	15	11
Zinc	5.0	1.16	0.67	0.79
Lead	0.10	0.04	0.07	<0.01
Iron	3.0	0.07	0.13	0.08
Copper	3.0	<0.01	0.05	0.03
Cadmium	2.0	<0.01	BDL	BDL
Cyanide	0.2	<0.01	BDL	BDL

Except pH all values are in mg/lit

2. Balaria Mine Water Report

Parameters	Effluent Standards as per IS:2490	July-20	Dec-20	Jan-21
pH	5.5-9.0	7.82	7.38	7.72
Chlorides	1000	139.96	182	163.95
Hardness	-	784	360	400
Total Solids	2200	1775	953	955
Total D.S.	2100	1770	936	946
Total S.S.	100	<5	17	9
Zinc	5.0	1.06	0.61	0.79
Lead	0.10	<0.01	0.05	<0.01
Iron	3.0	0.04	0.13	0.12
Copper	3.0	<0.01	0.06	0.03
Cadmium	2.0	<0.01	BDL	BDL
Cyanide	0.2	<0.01	BDL	BDL

Except pH all values are in mg/lit

3. Zawarmala Mine Water Report

Parameters	Effluent Standards as per IS:2490	July-20	Dec-20	Jan-21
pH	5.5-9.0	7.78	7.41	7.54
Chlorides	1000	95.97	169	143.95
Hardness	-	704	250	260
Total Solids	2200	1996	998	1027
Total D.S.	2100	1988	978	1012
Total S.S.	100	8	20	15
Zinc	5.0	0.16	0.61	0.73
Lead	0.10	<0.01	<0.01	<0.01
Iron	3.0	0.04	0.18	0.21
Copper	3.0	<0.01	0.05	0.06
Cadmium	2.0	<0.01	BDL	BDL
Cyanide	0.2	<0.01	BDL	BDL

Except pH all values are in mg/lit

4. Baroi Mine Water Report

Parameters	Effluent Standards as per IS:2490	July-20	Dec-20	Jan-21
pH	5.5-9.0	7.08	7.41	7.56
Chlorides	1000	97.97	203	239.92
Hardness	-	296	350	310
Total Solids	2200	769	998	1037
Total D.S.	2100	764	985	1025
Total S.S.	100	<5	13	12
Zinc	5.0	0.09	0.55	0.72
Lead	0.10	<0.01	0.06	<0.01
Iron	3.0	0.07	0.15	0.10
Copper	3.0	<0.01	0.05	0.07
Cadmium	2.0	<0.01	BDL	BDL
Cyanide	0.2	<0.01	BDL	BDL

Except pH all values are in mg/lit

Analysis of Tailing Dam Reclaim Water

Zawar Group of Mines

Except pH all values are in ppm.

SN	Parameters	Effluent Standards as per IS:2490	Jun-20	Jul-20	Sep-20	Oct-20	Dec-20	Jan-21	Feb-21	Mar-21
1	pH	5.5-9.0	7.16	7.06	7.64	7.33	7.15	7.78	7.93	7.26
2	Chlorides	-	103.97	75.98	81.97	81.97	198.52	102.95	92.95	126.27
3	TSS	100	10	32	29	16	4	12	13	10
4	Oil and Grease	10	<5.0	<5	<5.0	<5.0	3	<1.0	5	3
5	BOD 3 days at 27°C	30	13	8	10	12	1.5	7.67	10	12.4
6	COD	250	84	60	84	85	13.39	58.66	81.6	20.76
7	Zinc	5	1.54	0.07	0.51	0.32	0.12	1.05	0.67	0.86
8	Lead	0.1	<0.01	<0.01	<0.01	<0.01	<0.01	0.05	<0.01	0.02
9	Iron	3	0.17	<0.01	<0.01	<0.01	0.03	0.02	<0.01	0.03
10	Copper	3	<0.01	<0.01	<0.01	<0.01	<0.01	.02	0.03	0.05
11	Cadmium	2	<0.01	<0.01	<0.01	<0.01	<0.001	0.009	<0.001	<0.001
12	Cyanides	0.2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05
13	Nickel	3	<0.01	<0.01	<0.01	<0.01	<0.01	0.04	<0.01	0.02
14	Cobalt	-	<0.05	<0.05	<0.05	<0.05	<0.01	0.04	0.04	<0.01
15	Chromium	2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

HINDUSTAN ZINC LIMITED

Ashok Nagar STP Analysis Report for 2020-21

Except pH all value are in mg/Lt

Parameter s	Limit s	Jun- 20	Jul- 20	Aug- 20	Sep- 20	Oct- 20	Nov- 20	Dec- 20	Jan- 21	Feb- 21	Mar- 21
pH	5.5- 9.0	7.45	7.82	7.56	7.33	7.40	7.53	7.56	7.85	6.93	7.36
Total Suspended Solids	100	19	45	19	23	19	13	28	11	12	36
Oil & Grease	10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	5	<1.0	3.0	6.0
Biochemical Oxygen Demand (3 days at 27 °C)	30	13	10	12	13	16	13	16.4	2.0	6.0	10
Chemical Oxygen Demand	250	85	60	89	85	151	142	87.34	13.54	48.96	83.02
Total Residual Chlorine	1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Kjeldahl Nitrogen (as N)	100	26	2.52	6.10	13.5	15.2	12.0	7.07	2.80	4.87	25.48
Ammoniacal Nitrogen (as N)	50	8	<5.0	<5.0	6.3	7.5	7.2	4.87	2.24	2.25	19.88
Sulphide (as S)	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.62	<0.1	<0.1	0.62
Nitrate Nitrogen	10	4.3	3.94	5.12	4.15	6.7	5.2	9.15	9.1	4.01	7.78
Chlorides	1000	153.9	89.97	95.97	81.06	143.9	149.9	223.96	88.91	122.30	126.27
Sulphates	1000	235.6	26.01	31.05	41.32	89.2	77.3	158	45.65	43.0	66.44

Ram Nagar STP Analysis Report for 2020-21

Except pH all value are in mg/lt

Parameter s	Limit s	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21
pH	5.5-9.0	7.53	7.68	7.37	7.50	7.30	7.69	7.91	7.13	7.12	7.25
Total Suspended Solids	100	22	46	32	27	24	19	22	12	42	47
Oil & Grease	10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	4.0	4.0	3.0	5.0
Biochemical Oxygen Demand (3 days at 27°C)	30	16	18	15	16	18	16	13.6	6.11	9.0	12.67
Chemical Oxygen Demand	250	127	160	143	151	178	161	70.4	49.63	48.96	95.87
Total Residual Chlorine	1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total kjeldahl Nitrogen(as N)	100	16	22.4	19.6	16.5	20.8	15	5.6	5.60	5.33	35.52
Ammoniacal Nitrogen (as N)	50	7	18.8	10.5	8.1	9.6	6.8	5.23	4.20	2.34	13.24
Sulphide (as S)	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.58	<0.1	<0.1	0.58
Nitrate Nitrogen	10	4.8	11.4	10.2	7.42	9.1	7.3	9.84	9.3	3.83	7.56
Chlorides	1000	143.9	109.96	115.96	123.96	121.9	139.9	229.98	88.91	117.41	126.27
Sulphates	1000	269.3	84.86	89.35	72.65	65.4	56.2	158	66.60	40.25	69.33