



Ref : HZL/RA/ENV/MoEF&CC/2024-25/ \ \2 6

27.11.2024

To,
The Deputy Director (S) /Scientist -C
Ministry of Environment, Forest & Climate Change,
Integrated Regional Office, A-209&218, Aranya Bhawan,
Jhalana Institutional area Jaipur-302004

Sub: Six monthly environmental compliance reports from April 2024 to September 2024.

Ref	Ref : Environment Clearances and Amendments		
<ol> <li>Environment Clearance vide No.: J-11015/267/2008-IA.II (M) Dtd. 11.12.2009.</li> </ol>			
2.	Environment Clearance Amendment vide No. J-11015/267/2008-IA.II (M) dtd. 05.03.2012		
3.	Environment Clearance Amendment vide No. J-11015/267/2008-IA.II (M) dtd. 22.08.2014		
4.	Environment Clearance Amendment vide No. J-11015/267/2008-IA.II (M) dtd. 12.12.2014		
5.	Environment Clearance Amendment vide No. J-11015/267/2008-IA.II (M) dtd. 28.12. 2015		
6.	Environment Clearance Amendment vide No. J-11015/267/2008-IA.II (M) dtd. 28.02. 2020		

Sir / Madam,

Please find enclosed herewith the compliance status report of above referred Environmental Clearance granted by the Ministry of Environment, Forest and Climate Change for the period April 2024 to September 2024, along with soft copy in a CD.

Thanking you,

Your faithfully

(Kishoro-Kumar SCEO - IBU Agucha CEO (Agucha IBU)lindustan Zinc Limited Rampura Agucha Mines

Cc to:

PO - Agucha Distt. - Bhilwara (Raj.)

- In-Charge (Zonal office)
   Central Pollution Control Board,
   Vithal Market, Paryavaran Parisar, E-5, Arera Colony,
   Bhopal, 462 016 (MP)
- Member Secretary
   Rajasthan Pollution Control Board
   4 Institutional Area, Jhalana Doogri,
   Jaipur (Raj) -302004
- The Regional officer
   Rajasthan Pollution Control Board Regional Office,
   18, Azad Nagar, Pannadhay Circle Mining Engineer Office Road (Near Telephone Exc.) Bhilwara-311001

#### Hindustan Zinc Limited

Rampura Agucha Mines, P.O. Agucha, Dist. Bhitwara (Rajasthan) - 311 022 M +91-9001294954-57 www.hzlindia.com

## HINDUSTAN ZINC LIMITED RAMPURA AGUCHA MINE

MoEF Environmental Clearance for Expansion of Rampura Agucha Lead and Zinc Opencast and Underground Mining Project (from 5.00 to 6.15 mTPA) and Beneficiation Capacity of Beneficiation Plant (from 5.00 to 6.50mTPA) Env Clearance Vide No. J-11015/267/2008-IA.II (M) Dtd 11.12.2009

S. No.	Condition	Status
	A. Specific Conditions	
	The project proponent shall obtain Consent to Establish and Consent to Operate from the Rajasthan State Pollution Control Board and effectively implement all the conditions stipulated therein	Consent to establish obtained from RSPCB. Consent to Operate granted by RSPCB vide File F(CPM)/Bhilwara(Hurda)/2(1)/2019-2020/7113-7117 dated 28/02/2023 for mining activity. RSPCB. Consent to Operate granted by RSPCB vide File F(HDF)/Bhilwara(Hurda)/1(1)/2023-2024/1629-1631 dated 14/06/2023 for Beneficiation plant, and the conditions stipulated are implemented.
ii	The environmental clearance is subject to approval of the State Land use Department, Government of Rajasthan for diversion of agricultural land for non-agricultural use.	Land purchased within Mine Lease area and converted in name of HZL for mining.
Ni	The project proponent shall ensure that no natural watercourse and/or water resources shall be obstructed due to any mining operations.	No natural watercourse or water resources are obstructed due to mining operations.
iv	The top soil shall temporarily be stored at earmarked site(s) only and it should not be kept unutilized for long. The topsoil shall be used for land reclamation and plantation.	Top soil utilized on waste dump for its stabilization and plantation.
•	The over burden generated during the mining operation shall be stacked at earmarked dump site(s) only and it should not be kept active for a long period of time and its phase-wise stabilization shall be carried out. The maximum height of the dump should not exceed 100m having 5 terraces as recommended by the Central Institute of Mining and Fuel Research, Dhanbad. The recommendations made by the Central Institute of Mining and Fuel Research, Dhanbad shall be effectively implemented. The over burden dump shall be scientifically vegetated with suitable native species to prevent erosion and surface run off. Monitoring and management of rehabilitated areas shall continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment & Forests and its Regional Office located at Lucknow on six monthly basis	Amendment in this condition was granted in EC vide letter No J-11015/267/ 2008-I-A.II (M) dated 22 <sup>nd</sup> August, 2014.  The maximum height of the dump shall not exceed 140 m (in two lifts of 20m each). Waste dump vegetated phase manner.  Waste dump covered by application of geotextile and plantation.
vi	The void left unfilled in an area of 25 ha shall be converted into water body. The higher benches of excavated void/mining pit shall be	Will be complied during the mine closure.

	terraced and plantation done to stabilize the	
	slopes. The slope of higher benches shall be	
	made gentler. Peripheral fencing shall be	
	carried out along the excavated area.	
vii	Catch drains and siltation ponds of appropriate size should be constructed to arrest silt and sediment flows from mine working and over burden dump. The water so collected should be utilized for watering the mine area, roads, green belt development etc. The drains should be regularly desilted particularly after monsoon and maintained properly.  Garland drain (size, gradient and length) shall	Garland drain of adequate size is constructed along the waste dump toe & mining pit, along with siltation pond that provides adequate retention time for settling of silts and rain water collection lined sumps of about 8.5 lakh CuM. The water collected is utilized for watering the mine area, roads, green belt development etc Annexure –VIII
	be constructed for both mine pit and over burden dump and sump capacity should be designed keeping 50% safety margin over and above peak sudden rainfall (based on 50 years data) and maximum discharge in the area adjoining the mine site. Sump capacity should also provide adequate retention period to allow proper settling of silt material. Sedimentation pits should be constructed at the corners of the garland drains and desilted at regular intervals.	
viii	Dimension of the retaining wall at the toe of dump and OB benches within the mine to check run-off and siltation should be based on the rain fall data.	The retaining wall at the toe of the OB dump is constructed along with garland drain. Annexure VIII
ix	Regular monitoring of subsidence movement on the surface over working area and impact on water bodies/vegetation/ structures/ surrounding shall be continued till movement ceases completely. In case of observation of any high rate of subsidence movement, appropriate measures shall be taken to avoid loss of life and material. Cracks shall be effectively plugged with ballast and clayey soil/suitable material.	A comprehensive assessment and monitoring of subsidence movement on the surface over working area is done by a dedicated team comprising of Rock mechanic engineers. There has been no subsidence or movement observed.
×	All the mine entries shall be above the highest flood level to avoid any anticipated flooding of mine from the surface water during the rainy season	The underground mine opening is at 392 mRL against highest flood level at Agueha reservoir of 391 mRL. Further, A peripheral bund is constructed around the mine pit for protection of the mine from flooding due to rain water.
хi	In areas where subsidence is anticipated in shallow mineral occurrence, such areas be identified and provided with garland drains to ensure draining of water and avoid ingress of the same in to the underground mine.	No subsidence is anticipated in the proposed area.
xii	The project authorities shall check the possibility of existence of fault(s) before	Mining activities are carried out as per Mine plan as approved by IBM.

xiii	deciding about the thickness of safe barrier required to be maintained between the working face and the water bodies, if any, in consultation with the Director General Mines & Safety (DGMS). De-pillaring should also be carried out after taking prior approval of the DGMS.  The project proponent shall carry out conditioning of the ore with water to mitigate fugitive dust emission, without affecting flow of ore in the ore processing and handling areas.  The effluent from the ore beneficiation plant shall be treated to conform to the prescribed	Water sprinklers are installed on conveyer belts, transfer points, and conditioning of ore is done during crushing to mitigate fugitive dust.  Annexure- XXXII  Tailings are being disposed through closed
	standards and the tailings slurry shall be transported through a closed pipeline to the tailing dam.	pipeline to the earmarked Tailing dam after necessary lime treatment. Annexure- XXXIV
xv	The decanted water from the tailing dam shall be re-circulated and there should be zero discharge from the tailing dam. Acid mine water, if any, shall be neutralized and reused within the plant.	Tailing dam water is completely reused in process plant and zero discharge is maintained. There is no acid mine drainage occurring in the mine.
xvi	Plantation shall be raised in an area of 670.7ha including a green belt of adequate width by planting the native species around ML area, OB dump, around tailing dam, around beneficiation plant, roads etc. in consultation with the local DFO / Agriculture Department. In addition, the township area shall also be adequately planted. The density of the trees should be around 1500 plants per ha. Green belt shall be developed all along the mine lease area in a phased manner and shall be completed within first five years.	Green belt developed all along the acquired mine lease area. Progressive plantation is being carried out on waste dump benches every year Seed spreading and geotextile laying is also carried out on waste dump slopes. As per SRSAC study conducted based on Nov 2021 satellite imagery, 694103 Nos of plants are existing with in 348 Ha area. Further FY 2022-23, FY 2023-24, and FY 2024-25, 15000 Nos, 23000 Nos and 5000 Nos saplings planted as gap filling. Currently 737103 Nos of plants are exiting in 348 Ha. Detailed SRSAC report attached as Annexure XXXV. Plantation in remaining area will be completed by closure of mine. Additional plantation has been done in 37.70 ha in the township and along roadsides. Annexure –IX.
xvii	Regular water sprinkling should be carried out in critical areas prone to air pollution and having high levels of SPM and RPM such as haul road, loading, unloading and transfer points and other vulnerable areas. It should be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard.	Water sprinkling is carried out by 4 Nos. of 40 KL water sprinkler on Haul roads to mitigate air pollution in mine area. Dust extraction system and Water sprinkling nozzles are installed at the crusher, transfer points and coarse stockpiles for dust suppression. The parameters of Ambient Alr quality monitored are within the prescribed norm of CPCB. Annexure-X
xvili	The project authority should implement suitable conservation measures to augment ground water resources in the area in consultation with the Regional Director, Central Ground Water Board.	3 Nos. of anicuts have been constructed for groundwater augmentation in consultation with the CGWB. 4 anicults constructed in the area under MJSA. 8.72 MCM groundwater recharge work has been completed four blocks of Bhilwara

		district. (Annexure –XI). Detailed report shared in six monthly EC report of Oct-21 to Mar-22. Ref: HZL/RA/ENV/MoEF&CC/2022-23/463
xix	Regular monitoring of ground water level and quality shall be carried out in and around the project area (mine lease, beneficiation plant and tailing dam) by establishing a network of existing wells and installing new plezometers during the operation. The periodic monitoring [(at least four times in a year- pre-monsoon (April-May), monsoon (August), post-monsoon (November) and winter (January); once in each season)] shall be carried out in consultation with the State Ground Water Board/Central Ground Water Authority and the data thus collected may be sent regularly to the Ministry of Environment and Forests and Its Regional Office Lucknow, the Central Ground Water Authority and the Regional Director, Central Ground Water Board. If at any stage, it is observed that the groundwater table is getting depleted due to the mining activity; necessary corrective measures shall be carried out.	Regular groundwater monitoring is being done by piezometers and wells outside and inside the lease area. Report enclosed as Annexure -I Six monthly reports are submitted to MoEF & CPCB. Quarterly report being sent to RSPCB, CGWA and CGWB.
ж	The project proponent shall ensure that no additional water is drawn for the expansion project. The additional requirement of water will be met out of the water saved by adopting water conservation measures.	No additional water is drawn. The additional requirement of water if any in future will be met out by water conservation measures.
xxi	Suitable rainwater harvesting measures on long term basis shall be planned and implemented in consultation with the Regional Director, Central Ground Water Board.	Various rainwater-harvesting measures are implemented including the construction of rainwater collection pond of about 1.5 Lakh cum in the township, collection sumps of 8.5 lakh CuM capacity to collect and reuse the rainwater. Annexure XII
xxii	Regular monitoring of groundwater quality around the tailing dam shall be carried out in consultation with Central Ground Water Authority and records maintained. It shall be ensured that the groundwater quality is not adversely affected due to the project	Groundwater quality is regularly monitored around the tailing dam through piezometers within ML area and wells inside as well as outside the lease area. The groundwater quality report is being submitted to MoEF, CPCB, RSPCB, CGWA and CGWB on regular basis.
xxili	Groundwater and surface water in and around the mine shall be regularly monitored at strategic locations for heavy metals such as Ni, Co, Cu, Zn and Cd. The monitoring stations shall be established in consultation with the Regional Director, Central Ground Water Board and State Pollution Control Board	Ground and surface water is regularly monitoring for heavy metals. Report enclosed as in point no. xix.
xxiv	Vehicular emissions should be kept under control and regularly monitored. Measures shall be taken for maintenance of vehicles used in mining operations and in transportation of	Periodic preventive maintenance of vehicles is part of our operations. All the trucks are covered with tarpaulin while transportation of concentrates to the smelters and no overloading

	mineral. The vehicles should be covered with a tarpaulin and shall not be overloaded	is allowed. Annexure -XIII
xxv	Blasting operation should be carried out only during the daytime. Controlled blasting should be practiced. The mitigative measures for control of ground vibrations and to arrest fly rocks and boulders should be implemented	Blasting operation is carried out in underground during daytime with various mitigation measures as per DGMS guidelines. The vibrations monitored are well within the prescribed limits by DGMS.
xxvi	Drills shall either be operated with dust extractors or equipped with water injection system	Wet drilling system is adopted.
xxvii	Digital processing of the entire lease area using remote sensing technique should be done regularly once in three years for monitoring land use pattern and report submitted to Ministry of Environment and Forests and its Regional Office, Lucknow	Noted. The land use & land cover change study carried out in 2023. Copy attached. Annexure-XIV
xxviii	The tailing dam shall be lined by LDPE lining on the sides as the height of the dam is raised. The ultimate height of the dam shall be maintained to 51m and provided with garland drains. The disaster management plan for tailing dam shall be prepared and implemented	The sides of the tailing dam are lined with HDPE. As per letter No. Environment Clearance Amendment vide No. J-11015/267/2008-IA.II (M) dtd. 28.02. 2020 ultimate height shall be 74m. The present height of tailing dam is 60 meter. Garland drains are constructed around the tailing pond with pumping arrangement to collect any seepage and rainwater runoff back to tailing pond. Disaster management plan for the tailing pond is prepared and implemented. Annexure XV
xxix	The recommendations of the study report of NEERI, Nagpur on pollution vulnerability of aquifer shall be effectively implemented and action taken report submitted to the Ministry and its Regional Office, Lucknow on six monthly basis	Complied on the recommendations of NEERI i.e. network of piezometer established and report submitted on six monthly basis. Report enclosed as point no xix.
жж	The project proponent shall regularly analyse the waste generated from the mining (at least once a year) for heavy metals such as Ni, Co, Cu, Pb, Zn and Cd and the data thus collected may be sent regularly to Ministry of Environment and Forests and its Regional Office, Lucknow. It should be ensured that the parameters conform to the prescribed norms	Being analyzed and report is submitted on six monthly basis. Annexure II
XXXI	The recommendations of the study report on blood lead levels of children to monitor levels of lead in human system carried out by National Institute of Occupational Health, Ahemdabad shall be effectively implement and action taken report submitted to the Ministry and its Regional Office, Lucknow on six monthly basis.	villages to keep a track of the health status. Annexure XX
xxxii	Pre-placement medical examination and periodical medical examination of the workers engaged in the project shall be carried out and	Pre-placement medical examination and periodical medical examination of the employees are being carried out at regular interval as per

	records maintained. For the purpose, schedule of health examination of the workers should be drawn and followed accordingly	the Mine Act.
xxxiii	Sewage treatment plant shall be installed for the colony. ETP shall also be provided for the workshop and the wastewater generated during mining operation	Sewage treatment plant of 425 KLD capacity in colony and 300 KLD in mine area operating efficiently. Oil & Grease Traps installed and water reused in process. Annexure XVI
xxxiv	Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project	No construction labour housing is proposed in mining area. However, the sanitation and drinking water facility is provided to the workers, working at site.
XXXV	Acid mine water, if any, has to be treated and disposed of after conforming to the standard prescribed by the competent authority	No acid mine water generated & mine pit water is used in process plant.
xxxvi	The critical parameters such as RSPM (Particulate matter with size less than 10µm i.e., PM <sub>20</sub> and with size less than 2.5µm i.e., PM <sub>25</sub> ), NOX in the ambient air within the impact zone, peak particle velocity at 300m distance or within the nearest habitation, whichever is closer shall be monitored periodically. Further, quality of discharged water shall also be monitored [(TDS, DO, PH and Total Suspended Solids (TSS)]. The monitored data shall be uploaded on the website of the company as well as displayed on a display board at the project site at a suitable location near the main gate of the Company in public domain. The circular No. J-20012/1/2006-IA.II(M) dated 27.05.2009 issued by Ministry of Environment and Forests, which is available on the website of the Ministry www.envfor.nic.in shall also be referred in this regard for its compliance	Monitoring of Ambient air at 3 locations inside mine and 3 locations outside the mine area is regularly carried out. Monitoring report is enclosed as Annexure III.  Peak Particle velocity of blast vibration is being monitored for every blast & records are maintained. No effluent, treated or untreated, is discharged outside the project area as Zero discharge is maintained at all times. Monitoring data are displayed at Main Gate.  Annexure XVII.
xxxvii	A Final Mine Closure Plan along with details of Corpus Fund should be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval	A Final Mine Closure Plan along with details of Corpus Fund will be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval.

CEO - IBU Agucha Hindustan Zinc Limited Rampura Agucha Mines PO - Agucha Distt. - Bhilwara (Raj.)

## HINDUSTAN ZINC LIMITEDRAMPURA AGUCHA MINE

MoEF Environmental Clearance Compliance to amendment in EC vide letter No J-11015/267/2008-I-A.II (M) dated 5 March, 2012

Sr. No	Condition	Status
ı	In the environment clearance letter dated 11th December, 2009, in para number 1, the words "The mineral will be transported through the road." will be substituted by the words "The mineral will be transported through the rail".	Amendments granted by MoEF vide letter dated 28.12.2015 "The mineral will be transported both through road and rail". Railway line commissioned but not operative.
ii (a)	All the requisite prior clearance from the concerned authorities, as may be applicable to such project shall be obtained and the conditions, if any, stipulated there under shall be effectively implemented.	All the requisite prior clearance from the concerned authorities, as may be applicable to such project shall be obtained and the conditions, if any, stipulated there under shall be effectively implemented.
ll (b)	The project affected people whose land will be acquired for laying of the railway track shall be compensated as per the National / State Policy in this regard.	Compensation given to land owners done by RIICO, GOR as per the norms.
ii (c)	The company shall submit within 3 months their policy towards Corporate Environment Responsibility which should inter alia provide for (i) Standard operating process / process to bring into focus any infringement / deviation / violation of the environmental or forest norms / conditions, (ii) Hierarchical system or administrative order of the company to deal with the environmental issues and for ensuring compliance with the EC conditions and (iii) System of reporting of non compliance s / violations of environmental norms to the Board of Directors of the company and / or shareholders or stakeholders.	Policy towards Corporate Environment Responsibility enclosed.

CEO - IBU Agucha Hindustan Zinc Limited Rampura Agucha Mines PO - Agucha Distt. - Bhilwara (Raj.)

## HINDUSTAN ZINC LIMITED RAMPURA AGUCHA MINE

MoEF Environmental Clearance Compliance to amendment in condition no (v) in EC vide letter No J-11015/267/2008-I-A.II (M) dated 22<sup>nd</sup> August, 2014

Specific Condition		
S.No	Condition	Status
ī -	The Open crack, whenever developed in the partially consolidated new dump mass, should be consolidated with proper filling/ leveling with the help of dozer/ compactors.	In such case, we shall consolidate with proper filling/ leveling with the help of dozer.
ii	Dump foundation preparation should be done by excavating and removing soil before dumping, to improve the frictional resistance at the base of dump. It should be filled with over burden containing stones.	Complied
m	There should not be any dumping in pool water or on slushy ground.	No dumping is done in water pooled / slushy ground
lv	Discontinuous dumping should be avoided to check water accumulation between two isolated dumps.	Dumping is done at a single earmarked area.
v	During rainy season, an officer should be deputed to go in and around the dump site every morning to see the effectiveness of drain. If any blockage is observed, immediately steps should be taken to make it effective.	Mining officer is always deputed during rainy season to ensure smooth flow of runoff water.
Vİ	The dump should be surveyed periodically to produce up-to-date and accurate dump geometry.	Survey team survey the dump once in a month to produce up-to-date and accurate dump geometry.
vli	The slope and stability monitoring by Radar should be done and its report should be sent to MoEF and its Regional Office every six – months.	Stability monitoring by Radar. Report enclosed as Annexure VII
viii	The dump design should be reviewed by CIMFR or any other scientific agency after reaching dump height of 120m and its report sent to MoEF and its Regional office.	Complied. Waste dump design and slope stability is being reviewed yearly by CIMFR and report being submitted to MoEF Regional Office. Latest report is attached as Annexure XXI. Recommendations of current 2 quarters also attached.
ix	Waste dump has to be managed as per the guidelines of DGMS and quarterly monitoring report to be submitted to DGMS and regional office	Waste dump is being managed as per the DGMS guidelines and quarterly monitoring report shall be submitted to DGMS and regional office.
х	On stabilized dumps, more species such as Pongamia, Bombax ceiba, Tamarind, Arjun, Gravillea robusta and Amla to be planted.	

xi	The Radar monitoring system should satisfactorily sub-serve the dual objectives viz.(a) Investigative monitoring to provide an understanding of the slope behavior over time and typical response to external events (e.g. Precipitation and seasonal fluctuations) and (b). Predictive Monitoring: To provide a warning of a change in behavior, enabling the possibility of limiting or intervening to prevent hazardous sliding. The data so analyzed should be provided with reference to the above.	The analyzed data is enclosed Annexure — VII
xii	Paved drains are to be provided to protect the slope surface against rain-cuts and seepage during rains to make a safe way to discharge top and surface water to the bottom of the dump. Constant vigilance on the condition of dumps with special reference to accumulation of water and development of cracks.	Paved drains are provided. Constant vigilance shall be given on the dump condition with special reference to water accumulation and development of cracks.
xili	Regular Monitoring of above mentioned specific conditions shall be included in the monitoring plan and report submitted to the Ministry of Environment, Forest and Climate Change and its Regional Office located at Lucknow on six monthly basis.	Regular monitoring of the above mention conditions conducted and report is enclosed. Annexure – XXI. Recommendations of current quarters also attached.

CEO - IBU Agucha Hindustan Zinc Limited Rampura Agucha Mines PO - Agucha Distt. - Bhilwara (Raj.)

## HINDUSTAN ZINC LIMITED, RAMPURA AGUCHA MINE

MoEF Environmental Clearance Compliance to amendment in EC vide letter No. J-11015/267/2008-I-A-II (M) dated 28<sup>th</sup> February , 2020

S.No.	Condition	Status
1.	PP shall ensure that the recommendation provided in study conducted by Indian Institute of Science, Bangalore shall be complied for increasing the height of the tailing dam.	Height raising of the tailing dam is done as per the recommendations of Indian Institute of Science, Bangalore study.
2	The risk arising due to surface runoff during rainy season or otherwise, from the tailing area/heap, shall be assessed on regular basis and corrective measures shall be undertaken and reported to SPCBs.	Tailing Dam is always having freeboard and there is no risk of surface runoff from the area.
3	PP shall engage sultable agency for conducting subsidence study for increasing the depth of working from 1000 mbgl to 1500mbg. The report shall be submitted to Ministry within 6 months.	Study conducted by Central Institute of Mining & Fuel Research (CSIR- CIMFER). Copy of the study report "Numerical Modelling Studies for Subsidence predication at Rampura Agucha Mine, HZL" submitted vide letter No. HZL/RAM/ENV/2020-2021/789 dated 28.08.2020.  Report cover page — XXXIII
4	No waste to be transported outside the mining lease area.	No waste is transported outside the lease area. If required to be done in future, necessary approvals will be taken.
	ndard Conditions:	019 and Ministry's O M No 22 24/2019 In III dated
(As	Ministry's O.M No 22-34/2018-IA.III dated 8.01.2 16.01.2 atutory compliance	
(As	Ministry's O.M No 22-34/2018-IA.III dated 8.01.2 16.01.2 atutory compliance This Environmental Clearance (EC) is subject to orders/ judgment of Hon'ble Supreme Court of India, Hon'ble High Court, Hon'ble NGT and any other Court of Law, Common Cause Conditions	
(As	Ministry's O.M No 22-34/2018-IA.III dated 8.01.2 16.01.2 atutory compliance This Environmental Clearance (EC) is subject to orders/ judgment of Hon'ble Supreme Court of India, Hon'ble High Court, Hon'ble NGT and any other Court of Law, Common Cause Conditions as may be applicable.	All applicable orders/ and Judgment will be complied.  Till date no liability raised by state government. If
(As	Ministry's O.M No 22-34/2018-IA.III dated 8.01.2 16.01.2 atutory compliance  This Environmental Clearance (EC) is subject to orders/ judgment of Hon'ble Supreme Court of India, Hon'ble High Court, Hon'ble NGT and any other Court of Law, Common Cause Conditions as may be applicable.  The Project Proponent complies with all the statutory requirements and judgment of Hon'ble Supreme Court dated 2nd August, 2017 in Writ Petition (Civil) No. 114 of 2014 in matter of Common Cause versus Union of India & Ors	All applicable orders/ and Judgment will be complied.  Till date no liability raised by state government. If

	Clearance from MoEF&CC subsequent to the recommendations of the Standing Committee of National Board for Wildlife, if applicable to the Project.	
5	This Environmental Clearance shall become operational only after receiving formal Forest Clearance (FC) under the provision of Forest Conservation Act, 1980, if applicable to the Project.	Forest clearance not applicable as there is no forest land in Mine Lease area.
6	Project Proponent (PP) shall obtain Consent to Operate after grant of EC and effectively implement all the conditions stipulated therein. The mining activity shall not commence prior to obtaining Consent to Establish/ Consent to Operate from the concerned State Pollution Control Board/Committee.	Consent to Establish was granted by RSPCB vide letter No. F(Mines)/Bhilwara (Hurda)/1(1)2009-2010/4792 dtd 21/01/2010 (Copy attached as Annexure - XXXII). Consent to Operate granted by RSPCB vide File F(CPM)/Bhilwara(Hurda)/2(1)/2019-2020/7113-7117 dated 28/02/2023 for mining activity. RSPCB. Consent to Operate granted by RSPCB vide File F(HDF)/Bhilwara(Hurda)/1(1)/2023-2024/1629-1631 dated 14/06/2023 for Beneficiation plant, and the conditions stipulated are implemented. (Copies attached as Annexure -XXXIII) There is no requirement of obtaining CTE & CTO afresh as this is an amendment in existing EC.
7	The PP shall adhere to the provision of the Mines Act, 1952, Mines and Mineral (Development & Regulation), Act, 2015 and rules & regulations made there under. PP shall adhere to various circulars issued by Directorate General Mines Safety (DGMS) and Indian Bureau of Mines from time to time.	Adherence to all provisions of Mines Act, MMDR Act and circulars of DGMS & IBM is ensured.
8	The Project Proponent shall obtain consents from all the concerned land owners, before start of mining operations, as per the provisions of MMDR Act,1957 and rules made there under in respect of lands which are not owned by it.	All the land is owned by HZL. Operations were started in the year 1991.
9	The Project Proponent shall follow the mitigation measures provided in MoEF&CC's Office Memorandum No. Z-11013/57/2014-IA. II (M), dated 29 <sup>th</sup> October, 2014, titled "Impact of mining activities on Habitations-Issues related to the mining Projects wherein Habitations and villages are the part of mine lease areas or Habitations and villages are surrounded by the mine lease area"	No village and Habitation are part of mining lease area.
10	The Project Proponent shall obtain necessary prior permission of the competent authorities for drawl of requisite quantity of surface water and from CGWA for withdrawal of ground water for the project.	Permission for mine dewatering issued by CGWA vide NOC No. CGWA/NOC/MIN/REN/2/2022/7143 valid till 07.07.2024. (Annexure XXIV). NOC of water withdrawal from Banas radial well has been renewed vide no. CGWA/NOC/MIN/REN/3/2023/7399 same is valid till

		07/07/2024 (Annexure XXV).
11	A copy of EC letter will be marked to concerned Panchayat / local NGO etc. if any, from whom suggestion/ representation has been received while processing the proposal.	Renewal application submitted  Copy of EC letter was submitted to Panchayat in 2009.
12.	State Pollution Control Board/Committee shall be responsible for display of this EC letter at its Regional office, District Industries Centre and Collector's office/ Tehsildar's Office for 30 days.	Copy is marked to Rajasthan State Pollution Control Board.
13	The Project Authorities should widely advertise about the grant of this EC letter by printing the same in at least two local newspapers, one of which shall be in vernacular language of the concerned area. The advertisement shall be done within 7 days of the issue of the clearance letter mentioning that the instant project has been accorded EC and copy of the EC letter is available with the State Pollution Control Board/Committee and web site of the Ministry of Environment, Forest and Climate Change (www.parivesh.nic.in). A copy of the advertisement may be forwarded to the concerned MoEFCC Regional Office for compliance and record.	Copy of the advertisement was sent to MoEF &CC, Lucknow vide letter No HZL/RAM/Env/Exp/2009 Advertised in two News papers on 03.01.2010.
14	The Project Proponent shall inform the MoEF&CC for any change in ownership of the mining lease. In case there is any change in ownership or mining lease is transferred than mining operation shall only be carried out after transfer of EC as per provisions of the para 11 of EIA Notification, 2006 as amended from time to time.	Will inform as per EIA notification in case of any change in ownership or transfer of the mining lease.
15	In pursuant to Ministry's O.M. No 22-34/2018- IA.III dated 16.01.2020 to comply with the direction made by Hon'ble Supreme Court on 8.01.2020 in W.P. (Civil) No 114/2014 in the matter Common Cause vs Union of India, the mining lease holder shall after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to other mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc.	Reclamation is carried out progressively for growth of flora and fauna.
16	II. Air quality monitoring and preservation  The Project Proponent shall install a minimum	Three Online Ambient Air Quality Monitoring
	of 3 (three) unline Ambient Air Quality Monitoring Stations with 1 (one) in upwind and 2 (two) in downwind direction based on long	Stations are in place, 1 in upwind and 2 in downwind direction.  Six Ambient air monitoring locations, three each in

term climatological data about wind direction core and buffer zone each are selected in such that an angle of 120° is made between the consultation with the SPCB. AAQ monitoring is monitoring locations to monitor critical carried out every fortnightly parameters, relevant for mining operations, of air pollution viz. PM10, PM2.5, N02, CO and S02 Data digitally displayed at main gate. Attached as etc. as per the methodology mentioned in Annexure-XXVI. NAAQS Notification No. B-29016/20/90/PCI/I. dated 18.11.2009 covering the aspects of transportation and use of heavy machinery in the impact zone. The ambient air quality shall also be monitored at prominent places like office building, canteen etc. as per the site condition to ascertain the exposure characteristics at specific places. The above data shall be digitally displayed within 03 months in front of the main Gate of the mine 17 Effective safeguard measures for prevention of Water sprinkling is carried out by 4 Nos. of 40 KL dust generation and subsequent suppression water sprinkler on Haul roads to mitigate air (like regular water sprinkling, metalled road pollution in mine area Annexure-X. Dust extraction construction etc.) shall system and Water sprinkling nozzles are installed at be carried out in areas prone to air pollution the crushers, transfer points and coarse stockpiles wherein high levels of PM 10 and PM2.5 are for dust suppression, Industrial roads are cleaned by evident such as haul road, loading and using Truck mounted vacuum road sweepers. unloading point and transfer points. The (Annexure-XXII) The parameters of Ambient Air Fugitive dust emissions from all sources shall be quality monitored are within the prescribed norm of regularly controlled by installation of required CPCB. equipment's/ machineries and preventive maintenance. Use of suitable water-soluble chemical dust suppressing agents may be explored for better effectiveness of dust control system. It shall be ensured that air pollution level conform to the standards prescribed by the MoEFCC/ Central Pollution Control Board. III. Water quality monitoring and preservation 18 In case, immediate mining scheme envisages Permission for mine dewatering issued by CGWA intersection of ground water table, then vide NOC No. CGWA/NOC/MIN/REN/2/2022/7143 Environmental Clearance become valid till 07.07.2024. (Annexure XXIV). NOC of water operational only after receiving formal withdrawal from Banas radial well has been clearance from CGWA. In case, mining renewed vide operation involves intersection of ground water CGWA/NOC/MIN/REN/3/2023/7399 same is valid till table at a later stage, then PP shall ensure that 07/07/2024 (Annexure XXV). and prior approval from CGWA and MoEFCC is in application submitted and attached with annexure place before such mining operations. The XXIV and XXV. permission for intersection of ground water table shall essentially be based on detailed hydro-geological study of the area. Regular monitoring of the flow rate of the There is no perennial nallahs in and around mine 19 springs and perennial nallahs flowing in and lease. Not disturbed any village's natural water around the mine lease shall be carried out and bodies or streams.

records maintain. The natural water bodies and Regular water monitoring carried out for open dug or streams which are flowing in an around the well / piezometers near mining area and water level village, should not be disturbed. The Water and water quality report Quarterly to CGWA, GCWB Table should be nurtured so as not to go down & State Pollution Control Board. below the pre-mining period. In case of any Drinking water is provided to the nearby villages water scarcity in the area, the Project through tankers. Proponent has to provide water to the villagers Report Submitted to MoEF&CC on six monthly basis. for their use. A provision for regular monitoring Attached as Annexure -I of water table in open dug wall located in village should be incorporated to ascertain the impact of mining over ground water table. The Report on changes in Ground water level and quality shall be submitted on six-monthly basis to the Regional Office of the Ministry, CGWA and State Groundwater Department/ State Pollution Control Board. 20 Project Proponent shall regularly monitor and Ground water level and water quality monitoring maintain records w.r.t. ground water level and done regular basis and report submitted to CGWA, quality in and around the mine lease by State Pollution Control Board and MoEF&CC on establishing a network of existing wells as well quarterly basis and six-monthly basis. as new piezo-meter installations during the mining operation in consultation with Central Ground Water Authority/ State Ground Department. The Report on changes in Ground water level and quality shall be submitted on six-monthly basis to the Regional Office of the Ministry,CGWA and State Groundwater Department/ State Pollution Control Board 21 The Project Proponent shall undertake regular There is no perennial nallahs in and around mine monitoring of natural water course/ water lease. resources/ springs and perennial nallahs Regular Monitoring of natural water resources existing/ flowing in and around the mine lease around mining lease is carried out. and maintain its records. The project Regular water monitoring carried out for open dug proponent shall undertake regular monitoring well / piezometers near mining area and water level of water quality upstream and downstream of and water quality report Quarterly to CGWA, GCWB water bodies passing within and nearby/ & State Pollution Control Board. (Annexure- I (1, 2 & adjacent to the mine lease and maintain its 3). records. Sufficient number of gullies shall be provided at appropriate places within the lease for management of water. PP shall carryout regular monitoring w.r.t. pH and included the same in monitoring plan. The parameters to be monitored shall include their water quality visa-vis suitability for usage as per CPCB criteria and flow rate. It shall be ensured that no obstruction and/ or alteration be made to water bodies during mining operations without justification and prior approval of MoEFCC. The monitoring of water courses/ bodies existing in fease area shall be carried out four times in a

	year viz. pre- monsoon (April-May), monsoon (August), post-monsoon (November) and winter (January) and the record of monitored data may be sent regularly to Ministry of Environment, Forest and Climate Change and its Regional Office, Central Ground Water Authority and Regional Director, Central Ground Water Board, State Pollution Control Board and Central Pollution Control Board. Clearly showing the trend analysis on sixmonthly basis.	
22	Quality of polluted water generated from mining operations which include Chemical Oxygen Demand (COD) in mines run-off; acid mine drainage and metal contamination in runoff shall be monitored along with Total Suspended Solids (TDS), Dissolved Oxygen (DO), pH and Total Suspended Solids (TSS). The monitored data shall be uploaded on the website of the company as well as displayed at the project site in public domain, on a display board, at a suitable location near the main gate of the Company. The circular No. J- 20012/1 /2006-IA. II (M) dated 27.05.2009 issued by Ministry of Environment, Forest and Climate Change may also be referred in this regard.	Water generated from mining operations is utilized in Beneficiation Plant and zero discharge is maintained. There is no acid mine drainage occurring in the mine. Garland drains are constructed around the tailing dam and waste dump with collection sumps.
23	Project Proponent shall plan, develop and implement rainwater harvesting measures on long term basis to augment ground water resources in the area in consultation with Central Ground Water Board/ State Groundwater Department. A report on amount of water recharged needs to be submitted to Regional Office MoEFCC annually.	Garland drains are constructed around the tailing dam and waste dump with collection sumps of 8.5 lakh CuM capacity to collect and reuse the rain water. Collection pond of 1.5 lakh CuM has been constructed in the township. 3 Nos. of anicuts have been constructed for groundwater augmentation in consultation with CGWB. 4 anicults constructed in the area under MJSA. 8.7 MCM groundwater recharge work has been completed in four blocks of Bhilwara district.
24	Industrial waste water (workshop and waste water from the mine) should be properly collected and treated so as to conform to the notified standards prescribed from time to time. The standards shall be prescribed through Consent to Operate (CTO) issued by concerned State Pollution Control Board (SPCB). The workshop effluent shall be treated after its initial passage through Oil and grease trap	No waste water generation from mining. Water generated during mining intersection is used in sprinkling and beneficiation process. Water from tailing dam is recycled back to the Beneficiation Plant and zero discharge is maintained. Oil & Grease traps are installed near work shop and water reused in beneficiation process. Annexure V & Annexure XVIII.
25	The water balance/water auditing shall be carried out and measure for reducing the consumption of water shall be taken up and reported to the Regional Office of the MoEF&CC and State Pollution Control Board/Committee.  IV. Noise and vibration monitoring and prevention	Water balance attached as annexure XXVII

26	The peak particle velocity at 500m distance or within the nearest habitation, whichever is closer shall be monitored periodically as per applicable DGMS guidelines	Peak particle velocity monitoring done as per guidelines. Annexure-XXIII
27	The illumination and sound at night at project sites disturb the villages in respect of both human and animal population. Consequent sleeping disorders and stress may affect the health in the villages located close to mining operations. Habitations have a right for darkness and minimal noise levels at night. PPs must ensure that the biological clock of the villages is not disturbed; by orienting the floodlights/ masks away from the villagers and keeping the noise levels well within the prescribed limits for day /night hours.	Lights are installed in a manner so that no disturbance to the villagers. Noise levels are also within prescribed limits. Annexure- IV
28	The Project Proponent shall take measures for control of noise levels below 85 dBA in the work environment. The workers engaged in operations of HEMM, etc. should be provided with ear plugs /muffs. All personnel including laborers working in dusty areas shall be provided with protective respiratory devices along with adequate training, awareness and information on safety and health aspects. The PP shall be held responsible in case it has been found that workers/ personals/ laborers are working without personal protective equipment.	PPEs like ear plugs / muffs, dust masks, safety goggles, safety shoes etc. provided to all workers/ personals/ laborers. Adequate trainings provided to all concerned and toolbox talks are carried out before starting work. Noise monitoring done as per guideline report attached as per Annexure —IV
2000	V. Mining plan	A STATE OF THE PROPERTY OF THE PARTY OF THE
29	The Project Proponent shall adhere to the	Working as per mining plan. There is no changes in mining technology scope of work, method of mining, overburden & dump management, OB & dump mining, mineral transportation mode, ultimate depth of mining.  As per the latest MoEF&CC O.M. No. 22-44/2018-IA.III dated 14.05.2020, production will not be extended beyond EC approved quantity.
30		Progressive Mine Closure Plan is part of approved

	Closure Plan along with Financial Assurance approved from Indian Bureau of Mines/Department of Mining & Geology as required under the Provision of the MMDR Act, 1957 and Rules/ Guidelines made there under. A copy of approved final mine closure plan shall be submitted within 2 months of the approval of the same from the competent authority to the concerned Regional Office of the Ministry of Environment, Forest and Climate Change for record and verification.	Mining Plan. Final Mine Closure Plan along with details of Corpus Fund will be got approved from IBM and copy of the same will be submitted to MoEF&CC well in advance of final mine closure.
31	The land-use of the mine lease area at various stages of mining scheme as well as at the end- of-life shall be governed as per the approved Mining Plan. The excavation vis-a-vis backfilling in the mine lease area and corresponding afforestation to be raised in the reclaimed area shall be governed as per approved mining plan. PP shall ensure the monitoring and management of rehabilitated areas until the vegetation becomes self-sustaining. The compliance status shall be submitted half- yearly to the MoEFCC and its concerned Regional Office.	Land use of mine lease area, excavation and afforestation and reclamation are done as per approved mining plan.
32	VI. Land reclamation  The Overburden (OB) generated during the mining operations shall be stacked at earmarked OB dump site(s) only and it should not be kept active for a long period of time. The physical parameters of the OB dumps like height, width and angle of slope shall be governed as per the approved Mining Plan as per the guidelines/circulars issued by D.G.M.S w.r.t. safety in mining operations shall be strictly adhered to maintain the stability of top soil/OB dumps. The topsoil shall be used for land reclamation and plantation.	Overburden burden is stacked at earmarked Waste Dump site. Physical parameters maintain as per mining plan and DGMS guidelines and circulars. The topsoil is used for land reclamation and plantation. In current FY there is no top soil generation.
33	The reject/waste generated during the mining operations shall be stacked at earmarked waste dump site(s) only. The physical parameters of the waste dumps like height, width and angle of slope shall be governed as per the approved Mining Plan as per the guidelines/circulars issued by DGMS w.r.t. safety in mining operations shall be strictly adhered to maintain the stability of waste dumps.	Overburden burden is stacked at earmarked Waste Dump site. Physical parameters maintain as per mining plan and DGMS guidelines and circulars. stability monitoring by Radar Report enclosed as Annexure –VII
34	The reclamation of waste dump sites shall be done in scientific manner as per the Approved Mining Plan cum Progressive Mine Closure Plan.	Reclamation of waste dump site as per mining plan.
	1 a marti	

	scientific manner with suitable native species to maintain the slope stability, prevent erosion and surface run off. The selection of local species regulates local climatic parameters and help in adaptation of plant species to the microclimate. The gullies formed on slopes should be adequately taken care of as it impacts the overall stability of dumps. The dump mass should be consolidated with the help of dozer/ compactors thereby ensuring proper filling/ leveling of dump mass. In critical areas, use of geo textiles/ gee-membranes / clay liners / Bentonite etc. shall be undertaken for stabilization of the dump.	in scientific manner using geotextile and with native and arid zone seeds (like <u>Acacia nitolica ,Ziziphus Jojoba ,Prosopis cineraria, Alkanno Tinctoria, Capparis decidua, Gundi, Salvadorapersica spread on waste dump slopes. Aloe Vera and Vetiver grass planted during laying of geotextiles  Annexure XXVIII</u>
36	The Project Proponent shall carry out slope stability study in case the dump height is more than 30 meters. The slope stability report shall be submitted to concerned regional office of MoEF&CC.	Waste dump design and slope stability is being reviewed yearly by CIMFR and report being submitted to MoEF&CC Regional Office. Latest report enclosed as Annexure XXI.
37	Catch drains, settling tanks and siltation ponds of appropriate size shall be constructed around the mine working, mineral yards and Top Soil/OB/Waste dumps to prevent run off of water and flow of sediments directly into the water bodies (Nallah/ River/ Pond etc.). The collected water should be utilized for watering the mine area, roads, green belt development, plantation etc. The drains/ sedimentation sumps etc. shall be de-silted regularly, particularly after monsoon season, and maintained properly	Garland drains of adequate size are constructed along the waste dump toe & mining pit, along with lined collection sumps of about 8.5 lakh CuM . The water collected is utilized for various purposes. Desilting sump and drains are desilted on regular basis. Annexure –VIII
38	Check dams of appropriate size, gradient and length shall be constructed around mine pit and OB dumps to prevent storm run-off and sediment flow into adjoining water bodies. A safety margin of 50% shall be kept for designing of sump structures over and above peak rainfall (based on 50 years data) and maximum discharge in the mine and its adjoining area which shall also help in providing adequate retention time period thereby allowing proper settling of sediments/ silt material. The sedimentation pits/ sumps shall be constructed at the corners of the garland drains.	Garland drains of adequate size are constructed along the waste dump toe & mining pit, along with lined collection sumps of about 8.5 lakh CuM . The water collected is utilized for various purposes. Desilting sump and drains are desilted on regular basis. Annexure –VIII
39	The top soil, if any, shall temporarily be stored at earmarked site(s) within the mine lease only and should not be kept unutilized for long. The physical parameters of the top soil dumps like height, width and angle of slope shall be governed as per the approved Mining Plan and as per the guidelines framed by DGMS w.r.t.	The topsoil has been utilized for land reclamation and plantation. At present no top soil dump at site.

	safety in mining operations shall be strictly adhered to maintain the stability of dumps. The topsoil shall be used for land reclamation and plantation purpose.	l .
	VII. Transportation	14 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
40	No Transportation of the minerals shall be allowed in case of roads passing through villages/ habitations. In such cases, PP shall construct a 'bypass' road for the purpose of transportation of the minerals leaving an adequate gap (say at least 200 meters) so that the adverse impact of sound and dust along with chances of accidents could be mitigated. All costs resulting from widening and strengthening of existing public road network shall be borne by the PP in consultation with nodal State Govt. Department. Transportation of minerals through road movement in case of existing village/ rural roads shall be allowed in consultation with nodal State Govt. Department only after required strengthening such that the carrying capacity of roads is increased to handle the traffic load. The pollution due to transportation load on the environment will be effectively controlled and water sprinkling will also be done regularly. Vehicular emissions shall be kept under control and regularly monitored. Project should obtain Pollution Under Control (PUC) certificate for all the vehicles from authorized pollution testing centers.	habitation. Regular water sprinkling is done on haul roads (Annexure X). Industrial roads are cleaned using truck mounted vacuum Road Sweepers( Annexure-XXII ). Periodic preventive maintenance of
41	The Main haulage road within the mine lease should be provided with a permanent water sprinkling arrangement for dust suppression. Other roads within the mine lease should be wetted regularly with tanker-mounted water sprinkling system. The other areas of dust generation like crushing zone, material transfer points, material yards etc. should invariably be provided with dust suppression arrangements. The air pollution control equipments like bag filters, vacuum suction hoods, dry fogging system etc. shall be installed at Crushers, belt-conveyors and other areas prone to air pollution. The belt conveyor should be fully covered to avoid generation of dust while transportation. PP shall take necessary measures to avoid generation of fugitive dust emissions.  VIII. Green Belt	Regular water sprinkling is done on haul roads ( Annexure X).  Dust extraction system and Water sprinkling nozzles are installed at the crushers, transfer points and coarse stockpiles for dust suppression. Industrial roads are cleaned by using Truck mounted vacuum road sweepers. (Annexure-XXII) The parameters of Ambient Air quality monitored are within the prescribed norm of CPCB.
	VIII. Green Kelf	

	in 7.5m wide safety zone all along the mine lease boundary as per the guidelines of CPCB in order to arrest pollution emanating from mining operations within the lease. The whole Green belt shall be developed within first 5 years starting from windward side of the active mining area. The development of greenbelt shall be governed as per the EC granted by the Ministry irrespective of the stipulation made in approved mine plan.	
43	The Project Proponent shall carryout plantation/ afforestation in backfilled and reclaimed area of mining lease, around water body, along the roadsides, in community areas etc. by planting the native species in consultation with the State Forest Department/ Agriculture Department/ Rural development department/ Tribal Welfare Department/ Gram Panchayat such that only those species be selected which are of use to the local people. The CPCB guidelines in this respect shall also be adhered. The density of the trees should be around 2500 saplings per Hectare. Adequate budgetary provision shall be made for protection and care of trees.	Green belt developed all along the acquired area. Progressive plantation is being carried out on waste dump benches every year. Seed spearing and geotextile laying is also carried out on waste dump slopes. As per SRSAC study conducted based on Nov 2021 satellite imagery, 694103 Nos of plants are existing with in 348 Ha area. Further FY 2022-23, FY 2023-24, and FY 2024-25, 15000 Nos, 23000 Nos, and 5000 Nos saplings planted as gap filling. Currently 737103 Nos of plants are exiting in 348 Ha. Detailed SRSAC report attached as Annexure XXXV. Additional plantation has been done in 37.70 ha in the township and along roadside. Density of the plantation will be increased in phase manner. (Annexure –IX)
44	The Project Proponent shall make necessary alternative arrangements for livestock feed by developing grazing land with a view to compensate those areas which are coming within the mine lease. The development of such grazing land shall be done in consultation with the State Government. In this regard, Project Proponent should essentially implement the directions of the Hon'ble Supreme Court with regard to acquisition of grazing land. The sparse trees on such grazing ground, which provide mid-day shelter from the scorching sun, should be scrupulously guarded/ protected against felling and plantation of such trees should be promoted.	Hindustan Zinc Ltd. is carrying out various work for livestock and agriculture development under its flagship project named "Samadhan" in collaboration with BAIF (National level Origination)
45	The Project Proponent shall undertake all precautionary measures for conservation and protection of endangered flora and fauna and Schedule-I species during mining operation. A Wildlife Conservation Plan shall be prepared for the same clearly delineating action to be taken for conservation of flora and fauna. The Plan shall be approved by Chief Wild Life Warden of the State Govt.	Not applicable there is no Shedule-1 species in mining area
46	the State Govt.  And implemented in consultation with the	Not applicable There is no Shedule-1 spec

	State Forest and Wildlife Department. A copy of Wildlife Conservation Plan and its implementation status (annual) shall be submitted to the Regional Office of the Ministry.	mining area
	IX. Public hearing and human health issues	
47	The Project Proponent shall appoint an Occupational Health Specialist for Regular as well as Periodical medical examination of the workers engaged in the mining activities, as per the DGMS guidelines. The records shall be maintained properly. PP shall also carryout Occupational health check-ups in respect of workers which, are having ailments like BP, diabetes, habitual smoking, etc. The check-ups shall be undertaken once in six months and necessary remedial/ preventive measures be taken. A status report on the same may be sent to MoEFCC Regional Office and DGMS on half-yearly basis.	Appointed Occupational Health Specialist. Regular as well as Periodical medical examination of the workers are carried out as per Mines Act. Copy of the return submitted to DGMS is attached as annexure –XXIX
48	The Project Proponent must demonstrate commitment to work towards 'Zero Harm' from their mining activities and carry out Health Risk Assessment (HRA) for identification workplace hazards and assess their potential risks to health and determine appropriate control measures to protect the health and wellbeing of workers and nearby community. The proponent shall maintain accurate and systematic records of the HRA. The HRA for neighborhood has to focus on Public Health Problems like Malaria, Tuberculosis, HIV, Anaemia, Diarrhoea in children under five, respiratory infections due to bio mass cooking. The proponent shall also create awareness and educate the nearby community and workers for Sanitation, Personal Hygiene, Hand washing, not to defecate in open, Women Health and Hygiene (Providing Sanitary Napkins), hazard of tobacco and alcohol use. The Proponent shall carryout base line LIRA for all the category of workers and there after every five years.	We are committed for Zero Harm from our mining activities. Various studies have been done for health risk assessment regarding identification and control measures for workplace hazards. Regular health check-ups of nearby community are done through "Government PHC (Primary Health Center)" (Annexure-XX) and awareness sessions are also conducted.
49	The Proponent shall carry out Occupational health surveillance which be a part of HRA and include Biological Monitoring where practical and feasible, and the tests and investigations relevant to the exposure (e.g. for Dust a X-Ray chest; For Noise Audiometric; for Lead Exposure Blood Lead, For Welders Full Ophthalmologic Assessment; for Manganese Miners a complete Neurological Assessment by	maintain by Occupational health team. No

a Certified Neurologist, and Manganese (Mn) Estimation in Blood; For Inorganic Chromium-Fortnightly skin inspection of hands and forearms by a responsible person. Except routine tests all tests would be carried out in a Lab accredited by NABH, Records of Health Surveillance must be kept for 30 years, including the results of and the records of Physical examination and tests. The record of exposure due to materials like Asbestos, Hard Rock Mining, Silica, Gold, Kaolin, Aluminium, Iron, Manganese, Chromium, Lead, Uranium need to be handed over to the Mining Department of the State in case the life of the mine is less than 30 years. It would be obligatory for the State Mines Departments to make arrangements for the safe and secure storage of the records including X-Ray. Only conventional X-Ray will be accepted for record purposes and not the digital one). X-Ray must meet ILO criteria (17 x14 inches and of good quality). The Proponent shall maintained a record of performance indicators for workers which includes (a) there should not be a significant decline in their Body Mass Index and it should stay between 18.5 -24.9, (b) the Final Chest X-Ray compared with the base line X-Ray should not show any capacities (c) At the end of their leaving job there should be no Diminution in their Lung Functions Forced Expiratory Volume in one second (FEV1 ), Forced Vital Capacity

Periodical medical examination of the workers are being carried out as per DGMS guidelines and records are being maintained.

Further, as no changes in the performance indicators have been reported, the need for paying compensation didn't arise.

performance indicators for workers which includes (a) there should not be a significant decline in their Body Mass Index and it should stay between 18.5 -24.9, (b) the Final Chest X-Ray compared with the base line X-Ray should not show any capacities, (c) At the end of their leaving job there should be no Diminution in their Lung Functions Forced Expiratory Volume in one second (FEV1), Forced Vital Capacity (FVC), and the ratio) unless they are smokers which has to be adjusted, and the effect of age, (d) their hearing should not be affected. As a proof an Audiogram (first and last need to be presented), (e) they should not have developed any Persistent Back Pain, Neck Pain, and the movement of their Hip, Knee and other joints should have normal range of movement, (f) they should not have suffered loss of any body part. The record of the same should be submitted to the Regional Office, MoEF&CC annually along with details of the relief and compensation paid to workers having above indications.

50

The Project Proponent shall ensure that Personnel working in dusty areas should wear protective respiratory devices and they should also be provided with adequate training and information on safety and health aspects.

Dust masks are provided to all workers/ personals/ laborers. Adequate trainings provided to all concerned and toolbox talks are carried out before starting of work.

Project Proponent shall make provision for the housing for workers/ labors or shall construct labor camps within/ outside (company owned land) with necessary basic infrastructure/ facilities like fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, creche for kids etc. The housing may be provided in the form of temporary structures which can be removed after the completion of the project related infrastructure. The domestic waste water should be treated with STP in order to avoid contamination of underground water.	No construction labor housing is proposed in mining area. However, the sanitation and drinking water facility is provided to the workers, working at site. Sewage Treatment Plants are also installed at mining area and township.
The activities proposed in Action plan prepared for addressing the issues raised during the Public Hearing shall be completed as per the budgetary provisions mentioned in the Action Plan and within the stipulated time frame. The Status Report on implementation of Action Plan shall be submitted to the concerned Regional Office of the Ministry along with District Administration.	All the issues raised during Public Hearing in the year 2009 were addressed.
X. Corporate Environment Responsibility (CER)	
The activities and budget earmarked for Corporate Environmental Responsibility (CER) as per Ministry's O.M No 22-65/2017-IA. II (M) dated 01.05.2018 or as proposed by EAC should be kept in a separate bank account. The activities proposed for CER shall be implemented in a time bound manner and annual report of implementation of the same along with documentary proof viz. photographs, purchase documents, latitude & longitude of infrastructure developed & road constructed needs to be submitted to Regional Office MoEF&CC annually along with audited statement.	Separate Cost center and GL account are maintained. Activities proposed for CER will be implemented in time bound manner.
Project Proponent shall keep the funds earmarked for environmental protection measures in a separate account and refrain from diverting the same for other purposes. The Year wise expenditure of such funds should be reported to the MoEFCC and its concerned	Environmental funds are earmarked for environment work only. Separate Cost center and GL account are maintained. Environmental expenditure is reported on six monthly basis enclosed as Annexure -VI
	housing for workers/ labors or shall construct labor camps within/ outside (company owned land) with necessary basic infrastructure/ facilities like fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, creche for kids etc. The housing may be provided in the form of temporary structures which can be removed after the completion of the project related infrastructure. The domestic waste water should be treated with STP in order to avoid contamination of underground water.  The activities proposed in Action plan prepared for addressing the issues raised during the Public Hearing shall be completed as per the budgetary provisions mentioned in the Action Plan and within the stipulated time frame. The Status Report on implementation of Action Plan shall be submitted to the concerned Regional Office of the Ministry along with District Administration.  X. Corporate Environment Responsibility (CER)  The activities and budget earmarked for Corporate Environmental Responsibility (CER) as per Ministry's O.M No 22-65/2017-IA. II (M) dated 01.05.2018 or as proposed by EAC should be kept in a separate bank account. The activities proposed for CER shall be implemented in a time bound manner and annual report of implementation of the same along with documentary proof viz. photographs, purchase documents, latitude & longitude of infrastructure developed & road constructed needs to be submitted to Regional Office MoEF&CC annually along with audited statement.  Project Proponent shall keep the funds earmarked for environmental protection measures in a separate account and refrain from diverting the same for other purposes. The Year wise expenditure of such funds should

56	The Project Proponent shall prepare digital map (land use & land cover) of the entire lease area once in five years purpose of monitoring land use pattern and submit a report to concerned Regional Office of the MoEFCC.	The land use & land cover change study carried out in 2023. Copy attached Annexure-XIV
57	The Project Authorities should inform to the Regional Office regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.	Being operational unit, condition is not applicable.
58	The Project Proponent shall submit six monthly compliance reports on the status of the implementation of the stipulated environmental safeguards to the MOCFCC & its concerned Regional Office, Central Pollution Control Board and State Pollution Control Board.	Compliances report submitted to MOEF&CC & Regional Office, Central Pollution Control Board and State Pollution Control Board. Environment statement submitted on 6th Auguest 2024. Annexure-XIX.
59	A separate 'Environmental Management Cell' with suitable qualified manpower should be set-up under the control of a Senior Executive. The Senior Executive shall directly report to Head of the Organization. Adequate number of qualified Environmental Scientists and Mining Engineers shall be appointed and submit a report to RO, MoEF&CC.	Environment Management Cell has been set up having adequate qualified Executives and a Senior executive who reports to IBU CEO directly. Adequate number of mining engineers are appointed for mine planning, execution, Geotech etc.
60	The concerned Regional Office of the MoEF&CC shall randomly monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the MoEF&CC officer(s) by furnishing the requisite data / information / monitoring reports.	Noted

CEO - IBU Agucha Hindustan Zinc Limited Rampura Agucha Mines PO - Agucha Diett. - Bhilwara (Raj.)

## Mechanism for addressing Environmental Issues

HZL has a Health Safety and Environment Policy, given below, signed by its CEO and forms the guidelines for the entire organization. A well laid mechanism is implemented uniformly across all units of HZL for the implementation of the policy.

All operating uints of Hindustan Zinc Limited are certified for ISO-14001 Environmental Management system (EMS). The Management Representative (MR) of the certification system is an experienced environmental officer with due authority to implement and drive a responsible EMS. The MR is duly supported by a committee constituting the operations and maintenance officers of the unit. The system has a well laid documented procedure for identification of all environmental aspect, Impacts and implementation of suitable mitigation measures.

The company has three level monitoring mechanism for addressing environmental concerns starting at unit level, HZL corporate level and Vedanta group company level. Depending on the scale and nature of the issue, the concern is escalated to different level right up to the Board of the company and also the shareholders of the company in the general body meetings.

The compliances to Environment Clearance and all environmental licenses are reviewed and monitored regularly and reports are submitted to the respective regulatory authorities at every unit, by a dedicated environmental professional, who reports directly to the unit head. The compliance is periodically reviewed and audited by Corporate Environment Department, which reports to the top management of the company. A Corporate Sustainability Committee, chaired by the CEO of the company, oversees all sustainability issues including Environment, Safety and Health and also reviewing any policy matters.

Any non-compliances/show cause/notices/complaints received from regulatory authority or any stakeholder is addressed jointly by the unit and corporate environment department. Such issues are also reported and the actions taken are reviewed by the top management every month. Further, all show cause, complaint letters and notices from any stakeholder, along with the action taken report is submitted to the Board of Directors of the company every quarterly. All major concerns are reported to the stakeholders through the annual general body meetings of the company.





## HINDUSTAN ZINC

## **Environmental Policy**

#### Purpose

Hindustan Zinc Limited is committed to achieving excellence in environmental management. Our goal is to minimise environmental impacts of our business across the entire lifecycle by implementing pollution-prevention and natural resource congenitation actions within continuous lifety.

This pulley inforward looking and sets a vision for businesses across the Hindusten Zinc Limited

#### Score

This policy is applicable to all Mindustan Zinc Limited business units, including substituries, joint ventures, and acquisitions, mantipod sites, licensees, poliseuroing partners, corporate offices, and research tacklities. This policy is also applicable to all. Hindustan Zinc Limited employees, contractor employees, business partners, suppliers, and others with whom limituation Zinc does business.

In addition, this policy is applicable throughout the operational blocycle of the projects and mines, covering stages from exploration and planning to evaluation, operation, and closure. Furthermore, it extends to activities in our upstream and downstream value chain. It is in the distribution, legistics, and sale of products and services to the ousterner.

#### Objectives of the Environmental Policy

#### Hindustan Zinc will strive to:

- Comply with applicable national, regional, and local environmental regulations and statutory obligations. In the absence for lacklind appropriate legislation, industry best practices and applicable international standards will be used.
- Dovelop, implement, and improve coving expensal management systems, consistent with world-class standards.
- Set tergets and objectives to avoid reduce or mitigate Environmental impacts on people and planet.
- Consistently assess our environmentativels, manage our impacts, take appropriate mitigation and adaptation measures, and commentations on vironmental strategy to our stakeholders.
- 6 Incorporate appropriate environmental criteria for all business decisions including the planning, operationalization, and clasure of the projects.
- Conduct regular environmental review and due diligence of the projects fincluding for mergers & acquisitional to identify, prioritize, assess, and take effective actions for mitigating the potential environmental risks.
- Drive continuous environmental performance improvement by implementing appropriate available practices and technology.
- Conserve natural resources by adopting environment-trienally and energy-efficient technologies through process improvements.
- Apply mitigation hierarchy lavoid, reduce, reuse, recycle, disposables environmental impacts and adopt the principles of circular economy.
- Manage impacts related to energy, carbon emissions, weste, nature, air emissions, land-use & biodiversity, and water.
- Raise awareness of internal and laternal stakeholders including business portners, suppliers, and other stakeholders on adoption of practices in alignment with our policies, thereby featuring a collective commitment to managing environmental impacts.
- Provide appropriate training to all employees and emphasise the importance of minimising risks to environment, while also understanding the impacts of their work activities on the environment.
- Engage with relevant stokeholders in building capacity and capability to identify and proactively manage environmental, released scores.
- Communicate with all our stakeholders on the progress and performance of Environment management.
- Review the performance against the policy on A periodic basis to ensure management of environmental impacts as por our sbjectives including the sharing of good practices throughout the organization and stakeholders.

#### Responsibility & Review

This policy is part of the Vedenta Sestainability Framework, and each Hindustan Zinc Limited business unit shall implement this policy. Our CEO will be accountable for controlling and setting the policy, and the Executive Committee are responsible for the full. Implementation of the policy and essociated standards. The Board ESO committee will review this policy annually and excommend appropriate revisions to the Board as may deem necessary.

Related additional policies: Emergy & Climate Change Petics, Blastnersity Policy, Water Policy, Tailing Management Petics,

Manu Hibba

Arun Misra CEO & Whole Timo (Tayelot, H2).

Date: 06° August, 2024

- 110-

Welchenge Acid





## HINDUSTAN ZINC

## **Biodiversity Policy**

#### Purpose

Protecting and professing is newership is an integral part of Hindusten Track commonwest to various development. We are conscious of the patients if the patients and dependent and are travership in general and on blockers-by integrating the need for ded-versity conservation who operational decision-making processes are taking measures to minimize impacts is a commitment across the decipanty with a various finance of the particular or position.

Redworsky is a complex phenomenon that receds to be received, understood, and valued from a brological and societal itie, in terms of acceptation someostapes per live and the Company's Conscious of the personnel and description of acceptance of the personnel of a personnel and description of the personnel of a personnel of the 
This policy is forward looking and sets a vision for businesses across the Hindustan Zinc.

#### Street

I

1

This policy is applicable to all Hindustan Zinc Limited business units, including exhibitants, joint ventures, and acquisitions, managed 6 les. Increases, autocurry of partitions, temperate of less, and research Desirion. This policy is also applicable to all Hindustan Zinc Limited ort players, contractor employees, business, parties or, pagalors, and others with whomilified sour Zinc does business.

is addition. The policy is applicable throughout the operational the projects and music conving stages from explaints and planning to evaluation operation, and closure, furthermore, a personal to activities in our upstrain refusions.

Objectives of the Biediver sity Policy

#### Mindustan Zing will strive to:

- Ather-analyze powiere impacts to bloovers by values by implementing interest or an agreement actions either on site or off site, to compressive for any project impacts to access recognized neglectally or internationally far their high values of threatened, explained or interatory / congregatory species or unique and threatened ecosystems.
- Comply with, and expect wherever too lote, the local, regional, and national regions the requirements concerning land transportent and to adversibly conservation, as well as relayant international agreements, in all fair lot class where we operate.
- Avoid deferentation and habitations in internationally avoid aroun such as World Hardage Sites. USN extensive 9-MI Protected areas, its 981y designated protected areas, and Key Blockwards Areas.
- Compensate with future retarestation fromet definestation) by appropriate each off-site habitat centeralise. Plan to achieve No Brosis
  Deforestation in protected arrays and strive to achieve No Net Deforestation in operating along by 2050 against the baseline of 7020.
- Achieve No-Not Loss (WML) at our project operations and ensure that we will operate on the principles of Not Positive Import (MPR) for chical babdies (when we operate in or note sense declared as baddership battapet areas, occlopically sensitive as est, internal shoot further Ennounced Market and Ennounced Market and Endough All Market and Endough Ma
- Set targets and objectives to avail, reduce or redigate block wordly and nature-based impacts on people and planet.
- Integrate blockversity & nature considerations into our strategic approach. Respects planning and analyzing the nature-related mass and
  exportunities throughout the project library including decommendationing, closure, and exhabilitation.
- Conduct block remark assessment and apply the miligation is branchy to availar on stimus block remarks and nature-bisted risks.
- Ensure consulate improvements in bladwersity performance through effective management and implementation of action plans in alignment with the "Nature-Gased Solutions" approach.
- Moview one personnence against the public on a portions having to assume assumption of Medience by assuming on each our about real residence of the sharing of good practices throughout the organization and stakeholders.
- Engage with local, national, and global conservation initiatives, conservation experts and organizations. Support joint offerts by the private and grabble sections, and locator knowledge, awareness, and participates, among relevant stakeholders, including employees, to collectively appreciabled versity and nature-national challenges.
- Engage and have awareness amongst our conjugaces, business partners, supply choin and other stakeholders to enhance that it know today
  and understained of block worsely and ecosystem menagement anothers.
- Actively encourage value chain portners and mappines to align with this policy and avoid operational activates near national aring glabally: an nationally important blood versity.

#### Responsibility & Review

This policy aligned with for uning intermed. Clabel Bladieth by Framework is part of the Nederla Section ability Framework, and each Wintertan Zing, business shall implement this palicy. Group CEO will be accountable for controlling and setting the palicy, and the Group Exposure Committee any respects late for the fact implementation of the palicy and associated standards. Beard ESO will review this policy annually and recommend appropriate resisting to the Beard as may dearn not excern.

Arun Howa

Arun Misra

CEO & Whole Tring Director, HZL

Date: 06"August, 2024

# **Annexures Table**

5, No	Descriptions	Annexure No.					
1	Water PZ & well water quality data water level	Annexure I(1,2 & 3)					
2.	Waste Dump rock analysis	Annexure II					
3	Ambient air quality data	Annexure III					
4.	Noise level monitoring	Annexure IV					
5.	Oil & Grease separator water analysis	Annexure V					
6.	Environmental Expenditure	Annexure VI					
7.	Dump Slope monitoring Data: Radar & Prism data	Annexure VII					
8.	Retaining wall &Garland Drain	Annexure VIII					
9.	Plantation in mining area	Annexure IX					
10	Water sprinklers in mining haul road	Annexure X					
11	Anicuts photo	Annexure-XI					
12	Environment Sump	Annexure XII					
13	Truck covered with tarpaulin	Annexure XIII					
14	Land use mapping by digital processing report	Annexure XIV					
15	HDPE laying in tailing dam	Annexure XV					
16	STP (300KLD & 425 KLD)	Annexure XVI					
17	Display board at Main gate	Annexure XVII					
18	Oil & grease trap	Annexure XVIII					
19	Environment statement (Form V)	Annexure XIX					
20	Government PHC (Primary Health Center) Report	Annexure XX					
21	Dump stability monitoring report by CIMFER	Annexure XXI					
22	Truck mounted vacuum road sweepers	Annexure XXII					
23	Peak particle velocity monitoring	Annexure-XXIII					
24	existing CGWA NOC for mine water intersection and renewal application	Annexure XXIV					
25	Existing CGWA NOC for Ground water withdrawal from Banas radial well and renewal application	Annexure XXV					
26	Digital Display	Annexure XXVI					
27	Water balance	Annexure XXVII					
28	Geotextiles Photo	Annexure XXVIII					
29	Periodical medical examination	Annexure XXIX					
30	Covered Conveyer belt	Annexure XXX					
31	Subsidence Study report	Annexure XXXI					
32	Copy of Consent to establish and revised copy of EC	Annexure XXXII					
33	Copy of Valid CTO	Annexure XXXIII (A) and XXXIII (B)					
34	Tailing through closed pipeline	Annexure XXXIV					
35	Green Cover Assessment by SRSAC Report	Annexure XXXV					

#### HINDUSTAN ZINC LIMITED RAMPURA AGUCHA MINE

#### WELL WATER ANALYSIS REPORT-April-2024 to Supt- 2024

S. No		1	- 2	ı		3		4	:	5		6		7		8	,		10		11	
Cede	wv	V-80	mm-22		67	VD.	WW-13		HP-I		WW-15		WW.46		WW-23		PRKJ				w	N.14
Month	June-24	Aug-24	June-24	Aug-24	June-24	Aug-24	June-26	Aug-24	June-26	Aug-24	Aune-24	Aug-24	Ame-26	Aug-34	June-24	Mig-26	Ame-21	Aug-24	June- 24	Aug-24	June-24	Aug-24
pil	1.98	7.00	8.09	3.80	7.66	9.00	230	8.16	7.62	7.31	8.02	7.28	7.71	7.44	8.30	114	7.30	787	840	2.79	7.70	6.15
Allalinity	281.60	205.83	118.20	917.80	179.00	900.00	201.08	1011	106.60	424.00	11600	536.00	400.00	467.00	365.69	23.29	31638	men	346.80	112.00	207.30	403.80
Ciderida	181.62	366.35	45.13	6.30	4636	46.0	59.61	293,90	200.00	281.17	168.10	150.54	312.75	19479	71.88	41.75	180,48	188.11	305.30	50.35	109.25	156.81
Sulphore	390.80	31438	F3.48	11.07	162.07	ma	41.21	22.00	180.00	319.85	05.39	76.50	292.05	167.64	12.38	50.85	177,18	209,57	240.00	40.10	10857	525.00
CN	+6.94	+0.84	-8.04	+0.04	4694	+9.84	48.69	+0.64	45.04	+0.04	+9.04	<0.94	10.66	12.01	-0.84	40.01	+2.04	49,84	18,00	+8.04	10.84	+9.04
P3	16.00	+0.8t	+9.60	on.	dit	-(3.8)	<0.81	<0.05	da	+0.81	43.00	4683	40.61	+8.04	13.04	44	+9.06	-0.61	+8,0E	4.0	46.81	<0.01
Ze	8.118	6.335	0.000	6.000	3.613	0.00	0.040	-9.66	0.076	0.000	0.040	0.000	0.000	9.048	0.940	8.076	0.860	6,800	0.298	o.cm	0.000	0,000
Fe	8.000	6.000	+8.00	46.81	1.018	0.800	40.81	<9.0t	8.06	6.88	-0.0L	46.01	-10.01	-2.01	10.61	48	+9.01	+0.81	+8.08	+8-01	+6.81	HARL.
Cé.	40.003	40.000	40.60c	46.801	48.000	-0.001	-0.001	-9.000	-9.000	-0.801	-0.800	1600	-0.891	+0.000	10.86L	-94/94	10.004	-0.004	10.000	-0.004	-6-101	-0.405
Cu	+6.00	-0.01	+8.06	-9.81	-66t	<0.01	-0.81	<0.04	-601	+0.81	+0.01	- KE OT	-0.01	48.00	13.00	4.00	va.ce	40.61	+8.06	+4.00	+6.00	49.00
Ce	46.00	-0.01	+8.00	40.81	48.68	+0.81	441	+0.08	16.05	+0.81	-0.05	-6-05	46.65	+9.05	+0.85	466	-0.65	40.81	+0.00	48.00	-0.01	40.00
N	+600	-0.81	-4.01	40.00	+8-01	-081	-6.8i	-0.01.	- 4800	with:	-0.0s.	-08/03	40.01	4.00	40.61	44.	+0.61	40.01	+0.00	-6.00	-6.01	+0.01

All figures are in mgfl corept pH

Odlis

### Annexure - I (2/3)

#### HINDUSTAN ZINC LIMITED RAMPURA AGUCHA MINES

## PIEZOMETER WATER ANALYSIS REPORT - April-2024 to September- 2024

S. No.	1 1	1		2		3		4		5		6		7		8
Code		2	)	H	Ei		GI		n		K		A		A	dm
Months	June-24	Aug-24	June 24	Aug-24	June 24	Aug-24	June-24	Aug-24	June-24	Aug-24	June-24	Aug-24	June-24	Aug-24	June-24	Aug-24
pH	7.40	6.88	6.95	7.22	7.57	7.19	7.35	7.31	7.75	7.03	8.15	7.16	7.39	7.42	7.60	6.89
Alkalinity	428.40	413.40	338.64	350.88	117.30	84.80	479.40	459.00	448.80	148.40	240.72	265.00	224.40	243.80	146.88	169.60
Chlorides	277.57	294.52	328.98	285.80	318.70	380.02	179.91	152.75	308.42	380.02	328.98	332.52	231.31	285.02	272.43	266.02
Sulphate	371.42	382.60	384.50	355,69	348.57	352.85	372.60	375.00	188.50	195.00	198.57	191,42	360,40	385.71	211.40	237.50
CN	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	< 0.04
Pb	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	< 0.01
Zn	0.07	0.10	0.07	0.01	0.09	0.09	0.05	0.06	0.090	0.010	0.07	0.13	0.10	0.01	0,70	0.01
Fe	0.06	0.18	<0.01	<0.01	<0.01	<0.10	<0.01	<0.01	0,070	0.010	<0.01	< 0.01	0.07	0.03	0.02	0.02
Cd	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.001	<0.001
Cu	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	90.01	<0.01	<0.01	<0.01	<0.01	< 0.01	<0.01	< 0.01
Co	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	90.05	<0.05	40.05	<0.05	<0.05	<0.05	<0.05	<0.05
NI	< 0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	< 0.01	<0.01	<0.01	<0.01	<0.01
Ar	< 0.001	<0.001	<0.001	<0.001	<0.001	< 0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Hg	<0.001	<0.001	<0.001	<0.001	< 0.001	<0.001	< 0.001	< 0.001	<0.001	< 0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Ca	150.94	173.08	188.68	177.36	132.08	161.54	283.02	264.15	207.55	269.23	143.4	161.54	158.49	165.38	49.06	57.69
Mg	50.43	35,05	59.6	57.31	48.14	37.38	52.72	50.43	45.84	16.36	43.55	39.72	27.51	35.05	22.92	18.69



### Annexure I (3/3)

### HENDUOTAN BENC LAD

#### RAMPURA AGUCHA MINE

### WELL WATER LEVEL MONITORING

(Below the ground level in meters)

Months	W-10	W-22	W-13	W-14	W-15	W-16	W-23	GWD	PRK-1	KOT-1
April-24	6.8	6.3	8	11.1	8.1	17.6	5.8	10.1	7.3	10.4
May-24	7.2	6.5	30.2	18.8	8.5	17.8	5.9	12.5	7.5	13.1
June-24	6.5	5.9	12.5	15.7	8.1	18.4	5,1	15.8	7.8	16.9
July-24	6.5	6.1	8.1	9.3	7.8	15.1	5.2	9.6	7.5	8.6
Aug-24	4.2	5.5	5.4	7.4	5.5	11.2	4.1	6.7	4.4	6.6
Sept-24	3.8	4.3	5.1	6.9	4.1	9.8	3.2	4.7	3.2	4.3



Annexure - II

## Analysis of Waste Dump Rocks

Location:	Waste Dum	р	
Element		Range	
Pb	0.0002%	-	0.0067%
Zn	0.0139%	-	0.0191%
Cu	0.0021%	-	0.0219%
Cd	0.0002%	-	0.0002%
Ni	0.004%	-	0.0066%
Co	0.0021%	-	0.0059%



#### HINDUSTAN ZINC LIMITED HINDUSTAN ZINC LIMITED RANPURA AGUCIIA MINE

Lecation				Mix	Shi		V CALL	Main Sate				MingTever							
mently :	Bankaria bir	5994	Pile	PPA	301	90,	CD	IV.V.	PMin	PM	50,	193,	CD	SPAF	995 <sub>18</sub>	PMo	501	50,	CD
best .	Portoglas	(perfect)	legi wild	Equ/m00	he/mil	Eaglin(1)	(sectod):	6xc/m34	lim/relii	\$10/m06	Eug/milb	Equ(m(1)	September 1	Date (Mal)	(Att/mil	949/448	tie/wit	fallvit.	fre/mil
April 14	he.	14534	77.86	37.30	6.50	15.76	340.80	156,34	23,46	30.64	6.52	04.70	(MO 80)	1886L	36.91	81.00	6.80	11.50	380.00
- PE - 1-1	64	207.53	39.36	88.77	8.52	14.90	370.80	149.89	79.25	80.96	4.25	1408	960.60	151.06	24.41	35.00	5.95	15.39	390.90
Mry38	- Pari	141.48	15.60	48.92	6.85	13.72	420.56	145.39	174.53	35,65	4,15	14.45	440.55	139.8	77.23	19.54	6.61	16.9	450.80
	Sec.	180.69	90.21	38.31	6.85	15.13	430.00	107.03	80.13	14.80	6.50	34.74	640.00	183.8T	85.21	\$1.30	5.58	34.54	420.00
V	- ber	546.69	\$6.83	35.90	5.10	1437	430.30	137.54	88.37	83.55	6.17	15.03	78046	198.10	83-61	12.86	6.73	. 14.41	450:00
Leeville.	Fire.	198.17	60.81	19.12	6.60	14.45	380.80	127.73	63,75	30,30	6.12	54.10	\$40.50 ·	129/06	67.31	81.87	6.83	14.90	380.00
	- to	39.79	54.56	27086	6.90	54.96	340.20	133.81	48.90	20.01	490	18.68	300.00	108.03	CLM:	37.04	5.63	14.41	350.00
Act and	Elect.	131.46	12.01	52.99	6.36	14.68	595.50	145.20	74.24	75.60	5.00	1A.78	300-00	130.15	75.16	11.27	0.85	24.26	370.30
Aug-lit.	and the same	Lab. Std.	9991	4447	445.	erec.	-	****	100	mr.te.	***	1440	1,0110	APPONT.	21.25	III/20	944	45.64	ALMON
-	Eq.	103.01	16.41	2435	4.88	24.90	220,00	1.05.55	54.58	25.40	6.72	DOTE	130.00	186-01	50.60	34.60	1.26	24.90	360,00
Scat-34	P-	55.68	50.91	25.63	6.99	14.97	24030	185-04	10.57	31.40	5.00	13.66	190.00	104 97	54.81	34.29	6.78	14-62	226.00
	E-ri	246-40	75.41	38.43	6.77	14.48	300.00	181.ET	77.62	20.45	638	1813	340.08	153.00	63.03	11:30	6.66	24.67	116:00

Lacation-				Apato	vidago			James 1		Batteye	dige		and the second	The same	n Danie	- Sherakh	en village.	Augus	4.02.00
mently.	-	3894	PRING	PRI <sub>LIT</sub>	90.	190,	00	SPM	PM <sub>m</sub>	PMAR	50s	100.	60	SPEE	PMG	PMO	10,	FIG.	60
New	Pomergini	fasteD:	(Lefqs)	fag/m64	(cs/n/ii	ba/niii	LeAnti	EMP/WID	(supreside	2497945	bales.	bus/vidt)	tig/id0	(Landonski)	(age (all)	(apple 14	(ex/will	he/will	(Bas/est)
Appen	te.	104.00	59.80	22.68	5.78	13.10	270,00	128.03	30.11	35.84	641	12.84	340.00	130.00	53.20	36.21	5.29	14.27	218:00
April 1	Birg	101.69	60.83	29.68	5.76	1346	290.00	138.44	69.67	35.33	5.80	13.99	379.08	11148	76.76	21.81	147	1142	208.00
Mary St.	p	124.51	57.65	1531	5.90	13.42	190.00	129.46	59.40	21.69	9.33	13.33	318.08	124.38	\$2.66	23.51	5-67	18.56	258.00
Hay-34	Bet .	121100	66.24	24.39	1.61	13.00	280.00	128-28	88.50	25.00	584	13.36	751.00	127.55	53:16	26.56	1.65	1438	379.00
tres 30	P	125.57	34.76	27.47	5.29	14.00	50030	121.40	65.53	1747	5.76	13.32	200.00	106.27	58.71	NB	1.06	1441	250.00
Separate .	Pre-	120/04	60.76	29.36	5.07	13.90	10040	128.67	60.88	30.31	5.71	13.18	350.62	103.58	58,02	21.21	5.55	15.73	218.00
Aveza	Is.	10.15	41.81	21.36	6.80	10.98	160.00	89.09	47.65	28.51	6.80	15.99	183.00	82.56	42.00	21.54	6.08	10.68	179.00
marie.	Best.	155.27	36-01	25.35	5.80	15.18	350-68	100.00	55.89	34,71	620	12.97	348.00	171.15	66.54	21.82	8.00	12.79	268.00
	Je.	72:08	40.E1	18.52	6.80	13.06	160.00	22,78	46.02	16.71	680	13,07	178.00	68,36	58.23	21.50	5.00	MLOS	250.08
with the	Berg .	68.23	38.71	17.48	6.00	1304	180-00	55.59	36.70	38.81	680	11:50	1311.00	75,71	30.00	26.56	6.00	18.58	293.08
Feet 24	la .	83.17	44.03	25.75	5.80	13.72	150.00	98.53	\$4.37	19.66	6.80	19.61	179.03	95.11	54.49	37.77	9.00	13.57	389.00
Sept-34	Berg .	125.99	10.21	28.71	-18	12.80	126.00	126.07	45.42	23.56	146	13.64	336.00	100.67	55.33	22.74	-66	13.16	190.00

At tigate are in opposite

		THE RESERVE	OF PERSONS SELECTION	
Black Ty	Porturgiti,	Pr Custom (DPM)	Hear Pr Drawbar Drawt	
Con.	P	27,08	2581	1.5
Michell	for	26.28	37.22	10
	Ja.	28.16	20.18	10
May 20	1+	29.34	35-51	Affaire
L'Ober	P	27.99	39.09	escin.
lime 98	gre.	78.68	60.26	Ongitted
Section 1	P	11.25	36.47	1000
Wild Co.	Pr.	27.38	20.61	1
Table :	P	29.55	TO 01	10
AND DE	14	24.72	36-31	
4.44	E.	28.72	30.63	
min su	pa.	27.32	37.62	

Moeth	(0) (mg/mmg)	Meter: (eg/teri)	Mix, (com)	IMMIC Imp/Smill
May 24	114	-58.34	275	41
August	136.5	58.46	278	39



Annexure-IV

SMo.	Area of Munitaring	NOBE LEVE	LAT WORK I	ENVIRONMEN	T IN 4B(A)			Scalement Candition
amo.	Area or maintaining	April-28	May-24	June-35	July 21	Aug-36	Supt 25	
	MINITEGRATION PLANT							
	o, MDILAmbient	72.3/68.5	76.4/63.5	20,8/64.6	75,5453.0	73.1/81.5	76.28409.90	how Wats
	S. MIT- Grinding Area	79.7	76.4	80.2	80.90	79.60	79.80	Plant is in summing samplition
	a. Operation orbits mill arms	71.4	70.5	21.5	30.80	79.80	71.50	-45-
	d. Rotation ruli sess	32.6	72.5	204	72.80	79.98	75.30	-6>-
	n. APRI's called sed area	75.0	78.0	23-3	12.80	79.90	38.50	-do-
	4 Shift engineer's room	72.3	73.2	39-3	72,30	73.19	73.60	-45-
	g. Control recore	32.1	708	72.8	10.60	79.10	71.00	relier
	July to hill from the control of the	- 25 m	T148		4141	1246	The State of the S	
	A Hillian Tomas	73.2/64.30	79.20/63.30	78.10/64.30	28.20/65.30	12.80/93.50	71.71/62.80	760
	MINNAMY CAUSE-STA							
1	s. Printing Crasher I Control Room	7145/6180	72399440	73.45/45.80	25,65/04.40	FEDNACO	74.90/94.93	Days State
	k. Primary Grather & Coulest Boom	75.65,642.50	T\$180/94.80	78.2/94.90	27.70/66.30	74.5/55.30	74.18/45.30	Day/ Sight
	SIC, FEORE, CAUSEUM	- 200 March 1974	2000		5.0000000	0.685.00		- 20 VS (55 to -
12	a, Staff Pages feet Country	700/80.5	765/852	71.6/43.4	12.4/64.1	72.5/82.8	29.08/89.30	Sie/Vogia
	6. Scrandary counter control more	75.5	74.2	75.6	12.50	72.60	74.30	Heat is in over incondition
	Anthers Mile PK	75.3/66.6	76.9/63.2	24.0/40.4	12,5/08.9	73.3/96.8	74.29/68.90	Day Night
12	Ambiret Nobe	TO - 12 22 22 22 23 24 24	Para Contract	DOLLAR COS	1.000 VX	1000 CO. NO.	100000000000000000000000000000000000000	
	Main Cure	61.25/64.30	64.40/50/85	64.29/20.20	64.45200.45	65.10/61.0	64.SBA(2,10	Duyi Night
	Militar monitoring			2000	0.000	0.00000	77-77-01-	
V4 1	Agetho	48,3342,3	47.59/43.60	48389130	49.4045.19	48,10/94.20	45,29/43,26	Day/ Night
(B)	Biocylifore	49.7640.50	10.10/42.30	48.55,49.55	50.642.30	90.80/NI.10	\$1,58,92.60	Davi Sight
	Bellita	AT 10541.30	46.30/11.00	47.86/42.83	48.30347.30	47.30/83.80	0E 89,741.90	Divy/ Night

	DG set Note	Montaring	
	reio.	Location	Briefe (B)
	L N	DG set Goeralise's recom-	20.26
1 . ]	June-24	DG ogt Hall	87.59
	1-11	DG set Gasvatur's recen	89.50
	Aug-34	DG set Hall	96,70



Approved by Michelry of Emirocontent and Forest, Government of India as Emirocontel Laboratory 1909 9801:2016, 150 16001:2016, 180 45001:2018 (OHES)

RSPCB 180 9604 (White: E-65, Chieranjan Marg. U-5chens, Jaipur 19200), Rejaction Phone: +95 0371210064, 544-087257, Website: newlectamications com Enail ( transl-theory) gualicom

6) 100 48 (200 to the transfer of the transfer JBA/UDIT

Annexure -V

#### TEST REPORT

Report Neut/LR No. :	24200861031	Date :	05-06-2024
tailing to:	IAIS Hindutan Jano Liz (rigueno) Rompuro Agretio Mines PO : Aguetio 311026, Gustovira, District : Britisaro (Recostlian),	Type of Unit:	mirros
Type of sample / Discipline :	Liquid Effuerts / Chemital	Date of Sample Collection/Monitori ing :	24-06-2024
Point of Collection	Oil Gresse Separator Outlet Water (HEMM Workshee)	Date of Receipt :	28-05-2024
Date of Test/Analysis :	28-05-2624 to 05-05-2624	Sampling Plan:	AP14A 2017 ; 1060
Country of Sample :	2 tr,	Sample Collected By:	Praised yogi
Onife representative t	Mr Dinesh Kustar Pakwal	Consisten of Sample :	Fit for testing

		RESULTS		
S.No	Parameters	Observed Value	Testing Protocol	Limits as per Environment omlection rules. 1986
1:	Suspended Solids (mg/l)	35	2540-O , APHA 24th Edition	100
2	Blochemical Oxygen Demand (BOO) [mg/l]	26	5210-B , APHA 24th Edition	30
3	Chemical Oxygen Demand (OOD) [mg/l]	149,97	5220-C , APHA 24th Edition	250
4	pH .	7,54	4500 H+B , APHA 24m Edition	5.5 - 9.0
5	Oil & Grosso (mg/l)	5	5520- B , APHA 24th Edition	10

The results saled refer only to the bedded simple (s) it persentation (s). Enterpended of projums is neither inferior one implient. This report is not to be reported on the project of th

Sa Suail Xumar

Rajdsh Maheshwari Autoras Signatory

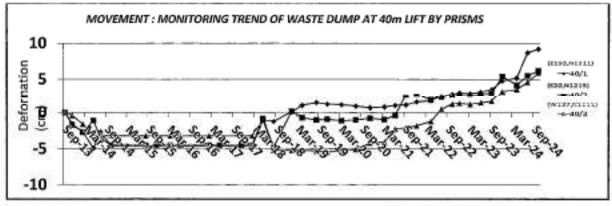
#### Annexure -VI

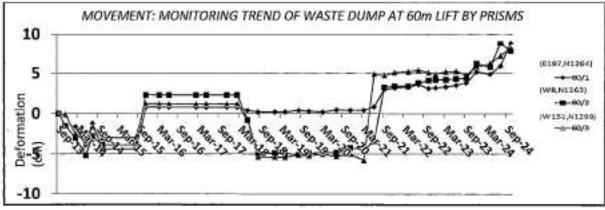
#### ENVIRONMENTAL EXPENDITURE DETAILS

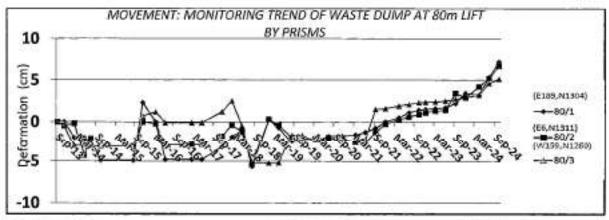
Particulars				2024-25					
-	April 2024 to Sept 2024								
Expenditure	April-24	May-24	June-24	July-24	Aug-24	Sept-24			
	64.82	51.92	115.33	90.92	79.84	68.78			
TOTAL Rs (Lacs)						116.4			

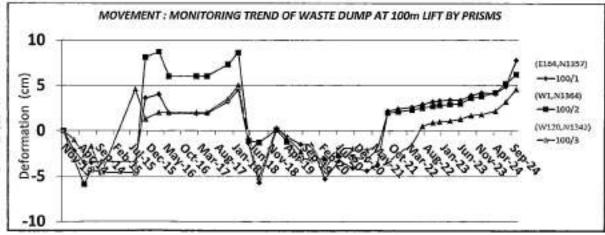
# Dump Slope monitoring Data: Radar & pillar-prism Monitoring data for MOEF\_ Oct2024

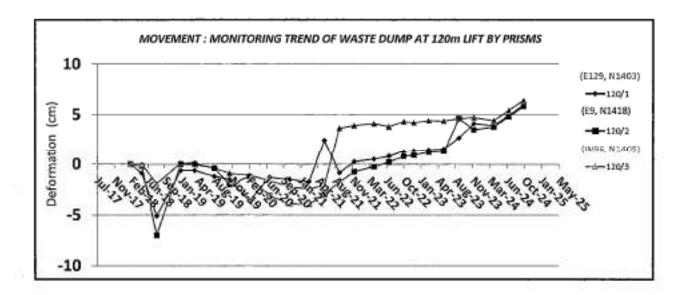
Page | 37



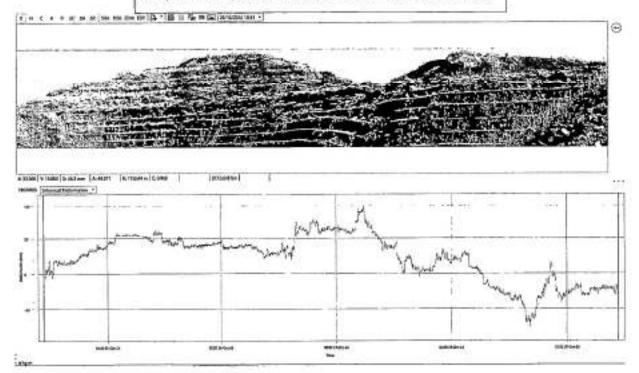




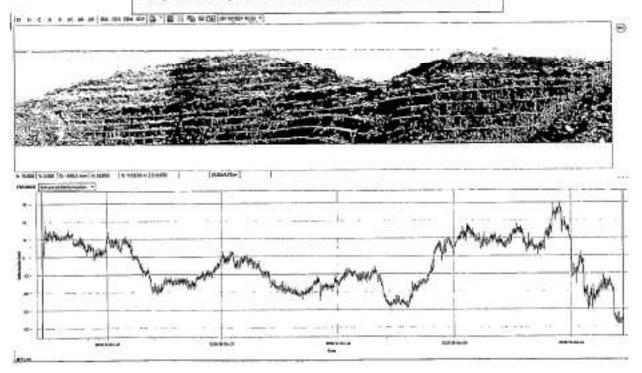




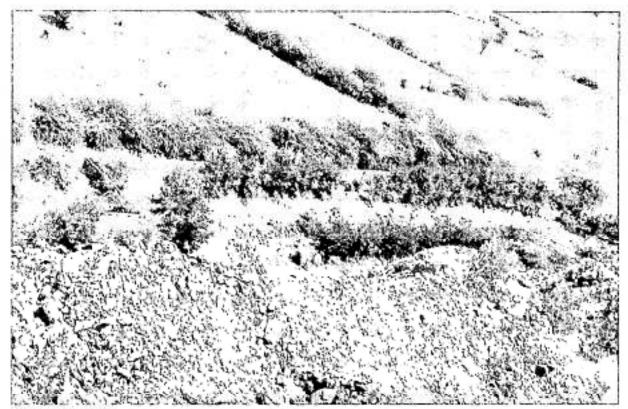
# Slope Stability Radar monitoring on waste Dump Area



# Slope Stability Radar monitoring on waste Dump Area

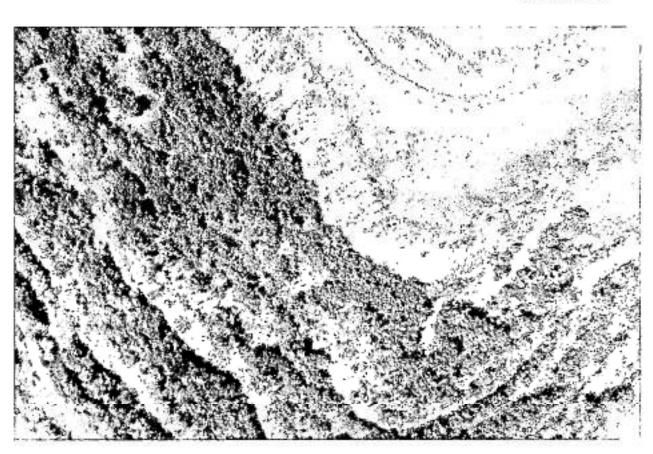


# Annexure - VIII



Garland Drain Photo

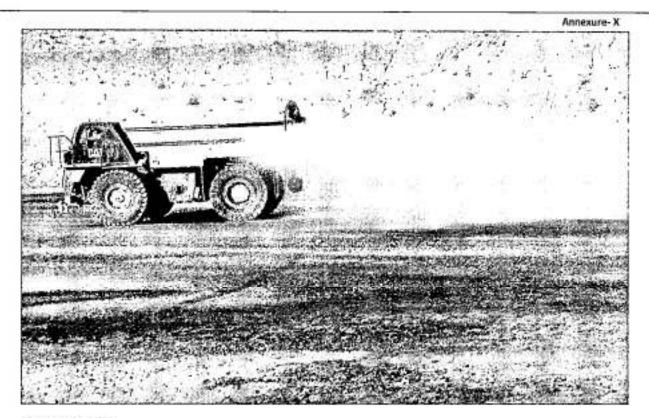
Annexure - IX







Plantation

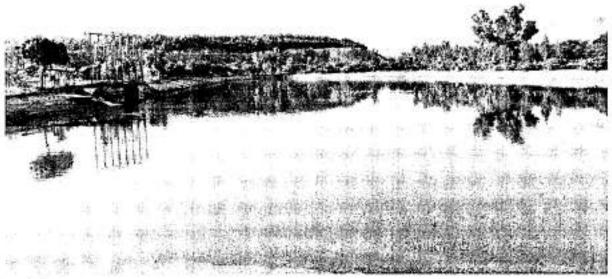


40KL Water sprinkler

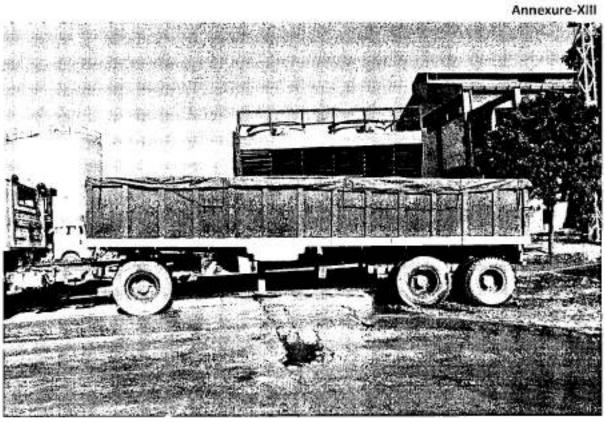
#### Annexure XI



Anicut Photos

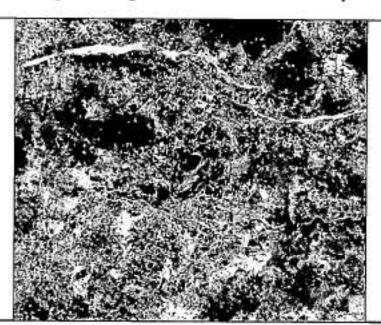


Pond Photo



Truck covered with tarpaulin

Land use mapping of 15 km radius area of Rampura-Agucha mine of the year 2023 using remote sensing techniques and showing the changes in land use in the last five years



Sponsor: Hindustan Zinc Limited, Rampura-Agucha Mine, Bhilwara

Studied by:



Estb: 1988

Studied for:



Hydro-Geosurvey Consultants Private Limited

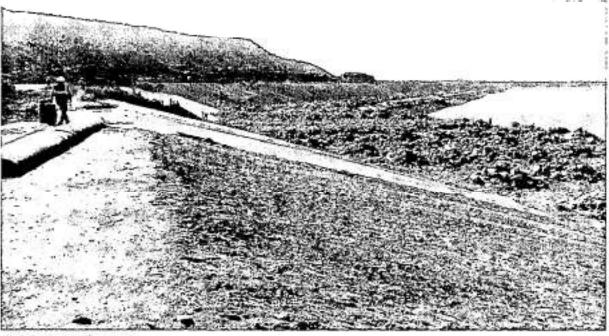


CERTIFICATE NO.: NABET/GWCO/JA/GW003

Address: C-103, Shastri Nagar, Jodhpur- 342003 Phone: - 0291-2431754

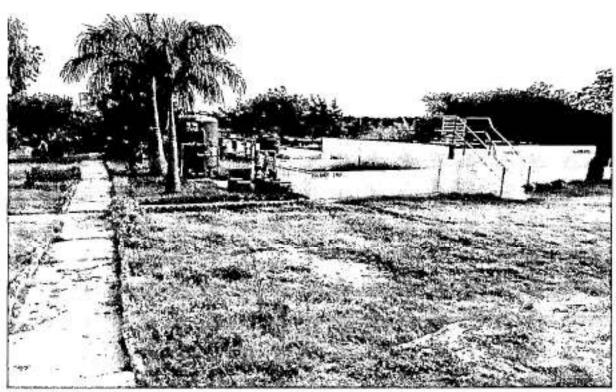
Web: www.hydrogeosurvey.com, E-mail: - hydro.geosurvey@yahoo.com June, 2023

# Annexure -XV



HDPE laying in tailing dam

# Annexure-XVI



STP (300KLD) in plant premises

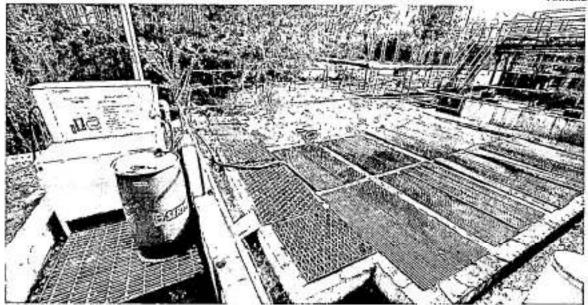


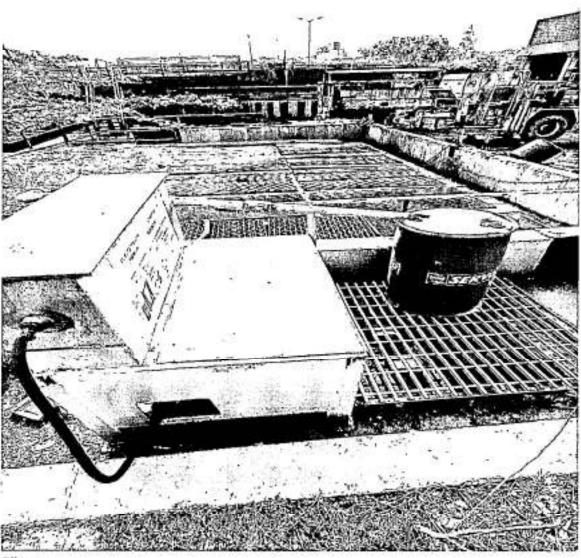
STP (425KLD) in plant premises

Annexure -XVII

-	diam'r.	diam'r.	4		<b>国 (2)</b>	PER STEEL	are Permitte Depet with the	er core s	4	22		77.79	23333	-	ery Aguada Standard I	■第2年八月	4
And so	11 834 11 834	det are a fletsbyg	or fails:	क स्थापा का न्यूक	42 40	HETE GENERAL	1981	C7874			r reports				Language	ort. Sonor	TO BETT
		3.4.3.1	4.7	4	NU NY	TO SEE	1	1	4900000	200	or other	-	And in case of	NAME OF TAXABLE PARTY.	2000	TO SECURE	toris an
774		ale to	· N	174 NY 25	tine . It was		9 PHHTDS		21302	-		ALC: U	Carsty I	March Control	11 180	The Arts	
STON.	14	Averes .	100	-	S.Ser		व्यक्ति विश्वपूर्ण विश्वपूर्ण	20	3650	900	200	VIET I	100000	No. of Contract	10.00	<b>是国际</b>	
	10	0.00	W. 15	11333	No. of the	W 36	TELEPHONE PROPERTY.	STATE OF THE PARTY OF	A77.00		211	essem.	75	MI COLUMN	-	COUNTRAL	CAST SELV
		10000			100		2004	100	1000	4.6	Sec. A.	and the	104125		Section 1	CHC CO	10000
più vilia	*	MATERIAL SE	Politic THE ACC RESTS	517	of that	Aprile BOG-DUD BOG-DUD	Man Bent After gif wither	Alter Alter	=	1	-	=	=	Ξ.		distant to	
erity.	761	100	șe tar	1000	दुर्ग्य कान्त	access?	10 Ses	the ty	Phimu	20	ton.	Deta.	HAR	-	-	Jan	
	2	No.	PER P	TOTAL ST	77.53	The same	<b>用的原</b> 原数	TO LET TE	Party.	100	W0.52	Man &	3000	CHIEF.	5320	NAME OF TAXABLE PARTY.	-
-tre			treate i	ecina u		प् किन पर	eran à res ret fee ea	A COLUMN TWO IS NOT THE OWNER.	- to-	NAME OF TAXABLE PARTY.	12.		Biometer C Principles	32	Meanin	no Carrya	does -
2941	BOPE	two-	11/97	THE PROPERTY.	ALC: UNK	C. San Printers and Parket	fluid ata	कुर्वतः सङ्ग्रह	Pitter	Coule	(Legister)	10 m 9	V (00 m)	- A 60	<b>Proposition</b>	revised	-
-	_	ra Para G	10 10	100	C 4	Control of the Contro	क्टिका चर्मा	dan auce	Sets/Fers	Diggs	(too	16 to 19	150 mg/m	M 4474	-	-	- Inquire
	CAL LA		14.6		and Ad	Per S STREET	W40 1913	ges, tent	- West	Cherry	100	39 m 38	er, isologie	m- 61.00		Trided	Corpora
			Jacob	Section 1	3	251000	100	-24,2003	Different Control	3.333		9.8659	710106	Mary Street	4000	部型 NA	1.55
4.3	441.4		10	54		elitio editi	Print.	and and		Patentili Wide		aneggery of hand strongs stronger	Sharedy processes per mayor	- mateur	y Mared eprilad.	Capacity.	-
393	44.14	e Appa	1.1.5 4	Comme	000 3	**577.0	790 k.A	fitters.	Seed of	4	130	1.900.1	But Miles	411,100	and the	780 MA	Sale
Plan	nts.	16.61	0.150			1977	Printeriore printeriore	u Brones	SCHOOL STATES			0 F5K.1	many ten	DE	(wu	7000 mm	Unpredict Charles
207	10.4	Section 1	400	No. of Lot,	6. X.	21 (23)	SPEC D	STANSON.	Mindus.	win Ann	On the	-1001		Jane 200	NO. OF THE PARTY NAMED IN	and the same	A CHARLE
Tive to	A SECURE		2000	Black string	tiples to and a	THE PART OF	T the production	de la lace	Shart	-	BCC (2011)	.1104G-134	NAME OF THE OWNER OWNER OF THE OWNER	ASSES A SERVICE	Wald it	The second	100
18-74 Y	100	Britis Print		JA been h.	NAME AND ADDRESS.	( Page			Little She	AUTOC	-		Charles and	m 14 40 K/d	town for	Pripare	np
		1		CONTRACTOR	DO CARRES	Market 11		September 1	A COLUMN	11.0	-	-	130	100	diam'r.	2- 1- Inform	
T'THE	No.	-	3 April 1	10.00	B1.0	40000	-	SC 9 (6.05 y 7 7 7)	100.00	712		-	35	200		-	ennel.
494	1990		2 (00)	HET THE	25.767	1000	146	1000	222	-1-	-	27.7	出力を持	は、	6	Industry	March.
-	MARK I	CONTRACTOR OF THE PERSON NAMED IN	3350	0.00	42000000	A 1500 NO. 1	45.00	13.05 (0.4)	0.00	100	1900 20	CONTRACTOR OF	1.7	17775555E	日かちの	SECONDAY.	SAME BOOK

Display board at Main gate





Oil trap





HZL/RAM/Env/2024-2025/602

August 06, 2024

Member secretary, Rajasthan Pollution Control Board, 4, Institutional Area, Jhalana Doongri, Jaipur.

Sub: Environment Statement of Rampura Agueha Mine for year 2023-2024.

CTO Mine order No 2022-2023/Mines/10762 dated 28/02/2023.

CTO Mill order No 2023-2024/HDF/9370 dated 14/06/2023. EC Letter No J-11015/267/2008-IA.II (M) dated 11.12.2009.

Sir.

Please find enclosed berewith the environmental statement for financial year ending on 31st March 2024.

Thanking you

Yours, truly,

(Kishoub Kumar S)

CEO Aguelsa IBU

CEO - IBU Agucha Hindustan Zine Limited Rampura Agucha Mines PO - Agucha Distt. - Bhiiwara (Raj.)

ce to:

Regional Officer,

Rajasthan State Pollution Control Board, 18, Azad Nagar, Pannadhay Circle,

Mining Engineer Office Road (Near Telephone Exchange)

Bhilwara (Raj.)

The Joint Director,

Ministry of Environment, Forest & Climate Change, Integrated Regional Office, A-209&218, Armya Bhawan,

Jhalana Institutional area Jaipur-302004.

Env. - 0/c

Hindustan Zinc Limited

Rainpura Agustia Hines, P.D. Agustia, Dist, Bhriwara (Rajasthani - 311 922 16 + 51-9001294756-57 www.hzlmdia.com

Registered Office - Yashind Bhowart, Milliopin Majasifiand 213 004 CIN No. 127284/LJ1946PLC011208

# कार्यालय चिकित्सा अधिकारी प्रभारी आर्दश प्राथमिक स्वास्थ्य केन्द्र रूपाहेली कलां

TOTAL OPD = 19057

IPD = 596

S.No	DISEASES	TOTAL				
1	BACK PAIN	2110				
	PUD	980				
3	COMMON COLD	4000				
4	VOMITING	500				
<del>                                     </del>	DIATRIA	700				
6	ANEMIA	1000				
7	DOG BITE	24				
8	SANKE BITE	0				
9	ACCIDENT RTA	110				
10	SCABIESH	70				
11	FUNGAL INFECTION	660				
12	HTN	1645				
	DM	1210				
13	TYPHOID	5 20				
15	PNEAUMIA					
	MALARIA	0				
16	DENGUE	450				
18	ASTHMA	100				
19	COPD	25				
20	TB	400				
21	CAD	150				
22	BURN	180				
23	GASTRITIS	250				
And the last of th	ACNE	700				
24	EAR INFECTION	500				
25	EYE INFECTION					
26	GLUCAUMA	10				
27	CATARACT	20				
28	DNS	10				
29	THALASEMIA	1				
30	ARTHRITIS	100				
31	PICA	80				
32	ETC.	3638				
33	TOTAL	19653				

2/01/24 to 31/0ct./24 ap 104 100

CS CamScanner

Page No. 52 to 53

# राजस्थान सरकार कार्यालय प्राथमिक स्वास्थ्य केन्द्र कोठियाँ, जिला–शाहपुरा

1 BACK PAIN 1115 2 PUD 406 3 COMMON COLD 3178 4 VOMITING 321 5 DIAIRA 397 6 ANEMYA 685 7 DOG BYTE 87 8 SANEK BITE 0 9 ACCIDENT ATA 172 10 SCEBESH 148 11 FUNGAL INFECTION 4.15 12 HINT 832 13 DM 786 14 TYPHOID 56 15 PNEAUMIA 14 16 MALERIYA 9 17 DENGUE 0 18 ASSTHMA 436 19 COPP 98 20 YE 10 21 CAD 138 22 BURN 89 23 GASTRITIS 196 24 ACNE 152 25 EAR INFECTION 336 26 27 GELICAUMA 7		TAL OPD -12097	4074
PUB   406   3178   3	SNo	DISEASES	TOTAL
CEMMON COLD   3178	1	BACK PAIN	1115
4         VOMITING         321           5         DIAIRIA         387           6         AREMIA         685           7         DOG BITE         87           8         SANEK BITE         0           9         ACCIDENT RTA         172           10         SCEBIESH         148           11         FUNGAL INFECTION         415           12         HNI         832           13         DM         786           14         TYPHOID         56           15         PNEAUMIA         14           16         MALERIYA         9           17         DENGUE         0           18         ASTHMA         436           19         COPO         98           20         YB         10           21         CAD         438           22         BURN         89           23         GASTRITIS         196           24         ACNE         152           25         EARINFECTION         608           26         EXENDECTION         334           27         GLUCAUMA         7 <td< td=""><td>3</td><td>PUB</td><td>406</td></td<>	3	PUB	406
5         DIAIRA         397           6         AREMIA         665           7         DOG BITE         87           8         SANEK BITE         0           9         ACCIDENTATA         172           10         SCEBIESH         148           11         FUNGAL (NYECTION)         425           12         HMT         832           13         DM         786           14         TYPHOID         56           15         PNEAUMIA         14           16         MALERIYA         9           17         DENGUE         0           18         ASTHMA         436           19         COPO         98           20         TB         10           21         CAD         138           22         BURN         89           23         GASTRITIS         196           24         ACNE         152           25         EAR INFECTION         336           26         EYE INFECTION         336           27         GLUCARMA         7           28         CATARACT         19           <	3	COMMON COLD	3178
6 AMEMIA 665 7 DOG BITE 87 8 SANEK BITE 0 9 ACCIDENT HTA 172 10 SCEBIESH 148 11 FUNGAL INFECTION 425 12 HMT 832 13 DM 786 14 TYPHOID 56 15 PNEAUMIA 14 16 MALERIYA 9 17 DENGUL 0 18 ASSTHMA 436 19 COPP 98 20 TE 10 21 CAD 138 22 BURN 89 23 GASTRITIS 196 24 ACNE 152 25 EAR INFECTION 408 26 EYE INFECTION 334 27 GILLCAUMA 7 28 CATARACT 19 29 DNS 2 30 THALASSEMIA 0 31 ARTHRITS 62 32 PICK 02 31 ACRES 122 32 PICK 02 31 ARTHRITS 62 32 PICK 02 31 ARTHRITIS 62 32 PICK 02 31 ARTHRITIS 62 32 PICK 02 31 ARTHRITIS 62	4	VOMITING	321
7         DOGBSTE         87           8         SANEK BITE         0           9         ACCIDENT RTA         172           10         SCEBIESH         148           11         FUNGAL INFECTION         4.15           12         HMT         832           13         DM         786           14         TYPHOID         56           15         PNEAUMIA         14           16         MALERIYA         9           17         DENGUE         0           18         ASTHMA         436           19         COPD         98           20         TB         10           21         CAD         138           22         BURN         89           23         GASTRITIS         196           24         ACNE         152           25         EARINFECTION         408           26         EYEINFECTION         334           27         GLUCAUMA         7           28         CATARACT         19           29         DNS         2           30         THALASEMIA         0	.5	DIAIRA	397
8         SANEK BITE         0           9         ACCIDENTATA         172           10         SCEBIESH         148           11         FUNGAL INFECTION         425           12         INIT         832           13         DM         786           14         TYPHOID         56           15         PREAUMIA         14           16         MALERIVA         0           17         DENGUE         0           18         ASTHMA         436           19         COPD         98           20         TB         10           21         CAD         438           22         BURN         83           23         GASTRITIS         196           24         ACNE         152           25         EARINFECTION         408           25         EARINFECTION         334           27         GUICARIMA         7           28         CATARACT         19           29         DINS         2           30         THALMSEMIA         0           31         ARTHRITS         62           <	6	ANEMIA.	665
9 ACCIDENT # 172 10 SCEBIESH 148 11 FUNGAL INFECTION 425 12 NNT 832 13 DM 786 14 TYPHOID 56 15 PREAUMIA 14 16 MALERIYA 9 17 DENGUE 0 18 ASTHMA 436 19 COPD 98 20 TB 10 21 CAD 138 22 BURN 83 23 GASTRITIS 196 24 ACNE 152 25 EAR INFECTION 334 27 GUICARIMA 7 28 CATARACT 19 29 DNS 2 30 THALMSSIMEA 0 31 ARTHRITIS 62 32 PICK 62	7	006@TE	87
10 SCEBESH 148 11 FUNGALINFECTION 425 12 HNT 832 13 DM 786 14 TYPHOID 56 15 PNEAUMIA 14 16 MALERIYA 9 17 DENGUL 0 18 ASTHMA 436 19 COPP 98 20 TB 10 21 CAD 138 22 BURN 89 23 GASTRITIS 196 24 ACNE 152 25 EARINFECTION 408 27 GLUCAUMA 7 28 CATARACT 19 29 DMS 2 30 (HALASSIVIA 0 31 ARTHRITS 62	B	SANEK BITE	0
11         FUNGAL INFECTION         4.25           12         HNIT         832           13         DM         786           14         TYPHOID         56           15         PNEAUMIA         14           16         MALERIYA         0           17         DENGUL         0           18         ASTHMA         436           19         COPD         98           20         TB         10           21         CAD         438           22         BURN         89           23         GASTRITIS         196           24         ACNE         152           25         EARINFECTION         408           26         EYE INFECTION         334           27         GLUCAUMA         7           28         CATARGCT         19           29         DMS         2           30         (HALASSIMA)         0           31         ARTHRITIS         82           32         PICA         62	9	ACCIDENTIFIA	172
11 FUNGALINFICTION 425 12 HNT 832 13 DM 786 14 TYPHOID 56 15 PNEAUMIA 14 16 MALERIYA 0 17 DENGUL 0 18 ASTHMA 436 19 COPD 98 20 YB 10 21 CAD 438 22 BURN 89 23 GASTRITIS 196 24 ACNE 152 25 EARINFECTION 408 26 EYE INFECTION 334 27 GLUCAUMA 7 28 CATARACT 19 29 DNS 2 30 FALLASSIMIA 0 31 ARTHRITS 62 32 MICK 62	10	SCEBIESH	148
13         DM         786           14         TYPHOID         56           15         PNEAUMIA         14           16         MALERIYA         9           17         DENGUE         0           18         ASTHMA         436           19         COPD         98           20         TB         10           21         CAD         438           22         BURN         89           23         GASTRITIS         196           24         ACNE         152           25         EARINFECTION         608           26         EYE INFECTION         334           27         GLUCARIMA         7           28         CATARACT         19           29         DNS         2           30         THALASEMIA         0           31         ARTHRITS         62	n	FUNGAL INFECTION	425
14         TYPHOID         56           15         PNEAUMIA         14           16         MALERIYA         9           17         DENGUE         0           18         ASTHMA         436           19         COPD         98           20         YE         10           21         CAD         138           22         BURN         89           23         GASTRITIS         196           24         ACNE         152           25         EAR INFECTION         608           26         EYE INFECTION         934           27         GLUCAUMA         7           28         CATARACT         19           29         DNS         2           30         INALASSIVIA         0           31         ARTHRITS         62           32         MCA         92	12	HNT	832
15         PNEAUMIA         14           16         MALERIYA         9           17         DENGUE         0           18         ASTHMA         436           19         COPD         98           20         TB         10           21         CAD         438           22         BURN         89           23         GASTRITIS         196           24         ACNE         152           25         EARINFECTION         408           26         EYE INFECTION         334           27         GLUCAUMA         7           28         CATABACT         19           29         DNS         2           30         THALASEMIA         0           31         ARTHRITIS         63           32         MCA         62	13	DM	786
16         MALERIYA         0           17         DENGUE         0           18         ASTHMA         436           19         COPD         98           20         TB         10           21         CAD         438           27         BURN         89           23         GASTRITIS         196           24         ACNE         152           25         EAR INFECTION         408           26         EYE INFECTION         334           27         GLUCAUMA         7           28         CATARACT         19           29         DNS         2           30         THALASEMIA         0           31         ARTHRITIS         62           32         PICX         62	14	TYPHOID	56
17 DENGUE 0 18 ASTHMA 436 19 COPD 98 20 TB 10 21 CAD 438 27 BURN 89 23 GASTRITIS 196 24 ACNE 152 25 EARINFECTION 608 26 EYE INFECTION 334 27 GLUCAUMA 7 28 CATARACT 19 30 THALISEMIA 0 31 ARTHRITS 62 32 WICK 62	15	PNEAUMIA	14
18       ASTHMA       436         19       COPD       98         20       TB       10         21       CAD       138         22       BURN       89         23       GASTRITIS       196         24       ACNE       152         25       EARINFECTION       498         26       EYE INFECTION       334         27       GLUCARIMA       7         28       CATARACT       19         29       DNS       2         30       THALASELMA       0         31       ARTHRITS       62         32       MICA       62	16	MALÉRIYA	9
19 COPD 98 20 TB 10 21 CAD 138 22 BURN 89 23 GASTRITIS 196 24 ACNE 152 25 EARINFECTION 408 26 EYE INFECTION 334 27 GLUCAUMA 7 28 CATABACT 19 29 DNS 2 30 THAL/SEMBA 0 31 ARTHRITS 62 32	17	DENGUE	0
20         TB         10           21         CAD         138           27         BURN         89           23         GASTRITIS         196           24         ACNE         152           25         EAR INFECTION         408           26         EYE INFECTION         334           27         GLUCAUMA         7           28         CATARACT         19           29         DNS         2           30         THALMSEMIA         0           31         ARTHRITS         62	18	<b>ASTHMA</b>	436
21         CAD         138           22         BURN         89           23         GASTRITIS         196           24         ACNE         152           25         EAR INFECTION         498           26         EYE INFECTION         334           27         GLUCAUMA         7           28         CATARACT         19           29         DNS         2           30         THALASEMIA         0           31         ARTHRITS         62           32         MCA         62	19	COPD	98
BURN   89	20	Ye	10
23 GASTRITIS 196 24 ACNE 152 25 EAR INFECTION 408 26 EYE INFECTION 334 27 GLUCAUMA 7 28 CATABACT 19 29 DNS 2 30 THALMSEMBA 0 31 ARTHRITS 62 32 MCA 62	21	CAD	198
24         ACNE         152           25         EARINFECTION         498           26         EYE INFECTION         334           27         GLUCAUMA         7           28         CATARACT         19           29         DNS         2           30         THALASEMIA         0           31         ARTHRITS         62           32         MCA         62	27	BURN	A 12
25 EAR INFECTION 608  26 EYE INFECTION 336  27 GLUCARIMA 7  28 CATABACT 19  29 DNS 2  30 THANSEMBA 0  31 ARTHRITS 62  32 MICA 62	23	GASTRITIS	196
26         EYE INFECTION         334           27         GLUCAUMA         7           28         CATARACT         19           29         DNS         2           30         THADASEMIA         0           31         ARTHRITS         62           32         MCA         62	24	ACNE	
27 GLUCARIMA 7 28 CATARACT 19 29 DNS 2 30 THADASEMIA 0 31 ARTHRITS 62 32 MCA 62	25	EARINFECTION	1. \$ 30 Sec. 20 3
28 CATARACT 19 29 DNS 2 30 THALASEIMA 0 31 ARTHRITS 62 32 MICA 62	26	EYE INFECTION	334 (6. 100 )
29 DNS 2 30 THAL/SEMIA 0 31 ARTHRITS 62 32 MGX 62	27	GLUCAUMA	7, 2
30 [HADÁSEMIA 0 31 ARTHRITÍS 62 32 PICK 02	28	CATARACT	F 19 19 19 19 19 19 19 19 19 19 19 19 19
31 ARTHRITIS 62 32 PICK 02			
32 PICK 62	The second secon		The second secon
		the second secon	
23 FIC 1622	32	NGX I	62
	_		4.4.4

01-01-2024 to 31-10-2024 tak jpd opd

Fall States (State for a control of the control of

# CSIR-CENTRAL INSTITUTE OF MINING AND FUEL RESEARCH, BARWA ROAD, DHANBAD

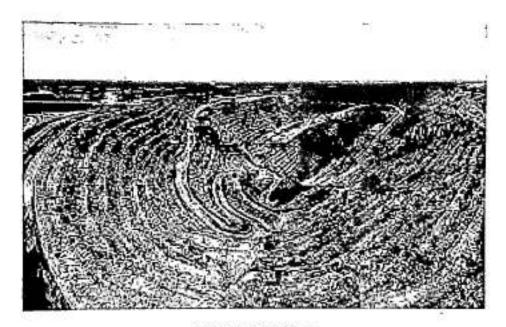
(Council of Scientific and Industrial Research)



FINAL REPORT

# PROJECT TITLE:

Assessment of Open Pit Slope Stability, Waste dump Stability and Ground Surface Movement through Monitoring and Data Analysis at Rampura Agucha Mine of HZL.



SPONSORED BY:

HINDUSTAN ZINC LIMITED

MAY, 2023

PROJECT NO.: SSP/585/2021-22

Page. No. 54 to 102

# CSIR-Central Institute of Mining and Fuel Research, Dhanbad

(Council of Scientific and Industrial Research)

Project Title

Assessment of open pit slope stability, waste dump

stability, ground surface movement through monitoring and data analysis at Rampura Agucha mine of HZL.

CIMFR Project No. :

SSP/585/2021-22

Sponsor

M/s Hindustan Zinc Limited

Project Co-ordinator:

Mr. Ajit Kumar, Ex-Chief Scientist

Project Leader

Mr. J. K. Singh, Chief Scientist

Project Collaborator ;

Dr. S. K. Roy, Chief Scientist

Mr. Kartik Varwade, Scientist

Mr. Rakesh Kumar Singh, Sr. Technical Officer (1) Mr. Manish Kumar, Sr. Technical Officer (1) Mr. Prince Kumar, Technical Assistant, and

Mr. Swapan Mahato, Technician.

May, 2023

#### DISCLAIMER

The report is meant only for the internal use of the sponsor and it should not be published in full or part by the sponsor or any of its staff members. It should not be communicated or circulated to outside parties except concerned Government departments. CIMPR reserves the right to publish the results in a general way for the benefit of the industry without disclosing the name of the sponsor. Recommendations stipulated in the report should be implemented in letter and spirit under the supervision of competent persons /agencies,

Conclusions and recommendations mentioned in the report are based on the geo-mining conditions specified in the report. Moreover, CSIR-CIMFR has no control in implementation of the recommendations stipulated in the report, research team will not be held responsible for any untoward incidences caused by changes in geo-mining conditions as well as due to non-compliance to recommendations of the report.

Project Leader

(J K Singh) Chief Scientist & HORG

Slope Stabilisation & Landslide Management

(S K Roy)

Chief Scientist

Slope Stabilisation & Landslide Management

CSIR-CIMFR Authorised Signatorics

(Niraj Kamar)

Principal Scientist & HOS Project Planning and Monitoring

Chief Scientist & Coordinator Project Planning & Industry Interface

# INTRODUCTION

1

The importance of safe, properly designed and scientifically engineered slope is well known. The benefit of an openpit operation largely depends on the use of the steepest slopes possible, which should not fail during the life of the mine. So, the design engineer is faced with the two opposite requirements, stability and steepne ss, in designing the deep openpit slopes. Steepening the slopes, thereby reducing the amount of material to be excavated, can save a vast sum of money. At the same time excessive steepening may result into slope failure leading to loss of production, extra stripping costs to remove failed material, reforming of benches, rerouting of haul roads and production delays. The Directorate of Mines Safety may even close the mine, in case unsafe conditions are created. Therefore, it is necessary that a balance between economics and safety should be achieved.

Mine management of Agucha Mine entrusted the slope stability and slope monitoring studies to CSIR-CIMFR, in consultation with DGMS, along with the slope steepening for years. This report is for assessment of open pit slope stability, waste dump stability and ground surface movement through monitoring and data analysis at Rampum Agucha Mine of HZL for the year 2021-2022.

Rampura Agucha mining complex is situated in Tehsil Hurda, District Bhilwara in Rajasthan and connected by road from Gulabpura railway station on Delhi-Udaipur railway line.

The orebody has been proved for a strike length of 1.7 km, with 109.34 million tonnes of ore reserve and resource. The deposit is being mined with Shovel dumper combination. The overall pit slope is currently planned with 35° on footwall side and 42° on the hanging wall. The current pit depth is 390 m with bottom bench of zero mRL. Presently there is no mining operation in open pit, however pit slope monitoring is being continued in order to take care of safety of opencast as well as underground mining and other operations nearby.

The rock discontinuities were mapped by the resident geologist and validated by CIMFR at the freshly exposed benches of the pit as per the norms of International Society of Rock Mechanics (ISRM 1978). Geotechnical mapping was undertaken to determine the critical orientation of structural discontinuities. The freshly exposed slope materials were tested at CIMFR to determine any significant changes in the properties because any significant change will influence the slope steepening exercise. The slope monitoring was done to determine any movement in and around the mine and dump.

# INTRODUCTION OF PRESENT MINING AT RAMPURA AGUCHA MINE

Rampura Agucha mine belonging to Hindustan Zinc Limited has a stratiform, sediment-hosted, high-grade zinc and lead deposit. The ore body is massive and lens shaped. The Lead-Zinc deposit is currently being extracted by underground stopping methods at a deeper horizon below the exhausted open pit mine. The open pit operated from 1991 to March 2018, has reached a depth of about 400m from the surface. The underground stopping operations are being carried out since June 2013. The lowest point of the exhausted open pit floor at -10mRL and underground stopping areas are separated by a 60m crown pillar. Figure 1 shows the transverse section of the orebody, including different rocks in the hangwall. The underground mining is being carried out by Long Hole Open Stopping (LHOS) with the paste fill method. Initially, the overhand (Bottom-up) LHOS method was followed for the production. After obtaining permission from the Directorate General of Mines Safety (DGMS), the orebody is being extracted between -230mRL and -255mRL (S640 to N607 Grid), between -255mRL and -280mRL (S640 to N590 Grid), and between -280mRL and -330mRL (S640 to N570 Grid) by underhand (Top-down) LHOS method with paste fill.

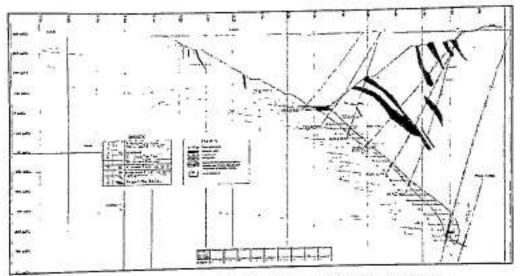


Figure 1: Transverse section of the geological plan theming the archedy, and different types of rocks.

3

# METHOD OF MINING

ý

In Rampura Agucha mine, the orebody was extracted by the open pit working which had been discontinued as it reached around 400m depth of cover. Presently, underground mining operations are going on below the open pit working by keeping a 60m crown pillar between the open pit and underground mines. The underground mining is carried out by Long Hole Open Stopping (LHOS) with paste fill. Initially, the production from the underground wasstarted by the overhand LHOS method with paste fill. In the overhand method, stopping is commenced from the lower level and is progressing upwards. Presently, both underhand (Top-down) and overhand (Bottom-up) LHOS methods are going on for production. Figure 2 shows the schematic diagram of the underhand method of mining.

The strike length of the orebody is divided into stopping panels. The stopping panels are divided into primary and secondary. Following the permission from DGMS, the ore body is divided into stopes of 15m wide (along strike), 25m high (the distance between the two levels), and the length depending on the thickness of the orebody, the maximum length allowed is 30m in a stope/panel. The stope dimensions are usually: 25m (H) × 15m (W) × up to 30m (L) with an average stope volume of 6000 – 7000m3. The stopes are extracted by the transverse stopping method. The primary and secondary stopes are extracted and backfilled sequentially. The secondary stopes are developed and extracted after completion and backfilling of two adjacent primary stopes. The LHOS with paste fill method in the Top-down approach at Rampura Agucha underground mine was designed by M/s BECK Engineering, Australia.

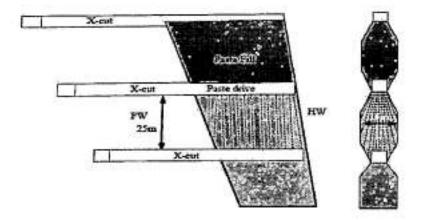


Figure 2: Schematic diagram of the underhand method of mining.

Stopé development

The footwall drive of 5.6m (width) x 5.3m (height) was driven along the strike of the orebody by keeping at least 30m distance from the orebody. From the footwall drive, the x-cuts of 4.8m x 4.8m are driven at an interval of 15m. The footwall drive of the top level is used for drilling and the footwall drive of the bottom level is used for mucking.

# Drilling and blasting

The diameter of the production drill ranges from 89mm to 127mm. The toe burden between holes is 2.0-3.5m and ring spacing is 2.0-3.0m. Multiple electronic delays are used to fire individual holes and between the rings. The ore is mucked by the remote Load Haul Dumper (LHD) and transported by the low-profile dump truck (LPDT).

#### Backfill

1

7

3

After completion of the stope, a barricade is made at the lower level x-cut. Then, the open stope is backfilled by the paste and cured to gain sufficient strength before mining of lower stope. For underhand stopping, there would always be 2-3m void above and below the filled stopes throughout the level.

Excavation sequencing for mining near paste-filled stopes

Stopes are extracted in a transverse manner. The sequence of mining is a combination of Primary-Secondary and Continuous stopping with oblique/inclined multiple fronts along the strike of the orebody. After filling the primary stope, the development of the roadways or stopping operation adjacent to the filled primary stope does not start immediately. The paste fill material is given sufficient time to gain the required strength. The development of the secondary x-cuts in rock mass adjacent to the filled primary stope is started after gaining 0.1-0.2MPa required strength of the paste. The first secondary stope adjacent to the filled primary stopes is taken place after attaining the required strength of 0.4-0.45MPa. The second secondary stope adjacent to the filled primary stope is not blasted without filling until attaining the required strength by the first filled secondary stope. The development through the paste fill can only be started after attaining the required strength of 0.75MPa. Extraction of primary stope below paste-filled stope can be done after gaining the fill material strength of 1.2MPa. Depending on the area of exposure, the required strength can be varied.

The stopping level was -305mRL at Feb. 2021 and currently the stopping depth is -405mRL as on Oct, 2022.

#### Physical Characterisation of the Discontinuities

The geotechnical mapping was done by the resident geologist on the exposed benches. CIMFR validated the collected data in the field. The objective was to detect any

Study on More Stability Condition of Rampura Agueba Mine and Dump-



unfavourably oriented persistent discontinuity in the freshly exposed slope mass, which can influence the stability of the slope standing after slope steepening exercise. The mapping did not reveal any advance geotechnical structure in the freshly exposed slope mass.

# Mine and Dump Drainage

The pit benches should be properly levelled. The heap of muck should not be left on the benches. The rainwater will collect between the toe of the bench and the muck. The water will seep to deeper levels through cracks. The hydrostatic pressure will increase behind the slope, which may cause slope failure in due course of time. The muck should be cleaned and the gradient of the bench should be such that the rainwater flows to lower level in a planned way.

The mine management has made garland drains/ bunds and bench collector drains in the mine. However, the drains/ bunds are planned to be constructed with special care to the weak and weathered lithological units of the mine. These drains in weak and weathered zone must be kept effective.

The drainage must always be directed away from the excavated pit. All the benches or at least alternate benches should have an effective toe drains. These drains should be interconnected to drain out the rainwater into the mine sump. This is necessary to avoid the flow of rainwater on the benches of the precarious litho units, which affect their slope stability. All the drains should be kept clear of soil debris and effective for the free flow of water. The discontinuance of the pre-monsoon preparation at any location will jeopardise the whole effort of maintaining designed slopes.

There should not be unplanned water flowing channels on the benches of the mines, which may run across few benches. The benches should be provided with bench drains to collect the rainwater. It will help to arrest the momentum of fast moving water as soon as it meets the garland drain or drain of other bench. It should not be allowed to flow down to lower benches in an uncontrolled manner. The slope of the upper most benches should be well graded so that the rainwater goes to the valley side and not in the mine.

The entry of the rainwater from the northern end of the footwall of the pit has been checked by making a bund at the mouth / entry point/ start point of the haul road. The entry of rainwater of the adjacent catchment area should be checked by garland drain/ bund depending up the topography of the area.

At few locations it may not be possible to divert the rain/ seepage water away from the pit, in that case a proper drain pattern should be developed to divert the water into the pit sump. The water should not be allowed to enter into the pit from many channels or left uncontrolled. By guiding the flow of water in a fixed channel erosion/ failure of soil/ clays can be checked. The unchecked erosion may lead to failure in these soil slopes in due course of time.

Sub-horizontal drain holes drilled into the slope face are effective in reducing water pressures near the seepage zone. It should be inclined at an angle of five deg. to facilitate free flow of water. The holes may be drilled at the interval of 5m or even closer in the area of requirement. A pipe should be inserted into the hole to prevent caving. The pipe is perforated or slotted to allow water to drain into it. This water will freely flow out of the slope under the gravity. It will improve the stability condition of slopes. The following sub-horizontal holes already available are effective in the bench slope.

SI No	Month	Area	HW/FW	mRL	No of Holes	N/S	E/W	Z/mRL	Hole Depth
					1	\$-451.32	E-721.46	360.30	100.77
5 NOV- 2015		1			1	S-450.65	E-721.53	360.32	100.29
			360mRL	1	S-449.28	E-720.84	360.34	100.69	
		HW		1	S-555.48	E-614.22	361.18	100.34	
				1	1	S-558.92	E-614.45	361.21	101.17
					1	S-559.86	E-614.38	361.14	97.26
		S4	HW	210mRL	1	S-651.95	E-325.88	209.81	100.00
9 MAR- 2016	1749	Ramp	FW	180mRL	1	N-647.00	E-159.02	180.80	100.00
	Ramp	FW	180mRL	1	N-648.13	E-159.52	180.80	100.00	
		Ramp	FW	180mRL	ı	N-649.40	E-159.76	180,49	100.00

. NA	
12000	
E100 CC 101	ζ
2007	Ś

HOLE NO	DEPTH	CASING	N/S	E/W	RL	DATE OF DRILLING
1	100.9458	3.6	N-587.57	E-569.78	320.13 mRL	11 April 2017
2	100.514	3.5	N-478.54	E-644.28	320.10mRL	11 April 2017
3	100.2346	3.7	N-475.26	E-646.04	319.79mRL	11 April 2017
4	100.641	3.5	N-615.45	E-541.49	310.26mRL	14 May 2017
5	97.5422	3.6	N-615.30	E-541.32	310.14mRL	14 May 2017
46	101.022	3.6	N 639.2201	E 576.9097	331.00mRL	04 October 2017
47	100.9966	3.5	N 554.8813	E 664.578	331.17 mRL	05 October 2017
48	100.26	3.6	N 538.5584	E 671.3667	330.97mRL	06 October 2017
57	100.7934	3.6	N 654.4727	E 481.3891	291.87 mRL	14 November 2017
58	100.26	3.6	N 629.9021	E 503.4513	291.42mRL	15 November 2017
73	100.1838	3.6	N 669.2445	E 453.9323	278.42 mRL	19 December 2017
74	97.847	3.7	N 584.8226	E 527.2184	279.91mRL	20 December 2017
75	96.704	3.3	N 624.9913	E 496.0597	281.10mRL	21 December 2017
76	100.9204	3.5	N 640.2306	E 482.2159	281.43mRL	23 December 2017
77	101.276	3.6	N 652.7714	E 469.6828	281.21 mRL	24 December 2017

The groundwater is likely to be present at various stages of pit development, 200 mm dia depressurization holes are drilled at surface, on footwall side, Hanging wall side, south across of pit and in-pit at 240 mRL and at footwall 366 mRL., The following depressurisation holes are available in the field. As soon as benches are taking final shape, advance-pumping boreholes should be located on lower benches for more effective advance pit dewatering.

Serial		Depressur		oordinate		Hole	
No	Area	Diameter (mm)	East	North	Level	Depth (m)	Pump Depth (m)
1		200	459.9	855,2	393.8	300	Dry Hole; No pump
2		200	303.7	956.3	395.3	300	Dry Hole; No pump
3	North Across	200	200.7	979.9	397.3	300	Dry Hole; No pump
4	(South Toe of	200	155.0	1033.2	398.1	300	Dry Hole; No pump
5	Waste Dump)	300	99.3	1000.5	398.2	300	Dry Hole; No pump
6		200	-37.9	1030.7	400.0	300	Dry Hole; No pump
7		200	44.7	1036.2	399.2	300	Dry Hole; No pump
8		300	-271.4	523.6	397.1	300	200
9	_	300	-268.2	475.5	396.0	300	150
10	4	200	-283.6	432.5	395.6	300	150
11	1	300	-288.5	406.6	394.6	300	150
12	Footwall	200	-290.7	389.2	395.3	300	150
13	North	300	-292.0	363.0	394.5	300	150
14		200	-293.1	334.6	394.8	300	150
15		200	-293.1	297.9	394.3	300	220
16		200	-297.1	260.1	394.2	300	150
17		200	-299.8	232.2	393.9	300	150
18		200	-268.3	-33.0	392.8	300	Dry Hole; No pump
19		300	-268.4	-32.9	392.8	300	Dry Hole; No pump
20	Footwall South	200	-351.0	-200,5	392.1	300	Dry Hole; No pump
21		200	-283.3	-260.3	392.0	300	180
22		200	-292.5	-290.0	392.0	300	160
23	4	200	-285.3	-318.0	391.4	300	270
24		200	-228.2	-741.4	388.6	300	280
25	_	200	-222.4	-779.5	389.2	300	150
26		200	-211.2	-813.3	389.0	300	100



27		200	-194.4	-875.1	389.1	300	150
28		200	-183.2	-892.3	389.2	300	100
29		200	-156.5	-906.9	388.2	300	170
30		200	-122.0	-903.2	387.8	300	180
31		200	563.6	-810.6	388.1	300	220
32		200	536.0	-835.3	387.8	300	280
33	. 8	200	508.6	-860.2	388.2	300	280
34		200	453.9	-892.4	389.1	300	150
35		200	280.0	-986.8	388.1	300	150
36	South Across	200	103.5	-1005.9	388.9	300	250
37	ACTOSS	200	26.6	-996.7	389.3	300	100
38		200		South- 901		300	Dry Hole; No
39		200	West-	-		300	Dry Hole; No
40		200	865.7	-31.8	383.0	300	190
41		200	870.2	-61.5	381.8	300	180
42		300	866.7	-99.2	381.5	200	150
43		300	866.2	-183.6	380.2	200	150
44		300	864.2	-261.1	380.6	300	250
45		200	788.2	-396.9	382.0	300	180
46		200	770.8	-439.6	382.1	300	190
47		200	736.4	-505.3	381.5	300	180
48		200	719.5	-549.1	381.7	300	180
49		200	634.3	-702.7	384.1	300	200
50		300	623.6	789.6	390.3	300	270
51		300	654.9	758.6	389.3	300	260
52	Hangwall	300	675.6	743.4	388.9	300	275
53	North	300	698.0	722.5	388.0	300	290
54	7	300	720.9	702.7	386.9	300	280
55		300	733.4	678.4	386.3	300	290
56		300	760.2	631.5	386.7	300	290
57		300	770.3	602.6	386.4	300	180
58		300	779.3	584.3	386.2	300	280
59		300	789.3	562.6	386.4	300	280
60		300	800.8	533.3	385.7	300	270
61		300	809.5	510.9	385.5	300	280
62		300	820.1	483.7	385.9	300	290
63		300	828.4	458.9	385.8	300	290
64		300	834.3	426.9	386.0	300	290



65		300	823.8	405.1	386.2	300	150
56		300	826.0	367.6	385.5	300	150
67		200	842.7	321.6	384.6	300	150
68		300	851.3	294.6	384.6	300	170
69		200	865.1	256.9	384.2	300	190
70		300	870.6	227.1	384.2	300	200
71		200	875.6	187.4	384.2	300	200
72	1	200	883.4	162.6	384.0	300	200
73		200	875.8	95.7	383.8	300	200
74		200	874.1	44.3	383.3	300	195
75		300	869.4	13.2	383.5	300	210
76	Hangwall	200	504.1	-781.4	361.0	300	Dry Hole; No pump
77	360mRL	200	478.6	-806.4	360.5	300	Dry Hole; No
78	Hangwali 320mRL	200	688.3	123.6	319.2	300	Dry Hole; No pump
79	South	200	263.1	-792.7	242.8	300	150
80	Across 240mRL	200	205.9	-807.1	242.0	300	150
81		200	972.4	293.8	384.7	300	150
82		300	977.2	323.2	384.5	300	150
83	7	200	965.1	356.2	385.0	300	270
84	7	200	953.1	408.5	384.9	300	150
85	-	200	958.2	424.2	384.5	300	170
86	1	300	963.2	455.2	384.7	300	175
87	7	200	942.8	465.9	386.4	300	150
88		200	934.1	513.8	385.5	300	180
89	Hangwall	300	944.1	533.0	385.4	300	250
90	(Beyond	200	929.8	561.3	385.7	300	270
91	Waste	300	943.6	572.6	385.9	300	150
92	Dump)	200	927.1	615.1	385.6	300	200
93	7	300	957.1	649.8	385.4	300	270
94		300	949.9	675.4	385.6	300	270
95	1	200	923.3	650.9	385.8	300	200
96	1	300	941.8	707.2	385.8	300	200
97	7	200	913.9	730.7	386.4	300	170
98		300	903.0	823.6	386.1	300	290
99		300	839.7	843.7	386.1	300	290

100	200	804.3	848.7	386.8	300	250
101	300	884.7	875.6	386.4	300	270
102	300	880.0	893.2	386.2	300	270
103	300	872.0	912.1	386.3	300	280
104	300	854.5	943.1	386.5	300	220

The following piezometers are installed towards footwall side only to measure the water level in different geo-mining conditions.

	P	iczometer Details at RAM HZL		
Serial No	Piezometer No	Location	Depth (m)	mRL (m)
1	PZ 1	Hangwall Surface N250	65	384.5
2	PZ 2	Hangwall Surface N250	95	384.5
3	P2 3	Hangwall 310mRL N300	70	309.2
4	PZ 4	Hangwall 310mRL N300	120	309.2
5	PZ 5	North Across Mine tower N900	65	389.2
6_	PZ 6	Footwall 366mRL Bench N500	90	365.9
7	PZ 7	Footwall Surfac RMC Plant S300	80	392.7
8	PZ 8	Hangwall 360mRL S750	75	360.9

It should regularly be measured by piezometers to know the changes in the groundwater condition during different phases of the mine development. The mine management is taking observation of the water level fluctuation in a few boreholes dug for this purpose. It gives information about the water level at any point of time. It helps in keeping the working benches dry and adverse effect of the ground water pressure can be minimised. The number of deep boreholes should be increased for advance pit dewatering. More sub-horizontal drain holes should be drilled to depressurise the slope mass, especially near the seepage zones.

All around the periphery of dump, a collector drain/ bund should be formed to divert the rainwater away from the dump. The dump top should be properly levelled with a slope to avoid water retention on dump top/ dump benches and to prevent the rainwater flowing along slope. The drains should be kept clear of soil debris and effective for the free flow of water. It should be done well before the onset of monsoon. The discontinuance of the pre-monsoon preparation at any location will jeopardise the whole effort of maintaining the designed slopes.

The gradient along the floor of the dump should be properly maintained for free flow of water. The rainwater blocked on different levels and different portions of the dumps will percolate at the bottom of the dump. So, every attempt should be made to make a proper gradient of the dump floor. It will facilitate an effective seepage/ flow of water retained in dumps as well as run-off of rainwater to the drains. The drains should be effectively maintained to divert the drained water away from the dump. If this drainage system is not effectively achieved then the dumps may fail due to increase in saturation at the bottom of the dumps and subsequently cause a failure.

The dump floor of soil which forms the base of the external dump should be excavated and removed before dumping to improve the frictional resistance at the base of the dump. It should be filled with OB consisting of stones. It will facilitate the passage of water through the dump floor, thus preventing accumulation of water at the base of dump. Alternatively, the dump floor of hard rock, which forms the base of dump, should be ripped or blasted to a depth of one to two metres, before dumping to improve the frictional resistance at the base of the dump. It will also facilitate the passage of water through the dump floor down to the competent rock strata, thus preventing accumulation of water at the base of dump.

The presence of any well compacted elevated road or any other civil structure near the (external) dump acts as a barrier. It checks the flow of the collected water, near the dump toe, across the road. It is advisable not to construct the road near the dump toe. If it is unavoidable then the road should be located at a minimum distance of 100m from the existing effectively stabilised toe of the dump. The Hume pipes/ culvert should be provided at an interval of each 50m for effective drainage of water across it. The Hume pipes/ culverts should be regularly cleaned to keep them effective. Otherwise the dump would get saturated and may lead to a failure. Alternatively the level of the road should be lower than the toe of the dump.

#### Mining & Dump Condition and Few Suggestions

The dump mass should be maintained in drained condition. These dumps are likely to be safe with good drainage. Water entry should be checked from entering in to the toe of the dump by providing suitable drainage. The foundation of the external dump should be gneiss. The top soil should be removed and spread at the top of dump for plantation. Attention must be paid to avoid entry of rain/ surface water in the slope by providing suitable drainage in and around the dump, failing which the slope can become unstable. It should be taken up well before the onset of monsoon.

The importance of the method of construction of dumps is considered to be an important factor in spoil pile stability. Controlled placement of spoil is required to ensure that weak top layer is not dumped at the base of the dump. The clay contains a lot of swelling minerals. It swells too much after coming in contact of water, which may cause failure of slope material lying over them. The top soil of overburden can be selectively dumped separately and should not be put within dumps or at base of dumps. There should not be any dumping in water bodies/ ponds.

Whenever any crack is detected on the existing dump, dozing should be done for proper leveling of the dump. It will consolidate the dump material also and the cracks would also be filled up. The entry of rainwater to the open cracks would also be checked due to closure of the cracks.

The crest of any pit and any civil construction/ installation should be located at a minimum distance equal to the dump height from the effectively stabilized toe of the dump. The distance should be considered in the direction through which it is the minimum.

Proper cleaning/ de-silting and leveling of the drains would be necessary to keep the drains effective. The drains at critical locations may be cemented. It would make the drain more effective. The cleaning would be easy. It would also check the rain water seepage through the drain itself.

The discontinuous dumping should be avoided for better dump slope stability. These depressions/ gaps between the dumps will get filled with minwater. It may surcharge/liquefy the foundation of the dump, which may result in to failure of the overlying dump material.

The rainwater may percolate through the interspaces between the loose dumped soils, if the slope of the dumps is not proper. The uncontrolled entry of water in the dumps may cause liquefaction of the dumps. It is very difficult to make high dumps with steep slopes because the spoil starts flowing like a liquid under its own weight. With continued dumping the dump height increases and with excess addition of water, slope deformation occurs. The dump slope will quickly flatten to relatively low slope angle.

Proper leveling and compaction of the dumped material should be done with the help of dozer and compactor. It will help to consolidate the dumped material and will minimise the infiltration of water inside the dumps. The upper slope surface, immediately behind the crest, is an area of considerable potential danger. The water, which is allowed to pond in this area, will almost certainly find its way into the slope through cracks and fissures. Grading of this surface will enhance run- off of any collected water.

The vegetation is certainly the best method of slope surface protection, as they will bind the surface together. In turn, it will reduce surface erosion considerably and will tend to inhibit the entry of water into the slope. The biological reclamation of the dumps should also be done by planting the local self-sustaining plants on the final dumps. It increases the stability of dumps.

The ground profile between the toe of dump (towards south across side) and road (near water reservoir) leading to Agucha village has been properly levelled for quick run-off of the rain water away from the dump foundation. Improper drainage at the dump foundation level towards south across would result in to yielding of the foundation due to liquefaction by the stagnant water between dump toe and road.

The In-house (HZL) geotechnical team should be consulted by the production team for their suggestion to meet the safety requirement of the mine.

#### Slope Monitoring

The monitoring information is used for variety of crucial functions including safety control, evaluation of current mining plans and future slope design. With the precise nature of the monitoring system at Agucha mine, it provides an active input into mine planning. The early identification of movement zones allows steps to be taken to minimise the impact of mining on stability by the implementation of corrective measures and at the same time provides for optimum ore extraction. The system contrasts strongly with more common 'passive' systems that frequently only record the occurrence of an event for subsequent postmortem examination. The active monitoring system permits early and confident decision making by management both for safety purposes and for optimum excavation sequencing.

# Objectives and Importance of Slope Monitoring

The main objective of slope monitoring study is to detect any instability well in advance so that any damage to men and machineries can be avoided. If the failure is unavoidable then it can be brought down in a predictable manner. If any instability is detected in the early stage then it can be stabilised by applying the suitable remedial measure. If the instability is detected at a later stage then it will be very difficult to check the instability.

The relevance of slope monitoring is recognised considering the increasing trend of steeper slopes and deeper mines. All geotechnical investigations aimed at collecting input design parameters, however complete, involve an inherent risk of inaccuracy. Furthermore, the overall design being based mainly on experience, empirical methods such as rock mass classifications or limit equilibrium stability analyses don't take into account the time dependent behaviour (stability) of slopes. Hence, any attempt of slope stability analyses and evaluation need to be supported by a sound slope monitoring programme in order to ensure the safe and smooth mining operations.

The slope failure never occurs suddenly. It gives sufficient signs to understand that the slope is unstable and it can fail. Generally, the first obvious sign of instability is exhibited by the formation of tension cracks on the crest of the slopes. It must be treated as warning of instability (Barton, 1971).

It should be noted that the order of movement near failure are large, of the orders of metres, and not millimeters (Kennedy, 1971). The real hazard is not only the detection of movement in the slope, but it is the accelerated rate movement which causes failure.

As soon as any movement is detected generally a question is asked regarding the rate of movement at which men and machinery should be removed. Actually the rate of movement near failure will depend on many factors including rock soil type, water pressure behind the slope, type of discontinuity along which failure is occurring etc. For each specific condition an empirical norm has to be established and then only it is possible to have an exact idea of rate of movement during failure which is not so easy. So, it is only the rate of acceleration of the movement, which can clearly tell the time to remove the men and machinery (Brawner, 1970).

Brawner (1970) from studies on over 200 slides in soil and rock concluded that complete failure has not occurred in less than 24 hours when the rate of movement was less than 25 mm per day with the exception of slides triggered by earthquake.



# Monitoring Systems

The slope monitoring techniques vary widely ranging from simple visual observations of signs of potential instability such as slope bulging, surface fretting and the formation of tension cracks to the use of somewhat complex instrumentation. The scale of the mining operation, ore transport system and the nature and location of the potential slope failure decides the application of a particular technique.

Survey based methods can be used for absolute monitoring, that is determining the movement of a point or points relative to some datum believed to be outside the zone of potential deformation. These include:

- (a) Total station Precise level based monitoring,
- (b) Tension crack monitors.

Other monitoring methods that may find future and more widespread application include:

- (a) Global Positioning Systems,
- (b) Computerised Total station monitoring,
- (c) 3D Terrestrial Laser Scanner Method
- (d) Slope stability radar,

Whichever is the technique used for slope monitoring, the objective is to predict future slope instability by appropriate interpretation of Displacement - Time data and analyses of failure mechanism. The slope monitoring based on standard surveying techniques have found wide acceptance because of the ability to remotely monitor a wall following the establishment of targets. Use of Total Station techniques along with angular measurements have become most popular because of the perceived advantage of only having to monitor from one location.

The slope stability radar technology provides complete slope face coverage from a remote location without need of reflective prisms. This mobile system can easily be moved into a pit to provide high-precision monitoring of a slope face up to 850 m away. Customized software processes the radar data to display slope movement and acceleration on a high-resolution CCD camera image. The unit can provide continuous coverage in all weather conditions, including dust and fog, and can be monitored via radio link and the Internet from remote locations. The SSR is deployed at Rampura Agucha mine. It is being used for slope monitoring by the mine management.



## Monitoring observation

à

The slope materials are inherently weak in the mine. The consequences of slope failures can be very devastating when men or heavy earth moving machines come/ work close to an unstable zone. The slope failure can cause severe disruption to the complete mining operations.

The objective of monitoring is to detect possible slope instability so that appropriate remedial measures can be taken in time. The main concern is the protection of men and equipment.

Over the last few years, the technology for monitoring has improved considerably both in precision and cost effectiveness. Survey based monitoring systems are by far the most widely applied methods of pit slope monitoring. Effective monitoring based on survey methods require meticulous planning, a recognition of instrument precision, measurement repeatability.

The principal monitoring activity is measuring movement. The precise monitoring instrument used at Agucha mine is Total Station.

The slope monitoring study was conducted on quarterly basis, i.e. four times in a year by CIMFR. The changes of two monitoring observations give the data related with movement on the installed stations. The slope monitoring was conducted on the monitoring stations erected along the crest of the footwall. The base station is located in the stable zone of the hangwall side of the mine for setting the instrument.

#### Open pit mine:

- Total number of visible and accessible monitoring stations which were made available for monitoring during the visit of October 2022 is 272, 99 stations are located towards hangwall side and 173 stations are towards footwall side of the mine.
- The following changes were observed among the stations made available for the monitoring purpose.
- The overall maximum cummulative change of 42.3 cm has been observed at S/100 of 30mRL bench, (Initial observation April 2019), towards hangwall side. During past one and half year (February 2021 to October 2022). The change in horizontal distance 23.1 cm. However, the rate of movement during period (from 2021 to October 2022) was 0.41 mm/day, which may be considered safe.
- 98 numbers stations are showing commulative changes between 2.2 cm to 39.3 cm in hangwall side during the observed period.





- The overall maximum commutative change of 37.8 cm has been observed at S/50 of 366mRL bench, (Initial observation October 2018), towards footwall side. During past one and half year (February 2021 to October 2022). The change in horizontal distance 14.6 cm. however, the rate of movement period (from February 2021 to October 2022) was 0.26 mm /day.
- 172 numbers stations are showing commutative changes between 2.1 cm to 21.9 cm in footwall side during the observed period.
- The monitoring should be done departmentally on daily basis in the zone of movement to check any impending failure. It should also be supplemented by SSR.

#### Dump:

- Total 26 stations were made available for the monitoring purpose. The overall
  maximum commulative change of 16.2 cm has been observed at W/125 during the
  observation of October 2022.( Intial observation October 2018) during past six month
  (April 2022 to October 2022). The change in horizontal distance 1.3 cm. However the
  rate of movement period (from April 2022 to October 2022) was 0.075 mm /day
- 25 numbers stations are showing commulative changes between 0.1 cm to 15.1 cm, during the observed period.

#### · Subsidence Monitoring

- Total number of visible and accessible monitoring stations which were made available
  for monitoring during the visit of October 2022 is 34, 22 stations are located towards
  hangwall side (Surface/ Inpit) and 12 stations are located towards footwall
  side(Surface/ Inpit) of the mine.
- The overall maximum commutative change of 3.9 cm has been observed at H/W in pit S-70 (Initial observation February 2021) to till the date of observation.
- The overall maximum commutative change of 1.6 cm has been observed at F/W surface N-725 (Initial observation February 2021) to till the date of observation.

More movement may occur in near future on the monitoring stations and/ or on rest part of the pit. It may get momentum any time and may cause a big failure. The continuous mining operation, blasting and changes in groundwater conditions continuously disturb the existing stress condition in the field. The whole system tries to come into equilibrium by stress redistribution and adjustment, which may result into movement of the slope any time.

The development of any tension crack on different benches formed in weak slope material should be observed. The iron rods (with serial numbers) should be installed across the crack to measure the movement with the help of tape, if possible daily/ weekly. If the

11:42

persistence of the crack is in two or more benches and the trend of the movement is continuously increasing, i.e. accelerating, then it is a matter of concern because it may cause large scale failure. The tension cracks should be filled with weathered rockmass and scaled with clay to prevent the entry of water, which may cause failure.

It is prudent to continue the monitoring of the slope regularly. It will be helpful to make use of remedial measures as soon as any movement is detected to check the impending failure. If the movement is continued for a year, it will be very difficult to control the instability by applying any remedial measure thereafter. World over, the scientists recommend that remedial measures should be adopted as soon as movement starts or even before. The monitoring should be continued to detect the on-set of any major movement, which in-turn will be helpful in applying a suitable remedial measure for the critical slope timely. A long-term association between HZL and CIMFR can only achieve it.

## Conclusion and Recommendations

#### Open pit mine:

- Total number of visible and accessible monitoring stations which were made available for monitoring during the visit of October 2022 is 272. 99 stations are located towards hangwall side and 173 stations are towards footwall side of the mine.
- The following changes were observed among the stations made available for the monitoring purpose.
- The overall maximum cummulative change of 42.3 cm has been observed at S/100 of 30mRL bench, (Initial observation April 2019), towards hangwall side. During past one and half year (February 2021 to October 2022). The change in horizontal distance 23.1 cm. However, the rate of movement period (from 2021 to October 2022) was 0.41 mm/day, which may considered safe.
- 98 numbers stations are showing commulative changes between 2.2 cm to 39.3 cm in hangwall side during the observed period. However rate of movement is within safe limit.
- The overall maximum commutative change of 37.8 cm has been observed at S/50 of 366mRL bench, (Initial observation October 2018), towards footwall side. During past one and half year (February 2021 to October 2022). The change in horizontal distance 14.6 cm. however, the rate of movement period (from February 2021 to October 2022) was 0.26 mm /day.
- 172 numbers stations are showing commutative changes between 2.1 cm to 21.9 cm in footwall side during the observed period.

It may be concluded that the average observed values of movement of monitoring
points for the open pit mine is within the safe limit. Considering the dimension and
depth of mine, the first trigger point may be considered for the open pit as average
Imm/day movement over a period of 3 months for the majority of pillars in a zone of
mine. Therefore it may be concluded that the condition of pit slope of the mine is
under safe condition till the last monitoring observation of the mine during October
2022.

#### Dump:

- Total 26 stations were made available for the monitoring purpose. The overall
  maximum commulative change of 16.2 cm has been observed at W/125 during the
  observation of October 2022.( Intial observation October 2018) during past six month
  (April 2022 to October 2022). The change in horizontal distance 1.3 cm. However the
  rate of movement period (from April 2022 to October 2022) was 0.075 mm /day
- 25 numbers stations are showing commutative changes between 0.1 cm to 15.1 cm, during the observed period.

## Subsidence Monitoring

- Total number of visible and accessible monitoring stations which were made available
  for monitoring during the visit of October 2022 is 34, 22 stations are located towards
  hangwall side (Surface/ Inpit) and 12 stations are located towards footwall
  side(Surface/ Inpit) of the mine.
- The overall maximum commutative change of 3.9 cm has been observed at H/W in pit S-70 (Initial observation February 2021) to till the date of observation.
- The overall maximum commulative change of 1.6 cm has been observed at F/W surface N-725 (Initial observation February 2021) to till the date of observation.
- The external dump, placed towards South Across zone, is a dead weight over standing slope mass. Cracks were present along the crest of first tier of this dump before the recent dozing operation. The reopening of cracks should be regularly observed, especially during rainy season.
- The level of the ground between the toe of dump (south across side) and road (near water reservoir) leading to Agucha village should be regularly maintained for quick run-off of the rain water away from the dump foundation. Poor drainage at the dump foundation level would result in to yielding of the foundation due to liquefaction by stagnant water between dump toe
- The monitoring should be done departmentally on daily basis in the zone of movement to check any impending failure. It should also be supplemented by SSR.

- The rock mass is weak, weathered and fractured. Constant vigil should be kept in these parts of the pit. It is advisable to continue slope monitoring to detect the onset of failure so that early and effactive stabilisation measures can be taken at the earliest. If the instability is unavoidable then it can be brought down in a predictable manner. The iron pegs should be installed along old and new cracks to monitor opening of the crack.
- The lithology is highly weathered and fractured towards southern part, especially southwest part, of the footwall. The monitoring has revealed progressive change in data. It indicates impending failure,
- Location of monitoring stations should be shown on working plan and made available to CIMFR.
- The broken station should be reinstalled. The stations should be installed in such a way that it cover the whole pit and dump.
- The monitoring stations are installed only towards footwell side at different levels. Stations should also be installed towards hangwall side.
- No heap of muck should be left on the benches. The muck should be cleaned and the gradient
  of the bench should be such that the rainwater flows to lower level in a planned way.
- The mine and dump should have an effective garland drain/ bund, all around, to collect runoff rainwater before it reaches the mine slopes and dump toe. The drains should be steeply
  graded to promote rapid water movement and minimise the chances of ponding. It is essential
  that these drains should be kept clear of silt and debris. The benches should have toe drains.

These drains should be again interconnected to drain out the rainwater into the mine sump.

The mine management should continue advance pit dewatering. Besides the existing boreholes for pumping, more boreholes should be drilled for dewatering.

- More sub-horizontal drainage and advance pit dewatering holes should be installed for depressurisation of adverse groundwater pressure, especially where seepage has been observed.
- The groundwater regime is likely to be present at various stages of pit development. Its
  measurement should be continued by installing piezometers. It is also recommended that the grid
  of piezometer stations should be expanded.
- During the rainy season, one person should be deputed to go in and around the mine in the morning to see any development of tension crack.
- The observations and analysis of slope monitoring data of the dump indicates an average of less than Imm/day movement for the majority of monitoring pillars in a zone of dump. Hence it may be concluded that the condition of the dump is safe as per observed data by CSIR-CIMFR till October 2022.



22

## Acknowledgements

Authors are thankful to the mine management for providing all facilities, information and helpful discussion during the period of study.

#### Bibliography

1

- Barton, N. R., 1971. A model study of the behaviour of steep excavated slopes, Ph.D. Thesis, Imperial College, London.
- Brawner, C.O., 1970. Stability investigations of rock slopes in Canadian mining projects, Proc. 2<sup>nd</sup> Int. Cong. Rock Mech., Belgrade.
- Coates, D.F., 1977. Pit Slope Manual, Chapter-5, Design, CANMET (Canada Centre for Mineral & Energy Technology, formerly Mines Branch, Energy, Mines and Resources, Canada).
- Hoek, E. and Bray J.W., 1977. Rock Slope Engineering, Inst. of Mining & Metallurgy, London.
- Hoek, E. and Londe, P., 1974. The design of rock slopes and foundations, 3rd Congress ISRM, Denver.
- ISRM, 1978. Suggested methods for the quantitative description of discontinuities in rock masses. Commission on the standardization of laboratory and field tests in rock mech.
- Kennedy, B.A., 1971. Methods of monitoring open pit slopes, Rock Mech., pp. 537-572.
- Larocque, G, 1977. Pit Slope Manual, Chapter-8, Monitoring, CANMET.
- Norton, P. J., 1986. Monitoring of ground movements in surface mining,
- Walker, B, and R. Fell, Soil slope Instability and stabilisation, A.A. Balkema, Rotterdam, 1987.

Table 1: Changes in Horizontal Distance from hangwall Base Station for F/W Pillars.

(Monitoring stations are located on 390 M RL bench)

Station	Horizontal	Change in	Horizonta	I Distance in	cm.
No.	Distance in meter. October 2018	February 2021	April 2022	August 2022	October 2022
N/675	1286.281	-1.5	-2.4	-2.8	-3.0
N/650	1279.263	-1.5	-2.4	-3.0	-2.9
N/600	1260,210	-3.5	-4.6	-5.0	-5.2
N/575	1255.757	-1.3	-2.4	-3.0	-3.1
N/550	1254.826	-1.9	-3.1	-3.4	-3.8
N/500	1251.294	-2.8	-4.4	-4.9	-5.1
N/475	1245.527	-3.3	-4.9	-5.7	-5.8
N/425	1235.057	-2.6	-4.0	-4.7	-4.9
N/400	1229.828	-2.8	-4.4	-5.3	-5.5
N/300	1205.676	-3.0	-4.7	-5.6	-5.9
N/250	1190.508	-3.2	-4.1	-5.0	-5.1
N/175	1169.167	-2.9	-4.3	-5.4	-5.5
N/75	1132.917	-2.8	-4.3	-5.2	-5,3
N/50	1128.066	-2.4	-3.8	-4.1	-4.4
N/25	1123.771	-3.0	-4.6	-5.3	-5.7
NS00	1120.169	-5.9	-7.4	-10.4	-10.8
S/25	1116.391	-3.0	-4.5	-5.5	-5.5
S/125	1104.099	-6.9	-11.0	-12.1	-12.4
S/175	1108.839	-7.0	-10.5	-12.0	-12.4
S/200	1111.569	-9.2	-10.2	-11.6	-12.0
S/225	1115.711	-5.3	-7.4	-8.7	-8.8
S/250	1116.993	-5.2	-7.3	-8.7	-9.0
S/275	1121.490	-6.2	-B.9	-10.2	-10.6
S/300	1124,947	-4.8	-6,9	-8.2	-8.3
S/350	1137.185	-17.6	-20.1	-21.4	-21.9
S/400	1160.522	-4.3	-6.3	-7.3	-7.6



Table 1 contd : Changes in Horizontal Distance from hangwall Base Station for F/W Pillars.

(Monitoring stations are located on 390M RL bench)

Station	Horizontal	Change in	Change in Horizontal Distance in cm.				
No.	Distance in meter, October 2018	February 2021	April 2022	August 2022	October 2022		
S/425	1169.705	-5.1	-7.0	-8.0	-8.0		
S/450	1177.498	4.0	-5.8	-6.8	-6.8		
S/475	1184.466	-3.9	-5.1	-5.9	-5.9		
S/500	1190.170	-3.8	-5.0	-5.5	-5.7		
S/525	1197.167	-3.5	-4.4	-5.3	-5.3		
S/550	1206.498	-3.2	-5.8	-6.1	-6.4		
S/575	1213.167	-3.8	-5.0	-5.4	-5.7		
S/600	1216,148	-5.5	-5.3	-5.8	-5.8		
S/625	1218.553	-2.3	-2.9	-3.6	-3.5		
S/650	1223.945	-2.1	-2.5	-2.8	-2.8		
\$/825/370	1247.862	-6.4	-6.7	-7.4	-7.1		
S/810/360	1237,093	-6.0		-6.5	-8.4		
S/775/360	1226.714	-8.7	-9.1	-9.8	-9.8		
S/770/350	1209.790	-6.3	-5.5	-6.1	-6.0		
S/B10/350	1220.781	-4.0	-3.9	-4.4	-4.1		
S/805/350	1207.160	-3.6	-3.3	-3.6	-3.5		
S765/350	1199.102	-4.7	-4.8	-5.5	-5.5		
S/775/280	1100.801	-3.0	-2.8	-3.8	3.6		
S/725/275	1089.225	-2.2	-1.8	-2.9	-2.9		
S/650/270	1086.037	-1.9	-1.6	25			
S/575/270	1070.241	-2.8	-3.2	-4.9	-4.8		
S/700/230	992.765	-1.8	-0.3	-2.0	-1.6		
5/685/230		-1.9	-0.8	-2.5	-2.5		
5/620/220		-1.6	-1.1	-2.9	-2.8		
5/610/220	966,414	-2.3	-1.5		1-		

Table 2: Changes in Horizontal Distance from hangwall Base Station for F/W Pillars. (Monitoring stations are located on 366 M RL bench)

Station No.	Horizontal Distance in meter, October 2018	Change in Horizontal Distance in cm.				
		February 2021	April 2022	August 2022	October 2022	
\$/250	1085.630	-4.8	-7.0	-8.3	-8.6	
S/200	1078.232	-5.5	-7.9	-9.4	-9.7	
\$/150	1071,999	-8.3	-12.3	-14.2	-14.7	
S/100	1071.267	-10.8	-16.2	-18.2	-18.8	
8/50	1075.261	-23.2	-34.8	-36,9.	-37.8	
NS/00	1086.345	-3.0	-4.4	-5.3	-5.6	
N/50	1092.905	-3.3	-4.8	-5.6	-6.0	
N/150	1137.815	-3.3	-4.7	-5.7	-5.9	
N/275	1171.290	-2.1	-3.6	-4.5	-4.8	

Table 3: Changes in Horizontal Distance from hangwall Base Station for F/W Pillars. (Monitoring stations are located on 354 M RL bench)

-	Horizontal Distance in meter. October 2018	Change in Horizontal Distance in cm.				
Station No.		February 2021	April 2022	August 2022	October 2022	
		-2.9	-4.5	-5.8	-5.8	
N/400	1128.782		-3.3	1-4.1	-4.2	
N/500	1161.289	-2.2		-3.4	-3.5	
-	1194.011	-2.0	-2.8			
N/600	g stations are locate	d on 342 M	RL bench	)	1.0	
	g stauoris are locale	-2.5	-3.9	-4.8	-4.9	
N/475	1140.948		-4.3	-5.2	-5.3	
N/410	1116.325	-2.8	1	-5.6	-5.8	
N/300	1080.614	-3.1	-4.5	-0,0		



	Horizontal	Change in	Horizonta	l Distance in	cm.
Otation No.	Distance in meter, October 2018	February 2021	April 2022	August 2022	2022
N/600	1165.483	-2.1	-3.1	-4.0	-4.1
N/500	1129.650	-2.5	-3.6	-4.6	-4.8
N/475	1126.809	-2.9	-		-
N/450	1116.086	-2.8	-4.0	-5.0	-5.1
N/400	1100.375	-3.5	-5.2	-6.3	-6.6
N/300	1066.725	-3.8	-5.6	-6.7	-7.0
N/250	1051,388	-4.2	-5.8	-6.8	-7.2
N/100	1019.723	-4.2	-6.1	-7.7	-8.1
S/100	1021.503	-7.3	-10.5	-12.6	-12.9
S/200	1029.769	-6.4	-9.1	-11.0	-11.2
S/400	1071.803	-5.4	-7.3	-8.9	-8.9
S/500	1119,450	-3.5	-4.4	-5.5	-5.5
S/600	1141,624	-3.2	-3.8	-4.7	-4.7
(Monitoring	stations are locate	d on 340 M	RL bench	)	
N/50/340	1058.040	-3.1	-4.6	-5.7	-5.9
(Monitoring	stations are locate	d on 310 M	RL bench)		
5/300	1044.087	-4.6	-6.8	-	
N/25	985,721	-7.6	-11.4	-13.8	-14.3
N/100	995.726	-4.5	-6.2	-8.0	-8.3
N/175	1006.147	-5.6	-8.2	-10.2	-10.8



Table 4: Changes in Horizontal Distance from hangwall Base Station for F/W Pillars. (Monitoring stations are located on 290 M RL bench)

01.11	Horizontal	Change In	Monizonte	d Distance in	
Station Distance in No. meter. October 2018	February 2021	April 2022	August 2022	October 2022	
S/100	942,521	-7.3	-10.3	-12.8	-13.3
NS/00	957.476	-7.8	-11.0	-13.6	-14.1
N/100	972.517	-5.1	-7.4	-9.2	-9.4
N/300	1018.625	-4.3	-6.3	-7.8	-8.1
(Monitorio	ng stations are locate		RL bench	)	
N/350	1018,180	-4.4	-6.2	-7.8	-8.1
manufacture of the second second	ng stations are locate	d on 260 M	RL banch	)	
N/350	1001.423	-5.2	-7.4	-9.2	-9.3
N/300	987.209	-5.4	-8.0	-10.2	4.5
N/200	953.537	-5.7	-8.2	-10.5	-10.6
N/100	935.345	-5.8	-8.0	-10.0	-10.3
NS/00	922.464	-8.4	-11.7	-14.5	-15.1
S/100	907,552	-7.4	-10.4	-13.4	-13.7
S/200	915.569	-7.0	-9.3	-12.3	-12.9
S/300	932,675	-6.4	-8.1	-10.7	-11.2
S/400	969.240	-5.0	-6.6	-8.6	-8.9
S/500	1010.580	-4.1	-	-6.3	-6.4
	g stations are locate	d on 220 M	RL bench	)	
S/300	886.294	-6.4	-8.3	-11.1	-11.5
S/200	868.264	-6.9	-9.1	-12.2	-12.7
S/100	860.585	-7.7	-10.2	-13.4	-14.1
NS/00		-8.2	-10.9	-14.1	-14.5
N/100	The state of the s	-7.0	-9.9	-12.1	-12.4
V/200	000,100	-7.0	-10.1	-12.5	-12.9
N/500	010.00	-3.8	-4.3	-6.2	-6.3



Table 5: Changes in Horizontal Distance from hangwall Base Station for F/W Pillars. (Monitoring stations are located on 190 M RL bench)

	Horizontal	Change in	Horizonto	I Distance in	em.
No. Dis	Distance in meter, October 2018	February 2021	April 2022	August 2022	October 2022
S/325	829.306	-1.4	-3.8	-7.2	-7.5
S/350	839,227	-2.6	-9.0	-12.0	-12.3
S/425	866.094	-6.5	1-		
(Monitori	ing stations are locate	5.75.557	RL bench	1)	
8/425	853.539	-5.6	-6.3	-9.0	-9.4
\$/400	837.148	-5.7		-	-
S/300	810.945	-6.7	-8.7	-11.8	-12.4
S/75	816.637	-7.9	-11.1	-14.4	-14.9
S/25	822.594	-8.3	-11.5	-14.9	-15.6
N/400	929.018	-6.1	-7.6	-10,1	-
(Monitori	ng stations are locate	d on 170 M	RL bench	)	
N/450	943.230	-5.1	-6.7	-9.2	-9.3
N/400	923.938	-6.2	-7.5	-10.3	-10.5
N/300	899.240	-7.0	-8.9	-11.7	-11.9
N/250	870.586	-7.0	-9.6	-12.6	-13.1
8/100	769.728	-8.7	-11.7	-15.3	-15.9
S/200	782.330	-3.1			
S/300	800.034	-7.0	-8.5	-11.8	-12.3
(Monitorir	ng stations are located	d on 160 M			
S/250	776.941	-	-10.7	-14.0	-15.2
S/50		-8.8	-11.5	-15.6	-16.0
N/175		-7.2	-9.3	-12.8	-12.7
N/275		-8.0	-10.4	-13.1	-13.8
N/375		-5.7	-4.3	-10.2	-10.4
Monitorin	g stations are located	on 140 M F			
W375	- Content	6.0	-6.8	-9.9	-10.3
V/325	864.978	6.7	-9.0	-11.8	-12.1

Table 6: Changes in Horizontal Distance from hangwall Base Station for F/W Pillars. (Monitoring stations are located on 100 M RL bench)

	Horizontal	Change In	Horizonta	I Distance in	om.
Station No	Distance in meter. April 2019	February 2021	April 2022	August 2022	October 2022
S/50	536,174	-6.7	-10.2	-12.1	-10.0
S/150	514.209	-5.4	-7.6	-10.0	-10.4
S/250	516.026	-3.2	-7.6	-9.4	-9.7
S/300	526.476	-3.7	-5.0		-6.6
\$/400	553.163	-3.0	-2.8	-4.3	-4.6
S/500	598.758	-1.5	-0.7	-1.4	-1.5
(Monitoring	stations are locate				
\$/325	505,774	-3.8	-3.8	-5.7	1-5.7
S/250	493.722	-3.6	-9.2	-11.2	-11.3
S/150	493.181	-5.7	-7.8	-9.6	-10.2
(Monitoring	stations are locate				
S/200	478.597	-	7-	T-	1-
S/300	485.722		-	1.	1.
S/350	500.327	-3.2	-2.9	-4.7	-4.8
(Monitoring	stations are locate				
N/100	575.054	-7.3	-11.3	-13.8	-14.2
N/150	589.115	-7.6	-10.9	-12.9	-13.4
N/175	599.364	-6.9	-10.7	-12.3	-12.6
N/200	614.903	-7.0	-10.1	-12.0	-12.5
N/200	633.136	-5.9	-8.2	-9.7	-10.1
N/200	660.286	-5.3	-7.7	-9.0	-9.2
(Monitoring	stations are locate	d on 340 M	RL bench	)	
S/25	206.246	-		-	
S/275	102.882	-5.5			
(Monitoring	stations are located	d on 160 M	RL bench)		0
S/245	587,279	-7.0	-10.1	-11.9	-12.5
5/325	596.396	-5.5	-7.4	-8.9	-9.2
8/375		-4.6	-5.8		-7.5
Monitoring :	stations are located		RL bench)		
3/405	4 10	662,217		1.2	1.2
5/400	-	628.336	-	-2.7	-2.5



Table 7: Changes in Horizontal Distance from hangwall Base Station for F/W Pillars. (Monitoring stations are located on Shear zone)

Station No	Horizontal Distance in meter. February	Change in Horizontal Distance in cm.	
	2021	April 2022	
S Zone S-825	1247.798	-0.3	
S Zone S-810	1237.033	•	
S Zone S-775	1226,627	-0.4	
S Zone S-770	1209.737	-0.2	
S Zone S-810	1220.741	+0.1	
S Zone S-805	1207.124	+0.3	
S Zone S-765	1199.055	-0.1	
S Zone S-775	1100.771	+0.2	
S Zone S-725	1089.203	+0.4	
S Zone S-650	1086.018	+0.3	
S Zone S-575	1070.213	-0.4	
S Zone S-700	992.747	+1.5	
S Zone S-685	994.026	+1.1	
S Zone S-620	968.625	+0.5	
S Zone S-610	966.391	+0,5	

Table 8: Changes in Horizontal Distance from hangwall Base Station for F/W Pillars. (Monitoring stations are located on Shear zone)

NINGS O	Horizontal Distance in	Change Distance	
Station No	meter. February 2021	August 2022	October 2022
140mRL			
N-500	890.109	-1.9	-1.9
N-400	830.505	-3.3	-3.2
390mRL			
S-99	1109.080	+2.3	+1.8
S-53	1114.575	+5.0	+4.6
S Zone S-780	1259.327	+6.9	+7.3
S Zone S-790	1262.048	+7.5	+7.9
S Zone S-827	1276,671	+6.5	+6.7
S Zone S-860	1266,858	+7.7	+8.1
S Zone S-763	1170.819	+6.6	+6.5
S Zone S-798	1163.120	+6.7	+6.8
S Zone S-786	1191.001	+6.4	÷6.4
360mRL			
S-865	1217.383	+8.0	+8.2
S-920	1200.938	+8.6	+8.8
S-945	1148.090	+10.0	+10.2
S-940	1104.995	+9.8	+10.2
395mRL			
N-935	1363.071	+7.1	+7.1
N-880	1348.907	+6.9	+7.0
N-820	1325.189	+6.4	+6.3

Table 9: Changes in Horizontal Distance from Footwall Base Station for H/W Pillars. (Monitoring stations are located on 370 M RL bench)

	Hadassis	Change in	Horizonta	al Distance in	cm.
Station No.	Horizontal Distance in meter. October 2018	February 2021	April 2022	August 2022	October 2022
N/850	1079.481	-3.2	-5.2	-5.7	-5.7
N/825	1080.326	-4.4	-6.9	-7.3	-7.8
N/750	1074.429	-8.0	-11.7	-12.4	-13.1
N/725	1076,972	-7.1	-9.9	-11.0	-11.2
(Monitori	ng stations are locate	d on 360 M	RL bench	)	
N/575	1110.064	-8.0	-12.2	-13.3	-14.0
N/625	1117.785	-7.1	-11.0	-11.9	-12.3
N/650	1093,372	-6.6	-10.1	-11.0	-11.5
N/700	1061.799	-7.0	-10.5	-11.7	-11.9
N/725	1058.302	-11.2	-17.1	-18.4	-19.5
N/775	1060,770	-20.7	-25.1	-26.1	-26.8
N/800	1065.492	-4.8	-7.5	-8.2	-8.5
N/850	1068.669	-3.4	-5,2	-5.6	-6.0
N/875	1065.320				· ·
N/925	1045.069	-1.1	-2.0	-2.2	-2.2
(Monitorin	g stations are locate	d on 350 M	RL bench	)	
N/875	1049.968	-2.2	-3.5	-3.8	-3.8
N/775	1049.858	-5.3	-10.3	-11.2	-11.6
N/700	1047.736	-14.8	-21.8	-23.8	-25.0
S/400	1019.083		-11.2	-	-13.2
(Monitorin	g stations are located	d on 340 M F	RL bench)		
N/450	1077.351	-8.7	-13.4	-14.7	-15,5
V/525	1082.133	-8.5	-13.1	-14.3	-15.2
S/175	969.599	-10.2	-18.4	-21.2	-24.1
3/200	971.056	-9.9	-17.7	-20.1	-21.4
5/275	1059.386				
3/300	988.732	8.1	-14.5	-16.4	-17.4

Table 10: Changes in Horizontal Distance from Footwall Base Station for H/W Pillars.
(Monitoring stations are located on 360 M RL bench)

	Harrista	Change in Horizontal distance in cm.				
Station D	Horizontal Distance in meter. October 2018	February 2021	April 2022	August 2022	October 2022	
S/500	1028.800	-	-9.5	-10.3	-11.0	
S/650	1043.452	-4.3	-7.4	-8.1	-8.5	
S/700	1051.904	-	-	-8.2	-8.7	
S/750	1058,332	-3.1	-5.7	-6.2	-6.5	
S/800	1070.657	-	-4.8	-	-	
(Monitoria	ng stations are locate	d on 330 M	RL bench	)		
S125	961.236	-9.8	-17.6	-20.0	-21,3	
(Monitoria	ng stations are locate	d on 320 M	RL bench	)	-20010-20-20-	
N/150	932.405	-10.8	-18.8	-21.3	-22.6	
N/100	925.838	-10.6	-18.5	-21.0	-22.2	
(Monitorin	ng stations are locate	d on 310 M	RL bench	)		
N/250	937.220	-10.9	-18.4	-20.6	-22.0	
N/200	932.800	-10.0	-17.8	-20.2	-21.4	
(Monitorir	ng stations are locate	d on 300 M	RL bench	)		
N350	945.824	-9.9	-17.7		-20.7	
N/300	943.207	-9.9	-17.5	-19.7	-20.8	
(Monitorin	g stations are locate	d on 290 M	RL bench	)		
N/425	946.101	-11.0	-19.2	-21.6	-22.6	
Monitorin	g stations are locate	d on 280 M	RL bench)	)		
N/625	934.326	-8.7	-12.3	-13.5	-13.9	
N/575	931.288	-14.7	-19.8	-21.4	-21.7	
N/475	941.314	-11.3	-19.5	-21.9	-22,9	

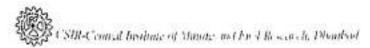


Table 11: Changes in Horizontal Distance from Footwall Base Station for H/W Pillars.
(Monitoring stations are located on 270 M RL bench)

	Horizontal	Change in	Horizontal	distance in o	om.
Station No.	distance in meter. October 2018	February 2021	April 2022	August 2022	October 2022
N/825	961.368	-1.9	-2.7	-3.4	-3.6
N/625	933.253	-4.5	-		
(Monitori	ng stations are locat	ed on 260 M	RL bench	1)	
N/750	928.315	-2.7	-4.5	-5.2	-5.4
N/725	920.922	-3.7	-5.8	-6.7	-7.0
S/100	862.646	-10.1	-18.0	-20.8	-22.1
S/200	867.709		-	1.	1.
\$/300	883.112	-8.4	-14.8	-17.4	-17.9
(Monitori	ng stations are locat	ed on 250 M	RL bench	1)	
S/350	888.108	-7.4	-12.8	-14.6	-15.3
\$/125	855.611	-9.4	-16.8	-19.1	-20.3
S/75	854.076	-10.4	-		
N/25	861.149	-10.1	-17.0	-19.5	-20.7
	ng stations are local	ted on 240 M	RL bench	1)	
S/750	867.567	-2.8	1.	-	
(Monitori	ing stations are local	ted on 220 M	RL benci	n)	
S/550	854.993	-3.9	-6.7	-7.8	-7.8
S/625	868,426	-3.4	-6.2	-7.1	-7.4
income in the second statement	ing stations are local	ted on 200 M	RL bench	n)	
S/325	838.663	-7.1	-12,4	-14.2	-15.0
S/250	822.848	-8.3	-15.2	-17.1	-18.3
8/150	812.072	-8.5	-15.4	-17.6	-18,7
S/100	808.974	-9.2	-16.2	-18.1	-19.5
S/50	810.541	-8.9	-15.9	-18.3	-19.5
N/50	B15.699			-	7

Table 12: Changes in Horizontal Distance from Footwall Base Station for H/W Pillars.

(Monitoring stations are located on 190 M RL bench)

0	Horizontal	Change in	Horizontal	distance in c	m.
Station No.	distance in meter. October 2018	February 2021	April 2022	August 2022	October 2022
S/225	810.354	-8.2	-14.8	-17.0	-18.1
S/150	801.476	-9.0	-15.6	-17.4	-18.9
S/75	799.918	-8.1	-14.1	-16.8	-17.1
(Monitorir	ng stations are locate	ed on 180 M	RL bench)	Almes III	
N/100	800.522	-8.8	-15.0	-17.7	-18.6
N/50	796.751	-8.7	-15.0	-17.0	-18.1
S/50	791.809	-8.2	-13.9	-16.1	-17.1
S/125	791.716	-7.8	-13.4	-15.6	-16.4
(Monitoria	ng stations are locate	ed on 160 M	RL bench)	S	
S/50	744.854	-8.5	-14.4	-16.4	-17.7
S/150	744.267	-9.0	-15.0	-17.6	-18.2
S/225	756.040	-	-15.1	-17.0	-18.1
(Monitori:	ng stations are locate	ed on 130 M	RL bench)		
N/300	895.734	-10.1	-16.3	-19.0	-19.9
N/125	730.924	-9.6	-17.0	-19.7	-21.4
N/75	723.088	-10.4	-18.2	-21.3	-22.4
S/25	717.473	-9.7	-16.2	-18.5	-19.5
S/125	715.982	-10.7	-18.9	-22.0	-23.6
N/225	April 2019 564.338	-10.6	-18.9	-	

Table 13: Changes in Horizontal Distance from Footwall Base Station for H/W Pillars,
(Monitoring stations are located on 100mRL bench)

No.	Horizontal distance in meter.	Change in Horizontal distance in cm.				
	April 2019	February 2021	April 2022	August 2022	Octobe 2022	
S/250	664.644	-8.1	-15.3	-17.5	-18.1	
S/375	714.150	-4.6	-9.1	-10.4	-10.9	
(Monitorin	ng stations are locate			-	-	
S/250	640.877	-8.7	-16.8	-18.8	-19.7	
S/125	585.044	-12.6	-23.2	-26.6	-27.7	
N/100	542.254	-14.1	-25.6	-29.8	-32.2	
N/250	471.852	-12.3	-20.6	-24.1	-24.6	
(Monitorin	ng stations are locate					
N/225	489.339	-12.8	-20.8	-24.3	-25.4	
(Monitorir	ng stations are locate	ed on 50 M	1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	1.22.00	1.000	
N/175	486.365	-13.8	-23.6	-26.9	-28.4	
N/75	526.262	-16.4	-29.0	-33.4	-36.1	
S/25	544.145	-16.2	28.6	-33.3	-35.0	
S/100	562.848	-14.5	-25.9	-30.2	-31.3	
(Monitoria	ng stations are locate	ed on 30 M	RL bench)			
S/150	567.966	-16.6	-31.4	-35.5	-37.3	
S/100	543.203	-19.2	-34.9	-40.0	-42.3	
8/30	526.064	-18.2	-32.8	-37.1	-39.3	
N/160	474.559	-12.8	-22.5	-25.3	-27.0	

Table 14: Changes in Horizontal Distance from Footwall Base Station for H/W Pillars.
(Monitoring stations are located on 380mRL bench)

Station No.	Horizontal distance in meter	Change cm.	in Horizonta	il distance
	February 2021	April 2022	August 2022	October 2022
N-974	1052,557	+0.6	+1.1	+0.9
N-944	1069.365	+0.5	+0.8	+0.8
N-910	1087 729	-0.2	-0.5	-0.6
N-855	1097.014	-0.7	-0.9	-0.8
N-790	1094.035	-1.4	-1.0	-2.0
N-715	1086.962	-2.5	-3.0	-3.5
N-705	1087.155	-2.2	-2.7	-3.3
290mRL				.1
N-750	992.530	-2.2	-2.2	1-2.9
N-850	983.979	+0.4	+0.5	+0.5
330mRL				
S-850	1021.436	-0.6	-0.6	-0.8
S-795	1004.720	+0.7	+1.0	+0.9
310mRL		100		_
N-2	912.719	-6.7	-9.5	-10.8
300mRL		-		10.165
S-181	931.981	-6.8	-9.1	-10.4
270mRL				
S-470	944.177	-2.4	-3.1	-3.7
S-560	950.066	-1.8	-2.0	-2.5
260mRL			1	N
S-490	905.242	-2.0	-2.5	-3.1
230mRL				
S-570	892.939	-1.3	-1.9	-2.6

DUMP
Table 15: Changes in Horizontal Distance from NWM 1.
(Monitoring stations are located on 435 M RL Dump)

Station	Horizontal distance in	Change in Horizonta distance in cm.
No.	meter. January 2019	February 2021
W/300	311.608	
W/500	170.017	
W/675	228.265	© Transmission of the Control of the
(Monitoring	g stations are locate	ed on 475 M RL Dump)
W/450	287.441	+1.1
W/600	303.168	+1,2
W/700	364.045	
(Monitoring	stations are locate	d on 535 M RL Dump)
W/400	437.048	+0.8
W/600	437.207	+0.8
W/700	512.789	+1.1
(Monitoring	stations are locate	d on 520 M RL Dump)
W/500	385.813	
W/650	435.882	-
008/W	532.654	• :
W/900	593,313	
W/950	647.070	

Table 16: Changes in Horizontal Distance from NWM 1. (Monitoring stations are located on 475 M RL Dump)

Station No.	Horizontal distance in meter.	Change in Horizonta distance in cm.		
	April 2019	February 2021		
W/410	288.018	+0.9		
W/1275	350.840	•		
W/925	389.229	+0.9		
W/540	294.132			
W/725	524.227			
W/640	312.389	-		

Table 16 (Contd.): Changes in Horizontal Distance from NWM 1. (Monitoring stations are located on 410 M RL Dump)

Station	Horizontal	E 1	Change in Horizontal distance in cm.		
Station No.	distance meter. April 2022	August 2022	October 2022		
W540	1079,815	+0.2	-0.6		
W590		1072.581	-0.8		

Table 16 (Contd.): Changes in Horizontal Distance from NWM 1. (Monitoring stations are located on 495 M RL Dump)

Chattan	Horizontal distance in		Change in Horizontal distance in cm.		
Station No.	meter. April 2022	August 2022	October 2022		
W715	1618.589	+1.6	+1.1		
W630	1533.679	+1.1	+0.5		
W590	1508.840	+1.1	+0.5		
W525	1477.285	+0.7	+0.9		

Table 17: Changes in Horizontal Distance from NWM 1. (Monitoring stations are located on 515 M RL Dump)

Station	Horizontal distance in	Change in	Horizon	tal distance	In cm.
No. me	meter. October 2018	February 2021	April 2022	August 2022	October 2022
E/130	1668,464	-6.1	-11.2	-10.1	-11.0
E/170	1703,150	-7.2	-12.8	-12.6	-12.8
E/10	1737,702	-5.3	-10,2	-9.1	-10.2
W/40	1760.657	-5.1	-	2	
W/100	1782.147	-5,5			
(Monitoria	ng stations are locate	ed on 495 M	RL Dun	ip)	
W/120	1743.351			-	
E/110	1637.058	-6.2	-		
E/165	1611.521	-11.7	-15.8	-14.1	-15.1
E/500	1450.291	-5.2		-	
E/600	1502.015	-15.5			
(Monitorir	g stations are locate	d on 475 M	RL Dum	p)	
W/15	1656.298		-10.6	-9.2	-10.2
W/160	1699,168	-5.4	*:	-	-
E/700	1478,575	-			-
E/560	1442.519	-			-
E/465	1420.321	-8.5		-	
(Monitorin	g stations are locate	d on 455 M	RL Dum	p)	
E/190	1518.000		-9.4	-8.6	-9.6
W/150	1645.517	-6.9	-	-	-
W/10	1614.675	-6.7	-		
(Monitorin	g stations are locate	d on 435 M	RL Dum	p)	- U. C. DANG CHI-TANA
W/125	1600.171		-14.9	-15.2	-16.2



Table 18: Changes in Horizontal Distance from NWM 1. (Monitoring stations are located on 455 M RL Dump)

	Horizontal	Change in	Horizontal	Distance in	cm.
Station No.	Distance in meter. October 2018	February 2021	April 2022	August 2022	October 2022
N/2050	429.939	-0.3	-0.2	+0.2	+0.3
N/1875	426.161	0.0	+0.1	+0.7	+0.6
N/2375	(Jan. 2019) 561.920	-1.7	-1.3	-1.0	-1.1
(Monitoring s	tations are locat	ed on 435 M	RL Dump		
N/1875	374.690	-0.8	-1.5	-1.0	-1.2
N/2100	399.191	-6.6	-0.4	+0.1	-0.1
N/2335	(Jan. 2019) 497.828	-0.7	-0.5	-0.3	-0.3



# Subsidence Monitoring

Table 19: Changes in Reduced Level (Ground Movement/Subsidence Monitoring Stations are Located on Hangwall Side)

	Reduced	Change in F	Reduced Level in cm.	
Station No.	Level in meter. February 2021	April 2022	August 2019	October 2022
160mRL	1			
H/W in pit N-60	158.882	+4.7	+0.7	-0.5
170mRL				
H/W In pit S-70	172.151	8.0+	-3.9	-3.7
200 mRL				
H/W in pit S-350	199,132	-2.4	+1.7	+2.5
215 mRL	-			
H/W in pit S-505	216,861	+5.2	+5.1	+5.9
340 mRL				
H/W in pit S-335	340.637	-1.8	-1.3	-1.3
310 mRL				
HAW in pit N-210	311.215	-1.0	-1.3	-2.0
HWV in pit N-300	309.983	+0.4	-0.7	+0.2
H/W in pit N-395	310,138	0.0	-1.2	+1.1
H/W in pit N-490	310.664	-1.1	-1.6	-0.7
HW in pit N-560	310.547	+8.2	+5.1	+5.2
270 mRL				
H/W in pit N-615	281.543	-0.6	-2.2	-0.9
H/W in pit N-725	269.994	+8.9	-0.6	+0.5
H/W in pit N-780	270.022	+12.4	+1.5	+1.6
HAV in pit N-820	270.708	+13.1	+3.4	+3.9

Note: "+" and "-" signs indicate increase and decrease in the Reduced Level respectively.



## Table 20: Changes in Reduced Level (Ground Movement/Subsidence Monitoring Stations are Located on Hangwall Side)

	Reduced	Change in Reduced Level in cm.				
Station No.	Level in meter. February 2021	April 2022	August 2019	October 2022		
Surface				1		
H/W Surface N-910	395.121		-			
H/W Surface N-660	386.652		+10.3	+10.9		
H/W Surface N-470	385.998	*:	+19.7	+19.3		
H/W Surface N-115	384.556	•	+5.9	+0.4		
H/W Surface S-230	381.481	-				
H/W Surface 8-480	382.090	-	+28.2	+28.1		
H/W Surface S-635	380,770		+26.7	+26.6		
H/W Surface S-165	384.786	20	+0.2	+0.3		
H/W Surface N-285	384.656	-	1-	-		
H/W Surface N-625	385,615	+4.3	+1.1	+2.2		
HW Surface S-245			381.908	+0.1		

Note: "+" and "-" signs indicate increase and decrease in the Reduced Level respectively.

Table 21: Changes in Reduced Level (Ground Movement/Subsidence Monitoring Stations are Located on Footwall Side)

-840-80	Reduced	Change in Reduced Level in cm.						
Station No.	Level in meter. February 2021	April 2022	August 2019	October 2022				
Surface	·							
F/W Surface S-650	390.922	+2.7	+2.3	-				
F/W Surface S-280	391.764	+5,6	+3.3	+2.8				
F/W Surface S-160	392.555	•	-					
F/W Surface N-60	393.364	+8.5	+4.6	+5.9				
F/W Surface N-275	394.010	-	-					
F/W Surface N-430	395.659							
F/W Surface N-610	397.420	+0.7	+1.8	+1.2				
FAN Surface N-725	397.537	-1.6	+1.4	+0.8				
F/W Surface N-900	399.327	+2.4	-					



## Table 21( Contd): Changes in Reduced Level (Ground Movement/Subsidence Monitoring Stations are Located on Footwall Side)

	Reduced	Change in Reduced Level in on-							
Station No.	Level in meter, February 2021	April 2022	August 2019	October 2022					
355mRL				1					
F/W in pit N-365	355.279	+1.2	+1.1	+1.2					
330mRL	-								
F/W in pit N-175	336.872		+1.3	+1.6					
300mRL	-								
FAV In pit S-195	298.857	+1.1	-0.7	0.0					
26mRL	-								
F/W in pit S-645	260.070	+2.8							
F/W in pit S-421	222.027	+1.7	-0.2	-0.8					
180mRL	-		100000						
F/W in pit 8-100	181,262	+1.9	+1.8	+1.2					
160mRL	Lasinesesia.			-1					
F/W in pit N-55	161.514	+2.8	+1.2	+1.4					
130mRL									
F/W in pit N-445	130.806	+0.3	+1.7	+1.2					
110mRL									
F/W in pit N-255	111.528	+7.1	+0.5	+0.7					
			- Auto Production						

Note: "+" and "-" signs indicate increase and decrease in the Reduced Level respectively.

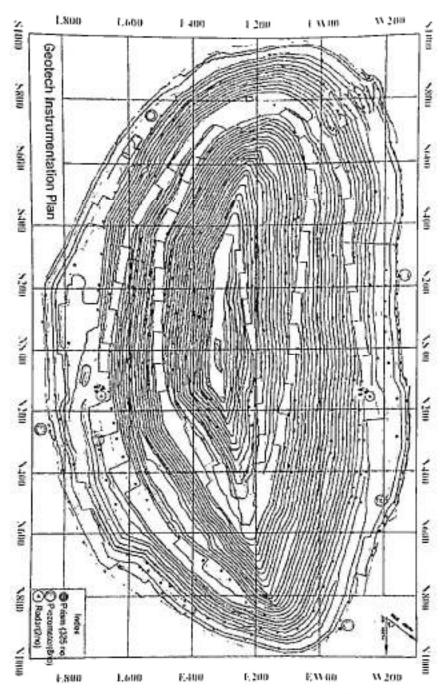


Fig 3: Geotechnical instrumentation plan with slope monitoring pillars.



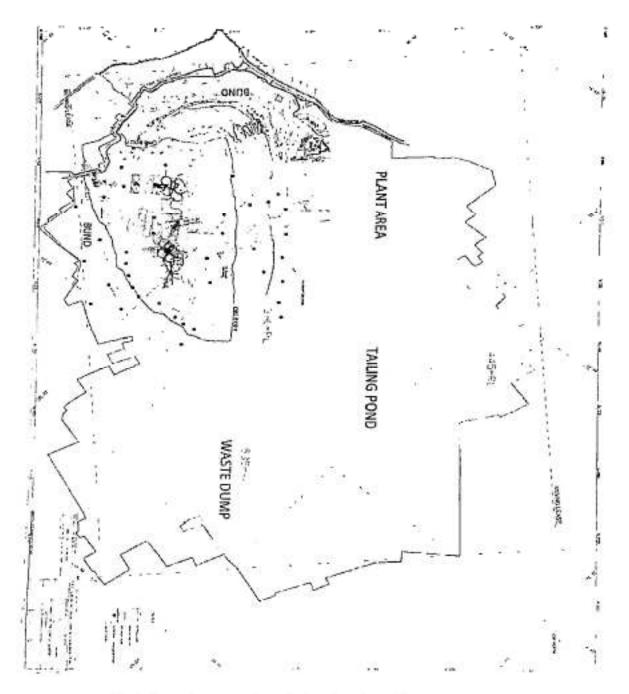


Fig 4: Ground movement monitoring plan above U/G mine.

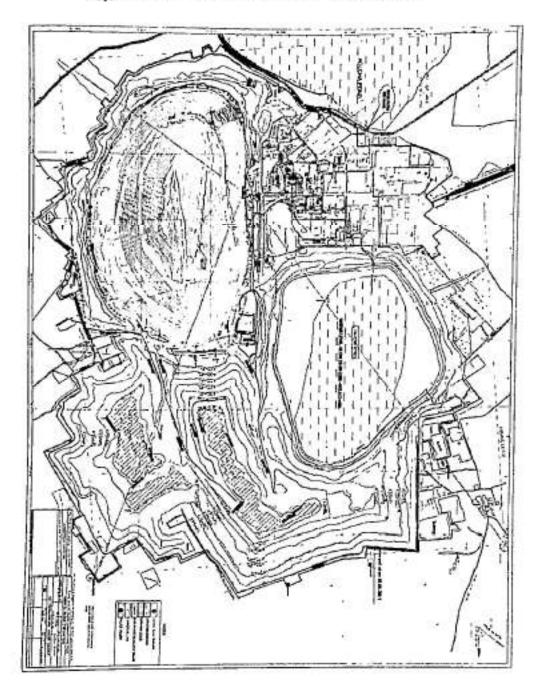
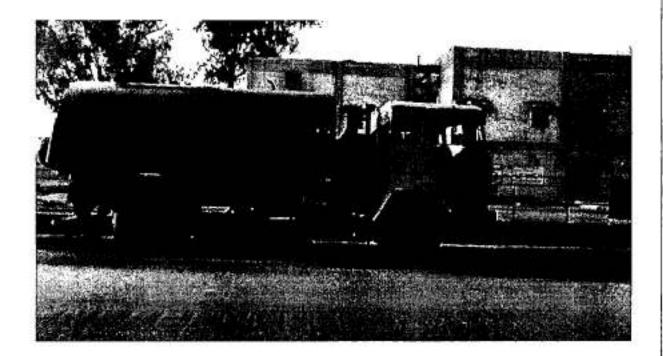


Fig 5: Geotechnical instrumentation plan for Dump with slope monitoring pillars.

## Annexure -XXII



AND S	Stranger	alandaria	Blast vibration data (Montoring	(OU)			(6.2)
S.No	Date	Blast location (stope)	Monitoring location	Radial distance (m)	MCPD (kg)	PPV (mm/s)	Frequency (Hz)
1	10-Apr- 23	-405L_S67	-380L South Access Refuge Chamber	478	185	1.15	80
2	13-Apr- 23	-280L_S656	-380L South Access Refuge Chamber	456	77	0.79	80
3	19-Apr- 23	-355L_S622	-380L South Access Refuge Chamber	254	62	1.26	96
4	22-Apr- 23	-355L_S622	-380L South Access Refuge Chamber	254	125	1.54	120
5	24-Apr- 23	-3801_S187	-380L South Access Refuge Chamber	232	125	1.58	95
6	25-Apr- 23	-405L_S277	-380L South Access Refuge Chamber	179	107	1.01	105
7	6-May- 23	-355L_N82	-380L South Access Refuge Chamber	320	125	0.50	80
8	10-May- 23	-355L_S157	-380L South Access Refuge Chamber	265	142	1.66	80
9	15-May- 23	-380L_N22	-380L South Access Refuge Chamber	430	85	1.00	100
10	17-May- 23	-380L_\$307	-3801. South Access Refuge Chamber	170	96	0.53	120
11	21-May- 23	-355L_S547	-380L South Access Refuge Chamber	200	103	1.59	105
12	14-Jun- 23	-405L_S82	-380L South Access Refuge Chamber	330	76	1.73	111
13	14-Jun- 23	-380L_S562	-380L South Access Refuge Chamber	220	71	1.25	97
14	15-Jun- 23	-430L_N52	-380L South Access Refuge Chamber	400	58	1.1	162
15	17-Jun- 23	-380L_S562	-380L South Access Refuge Chamber	220	42	0.536	98
16	26-Jun- 23	-405L_S82	-380L South Access Refuge Chamber	330	153	0.741	105
17	8-Jul-23	-455L_N142	-380L South Access Refuge Chamber	440	82	1.54	100.0
18	10-Jul-23	-330L_S637	-280L South Access Refuge Chamber	290	64	1.02	160.8
19	16-Jul-23	-305L_S202B	-380L South Access Refuge Chamber	230	148	0,91	214.3
20	23-Jul-23	-405L_N247	-380L South Access Refuge Chamber	500	101	0.47	167.6
21	31-Jul-23	-380L_S412	-380L South Access Refuge Chamber	140	50	0.52	188.9
22.	2-Aug-23	-355L_S232	-355 North Access MB	475	48	0.8	68.6
23	4-Aug-23	-380L_N8	-355 North Access MB	265	86	1.37	90
24	10-Aug- 23	-405L N247	-355 North Access MB	155	150	0.66	68.1

1				<u> </u>				
	25	14-Aug- 23	-405L_S37	-355 North Access MB	318	133	2.08	62.4
	26	30-Aug- 23	-430L_N202 A	-380L South Access Refuge Chamber	615	57	0.489	111
	27	1-Sep-23	-405L_N23	-380L South Access Refuge Chamber	400	59	0.66	180.0
	28	2-Sep-23	-380L_S142	-380L South Access Refuge Chamber	280	119	1.39	98.0
	29	9-Sep-23	-405L_S562	-380L South Access Refuge Chamber	240	84	0.76	179.0
	30	13-Sep- 23	-355L_S637	-380L South Access Refuge Chamber	290	44	1.57	171.0
	31	15-Sep- 23	-405L_N307 A	-380L South Access Refuge Chamber	600	57	1.25	149.0

Peak particle velocity



Enter trans

and other affects

and others, of there

and others, of there

and other transport

fields of actified the

Consequence of the a

Consequence of the Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Consequence

Conseque

## (भूपत विकासी हेतु अनापति प्रयस्य पत) NO OBJECTION CERTIFICATE (NOO) FOR GROUND WATER ABSTRACTION

Project Apprels*				H rd.		ing L	ss., Plans	ours Age	era Mi	ne. V.L	15¢ - Agu	cha, Te	osa - M	urda		
Vitage:	Agun	Aguncta					Hu	Hures								
Catriet Briw					ara				State:	Ra	nertas,					
Pri Code	t.															
					hundustan Eine Ltd., Rampura Apucha Mine, Wage - Apucha, Tehsa - Hurda Bhilwara Hurda, Shiwara, Rajastran - 311022								urda			
Address	6" CG///S F	epenat	Orice:		a Good			ard Wes	uro Ae	gion 6	a Tratan	a Door	ori Jaip	<i>ح.</i>		
1. NOO	Ne.:	¢q.v	74,7100	a Mich P	ekze	0020	7143									
2. App 4	ration No.:	21-4	21-4401/RJW.N/2006						Catego (GW/P4		Over Expidited					
4 P.P. 91	ct Status:	Siela	ting Gre	und Wil	ter			. F.	NOC T	PF:	-Pe	Renewal				
6 Yasa	frem;	040	7,0000					7.	Valid u	p te:	67/07/2004					
4. Grow	of Water Ab	STACE	n Pemi	cea:												
Fresh Water				Catrice	Catine Water					Countered			Total			
military mily		VEST	re/	VERY	Whytest		military		mNyear		m/cay		mAyear			
				.00		000		250.00	5	250.00	3					
9. Orui	s of ground	water a	di baco	on/Deu	aterms	150	chees									
		Tel	tal Eris	ting Ne	ing Ne.:1					T	Total Proposed No.30					
			DW	DCS	EW.	TW	22	1520	CW	COS	877	771	MP	MPV.		
Cewat	ering Struct	une"	0	0	0	D	1		0	0	0	0	0	0		
	HE DES-DAY	77.10.70		100000000000000000000000000000000000000	7. 315 5	-		ne Inches	-Line D.							
10. Groun	d Water Ab	stracted	r. Resto	ration C	Marger	914	(45.)									
	er of Please nuclear men						No. of	Piezome	ers.		Vorterr	S PRES	unch			
									1.6	ENGE	CWLR**	DWD	With T	elemetry		
"TANLE - Digital Wisser Land Recorder								1		0	1		0			
				(Con	npikano	ce Co	nditien	s given e	overlea	13						
								( 4 mm) ~								
			,	A 10 20	dies San		asse, mar									

ংক্রাং, পরেকারে রাজের মান্তরিয়ে নিয়ে, বা বিলাই - ২০০০ে বা চেনাং, ইংলাজ্যুক্ত বিভাগে, শাক্তাক্রিক বাভাগে, ইংলাজ্য ইংলাজ্য হ্রান্তর্ভার ইংলাজ্যার স্থান ক্রান্তর্ভার, প্রয়েশনার সংগ্রাক্তার, ক্রান্তর্ভার

पानी बनाय - भीवन बनाय इंद्रण्ड फंट्रण्ड - इंद्रण्ड हताह

#### Government of India Ministry of Jal Shakti

#### Department of Water Resources, River Development and Ganga Rejuvenation Central Ground Water Authority (CGWA) Application for Issue of NOC to Abstract Ground Water (NOCAP)

#### Application for Renewal of NOC to Dewater Ground Water for Mining Industry (Application for Renewal of NOC)

Application Number: 21-4/301/RJ/MIN/2005

Applied For Renewal: 3rd General information:

Water Quality:

Salmer Brackshi

Purpose of Benevial Application:

Evet no with And Fonal Grand Mater Deg Irment

Application Type Category/ Type of Application

Base Metal Ores

Name of Mine/Project:

HUNDUSTAN ZING LIMITED

Location Details of the Mining Unit- (Attach Site, Approved Mining Plan, Toposketch of Surrounding 10km Radius

Outside) (1):

Address Line 1:

HINDUSTAN ZINCLTD.

Address Line 2:

RAMPURA AGUCHA MINE VILLAGE - AGUCHA

Address Line 3:

TEHSIL - HURCA BHILWARA

SIZE District RASSTHAN BHILWARA

Sub-District: Village/Town: HURBA Agunona

Latitude:

Logitude:

Area Type:

Non-Notifed

Area Type Category: Whether industry is MSME: Over Exploited No

4. Communication Address

Address Line 1:

HINDUSTAN ZINC LIMITED

Address Line 2:

RAMPURA AGUCHA MINE

Address Line 3:

P.O. AGUCHA RACASTHAN

SIZE District:

Pincode:

BHILWARA

Sub-District:

HURCA 311029

Prione Number with Area Code:

Mobile Number:

91 8003097083

Far Number Details of Existing NOC issued by CGNVA (enclose copy)
 Committee or patrial overlants coin.

NOC Letter No:

CGWANOCMINREN2/2022/143

Date of issuance:

18082022

Vallidity (Start):

08/07/2022

Validity (End):

07/07/2024

04/07/2024 05:46 PM

Page 1 of 9

#### Department of Water Resources, River Development and Ganga Rejuvenation Central Ground Water Authority (CGWA) Application for Issue of NOC to Abstract Ground Water (NOCAP)

### Application for Renewal of NOC to Dewater Ground Water for Mining Industry (Application for Renewal of NOC)

Application Number: 21-4/801/RJ/MIN/2005

Applied For Renewal: 3rd

Reason for not applying for renewal before expiry of NOC Validity (Attach Afficavit);

6. Change in Land Use Pattern after execution of Project and Surroundings (10 km Radius - Outside)

ML

7. Land Use Detail of Project Area

Land Use Details	Existing (sq meter)	Proposed (sq meter)	Grand Total (sq meter)
Green Belt Area	3372000.00	0.00	3372000.00
Open Land	5997900.00	0.00	5997900 00
Road' Paved Area	105000.00	2.00	105000.00
Roomop area of building/ sheds	741400.00	0.00	741400.00
Total	10216300.00	3.00	10215300 00

- Whether there is a change in Topography of the Area after. No the execution of the Project:
  - a) Regional
  - b) Project Area
- Whether there is change in Drainage pattern of the area No after the execution of the Project:
  - a) Regional
  - b) Project Area
- Present Townships / Villages within 10 km radius of the Project;

Agusha Vitage, Sherukhera-Fand II, Rampura, Kheda Pēlota, Hurdā, Kothya etc

# Government of India Ministry of Jal Snatdi Department of Water Resources, River Development and Ganga Rejuvenation Central Ground Water Authority (CGWA) Application for Issue of NOC to Abstract Ground Water (NOCAP)

#### Application for Renewal of NOC to Dewater Ground Water for Mining Industry (Application for Renewal of NOC)

Application Number: 21-4/801/RJ/MIN/2008

(a) Water Supply

WAL	med rot H	enemal . an	<b>u</b>							
11.	Whether to	e Groundwa	ter Table	will be Inc	ersected by	Activity:-			Yes	
	(a) At W	на счерил (т	ogij			named and and and	Pre-mx	MS000	Post-m	onsoon
	Minio	num (m bgl)						10.03		6.30
	Maxin	num (m bgt)						21.36		17 60
	(b) Maxir	rum Depth P	roposed t	o Dewater	(m bgi)		25,00			
	(c) Grou	ndvrater Flow	Direccion	(Attach A	Sap)(\$)		West to Eas	:		
		ther informa	A STORY TO SECTION				No			
12,	Total Wate	r Requirmen	t for vario	us Purpos	e to be Me	mioned	Existing (m3/day)	Additional (m2/dz/)	Existing (m3/year)	Additional (m3/year)
	Ground W	ater Requires	d through	Abstract :	Structure		0.00	0.00	0.00	0.00
	Seepage	ater Abstract		ount of Di	eviatering /	Mining	250.00	2250,00	91250.00	
		ind Water Wi					250.00	2250,00	91,250,00	821250.00
13.		De-Watering								
	(a) De-W	atering Exist	ing Struct	ure						
	Number of	Existing Str	uctures:			1				
	SNo.	Structure Name / Year of Construction		Depth to Water Level (Meters below Ground Level)	Discharge (mirHour)	Hours(Day) / Days (Year)	ed Lift Name	Horse Power of Pump	Whether otted with Water Meler	Whether Permission Registered with OGWA At so Details Thereo!
	i	Mre Purps 12022	1500	17.00	50.0	0 5/365	e Pump	100.00	Yes	Yes/Yes/ (2)Wricg Wards 1204
	(b) De-W	atering Requi	irment and	d Addition	a Structur	e Detail				
	Number of	Proposed St	tructures;			2	Topological Control			
	SPie.	Type of Structure Name / Year of Construction	(men)	Depth to Water Level (Weters below Ground Level)	Discharge (maHeur)	Operational Hours(Day) / Days(Year)	Mode of Lift Name	Herse Power of Pump	Vinether fitted with Water Meter	Whether Permission Registered with COWAM 50 Details Thereof
	,	Mine Pumps /2024	900.00 / 1500	17,63	75.00	15/365	Submersi Die Pump	125.00 \	F .	<b>10</b> /-
	2	Mine Pumps 72024	900.00 / 1500	17,60	75.00	15 / 125	Submersi De Pump	125.00 \	e 1	lo/-
14.	Detaits of I	Utilization of	Pumped V	Valer (Ple	ase Attach	Details)(m3/)	(ear) (\$)			

04/07/2024 05:46 PM

140

Page 3 of 9

# Covernment of India Department of Water Resources, River Development and Canga Rejuvenation Central Geound Water Authority (CGWA) Application for Issue of NOC to Abstract Ground Water (NOCAP)

Application for Renewal of NOC to Dewater Ground Water for Mining Industry (Application for Renewal of NOC)

Application Number: 21-4/501/RAININ2006

		9.9	9jC/	SOLOGA JOH.	UOCE	CLUBS ROOM	KR 1905AV ODZEN	mod s	
og unus bysta bystaggor	STATE OF THE STATE	20.0	200	you young		Lines	Specific Part		
oremen nem onim	CHOTOMORA	8 4	wbbucross		2	OUCE	ped aligeon	Lera 1	
Someon of the	STURES	500	ance Condition		200	unuan6:	Conditions	1950	9
		- 30				80.000	O ert of some		14.
ansett ;	. *****		7.1	OCH MIN			3 14 01 010	,, com	
Detail SCOWA			(4681)		(Meters Delow Ground Ground Level)		u constracto		
crmed beam nich diw sticken hetsev rüke belek	Power or Pump	NU.	Days (Day)	(hibotham)	NEW BYEL	(mm) (mm)	10		
WEIDER MISELL		HOOR	DOGREDOO	Discussion	Depth	Depth	Type of	5190	
1555		13000000	. 0	and allocates		259JM200	S LEGOTIONA	numper of	NA.
isi)sti Shafi			14		(Sround				
co Weir colly			(MOL)		DEION		Constructo		
Water math		SmsM	SANO		Level	(ww)	10		
titled Permissi skilps Registe	Power	161	SHOH IS	(morrigue)	MXW.	(Neter) Diameter	Structure Name (Year		
mether which		Mode	CONTROO		Dipth	Choop	1) be of	CIVIC	
	a		0		73	:samp	outs bunstag	nuper of	N.
o dive Details):	nase nas (a a	so onsac	DOL 101 114 St	MAI SOLE SOLES	MER OF				
				- New York Control				pause	
trach detailed rep	a the project (A	uonnoa	אועל אווהו כצו	nb pue aun6a	M(\$))	ow director	AND ENIMOR	s days up	YA
			ON:				COST FIRM		The state of
E-91			pausery (s	afunounou	06.0 500	on was	al Quality of C	크게 없었다.	7
			20230000		16st X2]	IS for One	HALL IA ) C'HATAN	Piezor	
		2	benbeck	I SHAW OO			Details of G		100
		710	8		5		er of Wells I P	0.2	D
			benbezA .	ers (Latinae	Piezome	the Wells (	on Details of tude, Reduced	Toudi Tocsi	9
				((¢)deyr	mella) s	Mer Regin	Of Clound V.	BULIOLINO	12. 14
	7,180,799	a experie	u treat east a	tor benefaction	CTCH CCSR		COPER MARIN	O KIN (	)
		200		33	90		a6s	HICUM	).
E-7				7	Ot:	. 2	ession of Dus	uddins la	)
C=0					0,	1030	Ben Develop	(3.eeu	1)
					or.		e monte	noutry (c	2)
							pic: jewaus		70

6907 2684

W4 97/90 7707/4070

Signaligo, rov. notethes comos istav obsernou s

#### Department of Water Resources, River Development and Ganga Rejuvenation Central Ground Water Authority (CGWA) Application for Issue of NOC to Abstract Ground Water (NOCAP)

Application for Renewal of NOC to Dewater Ground Water for Mining Industry (Application for Renewal of NOC)

Application Number: 21-4/301/RJ/MIN/2008

Applied	FOR Ren	ewal: 3rd

oplied F	for Renewal : 3rd		
3	Groundwater quality monitoring - Pre- monitoon and Post monitoon	YES	The groundwater quality monitoring is conducted outing both pre-monsoon and post-monsoon periods to analyze the changes in water quality parameters.
4	Maintenance of recharge structures	Vec	Atamizining three anious theory cams repharging 0.18 MCM for sustainable water management and groundwater repharge.
5	Number of Pizometers as per NOC and Water Level Record	Yes	There is one piecowell with DWLR with telemetry.
6	Number of Tubeviel's Borevides as per 11000	Ye	There are one mine pump as GW abstraction structure as per NOC.
7	Picometer Ficed with AWLPs with telemetry as per NOC	Yes	There is one perowell with DWLR with teemetry.
3	Quartum of Groundvister as per NOC	Yes	Cuantum of Groundwater as per NOC 250 KED.
9	Recharge through ponds	ie	Three anouts/check dams recharging 0.18 IAOA for sustainable water management and groundwater recharge.
10	Recycle and reuse of water	Ye	Taking carn water is recycled back to the beneficiation plant and reused. Domestic waste water is treated in STPs and reused in plantation horizothere.
11	RNH and AR structures implemented	Yes	RVH and AR structures impremented and maintained.
12	Submission of Compliance report to the Region	Yes	Self compliance and self inspection report submitted online.
13	Water conservation measures	Yes	Water conservation measures are taken regular basis.
14	Water Security Plan of Villages	Not Applicable	18 100 1 00 100 100 100 100 100 100 100
15	We I monitored around the plant premises	Yes	Eight pezowels are montored monthly bass.
16	Wells fitted with water meter and its Record	Yes	Wets fitted with telemetry.
(b) C	compliance to the Condition prescribed	in the NOC - Other	

ENo. No Record Found

19. Gainful utilaization of pump water:-

Utilization of pumped water described in CHR.

20. Details of Arzimaster Harvesting and Artificial Recharge Measures for Groundwater Recharge in the Areat-Attached

Conditions given in NOC

04/07/2024 05:48 PM

Page 5 of 9

Status of Compliance

## Department of Water Resources, River Development and Ganga Rejuvenation. Central Ground Water Authority (CGWA) Application for Issue of NOC to Abstract Ground Water (NOCAP)

#### Application for Renewal of NOC to Dewater Ground Water for Mining Industry (Application for Renewal of NOC)

Application Number: 21</801/RJ/MIN/2008

Applied For Renewal: 3rd MINDAG USE-Self Declaration

If hereby certify that the data and information furnished above are true to the best of my knowledge and better and t am aware that if any part of the data / information submitted is found to be false or misleading at any stage, the application witibe rejected cutnight.

I hereby deciare that all the mandatory documents prescribed in the application form have been uploaded and no blank rinelevant documents have been uploaded. If am also aware that any talse/ vriong submission /uploading of document will lead to rejection of my application without any nodde.

It is to cert?/ that no case related to ground water vitings wa? contamination is pending against the industry/ project/ unit as on date. Any such case filed against the company/ project/ unit in respect of ground water withcrawa/ contamination during the pendency of this application shall be immediately prought to the notice of CG/VA.

I hereby uncertains that in case any environmental compensation/ penalty is imposed on the firm by any statutory authority, I shall comply with the decision of such authority.

- 1. Application Proforma is subject to modification from time to time.
- 2. Application is submitted online on weasite http://ogwa-noc.gov.in to following office.

Regional Director Central Ground Water Board Western Region, 6-A. Jhalana Doongri, JAIPUR, RAJASTHAN, 302004

3. Incomplete application will be summarily rejected.

Scanned copy of last page of application with signature and seal should be attached at presribed place before submission of application.

4. Recipt of Processing Fee of Rs. 5000.00 - (Rupees Five Thousand Only) submitted through NON TAX RECEPT PORTAL (https://branaticshipovin/) should be attached along with hard copy of application.

#### Processing Fee:-

Enaral Kosh Transaction

2606240042018

Ref. Not-

Sharat Kosh Transaction

26/08/2024

Dates

Note: The Processing Fee is Non-Refundable. Applicant should ensure and Check Eligibility of Submission of Application and Required Documents before Submitting Online Application.

5 Hard copy of application required.

250

6 Ground Water Quality

Not Define

Ground Water Charge

Not Define

Approved Ground W Receye:

Required: Ground Water Charge

AMMAG

Ground Water Areas Amount:

#### Attached Files:

Ground Water Charge

Ground/Vater flow Direction Map: (Refer:11-C)

S.No

Attachment Name

File Name

GW Fow Direction Map

GW\_Flow\_Direction\_Map.docx

2). GW Level of Observation Wells / Piezometer: (Refer:15-C)

04/07/2024 08:48 PM

Page 6 of 9

#### Department of Water Resources, River Development and Ganga Rejuvenation Central Ground Water Authority (CGWA) Application for Issue of NOC to Abstract Ground Water (NOCAP)

Application for Renewal of NOC to Dewater Ground Water for Mining Industry (Application for Renewal of NOC)

Application Number: 21-4/301/RJ/MIN/2003

Applied For Renewal: 3rd

5.No Attachment Name File Name

GW Level Prezoxets 1

GW Level Piecowels.docx

General Quality of Ground Water in the Area : (Refer: 17-D).

Attachment Name

File Manne

GW\_Cuality\_RA\_Mine

GW\_OUNTY\_RA\_Mine.pdf

4). Changes in Topogpraphy ; (Refer. 8)

S.No

Attachment Name

File Name

Charge in Topography

Change in Topography.docx

5). Changes in Drainage Pattern: (Refer. 9)

Change in Dranage

Attachment Name

File Name

Change in Drainage cook

Reason for Not Applying for Renewal before Expiring NOC: (Refer: 5)

No Attachment Found:

7). Existing NOC: (Refer: 5)

S.No.

Attachment Name

File Name

File Name

CGNVA NOC 250

CGWA NOC 250.005

Compliance to the Condition prescribed in the NOC: (Refer. 17-a).

Conditions given in NOC

Attachments

5.No. Attachment Name No Ataonment Found! 1 Area Specific Plantation 2 Domestic Water school Santation No Atlantment Found: 3 Groundwater quality montoring - Pire No Atlantment Found: monsoon and Post monsoon 4 Maintenance of recharge structures. No Attachment Found. 5 Number of Patometers as per NOC 160 Attachment Found? and Water Level Record

6 Number of Tuberreits Borevisies as No Attachment Found! per NOC

7 Pizometer Libed with AWLPs with No Ataonment Found? telemetrry as per NOC

3 Ovarrum of Groundwater as per

No Attachment Found:

9 Recharge through ponds

No Attachment Founds

10 Recycle and reuse of water

No Attachment Found:

04/07/2024 05:46 PM

9 to 7 sps9

#### Department of Water Resources, River Development and Ganga Rejuvenation Central Ground Water Authority (CGWA) Application for Issue of NOC to Abstract Ground Water (NOCAP)

Application for Renewal of NOC to Dewater Ground Water for Mining Industry (Application for Renewal of NOC)

Application Number : 21-4/801/RJMIN/2008

Applied For Renewal: 3rd

11 R.VH and AR structures implemented No Alacoment Found:

12 Submission of Compliance report to No Attachment Found! the Region

13 Water concentation measures

"to Attachment Found!

14 Water Security Plan of vicages

No Abaconment Found!

15 Well monitored around the plant No Attachment Found?

premises

16 Wells titled with vilater meter and its 140 Attachment Found:

9). Compliance to the Condition prescribed in the NOC - Other: (Refer: 17-b)

Conditions given in NOC

Attachments

S.No. Attachment Name

File Name

10). Extra Attachment:

S.No

Fecord.

Attachment Name

File Name

1 Non\_Availability\_Certificate\_Panchayat\_Non\_Availability\_Certificate\_Panchayat.pdf

2 CTE\_CTO\_Merged CTE\_CTO\_Merged.pdf

Self\_Compliance\_Inspection\_merged Self\_Compliance\_Inspection\_merged.pdf

Saine\_Water\_Affdart\_RA\_Mine\_With\_Saine\_Water\_Affdart\_RA\_Mine\_With\_Result.pdf Resut

Bharat Kosh Reciept (Porcessing Fee);

S.No.

Attachment Name

File Name

Perenditees Mire Devaging

Penewa nees Mine Dewareing pot

Application with Signature and Seat:

5.140

Attachment Name

File Name

Application\_Seal\_Signed\_Authorizatio\_Application\_Seal\_Signed\_Authorization\_Letter.pdf n Lester

13), MSME certificate in case of MSME:

No Attachment Found!

04/07/2024 05:48 PM

Page & of 9

#### Department of Water Resources, River Development and Ganga Rejuvenation Central Ground Water Authority (CGWA) Application for Issue of NOC to Abstract Ground Water (NOCAP)

### Application for Renewal of NOC to Dewater Ground Water for Mining Industry (Application for Renewal of NOC)

Application Number: 21-4/801/RJ/MIN/2006

Applied For Renewal: 3rd

Date:

Name & Signature of the applicant

Place:

(With official seat)

Associated User: HZLRA2021 Submitted By User: HZLRA2021 Submission Date: 04/07/2024

In case signed by any authorized signatory, the details of the signatory with the authorization shall be enclosed.

04/07/2024 05/46 PM

Page 9 of 9



भारत करकार जार नहिंद निकास जार मित्राच्या नदी विकास और एक सर्वक्रम निकास और पोप माने जार परिकास Government of India Ministry of Jal Shakil Dapartment of Water Resources, Fliver Davologment & Gonga Repvension Contral Ground Water Authority

#### (भूजत निकासी हेतू अनापति प्रमाण पत्र NO OBJECTION CERTIFICATE (NOC) FOR GROUND WATER ABSTRACTION

Project Namo:		Hindustan Zinc	Lid					1
Project Address:		'Hindustan Zing	Ltd., Ram	рия Адист	Mines,	Village - Ago	ucha	9
Village:		Aguncha		Blo	ok: F	iurda		
District:		Bhitwara		Sta	ie: F	lajasthan		
Pin Code:						83		
Communication Address;		Hindustan Zing Bhilwara, Hurd	Lid., Ram a, Bhilwara	pura Agucha , Rajasihan	Mine, V - 311022	ltage - Agus	tha, Tehsil- H	lurda,
Address of CGWB Region	nal Office :	Central Ground Rajasthan - 30		ard Western	Region,	6-a, Jhalane	Doongri, Jai	jaur,
1. NOC No.: O	GWANOC	MINITENT/202	3/7399	. 4				
20.5.03 (0).204001.p.c.c 1270	-4/2/RJ/MI		***************************************	3. Cat	egory: VHE 2021		r Exploited	
4. Project Status: Ex	dating Grou	and Water		. , 5. NO	C Type:	3rd	Renewal	
5. Valid from: 08	107/2022			7. Vall	d up to:	07/0	7/2024	2
8. Ground Water Abstract	ion Permit	ted:						
Fresh Water		Saline Water	3. 1	Dewale	ring		Total	2002 0
m*/day m*/year 11760.00 4270500.0		day milye	ear !	n <sup>1</sup> /day	m <sup>9</sup> /yea	r min	day m	yyear .
9. Details of ground water	abstractio	n /Dewatering st	ructures	**				
Total E	ixisting No	o.::6	avanter .		Total	Proposed N	0.:0	
-component of	DW I	CB BW TW	MP I	W DC	BW	TW	MP	
Abstraction Structure*	1 + 1		1 0	0 0	. 0	0	a	
DW- Dug Web; DCB-Dug-outh Bo	we Well: BW	Barg Welt: TW-Tube	WYR MP-Min	o Pit			1015150.00	
10. Ground Water Abstract						STAR OF START	1645150.00	
<ol> <li>Number of Piszometers constructed/ monitored</li> </ol>	& Monitori	ian wets) to be ng mechanism.	No. of P	lezomoters	K Bassa serse		Mechanism	1750 1670
			91 100		Manual	DWLR**	DWLR With	Telumetry
"DWLR - Digital Weter Level	Recorder			2	D	1 .	1	
	Tai	(Compliance (						

1871), जामनगर जाहरा, मानशिंह रोह, नई दिस्ती - 1980) / 1878, Jonaeger Bowe, Marzingh Rawl, New Dubb, 11901 Phone: 6011 1390361 Fac: 2300351, 2306345 Website: १९४४-१००-१००१

पानी बचाये - पीवन बचाने SAYE अध्यक्षम - SAYE LIFE

#### Department of Water Resources, River Development and Ganga Rejuvenation Central Ground Water Authority (CGWA) Application for Issue of NOC to Abstract Ground Water (NOCAP)

### Application for Renewal of NOC to Dewater Ground Water for Mining Industry (Application for Renewal of NOC)

Application Number: 21-4/2/RJ/M#1/2004

Applied For Renewal: 4th 1. General Information:

Water Quality:

Fresh Water

Purpose of Renewal Application:

Exiting Ground Water

Application Type Category/ Type of Application

Base Metal Ores

2. Name of Mine/Project:

HINDUSTAN ZINC LTD.

3. Location Details of the Mining Unit-(Attach Site, Approved Mining Plan, Toposketch of Surrounding 10km Radius

Outside) (\$):

Address Line 1:

HINDUSTAN ZINC LTD.

Address Line 2:

RAMPURA AGUCHA MINES

Address Line 3:

VILLAGE - AGUCHA

State:

**RAJASTHAN** 

District

**BHLWARA** 

HURDA

Sub-District: Vallage/Town:

Aguncha

Latitude:

Logitude: Area Type:

Non-Notified

Area Type Category:

Over Explosed

Whether inclustry is MSME:

No

4. Communication Address

Address Line 1:

HINDUSTAN ZINCLTD.

Address Line 2:

RAMPURA AGUCHA MINES

Address Line 3:

P.O. - AGUCHA

State:

RAJASTHAN

BHILWARA

District

HURDA

Sub-District:

Pincode:

311029 91 10 1000000000

Phone Number with Area Code: Mobile Number:

91 5003097083

Details of Existing NOC issued by CGWA (enclose copy) NOC Letter No:

nina stretowolewien temin CGWANOCMINTENS/2023/739

Date of Issuance:

09/01/2023

Vailidity (Start):

08.07/2022

Validity (End):

07/07/2024

0407/2024 05:11 PM

Page 1 of 9

#### Department of Water Resources, River Development and Ganga Rejuvenation Central Ground Water Authority (CGWA) Application for Issue of NOC to Abstract Ground Water (NOCAP)

Application for Renewal of NOC to Dewater Ground Water for Mining Industry (Application for Renewal of NOC)

Application Number: 21-4/2/RJ/MIN/2004

Applied For Renewal: 4th

Reason for not applying for renewal before expiry of NOC Validity (Attach Affidavit):

6. Change in Land Use Pattern after execution of Project and Surroundings (10 km Radius - Outside)

53

7. Land Use Detail of Project Area

Land Use Details	Existing (sq meter)	Proposed (sq meter)	Grand Total (sq meter)
Green Belt Area	5700.00	0.00	5700.00
Open Land	2400.00	0.00	2400 00
Road Paved Area	1180 00	0.00	1180.00
Rootop area of building/ sheds	2166.00	3.00	2:66.00
Total	11446.00	2.00	11445.00

- Whether there is a change in Topography of the Area after Nothe execution of the Project:
  - a) Regional
  - b) Project Area
- Whether there is change in Drainage pattern of the area No after the execution of the Project:
  - a) Regional
  - b) Project Area
- Present Townships / Villages within 10 km radius of the Project:

Acaden, Amarpura, Paroli, Gorbad, kano, Kotraj, Dhankara

# Government of India Ministry of Jal Shakti Department of Water Resources, River Development and Ganga Rejuvenation Central Ground Water Authority (CGWA) Application for Issue of NOC to Abstract Ground Water (NOCAP)

### Application for Renewal of NOC to Dewater Ground Water for Mining Industry (Application for Renewal of NOC)

	40	er or the same	AVVIII
Application	Number	: 21-4/2/R	J/MiN/2004

to the second second			
Annierd	For	Densuiral + 4th.	
AUDITEU	FUL	Renewal: 4th	

Ap;	plied For R	enewal : 41	n							
11.	Whether to	ne Groundwa	ater Table	will be Inte	rsected by	Activity :-			Yes	
	(a) At W	hat Depth (m	bgf)				Pre-mo	onsoon	Post-m	onsoon
	Minin	num (m bgl)	200					7.83		3.68
	Maxin	oxum (m bgf)						22,88		16.95
	(b) Maxin	num Depth P	roposed t	o Dewater	(m bgf)		25.00			
	(c) Groun	nchvater Flov	v Direction	(Attach M	(\$)(ap)		West to Eas			
	(d) Any C	Other Informs	ation		0000		Nil			
12.	Total Wate	er Requirmen	t for vario	us Purpos	e to be Men	tioned	Existing (makery)	Additional (mS/day)	Existing (m3/year)	Additional (m3/year)
	Ground W	ater Require	d through	Abstract S	tructure		11700.00		4270500,00	
	Seepage	ater Abstract		ount of De	valering f I	lining	0.00		0.00	
		and Water Wi					11700.00	0	4270500,00	D
13.		De-Watering								
	(a) De-W	atering Exist	ing Struct	ure						
	Number of	Existing Str	uctures:			6				
	3No.	Type of Structure Name / Year of	Depth (Meter)/ Diameter (mm)	Depth to Water Level	Discharge (mS/Hour)	Operational Hours/Day) / Days (Year)		Horse Power of Pump	Whether fitted with Water	Whether Permission Registered with CGWA
		Construction		(Veters below Ground Level)		6	5000000	5,000	Meter	At so Details Thereof
		Dugwet / 1991	20.00 <i>l</i> 5000	3.20	553.00	20/385	Submersion e Pump	100.00		Yes/Yes/ Ref. Letter No.21-4 (2/WRCG WA2005- 1205 cated 08/07/2013
	2	50rewet / 1991	110.007	23.00	130.00	1/1	Submersibi e Pump	70.00		Yes / Yes / Ref: Letter No.21-4 (2)/VR CG WA2005- 1205 dated 08/07/2015
	3	Borevet / 1991	110.00/ 200	23.00	150.00	1/1	Submerbible Pump	70.00		Yes I Yes I Reit Leber No.21-4 (2] NR CG WA 2005- 1205 diced 08 02/2015

04/07/2024 05:11 PM

Page 3 of 9

03/07/2015

# Government of India Ministry of Jal Shakdi Department of Water Resources, River Development and Ganga Rejuvenation Central Ground Water Authority (CGWA) Application for Issue of NOC to Abstract Ground Water (NOCAP)

### Application for Renewal of NOC to Dewater Ground Water for Mining Industry

			(Appli	cation for	Renewal o	of NOC)			*
Applica	tion Number ; 21-	-4/2/RJ/MI	N/2004						
Applied	For Renewal : 41	h							
	4 Borevel / 1991	110.00 / 200	23.00	130.00	21/1	Submersiol e Pump	70.00	) Yes	Yes / Yes / Ref: Letter No.21-4 (2)/VR/CG WA 2005- 1205 Gitled 03/07/2013
	5 Borevel / 199*	23.00 <i>i</i> 200	23.00	125.00		Submersible Pump	70.00	) Ye	YES / YES / Ret: Letter No.21-4 (2)(VR.CG WA2005- 1205 C&20 03:07/2013
	6 Borevel / 1991	110.00 <i>f</i> 200	25.00	125.00	11/1	Submersion e Pung	70.00	) Yes	Yes / Yes / Rel: Lepter No.21-4 (2)/VRCG WA2005- 1205 dated 03/07/2013
	De-Watering Requ		d Addition						
Nut	nber of Proposed S	aructures:		AND THE RESERVE	0			ACAMERICA	
	She. Type of Structure Name / Year of Construction	(mm)	Depth to Water Level (Meters below Ground Level)		Operational Hours/Day// Days/Year)	Mode of Lin Name	Power of Purro	Whether fitted with Water Meter	Whether Permission Registered with CGWACS SO Details Thereof
14. Det	ails of Utilization o	Pumped 1	Mater (Ple	ase Altach I	Details)(m3/)	(\$) (\$)			
(a)	Water Supply		Yes			200000000000000000000000000000000000000	Mining and S well as done along with C	esticiand of	n operations as see crinking
(p)	Agriculture		100						
(c)		3000	.00						
0.0	Suppression of D	ust	No						
200	Recharge		10	dance to leas			68		
	Any Other Rem	Miles of Physics		lance is inco	do see our	····			
	nitoring of Ground Location Details				ite. Atach	ed		27	
	Longitude, Reduc	ed Level)							
232	Number of Wells			527 ORG 1100	12				
(c)	Attach Details of Piezometers( At U	GNV Level ( Least for Ci	oe Year X	ation Wells / \$)	Attach	90			ž.
(d)	General Quality o	f GW In the	A183 & S	urrounding	(\$) Amach	ed .			2

04/07/2024 05:11 PM

Page 4 of 9

## Department of Water Resources, River Development and Ganga Rejuvenation Central Ground Water Authority (CGWA) Application for Issue of NOC to Abstract Ground Water (NOCAP)

#### Application for Renewal of NOC to Dewater Ground Water for Mining Industry (Application for Renewal of NOC)

Application Rumber: 21-4/2/RJ/MIN/2004

Applied For Renewal: 4th

(e) Any Other item

18

- Give the details of change in groundwater regime and quality after execution of the project (Attach detailed report with Map showing GW flow direction(\$))
   Attached
- 17. Proposed Pump / Pumping Groundwater Outside the Mine Pit for Domestic or Other Use (H so, give Details):

Number of	Existing Str.	ctures:			0				
Stio.	Type of Structure Name / Year of Constructio	Depth (Meter) / Diameter (mni)	Depth to V/ater Level (Meters below Ground Level)	Discharge (m3/Hour)	Operation all Hours (Day) I Days (Year)	Mode of Lift Name	Horse Power of Pump	Whether fitted with Water Meter	Whether Permission Registered with CGWA/H So Details Thereof
Number of	Additional S	tructures:			0				
SNo.	Type of Structure Name / Year of Constructio	Depth (Meter) / Diameter (mm)	Depth to Water Level (Meters below Ground Level)	Discharge (m3/Hour)	Operation all Hours (Day) / Days (Year)	Mode of Lift Name	Horse Power of Pump	Whether fitted with Water Meter	Whether Permissio 0 Registered with CGWANI SO Details Thereor

#### 18. (a). Compliance to the Condition prescribed in the NOC

SNo.	Conditions given in NOC	Compliance Conditions Applicable	Status of Compliance
1	Area Specific Plantation	Not Applicable	As per CTO/EO/trine plan plantation has been ensured.
2	Correctic Water School Sanitation	Not Applicable	
3	Groundwater cuality monitoring - Pre- monsoon and Post monsoon	Yes	The groundwater (GW) quality monitoring was conducted during both pre-monsoon and post-monsoon periods to analyze the changes in water quality parameters.
3	Maintenance of recharge structures	Yes	Maintaining village ponds and recharge sharts in 64 villages for sustainable water management and groundwater recharge.
5	Number of Picorneters as per NOC and Water Level Record	Yes	There are two piecousis. One is with DVLR and other is with DVLR with life theby.
6	Number of Tuberrells Screweles as per NOC	YE	There are 6 no. of tuberrel's (GW abstraction structure) as per NOC.
7	Pipometer fitted with AWLPs with telemetry as per NOC	Yes	One piecometer is filled with DMLR with leiemetry.

04/07/2024 05:11 PM

Page 5 of 9

#### Department of Water Resources, River Development and Ganga Rejuvenation Central Ground Water Authority (CGWA) Application for Issue of NOC to Abstract Ground Water (NOCAP)

Application for Renewal of NOC to Dewater Ground Water for Mining Industry (Application for Renewal of NOC)

Application Number: 21-4/2/RJ/MWI/2004

Applied	For	Renewal	: 4th
---------	-----	---------	-------

	2000 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		
8	Ovartum of Groundwater as per NOC	Yes	Ovantum of Groundwater as per NOC 11700 (4LD.
9	Recharge through ponds	Yes	recharged 8.72 MCM
10	Recycle and reuse of water	Yes	Taking carn water is recycled back to the beneficiation plant and reused. Domestic visuse reach bested in STPs and reused in prantation horizoiture.
11	RMH and AR studiures implemented	Yes	RWH and AR structures impremented and maintained.
12	Submission of Comprance report to the Region	Yes	self compliance and self inspection report submitted online.
13	Water conservation measures	Yes	Water conservation measures are taken regular basis.
14	Water Security Plan of villages	Not Applicable	55.
15	Well provitored around the plant premises	res	12 piezoksywels are monitored monthly basis.
15	Wells ficed with water meter and its Record	res	Wess fitted with telemetry.

(b), Compliance to the Condition prescribed in the NOC - Other

ENa. Con

Conditions given in NOC

Status of Compliance

No Record Found

19. Gainful utilaization of pump water:-

Utilizzaion et pumpea water is discussed in CHR.

20. Details of Brainwater Harvesting and Artificial Recharge Weapures for Groundwater Recharge in the Areas-

Report Attached

#### MINING USE- Self Declaration

In nereby certify that the data and information furnished above are true to the best of my knowledge and befel and I am aware that if any part of the data / information submitted is found to be false of misleading at any stage, the application will be rejected outright.

I hereby declare that all the mandatory documents prescribed in the application form have been uploaded and no blank little evant documents have been uploaded. I am also aware that any laise/ wrong submission /uploading of document will lead to rejection of my application without any notice.

It is to certly that no case related to ground water withdrawall contamination is pending against the industry/ project/ unit as on date. Any such case (sed against the company) project/ unit in respect of ground water withdrawall contamination during the pendency of this application shall be immediately brought to the notice of CGNA.

I hereby uncertake that in case any environmental compensation/ penalty is imposed on the firm by any statutory authority. I shall comply with the decision of such authority.

- Application Proforms is subject to modification from time to time.
- Application is submitted online on website http://ogwa-noo.gov.in to following office.

Regional Director.Central Ground Water Board Western Region, 6-A, Jhalana Doongri, JAIPUR, RAJASTHAN, 302004

04/07/2024 05:11 PM

Page 6 of 9

#### Department of Water Resources, River Development and Ganga Rejuvenation Central Ground Water Authority (CGWA)

Application for Issue of NOC to Abstract Ground Water (NOCAP)

#### Application for Renewal of NOC to Dewater Ground Water for Mining Industry (Application for Renewal of NOC)

Application Number: 21-4/2/RJ/MRI/2004

Applied For Renewal: 4th

Incomplete application will be summarily rejected.

Scanned copy of last page of application with signature and seal should be attached at prescribed place before submission of application.

4. Redigit of Processing Fee of As. 5000,004. (Ausees Fire Trousand Only) submitted through NDN TAX REGERT PORTAL. (https://bharat.esh.gov.in) should be attached along with hard copy of application.

Processing Fee:-

Bharat Kosh Transaction

2606240039433

Pet. 740:-

Bharat Kosh Transaction

28/03/2024

110

Note: The Processing Fee is Non-Refundable. Applicant should ensure and Check Eligibility of Submission of Application and Required Documents before Submitting Online Application.

5 Hard copy of application required:

6 Ground Water Qualty

No: Define

Ground Water Charge

Net Deine

Approved

Ground Water Charge No Required:

Ground Water Charge American

Receive:

Ground Water Areas

Amount.

#### Attached Files:

Ground Water flow Direction Map: (Refer:11-C)

SNo

Attachment Name

File Name

GW\_Flow\_Map 1

GNY Flow Map.dock

2). GW Level of Observation Wells / Piezometer: (Refer:15-C)

S.No

Attachment Name

Fire Name

1 GW Level Pleasands GW Level Plecovellocox

General Quality of Ground Water in the Area : (Refer: 17-D).

5.140

Attachment Name

File Name

GW\_Cuality 1

GW\_Oualty.por

4), Changes in Topography . (Refer. 6)

SNO

Attachment Hame

File Name

Change in Topography

Change in Topography.oocx

5). Changes in Drainage Pattern: (Refer: 9)

SNO

Attachment Name

File Name

Change in Drainage 1

Change in Drainage.dock

Reason for Not Applying for Renewal before Expiring NOC: (Refer: 5)

04/07/2024 05:11 PM

Page 7 of 9

#### Department of Water Resources, River Development and Ganga Rejuvenation Central Ground Water Authority (CGWA) Application for Issue of NOC to Abstract Ground Water (NOCAP).

(Application for Renewal of NOC)

Application for Renewal of NOC to Dewater Ground Water for Mining Industry

Application Number : 21-4/2/RJ/MIN/2004

Applied For Renewal : 4th

No Attachment Found:

7). Existing NOC: (Refer. 5) S.No Attachment Name File Name 11700 NOC 11700 NOC par 1 Compliance to the Condition prescribed in the NOC: (Refer: 17-a) Conditions given in NOC Attachments S.No. Attachment Name File Name No Ataonment Found! Area Specific Plantation No Attachment Found! 2 Domestic Water School Sanitation 3 Groundwater quality monitoring - Pre No Attachment Found: monsoon and Post monsoon 4 Maintenance of recharge structures. No Attachment Found: 5 Number of Pizometers as per NOC No Ataonment Pound; and Water Level Record 8 Number of Tuberiells Borewales as No Ataonment Found: per NOC 7 Pizometer fibed with AWLAs with No Attachment Found: telemetrry as per NOC No Attachment Found. 8 Ocartum of Groundwater as per NOC No Attachment Founds 9 Recharge through ponds No Attachment Found! 10 Recycle and reuse of water 11 RIVH and AR structures implemented No Attachment Found! 12 Submission of Compliance report to No Attachment Found! the Regon No Attachment Found! 13 Water conservation measures. No Atachment Founds 14 Water Security Plan of villages No Attachment Found 15 Well monitored around the plant. premises Wells fixed with water meter and its. No Attachment Pound: Record Compliance to the Condition prescribed in the NOC - Other: (Refer: 17-b) Conditions given in NOC Attachments File Name S.No. Attachment Name 10), Extra Attachment :

04/07/2024 05:11 PM

Page & of 9

# Government of India Ministry of Jal Shakti Department of Water Resources, River Development and Ganga Rejuvenation Central Ground Water Authority (CGWA) Application for Issue of NOC to Abstract Ground Water (NOCAP)

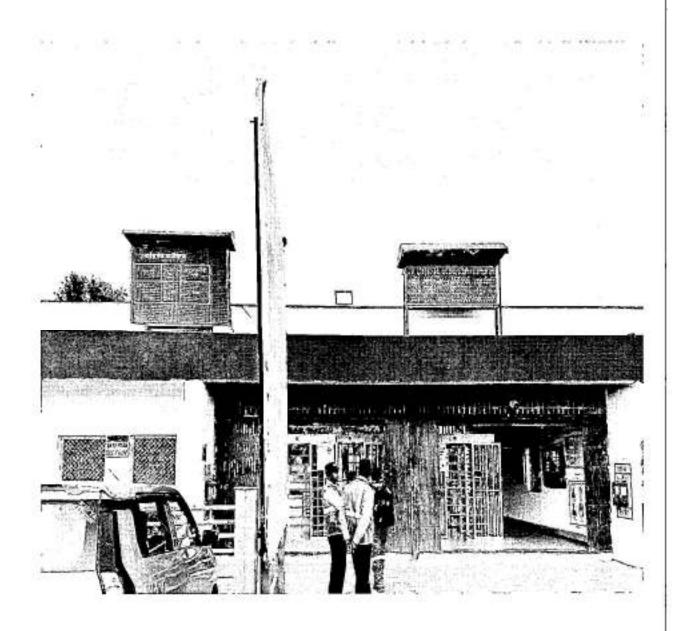
#### Application for Renewal of NOC to Dewater Ground Water for Mining Industry (Application for Renewal of NOC)

Application Number: 21-4/2/RJ/MRI/2004

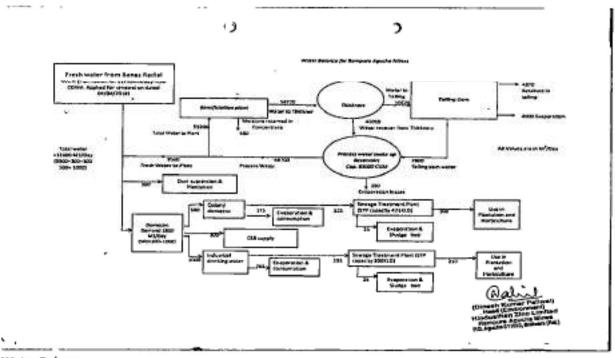
Applied For Renewal: 4th

ppnea For He	newal . 4th				
5.No	Attachment Name		File Name		
1	Set_Compliance_Filed	Self_Compliance_Filed.pdf		* ******	
1 2	Self_Inspection_Fited	'self_inspection_Filed.pdf	31.		200
3	Piezo Keywells	Piezo & Keywels.pdf			
4	CTE_CTO_Merged	CTE_CTO_Mergec.pdf	B		
5	STP_Afficient	STP_ARidavit.pci	25) 50		1988 - SI
11). Bharat	Kosh Reciept (Porcessing Fee):	****			/OK
5.No	Attachment Name		File Name		75.00
1	Renewal fees_Banas_26_06_2024	Peneval fees Banas 26 0	6 2024.001	40	41.00
12), Applica	tion with Signature and Seal:	5.4 5.5		7.5	
S.No	Attachment Name		File Name		-
1	Application_Seal_Signed_Aumorisation Letter	Application_Seal_signed_A		etter.pdf	
13), MSME	pertificate in case of MSME:	* *	305	10.00	
	hment Found!				
-					
Date :			Name & Sign		
Place :				(Man of	iciai sear)
Associated	User: HZLRA2021				
Submitted I	By User: HZLRA2021				
Submission	Date: 04/07/2024				
* In case si enclosed.	gned by any authorized signatory, tr	e details of the signatory w	in the author	ization shal	i be

#### Annexure-XXVI

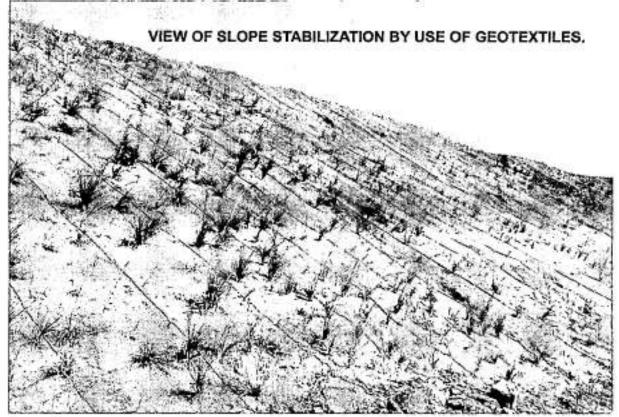


#### Annexure-XXVII



Water Balance

Annexure XXVIII



Geotextiles

106





Mine code: 270020

REMINENTECT 18120241 2147- 2148, 2149

Dated, 30/01/2014

Ta

E. The Director Designed of Maries Selecty
Office of DGMS
Service Road
GHANDAO
JHARAHAND
PRES 926001

Z. The Dy. Divector General of Mines Safety, NW Zone Haran Magni Sector-5, The hardrotra Main Road, Udaipur 313002 (Rajj

3. The Director of Mines Safety Differ of DCAIS Anabagus Juli Road AJAILR Report 1, RAJASTHAN Fir 305001

Sub-Submission of Annual Return in Form "1" for the year 2023

50

Please find enclosed the Annual Return Form "1" for the year encing 31". December- 2023, in respect of Rempura Agustia tead and Zinc Underground Mine of Hindustan Zinc Limited.

Englosed sulabove

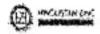
Thanking you

Sincerely yours

Sachin M. Deshmukh

M'ne Manager

Rampura Agustia Lead Zinc Underground Mine | Hindustan Zinc Umited



(FORM - T)

[See Rule 257 (I)]

Annual Return for the year ending on the 31" December - 2023

1. Name of Pines

ż

Ramoura Aguena Lead and Zinc-

Underground Mine.

2. Postal address of Hines

NS Hordustan Zook Emites.

Ramp is Agicha Mines

P.O Agucha

0 st. Bhisara ( 9A1 ) Rd 311022

3. Cate of opening of Pine

15 0: 2010

4. Date of desiry ( ficosed)

Not applicable

5. Stutton of Many (District/State)

Bhilwara/Rajasthan

6. Name of Owner, Posta address

5h. Arun Hista

CtO & Whole one Orestor Hindustan Zirk Limited Yashad Bhawan, HDAIFUR 317004

Aumber of sersor medically examined:

Type Et ME	Number of pers Medically examin		humber of persons Medically examined outing 2023		
	own	CONT	Own	COVIT	
\$ME	As per s	ec premere	0	458	
PRAE	162	1125	167	1125	

8 Number of persons declared

Medically unfit

hl.

 Catogoribat on of the persons Demand and:

MIL

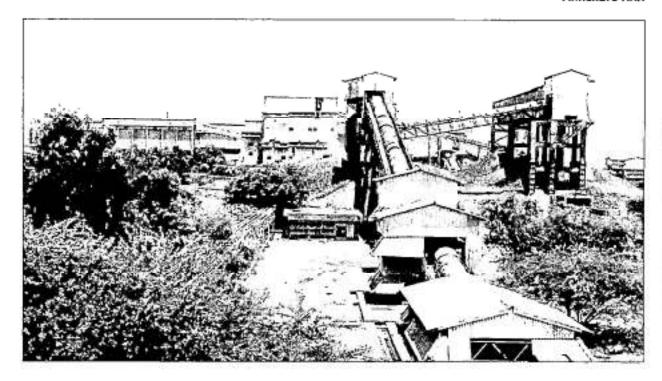
Certified that the information has been olven above, is correct to the best of my knowledge.

Date 30/01/2324

5 gnature ...

Ne're : Sagn'n M Deshmoch Designation: "Mine Manager"

#### Annexure-XXX



Covered conveyer belt



transforming elements HZL/RAM/ENV/2020-21/7 2 3



Dated: 28.08.2020

To. The Director, Ministry of Environment Forest and Climate Change, Regional Office (Central Region), Kendriya Bhawan, 5th Floor, Sector "11", Aligani, Lucknow - 226024

Subject: Submission of study report in in compliance of the EC amendment No: J-11015/267/2008-IA.H(M) dated 28.02.2020 of M/s Hindustan Zinc Limited in the mine lease area of 1200 Ha located in village Agucha, Tehsil Hurda, District Bhilwara, Rajasthan.

Sir.

Additional specific condition No. 3 in the above mentioned amendment letter is read as below:

"PP shall engage suitable agency for conducting subsidence study for increasing the depth of working from 1000mbgl to 1500mbgl. The report shall be submitted to Ministry within 6 months,"

In compliance of this condition, study has been conducted by Central Institute for Mining & Fuel Research (CSIR-CIMFR). Copy of the study report "Numerical Modelling Studies for Subsidence Prediction at Rampura Agueha Mine, HZI," is attached herewith for perusal please.

Thanking You.

Yours faithfully,

Director, Anucha SBJ umecror, Amuera 564 Hindustan Ziste Limited Rempura Aguelia Line PO- Aguelia Disti. - Uniferera (Raj.)

The Member Secretary, CC:

IA - Division (Non-Coal Mining)

Vaya Block, 3rd Floor, Indira Paryavaran Bhawan, Ministry of Environment, Forest & Climate Change

Jorbagh Road, New Delhi-110003.

Hindustan Zinc Limited

Rampure Agucha Mines, P.O. Agucha, Dist. Bhilisara (Rajosthan) - 311 822 M +91-9031294956-57, F +91-1483 229012 www.hzlindia.com

Registered Office : Yeshed Shakran, Udnigar (Rayasthan) 513 GSc ON No. L27204R31966PLESB1203

Olc- Ew.



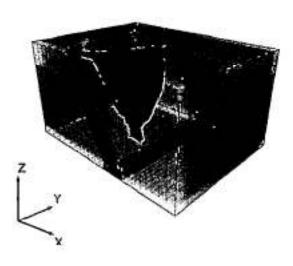


CENTRAL INSTITUTE OF MINING & FUEL RESEARCH
(Council of Scientific & Industrial Research)
Barwa Road, Dhanbad – 828 001, Jharkhand
Nagpur Research Center, Unit-1
17/C, Telenkhedi Area, Civil Line, Nagpur 440001, Maharashtra

Report on

Numerical Modelling Studies for Subsidence Prediction at Rampura Agucha Mine, HZL

PO No.: 2353084587 / 5100027984 Date:07.04.2020



Proj. No. SSP/N/493/2020-2021

July - 2020

Subsidence study report cover page



Rajasthan State Pollution Control Board
4, Institutional Area, Jihalana Doongari, Jaipur-302 004
Phone: 0141-5159600,5159695Fax: 0141-5159697
website: www.rpcb.nic.in
Registered

File No F(Mines)/Bhilwara(Hurda)/1(1)/2009-2010/ 47-92

Order No 2009-2010/Mines/401

Date: 21/1/2010

Mis Hindustan Zinc Limited (Rampura Agucha Mine), P.O.- Agucha, Bhitwara, District :Bhitwara

Sub: Grant of Consent to Establish under section 21(4) of Air (Prevention & Control of Pollution) Act, 1981 and under section 25/26 of Water (Prevention & Control of Pollution) Act, 1974 for your Major Mineral Mine at near Village-Agucha, Tehsil-Hurda District- Bhilwara (M.L.No.-1/2000).

Ref: (i) Your applications dated 22/11/2009

(ii) Received on 27/11/2009

Sir,

In view of the details submitted vide your above referred applications/ documents, the Consent to Establish under section 21(4) of Air (Prevention & Control of Pollution) Act, 1981 and under section 25/26 of Water (Prevention & Control of Pollution) Act, 1974 is hereby granted for carrying mining activities. This consent is subject to the following stipulations:-

- 1 That this consent is being granted in favour of M/s. Hindustan Zinc Limited, a Mine of Major Mineral having M.L.No.-1/2000 in an area measuring 1200 Hectares at/near Village-Agucha , Tehsil-Hurda, District-Bhilwara.
- 2 That this consent is valid for a period from 18/01/2010 to 17/01/2013, or commencement of production whichever is earlier.
- 3 That this consent is valid for following mining activities :-

Minoral	Permitted Mining Capacity
1 LEAD ZINC ORE MINING	6.150 MILLION TONNES PER ANNUM
2 BENEFICIATION PLANT FOR LEAD -ZINC ORE	6.500 MILLION TONNES PER ANNUM

4 That you shall achieve following standards in ambient air in mine area / mining

Pollutant	Standards for Ambient Air	Standards for mining activity		
SPM .	600 µg/M³	SPM = 600 µg/M <sup>3</sup>		
-80x2	120 µg/M²	(To be measured between 3		
NOx	120 µg/M*	to 10 meters from mining		
со	5000 µg/M²	activity)		



# Rajasthan State Pollution Control Board 4, Institutional Area, Jhalana Doongari, Jaipur-302 004 Phone: 0141-5150800,6150806Fax: 0141-5150807 website; www.rpcb.nic.in

Registered

File No F(Mines)/Bhilwara(Hurda)/1(1)/2009-2010/

Order No 2009-2010/Mines/401

Date:

- 5 That the Mining unit shall maintain zero discharge status of waste water from the premises. No trade effluent shall be discharged inside/outside mine premises.
- 6 That the occupier/operator of mine shall ensure that all the conditions imposed in the Environmental Clearance granted by the Ministry of Environment & Forests, Government of India., vide letter No J-11015/267/2008-IA.II (M) dated 11/12/2009 shall be strictly complied with.
- 7 That the occupier/operator of mine shall ensure that all the conditions imposed in the permission of Central Ground Water Authority granted vide its letter No 21-4(2)/WR/CGWA/2008-632 & 21-4(2)/WR/CGWA/05-417 dated 06/08/2008 & 13/05/2008 shall be strictly complied.
- 8 That you shall not operate the mine without obtaining Consent to Operate from the
- 9 That this Consent to Establish is for mining of product as mentioned above in M.L.No.-1/2000 and a separate Consent to Establish is required to be taken for Mineral Separation Plant/process if any and for any addition/ modification/ alteration or change in process.
- 10 That the lessee shall develop plantation in atleast 33% of the total lease area to maintain ambient air quality around the mine and the Action Plan for plantation submitted by you, shall be implemented.
- 11 That you will implement all the pollution control measures as per EIA/EMP Report.
- 12 That the top soil shall be stored at earmarked site only shall be utilized for plantation on reclaimed OB dumps.
- 13 The ovrburden generated during mining shall be stacked at earmarked site as per Approved Mining Plan & as per recommendations of Central Institute of Mining & Fuel Research, Dhanbad. The over burden dump shall be reclaimed by plantation of suitable native plant species.
- 14 Catch drains/ Siltations ponds of appropriate size shall be constructed to arrest silt and sediments flows from mine pits & overburden dumps. Garland drains of adequate size, properly designed shall be constructed arround the mine pit & dump yard. Garland drain should be provided with siltation pond.
- 15 Regular monitoring of subsidence, vibration shall be carried out & if any subsidences is observed appropriate measures be undertaken to avoid any loss of life and material and be reported to Board.
- 16 That the HZL shall carryout conditioning of mined ore with water to mitigate fugitive dust emission.
- 17 That Ore Beneficiation plant effluent shall be treated upto prescribed standards & tailing sturry shall be transported in close pipe line to talling dam.
- 18 That all other general conditions (1 to 21) enclosed as Annexure shall be strictly complied with.



# Rajasthan State Pollution Control Board 4, Institutional Area, Jhalana Doongari, Jaipur-302 004 Phone: 0141-5159600,5159695Fax: 0141-5159697 website: www.rpcb.nic.in

Registered

File No F(Minos)/Bhilwara(Hurda)/1(1)/2009-2010/

Order No 2009-2010/Mines/401

Dates

19 That this Consent is subject to the conditions as stated above and general conditions as stated in Annexure. Further, the mining unit will comply with the provisions of the Air (Prevention & Control of Pollution) Act, 1981 & Water (Prevention & Control of Pollution) Act, 1974 and any such conditions as may be openified from time to time by the State Board under the provisions of the aforesaid Acts.

This bears approval of the competent authority.

Encl: As Above

Yours Sincerely

Group Incharge-Mines

Copy To:-

1 Director, Department of Mines & Geology, Government of Rajasthan, Udeipur...

 Mining Engineer, Department of Mines & Geology, Government of Rajasthan, Bhilwara.

3 Regional Officer, Regional Office, Ratesthan State Pollution Control Board, Bhilwara- please ensure compliance of Consent Conditions.

4 Master File, Consent to Establish, Group Mine, Rajasthan State Pollution Control Board, Jaipur.

Group Incharge-Mines



### राजस्थान राज्य प्रदूषण नियन्त्रण मण्डल RAJASTHAN STATE POLLUTION CONTROL BOARD

Annexure

#### Consent to Establish under Air & Water Acts - Mining Units

#### General Conditions:-

- That this consent shall be subject to the condition that you shall operate the mining activities in the area as per the mining right allowed by the Mining Department in the Mining Lease only.
- That this consent shall be subject to the directions/orders passed in various busing/tinvironment related Wint Petitions by Hon'ble High Court and the Hon'ble Supreme Court.
- That you shall provide the necessary infrastructure facilities including equipment for the monitoring of ambient air in accordance with the directions given to you by the Pollution Control Board's officials from time to time.
- 4. That Mining Unit shall undertake the phased restoration, reclamation and rehabilitation of lands as per established practices & procedures (provisions of Mine Closure Plan in case of Major Minerals) affected by prospecting or mining operations and shall complete this work before the conclusion of such operations and the abundonment of prospects or mines.
- That overburden shall be stored in a systematic manner that it does not obstruct the natural drainage pattern of the area. It may be used for back filling. The land shall be identified for disposal of overburden at environmentally compatible site.
- That Mining unit shall strictly comply with the Mining Plan and Eco Priendly Mining Plan as submitted to & approved by the competent authority. (Eco Friendly Mining Plan for Minor Mineral & mining plan for Major minerals & marble, Granite Mines).
- That the water spray and sprinkling system so installed should always be maintained in order to utilize the same for dust suppression.
- That the domestic effluent if any, shall be treated and disposed of with properly designed septic tank followed by soak pit as per prescribed standard.
- That Air Emissions shall conform to the standards prescribed under the Environment (Protection) Act, 1986.
- That noise level shall be kept as detailed below and under no circumstances, it shall exceed the prescribed limit:-

a. Day time

(6.0 AM to 9.0 PM)

- 75 dB A (leq)

b. Night time

(9.0 PM to 6.0 AM)

- 65 dB A (leg)

 That this consent should not be treated as NOC or approval for mining in forest area, if any, falling in the lease and relevant permission under provisions of the Forest (Conservation) Act, 1980 shall be obtained from the competent authority.

4, इन्स्टीट्यूशनल एरिया, झालाना ढुंगरी, जवपुर

4, Institutional Area, Jhalana Doongri, Jaipur

Phone: 2709980, 2705731, 2707285 PBX 2711263, 2711329, 2711831, 2707938

Fnx: 2710647, 2709980, 2704578

- 12. That for Diesel Generator Set, acoustic enclosure/acoustic treatment shall be provided to meet the prescribed norms w.r.t. noise as per the Gazette Notification of Ministry of Environment & Forests dated 02.01.99. Adequate stack height with D.G. Sets shall also be provided and maintained. Noise from the Diesel Generator Sets shall be controlled by providing an acoustic enclosure or by treating the room acoustically. The acoustic enclosure/acoustic treatment of room should be designed for minimum 25 dB (A) Insertion Loss or for meeting the ambient noise standards, whichever is on the higher. The measurement for Insertion Loss may be done at different points at 0.5 metre from the acoustic enclosure/soom and then averaged. The Diesel Generator Sets should also be provided with proper exhausts muffler with Insertion Loss of minimum 25 dB (A). The stack height for the Diesel Generator Sets shall be as notified under the EP Act, 1986.
- That the Industry shalt compty with provisions of the Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 and the Hazardous Waste (Management & Handling) Rules, 1989 and related amendments, as applicable.
- That this consent is valid, subject to falfillment of all the other statutory requirements in other Law/Acts/Rules as applicable.
- That the industry shall submit quarterly compliance of all the above stated conditions to this office.
- That the unit shall submit Water Cess returns in case the water consumption is more than 10 KLD under provisions of the Water (Prevention & Control of Pollution) Cess Act, 1977 and as amended from time to time.
- 17. That notwithstanding anything contained in this letter of consent, the State Board hereby reserves to it, the right and power under section 21(6) of the Air (Prevention & Control of Pollution) Act, 1981 & under section 27(2) of the Water (Prevention & Control of Pollution) Act, 1974 to review anyone/or all the conditions imposed herein-above and to make such variations as deemed fit for the purpose of Air Act & Water Act.
- That this consent, under no circumstances, be construed as conferment of any property or any interest in the lease area. It is only confined for the purpose of regulation of provisions of the Air Act & Water Act.
- That any incorrect information submitted in the consent application form shall make the industry liable for legal action under section 38 of the Air Act & under section43of the Water Act.
- That in case of failure to comply with any of the consent conditions stated as above, the consent issued to the industry shall automatically stand revoked without any notice.
- That this Consent will not exempt you from any legal action for the past violations, if any, of the Act/Rules/Notifications/Circulars etc.

(Group Incharge-Mines)



#### Rajasthan State Pollution Control Board 4. Institutional Area, shalana Deengan, Ja pur-302 004 Phone 0141-5159600,5159695Fax 0141-5159697 website www.rpcb.nic.in

Website Www rpcb nic w Revised Consent

File No F; Minus | Bhirwara (Hurda) 21 11/2009-2010/3032-3026

Order No. 2011-2012/Mines-1149

Date: 01:09/2011

Atts Mindustan Zinc Limited

(Ramoura Aguena Wine), P.O. Aguena, Bhitmata,

District Bhilwara

Sith Grant of Connent to Establish under section 28(4) of Az (Prevention A Conto' of Pollution). Act 1981 and under section 25/26 or Wate (Prevention & Conto) of Pollution). Act 1974 for your Major Mineral Mine at one: Village-Agucha Tehsi-Hurda District Bhitward (M.L. No-1/2000 ).

Ref. (n Your popried cases pared (27/11/2009) not Rock (no on 27/11/2009)

23.9

In year of the ontal's submitted vide your above referred approximate independent to Establish under section 21(4) of Air (Prevention & Control of Polician) Act 1981 and under section 29/28 of Water (Prevention & Control of Polician) 1973 is neverly granted for earlying mining activities. This consont is subject to the religious operations.

- 1 That this consent is being granted in favour of Mis. Hindustan Zinc Limited, if Mino of Major Mineral halving M.L.No. 1/2000 in an area measuring 1200,0000 Hectares atmost Viruge-Agueha , "ehsil-Hurda Dishot-Bhilwara."
- 2 That this current is said for a period from 18/01/2010 to 17/01/2013, or commoncement of production whichever is earlier.
- 3. That this consent is valid for following in rung activities .-

Mangral	Permitted Mining Capacit,
T LEAD ENGINE ORE MINING	6 1500 MILION TONNES PER .
2 BENEF STATION PLANT FOR LEAD - ZHIC DRF	6 5000 MAJON TONNES PER I ANNUM



# Rajasthan State Pollution Control Board 4 Institutions: Area, Uhalana Doorgan, Japur-302 004 Phone 0141-5159600.5159695Fax 0141-5159697 website www.feco.bs.in

Remses Consert

File No Fillines (Bhilwara) Hurday 1-192009-2010/3072-3076

Order No. 2011-2012-Mines 1149

Dale 01-09/2011

4 That you was active tellowing standards in ambient out in minn area I mining activities.

3	Pollutant	Standards for Ambient Air	Standards for mining activity
	SPM	500 pg.W	SPM - 680 HS/M*
144636	50/	The second secon	(To be measured terment) 3
	NO.	126 µg/kt*	so so references on any
EURES DE L	co	2000 hBc///.	adiery)

- That the Mining und shall maintain zoro discharge status of waste value from the promises. No trase of fixent shall be discharged riside outside fixer premises.
- 6 That not occupied operator of name shall ensure that all the conditions improved in the Environmental Creaturge granted by the Ministry of Environment & Forests, Government of India , vido etter No. 3-11015/267/2008-1A is (V) district 11/12/2009 shall be shortly conducted with.
- 7 Term the one-representation of mine shall ensure that all bid conditions inspected in the permission of Central Ground Water Authority granted vise its little No. 21-4(2)/WR/CGWA/05-417 duted 06:08/2008 & 13/05/2008 and the strictly compared.
- 8 Thirt you shall not operate the mine without obtaining Consent to Operate from the States
- 9 Into the Consent to Establish is for mining a processing 7 beneficiation of product as interpreted above in ML No.-1/2000 and a separate Consent to Establish is estumes to be paramete for any other Mineral mining processing consent about Phintipiposes it any and for any addition modification, alteration or charge in the first.
- 10 That you will implement all the pollution control measures as per EMPEMP Report.
- 11 That the top soil shall be stored at earmarked site only shall be utilized for plantation on reclaimed OB dumps.
- 12 Catch drains! Sitation ponds of appropriate size shall be constructed to arrest siit and sediments flows from mine pits & overburden dumps Garland drains of adequate size, properly designed shall be constructed arround the mine pit & dump yard Garland drain should be provided with sitiation pond
- 13 Regular monitoring of subsidence, vibration shall be carried out & if any subsidences is observed appropriate measures be undertaken to avoid any loss of life and material and be reported to Board.



#### Rajasthan State Poliution Control Board 4. Institutional Aren, Japana Doongari, Japan-302 004 Phone 0141-5159600,5159695Fa.c 0141-5159607

website: www.rpcb.nc.in Revised Consent

File No FIVines y Bhilwara (Norda y 111 ) 2209-2010/3922-3920

Order No 2011-2012/Mines/1149

Date: 01/09/2011

- 14 That Ore Beneficiation plant effluent shall be treated upto prescribed standards & taking slurry shall be transported in close pipe line to talling dam.
- 15 That the HZL shall carry out conditioning of mined ore with water to mitigate fugitive dust emission.
- 16 The overburden generated during mining shall be stacked at earmarked site as per Approved Mining Plan & as per recommendations of Central Institute of Mining & Fuel Research, Dhanbad The overburden dump shall be reclaimed by plantation of suitable native plant species.
- 1) That the lessee shall develop plantation in atleast 33% of the total lease area to maintain ambient air quality around the mine and the Action Plan for plantation submitted by you, shall be implemented.
  - That in , roused consent letter that supercode the earlier or next letter in FIM.nest@niwara(Hurday)(19/2009-2010/4792-4796 dated 21/01/2019
  - 19 That all other general conditions engosed as Annexure small be sincly committed to the
- 20 final this Consent is subject to the conditions as stated above and general conditions as stated in Annexute. Further this mining unit will comply with the provisors of the Ad (Prevention & Control of Publicant Add 1981 & Water (Prevention & Control of Pollution) Act, 1974 and any such conditions as they be specified from time to time by the State Board under the provisions of the affected Ages.
- 21 That the grant of this Consent to Establish its issued from the environmental angle only and open not absolve the project proponent from the other ctatutory oblights protected under any other taw or any other nature and in force. The soul and complete responsibility to comply with the conditions to down in all other taxts for the transfer of the conditions in force or taxts with the industry. Into project properties.
- 72 that the grant of this Consent to Establish shall not in any way between uffect or jestimize the ega proceedings if any institutes in the part in their north he instituted against you by the State Beard for violation of the hipprocess of the Aut or the Rules made thereunder.

Time bears approval of the competent duthoray

Encl. As Apovo

23

Yours Sincerely

Group Incharge-Mines



Rajasthan State-Pollution Control Board
4. Institutional Area, Jhalena Doongari, Japan-302 804
Phono: 0141-5159600,5159695Fax: 0141-5159697
website: www.rpcb.nic.in
Revised Consent

File No F(\$Nogs) Showara(Hurde)/1(1)/2009-2010/3922-3926

Order No 2011-2017 Ntres/1149

Date: 01/09/2011

#### Copy To .

 Director, Department of Mines & Geology, Government of Rajastrian, Shastn Cross. Udantur

 V.ning Engineer, Department of Mines & Geology, Government of Rajasthan, Bh Nara

Regional Officer, Regional Office, Rajastian State Politican Control Board.
 Enilwara- piesse ensure compliance of Consent Conditions.

4 Master File. Consent to Establish, Group Mine. Rayastran State Pollution Control. Bourd. Japan

Group Incharge-Minos



### Rajasthan State Pollution Control Board

4, Institutional Area, Jhalana Doongari, Jaipur-302004

Ausexure

#### Convent to Establish under Air & Water Acts - Mining Gutts

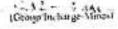
#### General Conditions:

- That this consent shall be subject to the condition that you shall operate the mining sent-stays in the area as per the mining right allowed by the Mining Department in the Mining Leave costs.
- That this consent shall be subject to the direction-kinders massed in surmous oftening travasciument remote Wint Petitions by Hon-Be High Court and the Him-life Supreme Court
- 3 This you shall provide the nacessary infrastructure facilities including equipment for the importanting of andwern are in accordance with the directions given in you by the Pollotion Control Board's citating from time to time.
- 4 That Matting Unit shall independe the placed restoration, reclamation and reliabilitation of leads as per established practices & procedures sportsions of Mine Classica Plan in case of Major Minerals) affected by prospecture or maning operations and shall camplete this work before the conclusion of such operations and the abandonstent of prospects or many.
- 5 This overfunden shall be stored in a systematic manner that it does not obstruct the natural distinger patients of the area. It may be used for back filling. The land shall be identified for disposal of overburden at environmentally composable site.
- 6 Fital the project proponent will stack the top soil separately and will use it for plantagen and reclamation of overburden dumps.
- 7 That Mining unit shall seriedly comply with the Mining Plan and Eco Friendly Mining Plan asvalvanted to & approved by the competent authority, (Eco Friendly Mining Plan for Minin Mining Plan for Major minerals & mirble, Granite Mines).
- B This the water spray and sprinkling system so matalled should always by maintained in indurto willing the same for dust suppression.
- That the domestic efficient if any, shall be treated and dispused of with properly designed reptic tank followed by soak pit is per prescribed standard.
- 10 That Air Entaspins shall conform to the standards prescribed water the Instrumental (Projection) Act. 1986.
- 11 This noise level shall be kept as deniled below and under no circumstances, it shall exceed the prescribed limits.
- 12 That this consent should not be prested as NOC or approved for mining in fevers area, it any falling in the lease and relevant permission under provisions of the Forest (Openers ander Act, 1980) shall be obtained from the competent authority.
- 13 That the Industry shall comply with previous of the Manufacture, Showing and Import of the aridens. Chemicals Rules, 1989 and the Thermitons Waste Allanagement of Handling (Bules, 1989) and related contributions, as applicable.
- That this convent is valid, subject to buildliness of all the other statutory requirements as other Law/Acts/Rules as applicable.

HE BORNER R. BERGROOM OF

P 1.65

- 15. That for Diesel Generator Set, requisite enclosure/acoustic treatment shall be provided to meet the prescribed norms w.r.t. moise as per the Gazette Notalization of Ministry of Envaranment & Israesis dated 02.01.99. Adequate stack height with D.G. Sets shall also be provided and maintained Noise from the Diesel Generator Sets shall be controlled by providing an acoustic exclosure or by treating the norm acoustically. The acoustic enclosure/acoustic excampline reduces of norm should be designed for minimum 25 dB (A) fascinon Lass or low meeting the ambient mass standards, whichever is on the higher. The measurement for Insertion Lars may be alone at different points at 0.5 metre from the acoustic enclosure/norm and then averaged. The Diesel Generator Sets should also be provided with proper exhausts and fler with Insertion Lass of minimum 25 dB (A). The stack height for the Diesel Generator Sets should be as notitied under the EF Act, 1986.
- 16 That the industry shall submit quarterly compliance of all the above stated conditions to this office.
- 17 That the unit shall stalmar Water Cess returns in case the water consumption is more than 10 KLD under provisions of the Water (Prevention & Control of Pollution) Cess Act, 1977 and as 1990 asset (print time to time).
- 18. That notwithstanding anything contained in this letter of consent. the State Brazil hereby reserves to it, the right and power under section 21(5) of the Air (Prevention & Control of Pollution) Act, 1981 & under section 27(2) of the Water (Prevention & Control of Pollution) Act, 1974 to review anytherior all the conditions imposed here-in-above and to make such surfactions as deemed fit for the purpose of Air Act & Water Act.
- 19 That this consent, under no circumstances, be construed as conferment of any property or any microst in the leave area. It is only confined for the purpose of regulation of provisions of the Air Act & Water Act.
- 20 That any uncorrect information subtented in the consent application form shall make the inclusing habite for legal action under section 38 of the Air Act & under section 43 of the Water Act.
- That in case of failure to comply with any of the consent conditions stated as above, the consent assued to the industry shall automatically stand revoked without any notice.
- That this Coaseat will not exempt you from any legal action for the past violations, if any, is the Act/Rules/Notifications/Carculars etc.
- 23. That the Drills shall be operated with water injection system i.e. wet drilling be carried out during mining or the drills shall be operated with dust extractors.
- That Gurland drains, Smilling tanks and check dams of appropriate size, gradient and length shall be constructed around the mineral and overhunder damps to prevent run off or water and flow of sediments.
- 25 That the Project Proposent shall construct Retaining Wall and Salmion Pond of approvedue save around the overburden dumps
- 26 Thes the controlled blasting shall be practiced. The mitigative measures for council of ground vubrations and to arrest By rucks and boulders should be languemented, and permission from the Director General Mine Safety and the Director Explosives.





## Head Office (Mines )

Rajasthan State Pollution Control Board 4, Institutional Area, Jhalana Doongari, Jaipur-302 004 Phone: 0141-2716814,2716813Fax: 0141-2716814



## Registered

File No

F(CPM)/Bhilwara(Hurda)/2(1)/2019-2020/7113-7117

Order No.

2022-2023/Mines/10762

Date:

28/02/2023

Unit 1d :

11,060

M/s Hindustan Zinc Limited

(Rampura Agucha Mine), P.O.- Agucha, Bhliwara,

District :Bhilwara

Sub:

Grant of Consent to Operate under Section 21(4) of Air (Prevention & Control of Pollution) Act, 1981 and under Section 25/26 of Water (Prevention & Control of Pollution) Act, 1974 for your Major Mineral Mine at near Village-Agucha, Tehsil-Hurda, District-Bhilwara (M.L.No-8/1999).

Ref:

(i) Your applications dated 28/10/2022

(ii) Received on 28/10/2022

Sir.

In view of the details submitted vide your above referred applications/ documents, the Consent to Operate under Section 21(4) of Air (Prevention & Control of Pollution) Act, 1981 and under Section 25/26 of Water (Prevention & Control of Pollution) Act, 1974 is hereby granted for carrying mining activities. This consent is subject to the following stipulations:-

- 1 That this consent is being granted in favour of M/s. Hindustan Zinc Limited, a Mine of Major Mineral having M.L.No.- 8/1999 in an area measuring 1200.0000 Hectares at/near Villago-Agucha ,Tebsil-Hurda,District-Bhillwara.
- 2 That this consent is valid for a period from 01/03/2023 to 29/02/2028
- 3 That this consent is valid for following mining activities:-

Mineral	Permitted Mining Capacity	
1 Lead &Zinc Ore Mining	6.1500 MILLION TONNES PER ANNUM	

4 That the project proponent will comply with the Standard as prescribed vide the Ministry of Environment, Forest and Climate Change notification no. GSR 826(E) dated 16th November, 2009 with respect to National Ambient Air Quality standards.

Signature Not Verified
Digitally signed by Khum Chand
Gupta
Date: 2023.02.28-11:11:09 IST
Reason: SativitesHd
Location:



## Head Office (Mines)



Rajasthan State Pollution Control Board 4, Institutional Area, Jhalana Doongari, Jaipur-302 004 Phone: 0141-2716814,2716813Fax: 0141-2716814

#### Registered

File No

F(CPM)/Bhlhvara(Hurda)/2(1)/2019-2020/7113-7117

Order No 2022-2023/Mines/10762

Date: 28/02/2023

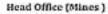
Unit Id :

11,060

- 5 That this consent to establish/consent to operate is only for carrying out mining of mineral/ore and not for any processing/benefication or crushing/grinding of ore/mineral for which a separate application for consent to establish and/or consent to operate should be submitted. The project proponent is required to obtain seprate consent to establish and consent to operate for carrying out mining of other minerals(s), if any or processing/beneficiation of such mineral(s) and for any addition/modification/alteration or change in process.
- 6 That this Consent to Operate is for mining / processing / beneficiation of product as mentioned above in M.L.No.-8/1999 and a separate Consent to Operate is required to be obtained for any other Mineral mining/ processing/ beneficiation any and for any addition/ modification/ alteration or change in process.
- 7 That the occupier/operator of mine shall ensure that all the conditions imposed in the Environmental Clearance granted by the Ministry of Environment, Forestand Climate Changevideletters dated 11/12/2009,22/08/2014,22/12/2014,28/12/2015 and 28/02/2020 are strictly complied with.
- 8 That this consent is valid for production of Lead & Zinc Ore Mining @ 6.15 Million Tonnes per Annum. For any change in product and/or increase in capacity/lease area, the mine has to seek fresh Environmental Clearance, consent to establish & consent to operate.
- 9 That the lease holder shall get the CAAQMS stations configured with the RSPCB OCEMS latest by 30.04.2023, else, Environmental Compensation shall be levied as per norms of RSPCB.
- 10 That plantation shall be developed so as to cover at least 33% of the total land use for mining and allied activities as given in Approved Mining Plan and shall be maintained at all the time to maintain ambient air quality around the mine.
- 11 That the lessee shall submit monitoring report of Ambient Air Quality within the lease area, once in 3 months.
- 12 That the entire water (dewatering in the mine) shall be reused after desilting, for mining operations (drilling etc). No water shall be discharged outside the mining lease area.
- 13 That haul roads should be regularly graded and compacted. Regular water sprinkling should be carried out on haul roads to minimize dust generations.
- 14 That adequate measure shall be taken for control of fugitive emissions from the areas prone to air pollution.

Signature Not Verified Digitally signed by Kham Chand Gupta Date: 2023.02.25 1:11:09 IST Reason: SelfAttested







Rajasthan State Pollution Control Board 4, Institutional Area, Jhalana Doongari, Jaipur-302 004 Phone: 0141-2716814,2716813Fax: 0141-2716814

#### Registered

File No

F(CPM)/Bhilwara(Hurda)/2(1)/2019-2020/7113-7117

Order No.

2022-2023/Mines/10762

Date: 28/02/2023

Unit id :

11.060

- 15 That you shall not operate any stone crusher/mineral grinding/mineral processing plant within said lease without obtaining prior consent of the State Board.
- 16 That this consent to operate shall not be valid, if the lessee has not obtained permissions required, if any, from NBWL/Forest Department etc. with respect to Wild Life Sanctuary /National Parks/ Critical Tiger Habitats compliance of various orders passed by any law/act/rule/regulation or order of MoEF&CC and/or any Court/Tribunal time to time.
- 17 That regular water sprinkling should be carried out in critical areas prone to air pollution and having high levels of SPM and RSPM such as on haul road, loading and unloading points and transfer points.
- 18 That the mine shall not allow making any obstacles to any natural water flow i.e., natural nallah/steam carrying rain water to any water body.
- 19 This the mine shall not allow unauthorized disposal of any solid waste on land inside or outside the premises.
- 20 That this consent to operate shall be subject to compliance of direction/order passed by Courts of Law in the matter,if any.
- 21 That the lessee should dump the overburden in such a manner that it does not get washed away to nearby water tanks and lakes etc. during rainy season.
- 22 This consent shall be subject to validity of mining lease.
- 23 That all other general conditions enclosed as Annexure shall be strictly complied with.
- 24 That this Consent is subject to the conditions as stated above and general conditions as stated in Annexure. Further, the mining unit will comply with the provisions of the Air (Prevention & Control of Pollution) Act, 1981 & Water (Prevention & Control of Pollution) Act, 1974 and any such conditions as may be specified from time to time by the State Board under the provisions of the aforesaid Acts.
- 25 That the grant of this Consent to Operate is issued from the environmental angle only, and does not absolve the project proponent from the other statutory obligations prescribed under any other law or any other instrument in force. The sole and complete responsibility, to comply with the conditions laid down in all other laws for the time-being in force, rests with the industry/ unit/ project proponent.

Signature Not Verified Digitally signed by Khym Chand Gupta Date: 9099.09.99 41:11:09 IST Reason: SolfAttestod



## Head Office (Mines )



Rajasthan State Pollution Control Board 4, Institutional Area, Jhalana Doongari, Jaipur-302 004 Phone: 0141-2716814,2716813Fax: 0141-2716814

#### Registered

File No

F(CPM)/8hilwara(Hurda)/2(1)/2019-2020/7113-7117

Order No

2022-2023/Mines/10762

Date:

28/02/2023

Unit id :

11,060

- 26 That the grant of this Consent to Operate shall not, in any way, adversely affect or jeopardize the legal proceedings, if any, instituted in the past or that could be instituted against you by the State Board for violation of the provisions of the Act or the Rules made thereunder.
- 27 That the grant of this consent to establish/operate is issued from the environmental angle only, and does not absolve the project proponent from the other statutory obligations prescribed under any other law or any other legal instrument in force. The sole and complete responsibility, to comply with the conditions laid down in all other laws for the time-being in force, rests with the industry/unit/project proponent.

This bears approval of the competent authority.

Encl: As Above

Yours sincerely,

Group Incharge-Mines

### (A): Copy To:-

- Director, Department of Mines & Geology, Government of Rajasthan, Shastri Circle, Udaipur...
- 2 Regional Officer, Regional Office, Rajasthan State Pollution Control Beard, Bhilwara-please ensure compliance of the consent conditions and monitor time to time
- 3 Mining Engineer, Department of Mines & Geology, Government of Rajasthan, Bhilwara-To inform that this consent has been issued from the environmental angle only, and ensuring compliance of any other law/act/rule/regulation or order of any Court / Tribunal is the sole responsibility of the project proponent and the concerned departments
- 4 Master File.

(B)

The Additional PCCF (Vit.) and Chief Wild Life Warden, Aranya Shawan, Institutional Aran, Jaipun/DCF(WL), Shitwara, To inform that this consent has been issued from the environmental angleonly, and ensuring compliance of any other lawlact/rutal/regulation or order of any Court /Tribunal is the sole responsibility of the project proponent and the concerned departments.

Group Incharge-Mines

Signature Not Verified Digitally signed by Khim Chand dupta Date: 2023.02.25 1:11:09 IST Roason: SelfAttedted Locations





## Head Office (HDF)

## Rajasthan State Pollution Control Board 4, Institutional Area, Jhalana Doongari, Jalpur-302 004 Phone: 0141-5159600,5159695



#### Registered

File No :

F(HDF)/Bhilwara(Hurda)/1(1)/2023-2024/1629-1631

Order No: 2023-2024/HDF/9370

Date:

Jun 14 2023 3:32PM

Unit Id :

11060

M/s Hindustan Zloc Limited

(Rampuro Agucha Mine), P.O.- Agucha, Bhilwara, , District:Bhilwara

Subi Consent to Operate under Section 25/26 of the Water (Prevention & Control of Pollution) Act, 1974 and under Section 21(4) of Air (Prevention & Control of Pollution) Act, 1981.

Ref: Your application for Consent to Operate dated 28/10/2022 and subsequent correspondence.

Sir.

Control of Pollution) Act, 1974 (hereinafter to be referred as the Water Act) and under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981, (hereinafter to be referred as the Air Act) as amended to date and rules & the orders issued thereunder is hereby granted for your Hindustan Zinc Limited Rampura Agucha Mines Beneficiation Plant plant situated at PO - Agucha Agucha Tehsil:Hurda District:Bhilwara , Rajasthan, subject to the following conditions:

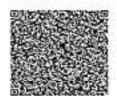
- 1 That this Consent to Operate is valid for a period from 01/03/2023 to 29/02/2028.
- 2 That this Consent is granted for monufacturing / producing following products / by products or carrying out the following activities or operation/processes or providing following services with capacities given below:

Particular	Туре	Quantity with Unit
Lead Zinc Ore Beneficiation	Activity	6.50 MILLION TONNES PER ANNUM

- 3 That this Consent to Operate is for existing plant, process & capacity and separate Consent to Establish/Operate is required to be taken for any addition / modification / alteration in process or change in capacity or change in fuel.
- 4 That the quantity of effluent generation along with mode of disposal for the treated offluent shall be as under:

Page 1 of 11

Signature Not Verified Digitally signed by Rijeev Mahnot Date: 2023.08.14 pd:33:22 IST Reason: Sell'Altersed Location:







## Rajasthan State Pollution Control Board

4, Institutional Area, Jhalana Doongari, Jaipur-302 004 Phone: 0141-5159600,5159695

## Registered

File No :

F(HDF)/Bhllware(Hurda)/1(1)/2023-2024/1629-1631

Order No:

2023-2024/HDF/9370

Date:

Jun 14 2023 3:32PM

Unit id :

11060

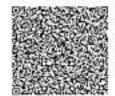
Type of effluent	Max. effluent generation (KLD)	Recycled Qty of Effluent (KLD)	Disposed Qty of offluent (KLD)and mode of disposal
Domestic Sewage	235,000	NIL	210.000  To be treated in STP and to be utilized in plantation and horticulture within the factory premises
Trade Effluent	16670,000	7,800.000	NIL

That the sources of air emissions along with pollution control measures and the emission standards for the prescribed parameters shall be as under:

Sources of Air Emissions	Pollution Control	Pre	scribed
	Measures	Parameter	Standard
Primary Crusher New( 750TPH)	ADEQUATE STACK HEIGHT, Bag Pilter, WATER SPRAYERS, WET SCRUBBER, WITH ADEQUATE STACK HEIGHT	Particulate Matter	150 mg/Nm3
Primary Crusher Old( 700TON/HR)	ADEQUATE STACK HEIGHT, Bag Filter, WATER SPRAYERS, WET SCRUBBER, WITH ADEQUATE STACK HEIGHT	Particulate Matter	150 mg/Nm3

Page 2 of 11

Signature Not Verified
Distally signed by Pheev Mahnot Date: 2023.08.14 pt 33:22 IST Reason: SelfAtterned Location:



## Head Office (HDF)



# Rajasthan State Pollution Control Board

4, Institutional Area, Jhalana Doongari, Jaipur-302 004 Phone: 0141-5159600,5159695

#### Registered

File No 1

F(HDF)/Bhilwara(Hurda)/1(1)/2023-2024/1629-1631

Order No: 2023-2024/HDF/9370 Date:

Jun 14 2023 3:32PM

Unit Id : 11060

1 11000	252111	25	211
Secondary Crusher( SOUTON/HR)	ADEQUATE STACK HEIGHT, Bag Filter, WATER SPRAYERS, WET SCRUBBER, WITH ADEQUATE STACK HEIGHT	Particulate Matter	150 mg/Nm3
Two DG Sets (5MW each)( 10MW)	ACOUSTIC ENCLOSURE , ADEQUATE STACK HEIGHT	CO Particulate Matter	150 mg/Nm3 75 mg/Nm3
		NOx NMHC	710 ppm 100 mg/Nm3

- 6 That the Hindustan Zinc Limited Rampura Agucha Mines Beneficiation Plant plant will comply with the standards as prescribed vide MoEF notification No. GSR 826(E) dated 16th November, 2009 with respect to National Ambient Air Quality Standards.
- 7 That the Trade Effluent shall be treated before disposal so as to conform to the standards prescribed under the Environment (Protection) Act-1986for disposal Into Inland Surface Water. The main parameters for regular monitoring shall be as under:

Page 3 of 11

Signature Not Verified Digitally signed by Ry Date: 2023.06.14 x 3: Reason: Self Attested Location:





## Head Office (HDF)

## Rajasthan State Pollution Control Board 4, Institutional Area, Jhalana Doongari, Jaipur-302 004 Phone: 0141-5159600,5159695

## Registered

File No : F(HDF)/Bhilwara(Hurda)/1(1)/2023-2024/1629-1631

Order No: 2023-2024/HDF/9370

Date:

Jun 14 2023 3:32PM

Unit 1d : 11060

Parameters	scandards	
Total Suspended Solids	Not to exceed 100 mg/l	
pH Value	Between 5.5 to 9.0	
Oll and Grease	Not to exceed 10 mg/l	
Ammonical Nitrogen ( ns N·)	Not to exceed 50 mg/l	
Biochemical Oxygen Demand (3 days at 27°C)	Not to exceed 30 mg/l	
Chemical Oxygen Demand	Not to exceed 250 mg/l	
Nitrate (as NO3)	Not to exceed 50 mg/l	

That the Trade Efficient shall be treated before disposal so as to conform to the standards prescribed under the Environment (Protection) Act-1986 for disposal Into Inland Surface Water. The main parameters for regular monitoring shall be as under

Page 4 of 11

Signature Not Verified
Digitally signed by Rijeev Mahnot
Date: 2023.06.14 y5:33:22 IST
Roason: SolfAttersed
Location:







## Rajasthan State Pollution Control Board 4, Institutional Area, Jhalana Doongari, Jaipur-302 004 Phone: 0141-5159600,5159695

## Registered

F(HDF)/Bhilwara(Hurda)/1(1)/2023-2024/1629-1631

2023-2024/HDF/9370 Order No:

Date:

Jun 14 2023 3:32PM

Unit Id:

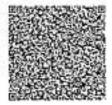
11060

Parameters	Standards
Total Suspended Solids	Not to exceed 100 mg/l
pH Value	Between 5.5 to 9.0
Oil and Grease	Not to exceed 10 mg/l
Biochemical Oxygen Demand (3 days at 27°C)	Not to exceed 30 mg/l
Lead ( as Pb )	Not to exceed 0.1 mg/l
Cadmium (as Cd)	Not to exceed 2.0 mg/l
Copper ( as Cu )	Not to exceed 3.0 mg/l
Zinc ( as Zn )	Not to exceed 5.0 mg/l
Nickel (as Ni)	Not to exceed 3.0 mg/l
Cyanide ( as CN )	Not to exceed 0.2 mg/l
Fluoride ( as F )	Not to exceed 2.0 mg/l
Sulphide ( as S )	Not to exceed 2.0 mg/l
Iron ( as Fe )	Not to exceed 3.0 mg/l
Chlerides	Not to exceed 1000 mg/l
Chemical Oxygen Demand	Not to exceed 250 mg/I

- 9 That this consent to operate is valid for operation of Lead Zinc Ore Beneficiation plant of 6.5 Million Ton Per Annum capacity. The industry has to seek fresh consent to establish for any change in product/by product/process/service/activity and modification/alteration.
- 10 That total capital investment as on 30.09.2022 as per the C.A. certificate submitted by you is Rs. 103564 (Lakh) which includes the cost of Land, Building, Plant & Machinery and miscellaneous assets.
- 11 That the industry shall comply with all the conditions of Environmental Clearance (E.C.) issued by the Ministry of Environment, Forest & Climate Change (MoEF&CC), Government of India, vide letters no. J-11015/267/2008-IA.H(M) dated 11.12.2009

Page 5 of 11

Signature Not Verified Digitally signed by Rejeev Mahnot Date: 2023 05.14 6:33:22 IST Reason: SelfAltered Location:



## Head Office (HDF)



## Rajasthan State Pollution Control Board

4, Institutional Area, Jhalana Doongari, Jaipur-302 004 Phone: 0141-5159600,5159695

## Registered

File No

F(HDF)/Bhilwara(Hurda)/1(1)/2023-2024/1629-1631

Order No: 2023-2024/HDF/9370

Date:

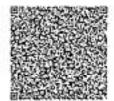
Jun 14 2023 3:32PM

Unit Id: 11060

- 12 That Hazardous Waste as defined under schedule IV of Hazardous & others Waste (Management, and Transboundary Movement) Rules, 2016 shall not be used as raw material without obtaining prior registration & authorization from the State Board.
- 13 That total water consumption/requirement for lead Zinc Ore Benification Plant shall not exceed to 9500 KLD which will be not from Banas Radial Wells.
- 14 That Industry shall comply with all the conditions of CGWA permission/NoC Issued by Central Ground Water Authority, Ministry of Water resource Govt of India vide letter no. 21-4/2/RJ/MIN/2004 dated 08.04.2022.
- 15 That water flow meters shall be provided and maintained at all suitable points to measure quantity of water received form Banas redial wells and water consumption for different purposes. Record of the same shall be maintained on daily basis.
- 16 That unit shall treat 235 KLD domestic sewage at sewage treatment plant of 300 KLD capacity (for mines and heatification plant) that entire treated sewage shall be reused for plantation and horticulture purpose and unit shall maintain zero liquid discharge outside the premises.
- 17 That the total quantity of trade effluent shall not exceed from 16670 KLD. Out of 16670 KLD , 7800 KLD will be recycled/reclaimed from tailing dam and remaing 4870 KLD retained in the tailing dam.
- 18 That waste water generated from tailing dam will be reused/recycled completely in mill/process.
- 19 That the industry shall take utmost precaution to cater seepage from tailing dams and ensure complete recycle of seepage water in process only.
- 20 That the industry shall explore & carry out some scientific and technical study with reputed experienced organization in the field for catering of seepage from talling dam.
- 21 That the industry shall re-circulate the decemted water from the tailing dam and shall maintain Zero Discharge Status from tailing dam.
- 22 That the effluent from the ore benefication plant shall be treated to confirm to the prescribed standards and the tailing slurry shall be transported through a closed pipeline to the tailing dam.
- 23 That the industry shall maintain the stability and safety of the tailing dam as assessed by CWPRS and NIRM
- 24 That no waste water (domestic & trade effluent) will be discharged inside or outside the factory premises in to a stream or well or sewer or on land in any case and complete zero discharge status shall be maintained.

Page 6 of 11

Signature Not Verified Digitally signed by Rejerv Mahnot Date: 2023.05.14 y5:33:22 IST Reason: Sall Alteracd Location:



## Head Office (HDF)



## Rajasthan State Pollution Control Board 4, Institutional Area, Jhalana Doongari, Jaipur-302 004

Phone: 0141-5159600,5159695

#### Registered

F(HDF)/Bhilwara(Hurda)/1(1)/2023-2024/1629-1631

Order No:

2023-2024/HDF/9370

Date:

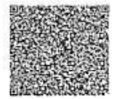
lun 14 2023 3:32PM

Unit Id :

- 25 That separate energy meter & hour meter shall be provided and maintained at all the air pollution control measures and record of daily running hours of pollution control measures and daily energy consumption shall be maintained in log book.
- 26 That for the control of fugitive emission guidelines / code of practice as issued by CPCB will be followed.
- 27 That the industry shall maintain stack of adequate height at crusher and air pollution control measures shall be operated regularly and efficiently to achieve the prescribed emission standards as per condition no.4.
- 26 That adequate infrastructure facility for stack emission monitoring shall be maintained at the stack of crushers.
- 29 That stack of adequate height as per norms and acoustic enclosure shall be maintained with two DG Sets of 5 MW KVA each.
- 30 That unit shall provide permanent safe infrastructure facility for stack monitoring with stack attached with two D.G set (5 MW each) within a month. The unit shall deposit bank guarantee for the same immediately.
- 31 That no additional source of air emission shall be installed without prior consent from the State Board.
- 32 That all the raw materials and products shall be stored in closed sheds.
- 33 That cemented roads shall be provided and maintained properly inside the premises to minimize fugitive emissions due to vehicular movement.
- 34 That water sprinkling and cleaning of haul roads by vocuum cleaner shall be done regularly to control the fugitive emissions generated due to vehicular movement.
- 35 That dust suppression system shall be maintained to minimize fugitive dust emission in Lead Zinc Ore handing area & at various transfer points and closed conveyor belts shall be used for the transfer of neaterial to reduce the fugitive emissions.
- 36 That unit shall provide flexible curtains vertically attached with crusher house shed(material feeding hopper points) so as to minimize escape of fines in addition to water spray nozzles at feeding hopper.
- 37 That the industry shall maintain dust collection and extraction system to control fugitive dust emissions at all the transfer points & loading/unloading areas.
- 38 That regular monitoring of ground water particularly in respect to heavy metals shall be carried out by establishing adequate numbers of prizeometric well around tailing dam.
- 39 That adequate arrangements shall be made to avoid flow of pollutants along with rain water.

Page 7 of 11

Signature Not Verified Digitally signed by Rejeev Mahnot Date: 2023.06.14 15:33:22 IST Reason: SetAttered Locations



## Head Office (HDF )



## Rajasthan State Pollution Control Board

4, Institutional Area, Jhalana Doongari, Jaipur-302 004 Phone: 0141-5159600,5159695

#### Registered

F(HDF)/Bhilwara(Hurda]/1(1)/2023-2024/1629-1631

Order No:

2023-2024/HDF/9370

Date:

Jun 14 2023 3:32PM

Unit ld : 11060

- 40 That the industry shall carryout effluent sampling/stack monitoring/ambient air quality monitoring and submit quarterly analysis report from the State Board laboratory/laboratory recognized by Ministry of Environment, Forests & Climate Change (MoEF&CC), Government of India
- 41 That industry shall comply with the provisions of Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2016 & Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 (as notified under Environment (Protection) Act, 1986 and record of daily hazardous waste generation and its disposal shall be maintained.
- 42 That the precautions/measures shall be taken for minimization of exposure to the workers involved in handling/processing of the lead and lead bearing material.
- 43 That the unit shall periodically examine their workers at least once in year for lead level in blood as well as urine. Persons with higher lead levels (greater than 40 pg/dl) should be shifted Immediately to non-load activity areas and given special medical treatment till the lead levels come back to acceptable level.
- 44 That the industry shall install and maintain adequately designed rain water harvesting structure for recharge of ground water in and around the area.
- 45 That the plantation of local species in the 33% of total area of the project shall be arried out & maintained.
- 46 That the industry shall get policy renewed from time to time under Public Liability Insurance Act (PLIA) and submit its copy to the Board
- 47 That the industry shall obtain Environmental Clearance from competent authority under EIA Notification dated 14.09.2006 before establishing any such activity which attracts Environmental clearance under EIA Notification dated 14.09.2006.
- 48 That unit shall submit time bound proposal along with Bank guarantee(10% of total cost of dry tailing facility) within one month, for installation of dry tailing facility instead of simple charge of waste water and tailings into tailing dam.
- 49 That unit shall ensure check and restore ambient air quality monitoring machines as per CAAQMS protocol and if required may be purchase proper CAAQMS machinery setup and ensure online connectivity with RSPCB Server and submit evidence based compliance to the State Board within a period of one month. That unit shall deposit Bank Guarantee for the same immediately.
- 50 That the industry shall submit the quarterly compliance report of all the above conditions to the State Board.

Page 8 of 11

Signature Not Verified Digitally signed by Rajeev Mahmot Dute: 2023.06.14 15:33-22 IST Reason: SelfAtterjed



## Head Office (HDF)



## Rajasthan State Pollution Control Board 4, Institutional Area, Jhalana Doongari, Jaipur-302 004 Phone: 0141-5159600,5159695

#### Registered

File No :

F(HDF)/Bhilwara(Hurda)/1(1)/2023-2024/1629-1631

Order No:

2023-2024/HDF/9370

Date:

lun 14 2023 3:32PM

Unit Id :

11060

- 51 That unit shall install PTZ camera and Online flow meter with the Tailing dam inlet and tailing dam reuse line, within one month, so as to ensure complete reuse of waste water in accordance with water balance submitted That unit shall deposit Bank Guarantee (10% of total cost of PTZ camera and online flow meter) immediately.
- 52 That PTZ cameras should be installed at the locations to cover entire area of tailing dam.
- 53 That unit shall complete the work related to replacement of monkey ladder to safe monitoring infrastructure monitoring facility for the stack attached with Primary Crusher-New (750 TPH) within one month and submit the evidence based report to the State Board. That unit shall deposit Bank Guarantee for the same immediately.
- 54 That unit shall comply with all the provisions of MSHIC Rules, 1989 and amended so and also with PLI Act, 1991.
- 55 That unit shall expedite completion of Hydro geological survey and isotopic analysis study.
- 56 That, notwithstanding anything provided hereinabove, the State Board shall have the power and reserves its right, as contained under Section 27(2) of the Water Act and under Section 21(6) of the Air Act to review anyone or all of the conditions imposed here in above and to make such variation as it deems fit for the purpose of Air Act & Water Act.
- 57 That the grant of this Consent to Operate is issued from the environmental angle only, and does not absolve the project proponent from the other statutory obligations prescribed under any other law or any other instrument in force. The sole and complete responsibility to comply with the conditions laid down in all other laws for the time-being in force, rests with the industry/unit/project proponent.
- S8 That the grant of this Consent to Operate shall not, in any way, adversely affect or joupardize the legal proceeding, if any, instituted in the past or that could be instituted againt you by the State Board for violation of the provisions of the Water Act and Air Act or the Rules made thereunder.
- 59 That the Project Proponent shall comply with provisions of the E-waste (Management) Rules, 2016 and ensure that e-waste generated by them is channelized through collection centre or dealer of authorized producer or dismantler or recycler or through designated take back service provider of the producer to authorized dismantler or recycler.
- 60 That the Project Proponent shall maintain record of e-waste generated by them in Form-2 and make such records available for scrutiny by the Board.

Page 9 of 11

Signature No. Verified Digitally signed by Releav Mohnot Date: 2023.06.14 233:22 IST Renson: SeiZAtterfed Location:



Valid Beneficiation plant CTO

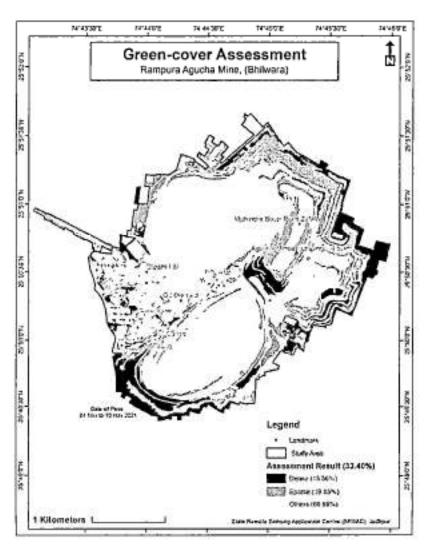
## Annexure-XXXIV



Tailing close pipe line

# **Green Cover Assessment**

# For Rampura Mine, Agucha of Hindustan Zinc Limited located in Rajasthan



Ву

## State Remote Sensing Application Centre (SRSAC)

Department of Science & Technology (DST), Government of Rajasthan

Subhash Nagar, Pal Road, Jodhpur – 342008 (Raj.)

January 2023

PageMo.158 to 182

This report is the outcome of the study conducted at SRSAC, Jodhpur, Rajasthan.

## Contributors:

## Overall Guidance

Mr. Rajeev Jain Project Director cum Deputy Secretary, SRSAC, DST, GoR, Jodhpur

## Project In-charge

Mr. Laxman Singh ARO, SRSAC, DST, GoR, Jodhpur

Mr. Mahendra Prakash Mathur Programmer, SRSAC, DST, GoR, Jodhpur

## Technical Team

Mr. Praveen Vishwakarma

Ms. Ayushi Parashar

Mr. Piyush Swami

## Technical Team (Aqucha)

Mr. Dineshkumar Paliwal

Environment Head-Agucha Mines.

Mr. Gaurav Kumar

Environment Engineer-RAM

## Preface

State Remote Sensing Application Centre (SRSAC) of the Department of Science & Technology, Government of Rajasthan, endeavours to make the best possible use of remote sensing and Geographic Information System (GIS) technologies towards fostering sustainable development in Rajasthan.

In Rajasthan, the remote sensing activities started with the establishment of Aerial Photo Interpretation Laboratory (APIL) in 1979 as a part of the centrally sponsored Desert Development programme, to assist soil and water conservation planning in the State, under State Agriculture Department. Later on, in 1985 looking to the multi-disciplinary utilities of Remote Sensing technology, the laboratory was transferred to the State Department of Science and Technology and renamed as State Remote Sensing Application Centre (SRSAC). SRSAC functions to fulfil the following objectives:

- To regularly generate a databank consisting of temporal and spatial databases.
- To generate information systems for natural resources.
- To interact with various user agencies for the formulation and implementation of developmental planning, using remote sensing technique.
- To undertake short term and long term experimental and operational remote sensing studies for various natural resources, infrastructure, and urban planning.
- To collaborate/interact with national-level remote sensing institutes like National Remote Sensing Centre (NRSC), Hyderabad, Space Application Centre (SAC), Ahmedabad, Regional Remote Sensing Centres (RRSC's) to carry out joint projects.
- To popularize remote sensing and GIS by organizing trainingcourses/workshops/seminars for different state user departments, technocrats, students, etc.

The Centre has been catering to the natural resource survey, monitoring and planning needs of the State since past more than three decades. Assistance is regularly provided to the user departments in the State for planning the development activities using Remote Sensing and GIS techniques. The Centre has long been collaborating with Indian Space Research Organisation (ISRO), Department of Space, Govt. of India for executing state level projects using space-based information support.

Four major categories of projects being carried out at SRSAC are:

## 1. Generating numerous geospatial layers for information support

Building natural resources information system, Land-use & land-cover (LULC) mapping, crop acreage estimation, surficial waterbodies mapping, groundwater quality mapping, wasteland mapping, land-degradation mapping, wetland mapping, forest blocks mapping, geomorphological & lineaments mapping, infrastructural mapping, cadastral mapping, administrative boundaries demarcation

# Planning various natural resources management and development planning activities Supporting decentralized rural development planning, forecasting agricultural outputs, Panchayat Samiti wise master-plan of water-harvesting-structure sites, silt prevention studies in Pushkar Lake, conservation planning of Jodhpur lift canal

## 3. Monitoring the landscape through change detection activities

Watersheds monitoring, waterbodies monitoring, river-flow change analysis, monitoring the crop-residue-burning, eco-sensitive zone monitoring, LULC change detection around mining areas, wasteland change analysis, forest cover change analysis, encroachment studies, industrial green cover assessment

## 4. Capacity building of the user departments / students / common man

Organizing trainings/courses/workshops/seminars, preparing atlases such as Resource Atlas of Rajasthan, Ground Water Atlas of Rajasthan, Watershed Atlas of Rajasthan, Ayurvedic Medicinal Plants Atlas of Rajasthan, Soil Resource Atlas or Rajasthan, exclusive workshops for spatial empowerment of Panchayati Raj Institutions.

The Centre aims to move forward from information support towards decision support for sustainable development and management of natural resources along with infrastructure development and urban planning through the application of remote sensing and GIS technology.

This report is an outcome of the study that was conducted by the Centre to assess the green cover area within the boundaries of Rampura Agucha Mine, of Hindustan Zinc Limited, Rajasthan, using remote sensing and GIS technologies.

# Table of contents

1.	Introduction
2.	Objective
3.	Study Area
	Datasets used
4	
4	2 Field data
5.	Methodology
6.	Results and Discussion
7.	Conclusion11
8.	References11
9.	Annexure-1: Field Photographs
10.	Flora of Rampura Mine
	Announce 2: Details of Blantations

# List of figures

Figure 1: Study area	2
Figure 2: True color composite of Sentinel-2(2a) satellite data (between 1 to 10 Nov 2021) that was used for green-cover assessment	. 3
Figure 3: Overall methodology	. 4
Figure 4: Ground truth dataset comprising a total of 169 points distributed across the study area	
Figure 5: Assessment results	8
Figure 6: Tree Count Pillar Points	9
Figure 7: Layout Plan Agucha Zinc Colony	12
Figure 8: Flora Of Rampura Mine	17
List of tables	
Table 1: Results	0
Table 2: Tree Count Dense10	0
Table 3: Tree Count Sparse1	0
Table 4: Tree Count Study Area	0

## List of abbreviation

DST	De	partment of	Science	&	Technology	1
-----	----	-------------	---------	---	------------	---

- ESA European Space Agency
- GIS Geographic Information System
- Gol Government of India
- GoR Government of Rajasthan
- HRSI High-Resolution Satellite Imagery
  - IRS Indian Remote Sensing Satellite
- ISRO Indian Space Research Organization
- NDVI Normalized Difference Vegetation Index
  - NIR Near-Infrared
- NRSC National Remote Sensing Centre
- SRSAC State Remote Sensing Application Centre

## 1. Introduction

Hindustan Zinc, a Vedanta Group Company, is one of the world's largest and India's only integrated producer of Zinc-Lead and Silver. The Company has its headquarters at Udaipur in the State of Rajasthan where it has its Zinc-Lead mines and smelting complexes. Hindustan Zinc is self-sufficient in power with captive thermal power plants and has ventured into green energy by setting upwind power plants. The Company is ranked 1st in Asia-Pacific and globally 5th in Dow Jones Sustainability Index in 2021 amongst Mining & Metal companies. Hindustan Zinc is a certified Water Positive Company and is the only Indian company to be recognized at the S&P Global Platts Metal Award 2022.

The company has embarked on an ambitious sustainability journey, led by its Sustainability Goals 2025, driven by its vision of 'ZERO HARM, ZERO DISCHARGE, ZERO WASTE.' These Sustainability Goals were developed by the company as an action agenda for accomplishing its overarching long-term goal of creating positive impacts across the value chain.

Green cover is the area with tree plantation and is intended to reduce pollution from the surrounding air. Both gaseous and particulate pollutants can get absorbed if an appropriate green cover is maintained. As per the Ministry of Environment, Forest and Climate Change (MoEFCC), Government of India, green belt is to be developed and maintained to minimize the impact due to air pollution and noise pollution in the environment. A minimum of 33% of the area is to be kept for green belt development.

## 2. Objective

The objective of the study presented here was to perform geospatial mapping of the study area for demarcation of the area under green (vegetation) cover, along with the approximation of tree count.

## 3. Study Area

The study area for the report presented here is Rampura Mine, Agucha located in Bhilwara District of Rajasthan.

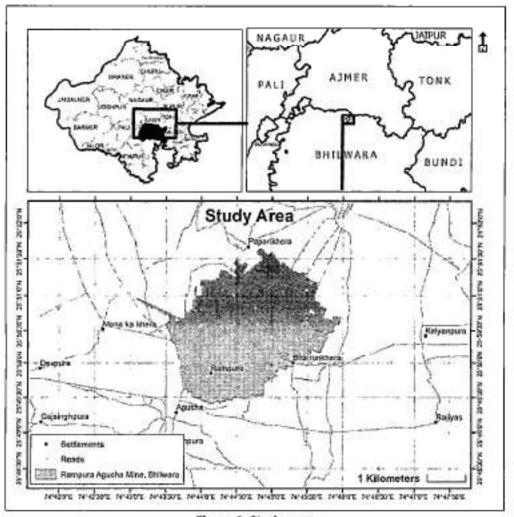


Figure 1: Study area

166

## 4. Datasets used

## 4.1 Satellite data

The green cover analysis was performed on Copernicus Sentinel-2 surface reflectance (Level2a) data of date ranging from 1<sup>st</sup> November 2021 to 10<sup>th</sup> November 2021 (Figure 2). During
the analysis, six bands were utilized, namely, Blue, Green, Red, Near-Infrared, Shortwave
Infrared-1 and Shortwave Infrared-2 (band numbers 2, 3, 4, 8, 11 and 12). The spatial
resolution of the bands 2, 3, 4 and 8 was of the order 10 m, while for bands 11 and 12, it was
20 m. Additionally, IRS-Cartosat-2E satellite image dataset of spatial resolution 0.65 m
panchromatic / 2 m multispectral was used as the reference.

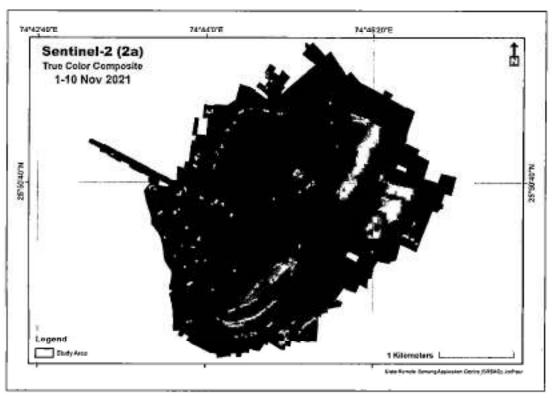


Figure 2: True color composite of Sentinel-2(2a) satellite data (between 1 to 10 Nov 2021) that was used for green-cover assessment

## 4.2 Field data

Field visit was conducted in the month of 20th April 2023, wherein, geo-tagged field photographs were acquired in order to support the ground truth requirements during the analysis. A few of the ground truth photographs are shown in Annexure 1.

## 5. Methodology

The study consisted of the following steps in the methodology (Figure 3):

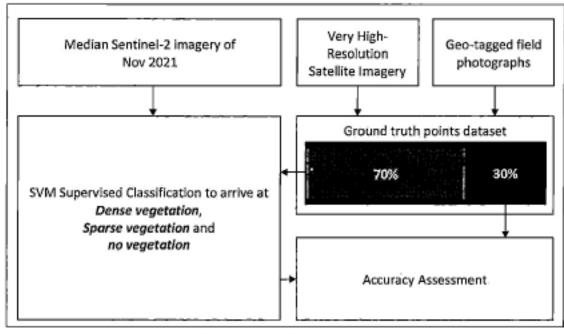


Figure 3: Overall methodology

- Designing the classification scheme: A three-class classification schema was designed that consisted of (i) dense green-cover, (ii) sparse green-cover / new plantation and (iii) other classes.
- Procurement/processing of primary satellite images: As mentioned in Section 4.1,
   the Copernicus Sentinel-z satellite image composite was prepared for the purpose of

The Automotive States of the Control

green cover analysis. This composite was prepared using the images from the month of November 2021 due to the following reasons.

- For the month of November, the agricultural cropped regions show a low/nil
  value of NDVI as during this period, Kharif crops are mostly harvested and
  Rabi crops are not grown to the stage where vegetation is significant.
- Vegetation detected in this month imagery is inclusive of both permanent and seasonal vegetation.
- Preparing a ground truth points dataset: A set of ground truth points was the prime requisite for validating the results of the study. The ground truth information was carefully compiled from various data sources, such as field photographs, drone-based images and very high-resolution satellite imagery. Field visit was conducted for collecting geotagged field photographs. Very high-resolution satellite data from Cartosat-2 series of satellites was procured from NRSC Data Centre of Indian Space Research organization (ISRO). This highly detailed satellite data was referred while preparing a geospatial points layer that was called as the ground truth points dataset (Figure 4). One part (about 70%) of the total ground truth points was used for training the classifier model, while the other part (about 30%) of the total ground truth points was utilized while performing the accuracy assessment. The training dataset was used to sample the input Sentinel-2 satellite imagery.



Figure 4: Ground truth dataset comprising a total of 169 points distributed across the study area

Classification using the Support Vector Machine (SVM) classifier: The SVM classifier
was used for the green cover analysis. The details of this classifier can be found in Pal
and Mather (2005). SVM classifier was trained using the above sampled training
dataset. Using the trained SVM classifier model, the unknown pixels from the
Sentinel-2 satellite imagery were classified. The output classified image was tested
for the accuracy of classification using the testing ground truth dataset. Kappa
accuracy of assessment was determined. Class-wise area statistics were determined.

## 6. Results and Discussion

The resultant classified image is as shown in Figure 5. The result was tested for the accuracy using an independent set of testing ground truth dataset as mentioned in the previous section.

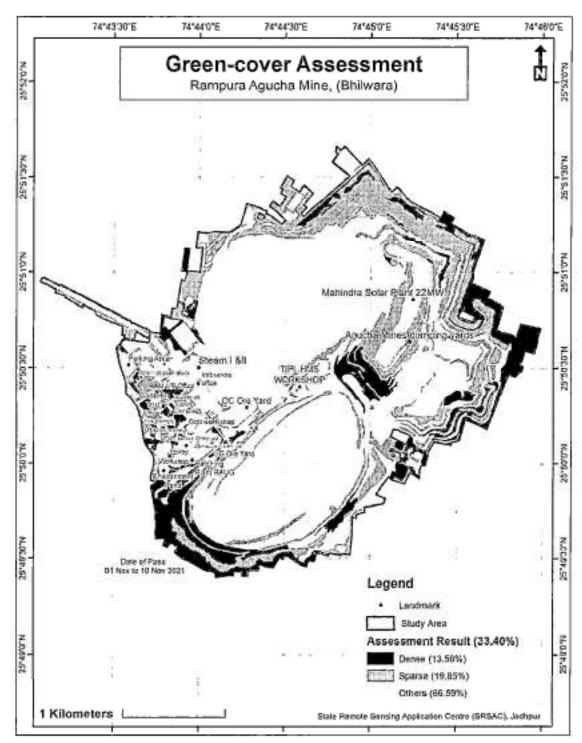


Figure 5: Assessment results

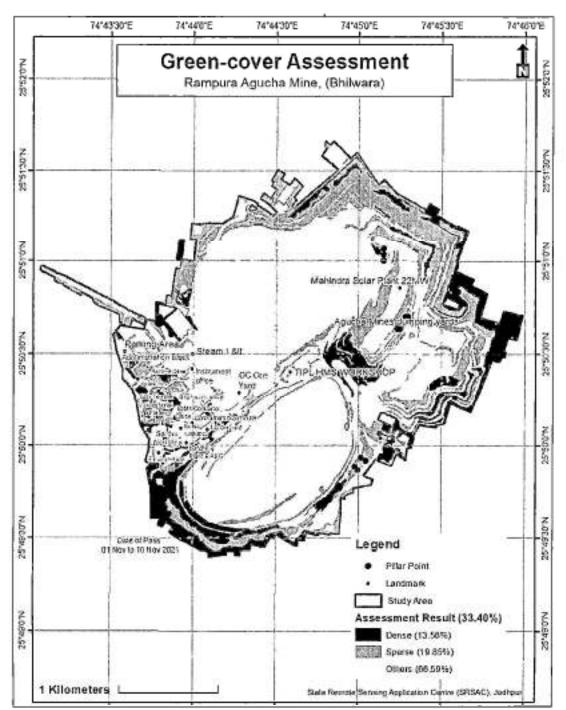


Figure 6: Tree Count Pillar Points

Table 2: Results

S. No.			rea	Total Green	Total Green
	Category	Hectares	Percentage	Area (Ha.) Cover	Cover %
1.	Dense	138.06	13.56	340.16 Ha.	33.40 %
2.	Sparse	202.10	19.85	340.16 Ha.	
3.	Others	678.00	66.59		
Total Area		1018.16			

## Table 2: Tree Count Dense

Site	Area Type	Tree (.50 Ha)	Average (1+2+3/3)	Tree in 1 Ha.
1	Dense	1980		
2	Dense	1703	5053/3 = 1684.33	1684.33X 2 = 3368.67
3	Dense	1370		
T	otal Count	5053	Total Count in 1 Ha.	3369 (Rounding off)

Table 3: Tree Count Sparse

Site	Area Type	Tree (.50 Ha)	Average (1+2+3/3)	Tree in 1 Ha.	
2	Sparse Sparse	734 530	1699/3 = 566.33	566.33X 2 = 1132.67	
3	Sparse	435	300.55		
To	Total Count 1699		Total Count in 1 Ha.	1133 (Rounding off)	

Table 4: Tree Count Study Area

S. No.	Category	Area			Total Trees (Approx.)	
		Hectares	Tree Count	Total Trees		
1.	Dense	1	3369	138.06X2047 = 4,65,124	6 04 103	
2.	Sparse	1	1133	202.10X1133 =2,28,979	6,94,103	

## 7. Conclusion

Green cover area estimation was carried out using Sentinei-2 image of date range from 1° to 10° of November 2021 with Cartosat-2E satellite imagery of Feb 2022 as reference. The analysis was also supported by the field-based ground truth information. Supervised learning-based image classification approach was adopted for classifying the input Sentinel-2 satellite imagery into three class-categories named dense, sparse and no green cover. The resultant classified image was tested for accuracy with respect to the ground truth dataset. As per the results, as on 10° November 2021, the total green cover area within the boundaries of Rampura Mine, Agucha was calculated to be 33.40 % of the total area.

## 8. References

Drisya, J., & Roshni, T. (2018). Spatiotemporal variability of soil moisture and drought estimation using a distributed hydrological model. In *Integrating disaster science and management* (pp. 451-460). Elsevier.

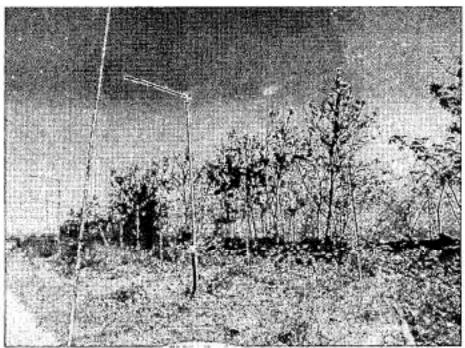
Pal, M., & Mather, P. M. (2005). Support vector machines for classification in remote sensing. *International journal of remote sensing*, 26(5), 1007-1011.

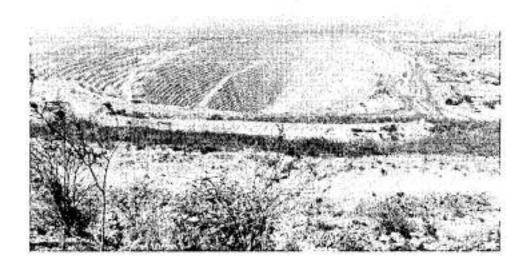


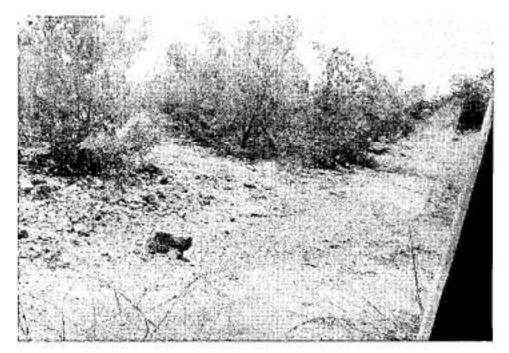
Figure 7: Layout Plan Agucha Zinc Colony

# 9. Annexure-1: Field Photographs

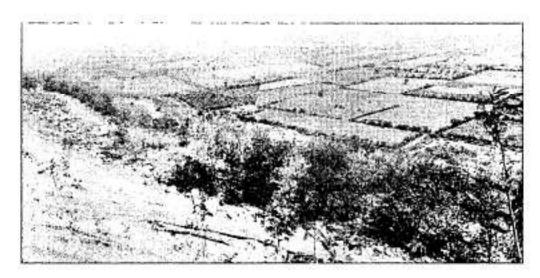


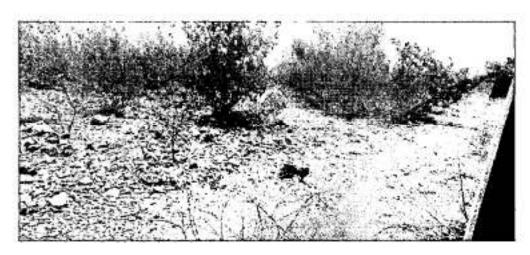




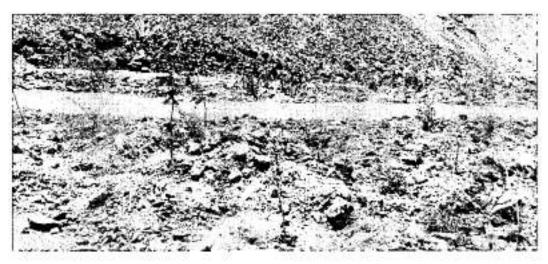














# 10. Flora of Rampura Mine

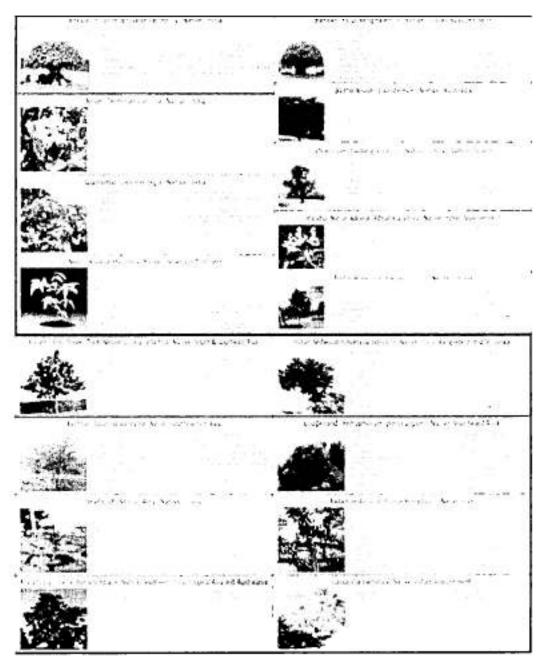


Figure 8: Flora Of Rampura Mine

# 11. Annexure-2: Details of Plantations

Azadirachta Indica
Saraca Indica
Plumeria Pudica
Hyophorbe Lagenicaulis
Hibiscus Rosa-Sinensis
Cascabela Thevetia
Dalbergia Sissoo
Ficus Benjamina
Millettia Pinnata
Cycas Revoluta
Delonix Regia
Phoenix Dactylifera
Alstonia Scholaris
Araucaria Columnaria
Acacia Nilotica
Nerium Indicum
Psidium Guajava
Terminalia Arjsuna