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HINDUSTAN ZINC
Zinc & Silver of India

Ref : HZL/RA/ENV/MoEF&CC/2022-23/ 1900

30.11.2022

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 2022 to Sep 2022.

Ref : Environment Clearances and Amendments	
1.	Environment Clearance vide No. : J-11015/267/2008-IA.II (M) Dtd. 11.12.2009.
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 2022 to Sep 2022.** along with soft copy in a CD.

Hope you find this in order.

Thanking you,

Your faithfully

(Kishore Kumar S)
CEO Agucha IBU

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

Cc to:

1. In-Charge (Zonal office)
   Central Pollution Control Board,
   Vithal Market, Paryavaran Parisar , E-5, Arera Colony,
   Bhopal, – 462 016 (MP)

2. Member Secretary
   Rajasthan Pollution Control Board
   4 Institutional Area, Jhalana Doogri,
   Jaipur (Raj) -302004

3. 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
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CIN No. L27204RJ1966PLC001208

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	
i	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(Mines)/Bhilwara(Hurda)/12(1)/2015-2016/1229-1233 dated 25/06/2019 for mining activity. RSPCB. Consent to Operate granted by RSPCB vide File F(CPM)/Bhilwara(Hurda)/2(1)/2019-2020/2498-2500 dated 22/10/2019 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.
iii	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.
v	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 22nd August, 2014. The maximum height of the dump shall not exceed 140 m (in two lifts of 20m each). Waste dump vegetated fase manner. Waste dump are covered by applicable of geotextiles.
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 terraced	Will be complied during the mine closure.

	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 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.	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
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.
x	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 Agucha 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.
xi	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. Garland drain is already constructed as a safety measure to avoid ingress of water into underground mining.
xii	The project authorities shall check the possibility of existence of fault(s) before deciding about the thickness of safe barrier required to be maintained between the working	Mining activities are carried out as per Mine plan as approved by IBM. De-pillaring, if required shall be carried out after prior approval of the DGMS.

	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.	
xiii	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.	Water sprinklers are installed on conveyer belts, transfer points, and conditioning of ore is done during crushing to mitigate fugitive dust. Annexure- XXXII
xiv	The effluent from the ore beneficiation plant shall be treated to conform to the prescribed standards and the tailings slurry shall be transported through a closed pipeline to the tailing dam.	Tailings are being disposed through closed pipeline to the earmarked Tailing dam after necessary lime treatment. Annexure- XXXVI
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 latest drone-based study 699280.00 Nos of plants are exiting in 348 Ha. 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. Detailed drone study report shared on 28/05/2022. Ref: HZL/RA/ENV/MoEF&CC/2022-23/463
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 Air quality monitored are within the prescribed norm of CPCB. Annexure-X
xviii	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.	Till date 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	Regular groundwater monitoring is being done by piezometers and wells outside and inside the lease area. Report enclosed as Annexure -I

	and tailing dam) by establishing a network of existing wells and installing new piezometers 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.	Six monthly reports are submitted to MoEF & CPCB. Quarterly report being sent to RSPCB, CGWA and CGWB.
xx	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 rain. 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.
xxiii	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 mineral. The vehicles should be covered with a tarpaulin and shall not be overloaded	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 is allowed. Annexure -XIII
xxv	Blasting operation should be carried out only during the daytime. Controlled blasting should be practiced. The mitigative measures for	Blasting operation is carried out with various mitigation measures as per DGMS guidelines to ensure the fly rocks are arrested. The vibrations

	control of ground vibrations and to arrest fly rocks and boulders should be implemented	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 2018. Copy already submitted on 28/05/2018. 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.
xxx	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.	As recommended by the NIOH, regular health checkups are carried out for the mine personnel and regular health checkup organized in nearby 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 records maintained. For the purpose, schedule of health examination of the workers should be drawn and followed accordingly	Pre-placement medical examination and periodical medical examination of the employees are being carried out at regular interval as per the Mine Act.
xxxiii	Sewage treatment plant shall be installed for	Sewage treatment plant of 425 KLD capacity in colony and 300 KLD in mine area operating

	the colony. ETP shall also be provided for the workshop and the wastewater generated during mining operation	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_{10} and with size less than 2.5µm i.e., $PM_{2.5}$), 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.

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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
i	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.
ii (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.

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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 22nd August, 2014

Specific Condition		
S.No	**Condition**	**Status**
i	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 mining rock waste dump on exiting waste dump.
iii	There should not be any dumping in pool water or on slushy ground.	No dumping is done in water pooled / slushy ground
iv	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.
vi	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.
vii	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 3 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.
x	On stabilized dumps, more species such as Pongamia, Bombax ceiba, Tamarind, Arjun, Gravillea robusta and Amla to be planted.	Plantation of Pongamia, Bombax ceiba, Tamarind, Arjun, Gravillea robusta, Amla and other species has been done on stabilized dumps.
xi	The Radar monitoring system should satisfactorily sub- serve the dual objectives viz.(a) Investigative	The analyzed data is enclosed Annexure - VII

	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.	
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.
xiii	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.

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Hindustan Zinc Limited
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PO - Agucha
Distt. - Bhilwara (Raj.)

A) Additional Specific Conditions		
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 will be 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 suitable 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" is 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.
B) Standard Conditions: **(As Ministry's O.M No 22-34/2018-IA.III dated 8.01.2019 and Ministry's O.M No 22-34/2018-IA.III dated 16.01.2020)** **I. Statutory compliance**		
1	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.
2	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 before commencing the mining operations.	Till date no liability raised by state government. If raised any in future, same will be complied.
3	The State Government concerned shall ensure that mining operation shall not be commenced till the entire compensation levied, if any, for illegal mining paid by the Project Proponent through their respective Department of Mining & Geology in strict compliance of 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.	Till date no liability raised by state government. If raised any in future, same will be complied.

4	This Environmental Clearance shall become operational only after receiving formal NBWL Clearance from MoEF&CC subsequent to the recommendations of the Standing Committee of National Board for Wildlife, if applicable to the Project.	Not Applicable for our operations.
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). Consents to Operate are valid till 28.02.2023. (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 29th 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). Application for permission of water withdrawal has been processed by CGWA vide email dated 15.10.2022. Charges has been deposited for issuance of the NOC on 27.10.2022. (Annexure XXV).
11	A copy of EC letter will be marked to concerned Panchayat / local NGO etc. if any, from whom	Copy of EC letter was submitted to Panchayat in 2009.

	suggestion/ representation has been received while processing the proposal.	
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.
II. Air quality monitoring and preservation		
16	The Project Proponent shall install a minimum of 3 (three) online Ambient Air Quality Monitoring Stations with 1 (one) in upwind and 2 (two) in downwind direction based on long term climatological data about wind direction such that an angle of 120° is made between the monitoring locations to monitor critical parameters, relevant for mining operations, of air pollution viz. PM10, PM2.5, N02, CO and S02 etc. as per the methodology mentioned in 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	Three Online Ambient Air Quality Monitoring Stations are in place, 1 in upwind and 2 in downwind direction. Six Ambient air monitoring locations, three each in core and buffer zone each are selected in consultation with the SPCB. AAQ monitoring is carried out every fortnightly Data digitally displayed at main gate. Attached as Annexure-XXVI.

	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 site.	
17	Effective safeguard measures for prevention of dust generation and subsequent suppression (like regular water sprinkling, metalled road construction etc.) shall be carried out in areas prone to air pollution wherein high levels of PM 10 and PM2.5 are evident such as haul road, loading and unloading point and transfer points. The Fugitive dust emissions from all sources shall be regularly controlled by installation of required 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.	Water sprinkling is carried out by 4 Nos. of 40 KL water sprinkler on Haul roads to mitigate air pollution in mine area 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.
III. Water quality monitoring and preservation		
18	In case, immediate mining scheme envisages intersection of ground water table, then Environmental Clearance shall become operational only after receiving formal clearance from CGWA. In case, mining operation involves intersection of ground water table at a later stage, then PP shall ensure that prior approval from CGWA and MoEFCC is in place before such mining operations. The permission for intersection of ground water table shall essentially be based on detailed hydro-geological study of the area.	Permission for mine dewatering issued by CGWA vide NOC No. CGWA/NOC/MIN/REN/2/2022/7143 valid till 07.07.2024. (Annexure XXIV). Application for permission of water withdrawal has been processed by CGWA vide email dated 15.10.2022. Charges has been deposited for issuance of the NOC on 27.10.2022. (Annexure XXV).
19	Regular monitoring of the flow rate of the springs and perennial nallahs flowing in and around the mine lease shall be carried out and records maintain. The natural water bodies and or streams which are flowing in an around the village, should not be disturbed. The Water Table should be nurtured so as not to go down below the pre-mining period. In case of any water scarcity in the area, the Project Proponent has to provide water to the villagers for their use. A provision for regular monitoring 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.	There is no perennial nallahs in and around mine lease. Not disturbed any village's natural water bodies or streams. Regular water monitoring carried out for open dug well / piezometers near mining area and water level and water quality report Quarterly to CGWA, GCWB & State Pollution Control Board. Drinking water is provided to the nearby villages through tankers. Report Submitted to MoEF&CC on six monthly basis. Attached as Annexure –I.

20	Project Proponent shall regularly monitor and maintain records w.r.t. ground water level and quality in and around the mine lease by establishing a network of existing wells as well as new piezo-meter installations during the mining operation in consultation with Central Ground Water Authority/ State Ground Water 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	Ground water level and water quality monitoring done regular basis and report submitted to CGWA, State Pollution Control Board and MoEF&CC on quarterly basis and six- monthly basis.
21	The Project Proponent shall undertake regular monitoring of natural water course/ water resources/ springs and perennial nallahs existing/ flowing in and around the mine lease and maintain its records. The project proponent shall undertake regular monitoring of water quality upstream and downstream of water bodies passing within and nearby/ adjacent to the mine lease and maintain its 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 vis-a-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 lease 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 six-monthly basis.	There is no perennial nallahs in and around mine lease. Regular Monitoring of natural water resources around mining lease is carried out. Regular water monitoring carried out for open dug well / piezometers near mining area and water level and water quality report Quarterly to CGWA, GCWB & State Pollution Control Board. (Annexure- I (1, 2 & 3).
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	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.

	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.	
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. Annexure-V. Oil & Grease traps are installed near work shop and water reused in beneficiation process. 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.	Water balance attached as annexure XXVII
IV. Noise and vibration monitoring and prevention		
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	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

	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.	
	V. Mining plan	
29	The Project Proponent shall adhere to the working parameters of mining plan which was submitted at the time of EC appraisal wherein year-wise plan was mentioned for total excavation i.e. quantum of mineral, waste, over burden, inter burden and top soil etc.. No change in basic mining proposal like mining technology, total excavation, mineral & waste production, lease area and scope of working (viz. method of mining, overburden & dump management , OB & dump mining, mineral transportation mode, ultimate depth of mining etc.) shall not be carried out without prior approval of the Ministry of Environment, Forest and Climate Change, which entail adverse environmental impacts, even if it is a part of approved mining plan modified after grant of EC or granted by State Govt. in the form to Short Term Permit (STP), Query license or any other name.	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	The Project Proponent shall get the Final Mine 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.	Progressive Mine Closure Plan is part of approved 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.
	VI. Land reclamation	
32	The Overburden (OB) generated during the mining operations shall be stacked at earmarked OB dump	Overburden burden is stacked at earmarked Waste Dump site. Physical parameters

	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.	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.
35	The slope of dumps shall be vegetated in 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.	Slopes of waste dumps are stabilized and vegetated in scientific manner using geotextile and with native and arid zone seeds (like *Acacia nitolica ,Ziziphus Jojoba ,Prosopis cineraria, Alkanna Tinctoria, Capparis decidua, Gundi, Salvadorapersica* spread on waste dump slopes. Aloe Vera and Vetiver grass planted during laying of geotextiles Annexure XXVIII
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. De-silting sump and drains are de-silted 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. De-silting sump and drains are de-silted 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. 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.	The topsoil has been utilized for land reclamation and plantation. At present no top soil dump at site.
VII. Transportation		
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.	Ore transportation is being done within acquired land and not passing through any village / 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 vehicles is part of our operations. All the trucks are covered with tarpaulin while transportation of concentrates to the smelters. PUC certificate is ensured for every truck prior to entry in the premises. Annexure XIII
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	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

	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.	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 Belt		
42	The Project Proponent shall develop greenbelt 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.	Green belt developed all along the acquired area.
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 latest drone-based study 699280.00 Nos. of plants in existing in 348.0 Ha. 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). Drone survey on assessment of plantation done by M/s SKYLARK DRONES.
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	And implemented in consultation with the 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.	Not applicable There is no Shedule-1 species in 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 HRA 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 work place hazards. Regular health check-ups of nearby community are done through “Deepak Foundation” (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 and tests and investigations relevant to the exposure are

	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 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).	carried out and record maintain by Occupational health team. No manganese and chromium mining so Mn & Cr monitoring not applicable. Blood lead monitoring is done on regular basis.
50	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 (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.	Periodical medical examination of the workers are carried out as per DGMS guidelines and records are maintained.
51	The Project Proponent shall ensure that Personnel working in dusty areas should wear protective respiratory devices and they should also be	Dust masks are provided to all workers/ personals/ laborers. Adequate trainings

	provided with adequate training and information on safety and health aspects.	provided to all concerned and toolbox talks are carried out before starting of work.
52	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.
53	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)	
54	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.
55	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 Regional Office.	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
	XI. Miscellaneous	
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 2018. Copy already submitted on 28/05/2018. 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	Being operational unit, condition is not applicable.

	authorities and the date of start of land development work.	
58	The Project Proponent shall submit six monthly compliance reports on the status of the implementation of the stipulated environmental safeguards to the MOEFCC & 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 27nd September 2022. 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 Location Head directly.
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
Distt. - 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.

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हिन्दुस्तान ज़िंक

स्वास्थ्य, सुरक्षा एवं पर्यावरण (एच.एस.ई.) नीति

स्वास्थ्य, सुरक्षा एवं पर्यावरण (एच.एस.ई.) के मार्गदर्शक सिद्धान्त

- प्रबंधन हर समय, प्रत्येक अवसर पर स्वास्थ्य, सुरक्षा एवं पर्यावरण के प्रति अपनी अग्रिम प्रतिबद्धता का प्रदर्शन करेगा।
- हर प्रकार की चोट व्यावसायिक बीमारियां तथा पर्यावरण संबंधी घातक घटनाएं रोकी जा सकती हैं।
- सभी घटनाओं की सूचना देना एवं इनकी जाँच करवाना, सांविधिक दायित्व है।
- चोटों, व्यावसायिक बीमारियों तथा घातक पर्यावरणीय घटनाओं को रोकने के लिए हम जिम्मेदार तथा उत्तरदायी हैं।
- असुरक्षित रूप से किये जा रहे किसी भी कार्य अथवा कार्यकलाप को रोकने में हम सक्षम हैं तथा यह हमारा नैतिक एवं सांविधिक दायित्व है।
- स्वास्थ्य, सुरक्षा तथा पर्यावरण के शाश्वत मूल्यों का अनुपालन एवं सम्मान हमारी सहमती आवश्यकता है, इससे किसी भी तरह का समझौता नहीं किया जाएगा।
- स्वास्थ्य, सुरक्षा तथा पर्यावरण प्रबंधन पद्धतियों का कठोर अनुपालन रोजगार की महत्वपूर्ण शर्त है।

स्वास्थ्य, सुरक्षा एवं पर्यावरण (एच एस ई.) नीति

हिन्दुस्तान जिंक निम्नलिखित नीति को लागू करके व्यावसायिक स्वास्थ्य, सुरक्षा और पर्यावरण (एचएसई) प्रबंधन में उत्कृष्टता प्राप्त करने के लिए प्रतिबद्ध है, जो सभी कर्मचारियों और निदेशकों, व्यावसायिक भागीदारों, आपूर्तिकर्ता, सलाहकारों और बाहरी सलाहकारों पर लागू होती है, जिन्हें नीति का पालन करने की आवश्यकता है, जब वे हिन्दुस्तान जिंक की ओर से कार्य करते हैं।

हिन्दुस्तान जिंक प्रयासरत है :

- राष्ट्रीय, क्षेत्रीय और स्थानीय विनियमों और वैधानिक मांगों का पालन करेगे। उपयुक्त कानून के अभाव (या कमी) में, उद्योग की सर्वोत्तम प्रथाओं और अंतर्राष्ट्रीय मानकों जैसा लागू हो, का उपयोग किया जाएगा।
- हमारी प्रतिबद्धताओं और विश्वासों के अनुरूप एच.एस.ई. प्रबंधन प्रणालियों का विकास, कार्यान्वयन और सुधार करें और विश्वस्तरीय मानकों के साथ तालमेलता बनाए रखें।
- व्यक्ति और पर्यावरण पर एच.एस.ई. से संबंधित प्रभावों को कम करने और न्यूनतम स्तर पर लाने के लिए लक्ष्य और उद्देश्य निर्धारित करें।
- संयंत्र, प्रौद्योगिकी, व्यावसायिक भागीदार और कर्मी चयन में सभी व्यावसायिक निर्णयों के लिए उपयुक्त एच.एस.ई. मानदंड शामिल करें।
- संभावित एच.एस.ई. खतरों की पहचान करने, प्राथमिकता देने, मूल्यांकन करने और प्रभावी कार्यवाई करें एवं उन जोखिमों को कम करने के लिए सभी 'गतिविधियों' का नियंत्रण प्रदर्शन, परीक्षण करें।
- पर्यावरण पर कर्मचारियों की गतिविधियों के प्रभावों को समझने के लिए उपयुक्त सर्वोत्तम उपलब्ध प्रणालियों का उपयोग करके और सभी कर्मचारियों को उचित प्रशिक्षण प्रदान करके लक्ष्य निर्धारित और समीक्षा करने के माध्यम से निरंतर एच.एस.ई. सुधार को बढ़ावा दें।
- प्रभावी संचार, सक्रिय भागीदारी, कर्मचारियों और व्यावसायिक भागीदारों के साथ परामर्श के माध्यम से सकारात्मक एच.एस.ई संस्कृति को बढ़ावा दे।
- पारदर्शिता के उच्चतम मानकों को बनाए रखने के लिए एच.एस.ई. और सस्टेनेबिलिटी (सस्टेनेबिलिटी) प्रबंधन की प्रगति और प्रदर्शन पर हमारे सभी हितधारकों के साथ संवाद करें।
- खतरों का निवारण और व्यावसायिक खतरों से जुड़े जोखिमों को कम करके एक सुरक्षित और स्वस्थ कार्य वातावरण प्रदान करके कर्मचारियों और व्यावसायिक भागीदारों में चोट और व्यावसायिक बीमारी को रोके।
- हमारे कर्मचारियों, व्यापारिक भागीदारों और स्थानीय समुदाय के लोगों के लिए सकारात्मक स्वास्थ्य कार्यक्रम चला कर अनुकूल परिणाम प्राप्त करें।
- कर्मचारियों को नियमित स्वास्थ्य और जोखिम आधारित निगरानी लागू करें और एच.एस.ई. मुद्दों के लिए निर्णय लेने की प्रक्रिया में श्रमिकों और उनके प्रतिनिधियों (जब लागू हो) को भागीदारी और परामर्श सुनिश्चित करें।
- प्रक्रिया में सुधार के माध्यम से पर्यावरण के अनुकूल और ऊर्जा कुशल प्रौद्योगिकी को लागू करके प्राकृतिक संसाधनों का संरक्षण करें।
- हमारे संचालन से प्रभावी अपशिष्ट प्रबंधन और पर्यावरण के लिए निपटान को कम करने के लिए अपशिष्ट से मूल्य पुनरुपयोग, पुनर्चक्रण और जानकारी उपयोग के सिद्धांतों को अपनाए।
- हमारे जलवायु संबंधी जोखिमों का लगातार आकलन करें, उत्सर्जन को प्रबंधन करें, संचित शमन और अनुकूल उपाय करें और टीसीएफडी दिशानिर्देशों के अनुरूप अपने हितधारकों को हमारी वार्षिकवायु रणनीति से अवगत कराएं।
- यह सुनिश्चित करें कि सभी सेवित्व संभरण सुविधाओं का सरकना निर्माण, संचालन एवं संवरण सभी उपयुक्त कानूनी आवश्यकताओं और विनियमों के अनुपालन में और स्वीकृत अंतरराष्ट्रीय पद्धति के अनुरूप हों।
- कर्मचारियों और स्थानीय समुदायों के प्रतिनिधियों के साथ सक्रिय रूप से जुड़कर उन्हें हमारे पर्यावरणीय दायित्वों, हमारे प्रदर्शन, हमारे संचालन के प्रभावों की प्रकृति से अवगत कराएं और इन उन्हें कैसे प्रबंधित करते हैं, इनके बारे में शिक्षित करें।
- हमारी नीतियों के अनुरूप सिद्धांतों और प्रथाओं को अपनाने के लिए कर्मचारियों, व्यावसायिक भागीदारों, आपूर्तिकारों और अन्य हितधारकों को प्रशिक्षित करके जागरूकता बढ़ाएं।

यह नीति वेदांता सस्टेनेबिलिटी फ्रेमवर्क का भाग है और हिन्दुस्तान जिंक इस नीति और इससे संबंधित तकनीकी प्रदर्शक मानकों को लागू करेगा। इस नीति की निगरानी एच.जेड.एल. के निदेशक मंडल द्वारा की जाती है। जोखिम कारकों के एच.एस.ई. के संबंधित प्रदर्शन के लिए जवाबदेह ठहराया जाएगा और संबंधित एच.एस.ई. मानकों के पूर्ण कार्यान्वयन के लिए लाइन प्रबंधन जिम्मेदार होगे। हम सम्पूर्ण संगठन में अच्छी प्रथाओं को साझा करने सहित एच.एस.ई. के प्रभावी प्रबंधन और संरक्षण एवं स्थायी व्यवसाय संचालन में एकीकृत दृष्टिकोण सुनिश्चित करने के लिए जोखिम आधार पर प्रदर्शन को मापेंगे और रिपोर्ट करेंगे। इस नीति की नियमवत्तु और कार्यान्वयन का समय-समय पर प्रबंधन द्वारा समीक्षा और आवश्यकतानुसार अद्यतन किया जाएगा।

टिप्पणी :

1. ये मानदंड उत्पाद वितरण और लॉजिस्टिक / सम्पूर्ण जीवन चक्र अर्थात खनन से लेकर उत्पाद वितरण और लॉजिस्टिक्स तक लागू होते हैं।
2. यह नीति न केवल हमारी मौजूदा संचालन एवं / नई परियोजनाओं पर लागू होती है, बल्कि यह हमारी सभी एसमर्थीसता, विलयन, अधिग्रहण, और अन्य प्रबंधक प्रचलन / लाइसेंस धारकों / तृतीय पक्ष विनिर्माताओं / संयुक्त उद्यमों / बाहरी स्रोत (आउटसोर्सिंग) भागीदारों के लिए भी लागू होती है।

Arun Mishra

अरुण मिश्रा
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दिनांक : 05 जुलाई, 2022

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Annexures Table

S. 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.	Environment sump 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	Deepak Foundation on 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	CGWA NOC for mine water intersection	Annexure XXIV
25	Application for CGWA water withdrawal mail processed and withdrawl charges deposition	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	Annexure XXXII
33	Copy of Valid CTO	Annexure XXXIII
34	Tailing through closed pipeline	Annexure XXXIV

HINDUSTAN ZINC LIMITED

RAMPURA AGUCHA MINE

WELL WATER ANALYSIS REPORT-April-2022 to Sep- 2022

S. No	1		2		3		4		5		6		7		8		9		10		11	
Code	WW-10		ww-22		GWD		WW-13		HP-1		WW-15		WW-16		WW-23		PRK-1		KOT-1		WW-14	
Month	May-22	Aug-22	May-22	Aug-22	May-22	Aug-22	May-22	Aug-22	May-22	Aug-22	May-22	Aug-22	May-22	Aug-22	May-22	Aug-22	May-22	Aug-22	May-22	Aug-22	May-22	Aug-22
pH	7.70	7.50	7.70	7.42	7.45	7.37	7.55	7.35	7.55	7.31	7.65	7.55	7.40	7.30	7.55	7.19	7.80	7.63	7.65	7.43	7.40	7.31
Alkalinity	280	270	305	280	381	374	215	201	314	288	260	245	322	313	329	299	313	290	402	376	373	352
Chlorides	44	41	53	49	113	101	46	44	64	61	75	71	68	61	78	72	187	173	116	103	41	37
Sulphate	268	261	68	63	139	126	69	61	195	181	97	91	191	185	79	72	215	203	161	154	76	72
CN	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb	0.004	0.003	0.006	0.004	0.008	0.006	0.005	0.004	0.008	0.006	0.006	0.005	0.009	0.007	0.010	0.011	0.009	0.007	0.007	0.008	0.008	0.006
Zn	0.070	0.070	0.009	0.006	0.090	0.080	0.090	0.070	0.090	0.080	0.060	0.050	0.110	0.070	0.100	0.110	0.120	0.100	0.130	0.100	0.100	0.090
Fe	0.120	0.110	0.110	0.120	0.100	0.100	0.100	0.120	0.130	0.080	0.090	0.080	0.120	0.100	0.140	0.100	0.130	0.150	0.100	0.080	0.110	0.090
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	0.001	0.001	0.001	0.001	0.001	0.001
Cu	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Co	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

All figures are in mg/l except pH

Walid

HINDUSTAN ZINC LIMITED **Annexure - I (2/3)**

RAMPURA AGUCHA MINES

PIEZOMETER WATER ANALYSIS REPORT - April-2022 to Sep-2022

S. No.	1		2		3		4		5		6		7		8	
Code	P		H		E1		G1		I1		K		A		Adm	
Months	May-22	Aug-22	May-22	Aug-22	May-22	Aug-22	May-22	Aug-22	May-22	Aug-22	May-22	Aug-22	May-22	Aug-22	May-22	Aug-22
pH	7.55	7.30	7.40	7.21	7.80	7.47	7.75	7.70	7.90	7.50	7.90	7.60	7.40	7.30	7.25	7.29
Alkalinity	333	315	390	370	365	346	358	323	440	413	344	321	330	301	421	374
Chlorides	175	159	129	108	192	167	189	175	131	123	172	167	205	187	271	246
Sulphate	232	209	349	313	365	319	399	368	388	346	285	243	336	298	311	298
CN	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb	0.006	0.005	0.007	0.006	0.011	0.009	0.013	0.011	0.005	0.003	0.009	0.007	0.001	0.001	0.020	0.010
Zn	0.080	0.060	0.140	0.110	0.110	0.090	0.130	0.120	0.080	0.060	0.140	0.120	0.160	0.130	0.090	0.070
Fe	0.130	0.110	0.110	0.090	0.110	0.080	0.120	0.100	0.090	0.070	0.140	0.120	0.120	0.100	0.120	0.090
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	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Co	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ni	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
As	<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	45	43	54	50	70	67	48	45	56	53	57	54	53	49	52	50
Mg	35	31	43	39	51	50	26	22	38	34	37	33	43	40	40	37

Annexure I (3/3)

HINDUSTAN ZINC LTD

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
Apr-22	5.2	2.45	4.2	5.1	5.3	11.6	5.3	5.2	4.4	7.1
May-22	5.9	3.8	4.85	6.6	6.9	14.5	4.9	7.1	4.1	7.9
Jun-22	6.1	5.25	5.7	7.2	7.75	16.2	6.6	7.8	5.9	8.5
Jul-22	5.9	5	5.5	6.8	7.45	15.5	6.0	7.1	5.5	8.1
Aug-22	5.7	4.9	5.3	6.5	7.2	15.4	5.7	6.9	5.3	8.0
Sep-22	5.6	4.7	5.1	6.7	7.3	15.2	5.7	6.8	5.2	7.8

Annexure - II

Analysis of Waste Dump Rocks

Location : Waste Dump

Element	Range		
Pb	0.0002%	-	0.0005%
Zn	0.0700%	-	0.0815%
Cu	0.0005%	-	0.0027%
Cd	0.0001%	-	0.0005%
Ni	0.0020%	-	0.0042%
Co	0.0010%	-	0.0025%

HINDUSTAN ZINC LIMITED

HINDUSTAN ZINC LIMITED RAMPURA AGUCHA MINE **Annexure- III**

AIR MONITORING: AMBIENT AIR & STACK : April 2022 to Sep 2022

Location		Mine Site						Main Gate						Mine Tower					
month/ year	Fortnight	SPM (µg/m3)	PM_{10} (µg/m3)	$PM_{2.5}$ (µg/m3)	SO_2 (µg/m3)	NO_x (µg/m3)	CO (µg/m3)	SPM (µg/m3)	PM_{10} (µg/m3)	$PM_{2.5}$ (µg/m3)	SO_2 (µg/m3)	NO_x (µg/m3)	CO (µg/m3)	SPM (µg/m3)	PM_{10} (µg/m3)	$PM_{2.5}$ (µg/m3)	SO_2 (µg/m3)	NO_x (µg/m3)	CO (µg/m3)
Apr-22	I st	209.60	82.21	32.16	2.76	11.40	360.00	194.62	76.36	36.89	2.41	14.01	360.00	204.75	75.26	43.20	4.33	20.20	310.00
	II nd	209.84	86.55	34.60	5.34	14.35	370.00	211.48	65.35	34.02	5.99	12.16	410.00	168.24	80.47	33.56	4.27	14.68	340.00
May-22	I st	213.42	76.63	47.11	5.07	13.55	340.00	209.19	73.33	32.66	4.77	11.47	360.00	248.66	84.45	36.15	5.52	14.04	350.00
	II nd	214.87	72.58	35.87	4.13	12.60	360.00	201.64	76.50	33.35	3.75	11.81	350.00	205.13	77.42	39.78	4.00	12.97	340.00
Jun-22	I st	153.42	70.94	31.93	4.43	11.56	380.00	209.35	74.46	32.31	4.33	14.43	420.00	203.98	72.10	34.34	4.15	14.43	430.00
	II nd	199.30	77.47	32.45	4.36	12.58	310.00	177.13	74.71	33.72	4.17	12.54	310.00	214.53	78.58	29.79	5.12	15.24	350.00
Jul-22	I st	156.26	60.81	32.55	3.24	12.32	390.00	189.50	70.92	26.52	3.75	12.30	410.00	151.36	70.10	25.66	2.65	12.26	430.00
	II nd	78.86	32.70	13.83	3.19	12.20	290.00	98.56	42.53	21.17	3.11	12.20	310.00	88.23	32.92	12.94	2.57	12.15	310.00
Aug-22	I st	113.82	50.28	23.58	3.87	12.50	220.00	133.26	46.54	20.62	3.87	12.35	230.00	106.23	40.78	19.16	3.72	12.39	180.00
	II nd	98.02	39.82	17.83	3.09	10.39	190.00	84.87	34.32	18.57	2.95	8.73	150.00	86.86	31.10	15.85	2.31	8.61	170.00
Sep-22	I st	162.27	55.14	24.21	3.93	12.85	260.00	143.11	58.54	26.10	3.84	12.62	240.00	156.03	56.47	25.28	3.85	12.54	240.00
	II nd	143.46	67.54	38.74	3.05	12.45	410.00	145.29	77.18	35.40	4.08	12.21	370.00	182.30	66.27	41.10	2.95	12.26	370.00

Location-		Agucha village						Kothiya village						Bherukhera village					
month/ Year	Fortnight	SPM (µg/m3)	PM_{10} (µg/m3)	$PM_{2.5}$ (µg/m3)	SO_2 (µg/m3)	NO_x (µg/m3)	CO (µg/m3)	SPM (µg/m3)	PM_{10} (µg/m3)	$PM_{2.5}$ (µg/m3)	SO_2 (µg/m3)	NO_x (µg/m3)	CO (µg/m3)	SPM (µg/m3)	PM_{10} (µg/m3)	$PM_{2.5}$ (µg/m3)	SO_2 (µg/m3)	NO_x (µg/m3)	CO (µg/m3)
Apr-22	I st	168.24	80.47	33.56	4.27	14.68	340.00	164.25	58.52	26.43	2.39	12.49	270.00	114.06	63.19	25.09	2.16	11.60	240.00
	II nd	155.13	64.53	31.14	4.04	14.57	360.00	145.38	68.98	26.30	4.43	11.11	250.00	145.75	58.86	26.81	5.01	12.95	210.00
May-22	I st	149.98	66.99	27.98	3.26	12.85	250.00	168.24	58.07	27.83	2.47	11.30	240.00	176.76	61.70	28.54	3.93	11.78	240.00
	II nd	149.32	62.84	27.18	3.03	11.12	260.00	138.52	51.30	25.21	2.91	10.48	260.00	157.46	61.35	24.71	3.06	9.60	250.00
Jun-22	I st	143.93	66.22	25.71	2.58	12.30	210.00	149.33	65.73	27.80	3.45	11.78	190.00	131.43	56.49	19.35	2.25	10.24	210.00
	II nd	153.85	69.79	26.85	2.97	12.96	250.00	151.92	66.16	27.47	3.56	13.78	250.00	127.06	60.37	29.73	3.48	9.69	260.00
Jul-22	I st	121.68	57.28	26.98	2.06	9.00	250.00	114.99	56.50	25.50	3.47	9.39	260.00	125.66	54.77	24.15	2.16	9.59	210.00
	II nd	78.69	36.84	17.47	2.85	12.38	270.00	84.46	39.18	15.21	3.13	12.27	250.00	76.18	34.64	17.08	3.16	12.30	260.00
Aug-22	I st	74.95	38.89	21.30	2.07	9.71	160.00	98.86	41.26	16.22	2.22	9.53	150.00	74.38	31.75	17.48	1.67	9.96	170.00
	II nd	83.89	32.10	17.02	2.05	9.36	170.00	82.60	34.18	16.81	2.39	9.26	160.00	72.51	30.18	16.66	2.52	9.40	170.00
Sep-22	I st	117.85	52.35	23.68	3.05	10.38	180.00	120.07	55.27	23.20	3.10	11.37	160.00	105.20	47.44	17.83	2.65	12.95	210.00
	II nd	161.28	58.08	29.37	1.92	13.65	270.00	152.16	52.88	29.37	1.78	13.90	250.00	120.38	48.66	28.45	1.73	12.84	260.00

All figures are in (µg/m3)

STACK MONITORING SPM

Month-Yr	Fortnight	Pr Crusher (SPM)	S. Crusher (SPM)	New Pr Crusher (SPM)
Apr-22	I st	19.64	25.74	29.17
	II nd	19.74	20.34	21.55
May-22	I st	38.58	42.38	40.55
	II nd	42.04	31.75	39.06
Jun-22	I st	16.05	35.02	19.33
	II nd	30.51	42.52	47.35
Jul-22	I st	31.46	37.83	19.38
	II nd	28.06	36.59	19.01
Aug-22	I st	22.49	13.03	23.61
	II nd	26.19	18.66	38.08
Sep-22	I st	14.83	21.63	19.63
	II nd	20.48	17.43	18.69

All figures are in (mg/m3)

Month	CO (mg/Nm3)	Particular Matter, (mg/Nm3)	NOx, (ppm)	NMHC (mg/Nm3)
May-22	97	51.37	287	35
Aug-22	80	51.85	220	26

Annexure-IV

SNo.	Area of Monitoring	NOISE LEVEL AT WORK ENVIRONMENT IN dB(A)						Equipment Condition
		Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	
1	BENEFICIATION PLANT							
	a. Mill Ambient	68.30/67.20	70.3/68.3	69.4/67.3	72.3/67.3	76.30/66.90	74.8/68.2	Day/ Night
	b. Mill- Grinding Area	81.20	83.20	82.30	81.20	80.40	79.30	Plant is in running condition.
	c. Operators cabin mill area	75.40	74.30	75.40	75.40	77.20	74.30	--do--
	d. Flotation cell area	80.20	81.20	80.10	79.30	78.50	74.30	--do--
	e. AFM's cabin cell area	77.40	78.30	75.30	79.40	75.30	76.50	--do--
	f. Shift engineer's room	78.40	75.30	75.60	74.50	72.30	75.40	--do--
	g. Control room	74.50	79.30	75.00	74.50	79.10	72.90	--do--
	h.Work Shop	77.70	77.10	76.40	76.50	73.80	74.90	
	i. Mine Tower	74.2/66.3	72.5/63.2	72.3/66.4	73.5/70.2	70.8/61.4	74.5/64.2	--do--
2	PRIMARY CRUSHER							
	a. Primary Crusher I Control Room	74.3/64.3	75.6/64.5	73.0/67.3	72.4/69.4	78.4/64	79.7/65.2	Day/ Night
	b. Primary Crusher II Control Room	76.7/60.5	75.1/65.9	70.4/64.5	73.5/70.1	72.4/63.6	71.7/62.4	Day/ Night
3	SEC./TERT. CRUSHER							
	a. Shift Room Sec. Crusher	77.7/63.2	73.2//66.3	72.1/63.2	73.4/71.2	71.5/64.1	74.1/61.8	Day/Night
	b. Secondary crusher control room	75.30	74.60	73.10	72.30	72.20	72.80	Plant is in running condition.
	Ambient Mine Pit	75.3/70.2	77.2/71.2	75.6/72.3	74.3/71/2	71.3/68.4	71.1/68.2	Day/ Night
4	Ambient Noise							
	Main Gate	72.1/64.3	70.5/67.3	73.2/65.9	71.3/68.3	70.1/64.8	73.9/65.1	Day/ Night
	Agucha	59.40/47.0	60.3/53.2	56.7/54.3	59.2/54.2	58.5/51.5	54.8/52.5	Day/ Night
	Bherukhera	58.3/52.3	57.9/52.4	60.1/54.1	58.3/51.3	55.4/52.5	58.4/52.9	Day/ Night
5	Village monitoring							
	Agucha	50.3/41.0	49.3/43.5	46.4/42.3	42.3/41.5	48.7/41.9	44.8/40.8	Day/ Night
	Bherukhera	49.5/42.3	47.6/41.2	48.3/47.4	44.6/43.2	44.8/40.9	46.7/44.3	Day/ Night
	Kothiya	48.3/40.3	49.0/41.1	49.0/43.9	48.2/42.1	48.7/40.7	46.9/40.4	Day/ Night

DG set Noise Monitoring			
Month		Location	Noise level(dB)
1	May-22	DG set Operator's room	74.90
		DG set Hall	101.20
2	Aug-22	DG set Operator's room	70.6
		DG set Hall	95.7

Annexure - V

Env. Sump water analysis (April-22 to Sep-22)

Prameter	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22
pH	7.8	7.6	7.4	7.5	7.3	7.2
Oil & Grease	BDL	BDL	BDL	BDL	BDL	BDL
Alkalinity	650	670	640	630	590	550
Chlorides	690	710	730	690	670	630
Hardness	943	970	890	810	790	730
TDS	1290	1310	1270	1210	1210	1190
Pb	0.01	0.01	0.01	0.01	0.01	0.01
Zn	2.1	2.2	2.0	1.9	1.6	1.5
Fe	0.14	0.15	0.16	0.13	0.11	0.1
Cd	0.01	0.01	0.01	0.01	0.01	0.01

All value are in mg/l except pH

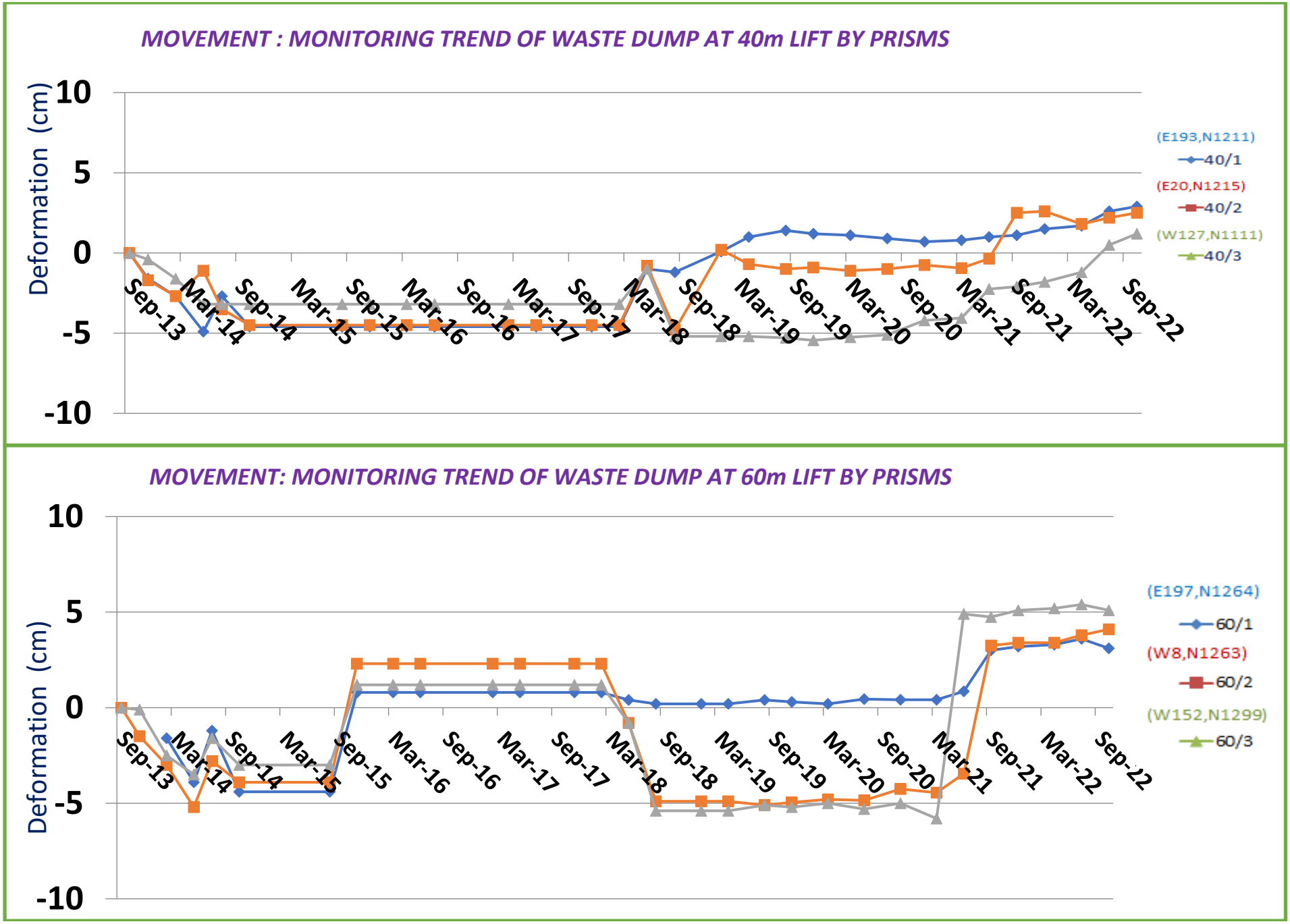
Remarks : Collected Water is pumped to reclaim reservoir and recycled back to plant for reuse. Zero discharge is maintained.

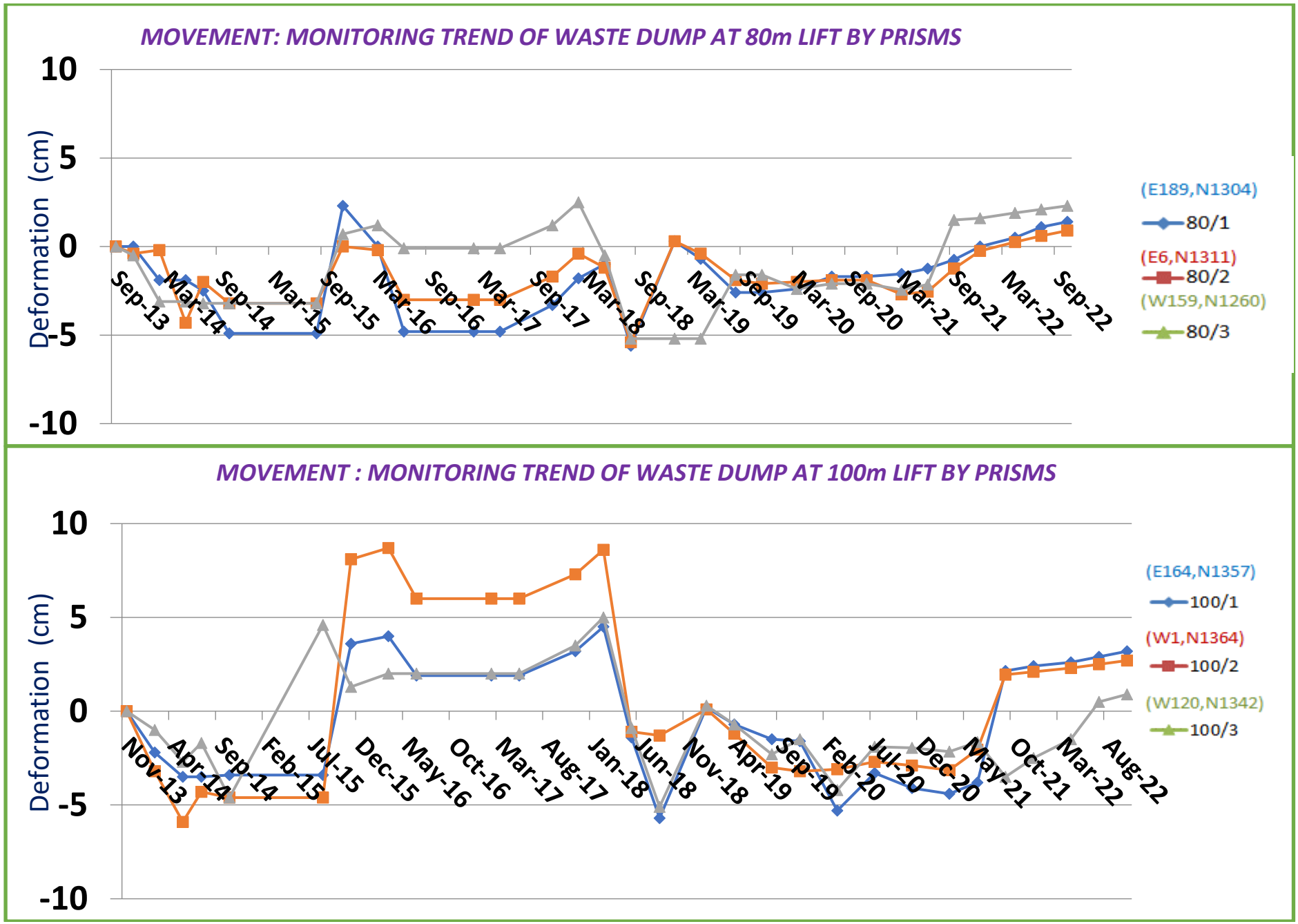
Annexure -VI

ENVIRONMENTAL EXPENDITURE DETAILS

Particulars	2022-23					
	October 2021 to March 2022					
Expenditure	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22
	9.44	15.96	16.37	110.87	50.73	11.22
TOTAL Rs (Lacs)	214.58					

Dump Slope monitoring Data: Radar & pillar-prism Monitoring data for MOEF_ NOV 2022


MOVEMENT : MONITORING TREND OF WASTE DUMP AT 40m LIFT BY PRISMS
Deformation (cm)
10
5
0
-5
-10
Sep-13
Mar-14
Sep-14
Mar-15
Sep-15
Mar-16
Sep-16
Mar-17
Sep-17
Mar-18
Sep-18
Mar-19
Sep-19
Mar-20
Sep-20
Mar-21
Sep-21
Mar-22
Sep-22
(E193,N1211)
40/1
(E20,N1215)
40/2
(W127,N1111)
40/3
MOVEMENT: MONITORING TREND OF WASTE DUMP AT 60m LIFT BY PRISMS
Deformation (cm)
10
5
0
-5
-10
Sep-13
Mar-14
Sep-14
Mar-15
Sep-15
Mar-16
Sep-16
Mar-17
Sep-17
Mar-18
Sep-18
Mar-19
Sep-19
Mar-20
Sep-20
Mar-21
Sep-21
Mar-22
Sep-22
(E197,N1264)
60/1
(W8,N1263)
60/2
(W152,N1299)
60/3


MOVEMENT: MONITORING TREND OF WASTE DUMP AT 80m LIFT BY PRISMS
Deformation (cm)
10
5
0
-5
-10
Sep-13
Mar-14
Sep-14
Mar-15
Sep-15
Mar-16
Sep-16
Mar-17
Sep-17
Mar-18
Sep-18
Mar-19
Sep-19
Mar-20
Sep-20
Mar-21
Sep-21
Mar-22
Sep-22
(E189,N1304)
80/1
(E6,N1311)
80/2
(W159,N1260)
80/3
MOVEMENT : MONITORING TREND OF WASTE DUMP AT 100m LIFT BY PRISMS
Deformation (cm)
10
5
0
-5
-10
Nov-13
Apr-14
Sep-14
Feb-15
Jul-15
Dec-15
May-16
Oct-16
Mar-17
Aug-17
Jan-18
Jun-18
Nov-18
Apr-19
Sep-19
Feb-20
Jul-20
Dec-20
May-21
Oct-21
Mar-22
Aug-22
(E164,N1357)
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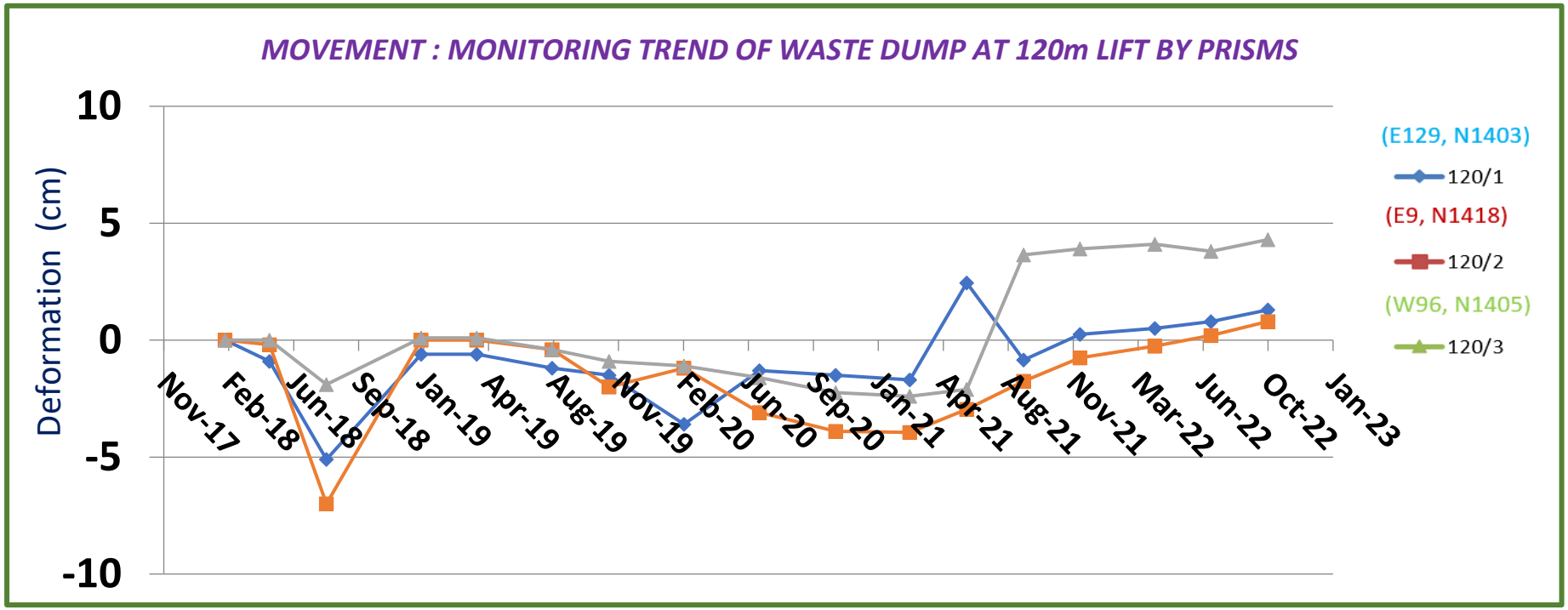
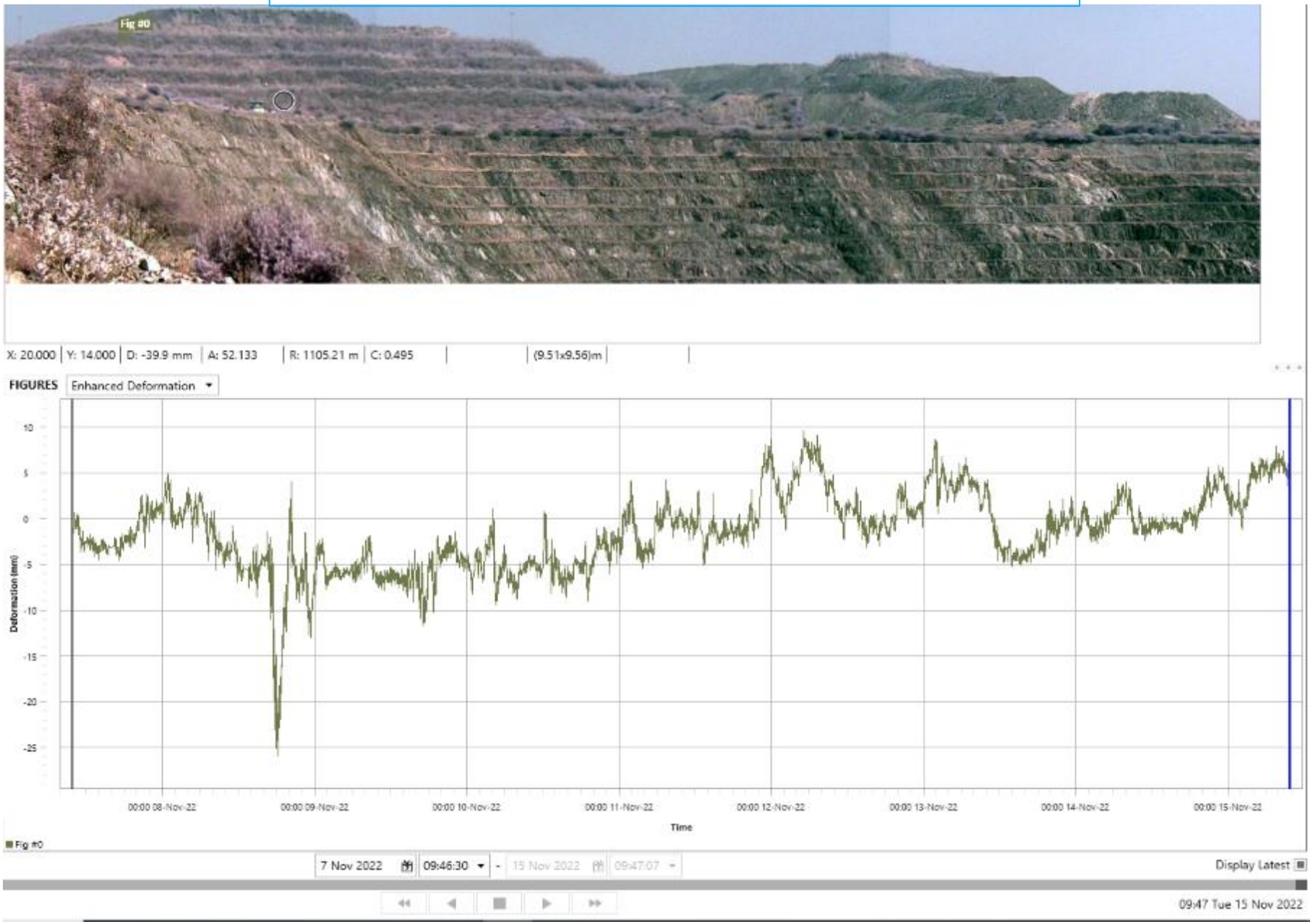
(W1,N1364)
100/2
(W120,N1342)
100/3


MOVEMENT : MONITORING TREND OF WASTE DUMP AT 120m LIFT BY PRISMS
Deformation (cm)
10
5
0
-5
-10
Nov-17
Feb-18
Jun-18
Sep-18
Jan-19
Apr-19
Aug-19
Nov-19
Feb-20
Jun-20
Sep-20
Jan-21
Apr-21
Aug-21
Nov-21
Mar-22
Jun-22
Oct-22
Jan-23
(E129, N1403)
120/1
(E9, N1418)
120/2
(W96, N1405)
120/3

Slope Stability Radar monitoring on waste Dump Area



Slope Stability Radar monitoring on waste Dump Area

Annexure – VIII

Garland Drain Photo

Annexure – IX

Plantation

Annexure- X

40KL Water sprinkler

Annexure XI

Anicut Photos

Annexure -XII

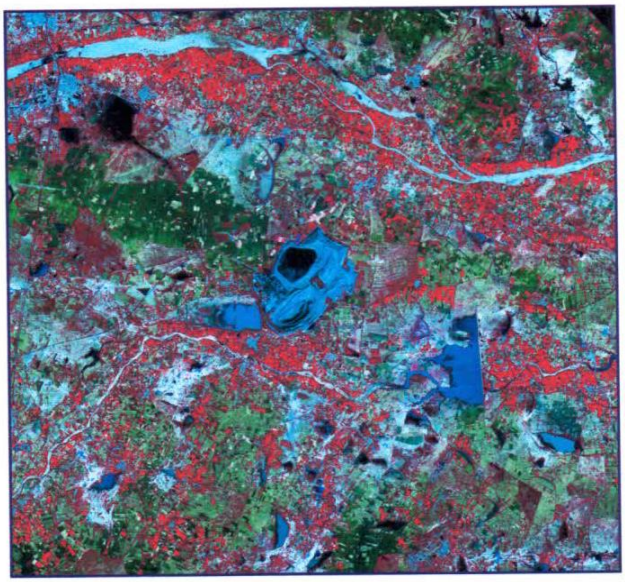
Pond Photo

Annexure-XIII

Truck covered with tarpaulin

Annexure -XIV

Land use mapping by digital processing of 15 km. radius of Rampura-Agucha mine, district Bhilwara using remote sensing techniques and showing the changes in land use during last three years



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

Studied by:

Estb: 1988

Studied for:

Hydro-Geosurvey Consultants Private Limited
C-103, Shastri Nagar, Jodhpur- 342003
Phone: - 0291-2431754
Web: www.hydrogeosurvey.com, E-mail: - hydro.geosurvey@yahoo.com
March, 2018

Annexure -XV

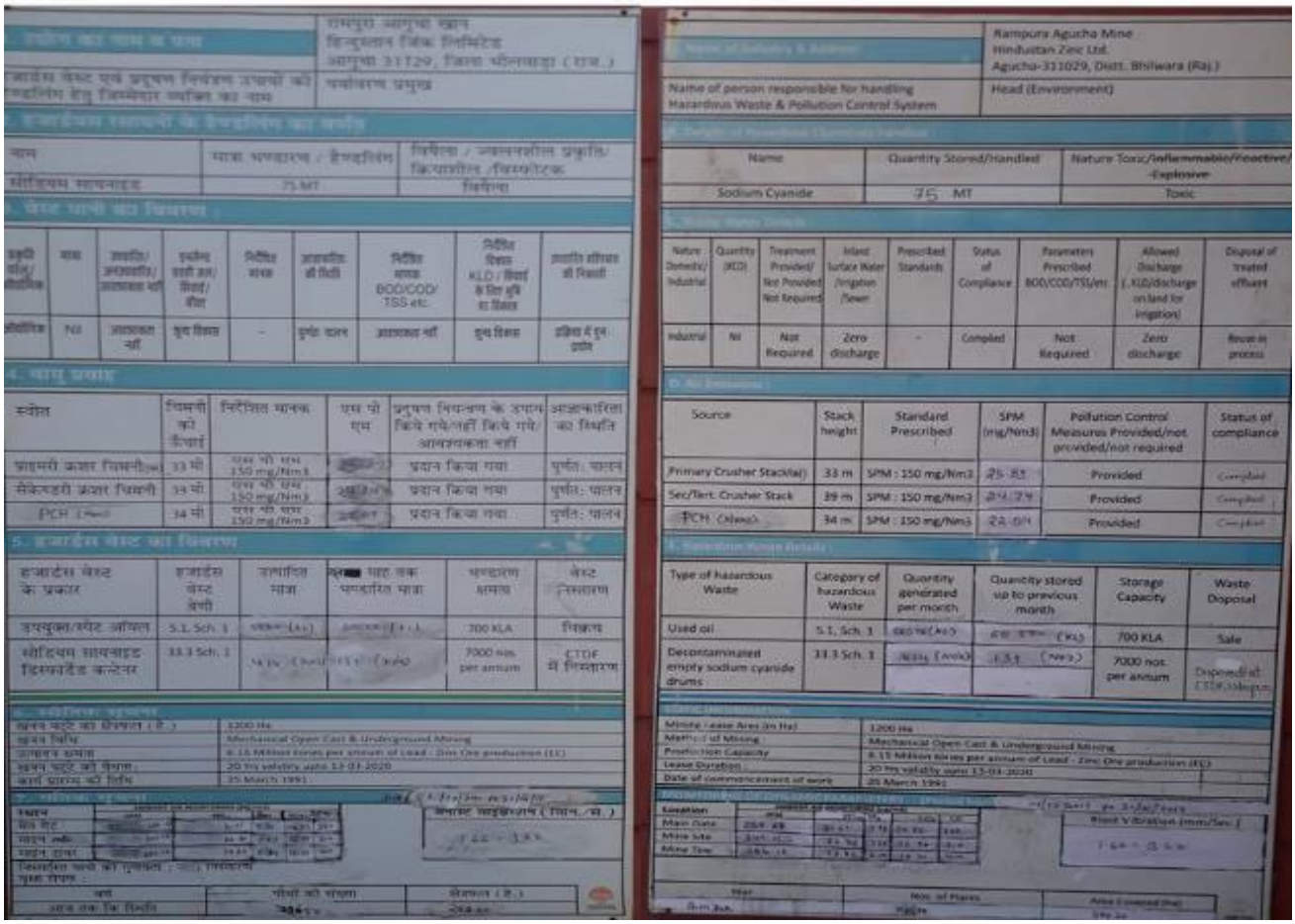
HDPE laying in tailing dam

Annexure-XVI

STP (300KLD) in plant premises

STP (425KLD) in plant premises

Annexure -XVII



Display board at Main gate

Annexure-XVIII

Oil trap

Annexure -XIX

vedanta
transforming elements

HZL/RAM/Env/2022-2023/1386

September 27, 2022

Member secretary
Raj. Pollution Control Board
4, Institutional Area
Jhalan Doongri
JAIPUR

Sub : Environment Statement of Rampura Agucha Mine for year 2021-2022

Ref: CTO granted vide order No 2019-2020/Mines/9959 dated 25/06/2019.
CTO granted vide order No 2019-2020/CPM/5547 dated 22/10/2019.
EC granted vide letter No J-11015/267/2008-IA.II (M) dated 11.12.2009

Sir/Madam,

Please find enclosed herewith the environmental statement for financial year ending on 31st March 2022.

Thanking you

Yours truly,

(Kishore Kumar S)
CEO Agucha IBU

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

cc to: **Regional Officer** **: for kind information please.**
Raj. State Pollution Control Board
18, Azad Nagar, Pannadhay Circle,
Mining Engineer Office Road (Near Telephone Exchange)
Bhilwara (Raj.)

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

Hindustan Zinc Limited
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→ O/C Environment

SWASTHYA SEWA

Quarterly Report

July '22 to September '22

Submitted to:

HINDUSTAN ZINC LTD.

Submitted By:

Deepak Foundation

Abbreviations

ASHA	Accredited Social Health Activist
ANC	Ante-Natal Care
AWW	Anganwadi Workers
BHO	Block Health Officer
BMI	Body Mass Index
BPL	Below Poverty Line
CHC	Community Health Center
HH	House Hold
HB	Hemoglobin
IEC	Information, Education and Communication
IFA	Iron-folic acid tablet
MHU	Mobile Health Unit
NCD	Non-Communicable Disease
OPD	Out-Patient Services
PHC	Primary Health Center
RBS	Random Blood Sugar

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Project: Mobile Health Services to improve the Health and Nutritional profile of underprivileged communities -A Corporate Social Responsibility Initiative

1.0 Introduction:

Hindustan Zinc Limited is committed to contributing to the quality of life and social well-being of the communities where it operates. The business model clearly states that "our social license to operate come not only from the Government but from the communities surrounding our operations. Our growth has true meaning when it creates betterment opportunities for the people around us.

Hindustan Zinc Ltd is already running its Zinc smelter plant at Zawar, Chanderiya, and Rampura Agucha Mines in Rajasthan. To support the healthcare of people in the villages around the plant, Hindustan Zinc initiated the provision of quality healthcare services in selected villages. Mobile Health Units have been envisaged to provide preventive, promotive, and curative health care in inaccessible areas and difficult terrains. Taking health care to the doorsteps is the principle behind this initiative and is intended to reach underserved areas. The Mobile Health units not only look after the curative and referral aspects but also render behavioral changes and awareness to promote healthy lifestyles by supporting existing healthcare programs, improving access to essential health services, providing a link for referral services, community health education, and health promotion, identification and referral of severely malnourished children among others.

Based on the needs assessed on the 'health' portfolio in the villages and experience of healthcare service provision in these selected regions, it is planned to extend the project in partnership with Deepak Foundation to provide basic healthcare facilities through Mobile Medical Unit that will cater to all the needs mapped.

1.1 Objective: To improve the health care service accessibility and awareness of key health and nutrition issues through a Mobile Health Unit in the underserved population of selected villages.

1.2 Location: The Mobile Health Unit is currently providing medical services in 26 selected villages nearby Rampura Agucha Mines.

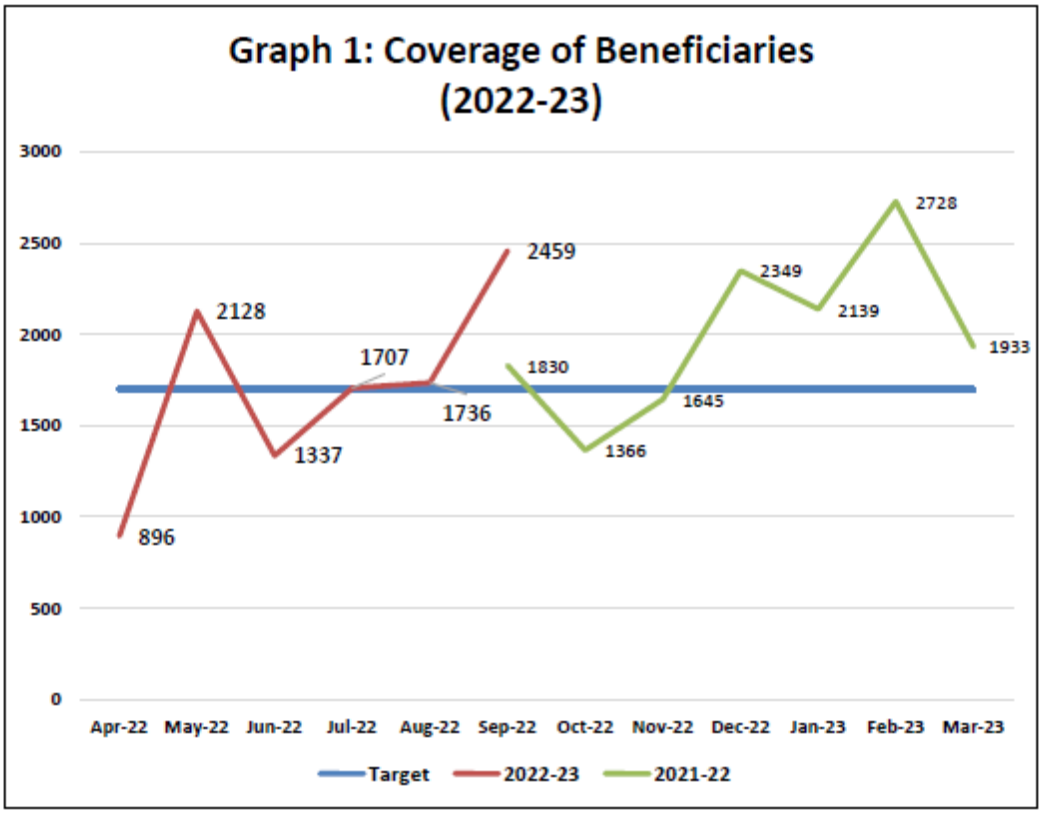
1.3 Methodology:

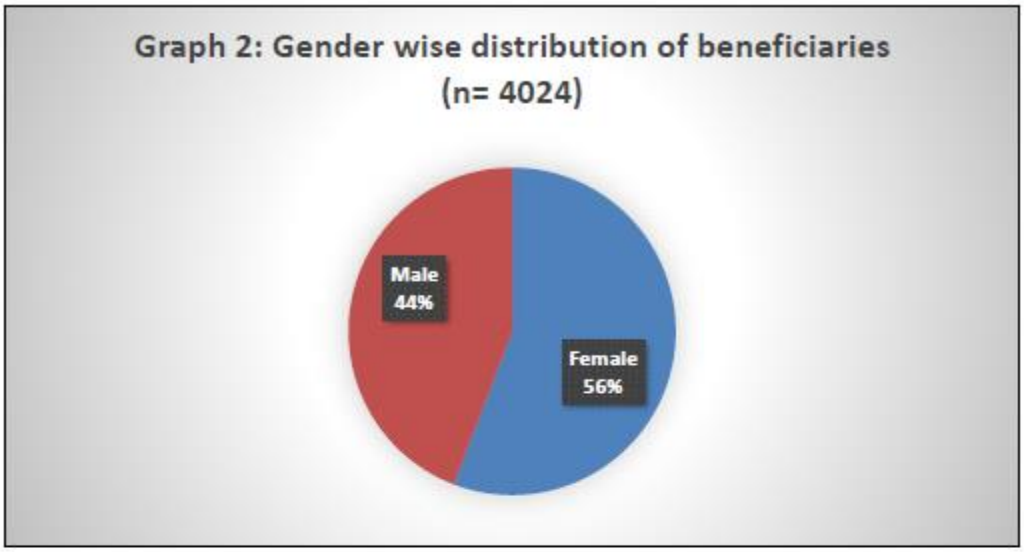
1. Monthly plans are made to cover villages twice a month.
2. Daily counseling is conducted as per the emerging needs of the community.
3. Awareness Session on key topics
4. Weight monitoring of children aged of 5 years

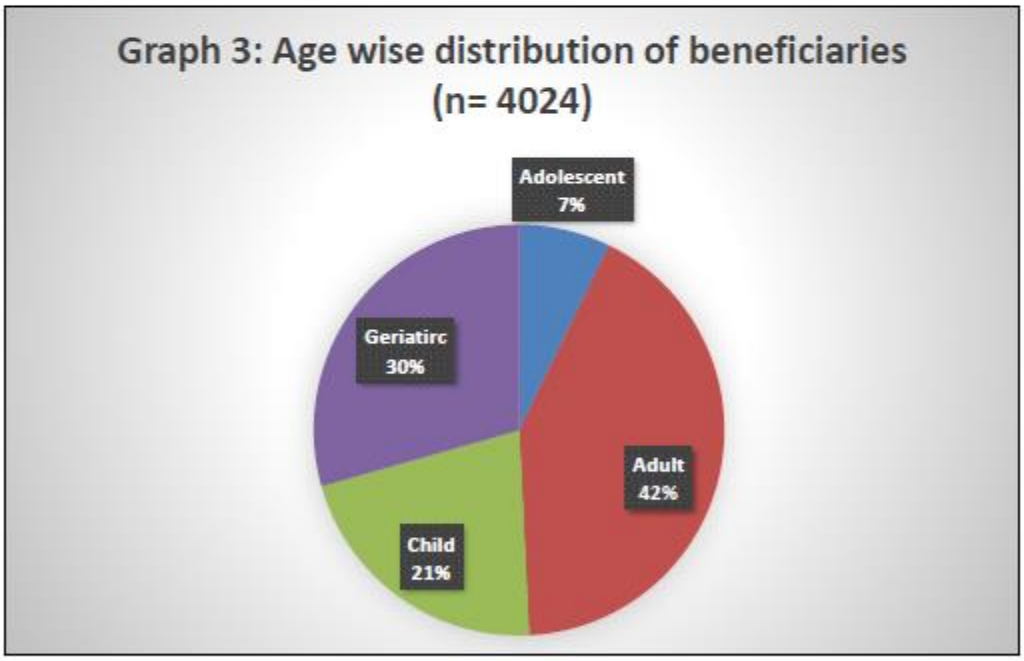
2.0 Activity report

The activities undertaken in three months – July 2022 to September 2022 are as follows

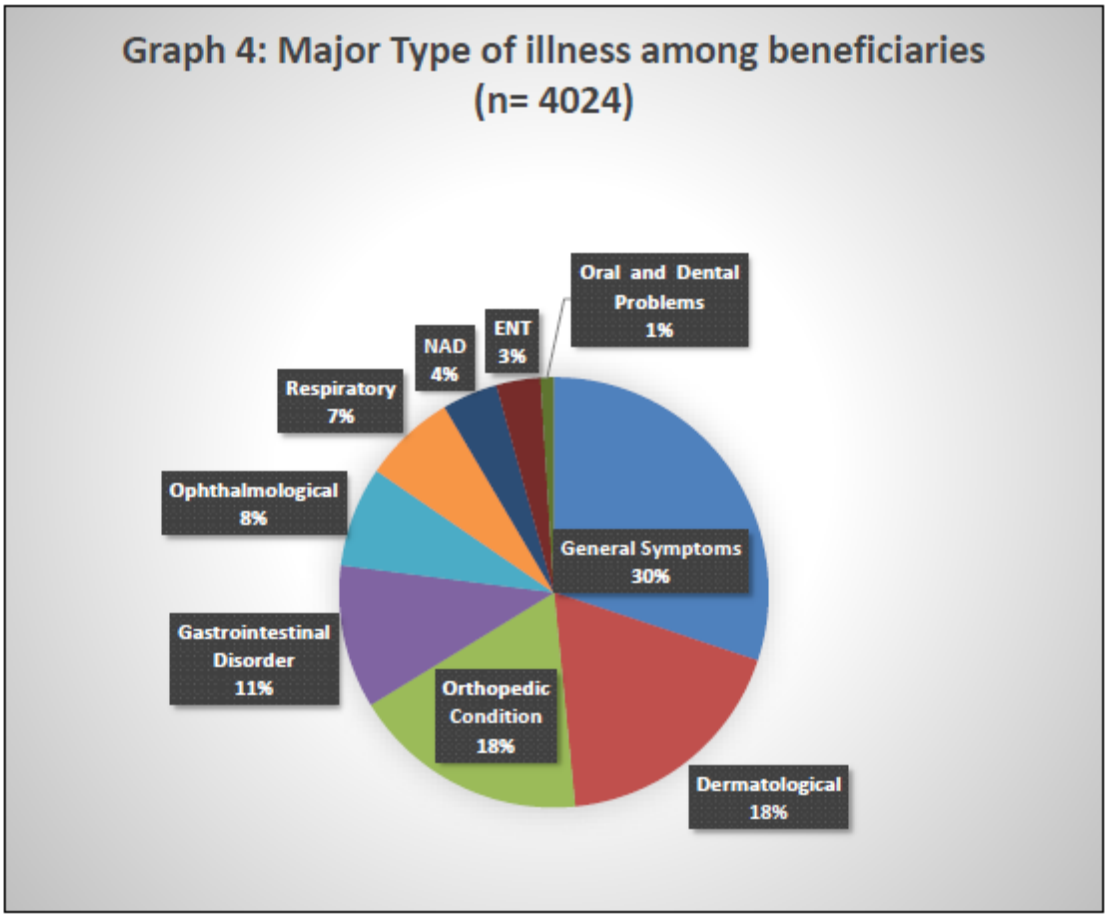
- **Total Beneficiaries:** The mobile health unit covered a total of 5902 beneficiaries during regular OPD, health camp, awareness sessions and daily counseling.
- **Household Coverage:** MHU services reached to new 604 households
- **Unique Patients:** Total 1919 new unique patients we treated in current quarter
- **OPDs:** The unit attended 4024 patients from July 2022 to Sept. 2022 **(Graph 2, 3 & 4)**
- **IEC/Counseling:** A total of 170 beneficiaries were counseled individually as well as in group, on topics related to personal hygiene and non-communicable diseases.
- **Awareness Session:** Counselled 1708 beneficiaries under different sessions




Graph 2: Gender wise distribution of beneficiaries
(n= 4024)
Male
44%
Female
56%


Graph 3: Age wise distribution of beneficiaries
(n= 4024)
Adolescent
7%
Geriatirc
30%
Adult
42%
Child
21%

Looking at the disease load (**Graph 4**) over a period of three months, General Symptoms were found to be very common (30%), followed by Dermatological problems (18%), Orthopedic Condition (18%) and Gastrointestinal disorder (11%).



Note: ENT is ear, nose, and throat & NAD – No abnormality detected

3.0 Telemedicine

Total patients screend in second quarter, through the system are 171. This includes 71 students from Siksha Sambhal Schools.

4.0 Special Days Celebration and Awareness Sessions

Sr. No.	Topic	Beneficiary	Remarks
1.	Skin Diseases (Fungal Infection)	24	2 villages
2.	Handwash and Hygiene Practices	170	6 villages
3.	Safety Training	110	2 villages
4.	National Nutrition Month	189	12 villages
5.	Tuberculosis	20	
6.	World First Aid Day	237	




5.0 Case Study

Javed Mohammad Rafik

Name: Javed Mohamad Rafik

Age: 18 Years

Gender: Male

Village: Khatikheda

For the last one and a half months, the patient was suffering from boils and pain. He visited the nearest hospital and followed the instructions given by the practitioner but was not able to get relief from the same. Meanwhile, the community mobilizer informed the patient about the services provided by Mobile Health Unit. He visited the van on 26th August 2022 and described the issue in detail to the medical officer.

He started the treatment provided by the unit and got relief from the boils. The counselor was in regular touch with the patient to get his exact status of him.

Complaints at the time of 1st visit: The patient had boils on the skin, the affected area was inflated and was complaining of pain and itching.

Medical reports: Hb reports 10.7, BP Normal, Sugar Normal.

Diagnosis: Boils.

Counseling and other support provided:

MHU continuously connected with the patient from 26th August 2022 and gave him proper tests, treatment, and counseling for a cure.

Remark and Feedback from the patient: He like the services are given by MHU and its staff.

BEFORE TREATMENT

AFTER TREATMENT

6.0 Glimpses





CSIR-Central Institute of Mining and Fuel Research, Dhanbad

(Council of Scientific and Industrial Research)

Project Title	:	Study on Slope Stability Condition of Rampura Agucha Mine and Dump, HZL.
CIMFR Project No.	:	SSP/360/2018-19
Sponsor	:	HZL
Project Co-ordinator	:	V. K. Singh, Chief Scientist (Ex)
Project Leaders	:	J. K. Singh, Chief Scientist
Project Collaborator	:	Mr. A. Kumar, Scientist Dr. S.K. Roy, Scientist Dr. Ritesh Kumar, Scientist Mr. Rakesh Kumar Singh, Mr. M. Kumar, Mr. U.K. Thakur & Mr. B.L. Sharma.

April 2020

Note:

1. The report is meant only for 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 department. CIMFR reserves the right to publish the results in a general way for the benefit of the industry without disclosing the name of the sponsor.
2. Recommendations stipulated in the report should be implemented under the supervision of a competent agency and strictly be followed.

30/04/2020

Project Leader
(J. K. Singh)
Chief Scientist
Slope Stability

30/04/2020

HOS & HORG
(J. K. Singh)
Chief Scientist & HORG
Slope Stability

CSIR-CIMFR Authorised Signatories

30/04/2020

(P. K. Mishra)
Sr. Principal Scientist & HOS
Project Monitoring

01/05/2020

(RVK Singh)
Chief Scientist & HORG
Business Development & Industrial Liaison

Introduction

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 steepness, 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.

The slope stability and slope monitoring studies are not yet included as an integral part of the total pit design in India. The subject gets importance only when slope failure takes place putting in danger the entire mining operations or when a failure is impending. But the mine management of Agucha Mine entrusted the slope stability and slope monitoring studies to CIMFR, in consultation with DGMS, along with the slope steepening. It shows the scientific and technical aptitude of the mine management for the safe and economic mining.

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 report deals with the assessment of slope stability condition at Agucha Mine and dump during the year 2018-19.

The stability of slopes depends on the geological structures, geomechanical properties of the slope materials and groundwater condition in the mine. A more justified and suitable remedial measure can be planned for any critical slope after sensitivity analysis.

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.

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 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 such structure in the freshly exposed slope mass.

Geo-mechanical Properties

The engineering properties of the litho units in freshly exposed slope face were tested to determine any significant changes in the properties. Because the significant changes in the properties influence the slope stability of steeper slopes. The testing revealed that the properties of the freshly exposed slope mass is same as that of the previously tested values, which were used for optimum slope design. It may however be prudent to continue the testing of freshly exposed slope mass for any significant changes in the engineering properties. Fresh sampling and

testing should be done to verify any change in the soil/ rock characteristic at different stages of mining. The updated geotechnical parameters are used for stability analysis to determine the stability condition of the slopes during different stages of mining. It helps to accommodate the changes by suitably modifying the slope design. It will help to detect any unfavorable conditions at different stages of mining at the earliest possible. The remedial measures can be taken well in advance without any loss to men and machineries.

Mine and Dump Drainage

The 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 planned to make 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 drain should be of the size to contain the rainwater of the catchment area and free from silt and debris. It should 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 can be very 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 are effective in the bench slope.

Sl No	Month	Area	HW/FW	mRL	No of Holes	N/S	E/W	Z/mRL	Hole Depth
5	NOV-2015	S-5 (S)	HW	360mRL	1	S-451.32	E-721.46	360.30	100.77
					1	S-450.65	E-721.53	360.32	100.29
					1	S-449.28	E-720.84	360.34	100.69
					1	S-555.48	E-614.22	361.18	100.34
					1	S-558.92	E-614.45	361.21	101.17
					1	S-559.86	E-614.38	361.14	97.26
9	MAR-2016	S4	HW	210mRL	1	S-651.95	E-325.88	209.81	100.00
		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	1	N-649.40	E-159.76	180.40	100.00

HORIZONTAL HOLE DETAILS in 2017-18						
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 de-pressurisation 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.

RAM Reference	Area	Diameter (mm)	Hole coordinate			Total Hole Depth	Pump Depth
			Easting	Northing	Level		
FW-5	Footwall	200	-290.749	389.1716	395.344	280	165
FW-4		300	-288.509	406.6101	394.5771	250	170
FW-3		200	-283.585	432.4879	395.5617	250	140
FW-2		300	-268.219	475.547	395.9831	300	180
FW-1		300	-271.366	523.6365	397.1367	300	175
FW-8		200	-293.092	297.9466	394.2964	250	150
FW-9		200	-293.092	297.9466	394.2964	300	150
FW-10		200	-297.137	260.0581	394.2441	300	160
HW S- 10	Hang wall South	200	719.5336	-549.085	381.6597	300m	no pump
HW S- 9		200	736.3627	-505.28	381.5443	300m	no pump
HW S-8		200	770.7632	-439.566	382.0639	300m	no pump
HW S-7		200	788.2154	-396.905	382.0412	300m	no pump
HW S-6		300	864.2075	-261.069	380.6063	300m	no pump
HW S-5		300	866.2058	-183.555	380.2014	150m	no pump
HW S-4		300	866.6772	-99.2262	381.4573	300m	150m
HW N-25	Hangwall North	200	874.0667	44.3036	383.3434	300m	180
HW N-24		200	875.8058	95.6745	383.8025	300m	170
HW N-23		200	883.3706	162.5701	384.023	300m	210
HW N- 22		200	875.5585	187.3812	384.2293	300m	200
HW N-21		300	870.6087	227.1129	384.2181	300m	150
HW N-20		200	865.0505	256.8628	384.1975	300m	no pump
HW N-19		300	851.2509	294.6044	384.6086	300m	200
HW N-18		200	842.6937	321.5851	384.5972	300m	no pump
HW N-17		300	826.0143	367.5951	385.495	300m	200
HW N-16		300	823.8102	405.1051	386.1844	220m	no pump
HW N-15		300	834.2513	426.8778	386.0202	300m	200
HW N-14		300	828.4029	458.89	385.8167	300m	180
HW N-13		300	820.09	483.7475	385.8984	300m	210
HW N-12		300	809.5273	510.9489	385.4936	300m	220
HW N-11		300	800.7824	533.3444	385.6768	300m	200
HW N-10		300	789.2551	562.6051	386.3938	300m	220
HW N-9		300	779.3143	584.3189	386.221	300m	220
HW N-8		300	770.3439	602.629	386.3574	150m	140
HW N-7		300	760.238	631.4697	386.714	300m	180
HW N-6		300	733.4017	678.3848	386.2636	300m	160

HW N-5		300	720.9251	702.6615	386.8758	300m	220
HW N-4		300	697.9528	722.5213	388.0278	300m	no pump
HW N-3		300	675.633	743.3517	388.9216	300m	no pump
HW N-2		300	654.9147	758.6027	389.264	300m	no pump
HW N-1		300	623.6079	789.6098	390.3405	300m	no pump
BH-1	HW (Beyond Waste Dump)	200	804.2718	848.6914	386.8391	300m	no pump
BH-2		300	839.726	843.652	386.0978	300m	160
BH-3		300	884.6845	875.6011	386.4324	300m	170
BH-24		300	879.9717	893.1632	386.2174	300m	150
BH-25		300	871.9622	912.1199	386.2913	300m	150
BH-26		300	854.5497	943.0866	386.4555	250m	180
BH-4		300	972.4053	293.7742	384.6721	300m	150
BH-5		200	977.1601	323.1639	384.5139	hole jaam	no pump
BH-6		200	965.0682	356.205	384.9563	200m	no pump
BH-7		300	953.091	408.5018	384.9115	250m	150
BH-8		200	958.2362	424.2117	384.5256	60m	no pump
BH-9		300	963.2216	455.1807	384.6935	300m	200
BH-10		300	942.8235	465.9094	386.3996	300m	180
BH-11		200	934.1046	513.8465	385.4714	220m	150
BH-12		200	944.1067	533.0436	385.4041	200m	160
BH-13		300	929.7688	561.2824	385.7308	160m	120
BH-14		200	943.5704	572.6062	385.859	200m	150
BH-15		300	927.0508	615.0502	385.5938	160m	170
BH-16		200	957.1403	649.8399	385.4196	240m	160
BH-17		200	949.9003	675.3548	385.5552	250m	150
BH-18		300	923.2753	650.9462	385.7562	300m	160
BH-19		200	914.1179	681.4057	385.5016	300m	180
BH-20		200	941.7511	707.1684	385.7951	200m	no pump
BH-21		200	913.8931	730.6833	386.4344	60m	no pump
BH-22		300	901.977	778.36	386.1074	200m	180
BH-23		200	903.0086	823.6372	386.1265	70m	60

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

Sr. No.	Piezometer No.	Location	Depth (m)	RL (m)
1	PM-3	S-400	150	373.1
2	PM-19	S-400	190	390.2
3	PM-43	S-400	108	378.5
4	PM-34	S-350	205	378.5
5	PM-30	S-300	190	384.7
6	PM-26	S-250	135	380
7	PM-9	S-200	160	390
8	PM-20	S-100	184	390
9	PM-33	S-100	83	391
10	PM-32	S-100	150	391
11	PM-16	NS-00	160	391
12	PM-44	N-120	106	382
13	PM-13	N-200	207	382
14	PM-31	N-300	175	393
15	PM-39	N-500	193	395
16	PM-40	N-575	103	395

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 rainwater. 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 20m high external dump has been placed at about 30m distance from the pit crest (390mRL) towards South Across zone. It is a dead weight over standing slope mass. It adds to instability. No dumping should be done near the pit crest.

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 post-mortem 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

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 November 2019 is 236. 87 stations are located towards hangwall side and 149 stations are towards footwall side of the mine.
  - The following changes were observed among the stations made available for the monitoring purpose.
    - The maximum change of 16.8 cm has been observed at N/775 of 360mRL bench, 10.7 cm at N575 of 280mRL and 9.4 cm at N/700 of 350mRL bench, towards hangwall side.
    - 54 numbers stations are showing change between 3.0 cm to 6.9 cm in footwall side during the visit.
    - 18 cm and 9.4 cm have been observed respectively at S/50 of 366mRL and S/350 of 390mRL bench of footwall side.
  - 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 43 stations were made available for the monitoring purpose. The maximum change of 9.4 cm has been observed at W/120 and W/1075, 8.1 cm at W/400 during the observation of November 2019.

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 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 sealed 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 November 2019 is 236. 87 stations are located towards hangwall side and 149 stations are towards footwall side of the mine.
- The following changes were observed among the stations made available for the monitoring purpose.
    - The maximum change of 16.8 cm has been observed at N/775 of 360mRL bench, 10.7 cm at N575 of 280mRL and 9.4 cm at N/700 of 350mRL bench, towards hangwall side.
    - 54 number stations are showing change between 3.0 cm to 6.9 cm in footwall side during the visit.
    - 18 cm and 9.4 cm respectively have been observed at S/50 of 366mRL and S/350 on 390mRL bench of footwall side.

Dump:

- Total 43 stations were made available for the monitoring purpose. The maximum change of 9.4 cm has been observed at W/120 and W/1075, and 8.1 cm at W/400 during the observation of November 2019.
- 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 and road.
- 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 effective 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 footwall 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 run-off 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.

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PIT

Table 1: Changes in Horizontal Distance from hangwall Base Station for F/W Pillars. (Monitoring stations are located on 390 M RL bench)

Station No.	Horizontal Distance in meter. October 2018	Change in Horizontal Distance in cm.			
		January 2019	April 2019	August 2019	November 2019
N/675	1286.281	-0.1	+0.1	-0.2	-0.5
N/650	1279.263	-0.2	0.0	-0.3	-0.5
N/600	1260.210	-0.2	-0.1	-0.3	N.V
N/575	1255.757	-0.1	+0.3	-0.1	-0.6
N/550	1254.826	-0.2	+0.1	-0.1	-0.7
N/500	1251.294	-0.1	0.0	-0.5	-1.2
N/475	1245.527	-0.2	+0.2	-0.7	-1.6
N/425	1235.057	-0.2	+0.2	-0.4	-1.0
N/400	1229.828	-0.2	+0.2	-0.5	-1.1
N/300	1205.676	-0.2	+0.3	-0.4	-1.2
N/250	1190.508	-0.3	+0.2	-0.4	-1.2
N/175	1169.167	-0.3	+0.4	-0.3	-1.1
N/75	1132.917	-0.3	+0.2	-0.2	-1.0
N/50	1128.066	-0.5	+0.1	-0.1	-0.8
N/25	1123.771	-0.4	+0.3	-0.2	-1.0
NS00	1120.169	-3.2	-2.9	-3.0	-4.0
S/25	1116.391	-0.4	+0.4	-0.4	-1.1
S/50	1113.655	-0.2	+0.7	-0.2	N.V
S/75	1109.964	-0.7	0.0	-0.7	N.V
S/100	1106.514	-0.6	+0.3	-0.6	N.V
S/125	1104.099	-0.6	+0.1	-1.7	-4.0
S/175	1108.839	-0.7	-0.1	-1.8	-3.8
S/200	1111.569	-0.9	-0.6	-1.6	-4.6
S/225	1115.711	-0.6	-0.3	-1.6	-2.8
S/250	1116.993	-0.6	0.0	-1.2	-2.7
S/275	1121.490	-0.4	+0.3	-1.1	-2.9
S/300	1124.947	-0.5	+0.5	-1.2	-2.7
S/325	1128.194	-15.1	N.V	N.V	+3.6
S/350	1137.185	-1.9	-2.9	-6.8	-9.4
S/400	1160.522	-0.8	-0.1	-0.9	-2.2

Note: "+" and "-" signs indicate increase and decrease in the Horizontal Distance respectively. N.V. stands for "Not Visible".

Table 1 contd : Changes in Horizontal Distance from hangwall Base Station for F/W Pillars.
(Monitoring stations are located on 390M RL bench)

Station No.	Horizontal Distance in meter. October 2018	Change in Horizontal Distance in cm.			
		January 2019	April 2019	August 2019	November 2019
S/425	1169.705	-0.7	0.0	-1.0	-2.1
S/450	1177.498	-0.6	+0.2	-0.7	-2.2
S/475	1184.466	-0.5	+0.1	-0.7	-2.3
S/500	1190.170	-0.7	0.0	-0.6	-2.5
S/525	1197.167	-0.5	+0.1	N.V	N.V
S/550	1206.498	-0.6	+0.2	-0.5	-2.3
S/575	1213.167	-0.7	0.0	-0.9	-0.3
S/600	1216.148	-0.4	+0.4	-0.5	-1.3
S/625	1218.553	-0.2	+0.5	-0.4	-1.4
S/650	1223.945	-0.5	+0.2	-0.1	-1.6
S/800/	1241.538	-0.7	-0.1	+25.2	N.V
S/825/370	1247.862	-0.8	-0.4	-1.1	-5.8
S/810/360	1237.093	-0.8	-0.1	N.V	-4.8
S/775/360	1226.714	-0.7	-0.2	-1.3	+3.2
S/770/350	1209.790	-0.9	-0.2	-1.1	N.V
S/810/350	1220.781	-0.5	-0.1	-0.8	-3.4
S/805/350	1207.160	-0.8	0.0	-0.8	-2.8
S765/350	1199.102	-0.8	-0.2	-1.0	-3.8
S/775/280	1100.801	-0.8	+0.1	-1.2	-2.4
S/725/275	1089.225	-0.5	+0.4	-1.0	-1.4
S/650/270	1086.037	-0.3	+0.6	-0.9	-1.0
S/575/270	1070.241	-0.5	+0.4	-0.9	-1.4
S/700/230	992.765	-0.6	+0.6	-1.1	-1.1
S/685/230	994.045	-0.5	+0.6	-1.2	-1.1
S/620/220	968.641	-0.5	+0.8	-1.0	-1.1
S/610/220	966.414	-0.9	+0.7	-1.4	-1.4

Note: "+" and "-" signs indicate increase and decrease in the Horizontal Distance respectively. N.V. stands for "Not Visible".

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.			
		January 2019	April 2019	August 2019	November 2019
S/250	1085.630	-0.7	+0.1	-1.3	-2.6
S/200	1078.232	-0.7	+0.3	-1.5	-3.0
S/150	1071.999	-0.8	-0.2	-2.6	-5.0
S/100	1071.267	-0.7	-0.1	-3.3	-6.9
S/50	1075.261	-0.8	-0.3	-7.0	-18.0
NS/00	1086.345	-0.6	+0.2	-0.5	-1.2
N/50	1092.905	-0.5	+0.2	-0.5	-1.2
N/150	1137.815	-0.5	0.0	-0.7	-1.5
N/275	1171.290	+0.5	+1.1	+0.2	-0.4

Note: "+" and "-" signs indicate increase and decrease in the Horizontal Distance respectively. N.V. stands for "Not Visible".

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

Station No.	Horizontal Distance in meter. October 2018	Change in Horizontal Distance in cm.			
		January 2019	April 2019	August 2019	November 2019
N/400	1128.782	0.0	+0.6	-0.8	-1.4
N/500	1161.289	-0.1	+0.3	-0.5	N.V
N/600	1194.011	-0.3	+0.2	-0.5	-0.7
(Monitoring stations are located on 342 M RL bench)					
N/475	1140.948	-0.3	+0.2	-0.8	-1.3
N/410	1116.325	-0.2	+0.3	-0.7	-1.3

N/300	1080.614	N.V	+0.6	-0.6	-1.6
(Monitoring stations are located on 330 M RL bench)					
Station No.	Horizontal Distance in meter. October 2018	Change in Horizontal Distance in cm.			
		January 2019	April 2019	August 2019	November 2019
N/600	1165.483	-0.2	+0.2	-0.6	-0.7
N/500	1129.650	-0.2	+0.4	-0.7	-1.1
N/475	1126.809	0.0	+0.5	-0.7	-1.2
N/450	1116.086	-0.3	+0.3	-0.8	-1.3
N/400	1100.375	-0.2	+0.1	-1.2	-1.7
N/300	1066.725	-0.5	+0.2	-1.2	-2.2
N/250	1051.388	-0.6	+0.1	-1.0	-2.1
N/100	1019.723	-0.4	+0.4	-1.0	-1.9
S/100	1021.503	-0.6	+0.2	-2.2	-4.2
S/200	1029.769	-0.6	+0.2	-2.0	-3.6
S/400	1071.803	-0.7	+0.2	-1.6	-3.2
S/500	1119.450	-0.4	+0.7	-0.9	-2.2
S/600	1141.624	-0.6	+0.3	-0.9	-2.2
(Monitoring stations are located on 340 M RL bench)					
N/50/340	1058.040	-0.4	N.V	-0.5	-1.2
(Monitoring stations are located on 310 M RL bench)					
S/300	1044.087	N.V	+0.8	N.V	-2.3
N/25	985.721	-0.8	-0.3	-2.4	-4.0
N/100	995.726	-0.5	+0.4	-1.2	2.0
N/175	1006.147	-0.6	+0.4	-1.6	-2.8

Note: "+" and "-" signs indicate increase and decrease in the Horizontal Distance respectively. N.V. stands for "Not Visible".

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

Station No.	Horizontal Distance in meter. October 2018	Change in Horizontal Distance in cm.			
		January 2019	April 2019	August 2019	November 2019
S/100	942.521	-0.5	+0.2	-2.2	-3.8
NS/00	957.476	-0.8	+0.1	-2.3	-4.0
N/100	972.517	-0.6	+0.2	-1.6	-2.5
N/300	1018.625	-0.1	+0.4	-1.3	-2.0
(Monitoring stations are located on 270 M RL bench)					
N/350	1018.180	-0.2	+0.4	-1.4	-2.1
(Monitoring stations are located on 260 M RL bench)					
N/350	1001.423	-2.0	+0.5	-1.7	-2.6
N/300	987.209	-0.4	+0.3	-2.1	-3.0
N/200	953.537	-0.7	+0.2	-2.2	-3.2
N/100	935.345	-0.5	+0.4	-2.0	-3.0
NS/00	922.464	-0.7	+0.1	-2.8	-4.6
S/100	907.552	-0.5	0.0	-2.3	-3.7
S/200	915.569	-0.8	+0.2	-2.4	-3.7
S/300	932.675	-0.8	0.0	-1.9	-3.1
S/400	969.240	-0.7	+0.3	-1.7	-2.7
S/500	1010.580	-0.9	+0.1	-1.6	-2.7
(Monitoring stations are located on 220 M RL bench)					
S/300	886.294	-0.4	+0.5	-2.3	-3.1
S/200	868.264	-0.5	+0.7	-2.4	-3.2
S/100	860.585	-0.9	+0.2	-2.6	-3.9
NS/00	875.405	-0.9	+0.1	-2.9	-4.2
N/100	889.488	-0.6	+0.3	-2.4	-3.0
N/200	910.230	-0.7	-0.1	-2.8	-4.3
N/400	972.914	-0.4	+0.3	-1.9	-0.2
N/500	1013.926	-0.3	+0.2	-1.5	-1.8

Note: "+" and "-" signs indicate increase and decrease in the Horizontal Distance respectively. N.V. stands for "Not Visible".

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

Station No.	Horizontal Distance in meter. October 2018	Change in Horizontal Distance in cm.			
		January 2019	April 2019	August 2019	November 2019
S/325	829.306	-0.9	+0.7	-2.2	-3.1
S/350	839.227	-0.5	+0.4	-2.1	-2.9
S/425	866.094	-0.3	+0.6	-2.0	-2.4
(Monitoring stations are located on 180 M RL bench)					
S/425	853.539	-0.6	+0.6	-2.0	-2.8
S/400	837.148	-0.8	+0.2		
S/300	810.945	-0.6	+0.2	-2.5	-3.2
S/75	816.637	-1.1	-0.1	-3.1	-4.3
S/25	822.594	N.V	+0.4	-3.2	-4.1
N/400	929.018	-0.1	+0.3	-2.5	-3.2
(Monitoring stations are located on 170 M RL bench)					
N/450	943.230	-0.3	+0.1	-2.3	-2.5
N/400	923.938	-0.4	0.0	-2.8	-3.0
N/300	899.240	-0.3	0.0	-3.1	-3.5
N/250	870.586	-0.3	+0.4	-3.0	-3.4
S/100	769.728	-1.3	+0.2	-3.5	-4.5
S/200	782.330	-0.9	0.0	-3.0	-4.1
S/300	800.034	-0.8	+0.4	-2.5	-3.5
(Monitoring stations are located on 160 M RL bench)					
S/250	776.941	-1.2	+0.1		
S/50	767.187	-0.9	0.0	-3.6	-4.8
N/175	833.543	-0.6	+0.6	-2.9	-3.7
N/275	868.114	-0.8	+0.5	-3.3	-3.8
N/375	906.789	-0.3	+0.1	-2.7	-2.9
(Monitoring stations are located on 140 M RL bench)					
N/375	892.259	-0.8	+0.2	-3.1	-3.1
N/325	864.978	-0.6	+0.1	-3.1	3.5

Note: "+" and "-" signs indicate increase and decrease in the Horizontal Distance respectively. N.V. stands for "Not Visible".

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

Station No	Horizontal Distance in meter. April 2019	Change in Horizontal Distance in cm.			
		January 2019	April 2019	August 2019	November 2019
S/50	536.174	-	-	-2.9	-3.2
S/150	514.209	-	-	-0.7	-2.6
S/250	516.026	-	-	-0.7	-2.6
S/300	526.476	-	-	-0.3	-1.8
S/400	553.163	-	-	-0.3	-1.7
S/500	598.758	-	-	-0.4	-1.3
(Monitoring stations are located on 80 M RL bench)					
S/325	505.774	-	-	-0.6	-2.4
S/250	493.722	-	-	-0.3	-2.4
S/150	493.181	-	-	-0.8	-3.2
(Monitoring stations are located on 70 M RL bench)					
S/200	478.597	-	-	-0.8	-2.1
S/300	485.722	-	-	-0.2	N.V
S/350	500.327	-	-	-0.2	-2.0
(Monitoring stations are located on 90 M RL bench)					
N/100	575.054	-	-	-0.7	-3.3
N/150	589.115	-	-	-1.1	-3.0
N/175	599.364	-	-	-1.3	-2.8
N/200	614.903	-	-	-1.6	-3.1
N/200	633.136	-	-	-0.9	-2.4
N/200	660.286	-	-	-0.7	-2.3
(Monitoring stations are located on 340 M RL bench)					
S/25	206.246	-	-	N.V	N.V
S/275	102.882	-	-	+1.0	+0.7
(Monitoring stations are located on 160 M RL bench)					
S/245	587.279	-	-	-1.2	-3.4
S/325	596.396	-	-	-0.5	2.9
S/375	609.051	-	-	-0.5	-2.6

(Monitoring stations are located on 170 M RL bench)					
S/425	626.639	-	-	-0.5	-1.9
S/485	662.245	-	-	-0.5	-1.6
S/400	628.382	-	-	N.V	-2.5

Note: "+" and "-" signs indicate increase and decrease in the Horizontal Distance respectively. N.V. stands for "Not Visible".

Table 7: Changes in Horizontal Distance from Footwall Base Station for H/W Pillars.

Station No.	Horizontal Distance in meter. October 2018	Change in Horizontal Distance in cm.			
		January 2019	April 2019	August 2019	November 2019
N/850	1079.481	+0.2	-0.5	-1.0	-1.4
N/825	1080.326	+0.1	-0.7	-1.3	-2.1
N/750	1074.429	-0.1	-0.9	-2.3	-4.2
N/725	1076.972	0.0	-0.8	-2.0	-3.6
(Monitoring stations are located on 360 M RL bench)					
N/575	1110.064	-0.1	-1.1	-2.2	-2.9
N/625	1117.785	-0.1	-1.0	-2.0	-2.5
N/650	1093.372	+0.1	-0.8	-1.6	-2.3
N/700	1061.799	-0.2	-0.7	-2.1	-3.2
N/725	1058.302	-0.3	-1.3	-3.4	-6.7
N/775	1060.770	0.0	-0.8	-2.6	-16.8
N/800	1065.492	+0.1	-0.6	-1.6	-2.5
N/850	1068.669	+0.2	-0.4	-1.1	-1.6
N/875	1065.320	+0.3	-0.3	-0.1	N.V
N/925	1045.069	+0.3	-0.2	-0.5	-0.5
(Monitoring stations are located on 350 M RL bench)					
N/875	1049.968	+0.1	-0.4	-0.9	-1.0
N/775	1049.858	0.0	-0.8	-2.2	-3.7
N/700	1047.736	-0.6	-1.5	-4.7	-9.4
S/400	1019.083	+0.1	-1.0	-2.2	-3.1
(Monitoring stations are located on 340 M RL bench)					
N/450	1077.351	+0.1	-1.1	-2.3	-3.3

N/525	1082.133	+0.2	-1.0	-2.3	-3.1
S/175	969.599	-0.1	-1.1	-2.7	-4.1
S/200	971.056	-0.1	-1.1	-2.5	-3.9
S/275	1059.386	+0.1	-1.2	-2.6	-3.6
S/300	988.732	0.0	-1.0	-2.3	-3.5

Note: "+" and "-" signs indicate increase and decrease in the Horizontal Distance respectively. N.V. stands for "Not Visible".

Table 8: Changes in Horizontal Distance from Footwall Base Station for H/W Pillars.
(Monitoring stations are located on 360 M RL bench)

Station No.	Horizontal Distance in meter. October 2018	Change in Horizontal distance in cm.			
		January 2019	April 2019	August 2019	November 2019
S/500	1028.800	+0.2	-0.8	-0.9	-2.6
S/650	1043.452	0.0	-1.0	-1.8	-2.2
S/700	1051.904	-0.1	-1.3	-1.2	-2.6
S/750	1058.332	+0.3	-0.6	-1.4	-1.6
S/800	1070.657	+0.3	-0.5	-1.2	N.V
(Monitoring stations are located on 330 M RL bench)					
S125	961.236	-0.1	-1.1	-2.6	-3.9
(Monitoring stations are located on 320 M RL bench)					
N/150	932.405	-0.2	-1.2	-2.7	-4.2
N/100	925.838	-0.1	-1.2	-2.7	-4.1
(Monitoring stations are located on 310 M RL bench)					
N/250	937.220	-0.1	-1.0	-2.8	-4.4
N/200	932.800	+0.1	-0.8	-2.3	-3.7
(Monitoring stations are located on 300 M RL bench)					
N350	945.824	+0.1	-0.8	-2.5	-4.3
N/300	943.207	+0.1	-0.8	-2.5	-3.9
(Monitoring stations are located on 290 M RL bench)					
N/425	946.101	+0.1	-0.8	-3.2	-4.7
(Monitoring stations are located on 280 M RL bench)					
N/625	934.326	-0.2	-0.8	-2.6	-5.7
N/575	931.288	-0.1	-0.9	-3.7	-10.7
N/475	941.314	0.0	-0.7	-3.0	-4.9

Note: "+" and "-" signs indicate increase and decrease in the Horizontal Distance respectively. N.V. stands for "Not Visible".

Table 9: Changes in Horizontal Distance from Footwall Base Station for H/W Pillars.
(Monitoring stations are located on 270 M RL bench)

Station No.	Horizontal distance in meter. October 2018	Change in Horizontal distance in cm.			
		January 2019	April 2019	August 2019	November 2019
N/825	961.368	+0.4	-2.0	-1.1	-1.6
N/625	933.253	+0.3	-2.0	-1.7	-2.8
(Monitoring stations are located on 260 M RL bench)					
N/750	928.315	+0.5	0.0	-1.4	-1.8
N/725	920.922	+0.2	-0.4	-1.7	-2.4
S/100	862.646	0.0	-1.0	-3.0	-4.7
S/200	867.709	0.0	-1.0	N.V	N.V
S/300	883.112	-0.2	-1.0	-3.1	-4.5
(Monitoring stations are located on 250 M RL bench)					
S/350	888.108	-0.1	-1.1	-3.1	-4.2
S/125	855.611	+0.1	-1.2	-3.2	-4.7
S/75	854.076	0.0	-1.0	-3.4	-4.9
N/25	861.149	0.0	-0.8	-3.2	-4.4
(Monitoring stations are located on 240 M RL bench)					
S/750	867.567	+0.1	-0.3	N.V	-3.0
(Monitoring stations are located on 220 M RL bench)					
S/550	854.993	+0.3	-0.4	-2.4	-3.0
S/625	868.426	+0.5	-0.4	-2.1	-3.0
(Monitoring stations are located on 200 M RL bench)					
S/325	838.663	+0.4	-0.8	-3.4	-4.7
S/250	822.848	+0.3	-0.8	-3.4	-5.0
S/150	812.072	+0.3	-0.7	-3.5	-4.8
S/100	808.974	+0.2	-0.6	-3.4	-4.9
S/50	810.541	+0.3	-0.6	-3.3	-4.9
N/50	815.699	+0.1	-0.3	-2.8	-4.3

Note: "+" and "-" signs indicate increase and decrease in the Horizontal Distance respectively. N.V. stands for "Not Visible".

Table 10: Changes in Horizontal Distance from Footwall Base Station for H/W Pillars. (Monitoring stations are located on 190 M RL bench)

Station No.	Horizontal distance in meter. October 2018	Change in Horizontal distance in cm.			
		January 2019	April 2019	August 2019	November 2019
S/225	810.354	+0.4	-1.0	-3.6	-4.9
S/150	801.476	+0.3	-0.8	-2.9	-4.6
S/75	799.918	+0.2	-1.0	-3.2	-4.5
(Monitoring stations are located on 180 M RL bench)					
N/100	800.522	+0.1	-1.1	-3.5	-4.9
N/50	796.751	0.0	-1.1	-3.4	-5.0
S/50	791.809	+0.3	-0.6	-3.3	-4.6
S/125	791.716	+0.2	-0.8	-3.2	-4.4
(Monitoring stations are located on 160 M RL bench)					
S/50	744.854	0.0	-0.4	-3.4	-5.0
S/150	744.267	+0.2	-0.9	-4.1	-5.7
S/225	756.040	-0.2	N.V	-4.1	N.V
(Monitoring stations are located on 130 M RL bench)					
N/300	695.734	+0.3	-0.3	-4.1	-5.9
N/125	730.924	+0.4	-0.3	-3.9	-5.7
N/75	723.088	+0.3	-0.1	-3.5	-5.8
S/25	717.473	+0.4	-0.5	-3.7	-5.5
S/125	715.982	+0.8	-0.9	-4.7	-6.1
N/225	-	-	564.338	-2.2	-4.1

Note: "+" and "-" signs indicate increase and decrease in the Horizontal Distance respectively. N.V. stands for "Not Visible".

Table 11: Changes in Horizontal Distance from Footwall Base Station for H/W Pillars. (Monitoring stations are located on 100 M RL bench)

Station No.	Horizontal distance in meter. April 2019	Change in Horizontal distance in cm.	
		August 2019	November 2019
S/250	664.644	-1.4	-2.8
S/375	714.150	-1.3	-2.0
(Monitoring stations are located on 70 M RL bench)			
S/250	640.877	-1.4	-3.2
S/125	585.044	-2.1	-4.4
N/100	542.254	-2.7	-4.9
N/250	471.825	-2.4	-4.5
(Monitoring stations are located on 80 M RL bench)			
N/225	489.339	-2.3	-4.7
(Monitoring stations are located on 50 M RL bench)			
N/175	486.365	-2.4	-5.0
N/75	526.262	-2.5	-5.0
S/25	544.145	-2.7	-5.2
S/100	562.848	-2.7	-4.8
(Monitoring stations are located on 30 M RL bench)			
S/150	567.966	-3.1	-5.7
S/100	543.203	-2.3	-6.0
S/30	526.064	-2.7	-5.6
N/160	474.559	-2.1	-4.5

Note: "+" and "-" signs indicate increase and decrease in the Horizontal Distance respectively. N.V. stands for "Not Visible".

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Table 12: Changes in Horizontal Distance from NWM 1.
(Monitoring stations are located on 435 M RL Dump)

Station No.	Horizontal distance in meter. January 2019	Change in Horizontal distance in cm.		
		April 2019	August 2019	November 2019
W/300	311.608	N.V	N.V	N.V
W/500	170.017	N.V	N.V	N.V
W/675	228.265	N.V	N.V	N.V
(Monitoring stations are located on 475 M RL Dump)				
W/450	287.441	N.V	N.V	N.V
W/600	303.168	N.V	N.V	N.V
W/700	364.045	N.V	N.V	N.V
(Monitoring stations are located on 535 M RL Dump)				
W/400	437.048	-2.6	-2.6	-8.1
W/600	437.207	-1.9	-2.1	-6.0
W/700	512.789	-1.8	-1.6	N.V
(Monitoring stations are located on 520 M RL Dump)				
W/500	385.813	-1.5	-1.6	-5.3
W/650	435.882	-3.0	-3.2	N.V
W/800	532.654	-2.3	-2.5	-4.2
W/900	593.313	-1.6	-1.4	-1.8
W/950	647.070	N.V	N.V	N.V

Note: "+" and "-" signs indicate increase and decrease in the Horizontal Distance respectively. N.V. stands for "Not Visible".

Table 13: Changes in Horizontal Distance from NWM 1.
(Monitoring stations are located on 475 M RL Dump)

Station No.	Horizontal distance in meter. April 2019	Change in Horizontal distance in cm.	
		August 2019	November 2019
W/410	288.018	0.0	+0.7
W/1275	350.840	0.0	+1.4
W/925	389.229	+3.0	N.V
W/540	294.132	N.V	+6.5
W/725	524.227	+3.0	+1.9
W/640	312.389	0.0	-6.8
(Monitoring stations are located on 495 M RL Dump)			
Station No.	Horizontal distance in meter. August 2019		
W/695	402.203	N.V	N.V
W/835	475.288	N.V	N.V

Note: "+" and "-" signs indicate increase and decrease in the Horizontal Distance respectively. N.V. stands for "Not Visible".

Table 14: Changes in Horizontal Distance from NWM 1.
(Monitoring stations are located on 515 M RL Dump)

Station No.	Horizontal distance in meter. October 2018	Change in Horizontal distance in cm.			
		January 2019	April 2019	August 2019	November 2019
E/130	1668.464	+0.7	0.0	0.0	-1.9
E/170	1703.150	+0.5	-0.6	-0.1	-2.8
E/10	1737.702	+0.8	+0.1	+0.2	-0.9
W/40	1759.657	+0.7	+0.3	+0.1	-1.0
W/100	1782.147	+0.5	-0.3	-0.2	-1.5
(Monitoring stations are located on 495 M RL Dump)					
W/120	1743.351	+0.5	-0.6	-0.5	-9.4
E/110	1637.058	+0.8	-0.1	0.0	-1.9
E/165	1611.521	+0.5	-0.2	-0.3	-6.5
E/500	1450.291	N.V	-1.2	-1.3	-4.3
E/600	1502.015	N.V	-2.3	N.V	-2.1
(Monitoring stations are located on 475 M RL Dump)					
W/15	1656.298	+0.5	-0.6	-0.4	-2.6
W/160	1699.168	+0.3	-0.3	-0.2	-2.1
E/700	1478.575	N.V	N.V	-0.3	-2.4
E/560	1442.519	N.V	N.V	-1.9	-6.6
E/465	1420.321	N.V	N.V	N.V	N.V
(Monitoring stations are located on 455 M RL Dump)					
N/600	1500.874	N.V	N.V	N.V	N.V
E/188	N.V	N.V	N.V	N.V	N.V
E/190	1518.000	+0.6	+0.5	+0.1	N.V
W/150	1645.517	+0.3	-0.4	-0.3	-3.2
W/10	1614.675	+0.4	-0.4	+0.3	N.V
N/500	1552.578	N.V	N.V	N.V	N.V
N/350	1750.174	N.V	N.V	N.V	N.V
TD/N/985	1691.123	+0.1	-0.5	-0.7	-5.8
TD/N/875	1627.604	+0.1	N.V	-1.0	-3.8
TD/N/780	1572.003	-0.1	-0.1	-1.0	-5.1
(Monitoring stations are located on 435 M RL Dump)					
E/200	1463.852	N.V	N.V	N.V	N.V
E/20	1557.634	N.V	N.V	N.V	N.V
W/125	1600.171	+0.5	-0.1	N.V	-5.6

Note: "+" and "-" signs indicate increase and decrease in the Horizontal Distance respectively. N.V. stands for "Not Visible".

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

Station No.	Horizontal Distance in meter. October 2018	Change in Horizontal Distance in cm.			
		January 2019	April 2019	August 2019	November 2019
N/2000	506.831	-0.6	N.V	N.V	N.V
N/2050	521.418	0.0	N.V	N.V	N.V
N/2150	537.322	+0.1	N.V	N.V	N.V
N/2315	-	602.768	N.V	N.V	N.V
(Monitoring stations are located on 475 M RL Dump)					
N/2250	528.978	+0.2	-0.7	N.V	N.V
N/2150	489.317	+0.1	-1.2	N.V	N.V
N/1950	458.873	+0.3	-0.7	N.V	N.V
(Monitoring stations are located on 455 M RL Dump)					
N/2050	429.939	+0.3	-0.7	-0.7	-0.4
N/1875	426.161	+0.3	-0.4	-0.4	+0.4
TD/N/1480	-	539.181	N.V	N.V	N.V
N/2375	-	561.920	N.V	-1.3	-1.6
(Monitoring stations are located on 445 M RL Dump)					
TD/W/1650	603.522	Broken	-	-	-
TD/W/1550	550.939	Broken	-	-	-
TD/W/1450	514.474	Broken	-	-	-
W/1590	564.358	Broken	-	-	-
W/1525	544.770	Broken	-	-	-
(Monitoring stations are located on 435 M RL Dump)					
N/1875	374.690	+0.1	-1.0	-0.9	-0.6
N/2100	399.191	+0.2	-0.7	-0.6	-0.5
N/2335		497.828		-0.9	-0.8
(Monitoring stations are located on 420 M RL Dump)					
TD/W/1645	489.208	Broken	497.814	N.V	N.V
TD/W/1570	487.665	Broken	561.907	N.V	N.V

Note: "+" and "-" signs indicate increase and decrease in the Horizontal Distance respectively. N.V. stands for "Not Visible".

Table 17: Changes in Horizontal Distance from NWM 1.
(Monitoring stations are located on 445 M RL Dump)

Station No.	Horizontal Distance in meter. October 2018	Change in Horizontal Distance in cm.			
		January 2019	April 2019	August 2019	November 2019
TDN/1045	553.488	Broken	-	-	-
TDN/900	417.592	Broken	-	-	-
TDN/725	302.163	Broken	-	-	-
TDN/560	295.317	Broken	-	-	-
TDN/425	373.361	Broken	-	-	-
Table 1: Changes in Horizontal Distance from NWM 2. (Monitoring stations are located on 475 M RL Dump)					
W/1100	341.836	-	-	-	-
W/1200	447.663	-	-	-	-
W/1225	339.978	-	-	-	-
(Monitoring stations are located on 455 M RL Dump)					
W/1075	292.854	Broken	294.983 (new)	+0.4	-9.4
W/1150	295.195	Broken	298.131 (new)	N.V	+1.5
W/1275	297.943	Broken	-	-	-
W/1120	-	-	250.837	N.V	+0.9
W/1300	-	-	307.250	N.V	-1.1
(Monitoring stations are located on 435 M RL Dump)					
W/1050	239.065	Broken	-	-	-
W/1375	288.558	Broken	-	-	-
W/875	-	-	364.296	N.V	N.V
W/1380	-	-	292.254	N.V	+4.3
W/780	-	-	312.018	N.V	+5.6
W/600	-	-	185.980	N.V	-6.4
W/1260	-	-	254.990	N.V	N.V
(Monitoring stations are located on 430 M RL Dump)					
W/450	-	-	185.776	N.V	-3.8

Note: "+" and "-" signs indicate increase and decrease in the Horizontal Distance respectively. N.V. stands for "Not Visible".

30/4/2020

Annexure -XXII

Annexure-XXIII

Blast vibration data (Monitoring at UG)							
S.No	Date	Blast location (stope)	Monitoring location	Radial distance (m)	MCPD (kg)	PPV (mm/s)	Frequency (Hz)
1	06-Apr-22	-330L_N487 A	-305L_N195 Substation	450	156	1.9	80
2	16-Apr-22	-330L_S547	-305L_S330 Substation	320	220	2.8	100
3	18-Apr-22	-330L_S52	-305L_S330 Substation	360	210	2.4	103
4	23-Apr-22	-355L_N397 C	-305L_N195 Substation	280	208	2.4	120
5	1-May-22	-405L_N112	-305L_N195 Substation	80	80	2.9	112
6	12-May-22	-330L_S187	-305L_S330 Substation	160	145	2.1	121
7	15-May-22	-230L_S225 A	-305L_S330 Substation	135	125	1.8	113
8	20-May-22	-330L_N352	-305L_N195 Substation	155	85	1.5	105
9	25-May-22	-355L_N292	-305L_N195 Substation	120	130	2.5	128
10	11-Jun-22	-330L_N240 (B)	-305L_N195 Substation	60	190	3.0	80

11	13-Jun-22	-305L_N412 (A)	-305L_N195 Substation	230	112	2.7	80
13	19-Jun-22	-380L_N217	-305L_N195 Substation	82	222	2.9	102
14	7-Jul-22	-305L_N8	-305L_N195 Substation	212	200	2.1	92
15	17-Jul-22	-305L_N412 (B)	-305L_N195 Substation	230	192	1.4	80
16	19-Jul-22	-305L_N322	-305L_N195 Substation	136	210	1.7	80
17	20-Jul-22	-305L_N412 (B)	-305L_N195 Substation	230	205	1.8	102
18	8-Aug-22	-355L_N442 A	-305L_N195 Substation	362	240	2.1	81
19	10-Aug-22	-355L_N277	-305L_N195 Substation	180	100	2.7	100
20	21-Aug-22	-380L_N232	-305L_N195 Substation	167	125	2.9	104
21	22-Aug-22	-305L_S157	-305L_S330 Substation	155	160	2.6	83
22	23-Aug-22	-280L_S127	-305L_S330 Substation	246	153	2.4	100
23	06-Sep-22	-330L_N22	-305L_S330 Substation	362	216	2.8	82
24	12-Sep-22	-230L_S82B	-305L_S330 Substation	270	290	2.1	80
25	24-Sep-22	-305L_N427 A	-330L_ N150 Refuge Chamber	290	111	1.4	101
27	26-Sep-22	-330L_N52	-305L_S330 Substation	390	83	1.4	80
28	08-Oct-22	-355L_S502	-305L_S330 Substation	221	97	1.8	100
29	15-Oct-22	-355L_S307	-305L_S330 Substation	134	107	2.6	103
30	22-Oct-22	-355L_N472	-330L_ N150 Refuge Chamber	337	233	2.5	94
31	23-Oct-22	-330L_S7	-330L_ N150 Refuge Chamber	162	244	2.9	122

Peak particle velocity

Annexure -XXIV

भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास
और गंगा संरक्षण विभाग
केंद्रीय भूमि जल प्राधिकरण
Government of India
Ministry of Jal Shakti
Department of Water Resources,
River Development & Ganga Rejuvenation
Central Ground Water Authority

(भूजल निकासी हेतु अनापत्ति प्रमाण पत्र)
NO OBJECTION CERTIFICATE (NOC) FOR GROUND WATER ABSTRACTION

Project Name:	Hindustan Zinc Limited		
Project Address:	Hindustan Zinc Ltd., Rampura Agucha Mine, Village - Agucha, Tehsil - Hurda, Bhilwara		
Village:	Aguncha	Block:	Hurda
District:	Bhilwara	State:	Rajasthan
Pin Code:			
Communication Address:	Hindustan Zinc Ltd., Rampura Agucha Mine, Village - Agucha, Tehsil - Hurda, Bhilwara, Hurda, Bhilwara, Rajasthan - 311022		
Address of CGWB Regional Office :	Central Ground Water Board Western Region, 6-a, Jhalana Doongri, Jaipur, Rajasthan - 302004		

1.	NOC No.:	CGWA/NOC/MIN/REN/2/2022/7143			
2.	Application No.:	21-4/801/RJ/MIN/2008	3.	Category: (GWRE 2020)	Over Exploited
4.	Project Status:	Existing Ground Water	5.	NOC Type:	Renewal
6.	Valid from:	08/07/2022	7.	Valid up to:	07/07/2024

8. Ground Water Abstraction Permitted:

Fresh Water		Saline Water		Dewatering		Total	
m³/day	m³/year	m³/day	m³/year	m³/day	m³/year	m³/day	m³/year
		0.00	0.00	250.00	91250.00		

9. Details of ground water abstraction /Dewatering structures

	Total Existing No.:1						Total Proposed No.:0					
	DW	DCB	BW	TW	MP	MPu	DW	DCB	BW	TW	MP	MPu
Dewatering Structure*	0	0	0	0	1	0	0	0	0	0	0	0

*DW- Dug Well; DCB-Dug-cum-Bore Well; BW-Bore Well; TW-Tube Well; MP-Mine Pit;MPu-Mine Pumps

10. Ground Water Abstraction/Restoration Charges paid (Rs.):

11. Number of Piezometers(Observation wells) to be constructed/ monitored & Monitoring mechanism.

No. of Piezometers	Monitoring Mechanism		
	Manual	DWLR**	DWLR With Telemetry
1	0	1	0

**DWLR - Digital Water Level Recorder

(Compliance Conditions given overleaf)

This is an auto generated document & need not to be signed.

18/11, जामनगर हाउस, शाहजहां रोड, नई दिल्ली - 110011 / 18/11, Jamnagar House, Shahjahan Road, New Delhi-110011
Phone: (011) 23382562 Fax: 23382652, 23386743
Website: cgwa-noc.gov.in

पानी बचाएं – जीवन बचाएं
SAVE WATER - SAVE LIFE

Dineshkumar Paliwal

From: no-reply-cgwa@gov.in
Sent: Saturday, October 15, 2022 12:14
To: Vinod Kumar; Dineshkumar Paliwal
Cc: rdwr-cgwb@nic.in
Subject: NOCAP-Payment of Charges -For Renewal NOC Number CGWA/NOC/MIN/REN/2/2013/1205 of Application No. 21-4/2/RJ/MIN/2004 Application No. 21-4/2/RJ/MIN/2004

External Sender: Use caution with links/attachments

To

M/s HINDUSTAN ZINC LTD.

Sub- Payment of Charges - For Renewal NOC Number CGWA/NOC/MIN/REN/2/2013/1205 of Application No. 21-4/2/RJ/MIN/2004

Sir,

Kindly refer to your application for abstraction of ground water. In this connection, it is to inform you that your application has been processed. In view of the new guidelines notified on 24.09.2020, you are hereby directed to pay Rs.(**41646150.00**).Details of which are as follows:

1. Penalty of Rs.(**0.00**) on account of (Not Defined).
2. Ground water abstraction/restoration Rs.(**41646150.00 (Fresh Water)**) for ground water abstraction **11700.00** m3/day or **4270500.00** m3/year.
3. Environmental Compensation Rs.(**0.00**) on account of illegal withdrawal of water from **Not Defined** to **Not Defined**

Total amount Rs.(41646150.00).

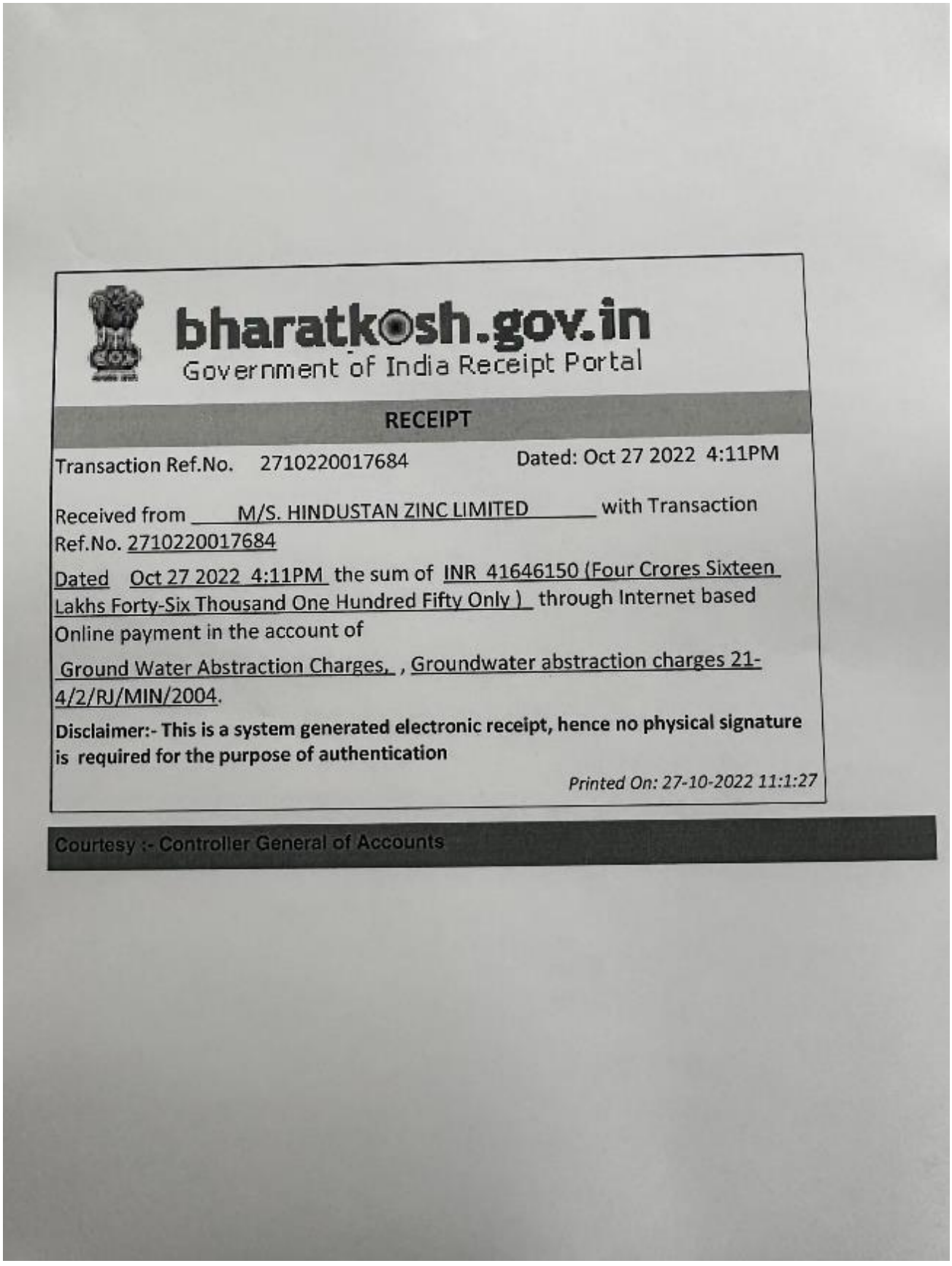
The above mentioned payment of ground water abstraction/ restoration charges may be deposited through Bharatkosh Portal (https://bharatkosh.gov.in) under Water Resources Department for the purpose of groundwater abstraction charges under head DDO- 202417 Officer Incharge, Central Ground Water Board, State Unit, Jamnagar House, Man Singh Road, New Delhi 110011 within 15 days of receiving of this letter.

Your NOC will be issued after depositing the ground water abstraction/ restoration charges and submitting the proof of payment to the concerned Regional office of CGWB and also copy to cgwa@nic.in through email. Failure to deposit the said ground water abstraction/ restoration charges within 15 days will lead to rejection of your application for NOC and further ground water withdrawal will be treated as unauthorized and you shall be liable to pay environmental compensation as per Notified Guidelines, 2020 (S.O. 3289(E).

***The arrears to be paid from 25/09/2020 till the date of issuance of NOC as per Notified Guidelines, 2020 (S.O. 3289(E)**

This is a computer generated document and need not be signed.

1



bharatkosh.gov.in
Government of India Receipt Portal

RECEIPT

Transaction Ref.No. 2710220017684 Dated: Oct 27 2022 4:11PM

Received from M/S. HINDUSTAN ZINC LIMITED with Transaction Ref.No. 2710220017684

Dated Oct 27 2022 4:11PM the sum of INR 41646150 (Four Crores Sixteen Lakhs Forty-Six Thousand One Hundred Fifty Only) through Internet based Online payment in the account of

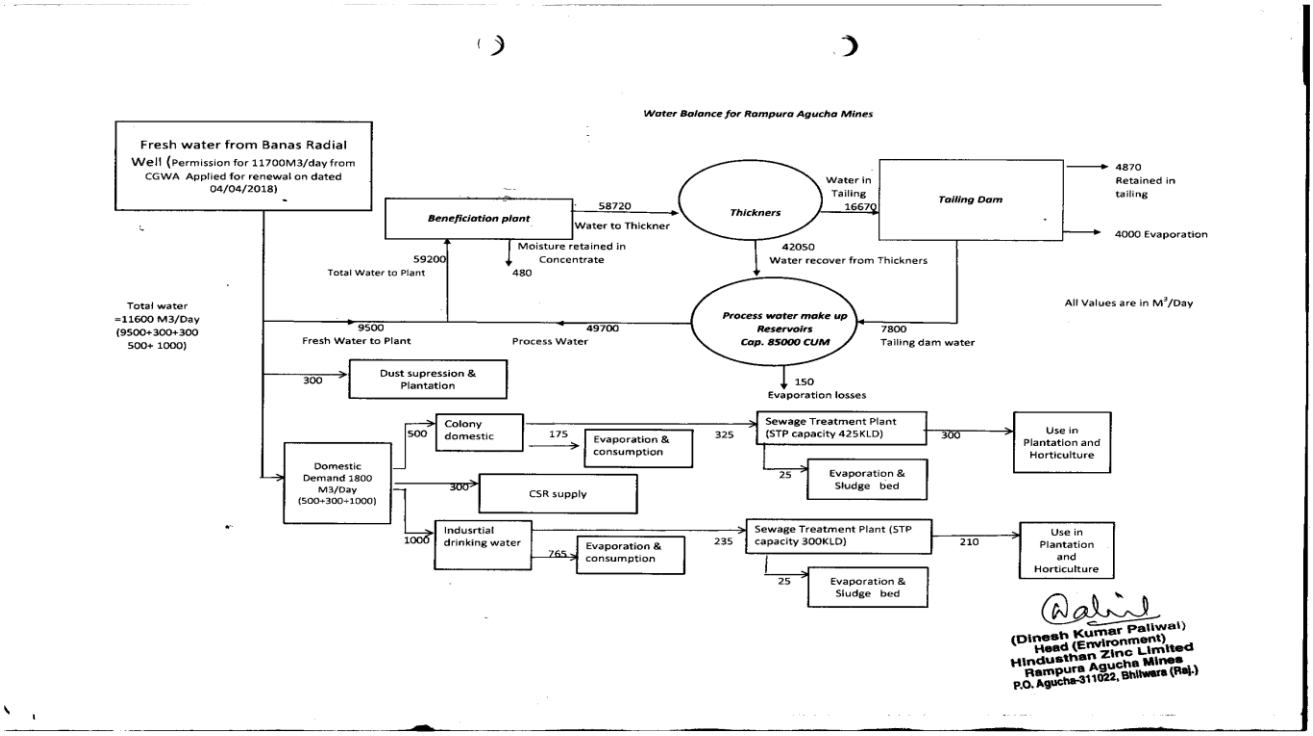
Ground Water Abstraction Charges, , Groundwater abstraction charges 21-4/2/RJ/MIN/2004.

Disclaimer:- This is a system generated electronic receipt, hence no physical signature is required for the purpose of authentication

Printed On: 27-10-2022 11:1:27

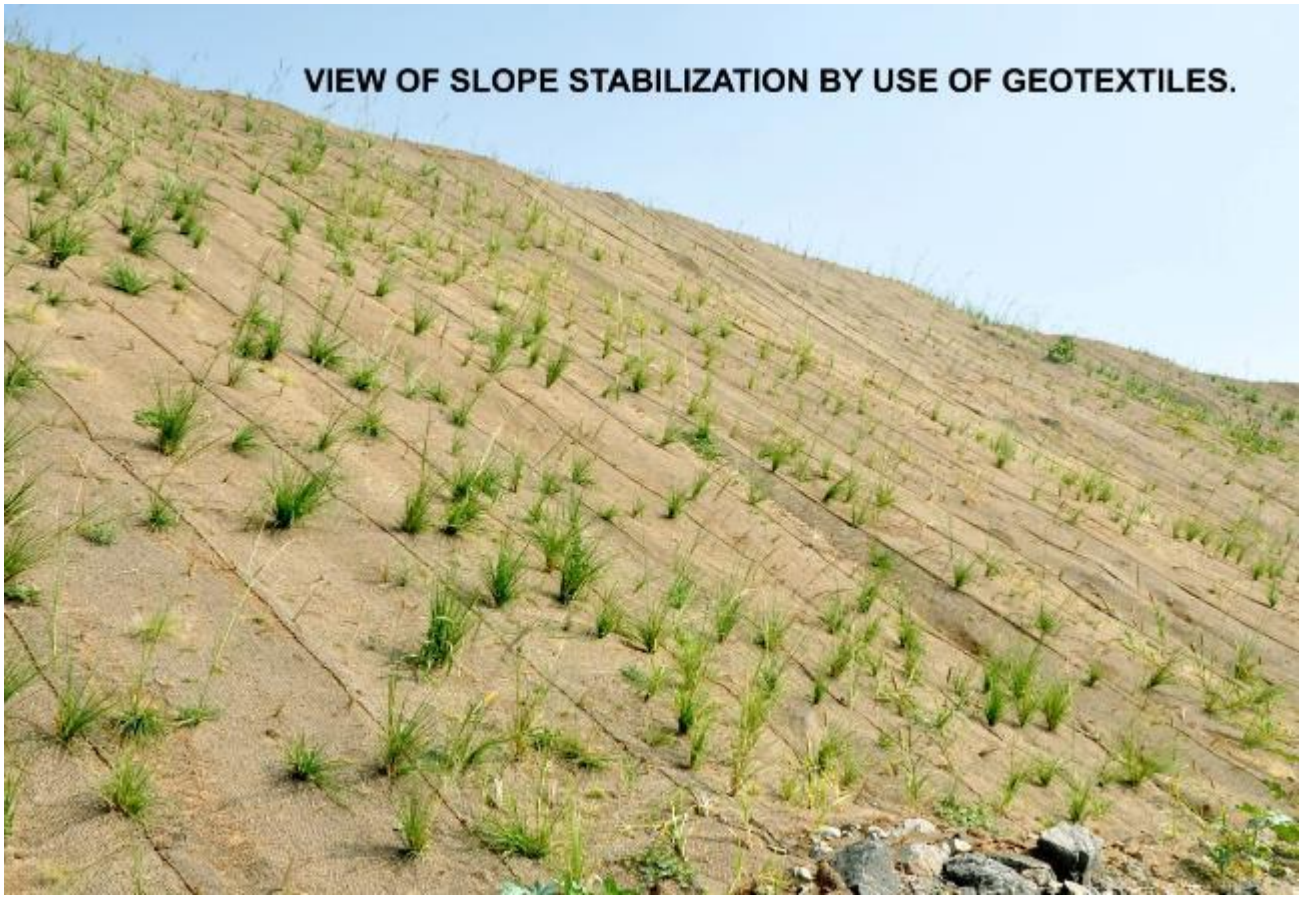
Courtesy :- Controller General of Accounts

Annexure-XXVII



Water Balance

Annexure XXVIII



Geotextiles

vedanta
transforming for good

HINDUSTAN ZINC
Zinc & Silver of India

Mine code: 270020

RA Mine/VTC/F.18/2022 / 2269-2271 Dated: 17.01.2022

To

1. The Director General of Mines Safety
Office of DGMS
Barwa Road
DHANBAD
JHARKHAND
PIN: 826001

2. The Dy Director General of Mines Safety
Office of DGMS, North Zone
Room No 201-3, Block –B, CGO Complex
HAPUR ROAD, KAMLA NEHRU NAGAR
GAZIABAD – UP
PIN: 201002

3. The Director of Mines Safety
Office of DGMS
Anasagar Link Road
AJMER,RAJASTHAN
PIN: 305001

Sub. : Submission of Annual Return in **Form "T"** for the year 2021

Sir,

Please find enclosed the Annual Return Form "T" for the year ending 31st December- 2021, in respect of Rampura Agucha Lead and Zinc Underground Mine of Hindustan Zinc Limited.

Enclosed as above

Thanking you

Sincerely yours

(Sachin M. Deshmukh)
"Mine Manager"

Mine Manager
Hindustan Zinc Limited
Rampura Agucha
Lead and Zinc Underground Mines
Post-Agucha-311022
Distt.-Bhilwara (Raj.)

Hindustan Zinc Limited
Rampura Agucha Mines, P.O. Agucha, Distt. - Bhilwara (Rajasthan) - 311 022
M +91-9001294956-57, F +91-01483 229012 www.hzlindia.com

Registered Office: Yashad Bhawan, Udaipur (Rajasthan) - 313 004
CIN: L27204RJ1966PLC001208

O/C

[FORM – T]

[See Rule 29P (i)]

Annual Return for the year ending on the 31st December – 2021

1. Name of Mines — Rampura Agucha Lead and Zinc Underground Mine.

2. Postal address of Mines — M/S Hindustan Zinc Limited,
Rampura Agucha Mines
P.O. Agucha – 311022
Dist. Bhilwara (RAJ.)

3. Date of opening of Mine — 15.01.2010

4. Date of closing (if closed) — Not applicable

5. Situation of Mine (District/State) — Bhilwara/Rajasthan

6. Name of Owner, Postal address — Sh. Arun Misra
CEO & Whole time Director.
Hindustan Zinc Limited
Yashad Bhawan,
UDAIPUR – 313004

7. Number of person medically examined:

Type of ME	Number of persons required to be Medically examined during 2021		Number of persons Medically examined during 2021	
	OWN	CONT	OWN	CONT
IME	As per requirement		0	577
PME	165	544	165	544

8. Number of persons declared Medically unfit — NIL

9. Categorization of the persons Declared unfit — NIL

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

Date:17.01.2022

17/1/2022

Signature: .....
Name : (Sachin M. Deshmukh)
Designation: **"Mine Manager"**

Mine Manager
Hindustan Zinc Limited
Rampura Agucha
Lead and Zinc Underground Mines
Post-Agucha-311022
Distt.-Bhilwara (Raj.)

Annexure-XXX

Covered conveyer belt

vedanta
transforming elements

HZL/RAM/ENV/2020-21/789 Dated : 28.08.2020

To,
The Director,
Ministry of Environment and Forest and Climate Change,
Regional Office (Central Region),
Kendriya Bhawan,
5th Floor, Sector "H", Aliganj,
Lucknow – 226024

Subject: Submission of study report in in compliance of the EC amendment No: J-11015/267/2008-IA.II(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 Agucha Mine, HZL" is attached herewith for perusal please.

Thanking You,

Yours faithfully,

(Sujal Shah)
SBU Director,

Director, Agucha SBU
Hindustan Zinc Limited
Rampura Agucha Mine
PO- Agucha
Distt. - Bhilwara (Raj.)

CC: **The Member Secretary,**
IA – Division (Non-Coal Mining)
Vayu Block, 3rd Floor, Indira Paryavaran Bhawan,
Ministry of Environment, Forest & Climate Change
Jorbagh Road, New Delhi-110003.

Hindustan Zinc Limited
Rampura Agucha Mines, P.O. Agucha, Dist. Bhilwara (Rajasthan) - 311 022
M +91-9001294956-57, F +91-1483 229012 www.hzlindia.com

Registered Office : Yashad Bhawan, Udaipur (Rajasthan) 313 004
CIN No. L27204RJ1966PLC001208

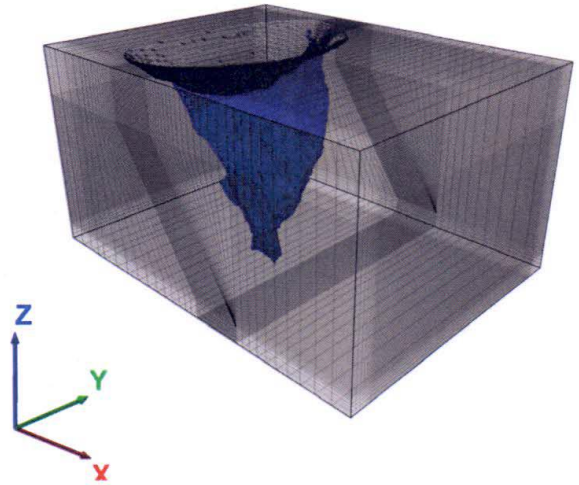
O/C Enw.

CENTRAL INSTITUTE OF MINING & FUEL RESEARCH
(Council of Scientific & Industrial Research)
Barwa Road, Dhanbad – 826 001, 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, Jhalana 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/ 4792

Order No 2009-2010/Mines/401 **Date:** 21/1/2010

M/s Hindustan Zinc Limited
(Rampura Agucha Mine), P.O.- Agucha, Bhilwara,
District :Bhilwara

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 :-

	Mineral	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 activities.

Pollutant	Standards for Ambient Air	Standards for mining activity
SPM	500 µg/M³	SPM = 600 µg/M³ (To be measured between 3 to 10 meters from mining activity)
SO_2	120 µg/M³	
NO_x	120 µg/M³	
CO	5000 µg/M³	

CTE

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(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, Goverment 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 Board.

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 slurry 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(Mines)/Bhilwara(Hurda)/1(1)/2009-2010/**

Order No 2009-2010/Mines/401 **Date:**

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 specified 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,Udaipur..
2 Mining Engineer, Department of Mines & Geology, Government of Rajasthan, Bhilwara.
3 Regional Officer, Regional Office, Rajasthan 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

Annexure

Consent to Establish under Air & Water Acts - Mining Units

General Conditions:-

1. 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.

2. That this consent shall be subject to the directions/orders passed in various Mining/Environment related Writ Petitions by Hon'ble High Court and the Hon'ble Supreme Court.

3. 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 abandonment of prospects or mines.

5. 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.

6. That Mining unit shall strictly comply with the Mining Plan and Eco Friendly 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).

7. That the water spray and sprinkling system so installed should always be maintained in order to utilize the same for dust suppression.

8. 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.

9. That Air Emissions shall conform to the standards prescribed under the Environment (Protection) Act, 1986.

10. 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 (leq)

11. 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 डूंगरी, जयपुर
4, Institutional Area, Jhalana Doongri, Jaipur
Phone : 2709980, 2705731, 2707285 PBX 2711263, 2711329, 2711831, 2707938
Fax : 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/room 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.

13. That the Industry shall comply 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.

14. That this consent is valid, subject to fulfillment of all the other statutory requirements in other Law/Acts/Rules as applicable.

15. That the industry shall submit quarterly compliance of all the above stated conditions to this office.

16. 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 here-in-above and to make such variations as deemed fit for the purpose of Air Act & Water Act.

18. 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

19. 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.

20. 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.

21. 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)

Head Office (Mines)
Rajasthan State Pollution Control Board
4, Institutional Area, Jhalana Doongari, Jaipur-302 004
Phone: 0141-5159600,5159695Fax: 0141-5159697

Registered

File No F(Mines)/Bhilwara(Hurda)/12(1)/2015-2016/1229-1233

Order No 2019-2020/Mines/9959 **Date:** 25/06/2019

Unit Id : 11,060

M/s Hindustan Zinc Limited

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

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-1/2000).**

Ref: (i) Your applications dated 30/10/2017
(ii) Received on 30/10/2017

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.- 1/2000 in an area measuring 1200.0000 Hectares** at/near Village-**Agucha** ,Tehsil-**Hurda**,District-**Bhilwara.**

2 That this consent is valid for a period from **01/03/2018** to **28/02/2023**

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.

(A)

Head Office (Mines)

Rajasthan State Pollution Control Board

4, Institutional Area, Jhalana Doongari, Jaipur-302 004

Phone: 0141-5159600,5159695Fax: 0141-5159697

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File No **F(Mines)/Bhilwara(Hurda)/12(1)/2015-2016/1229-1233**

Order No 2019-2020/Mines/9959 **Date:** **25/06/2019**

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.-1/2000** and a separate **Consent to Operate** is required to be obtained for any other Mineral mining/ processing/ beneficiation Plant/process if any and for any addition/ modification/ alteration or change in process.

7 **That the mine shall comply with all the conditions of the Environmental Clearance letter no. J-11015/267/2008-IA.II (M) dated 11/12/2009 issued by Ministry of Environment and Forest, Government of India.**

8 **That this consent to operate is valid for Lead & Zinc Ore Mining @ 6.15 million TPA. 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 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.**

10 **That mining operations shall be restricted to above ground water table and should not intersect ground water table. In case of working below the ground water table, prior approval of the Ministry of Environment, Forest& Climate Change and Central Ground Water Authority shall be obtained.**

11 **That the Mine shall comply with all the conditions of NOC granted by CGWA vide letter no. 21-4(258)WR/CGWA/2008-472 dated 28.04.2011.**

12 **That haul roads should be regularly graded and compacted. Regular water sprinkling should be carried out on haul roads to minimize dust generations.**

13 **That adequate measure shall be taken for control of fugitive emissions from the areas prone to air pollution.**

14 **That the total water consumption shall not exceed 2200 KLD without prior consent of the Board and permission from CGWA.**

15 **That the mine shall dispose its domestic waste water in scientific manner to avoid water pollution in and around the lease area.**

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File No F(Mines)/Bhilwara(Hurda)/12(1)/2015-2016/1229-1233

Order No 2019-2020/Mines/9959 **Date:** 25/06/2019

Unit Id : 11,060

16 **That no discharge of effluent shall be made within or outside the premises.**

17 **That the mine shall install suitable flow measuring devises/meters on the intake sources of the water and daily record of ground water abstraction and water consumption shall be maintained.**

18 **That the mine shall comply with provision of Hazardous Waste (Management, Handling & Transboundary Movement) Rules, 2008.**

19 **That the mine shall install adequately designed rain water harvesting structure for prevention and recharge of ground water in and around the lease area.**

20 **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.**

21 **That the mine shall not allow unauthorized disposal of any solid waste on land inside or outside the premises.**

22 **That this consent to operate shall be subject to compliance of direction/order passed by Courts of Law in the matter, if any.**

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.

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 [illegible] instituted against you by the State Board for violation of the provisions of the [illegible] the Rules made thereunder.

Head Office (Mines)
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Registered

File No **F(Mines)/Bhilwara(Hurda)/12(1)/2015-2016/1229-1233**

Order No 2019-2020/Mines/9959 **Date:** **25/06/2019**

Unit Id : 11,060

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, Shastri Circle, Udaipur..
2 Regional Officer, Regional Office, Rajasthan State Pollution Control Board, Bhilwara - please ensure 100 percent compliance or standard norms and monitor time to time
3 Mining Engineer, Department of Mines & Geology, Government of Rajasthan, Bhilwara
4 Master File .

Signature valid

Group Incharge-Mines

Valid Mine CTO

Annexure -XXXIII (B)

Head Office (CPM)
Rajasthan State Pollution Control Board
4, Institutional Area, Jhalana Doongari, Jaipur-302 004
Phone: 0141-5159600,5159695 Fax: 0141-5159697

Registered

File No : F(CPM)/Bhilwara(Hurda)/2(1)/2019-2020/2498-2500
Order No : 2019-2020/CPM/5547 **Date:** 22/10/2019

Unit Id : 11060

M/s Hindustan Zinc Limited

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

Sub: **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 30/10/2017 and subsequent correspondence.

Sir,

Consent to Operate under the provisions of section 25/26 of the Water (Prevention & 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 **Lead Zinc Ore Beneficiation plant** situated at **PO- Agucha, District- Bhilwara Agucha Tehsil:Hurda District:Bhilwara** , Rajasthan, subject to the following conditions:-

1 That this Consent to Operate is valid for a period from **01/03/2018** to **28/02/2023** .

2 That this Consent is granted for manufacturing / producing following products / by products or carrying out the following activities or operation/processes or providing following services with capacities given below.

Particular	Type	Quantity with Unit
Beneficiation for Lead Zinc Ore	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 sources of air emmissions along with pollution control measures and the emission standards for the prescribed parameters shall be as under:

Sources of Air Emmissions	Pollution Control Measures	Prescribed	
		Parameter	Standard

Head Office (CPM)
Rajasthan State Pollution Control Board
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Registered

File No : F(CPM)/Bhilwara(Hurda)/2(1)/2019-2020/2498-2500
Order No : 2019-2020/CPM/5547 Date: 22/10/2019
Unit Id : 11060

Primary Crusher New(750TON/HR)	ADEQUATE STACK HEIGHT , Bag Filter , 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
Secondary Crusher(500TON/HR)	ADEQUATE STACK HEIGHT , Bag Filter , WATER SPRAYERS , WET SCRUBBER , WITH ADEQUATE STACK HEIGHT	Particulate Matter	150 mg/Nm3
Two DG Sets(5MW EACH)	ACOUSTIC ENCLOSURE , SAFE STACK HEIGHT AS PER ER IV	CO Particulate Matter NOx NMHC	150 mg/NM3 75 mg/NM3 710 ppm 100 mg/NM3

5 That the **Lead Zinc Ore Beneficiation 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.

Signature valid

Head Office (CPM)
Rajasthan State Pollution Control Board
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File No : F(CPM)/Bhilwara(Hurda)/Z(1)/2019-2020/2498-2500
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6 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.
7 That total capital investment as on 30.09.2017 as per the C.A. certificate submitted by you is Rs. 846.09 Crore which includes the cost of Land, Building, Plant & Machinery and miscellaneous assets.
8 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.II(M) dated 11.12.2009.
9 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.
10 That total water consumption/requirement for lead Zinc Ore Benification Plant shall not exceed to 9500 KLD which will be met from Banas Radial Wells.
11 That the 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)/WR/CGWA/2005-1205 dated 08.07.2013.
12 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.
13 That waste water generated from tailing dam will be reused/recycled completely in mill/process.
14 That the industry shall take utmost precaution to cater seepage from tailing dam and ensure complete recycle of seepage water in process only.
15 That the industry shall explore & carry out some scientific and technical study with reputed experienced organization in the field for catering of seepage from tailing dam.
16 That the industry shall get renewed NOC for abstraction of ground water from CGWA and submit to the State Board.
17 That the industry shall re-circulate the decanted water from the tailing dam and shall maintain Zero Discharge Status from tailing dam.
18 That the effluent from the ore beneficiation 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.
19 That the industry shall maintain the stability and safety of the tailing dam as asssessed by CWPRS and NIRM.

Signature valid

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20 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.
21 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.
22 That for the control of fugitive emission guidelines / code of practice as issued by CPCB will be followed.
23 That at least four ambient air quality monitoring stations shall be established and maintained for PM-10, PM- 2.5, SOx & NOx monitoring.
24 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.
25 That adequate infrastructure facility for stack emission monitoring shall be maintained at the stack of crushers.
26 That stack of adequate height as per norms and acoustic enclosure shall be maintained with two DG Sets of 5 MW KVA each.
27 That no additional source of air emission shall be installed without prior consent from the State Board.
28 That all the raw materials and products shall be stored in closed sheds.
29 That cemented roads shall be provided and maintained properly inside the premises to minimize fugitive emissions due to vehicular movement.
30 That water sprinkling and cleaning of haul roads by vacuum cleaner shall be done regularly to control the fugitive emissions generated due to vehicular movement.
31 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 material to reduce the fugitive emissions.
32 That the industry shall maintain dust collection and extraction system to control fugitive dust emissions at all the transfer points & loading/unloading areas.
33 That regular monitoring of ground water particularly in respect to heavy metals shall be carried out by establishing adequate numbers of peizeometric well around tailing dam.
34 That adequate arrangements shall be made to avoid flow of pollutants along with rain water.

Head Office (CPM)
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35 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.

36 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.

37 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.

38 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 µg/dl) should be shifted immediately to non-lead activity areas and given special medical treatment till the lead levels come back to acceptable level.

39 That the industry shall install and maintain adequately designed rain water harvesting structure for recharge of ground water in and around the area.

40 That the plantation of local species in the 33% of total area of the project shall be carried out & maintained.

41 That the industry shall get policy renewed from time to time under Public Liability Insurance Act (PLIA) and submit its copy to the Board.

42 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.

43 That the industry shall submit the quarterly compliance report of all the above conditions to the State Board.

44 That, not withstanding anything provided hereinabove, the State Board shall have 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 the conditions imposed here in above and to make such variation as it deemed fit for the purpose of Air Act & Water Act.

45 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.

Head Office (CPM)

Rajasthan State Pollution Control Board

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File No : F(CPM)/Bhilwara(Hurda)/2(1)/2019-2020/2498-2500

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Unit Id : 11060

46 That the grant of this **Consent to Operate** shall not, in any way, adversely affect or jeopardize the legal proceeding, 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.

This **Consent to Operate** shall also be subject, besides the aforesaid specific conditions, to the general conditions given in the enclosed Annexure. The project proponent will comply with the provisions of the **Water Act and Air Act** and to such other conditions as may, from time to time , be specified, by the State Board under the provisions of the aforesaid Act(s). Please note that, non compliance of any of the above stated conditions would tantamount to revocation of **Consent to Operate** and project proponent / occupier shall be liable for legal action under the relevant provisions of the said Act(s).

This bears the approval of the competent authority.

Yours Sincerely

Group Incharge[CPM]

(A): **Copy To:-**

1 Regional Officer, Regional Office, Rajasthan State Pollution Control Board, Bhilwara to inspect the unit and verify the compliance of consent conditions and submit the complete report with water analysis report of piezometic well including all parameters and all metals within 30 days.

2 Master File.

Group Incharge[CPM]

Signature valid

Page 6 of 8

Valid Beneficiation plant CTO

Tailing close pipe line