BEFORE THE NATIONAL GREEN TRIBUNAL

SITTING AT BHOPAL

ORIGINAL APPLICATION No. 68 of 2020

IN THE MATTER OF:

OM PURI & ORS. ... APPLICANTS

VERSUS

HINDUSTAN ZINC LIMITED & ORS. ... RESPONDENTS

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RAMPURA AGUCHA MINE HZL

Dated: 14.10.2020

For Respondent no. 1

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REPLY ON BEHALF OF RESPONDENT NO.1

HINDUSTAN ZINC LIMITED

1. At the outset, the Respondent No. 1, M/s Hindustan Zinc Limited (hereinafter the "**Respondent HZL**"), denies each and every averment, contention and allegations made in the Original Application **(OA)**, save and except to the extent expressly admitted herein below. The Applicants have not only levelled completely false and baseless allegations against the Respondent HZL that are devoid of any material particulars, but has also withheld material facts purely to prejudice and mislead this Hon'ble Tribunal.

2. In brief, the Respondent HZL submits as follows:

    (a) The Applicants have withheld material facts regarding previous proceedings before this Hon'ble Tribunal with respect to this very Rampura Agucha Mine (the "**Mine**") of Respondent HZL.

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(b) Similar complaints raising almost identical issues concerning this very Mine have already been decided by a final judgment dated 12.5.2016 passed by this Hon'ble Tribunal in O.A. nos.128/2014 and 129/2014. Separately, this Hon'ble Tribunal has dismissed 100 O.A.'s filed in 2014 claiming compensation from the Respondent HZL based on the same complaints. The applicant in OA 129/2014, Davad Neelgar, and many of the applicants in the 100 OAs for compensation were from Kothiya. A copy of the OA no.129/2014 and the judgment dated 12.5.2016 passed by this Hon'ble Tribunal in O.A. no.129/2014 are annexed herewith and marked as **Annexure R – 1** and **Annexure R – 2** respectively. A copy of some of the orders passed by this Hon'ble Tribunal in the year 2016 dismissing applications for compensation are annexed and marked as **Annexure R – 3 colly**.

(c) 15 fresh OAs, including the present OA, have now been filed in 2020 on almost identical grounds, which were considered and decided in the judgment dated 12.5.2016 in OA 128/2014 but, curiously, the previous history of the matter set out above has been concealed, thus misleading this Hon'ble Tribunal into issuing notice. The Applicants cannot be permitted to re-agitate the very same issues over and over again, especially when they were fully aware of the 2014 OAs and chose not to file individual claims. The claim is hit by the principle of constructive *res judicata*.

(d) The Application is also barred by time under Section 15(3) of the National Green Tribunal Act, 2010 (the **"NGT Act"**)

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and cannot be entertained. The Respondent HZL was granted the mining lease on 12.3.1980 and actual mining was started in the year 1991. Since the allegations of air and water pollution, loss of agricultural produce and alleged damage to house due to blasting is based on the mining activities, the cause of action would have first arisen in 1991. The NGT Act came into force on 18.10.2010 where the period of limitation is provided in Section 15(3). In para.12.9, the Applicants also admit that they are aware that similar and identical applications are pending before this Hon'ble Tribunal. These applications were filed in 2014. However, the Applicants do not explain as to why they chose to wait till 2020 to file the OA. A claim made in June 2020 is, therefore, barred by time since it has not been made within the period of five years from the date from which the cause of action first arose. It is not even made within a period of five years from the date the NGT Act came into force.

(e) The OA claiming compensation from Respondent HZL is not maintainable since it is devoid of any material particulars:

(i) Form-II appended to the Rules requires the Applicants to give particulars of the place, date and time of the accident, nature of injuries suffered, name and address of the medical officer/ practitioner who attended to the injured victim, etc. None of these specific particulars have been given qua the Applicants. Rather, bald and vague allegations have been made against the Respondent HZL.

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(ii) The Applicants have not filed any evidence whatsoever in support of their claim for compensation. Certain photographs have been produced (which are common to all the 15 applications) without even stating specifically whether these photographs are of the agricultural fields of the Applicants. In fact, in para.12.8, the Applicants admit that they do not have any evidence in support of their case. In absence of any evidence, the claim for compensation is liable to be dismissed.

(iii) Even though the Applicants claim to be suffering from disease on account of mining operations, no particulars of the ailment, the details of the medical practitioner who attended to them, or even the medical prescription has been enclosed. In fact, in column 9 regarding medical practitioner, the Applicants have written "N/A" meaning not applicable. It proves that the claims are purely imaginary.

(iv) Similarly, no particulars are given regarding the livestock even though loss of domestic animals by unnatural death has been alleged. The Applicants have simply claimed a round figure without any particulars, details or supporting documents.

(v) A claim towards agricultural loss is made without giving details of their land, or the basis on which the loss is computed. A common set of photographs are

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produced in the applications without stating whether these photographs are of the Applicants' land. If not, the Applicant cannot claim compensation even assuming for the sake of argument that loss could be proved by producing a mere photograph.

(vi) The Applicants have also made a vague claim of "Other losses" without even stating as to what were these alleged other losses.

(vii) There is absolutely no evidence on record to show that any alleged loss, even assuming that there is such a loss, has been caused on account of the Respondent HZL's activities. The Applicants live more than 4 kilometres away from the Mine, and it is not possible that they have suffered any loss on account of the operations of the Respondent HZL.

(viii) The lack of necessary particulars proves that the Applicants have filed a completely false and baseless claim. The bald averments made in the application is no more than imaginary surmises and conjectures. Therefore, the alleged sums of money claimed towards the alleged "losses" cannot be sustained either on facts or in law, and the application is liable to be dismissed.

(ix) The OA is an abuse of process, and is a fishing and roving enquiry to extract money from a company that has always functioned in accordance with all environmental norms and has done substantial CSR

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activities in the area, which would be clear from the submissions below.

3. The Respondent HZL has a mining lease for lead, zinc and associated minerals over 1200 hectares on non-forest land known as Rampura Agucha Mines in Tehsil Hurda and Phuliakala, District Bhilwara, Rajasthan. The lease was granted on 12.3.1980 for a period of 20 years and has been subsequently renewed from time to time.

4. The Respondent HZL was a public sector undertaking in which the Government of India disinvested 62.92% of its shareholding in 2002 in favour of Sterlite Opportunities and Ventures Ltd. At present, the Government of India holds 29.54% of the shares in the Respondent HZL.

5. The Respondent HZL has all the statutory clearances to operate this mine, including the approved Mining Plan issued by the Indian Bureau of Mines (**IBM**), the environment clearance issued by the Ministry of Environment and Forests (**MoEF**), Government of India, and the Consent to Operate issued by the Rajasthan State Pollution Control Board (**RSPCB**). The Consent to Operate is valid up to 28.2.2023.

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6. The Respondent HZL is in compliance with the conditions stipulated in the approvals given by the statutory authorities. It submits periodic reports / returns to the IBM, the MoEF, the RSPCB and the Director, Mines and Geology in the State Government in terms of the approval conditions. The Central and State authorities, including the RSPCB, carry out periodic

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monitoring and inspection of the mining lease to ensure that conditions stipulated in the statutory clearances are complied with by the Respondent.

7. This Hon'ble Tribunal had in 2015 directed the RSPCB to examine almost identical allegations against this very Mine of the Respondent HZL with the assistance of district authorities. The RSPCB gave its report and found no wrong doing on the part of the Respondent HZL. This report was considered by this Hon'ble Tribunal in its final judgment dated 12.5.2016 in OA 128/2014, which is already marked as *Annexure R-2*. This judgment has attained finality in absence of any appeal therefrom. A copy of the order dated 23.9.2014 passed by this Hon'ble Tribunal and a copy of the report dated 16.11.2014 filed by the RSPCB (without its annexures) are annexed herewith and marked as **Annexure R - 4** and **Annexure R - 5** respectively.

8. The Respondent HZL submits that the OA nos.128 and 129 of 2014 have a direct and material bearing on the complete adjudication of the issues raised in the instant OA. Accordingly, it is prayed that the complete record of OA 128/2014 and OA 129/2014 decided by this Hon'ble Bench be tagged along with this OA. The complete record of said OAs are voluminous.

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9. Thereafter also, the RSPCB has carried out inspection of the Mine and found the operations to be within the stipulated norms. The Respondent HZL is annexing one such RSPCB inspection report of 16.1.2019, which is marked as **Annexure R - 6**.

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Ambient Air Quality

10. The village Arniya Chauhan is around 4.1 kilometres north of the Mine and at a road distance of more than 9 kilometres. The Respondent HZL submits that since identical complaints of residents of village Kothiya located at a distance of 2.5 kilometres is shown to be false in the replies to the connected OAs, the impact of Respondent HZL's activities on village Arniya Chauhan would be further less since it is located 4.1 kilometres from the Mine and 1.6 kilometres further away of village Kothiya. The Respondent HZL, therefore, is relying on the documents relevant for village Kothiya also to show that the allegations in this OA are false, without any basis, and the Applicants have been misled into filing this OA against the Respondent HZL.

11. The ambient air quality over village Kothiya is regularly monitored on a monthly basis and the quality is well within the stipulated norms, and by extension, it would be within the norms even for Arniya Chauhan village. The ambient air quality is also tested by M/s. Team Test House, Jaipur, a MoEF approved laboratory, and the quality was found to be within the norms. A table containing the air monitoring data for Kothiya village for the period April 2015 through March 2020 (which figures are taken from the monthly/quarterly reports submitted by the Respondent HZL to the RSPCB) is annexed herewith and marked as **Annexure R - 7.** A copy of some of the ambient air quality reports given by Team Test House of village Kothiya dated 7.5.2015, 19.11.2015, 20.5.2016, 2.11.2016, 20.7.2017, 15.12.2017, 1.8.2018 and 11.12.2018 and 5.12.2019, and RSPCB reports dated 6.4.2017

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and 4.9.2018 are annexed herewith and marked as **Annexure R – 8 colly**.

12. Even the statutory authorities like the RSPCB monitors the ambient air quality over Kothiya village. The RSPCB report also show that the air quality of village Kothiya is well within the stipulated norms. A copy of the RSPCB report is already annexed as *Annexure R – 8*. It is clear, therefore, that the allegations of the Applicants, who reside 1.6 kilometres further away from village Kothiya are completely false and baseless.

13. At present, the depth of the mining pit is around 420 metres below ground level and the mining is underground. The height of the overburden dump is around 140 metres. Therefore, for the dust to rise around 560 metres and reach the village around 2.5 kilometres away is not possible. This fact has been noticed by this Hon'ble Tribunal in its final judgment dated 12.5.2016 as follows:

> "28. The allegation that as a result of blasting lot of dust is created is also taken note of by us. While it has been stated that controlled blasting is carried out. We may also take note of the fact which is not disputed that the height of the waste deposit of the overburden excavated from the mines is of approximately 150 to 200 feet and the depth of the mine which is presently being mined and excavated has gone down below the ground level in the open cast area to nearly 300 to 400 feet. Thus in all about 450 to 500 feet high barrier is there before the dust can spill out and therefore we would agree to some extent with the submission of the Learned Counsel for the Respondent that in these circumstances the possibility of the dust

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from the mines reaching the inhabited areas is considerably reduced and minimized.

29. In addition to the above as has been submitted in the affidavit of the Respondent No. 1 that large scale plantation both on the waste dumps which are not in use and also in the periphery area along these waste dumps has been carried out and large scale plantation has been carried out in mine site creating a wind barrier between the mining area and the village. Apart from the above, the old plantation of the Forest Department was also taken over for improvement and plantation carried out by the Respondent No. 1 was shown from the photographs filed along with the affidavit. Sufficient plantation has been carried out to act as a buffer and wind breaker by way of dust containing measure between the mines and the village. In that view of the matter we are *prima facie* satisfied that dust suppression measure taken by way of above that is construction of the pakka roads and creating wind breakers by extensive plantation. The dust as a result of the mining can be sufficiently controlled."

The claim of the Applicants is without any basis, and they also cannot be permitted to re-agitate the same issues again.

14. Dust pollution levels are reduced to the minimum since the Respondent HZL has adopted world-class dust control measures to minimize it. The ambient air quality is regularly monitored within and outside the Mine and the results show that the quality is well within the norms, which is also clear from the various reports.

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15. The Respondent HZL has adopted one of the most modern and advanced mining techniques in the world. The Central Institute of Mining and Fuel Research (the "**CIMFR**"), a constituent laboratory

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of CSIR-CENTRAL INSTITUTE OF MINING & FUEL RESEARCH (Council of Scientific & Industrial Research) (the **"CSIR"**), has recognised the Respondent HZL's excellence in safe and environmentally friendly mining techniques and routinely utilizes the Respondent HZL's Rampura Agucha mine as a training and instructional facility.

16. The allegations in the OA are, therefore, completely false and baseless. Almost identical allegations as made in 2014 by some villagers from Kothiya are being repeated only to harass and put pressure on the Respondent HZL even though the Applicants live further away in Araniya Chouhan village.

Overburden Material

17. In para.12.8, the Applicants have alleged that "a storm of toxic dust and stones" from the overburden material is allegedly affecting the surrounding. The submission is misconceived and without any merit. The "over burden" generated from the mining operation is systematically stacked at earmarked dump sites and subsequently rehabilitated with vegetation to make it self-sustaining. These rehabilitated "waste dumps" are a part of the "green belt" which is a condition even in the Environment Clearance for this Mine.

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18. The Respondent HZL has undertaken various best-in-class measures to minimize dust pollution and enhance the environment in general. Some of these measures are as follows:

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(a) Peripheral plantation has been undertaken all along within the boundary wall of the acquired mining lease area. A further increase in plantation in terms of planting of 20,000 saplings inside the mining lease area for the financial year 2020-21 is already underway. This is a four-fold increase from 5000 sapling in 2015-16.

(b) The matured over-burdened benches are being stabilized by carrying out plantation and the slopes are being stabilized by use of geo-textile net and spreading of seeds.

(c) The total area within the mining lease that is presently covered by plantation is around 310 hectares, an increase of 50 hectares in the last five years.

(d) Water is sprayed around the area of mining operations to suppress dust particulate matter. In fact, water spraying at the point sources of dust emissions has been increased to 8 to 12 times a day since 2015.

(e) Dust suppressing chemicals called Dustron Nano PC and Dustron XT are used on the haul roads and the transfer points to prevent fugitive dust emissions, stabilize dumps and accelerate the dump-rehabilitation and vegetation process.

(f) Atomised water spray system, venturi scrubber, bag-dust collector at the crusher and now an additional mist sprayer deployed since March 2015 are actively used to further reduce fugitive dust emissions from the mining area.

(g) Vehicular tyre and truck washing bays are used to prevent fugitive particulate emissions.

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(h) Industrial roads are cleaned by using two Truck-mounted Vaccum Road Sweepers.

These measures ensure that the dust pollution is reduced to the minimum. The allegation regarding dust pollution in village Kothiya is misguided and ill-informed, and therefore, without merit. Similarly, even the allegation that there is a loss of crops and life of cattle due to dust pollution is devoid of any merit and without any basis. The Applicant is producing certain recent photographs showing the extent of vegetation, the activities undertaken by the Respondent HZL to control dust pollution, etc. A copy of some representative photographs taken at the site of the mine are annexed herewith and marked as **Annexure R - 9**.

Blasting Operations and alleged damage to houses

19. One of the claims for compensation is on account of damage to hutment allegedly due to blasting activity in the Mine. The allegation is completely false, misconceived and baseless.

20. On the direction of this Hon'ble Tribunal on 23.9.2014, the Executive Engineer PWD, Shahpura, Bhilwara examined the specific complaint of damage to houses in village Kothiya due to blasting in the mine and concluded that "*.. the cracks in the houses at village – Kothiya are not due to the impact of blasting done at HZL, Agucha Mine..*". This finding was part of the RSPCB Report submitted to this Hon'ble Tribunal in compliance with the order dated 23.9.2014. The RSPCB report was taken note of by this Hon'ble Tribunal in its final judgment dated 12.5.2016.

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21. The CIMFR, Dhanbad, had earlier carried out a study in March 2008 to investigate the impact of blasting on the houses / dwellings of Kothiya villages in which the villagers had duly cooperated. The CIMFR concluded that the recorded vibration and noise/air over-pressure data were well within the safe limit at the houses / dwellings of the said villages. It follows, therefore, that the vibration and noise limits for the Araniya Chouhan village would also be within the norms. A copy of the CIMFR Report dated March 2008 is annexed herewith and marked as **Annexure R - 10**.

22. Further, the Council for Scientific and Industrial Research (**CSIR**) in October 2014 gave a detailed report on the blasting activities and made recommendations for the Respondent HZL's mine. The CSIR analysed the blasting activity and found that it was *"excellent"* in terms of technique and overall safety considerations. The said CSIR report categorically concluded that *'cracks'* in houses in the vicinity of the mine are unnecessarily "*credited*" to mining whereas there are actually "*environmentally induced cracks*" which are caused by other reasons. A copy of the CMFRI report of October 2014 is annexed herewith and marked as **Annexure R - 11**.

23. Recently in May-June 2020, the CSIR – Central Institute of Mining & Fuel Research, Dhanbad (CIMFR) studied the blasting vibration report again and found that the vibrations were well within the standards stipulated by the Director General of Mines Safety (DGMS). The following table proves that there could be no impact of the blasting on the house of the Applicants:

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Date	Blasting Location	Instrument location	Frequency of the recorded blast vibration (Hz)	Radial distance of monitoring point from the blast face (m)	Trigger level of the seismograph instrument (mm/s)	Measured ground vibration magnitude (mm/sec)	DGMS limit for Kutcha, brick & cement houses (mm/s)	Distance between monitoring point and Arniya Chauhan village
18.5.20	-255N562	North Station	Not triggered	719	0.13	Not triggered	-	5.9 KM
19.5.20	-255S raise	South Station	Not triggered	1097	0.13	Not triggered	-	7.7 KM
20. 5.20	-5N637	North Station	Not triggered	1710	0.13	Not triggered	-	5.9 KM
22.5.20	-280N330	North Station	Not triggered	1276	0.13	Not triggered	-	5.9 KM
23.5.20	-255N487	OC view point	35.9	955	0.13	1.323	15	5.7 KM
24.5.20	-255S270	South Station	Not triggered	1126	0.13	Not triggered	-	7.7 KM
26.5.20	-5N637	OC view point	Not triggered	657	0.13	Not triggered	-	5.7 KM
27.5.20	-280N397	OC view point	19	1087	0.13	0.326	10	5.7 KM
29.5.20	-80N472	OC view point	21.38	825	0.13	0.605	10	5.7 KM
29.5.20	-280N127	OC view point	17.38	1226	0.13	1.016	10	5.7 KM
30.5.20	-5N637	OC view point	23.44	656	0.13	1.159	10	5.7 KM
30.5.20	-80N547	OC view point	16.56	799	0.13	0.209	10	5.7 KM
3.6.20	-280N300	OC view point	36.13	1126	0.13	0.16	15	5.7 KM
3.6.20	-255N487	OC view point	18.69	1011	0.13	1.595	10	5.7 KM
5.6.20	-280S240	WMM plant	19.5	1170	0.13	1.071	10	6.9 KM
11.6.20	-255N67	OC view point	19.88	1244	0.13	2.8	10	5.7 KM

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The above table shows that the impact of the blasting was well within the limits set by the DGMS for Kutcha, brick and cements houses even at a distance of 657 metres to 1700 metres from the blasting location. It is not possible that there would be any impact of blasting on the houses located at a distance of 4.1 kilometres to 6 kilometres from the monitoring points. It is, therefore, unjust and out rightly false to imply that the cracks in the houses in the village of Kothiya were in any manner attributable to the Respondent HZL's blasting activity at the mining site. A copy of the CSIR-CIMFR report of June 2020 is annexed herewith and marked as **Annexure R – 12**.

Ground Water

24. The Applicants have alleged that there is uncontrolled extraction of ground water and also that the water is contaminated allegedly on account of seepage of waste from the mine. These allegations again are completely false and baseless.

25. The Respondent HZL does not use ground water of the area for its activities. Therefore, the allegation regarding depletion of water level (even assuming for the sake of argument that it was true) could not have been attributable to the Respondent HZL's activities. The Respondent HZL had an understanding initially with the Government of Rajasthan and thereafter, has a no-objection certificate from the Central Ground Water Authority (CGWA) to draw water from the radial well in river Banas, which is situated around 70 kilometres from the Mine. This fact is noticed even in the Environment Clearance given to the Respondent HZL and the also in the inspection report of the

RSPCB. The water is brought to the project site through a pipeline. Since 2005, the agreement with the CGWA permits the Respondent HZL to draw 11,700 kilolitres of water per day out of which the Respondent HZL draws a maximum of around 10,500 kilolitres of water per day. The remaining water requirements are met internally by rain-water harvesting and reclaiming water from the tailing dam.

26. Even in 2014, similar allegation of depletion of ground water level on account of mining operations was made in OA 129/2014 filed by Sh. Davad from the same village. Vide order dated 23.9.2014, this Hon'ble Tribunal directed the RSPCB to examine the allegation with the assistance of district officials and file a report. In compliance, RSPCB filed its report dated 23.9.2014 wherein it filed a report from the Ground Water Department, Bhilwara, stating that "*The study carried out so far reveals that average ground water level fluctuation trends during the year 2004 and 2014 indicates +2.5 mt rise in the water level in and around the mine area*". It is pertinent to note that the Ground Water Department report is over a 10-year period from 2004 through 2014. The mining operations at the Mine having started in 1991, and if the operations were impacting the ground water level, it would be clear from the report for the period 2004-2014 itself. There is absolutely no basis for the Applicants' allegation in this regard.

27. Even for the period 2015 through 2020, the report of the Ground Water Department, Bhilwara, shows that water in the GWD well near village Kothiya is healthy and plentiful, between 15.15 and

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3.05 meters. A copy of the report dated 9.9.2020 of the Ground Water Department, Bhilwara, for the period 2015 through 2020 is annexed herewith and marked as **Annexure R – 13**.

28. The further allegation in para.12.4 that waste water is discharged from the said mine leading to contamination of ground water is baseless and absurd. The Mine is a zero-discharge unit, which is clear from the Consent-to-Operate granted by the RSPCB. No waste water is generated from mining activities. Waste water generated from beneficiation process is stored in tailing dam and supernatant water is recycled in the process. Adopting an extra cautious approach and to take care of any unforeseen condition, the Respondent HZL has constructed retaining wall / garland drains in the downstream of the tailing dam followed by collection sump / siltation pond to collect seepage water if any. Thus, the Mine maintains a zero-discharge status outside the lease area.

29. Further, the tailing dam is in the north-west corner of the mining lease area. The Kothiya village in question here is towards the north-east corner of the mining lease area. The tailing dam is approximately 2500 meters or 2.5 kilometres from the village of Kothiya. The village Arniya Chauhan is further away, being 4.1 kilometres from the Mine and 1.6 kilometres away from village Kothiya. The topography of the area in question is such that any water on the ground level can never have a flow in the north to east direction.

30. The Respondent HZL monitors the ground water quality, including near the tailing dam. Even the RSPCB inspects the groundwater quality, including near the tailing dam. As would

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be clear from the reports, there is no contamination of ground water as alleged and the parameters are all within settled norms. The RSPCB had taken water samples even on 13.11.2018 from the piezo wells around the tailing dam and the results were as under:

Peizometer No.	**Zinc (mg/l)**	**Lead (mg/l)**	**Iron (mg/l)**	**Cadmium (mg/l)**
Drinking Water Standard as per IA 10500:2012	*5*	*0.01*	*0.3*	*0.003*
H1 (Adjacent to Tailing Dam on west)	1.6	0.01	0.22	0.001
I1 (Adjacent to Tailing Dam on the north-west)	1.88	0.01	0.18	0.001
A On the western side of Tailing Dam	1.42	0.01	0.26	0.001
E (Adjacent to Tailing on the north)	1.47	0.008	0.22	0.001
P (South-west of Tailing Dam)	1.44	0.006	0.18	0.001
Near Administration Building	1.26	0.004	0.24	NT

Therefore, the allegation that seepage from the tailing dam pollutes the ground water 4.1 kilometres away in Arniya Chauhan cannot be true when the ground water of even Kothiya village, which is 2.5 kilometres away from the Mine, has not been found polluted and are well withing the norms. A copy of the RSPCB report dated 16.1.2019 is already marked as *Annexure R-6.*

34. The Respondent HZL has also provided 7 piezo-metric wells for monitoring the ground water quality in the surrounding areas, and data collected from these wells are regularly submitted with the State authorities, including the RSPCB. The quality of the ground water is well within the stipulated norms, and it is not possible that the ground water quality of Arniya Chauhan is pollulted as alleged. A copy of some of the reports of the piezo-

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metric well near Kothiya village submitted to the RSPCB is annexed herewith and marked as **Annexure R - 14 colly**.

32. The RSPCB, in a recent affidavit dated 9.6.2020 filed in M.A. 1 of 2020 in OA 187 of 2020 before this Hon'ble Tribunal concerning this very Mine, has found that the analysis of the ground water when compared with drinking water standard IS 10500 were within the stipulated norms. RSPCB has specifically pointed out in its affidavit that:

> "It is submitted that from perusal of the above submissions it is evident that the applicant has filed the present M.A. without any study or evidence with respect to his allegations regarding rampant mining, continuous discharge of wate water causing agricultural loss and contamination of ground water. The issue has already been dealt by this Hon'ble Tribunal in detail in O.A. no.128/2014 titled Raghu Nath Vs Hindustan Zinc Ltd. & Ors. And O.A. No.129/2014 titled as Davad Vs. Hindustan Zinc Ltd. & Ors."

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A copy of RSPCB affidavit dated 9.6.2020 filed in MA 1/2020 in OA 187/2014 is annexed herewith and marked as **Annexure R - 15**.

33. The Applicants have also alleged that they have become dependent on HZL for supply of drinking water. It is pertinent to mention that village Arniya Chouhan is self-sustaining with respect to drinking water since 2018 through dedicated pipelines laid by the Government under Project Chambal. Therefore, there is no absolutely basis for this allegation.

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34. The Respondent HZL, as part of their Corporate Social Responsibility, has been supplying around 20 kilolitres of drinking water per day to the residents of Khedapalola, which is a part of Kothiya village, and also to the other adjoining villages out of the water drawn from the Banas river. Even the staff members and employees of the Respondent HZL use this water for their drinking purposes. In terms of the direction of this Hon'ble Tribunal in OA 128/2014, the drinking water supplied to the villages were tested and found to be well within the accepted parameters. The quality of the drinking water continues to be tested, including by the M/s Team Test House, from time to time and the water was found safe for drinking. A copy of one such report of Team Test House dated 22.5.2020 is annexed herewith and marked as **Annexure R - 16**.

Alleged Loss of Agricultural Produce

35. One of the claims for compensation is on account of alleged agriculture loss. The allegation is devoid of any details, completely false, misconceived and baseless. The Applicants have not even given the details of the land or agricultural produce and the evidence in support thereof, or even the basis for reaching the amount claimed in the OA.

36. The identical allegation was levelled in OA 129/2014 pertaining to village Kothiya. On the direction of this Hon'ble Tribunal on 23.9.2014, the RSPCB was asked to look into the issue of alleged damage to the agricultural fields and loss of produce with the assistance of the district officials.

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37. The RSPCB, in compliance, filed its report dated 16.11.2014. The Sub-Divisional Officer and the Deputy Director, Agriculture, in their report to this Hon'ble Tribunal concluded that the "*Overall average crop yield is satisfactory in the area*". The SDO Shahpura reported that "*Water is not coming in the agriculture land from tailing dam site. There is no chance of depletion in agriculture crop*". The report was taken note of by this Hon'ble Tribunal in its final judgment dated 12.5.2016.

38. On further directions of this Hon'ble Tribunal in its order dated 18.12.2014, the soil of the agricultural land of Sh. Davad in Kothiya village was tested by the Deputy Director, Agriculture (Vistar), Zila Parishad, Bhilwara. In his report dated 16.1.2015, Deputy Director, Agriculture, clarified that the quality of the soil was found satisfactory. A copy of the report dated 16.1.2015 of Deputy Director Agriculture is annexed herewith and marked as **Annexure R - 17**.

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39. The Applicants, who are from the same village as Sh. Davad, and live more than 4.1 kilometres away from the Mine, are again levelling the self-same allegations without any basis.

Diseases allegedly caused by mining operations

40. There is no specific claim for compensation for alleged suffering from disease. However, bald allegations of prevalence of disease like asthma, skin and other diseases have been made, which are completely false and therefore, specifically denied.

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41. Identical allegations were made in OA 129/2014 pertaining to village Kothiya. On the direction of this Hon'ble Tribunal on 23.9.2014, the RSPCB was asked to look into the allegations with the assistance of the district officials.

42. The RSPCB, in compliance, filed its report dated 16.11.2014. The Chief Medical & Health Officer, Department of Health, Government of Rajasthan, in his report to this Hon'ble Tribunal (which was enclosed with the RSPCB report) concluded that the "*the level of respiratory disorder, skin diseases and other type of diseases is not beyond the average prevalence of diseases*". This report has been taken note of by this Hon'ble Tribunal in its judgment dated 12.5.2016.

43. Recently, the Satellite Hospital, Bhilwara, vide its letter dated 29.8.2020, has again confirmed that there was no record of treatment of any person of diseases attributable to lead and zinc pollution, or deaths on account thereof. A similar clarification has been given by the Community Health Centre, Phuliakalan, district Bhilwara on 24.8.2020. A copy of the letters dated 24.8.2020 and 29.8.2020 are annexed herewith and marked as **Annexure R - 18**.

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44. Clearly, the Applicants are harassing the Respondent HZL for ulterior motives and purposes.

Alleged Loss of Livestock

45. The claim for compensation for alleged loss of livestock, buffaloes, cows, etc. is specifically denied as false.

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46. Identical allegations were also made in OA 129/2014 pertaining to village Kothiya. On the direction of this Hon'ble Tribunal on 23.9.2014, the RSPCB was asked to look into similar allegations with the assistance of the district officials.

47. The RSPCB, in compliance, filed its report dated 16.11.2014. The Animal Husbandry Department, Government of Rajasthan, in its report to this Hon'ble Tribunal (which was enclosed with the RSPCB report) concluded that the *"Diseases and symptoms observed are of common type. Causes of death of animals are of common type. There is no depletion in the production of milk"*. This report has been taken note of by this Hon'ble Tribunal in its judgment dated 12.5.2016.

48. Recently, the Additional Director, Animal Husbandry, Bhilwara, in his letter dated 3.3.2020, has made it clear that there is no report of any loss to animals in the area on account of either pollution or infections. Clearly, the Applicants are making completely false and baseless claims. A copy of the letter dated 3.3.2020 is annexed herewith and marked as **Annexure R - 19**.

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Land Indentation

49. The Applicants, in para.12.8, have alleged that underground mining has led to cavity and mammoth holes at many places. The Respondent HZL categorically denies the allegation. The Applicants have not given any particulars. In fact, they have not even averred in the OA that the alleged land indentation has happened in their land. A common set of photographs bearing no relation to the lands of the applicants have been filed along with

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the applications. The Applicants are subject to strict proof of their allegation.

50. In any case, the Tehsildar, Phuliakalan, in his letter dated 11.9.2020, has informed that there is no record or complaint of land indentation in village Kothiya in the last five years on account of mining at the Respondent HZL's mine. A copy of the letter dated 11.9.2020 of the Tehsildar Phuliakalan is annexed herewith and marked as **Annexure R - 20**.

Corporate Social Responsibility (CSR) Activities

51. The Respondent HZL has for long been carrying on CSR activities in the areas around the Mine. Some of these activities have been noticed and their implementation monitored by this Hon'ble Tribunal in its detailed judgment dated 12.5.2016 in O.A. no.128 of 2014 titled Raghunath v. Hindustan Zinc Limited & Ors.

52. In the year 2015, Section 9B was introduced in the Mines and Minerals (Development and Regulation) Act, 1957 requiring each mining lessee to pay to the District Mineral Foundation an amount equivalent of a percentage of royalty not exceeding one-third of such royalty. The object of the Foundation is to work for the interest and benefit of persons in areas adjoining the mining leases.

53. This Mine of the Respondent HZL alone contributes around Rs. 220 crores each year to the District Mineral Foundation for development work in the region.

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54. In addition, the Respondent HZL has been carrying out the following CSR activities in the area, including village Kothiya:

(a) Providing health care services to villagers in vicinity of the Mine by running Mobile Health Unit (Smile on Wheels). 30 Villages of following Gram Panchayats – Kothiya, Agucha, Badla, Hurda, Itadiya, Arwar, Rupaheli, Bhadwo ki Kotdi, Bhojras and Barathiya are presently covered.

(b) Plantation of trees with installation of tree guards around roads, schools and Government land in the vicinity of the Mine.

(c) Providing potable water regularly to the villages around the Mine, which includes 1 Village of Kothiya Gram panchayat and 5 Villages of Agucha Gram Panchayat.

(d) Installed solar street lights in villages of following Gram panchayats - Kothiya, Agucha, Badla, Hurda, Itadiya, Arwar, Rupaheli, Bhadwo ki Kotdi, Bhojras and Barathiya.

(e) Installed solar system in 2 Government schools of Agucha Gram Panchayats.

(f) Initiated MindSpark project in 10 Govt Schools for IT based learning for rural students of class 1st to 8th. Under this, 1 School of Kothiya Gram Panchayat, 4 Schools of Agucha Gram Panchayat, 2 Schools of Barathiya Gram Panchayat, 2 School of Hurda Gram Panchayat, and 1 School of Arwar Gram Panchayat are presently covered under this project.

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(g) Running Siksha Sambal Project in 7 Government Schools for class 9th to 12th students. 1 school in Kothiya, 2 schools in Agucha, 2 schools in Hurda, 1 school in Barathiya, and 1 school in Bhadwo Ki Kotdi are presently covered under this project.

(h) Running Khushi Project (Anganwadi Project) in which 504 Anganwadi of 3 Blocks of Shahpura, Hurda and Suwana are presently covered.

(i) In order to encourage women empowerment, Sakhi Project is being presently run in the nearby Gram Panchayats Kothiya, Hurda, Agucha, Itadiya, Badla, Rupaheli, Barathiya, Bhojras, Bhadwo Ki Kotdi and Arwar.

(j) Constructed 25 Nandghar in Shahpura and Hurda Block (15 Greenfield and 10 Brown field projects) for upgrading the Anganwadi building structure.

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(k) Provided basic infrastructure facility in nearby Educational and Health Institutes and Villages, including rooms, play Ground development, Drinking water facility, Incinerators, Boundary wall, community hall, open gym etc.

(l) Providing veterinary assistance to the villagers around the project-site such as vaccination of cattle, cattle caps, artificial insemination of livestock, *etc.*

(m) Agricultural assistance to the farmers in partnership with Rajasthan Rural Institute of Development Management (RRIDMA), including by imparting training to farmers for

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growing cash-crops and vegetables, testing farmers soil for productivity, providing good quality seeds, pesticides and fertilizers and providing training on best agriculture practices.

(n) Running Skill and Entrepreneurship Development Institute (SEDI) which provides training in livelihood skills to the youth of nearby villages in major 4 areas: Electrician, Domestic data entry operator, Unarmed security guard and Retail sales, and also facilitates employment opportunities.

(n) These CSR works are in addition to thcarried out and monitored by this Hon'ble Tribunal in OA 128/2014 and OA 129/2014 details of which are noted in the judgment dated 12.5.2016.

Around Rs.31.39 crores have been spent by the Mine in the last four years on CSR activities. A copy of relevant extract of two of the CSR reports are annexed herewith and marked as **Annexure R – 21**.

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55. The Respondent HZL's have also been noticed for excellence in the field of environmental conservation by the IBM, various Institutes and Organizations like the Confederation of Indian Industries (CII), Federation of Indian Mineral Industries (FIMI). Awards have also been bestowed on the Respondent HZL during the Mines Environment and Mineral Conservation Week (MEMC) under aegis of Indian Bureau of Mines (IBM). Some of the awards / recognitions include:

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(a) Awarded overall excellence in Mines Environment and Mineral Conservation Week celebrations under the aegis of IBM for three consecutive years 2003-04, 2004-05 and 2005-06. First prize in overall performance in the years 2006-07, 2007-08, 2015-2016, 2016-2017, 2018-2019.

(b) FIMI National Environment Award (Gem Granite) under Best Open Cast Mechanized Mine in the years 1994 and 2006.

(c) CII Water Award - 2012 under the Category "Beyond the Fence" in 9th National Excellent Water Management Award 2012.

(d) Overall First prize in Safety Week conducted by DGMS in the year 2014.

(e) Overall First prize in the Mine Environment and Mineral Conservation Week for the year 2014-15.

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(f) Won the CII National Energy Management Award 2010 under the category of Energy Efficient unit.

(g) Won the Safety Innovation Award of Institution of Engineers in 2008.

(h) First mine audited by British Safety Council for Five Star Health Safety Management System and Practices and was rated 4 Star.

(i) IBM 5 Star rating for three consecutive years, 2015-2016, 2016-2017, and 2017-2018.

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(j) National level Energy Award in the year 2016 and State level Energy Award in the year 2016 and 2017.

(k) The Respondent HZL has been adjudged 1st in Environment category and overall 5th in the Metals & Mining sector category by the Dow Jones Sustainability World Index (DJSI World) in the year 2018.

(l) State level Bhamashah Awards for excellence in CSR activities for the year 2015, 2016, 2017, 2018, 2019 and 2020.

Para-wise Reply

56. The contents of para.1 are denied as being vague and without necessary particulars. There are four applicants against whom the word "diseased" has been used without specifying the nature of ailment, the details of treatment, name of the medical practitioner, etc.

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57. Paras. 2 to 4 need no reply except to state that there is no applicant who is a child as per the Memo of Parties.

58. In reply to para.5, the Respondent HZL submits that the Applicants have made a completely false and baseless claim for compensation. It is also denied that the Applicants have a continuous cause of action since the NGT Act specifically provides for a period of limitation from the date when the cause of action first arose.

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59. The contents of para.6 are denied for want of knowledge since the Applicants have not produced any material particulars or document in support thereof.

60. The contention in para.7 is specifically denied as false, frivolous and baseless. The Applicants have not provided even an iota of evidence in support of their claims.

61. The contents of paras.8-11, to the extent they are matters of record, need no reply. It is denied that any incident as alleged has taken place. It may also be noted that the details of the Medical Practitioner are not given, which clearly proves that the averments regarding the alleged medical condition are false.

62. The contents of para.12.1, to the extent they are matters of record, need no reply. However, the allegation regarding adverse environmental impact is specifically denied. As submitted above, the almost identical allegations levelled against this very Mine in 2014 were not proved. The statutory authorities like the RSPCB regularly monitors the mining operations and the Respondent HZL has been found to be operating within stipulated norms.

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63. In so far as the COVID-19 situation is concerned, the Respondent HZL is strictly abiding by the directions of the Central and the State Government and is functioning with utmost care and in accordance with law.

64. The allegations in para.12.2 are specifically denied as vague, bald and without any supporting evidence. The Respondent HZL denies that it is operating outside its sanctioned lease area or

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that there is any environmental degradation or victimization as alleged. The Applicants have not produced any evidence of whether they are suffering from any disease leave alone from the activities of the Respondent HZL. As submitted above, neither is the water contaminated nor is there any real impact of blasting outside of the lease area. It is also denied that there is continuous dust, obnoxious gases, contaminated water or any damage to health or agricultural lands on account of the Respondent's activities. It is further denied that there is any death of livestock on account of any act or operation of the Respondent HZL. The Applicants have not produced any particular or evidence in support of such wild and baseless allegations, and therefore, the issue of awarding any compensation does not arise. The submissions made hereinabove in this regard may be read as part and parcel of the reply to this para also.

65. The allegations in para.12.3 are denied as completely false and are being levelled only to prejudice this Hon'ble Tribunal. As submitted above, similar allegations were examined by this Hon'ble Tribunal in OA 129/2014 concerning this very village Kothiya and were not proved. The submissions made hereinabove in this regard may be read as part and parcel of the reply to this para also.

66. The Respondent HZL strongly objects to the allegation that the State administration and Central Government is hand in glove with the Respondent HZL or that the Respondent is allowed to function illegally. The Applicants are abusing the process of this

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Hon'ble Tribunal to level wild and baseless allegations against government and statutory authorities, and therefore, must be subject to heavy costs for such irresponsible statement. This Hon'ble Tribunal has examined similar allegations of environment damage and alleged pollution in 2014 through 2016 where it was pleased to get reports from the authorities and also monitored implementation of the activities. None of these allegations were proved in those proceedings. The submissions made hereinabove in this regard may be read as part and parcel of the reply to this para also.

67. The allegations in para.12.4 are categorically denied as false and without any basis. There is no water pollution, no contamination of ground water or destruction of "thousands of acre of agriculture land" as alleged. As submitted above, the mine is a zero-discharge unit and the waste water neither reaches the fields nor the underground water table. Identical allegations have been looked into by State authorities in the past on the direction of this Hon'ble Tribunal and found to be not true. The submissions made hereinabove in this regard may be read as part and parcel of the reply to this para also.

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68. The allegation in para.12.5 is denied as false and baseless. The Respondent HZL does not use ground water for its operations. Neither does it discharge any pollutant outside the lease area or underground. The waste water is collected in the tank, which is further reinforced by garland drains. The alleged contamination of surface or ground water is also denied. Identical allegations have been looked into by State authorities in the past on the

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direction of this Hon'ble Tribunal and found to be not true. Moreover, drinking water is supplied to the nearby villages as part of the CSR activities as and when requested by the local administration. The drinking water so supplied is also tested, and therefore, the allegation of contamination is baseless. The submissions made hereinabove in this regard may be read as part and parcel of the reply to this para also.

69. The allegations in para.12.6 are denied as being devoid of any detail or evidence is support. As is clear from the submission made herein above, there is no discharge of toxic water, or dust allegedly covering the fields, or contamination of ground water, or blasting and excavation allegedly beyond limits. Moreover, the ambient air quality reports prove that the allegation of air pollution is completely false and therefore, the alleged damages are also denied. The Respondent reiterates that there is absolutely no evidence that has been brought on record in support of any of these allegations. The only document annexed to the application is a set of photographs without even stating whether these photographs pertain to lands of the Applicants. In fact, the same set of photographs have been produced even in the other OAs filed in 2020.

70. The claim made in para.12.7 is denied as false and without any basis. In fact, the Applicants have not led any evidence to substantiate their alleged claims. Even the amounts claimed would show that these ware imaginary figures. For example, all claims are round figures and "Other losses" of Rs.20,000 have been claimed for each of the five years without stating as to what

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are these alleged losses. Similarly, a claim of Rs.25,000 for 2015-16, for example, has been made for livestock without even stating whether the amount is towards alleged deaths or treatment, and for how many livestock. Also, agriculture loss is claimed without giving the details of the land, what these alleged losses is for, and how this amount of Rs.10,000 for 2015-16, for example, was computed. Therefore, the Respondent HZL is not liable to compensate the Applicants for such unsubstantiated and baseless claims. The submissions made hereinabove in this regard may be read as part and parcel of the reply to this para also.

71. The allegations and contentions in para.12.8 are also denied. As submitted above, the controlled blasting in the underground mine has had no real effect on the areas outside of the mine. Further, the Applicants have not even stated that there is any alleged mammoth hole or indentation in their land. From the averment, it is clear that it is general and sweeping in nature. The same photographs have been used in the other OAs as well. As submitted above, the Tehsildar has clarified that there is no indentation of lands in village Kothiya. Therefore, there is no basis in the Applicant's claim against the Respondent HZL. In fact, the Applicants admit that they do not have evidence in support of their case. The submissions made hereinabove in this regard may be read as part and parcel of the reply to this para also.

72. In reply to para.12.9, it may be pointed out that the application for restoration, being M.A.4/2020 in OA 187/2014 and connected

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OAs, is presently pending before this Hon'ble Tribunal. However, it is important to note that the Applicants were fully aware of the pendency of the similar applications before the Hon'ble Tribunal since 2014 and yet chose to file a claim six year later, which is barred by time.

73. The content of para12.10 needs no reply at this stage.

74. The contents of paras.12.11 is denied for want of knowledge.

75. In reply to para.12.12, it is reiterated that the claim is barred by limitation. The submissions made hereinabove in this regard may be read as part and parcel of the reply to this para also.

76. The Respondent HZL submits that the Applicant has filed the underlying application with ulterior motives and is driven by malice. The Applicants are not very educated and they have been misled into filing this application. Curiously enough, the Applicants have chosen not to produce any documents which would support their stand but have chosen to rely on general and vague averments. Certain vested interests are misguiding the villagers into filing of completely false and baseless applications. As opposed to this, the Respondent HZL seeks to rely upon the various permissions, clearances, monitoring and compliance data acquired by it illustrating the environmental safeguards employed by the Respondent.

77. The Respondent notes that the other documents are voluminous since it pertains to a period of five years. The Respondent HZL,

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therefore, craves the leave of this Hon'ble Tribunal to file and rely upon additional documents should it be deemed necessary.

78. In view of the above and other points to be urged at the time of hearing, the present Application is completely devoid of any merit and may kindly be rejected with exemplary costs.

Respondent no. 1

Verification

I, Nishanth N., son of Sh. N. Vijaykumar, with office at Yashad Bhawan, Swaroop Sagar, Udaipur, Rajasthan, presently at Agucha, Tehsil Hurda, district Bhilwara, Rajasthan, do hereby solemnly affirm and verify that the contents of paras 3-7, 9-11, 14, 16-58, 60-66, and 68-77 are true to my knowledge based on records maintained by the Respondent no. 1 and paras 2, 8, 12, 15, 59, and 67 are believed to be true based on legal advise, and nothing material has been concealed therefrom.

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Respondent no.1

RAMPURA AGUCHA MINE
HZL

Place: Gulabpura, Hurda.

Date: 14.10.2020.

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Sworn before Me about the Contents affidavit by Shri Nishanth
identified by Shri
Hence Attested

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Gulabpura (Bhilwara Raj)

Annexure R-1 No. 129/14

3/c

Before the National Green Tribunal at Bhopal Branch, Bhopal

(under section – 18(1) read with Section 14, 15, 16 & 17 of National Green Tribunal Act – 2010)

Application No. of 2013.

Between

Davad S/o Sh. Kalu ji Neelgar and others – Applicant

And

1) **Hindustan Zinc Ltd. through its General Manager**
2) **Sterlite opertunities & Ventures Ltd. through its General Manager**

-Respondent

1) **Address** – Village - Kothiya, P.O. - Kothiya, Tehsil – Shahpura, Distt. Bhilwara, Rajasthan

2) **Address** -
   (i) General Manager / Hindustan Zinc Ltd. Rampura – Agucha Mines, Tehsil – Hurda, Distt. –Bhilwara, Rajasthan

   (ii) General Manager / **Sterlite opertunities & Ventures Ltd.** Rampura – Agucha Mines, Tehsil – Hurda, Distt.– Bhilwara, Rajasthan

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3) **Facts** -

(i) That necessary background for appreciating contravercy involved in Hindustan Zinc Ltd. (thereinafter as H.Z.L.) is a Government of India undertaking and Government of Rajasthan had granted original mining lease for the purpose of Mining of Lead, Zinc and associated minerals near Agucha – Rampura,

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Tehsil – Hurda, Distt – Bhilwara over 1200 Hectros of Land from 13-03-1980 for a period of 20 year's i.e. upto 13-03-2000 which has subsequently renewed till 13.03.2020.

The patition is that after to disinvestment in 2002 in favour of the 'Sterlite Oportunities & Ventures Ltd.' (thereinafter is S.O.V.L.).

2. That since 2003-2004 S.O.V.L. while the whole administration was being taken over from the H.Z.L. After purchasing 62.93% share's of the Co. H.Z.L. have no right to interfare in the administration and other works. Annex as Annexure – A1.

3. That since April 2003 to till date S.O.V.L. is adhered not to compliance the preventive checks as per rule / regulation against pollusion – control as per " Pollusion Control Board" Annexure at "Annexure W.W. A-2).

4. That Arr mixed with dust & stone is being accomulated, within 24 hours daily, near the village B.K.-II hardly at the distance of 100/200 meter, by which became a great wall upto the Height of 600'. Due to not compliance the Preventive checks and rules & Norms as per directed 'pollution control board', The toxic-dust along with Air spread upon the village alongwith whole area & effected with Toxic-Dust & Air Pollution upon its whole surrounding which effected upon crops – grass – Animal's Human kind.

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5. That being used water in high quantity & upto 1000' (beneath) defth in the mine for the mine. The water-level of the whole area effected for "No water & well dried". Resulted the poor peasants/ Residents got irrepairable – loss of crops – Animals – Plants etc.

6. That due to not available drinking water said company supply the drinking water through contractors by their tractors & tankers, which is Polluted-water only. By which moreover death accured due to water – born disease.

7. That mine is open & daily Hevy blast is being operate by which 2 crore ton's material accumulate & a storm of Toxic Dust with stones, effects the surrounding by which houses broken or damaged & at present the same condition is being.

8. That the most common of these Toxic substances, are the heavy metal companies including salts of coper – zinc, industrial waste in salt of zinc is being accumulated in primary setteling tank. The salt of zinc alongwith industrial waste. During raining season this tank was being broken & its toxic-water in the definition of flood effects about 2 hundred hacters crops. So that peasent/ villages faced the huge economic loss.

GROUNDS :-

I. That due to Toxic-Dust & Air born-deseases about 209 people alongwith children has been died & about 372 persons suffering with Toxic Dust & Air born deseases.

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2. That due to effected Gross & Crops 2300 animals (camle – Ox – Cow – Buffelo – Goats – Sheeps) died.
3. That due not availability of water effected the crops whenever before the mine, land was more fertile. A great loss of product was being faced while no employment by the mine.
4. That due to heavy-blast in the mine many houses broken & damaged & are being damaged and broken.
5. Kindly may please be permitted regarding, filing the claims indivisualy for the other persons in the village as they are effected.

LIMITATIONS :-

1. That S.O.V.L. taken over administration by H.Z.L. sicne 2002, but since April 2003 as the company S.O.V.L. is harming to the effected areas for which relief and compensation may please be grant. Direction may please be issued to the companies regarding follow the rules and regulations against pollution and other environmental damages & agoni.
2. That S.O.V.L. is an habitual agency regarding not to comply the prevented checks against pollution while the said company / agencies has been panalized Rs. 100 crore by the Hon'ble Supreme Court. Annexed a news of the paper cutting etc A-
3. May kindly please inspect by the Hon'ble Tribunal or Appointing the Commission.

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PRAYER

1- The Hindustan Zinc Limited/Sterlite Opportunities & Venture may please be directed regarding control the pollution at this polluted area and village.

2- And the Court/Tribunal may also be plea ed to pass such orders and other relief which it may think appropriate taking in o accounts the circumstances and the age of the case & a gross loss within the clai .t to be presented by the applicants.

3- And compensation may also be grante l u/s 15 read with section 18(1) of the N.G.T. Act 2010.

4- As Hon'ble Court/Tribunal deem fit.

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दावद

APPLICANT/APPLICANTS
(DAVAD NEELGAR S/O LT. SH. KALU JI NEELGAR)

(S.P.S. Nagar)

Authorized represented for the applicant/applicants.

VERIFICATION

I, **Davad Neelgar** S/o Lt. Sh. Kalu Ji Neelgar Age 62 yrs. R/o Village & Post Kothiya. Tehsil Shahpur, Distt. Bhilwara, Rajasthan do hereby that the contents of paras - to are true to my knowledge and paras to believed to be true on legal advice and that I have not surprised any material fact.

दावद

APPLICANT

Date : 30/3/2014
Place : Kothiya / Bhilwara

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Annexure R-2

BEFORE THE NATIONAL GREEN TRIBUNAL
CENTRAL ZONAL BENCH, BHOPAL

Original Application No. 128/2014 (CZ)
and
Original Application No. 129/2014 (CZ)

CORAM:

Hon'ble Mr. Justice Dalip Singh
(Judicial Member)

Hon'ble Dr. Satyawan Singh Garbyal
(Expert Member)

Original Application No. 128/2014 (CZ)

BETWEEN:

1. Raghu Nath
S/o Shri Dev Karan and Ors.
Village Bherukhera –II,
P.O. Agucha, Tehsil, Hurda,
District Bhilwara,
Rajasthan

.....Applicant

Versus

1. Hindustan Zinc Ltd.
through its General Manager
Rampura – Agucha Mines
Tehsil Hurda,
District Bhilwara,
Rajasthan

2. Sterlite Opertunities & Ventures Ltd.
Through its General Manager
Rampura – Agucha Mines
Tehsil Hurda,
District Bhilwara,
Rajasthan

3 The Rajasthan State Pollution Control Board,
Jaipur, Rajasthan

4. Regional Officer,
Rajasthan State Pollution Control Board,
Bhilwara, Rajasthan

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.....Respondents

Original Application No. 129/2014 (CZ)

BETWEEN:

1.

Davad
S/o Shri Kalu Ji &Neelgar and Ors.,
Village Bherukhra –II,
P.O. Kotia, Tehsil Shahpura,
District Bhilwara,
Rajasthan

.....Applicant

Versus

1. Hindustan Zinc Ltd.
through its General Manager
Rampura – Agucha Mines
Tehsil Hurda,
District Bhilwara,
Rajasthan

2. Sterlite Opertunities & Ventures Ltd.
Through its General Manager
Rampura – Agucha Mines
Tehsil Hurda,
District Bhilwara,
Rajasthan

3 The Rajasthan State Pollution Control Board,
Jaipur, Rajasthan

4. Regional Officer,
Rajasthan State Pollution Control Board,
Bhilwara, Rajasthan

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.....Respondents

Counsel for Applicant :	**Shri Dalip Singh, Adv.**
Counsel for Respondent No.1:	**Shri K.Venugopal, Sr. Adv.** **Shri U.N.Tiwari, Adv.e** **Shri Udai V.S.Rathore, Adv.**
Counsel for CPCB/RSPCB/ : **State of Rajasthan**	**Shri Sandeep Singh, Adv.**

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JUDGEMENT

Dated : May 12th , 2016

1) Whether the judgement is allowed to be published on the internet -- yes / no

2) Whether the Judgement is to be published in the All India NGT Report -- yes /no

DELIVERED BY HON'BLE MR. JUSTICE DALIP SINGH, JM

1. These two O.As had been filed by two Applicants who are the residents of village Bherukhera (II), Agucha Tehsil Hurda District Bhilwara with the allegations that after the establishment and as a result of the mining activities being carried out by the Respondent Hindustan Zinc Limited in their mines granted for excavation of lead, zinc and associated minerals near Agucha - Rampura in an area of 1200 hectares of land since 1980 and this site being in close proximity of distance of 100 to 200 meters from the village Bherukhera (II), as a result of the mining activity and non-compliance of preventive measures and directions of the PCB toxic dust results in severe air pollution which is affecting the whole surroundings and the environment as well as the crops, grass, animals and the human-beings.

2. Apart from the above it has been submitted that the tank water and the underground water have also been adversely affected and the water level in the entire area has gone down and some of the wells had even dried up resulting in the loss of crops and depriving both humans and animals of precious drinking water and affecting their health.

3. It has further been stated that the Respondent Company undertakes the supply of drinking water through tankers but the said water is polluted as a result of which the villagers and animals are forced to drink the polluted water which has resulted in both diseases and death.

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4. Thus, it is alleged that due to the non-compliance of the environmental conditions by the Respondent Company there has both air pollution and water pollution. It is also alleged that about 111 persons have died and 150 persons are suffering as a result of the above pollution on account of various diseases. It is further alleged that there has been major loss to the crops and since the area is mainly dependent upon animal husbandry about 1100 animals have died. It has further been alleged that the mining activity has affected the soil quality and as a result of the blasting being carried out in the mines many houses have been damaged and even broken.

5. Having stated so it was further submitted that the individuals who may be adversely affected may be permitted for filing their claims individually for seeking compensation.

It has been prayed by the Applicants as follows:

1. *The Hindustan Zinc Limited / Sterlite Opportunities & Venture may please be directed regarding control the pollution at this polluted area and village.*

2. *And the Court / Tribunal may also be pleased to pass such orders and other relief which it may think appropriate taking into accounts the circumstances and the age of the case & a gross loss within the claim to be presented by the Applicants.*

3. *And compensation may also be granted u/s 15 read with Section 18 (1) of the N.G.T Act 2010.*

6. After hearing the Applicants notices were ordered to be issued to the Respondents vide order dated 22.07.2014. Pursuant to the issue of notices the Respondent No. 1 put in his appearance on 20.08.2014 on which date noticing the fact that the Respondent No. 2 had not appeared in proceedings were ordered to be withdrawn *ex-parte* against the Respondent No. 2. Also since the matter involved and the relief claimed was in respect of compliance of pollution control measures the Tribunal directed that the RSPCB as well as the RO of the RSPCB, Bhilwara to be

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impleaded as party Respondents and accordingly after impleading them as party, notices were ordered to be issued to the newly added Respondents No. 3 & 4. Opportunity was granted to the Respondent No. 1 to file their reply.

7. On the next date of hearing Respondent No. 1 filed his reply. The PCB had put in their appearance in pursuance of the notice issued on the previous date and was directed to look into the complaints made in these two Applications. It was further directed that for ascertaining the grievances of the Applicants the RO has to contact the Applicants and after noting down their specific points regarding their grievances and taking the assistance of the concerned officers of the respective departments in the District submit a report before the Tribunal after carrying out detailed inspection. On 19.11.2014 the inspection report in pursuance of the order dated 23.09.2014 was submitted. Counsel for the Applicant as well as the Respondent No. 1 prayed for time to go through the compliance report and the inspection report and submit their response.

8. On 18.12.2014 the Applicant prayed for time to file his rejoinder / objections to the inspection reports submitted by the RSPCB. Since one of the issues pertained to the quality of drinking water being supplied through tankers by the Respondent No. 1 the RSPCB was directed to take samples of the water provided through the tankers and that stored in Bherukhera (II). While perusing the reports with regard to the various ailments as complained the reports of the Chief Medical Health Officer (CMHO) stated that " level of respiratory disorders, skin diseases and other type of disease are not beyond the average prevailing of diseases". It was also mentioned that out of 12 cases of respiratory diseases found 9 were smokers. Sputum examination was done for 7. In so far as the, other diseases were concerned it was directed that the Medical Officer who has given his opinion whether the patients who are suffering from the diseases noted in the report could be attributed to any activity of the Respondent No.

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1 or as a result of any alleged pollution from the same. Since the allegations in the Original Application were not specific and no names or details of specified persons were disclosed, it is not possible in this Original Application to give any finding on these issues of loss or compensation. As such the petition was heard for the purposes of general relief and taking precautionary measures and ensuring compliances of EC conditions. In the meanwhile, individually affected person have file Original Application under Section 15 of the National Green Tribunal Act which on being heard and dealt with separately.

9. While noting the dust emissions and the Air Ambient Quality from the report of the RO, RSPCB Bhilwara, and his findings that "fugitive emission of dust due to mining cannot be denied". It was directed that the Air Ambient Quality monitoring report of Bherukhera (II) for the year 2014 be filed. Accordingly, in the meanwhile on the basis of the precautionary principle remedial measures were ordered to be taken by the Respondent No.1. In the remedial measures as suggested it was inter-alia provided for water sprinkling system, water spray and plantation along the tail dam and road side be carried out. The Respondent No. 1 was directed accordingly to file the affidavit whether these corrective measures have been put into place and made operational.

10. During the course of hearing one of the issue raised in O.A. No. 129/2014 *Davad Neelgar & Ors. V/s Hindustan Zinc Ltd. & Ors.* was in respect of alleged seepage of water from the tail dams into the fields of the Applicants. It was accordingly directed that the Collector Bhilwara will depute the Agriculture Extension Officer and the Tehsildar to visit the land of the Applicant and submit the report before the Tribunal.

11. In pursuance of the order dated 18.12.2014 during the course of hearing on 23.03.2015 the PCB submitted the affidavit in which as far as the issue regarding the Air Ambient Quality was concerned it was observed that the dust may be occasioned as a result of vehicular traffic on the road to village Bherukhera (II) as well as

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the area being pre-dominantly dependent upon Animal Husbandry and their being large number of cattle sheeps and other animals in the area. Due to the movement of cattle & sheeps also excessive dust could be attributed.

12. It was pointed out by the Learned Counsel appearing for the Respondent No. 1 that they had approached the District Administration for construction of *Pakka* roads to village Bherukhera (II) from the junction point to the village which is at a distance of about 1 Km. and also alleged that the villagers would not permit the Respondent No. 1 to carry out this work of CSR and as such they were willing to do the work of construction of the road. Learned Counsel for the Applicant refuted the aforesaid charge and submitted that the Applicants and the villagers would have no objection to the Respondent No. 1 undertaking the CSR activity in Bherukhera (II) and construction of the road.

13. Based on the above the Respondent No. 1 submitted that they would be willing to undertake the CSR activity in Bherukhera (II) for the construction of the road. This it was submitted would be undertaken at an estimated cost of Rs. 70.60 lakhs. It was further submitted that the Respondent in addition to the above would construct two toilets separate for boys and girls in the school in village Bherukheda (II) and also install a RO plant for drinking water in the school.

14. Taking these facts into account the Collector Bhilwara was directed to depute the SDO to monitor the above works and in case any modifications or alterations were necessary to allow the same in consultation with the village Panchayat. The Tribunal directed the Respondent No. 1 also to undertake the plantation of trees on both sides of the road up to a depth of 3 meters of local species in consultation with the Forest Department. Learned Counsel for the Respondent No. 1 further submitted that in the mining leased area the project proponent Respondent No. 1 Company was going to undertake plantation of 5000 trees in the year 2015-2016. On this the direction was given to the Respondent No. 1 to carry out

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plantation on the south eastern parameter within the mining lease area where such plantation has not been carried out. The plantation was also ordered to be carried out so as to act as wind breaker and prevent any soil erosion.

15. By way of showing the compliance on the next date of hearing 20.07.2015 the Respondent No. 1 filed an affidavit indicating the extent of work that had been carried out.

Sl. No.	**Nature of Work**	**Status of the work**	**Cost to Respondent No. 1**	**Documents in support**
1	Construction of metal road in village Bherukheda II, including bye-lanes and construction of drains along the road	Finished the construction of metal road admeasuring 900 metres in length and 4-5 meters in width	Rs. 99 lakhs (approximate)	**Annexure A : [Pp5-27]** Copy of Work Order dated 01.05.2015 for Rs. 127 lakhs.* Annexure B : **[Pp5-28-32]** Photographs
2	Plantation on both sides of the metal road mentioned under Sl. No. 1 above	300 saplings of 8-10 feet of neem variety have been planted and tree guards have been installed	Rs. 2.7 lakhs	**Annexure C : [Pp-33-35]** Photographs
3	Construction of two toilets in the primary school in village Bherukheda II, separate for boys and girls, with water and flush facility	Work done	Rs. 3 lakhs	**Annexure D : [Pp-36-37]** Photographs
4	Installation of water cooler with RO plant in the primary school in village Bherukheda II for drinking water	Work done	Rs. 0.6 lakhs	**Annexure E : [Pp-38-41]** Photographs
5	**Additional work in village school** (a) Complete renovation of the primary school building, including re-plastering, replacing doors and windows, flooring and construction of boundary wall (130 meters in length X 2.1 meters in height) with steel gate	Work done	Rs. 8 lakhs	**Annexure F : [Pp-42-49]** Photographs
	(b) Construction of underground water storage facility with a capacity of 8000 litres.	Work done	Rs. 0.55 lakhs	
	(c) Planting of 60	Work done	Rs. 0.55 lakhs	

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	saplings of height of 8-10 feet			
6.	**Additional work in village** Construction of community hall for use by the villagers of Bherukheda II	Under construction	Rs. 12.2 lakhs	**Annexure C : [Pp-50]** Photographs
7	Plantation of 5000 trees within the mining lease area for the year 2015-16	Plantation completed. Plant varieties include Shesham, Jambul, Karanj, Khair, Acasia, Khejri, Gugal and Gular	Rs. 8.44 Lakhs Additional order placed for 12500 trees in 2015-16	**Annexure H : [Pp-51-70]** Work Order dated 10.03.2015 **Annexure I : [Pp-71-72]** Photographs
8	**Additional work in village** Construction of verandah in the village temple	Under construction	Rs. 3.23 Lakhs	
9	**Additional work in village** Solar lights (10 numbers)	Under process	Rs. 2 Lakhs.	

16. It was submitted by the Respondent No. 1 that for the above works that was carried out and which were in progress the estimated cost is about Rs. 140 lakhs. It was also submitted that regular Air Ambient Quality monitoring shall be done and also monitor the drinking water quality supplied in villages by the Respondent No. 1 and a monitoring report were filed along with the affidavit as Annexure J and K. As per the said reports all the parameters were found to be within the specified limits. Similarly, the water sample testing reports were also found to be in order. In respect of the above, the Collector Bhilwara, was directed to carry out an physical verification with regard to the completion of the works and file an affidavit. Some of the points with regard to the works done in the school pertaining to the provision of providing drinking water were ordered to be streamlined and improved and measures for maintenance of the RO and the water coolers as well as covering of the water tanks in the school were also directed. CC roads were constructed in the villages with drains along the said CC roads which were joined to the drains connected to the every house along the road. This resulted in the flow of the water from the households and proper drainage and sanitation.

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17. On 24.08.2015 the affidavit of the collector Bhilwara, was filed in which the progress made in the 3 affected villages Kotia, Bherukhera (II) and Agucha were mentioned. Since, one of the issue raised in the Application pertained to the alleged adverse impact on the health of the residents of the area and two villages Augcha and Kotia having been identified with a population of 6200 and 5700 respectively, their primary health centers were sought to be strengthened. The District Administration was directed to furnish the information with regard to the existing infrastructure. The Learned Counsel appearing for the Respondent No. 1 submitted that they would also look into the possibility for strengthening the existing infrastructure and removing deficiencies if any in consultation with the District Administration. Since the primary health centers were also required to keep certain medicines under refrigeration and looking to the power shortages and power cuts providing solar panels of sufficient capacity or running the said equipment was also directed to be explored and installed or alternates that may be suitable.

18. Since one of the grievances raised was with regard to the adverse impact on the cattle and their yield, the State was directed to provide information about the yield of milk and it was submitted that after 2010 there had been an increase in the production of milk as also efforts have been made for improving the quality of cattle and increasing the yield through artificial insemination. In all these activities the Respondent No. 1 agreed to participate and provide necessary assistance. Learned Counsel for the Respondent No. 1 also submitted that in consultation with the headmasters of the senior secondary school in village Agucha and Kotia they would provide additional computers as also contractual teachers for computer studies. It is also submitted that in the Aanganwadi camp food was being supplied by the Respondent No. 1 as also in the schools.

19. One of the issues raised in the Application was with regard to the pollution and also supply of polluted water through tankers by the

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Respondent No. 1. It was submitted before us by the Learned Counsel for the Respondent No. 1 that the entire area is deficient of water. Water for the colony of the Respondent No. 1as also in the adjoining villages is being brought by pipeline from the Banas river from the distance of about 60 kilometers and the said water is treated at the plant of the Respondent No. 1 and subsequently supplied through tankers on daily basis in the areas around the listed areas of the Respondent No. 1 including the villages in question on a day to day basis. Keeping this in mind the Tribunal directed the Respondent No. 1 to create a facility for construction of water storage tanks for drinking water in the villages concerned and separate arrangements be made for drinking water for human beings as well as for the cattle and other animals. The capacity of such water tanks be based upon the per capita need and looking to the population of the villages. The feasibility of installation of RO in consultation with the Public Health Engineering Department (PHED) of the Government was also ordered to be examined. This was ordered to take care of the allegations in the Original Application on account adverse health impact as a result of drinking polluted water.

20. On 8.10.2015 the Respondent No. 1 pursuant to the directions given on 24.08.2015 filed a compliance along with an affidavit according to which it was submitted that in compliance of the directions for upgrading the facilities at the primary health centers a letter was written to the Medical Officer on 28.08.2015 for which the replies were received by the two Medical Officers on 03.09.2015 and 10.09.2015 giving their list of requirements. It was stated by the Respondent No. 1 that in accordance with the above an amount of Rs. 13.66 lakhs and Rs. 15.50 lakhs for the two primary health centers at Kotia and Agucha had been sanctioned for improving the infrastructure and the work was in progress. The order for procurement of freezer, mattresses, RO, refrigerator, air-conditioners, ceiling fans and computer along with invertors for power back-up has also been placed.

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21. So far as the, directions for the facilities in the school is concerned likewise, teaching staff at the school at village Agucha, Kotia and Bherukhera (II) construction of chemistry and physics laboratory in the senior secondary school at Kotia had been initiated for which an estimated cost of Rs. 13 lakhs had been sanctioned. Orders had also been placed for procuring the computers and printers and RO system for the drinking water in the said school. As regards the, *Aanganwadi* camps the construction of the building as per Government request is in the planning stage and about 24 *Aanganwadi* camps under the *Nandghar* project of the Women and Child Development Department of the State has been undertaken.

22. At one stage it was submitted that there was a requirement for a girls hostel in the school. However, subsequently it was felt that since the students are coming from nearby villages there was no need for a girls hostel at this stage. However, the Respondent No. 1 has submitted that as and when such a decision is taken for opening a girls hostel the Respondent No. 1 would look into the feasibility and provide all support so far as water supply to village Bherukhera (II) is concerned the Respondent No. 1 has stated that they are exploring the feasibility of installing the RO plant in the village itself on a sustainable basis. For providing veterinary facilities already suitable measures are being undertaken in consultation with the Animal Husbandry Department of the Government by the Respondent for improving the production of milk and the productivity and quality of the cattle.

23. The PCB on its part firstly submitted their reports along with the reply that was filed on 18.11.2014.

24. In so far as, the issue regarding the contamination of the water in the two tanks popularly known as *Thakadia Ji Ki Nadi* and *Dev Nandi* are concerned the PCB after taking the samples and examining the same has given the finding that nothing adverse detected. At the same time, it has further been stated that there is no direct flow into these water tanks from the mining area of the

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Respondent No. 1 and there is no direct channel from the mine area towards these ponds. It was submitted that all along the waste dumps of the overburden garland drains have been constructed which channelize the storm water to the collection area created by the Respondent No. 1 and as such there is no direct flow of the storm water to these ponds from the mining area of the Respondent No. 1.

25. On the issue of alleged deaths of animals as well as drinking water of polluted water the report from the SDO, Gulabpura was obtained on 31.10.2014 according to which it was submitted that there was no recorded evidence of any death of animal as a result of consumption of polluted water or fodder and also there was no postmortem report conducted at any veterinary center in this behalf which could substantiate the aforesaid claims.

26. In so far as, the damage to the crops is concerned in the report of the SDO, Gulabpura District Bhilwara, it was stated that there has not been any shortfall in the production of agriculture crops as alleged by the Applicant. Also that no water-logging has been observed in the agriculture land of the Applicant and the yield of the land of the Applicants remains satisfactory as compared to the average crops yield in the area. On the question of air pollution and monitoring it was admitted that due to heavy vehicular movement and there being Kaccha roads and movement of animals in large number, it could not be denied that dust particles were present as a result to the same. For this corrective measure such as sprinkling of water through water sprinklers system regular water spraying and carrying out plantation along the road side had been suggested. As regards the use of sprinklers the direction was given for using waste water as against fresh water. On the question of pollution of the water it was submitted that to the local residents water is being supplied by the Respondent No. 1 after filtration and treatment through their water tankers after having been brought by pipeline from the Banas river and it was

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the same water which was utilized in the colony of the Respondent No. 1 for drinking by their staff and employees.

27. We have given out our thoughtful consideration to the issues that have been raised. Primarily, as quoted above, the prayer is with regard to the direction for compliance and adherence to the pollution control measures liable to be complied with and adopted by the Respondent No. 1 Company while carrying out its activities in the area and protection of environment and preventing loss or injury to the residents. We have already outlined the plantations required to be undertaken by the Respondent No. 1 Company, so far as the question of containing the dust and improving the Air Ambient Quality, which has been found to be within the norms. It has already been submitted that the major contribution of dust is as a result of the vehicular traffic and the movement of cattle and other animals. So far as dust is concerned directions were issued by the Tribunal for construction of *Pakka* road from the point of the highway to the village and in the mining area and in the village. As has been noted above this work has been carried out. We would further direct, that the PCB may wherever it feels necessary on account of finding vehicular traffic of the Respondent No. 1, it may give further directions or constructions of the road metal / pakka road to the Respondent No. 1 if new routes are used from the mining areas.

28. The allegation that as a result of blasting lot of dust is created is also taken note of by us. While it has been stated that controlled blasting is carried out. We may also take note of the fact which is not disputed that the height of the waste deposit of the overburden excavated from the mines is of approximately 150 to 200 feet and the depth of the mine which is presently being mined and excavated has gone down below the ground level in the open cast area to nearly 300 to 400 feet. Thus in all about 450 to 500 feet high barrier is there before the dust can spill out and therefore we would agree to some extent with the submission of the Learned Counsel for the Respondent that in these circumstances the

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possibility of the dust from the mines reaching the inhabited areas is considerably reduced and minimized.

29. In addition to the above as has been submitted in the affidavit of the Respondent No. 1 that large scale plantation both on the waste dumps which are not in use and also in the periphery area along these waste dumps has been carried out and large scale plantation has been carried out in mine site creating a wind barrier between the mining area and the village. Apart from the above, the old plantation of the Forest Department was also taken over for improvement and plantation carried out by the Respondent No. 1 was shown from the photographs filed along with the affidavit. Sufficient plantation has been carried out to act as a buffer and wind breaker by way of dust containing measure between the mines and the village. In that view of the matter we are *prima-facie* satisfied that dust suppression measure taken by way of above that is construction of the pakka roads and creating wind breakers by extensive plantation. The dust as a result of the mining can be sufficiently controlled.

30. Be that as it may it would still be the responsibility of the RSPCB through its local office at Bhilwara to carry out quarterly monitoring of the Air Ambient Quality and in case the same is found to be excessive not necessarily beyond the prescribed standards consequential remedial measures by way of directions to be issued by the PCB to the Respondent No. 1 for being implemented. Learned Counsel for the Respondent No.1also informed us that this would not be a problem as in the near future the Company would be undertaking underground mining operations as against surface opencast mining and the existence of dust particles would be sufficiently controlled.

31. As regards the issue of water contamination we are satisfied from the report of the PCB that the measures adopted by the Respondent No. 1 company for supply of drinking water to the residents of the area and of the affected villages in particular and also in compliance of the directions issued by this Tribunal from

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time to time for improving the present infrastructure and taking additional precautionary measures both for providing drinking water to the local population as well as separately for the cattle and other animals, the possibility of consumption of any contaminated water can reasonably be said to have been ruled out. We may add that the reports filed however do not at present show any water pollution. However, this shall need to be closely monitored as a continuous basis. There again the PCB shall continuously monitor the quality of the water being supplied and also in the ponds and also monitor measures that are being undertaken by the Respondent No. 1 company in this behalf. In addition to the above wherever necessary the PCB would be free to issue directions for improvement of the water quality and taking additional measures that may be necessary. The Medical and Health Department shall also monitor and keep record of any water borne diseases or ill health and adverse impact reported in the area as result of such water being consumed by any person in and brining the same to the notice of the PCB as well as to the District Collector and remedial steps shall immediately be taken in this behalf. Failure on the part of the local Medical Officer and the primary health center to report these matters to the PCB and the District Administration shall be viewed seriously in the event of any complaint being received by this Tribunal.

32. One of the complaints raised in the Application was with regard to the damage to property on account of blasting while we have noted the reply filed by the Respondent PCB, we would not like to at this stage deal with the aforesaid issue for lack of material and separate Applications for awarding of compensation by affected persons have been filed under Section 15 of the NGT Act 2010, before us and the same shall be dealt with in accordance with law in those proceedings.

33. In the end we would direct the RO of the PCB to monitor the progress and the maintenance of the steps undertaken by the Respondent No. 1 Company in terms of the directions given in our

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various orders during the pendency of this Application and noted herein. We may add that CSR is not a onetime obligation and needs to be carried out continuously. For the aforesaid purpose the District Administration in consultation with the local village Panchayat and the representatives of the people and considering the need for the same would ensure that CSR activities are undertaken and completed to the satisfaction and for the best use and benefit of the local people. So that they too may benefit from the same. Learned Counsel for the Respondent No.1 submitted that whatever additional measures by way of CSR or compliances are required shall also be given effect to by the Respondent No.1.

34. We would accordingly dispose of both these Original Applications No. 128/2014 & 129/2014, with the aforesaid direction with respect to the prayer made in the Application primarily for observance and implementation of environmental laws and maintaining the pollution level within the limits. At the same time, the prayer made by both the Applicants that they may be permitted to independently raise the grievances with regard to the damage that may have been suffered by them and for being awarded compensation independently by means of an Application under Section 15, as far as that is concerned the said prayer is allowed and the Applicant would be free to move any such Application in accordance with law.

35. **No order as to costs.**

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(Mr. Justice Dalip Singh)
Judicial Member

(Dr. S.S. Garbyal)
Expert Member

Bhopal:
May 12th, 2016

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Annexure R-3 colly

BEFORE THE NATIONAL GREEN TRIBUNAL, CENTRAL ZONAL BENCH, BHOPAL

Original Application No. 169/2014 (CZ)
Bhag Chand Vs. Hindustan Zinc Ltd. & Ors.
and
Original Application No. 184/2014 (CZ)
Shanta Devi Vs. Hindustan Zinc Ltd. & Anr.
and
000Original Application No. 198/2014 (CZ)
Yakoob Vs. Hindustan Zinc Ltd. & Anr.
and
Original Application No. 199/2014 (CZ)
Leela Devi Vs. Hindustan Zinc Ltd. & Anr.
and
Original Application No. 200/2014 (CZ)
Ghanshyam Vs. Hindustan Zinc Ltd. & Anr.

CORAM : HON'BLE MR. JUSTICE DALIP SINGH, JUDICIAL MEMBER
HON'BLE DR. SATYAWAN SINGH GARBYAL , EXPERT MEMBER

PRESENT : Applicant : Shri S.P.S. Nagar
Shri T.C. Sharma, Advocate
Shri Govin Ram
Respondent No. 1 : Shri U.N. Tiwari, Advocate
Shri Udai V.S. Rathore, Advocate
Respondent State & RSPCB : Shri Sandeep Singh, Advocate

Date and Remarks	Orders of the Tribunal
Item No. 12,17 & 24 to 26 (Connected) 13th July, 2016	In the M.As. No. 403/2015, 422/2015, 371/2016, 382/2016 to 384/2016 which have been filed the prayer made is for allowing the Applicant to amend the petition in accordance with the procedure of the National Green Tribunal Act, 2010 and that liberty has already been granted by the Tribunal to the Applicants in the last 3 orders and they were directed to file amended application along with the copy of the amended Original Application under Section 15. Even this simple direction could not be complied with by the Applicants. In the light of the above, we have no option but to reject the M.As. No. 403/2015, 422/2015, 371/2016, 382/2016 to 384/2016 and dismiss the Original Applications No.

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	169/2014, 184/2014 & 198/2014 to 200/2014. ....,JM **(DALIP SINGH)** ... .,EM **(Dr.S.S.GARBYAL)**

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BEFORE THE NATIONAL GREEN TRIBUNAL, CENTRAL ZONAL BENCH, BHOPAL

Original Application No. 175/2014 (CZ)
Saleem Neelgar Vs. Hindustan Zinc Ltd. & Anr.
in
(M.A. No. 394/2016)
and
Original Application No. 176/2014 (CZ)
Yogendra Singh Vs. Hindustan Zinc Ltd. & Anr.
in
(M.A. No. 395/2016)
and
Original Application No. 177/2014 (CZ)
Balu Mali Vs. Hindustan Zinc Ltd. & Anr.
in
(M.A. No. 396/2016)

and
Original Application No. 178/2014 (CZ)
Hagan Mali Vs. Hindustan Zinc Ltd. & Anr.
in
(M.A. No. 427/2015 & 397/2016)

and
Original Application No. 179/2014 (CZ)
Shanta Kanwar Vs. Hindustan Zinc Ltd. & Anr.
in
(M.A. No. 398/2016)
and
Original Application No. 183/2014 (CZ)
Moinuddin Vs. Hindustan Zinc Ltd. & Anr.
in
(M.A. No. 402/2016)
and
Original Application No. 201/2014 (CZ)
Balram Vs. Hindustan Zinc Ltd. & Ors.
in
(M.A. No. 404/2016)

and
Original Application No. 203/2014 (CZ)
Chotulal Vs. Hindustan Zinc Ltd. & Ors.
in
(M.A. No. 406/2016)

and
Original Application No. 204/2014 (CZ)
Mukesh Raygar Vs. Hindustan Zinc Ltd. & Ors.
in
(M.A. No. 407/2016)

and
Original Application No. 206/2014 (CZ)
Mukesh Raygar Vs. Hindustan Zinc Ltd. & Ors.
in
(M.A. No. 409/2016)

Sd

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and
Original Application No. 207/2014 (CZ)
Durgalal Nayak Vs. Hindustan Zinc Ltd. & Ors.
in
(M.A. No. 410/2016)

and
Original Application No. 208/2014 (CZ)
Indra Raj NayakVs. Hindustan Zinc Ltd. & Ors.
in
(M.A. No. 411/2016)

and
Original Application No. 209/2014 (CZ)
Ramkaran Mali Vs. Hindustan Zinc Ltd. & Ors.
in
(M.A. No. 412/2016)

and
Original Application No. 210/2014 (CZ)
Gopal Chamar Vs. Hindustan Zinc Ltd. & Ors.
in
(M.A. No. 413/2016)

CORAM : HON'BLE MR. JUSTICE DALIP SINGH, JUDICIAL MEMBER
HON'BLE DR. SATYAWAN SINGH GARBYAL, EXPERT MEMBER

PRESENT : Applicant : None
Respondent No. 1 : Shri Uday Tiwari, Advocate
Shri Udai V.S. Rathore, Advocate
Respondent State & RSPCB : Shri Sandeep Singh, Advocate

Date and Remarks	Orders of the Tribunal
Item No. 24 to 27, 31 32, 34, 35, 37 to 41 (Connected) 29th August, 2016	M.A. No. 394/2016, 395/2016, 396/2016, 397/2016, 398/2016, 402/2016, 404/2016, 406/2016, 409/2016 to 413/2016 have been filed by the Applicant seeking permission to amend and file the amended claim application in terms of Section 15 in the prescribed format. However, despite repeated opportunities having been granted, we find that no amended application in the prescribed format has been filed. In the light of the above and looking to the previous order dtd. 13.07.2016 we have no option but to dismiss the Original Application along with above mentioned M.As. The Original

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(22)

Application stands **disposed of.**

The M.A. No. 427/2015 filed by the Respondent for dismissal of the Application also stands disposed of.

Sd
.............................JM
(DALIP SINGH)

Sd
.............................EM
(Dr. S.S GARBYAL)

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BEFORE THE NATIONAL GREEN TRIBUNAL, CENTRAL ZONAL BENCH, BHOPAL

Original Application No. 211/2014 (CZ)
Jeevram Vs. Hindustan Zinc Ltd. & Anr.
in
(M.A. No. 414/2016)

and

Original Application No. 212/2014 (CZ)
Pannaal Vs. Hindustan Zinc Ltd. & Anr.
in
(M.A. No. 415/2016 & 766/2016)

and

Original Application No. 214/2014 (CZ)
Durga Lal Raigar Vs. Hindustan Zinc Ltd. & Anr.
in
(M.A. No. 417/2016)

and

Original Application No. 216/2014 (CZ)
Ram Chandra Vs. Hindustan Zinc Ltd. & Anr.
in
(M.A. No. 419/2016)

and

Original Application No. 217/2014 (CZ)
Mool Bairva Vs. Hindustan Zinc Ltd. & Anr.
in
(M.A. No. 420/2016)

and

Original Application No. 218/2014 (CZ)
Gopal Raigar Vs. Hindustan Zinc Ltd. & Anr.
in
(M.A. No. 421/2016)

CORAM : **HON'BLE MR. JUSTICE DALIP SINGH, JUDICIAL MEMBER**
HON'BLE DR. SATYAWAN SINGH GARBYAL, EXPERT MEMBER

PRESENT : **Applicant :** **None**
Respondent No. 1 : **Shri Uday Tiwari, Advocate**
Shri Udai V.S. Rathore, Advocate
Respondent State & RSPCB : **Shri Sandeep Singh, Advocate**

Date and Remarks	Orders of the Tribunal
Item No. 13, 14 , 16, 18 to 20 (Connected)	M.A. No. 414/16, 415/16, 417/16, 419/16, 420/16 & 421/16 have been filed by the Applicant seeking permission to amend and file the amended claim application in terms of Section 15 in the

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30th August, 2016	prescribed format. However, despite repeated opportunities having been granted, we find that no amended application in the prescribed format has been filed. In the light of the above and looking to the previous order dtd. 13.07.2016 we have no option to dismiss the Original Application along with above mentioned M.As. Learned Counsel prays for leave to withdraw the M.A. No. 766/2016. The same is allowed to be withdrawn. Accordingly, the M.A. No. 766/2016 stands disposed of. ....JM **(DALIP SINGH)** ....EM **(Dr. S.S GARBYAL)**

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BEFORE THE NATIONAL GREEN TRIBUNAL, CENTRAL ZONAL BENCH, BHOPAL

Original Application No. 231/2014(CZ)
Maqbool Neelgar Vs. Hindustan Zinc. Ltd., & Anr. Rajasthan
in
(M.A. No. 434/2016)

and
Original Application No. 232/2014(CZ)
Hari Gopal Sharma Vs. Hindustan Zinc. Ltd., & Anr. Rajasthan
in
(M.A. No. 435/2016)

and
Original Application No. 232/2014(CZ)
Bal Kishan Sharma Vs. Hindustan Zinc. Ltd., & Anr. Rajasthan
in
(M.A. No. 436/2016)

and
Original Application No. 235/2014(CZ)
Kalsum Neelgar Vs. Hindustan Zinc. Ltd., & Anr. Rajasthan
in
(M.A. No. 438/2016)

and
Original Application No. 236/2014(CZ)
Sammat Singh Chaged Vs. Hindustan Zinc. Ltd., & Anr. Rajasthan
in
(M.A. No. 439/2016)

and
Original Application No. 237/2014(CZ)
Sanwar Lal Gurjar Vs. Hindustan Zinc. Ltd., & Anr. Rajasthan
in
(M.A. No. 440/2016)

and
Original Application No. 238/2014(CZ)
Nanu Ram Kumawat Vs. Hindustan Zinc. Ltd., & Anr. Rajasthan
in
(M.A. No. 441/2016)

and
Original Application No. 239/2014(CZ)
Mahavir Vs. Hindustan Zinc. Ltd., & Anr. Rajasthan
in
(M.A. No. 442/2016)

and
Original Application No. 240/2014(CZ)
Teju Gurar Vs. Hindustan Zinc. Ltd., & Anr. Rajasthan
in
(M.A. No. 443/2016)

CORAM : **HON'BLE MR. JUSTICE DALIP SINGH, JUDICIAL MEMBER**
HON'BLE DR. SATYAWAN SINGH GARBYAL, EXPERT MEMBER

PRESENT : Applicant : **None**
Respondent No. 1 : **Shri Brijesh Shrivastav, Advocate for Shri UdayTiwari, Advocate**

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Respondent State & RSPCB : **Shri Sandeep Singh, Advocate**

Date and Remarks	Orders of the Tribunal
Item No. 7 to 9 & 11 to 16 (Connected) **1st September, 2016**	M.As. No. 434/2016, 435/2016, 436/2016, 438/2016, 439/2016, 440/2016, 441/2016, 442/2016 & 443/2016 have been filed by the Applicant seeking permission to amend and file the amended claim application in terms of Section 15 in the prescribed format. However, despite repeated opportunities having been granted, we find that no amended application in the prescribed format has been filed. In the light of the above and looking to the previous order dtd. 13.07.2016 we **dismiss the Original Applications along with above mentioned M.As.** ....,JM **(DALIP SINGH)** ....EM **(Dr. S.S GARBYAL)**

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BEFORE THE NATIONAL GREEN TRIBUNAL, CENTRAL ZONAL BENCH, BHOPAL

and

Original Application No. 222/2014(CZ)
Durga Lal RaigarVs. Hindustan Zinc. Ltd., & Anr. Rajasthan
in
(M.A. No. 425/2016)
and
Original Application No. 223/2014(CZ)
Ugma Lal Raigar Vs. Hindustan Zinc. Ltd., & Anr. Rajasthan
in
(M.A. No. 426/2016)

and
Original Application No. 225/2014(CZ)
Ram Chandra Chamar Vs. Hindustan Zinc. Ltd., & Anr. Rajasthan
in
(M.A. No. 428/2016)
and
Original Application No. 226/2014(CZ)
Sanwar Lal Raigar Vs. Hindustan Zinc. Ltd., & Anr. Rajasthan
in
(M.A. No. 429/2016)

and
Original Application No. 229/2014(CZ)
Gopi Nayak Vs. Hindustan Zinc. Ltd., & Anr. Rajasthan
in
(M.A. No. 432/2016)

and
Original Application No. 230/2014(CZ)
Durga Lal Raigar Vs. Hindustan Zinc. Ltd., & Anr. Rajasthan
in
(M.A. No. 433/2016)

CORAM : **HON'BLE MR. JUSTICE DALIP SINGH, JUDICIAL MEMBER**
HON'BLE DR. SATYAWAN SINGH GARBYAL, EXPERT MEMBER

PRESENT : Applicant : **None**
Respondent No. 1 : **Shri Brijesh Shrivastav, Advocate for Shri UdayTiwari, Advocate**
Respondent State & RSPCB : **Shri Sandeep Singh, Advocate**

Date and Remarks	**Orders of the Tribunal**
Item No. 14,15,17, 18,21 & 22 (Connected) **31st August, 2016**	M.As. No. 425/16, 426/16, 428/16, 429/16, 432/16 & 433/16 have been filed by the Applicant seeking permission to amend and file the amended claim application in terms of Section 15 in the prescribed format. However, despite repeated opportunities having been granted, we find that no amended application in the prescribed format has been filed. In the light of the above and looking to the previous order dtd.

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	13.07.2016 we dismiss the Original Applications along with above mentioned M.As. ……………………………………,JM **(DALIP SINGH)** ……………………………………,EM **(Dr. S.S GARBYAL)**

BEFORE THE NATIONAL GREEN TRIBUNAL, CENTRAL ZONAL BENCH,

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Original Application No. 293/2014(CZ)
Hari Singh Vs Hindustan Zinc Ltd. & Ors.

in

(M.A. No. 511/2016)

and

Original Application No. 294/2014(CZ)
Om Prakash Raigar Vs Hindustan Zinc Ltd. & Ors.

in

(M.A. No. 512/2016)

and

Original Application No. 295/2014(CZ)
Papodo Vs Hindustan Zinc Ltd. & Ors.

in

(M.A. No. 513/2016)

and

Original Application No. 296/2014(CZ)
Kailash Vs Hindustan Zinc Ltd. & Ors.

in

(M.A. No. 514/2016)

and

Original Application No. 297/2014(CZ)
Jagannath Nayak Vs Hindustan Zinc Ltd. & Ors.

in

(M.A. No. 515/2016)

and

Original Application No. 298/2014(CZ)
Madan Lal Vs Hindustan Zinc Ltd. & Ors.

in

(M.A. No. 516/2016)

and

Original Application No. 299/2014(CZ)
Tulsi Ram Vs Hindustan Zinc Ltd. & Ors.

in

(M.A. No. 517/2016)

and

Original Application No. 300/2014(CZ)
Naurat Lal Vs Hindustan Zinc Ltd. & Ors.

in

(M.A. No. 518/2016)

and

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REG. NO. 996/2008
EXP. DATE 02-07-2023
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Attested
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Gulabpura (Bhilwara)

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Original Application No. 301/2014(CZ)
Hagam Vs Hindustan Zinc Ltd. & Ors.

in

(M.A. No. 519/2016)

and

Original Application No. 302/2014(CZ)
Balu Singh Vs Hindustan Zinc Ltd. & Ors.

in

(M.A. No. 520/2016)

and

Original Application No. 303/2014(CZ)
Ladi Vs Hindustan Zinc Ltd. & Ors.

in

(M.A. No. 521/2016)

and

Original Application No. 304/2014(CZ)
Gheesa Lal Vs Hindustan Zinc Ltd. & Ors.

in

(M.A. No. 522/2016)

and

Original Application No. 305/2014(CZ)
Vidya Devi Vs Hindustan Zinc Ltd. & Ors.

in

(M.A. No. 523/2016)

and

Original Application No. 306/2014(CZ)
Haazari Daroga Vs Hindustan Zinc Ltd. & Ors.

in

(M.A. No. 524/2016)

CORAM : **HON'BLE MR. JUSTICE DALIP SINGH, JUDICIAL MEMBER**
HON'BLE DR. SATYAWAN SINGH GARBYAL, EXPERT MEMBER

PRESENT : **Applicant :** **None**
Respondent No.1 : : **Shri Udai V.S. Rathore, Advocate**

Date and Remarks	**Orders of the Tribunal**
Item No. 6 to 19 (Connected) **9th September, 2016**	M.As. No. 511/2016, 512/2016, 513/2016, 514/2016, 515/2016, 516/2016, 517/2016, 518/2016, 519/2016, 520/2016, 521/2016, 522/2016, 523/2016 & 524/2016 have been filed by the Applicants seeking permission to amend and file the amended claim application in terms of Section 15 in the prescribed format.

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	However, despite repeated opportunities having been granted, we find that no amended application in the prescribed format has been filed. In the light of the above and looking to the previous order dtd. 13.07.2016 we **dismiss the Original Applications along with above mentioned M.As.** ....,JM **(DALIP SINGH)** ....,EM **(Dr. S.S GARBYAL)**

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Annexure R-4

BEFORE THE NATIONAL GREEN TRIBUNAL, CENTRAL ZONAL BENCH, BHOPAL

Original Application No. 128/2014 ((CZ)
Raghunath Karan Vs. Hindustan Zinc Ltd. & Ors.

AND

Original Application No. 129/2014 (CZ)
Davad Neelgar & Ors Vs. Hindustan Zinc Ltd. & Ors.

CORAM : **HON'BLE MR. JUSTICE DALIP SINGH, JUDICIAL MEMBER**
HON'BLE MR. P.S.RAO, EXPERT MEMBER

PRESENT : Applicant	:	**Shri S.P.Nagar, Advocate & Shri Pramod Nagar, Advocate**
Respondent No.1	:	**Shri K.Venugopal, Advocate Shri U.N.Tiwari, Advocate**
Respondent No. 3 & 4	:	**Mr. Sandeep Singh, Advocate**

Date and Remarks	Orders of the Tribunal
Item No. 1 & 2 (Connected) **23rd September, 2014**	The Learned Counsel appearing for the Rajasthan State Pollution Control Board (RSPCB) prays for some time to submit the reply. Replies on behalf of Respondent No. 1 have been filed in both the Original Applications. The same are ordered to be taken on record. A copy of the reply has been received by the Learned Counsel for RSPCB. Learned Counsel for the RSPCB is directed that the RSPCB shall look into the complaint which has been submitted before us and specific issues which have been raised in these two Applications. For ascertaining the grievances of the Applicants, the Member Secretary of the RSPCB shall direct the Regional Officer, RSPCB, Bhilwara to contact the Applicants and note down the specific points regarding the grievance of the Applicants by taking assistance of the officers of the concerned Departments in the District for verification in the field by contacting the District Collector and submit a report after carrying out detailed inspection of the area.

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	List on 19th November, 2014. ....,JM **(DALIP SINGH)** ....,EM **(P.S.RAO)**

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Annexure R-5

(7)

BEFORE THE NATIONAL GREEN TRIBUNAL

CENTRAL ZONAL BENCH, BHOPAL

ORIGINAL APPLICATION NO. 128/2014

Raghunath Karan V/s Hindustan Zinc Ltd. & Ors

AND

ORIGINAL APPLICATION NO. 129/2014

Davad & Ors

.......Applicants

Versus

Hindustan Zinc Ltd. & Ors.

.......Respondents

COMPLIANCE REPORT OF THE ORDER DATED 23.09.2014 PASSED BY THE HON'BLE TRIBUNAL, ON BEHALF OF RESPONDENT, THE RAJASTHAN STATE POLLUTION CONTROL BOARD.

Here in I, Rakesh Gupta S/o Shri P.C.Gupta, aged 50 years, do hereby solemnly state and affirm as under:

A. That I am presently working as Environmental Engineer (Mines) in the Rajasthan State Pollution Control Board, Jaipur and as such I am well conversant with the facts and circumstances of the present application as per records available and am competent and authorized to swear by way of the present affidavit.

NOTARY GOPESH MISHRA ADVOCATE GOVT OF INDIA

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B. That I have read and understood the contents of the appeal filed before the Hon'ble Tribunal and in reply on behalf of the State Board thereto as under:-

1. That the Hon'ble Tribunal has passed order on 23.09.2014 as follows:-

"Learned Counsel for the RSPCB is directed that the RSPCB shall look into the complaint which has been submitted before us and specific issues which have been raised in these two Applications. For ascertaining the grievances of the Applicants, the Member Secretary of the RSPCB shall direct the Regional Officer, RSPCB, Bhilwara to contact the Applicants and note down the specific points regarding the grievance of the Applicants by taking assistance of the officers of the concerned Departments in the District for verification in the field by contacting the District Collector and submit a report after carrying out detailed inspection of the area."

2. That for the compliance of the order dated 23.09.2014 of the Hon'ble Tribunal the respondent Board directed the Regional Officer, Bhilwara vide letter dated 13.10.2014 to send the compliance report of the order passed by the Hon'ble NGT. The photo copy of the letter dated 13.10.2014 is annexed herewith and marked as **Annexure-R-3/1**.

3. That the respondent Board also requested District Collector, Bhilwara, vide letter dated 13.10.2014 to appoint a team of the officer of the Regional Office, Bhilwara, SDO/concerning Tehsildar, Executive Engineer, Public Works Department of the concerning area and the Mining Engineer, Department of

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Mines, Bhilwara for ascertaining the grievances submitted by the applicants before the Hon'ble NGT. The photo copy of the letter dated 13.10.2014 is annexed herewith and marked as **Annexure-R-3/2.**

4. That the Regional Officer, Bhilwara vide letter dated 21.10.2014 requested that the points/grievances are related to Agriculture Department, Animal Husbandry Department, Hydrology Department and CMHO, therefore advise District Collector Bhilwara to include the aforesaid department in the same team. The photo copy of the letter dated 21.10.2014 is annexed herewith and marked as **Annexure-R-3/3.**

5. That the respondent Board requested District Collector, Bhilwara, vide letter dated 22.10.2014 to include the officers/representative of the Agriculture Department, Animal Husbandry Department, Hydrology Department and CMHO. The photo copy of the letter dated 22.10.2014 is annexed herewith and marked as **Annexure-R-3/4.**

6. That the District Collector, Bhilwara vide letter dated 28.10.2014 constituted a team of the following officers for the compliance of the NGT order dated 23.09.2014:-

   i. SDO, Gulabputa (Sub Division Area, Gulabpura)

   ii. SDO, Shahpura (Sub Division Area)

   iii. Tehsildar, Baneda (Baneda Tehsil Area)

   iv. Executive Engineer, Public Works Department, Gulabpura (Sub Division Area Gulabpura)

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v. Executive Engineer, Public Works Department, Shahpura (Sub Division Area Shahpura)

vi. Mining Engineer, Bhilwara

vii. Deputy Director, Agriculture Department, Bhilwara

viii. Regional Officer, Rajasthan State Pollution Control Board, Bhilwara

ix. Deputy Director, Husbandry Department, Bhilwara,

x. Chief Medical and Health Officer, Bhilwara

xi. Junior Hydrologist, Ground Water Department, Bhilwara

The photo copy of the letter dated 28.10.2014 is annexed herewith and marked as **Annexure-R-3/5**.

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7. That in compliance of the order passed as referred above, directions issued by Member Secretary, Rajasthan State Pollution Control Board, Jaipur vide their order no.-387 dated 13/10/2014 and District Collector, Bhilwara vide their no.-44585 dated 28/10/2014, Shri **Raghunath S/o Sh. Dev Karan resident** of village-Bherukheda-II, Tehsil-Hurda, District-Bhilwara, the applicant, has been contacted to note the specific points regarding the grievances of the applicant in presence of SDO Shahpura and other district level officers of Department of Mines & Geology and concerning Patwari. The copy of the grievances noted is enclosed (**May kindly**

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refer to internal page no. 9 of Annexure- R-3/6) for the ready reference and kind perusal. The main issues raised are as follows:-

1. Water having chemicals and foul odour during rainy season from mine area site gets accumulated in small ponds namely THAKADIA JI KI NADI and DEV NADI located in the village. This water is unfit to the animals for drinking etc. Further this water while flowing enters in the fields during rain and affects the crop yields making the land infertile.
2. Crackes in the houses have been developed due to vibration resulting from the blasting at Rampura-Agucha Mines. Houses have been collapsed due to it also.
3. Dust emissions take place at the time of dumping of the mine overburden at dumping yard located near the village affecting villagers resulting into respiratory disorders, Asthma, Skin Diseases and early aging effects. Animals also got affected resulting into vomiting and loose motions.
4. The dust accumulates on the grass and fodder of the animals making it non consumable, and if animal getting starved consumes the grass it will die.
5. Water table of the area depleted significantly from 25 feet to 100 feet due to mining activity.
6. The drinking water supplied by the HZL management through tankers is some time non-potable and if it is consumed then it results into water born diseases.

Keeping all above in a view, as far as emission of the dust, quality of the ambient Air, Noise and Water is

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concerned team of RSPCB has surveyed the area on 28/10/2014 to 31/10/2014 to verify the contents of the issues raised. The findings as observed are as follows:-

I. The village Bherukheda-II is located approximately 225 meter towards North-East from the HZL Rampura-Agucha Mines area. The villagers are engaged mainly in agriculture and labor work. Rain water from the area gets accumulated in the small ponds namely THAKADIA JI KI NADI and DEV NADI of the village. The flow of the water from the catchment area through different channels towards both the ponds depends upon rain fall. **During visit no direct channel from the mine area toward both the ponds was found.** Samples of accumulated rain water from both the ponds i.e. THAKADIA JI KI NADI and DEV NADI have been collected by RSPCB team for analysis. ~~In addition to it~~ samples of water from Hurda Talab, Vill.-Hurda, Agucha Talab, Village-Agucha & Liha Talab, Village-Bharatiya, Tehsil-Hurda have also been collected by RSPCB team for analysis. These all samples are collected to assess the quality of water.

As per report from SDO Gulabpura, vide number 1758 dated 31/10/2014 (May kindly refer to internal page no. 15 of Annexure- R-3/6) it has been informed that, they do not have any recorded death of Animal or postmortem report showing cause of death due to pollution. And no report is there regarding crop depletion due to pollution arising from mining

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activities & no water logging problem has been observed in the agriculture land of the area (copy enclosed for ready reference and kind perusal).

The report from Deputy Director Agriculture, Zila Parishad, Bhilwara is also enclosed (May kindly refer to internal page no. 65 of Annexure- R-3/6) for ready reference and kind perusal, showing that overall average crop yield is satisfactory in the area.

II. Blasting is part of mining activity and it is difficult to have proper and desired mining without blasting. Impact of blasting to the surrounding & nearby area depends upon intensity of the blasting and strata of the area blasted. Controlled blasting confines the impact within the required area. **Comments from the department of Mines & Geology, Bhilwara reveal that the blasting is as per the prescribed parameters of DGMS. The peak particle velocity is within the parameter prescribed and vibration resulting from the blasting can't spread over up to the settlements and villages under reference. Copy of report no.-2123 dated 03.11.2014 submitted by Department of Mines & Geology, Bhilwara is enclosed (May kindly refer to internal page no. 28 and 29 of Annexure- R-3/6) for ready reference and kind perusal. Further, the cracks in the houses at Village-Bherukheda-II as per Assistant Engineer, PWD, Gulabpura, District-Bhilwara vide report letter no.-Spl-1 dated 31.10.2014 (May kindly refer to internal page**

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no. 47 of Annexure- R-3/6) (enclosed herewith for ready reference and kind perusal) are general and observed normally after construction. No house has been observed there appearing cracks due to blasting. He has observed one Kaccha house having its wall tilted resulting either from rain or vibration. He has not concluded on this issue.

Emission of dust in the mine during blasting is a normal physical phenomenon, and it is suppressed through water spray. Fugitive emission at the time of movement of dumpers, heavy earth movers and other vehicles are within the mine, and in transportation area. Dust emissions are not only because of mining as natural wind movement also makes the eroded dust particles air-borne. Impact of dust emission depends upon wind velocity, wind direction and size of dust particles emitted in the area. The good practice that may be prescribed to suppress the dust is through water spray and proper house-keeping within the mining site. Further, Fugitive emissions outside mine area due to vehicular movement in the village can't be denied but they can not be solely due to vehicular traffic. Strong natural wind movement also causes re-suspension of dust in the air. This type of fugitive emissions can be kept within the limit prescribed through proper cleaning of road and suppression of dust by water spray and dense plantation. As the dumping yard for mine overburden is about 225 meters from the village and its height is around 60-90 meters from ground

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level, dust emission while dumping of the mine overburden takes place and can be suppressed through water-spray. Its effects and dispersion depends upon wind direction, wind velocity, and particle size. During survey it has been observed that there was no active dumping of mine overburden at the dump located near to the village Bherukheda-II. The dumping was carried out at the tailing dam dump site which is around 2.5 to 3 Km from village Bherukheda-II.

Further, samples of ambient air have been collected from two locations of village Bherukheda-II, i.e. at the house of Sanwar Lal Vaishnav S/o Shri Ramniwas Vaishnav and Shri Bhagirath Gurjar S/o Shri Kalyan Gurjar to access the dust concentration in the ambient air by RSPCB team for further analysis.

Further, in this continuation M/s HZL, Agucha Mines has also been inspected on 30 & 31.10.2014 **(May kindly refer to internal page no. 148 to 151 of Annexure- R-3/6)** and inspection report is enclosed for ready reference and kind perusal. It has been observed that four number of drills were in operation out of which, one drill machine was operated without injecting water at the time of drilling resulting into fugitive dust emissions. Fugitive dust emissions were also seen at waste dump during unloading of over burden through dumper. This can be avoided by wetting of muck pile in the mine pit before its handling. House-keeping near site of beneficiation plant stream 01 and Zinc & Lead

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concentrate loading site is poor and need to be rectified and maintained properly. The monitoring team of RSPCB has collected samples of water from four piezometer wells located within the premises of M/s HZL & two piezometer wells located outside the premises of M/s HZL near village-Kheda Paiola to assess quality of ground water. Sample of tailing dam water has also been collected. Further, the team has carried out stack monitoring at the stack of primary crusher (Ventury Scrubber) and secondary crusher (Ventury Scrubber) and ambient air quality monitoring at mine site, mine tower, near main gate & near tailing dam. Noise level monitoring has also been carried out at near mill office, near main gate, at mine site & near mine tower by RSPCB team. Regarding odour, it has been observed that significant odour is there within the beneficiation plant. This odour is process and product specific and remains there. However, no specific odor, as observed within beneficiation plant, is felt in the nearby village streets.

Comments and findings with respect to the respiratory disorder, skin diseases and early aging effect and other diseases in the villagers provided by Chief Medical & Health Officer, Department of Health, Govt. of Rajasthan vide no.-7106 dated 05.11.2014 are enclosed (**May kindly refer to internal page no. 49 of Annexure- R-3/6**) for ready reference and kind perusal. **It has been submitted vide the comments as above that the level of respiratory**

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disorder, skin diseases and other type of diseases is not beyond the average prevalence of diseases.

Comments and findings with respect to the loose motion and other diseases in the animals provided by the Department of Animal Husbandry are enclosed for ready reference and kind perusal. **It has been submitted the comments vide no.-5757 dated 31.10.2014 (May kindly refer to internal page no. 52 of Annexure- R-3/6) that the diseases and symptoms of disease observed are of common type. The causes of death of animals are of common type. And there is no depletion in the production of milk.**

III. Deposition of the dust on the grass and fodder depends upon both atmospheric dust fall and fugitive emissions in that particular area. The dust ~~deposition~~ observed near the road side is significant, as in any other dusty road, due to fugitive emissions from vehicular and other movements. The dust deposition may occur both due to mining activity and natural and atmospheric dust fall. There is no standard to access the dust deposition on the grass and cannot be commented upon. However, samples of the ambient air have been collected to access the dust concentration in the ambient air from two points of village Bherukheda-II as mentioned above.

IV. The applicant and the villagers raised issue of the ground water depletion in the area due to mining activities carried out by M/s HZL. **The mining by M/s HZL is carried out**

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below the ground water table (Ground water table has been intersected) as per permission from Central Ground Water Authority (CGWA) vide its letter no.-21-4(2) WR/CGWA/2005/2014 dated 08/07/2013 and 2098 dated 27/11/2013 (Annexure-R-3/7) and it is monitored by CGWA as per their norms (copy enclosed for ready reference). However, report from In-charge Hydrologist Ground Water Department (S & R), Bhilwara vide its number 146 dated 30.10.2014 enclosed (May kindly refer to internal page no. 147 of Annexure- R-3/6) for ready reference and kind perusal shows that the study carried out so far reveals that average ground water level fluctuation trends during the year 2004 & 2014 indicates that (+)2.25 meters rise in the water level in & around periphery of mine area.

V. There are hand pumps and PHED supply in the village for drinking and other purposes. **Drinking water is also supplied daily by HZL under CSR activities as per requirement given through local administration. The source of water for M/s HZL is radial well constructed at the river Banas, N/v Kotri, Bhilwara. This same water is also supplied to HZL colony and plant for drinking purpose after disinfection through chlorine. The same water is being supplied from drinking water pump house to the villages through dedicated tankers.** The villagers said that the water supplied is potable almost

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all the time, but some time they felt some contamination resulting into bad taste and doubts of water born disease also. It is not possible to establish conclusion on supply of quality of potable water in past. For future, the the HZL may be asked to have its regular examination of water that is being supplied.

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8. That in compliance of the order passed as referred above, directions issued by Member Secretary,. Rajasthan State Pollution Control Board, Jaipur vide their order no.-387 dated 13/10/2014 and District Collector, Bhilwara vide their no.-44585 dated 28/10/2014, Shree Davad Neelgar S/o Sh. Kalu Ji Neelgar resident of village-Kothiya, Tehsil-Phuliya kalan, District-Bhilwara, the applicant has been contacted to note the specific points regarding the grievances of the applicant in presence of Tehsildaar Fuliya Kalan representative SDO Shahpura and other district level officers of Department of Mines & Geology, Animal Husbandry and concerning Patwari. The copy of the grievances noted is enclosed (**May kindly refer to internal page no. 12 of Annexure- R-3/6**) for ready reference and kind perusal. The main issues raised are:-

1. During mining operation and blasting, foul odour and dust occurs having impact at far distant area.
2. Wind from the direction of tailing dam has foul odour also.

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3. During rainy season boundary of tailing dam either fell down or broken by HZL to drain out the water, which enters in the nearby fields causing loss of crops.
4. Animals consume this water due to thirst and become ill and some of animal will die.
5. Blasting during mine operation results into loud noise, vibration and fear in the area. And also cracks develop in houses & sometime results into collapse of houses.
6. Dust emissions in huge quantity due to dumpers & other vehicles engaged in the mining activity.
7. Seepage of tailing dam contaminates the ground water. The ground water is not potable.
8. In the rainy season tailing dam overflows and the overflow water joins water of KACHOLIYA TALAB & MAI TALAB. Animals can't consume this water and if consumed they will become ill. Infertility, blood in urine & loose motion are being observed in the animals.
9. Paralysis, pain in foot, knee pain, kidney failure, respiratory disorder and early aging is being observed in the area.
10. No employment is given by the HZL to villagers. Land of the villagers were acquired and at the time of acquire they were given Rs.3000/- and promised to give employment to a member of each land account holder. And that is not given yet.
11. Village Bhillo Ka Kheda, panchayat Khotiya is shifted due to expansion of tailing dam. At present the Bhillo ka Kheda is around 300 feet from the tailing dam and there is

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no facility is given. The adverse effect due to tailing dam Viz. foul odour and water lodging is permanent there.

Keeping all above in a view, as far as emission of the dust, quality of the ambient Air, Noise and Water is concerned team of RSPCB has surveyed the area on 29/10/2014 to 31/10/2014 to verify the contents of the issues raised. The findings as observed are as follows: -

1. The village Khotiya is located approximately 2.5 Km towards North from the HZL Rampura Ahucha mines area. The villagers are engaged mainly in agriculture and labor work. Rain water from the area gets accumulated in the small ponds namely KACHOLIYA TALAB & MAI TALAB of the village. The flow of the water from the catchment area through different channels towards both the ponds depends upon rain fall. During visit no direct channel from the mine area toward both the ponds was found. KACHOLIYA TALAB was dry whereas some water is available in the MAI TALAB and sample of accumulated rain water from MAI TALAB has been collected by RSPCB team for analysis.

No evidence of tailing dam failure or broken were observed and even no report is available regarding failure or broken and over flow of tailing dam with the SDO, Shahpura and Department of Mines & Geology, Bhilwara. SDO, Shahpura vide letter no.-2889 dated 31.10.2014 (May kindly refer to internal page no. 18 of Annexure- R-3/6) has informed that the water is not

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coming in the agriculture land from the side of tailing dam in present conditions and there is no chance of depletion in agriculture crop. Deputy Director, Agriculture, Zila Parishad, Bhilwara has also submitted vide their inspection report dated 30.10.2014 (May kindly refer to internal page no. 65 of Annexure- R-3/6) that as per the experiment and result of agriculture in the area it has been observed that crop yield results have been observed satisfactory. Report of SDO, Shahpura and Deputy Director, Agriculture, Zila Parishad, Bhilwara is enclosed for ready reference and kind perusal.

Seepage from the nearby waste dumps is observed, which as a standard practice, is got collected through garland drain in a sump and pumped back to the reclaim reservoir of HZL for further captive consumption at beneficiation plant. Sample of water from this garland drain has also been collected by RSPCB team for analysis. Further samples of tube well from village Khotiya and Kheda Palola/ Bhilo Ka Kheda have also been collected by RSPCB team for analysis. (Bhillo Ka Kheda is Majra of Kheda Palola that is same settlement and it is located at the distance of 320 feet from the boundary of mines as per report of SDO Shahpura. Bhillo Ka Kheda has facilities of Electricity, Water and C.C. road as per report of SDO Shahpura vide no.-2889 dated 31/10/2014). In addition to it samples of water from Hurda Talab, Vill.-Hurda, Agucha

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Talab, Village-Agucha & Liha Talab, Village-Bharatiya, Tehsil-Hurda have also been collected by RSPCB team for analysis. These all samples are collected to assess the quality of water.

2. **Over flow of tailing dam at the time of rainfall has not been observed as per SDO, Shahpura and Department of Mines & Geology report (May kindly refer to internal page no. 18-19 and 28-29 of Annexure- R-3/6) as it is located above the average RL of the area.** Report enclosed for ready reference and kind perusal.

3. Blasting is part of mining activity. **Comments from the department of Mines & Geology, Bhilwara reveal that the blasting is as per the prescribed parameters of DGMS. The peak particle velocity is within the parameter prescribed and vibration resulting from the blasting can't spread over up to the settlements and villages under reference. Copy of report no.-2123 dated 03.11.2014 (May kindly refer to internal page no. 27 to 29 of Annexure- R-3/6) submitted by Department of Mines & Geology, Bhilwara is enclosed for ready reference and kind perusal. Further, the cracks in the houses at village-Kothiya are not due to the impact of blasting done at HZL, Agucha Mines as per Executive Engineer, PWD, Shahpura, District-Bhilwara report letter no.-2635 dated 30.10.2014 enclosed (May kindly refer to internal page no. 48 of**

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Annexure- R-3/6) herewith for ready reference and kind perusal.

Emission of dust in the mine during blasting is a normal physical phenomenon, and it is suppressed through water spray. Fugitive emission at the time of movement of dumpers, heavy earth movers and other vehicles are within the mine, and in transportation area. Dust emissions are not only because of mining as natural wind movement also makes the eroded dust particles air-borne. Impact of dust emission depends upon wind velocity, wind direction and size of dust particles emitted in the area. The good practice that may be prescribed to suppress the dust is through water spray and proper house-keeping within the mining site. Further, Fugitive emissions outside mine area due to vehicular movement in the village can't be denied but they can not be solely due to vehicular traffic. Strong natural wind movement also causes re-suspension of dust in the air. This type of fugitive emissions can be kept within the limit prescribed through proper cleaning of road and suppression of dust by water spray and dense plantation. To access the concentration of dust in the ambient air sampling of ambient air has been carried out at Patwar House, Village-Khotiya and Govt. Primary School, Kheda Paloia by RSPCB team for analysis.

Further, in this continuation M/s HZL, Agucha Mines has also been inspected on 30 & 31.10.2014 (**May kindly refer to internal page no. 148 to 151 of Annexure- R-3/6)**

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and inspection report is enclosed for ready reference and kind perusal. It has been observed that four number of drills were in operation out of which, one drill machine was operated without injecting water at the time of drilling resulting into fugitive dust emissions. Fugitive dust emissions were also seen at waste dump during unloading of over burden through dumper. This can be avoided by wetting of muck pile in the mine pit before its handling. House-keeping near site of beneficiation plant stream 01 and Zinc & Lead concentrate loading site is poor and need to be rectified and maintained properly. The monitoring team of RSPCB has collected samples of water from four piezometer wells located within the premises of M/s HZL & two piezometer wells located outside the premises of M/s HZL near village-Kheda Palola to assess quality of ground water. In this context sample of tailing dam water has also been collected. Further, the team has carried out stack monitoring at the stack of primary crusher (Ventury Scrubber) and secondary crusher (Ventury Scrubber) and ambient air quality monitoring at mine site, mine tower, near main gate & near tailing dam. Noise level monitoring has also been carried out at near mill office, near main gate, at mine site & near mine tower by RSPCB team. Regarding odour, it has been observed that significant odour is found within the beneficiation plant. However, no specific odor, as observed within beneficiation plant, is felt in the nearby village streets.

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4. Comments and findings with respect to the Paralysis, pain in foot, knee pain, kidney failure, respiratory disorder and early aging effect and other diseases in the villagers provided by **Chief Medical & Health Officer, Department of Health, Govt. of Rajasthan vide no.-7106 dated 05.11.2014 (May kindly refer to internal page no. 49 of Annexure-R-3/6) are enclosed for ready reference and kind perusal. It has been submitted vide the comments as above that the level of respiratory disorder, skin diseases and other type of diseases is not beyond the average prevalence of diseases.**
5. Comments and findings with respect to the Infertility, blood in urine, loose motion and other diseases in the animals provided by the Department of Animal Husbandry are enclosed for ready reference and kind perusal. **It has been submitted vide no.-5757 dated 31.10.2014 (May kindly refer to internal page no. 53 of Annexure- R-3/6) the comments as above that the diseases and symptoms of disease observed are of common type. The causes of death of animals are of common type. And there is no depletion in the production of milk.**

8. Employment to the villagers is the policy matter of M/s HZL. The matter of the land acquired in the past can't be commented upon at this stage, as no comment from revenue (SDO Shahpura) has been provided.

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The photo copy of the consolidated report of the OA No. 128/2014 and 129/2014 with supporting documents of the team is annexed herewith and marked as **Annexure-R-3/6**

9. That the brief comments on the findings inspection team of District Level Officers, Bhilwara constituted by District Collector, Bhilwara vide order dated 28/10/2014_are as follows:-

S.No.	District Level Officer	Findings
1.	SDO, Gulabpura (May kindly refer to internal page no. 15 of Annexure- R-3/6)	• Do not have any recorded death of animal or postmortem report showing cause of death. • No report regarding crop depletion due to pollution, no water logging problem observed.
2.	Deputy Director, Agriculture (May kindly refer to internal page no. 65 of Annexure- R-3/6)	• Overall average crop yield is satisfactory in the area.
3.	ME, Bhilwara (May kindly refer to internal page no. 28-29 of Annexure-R-3/6)	• Blasting is as per the prescribed parameters of DGMS
4.	AEN, PWD, Gulabpura (May kindly refer to internal page no. 47 of Annexure- R-3/6)	• Cracks in the houses are general and observed normally after construction. No house has been observed appearing cracks due to blasting.
5.	Ex.Eng., PWDShahpura (May kindly refer to internal page no. 48 of Annexure- R-3/6)	• No house has been observed appearing cracks due to blasting.
6.	CMHO (May kindly refer to internal page no. 49 of Annexure- R-3/6)	• Level of respiratory disorder, skin disease and other type of diseases is not beyond the average prevalence of disease.
7.	Animal Husbandry (May kindly refer to internal	• Diseases and symptoms observed are of common type. Causes of death of

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	page no. 53 of Annexure- R-3/6)	animals are of common type. There is no depletion in the production of milk.
8.	Ground Water (May kindly refer to internal page no. 167 of Annexure- R-3/6)	• The study carried out so far reveals that average ground water level fluctuation trends during the year 2004 & 2014 indicates +2.5 mt rise in the water level in and around periphery of mine area.
9.	SDO, Shahpura (May kindly refer to internal page no. 18 of Annexure- R-3/6)	• Water is not coming in the agriculture land from tailing dam site. There is no chance of depletion in agriculture crop. • No overflow from the tailing dam has been observed.
10.	Regional Officer, Bhilwara (May kindly refer to internal page no. 1 to 8 of Annexure- R-3/6)	• Fugitive emission of dust due to mining activity can't be denied. • There was no active dumping of OB at dump located near to vill. Bherukheda-II. The dumping was carried out at the tailing dam dump site which is around 2.5 to 3.0 kms from vill. BK-II. • Fugitive emission were observed from drilling site. • Fugitive emission were observed at waste dump site. • Significant odor observed within beneficiation plant. • But, no specific odor, as observed in beneficiation plant, was felt in the nearby village streets.

10. That from the careful analysis of the records and submissions made in para 1 to 9 above, it is humbly submitted that even though the situation is not alarming, following suggestions are warranted for the consideration of the Hon'ble NGT to kindly pass order, as appropriate. These recommendations are as follows:-

i. **Measures to reduce fugitive dust emission:** Hindustan Zinc Ltd. should take measures to control

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the fugitive emissions, even if these are not part of consent conditions, by providing water sprinkler system, regular water spraying and plantation along the tailing dam and road side. As far as possible, fresh water should not be used for spraying; rather, reuse of the wastewater originating from the mining operations should be preferred.

ii. **Measures to ensure the quality of drinking water:** M/s Hindustan Zinc Ltd. should periodically monitor the quality of potable water being supplied, as their corporate social responsibility (CSR) obligation, to nearby villages and the HZL colony through pipe/tankers.

iii. **Measures to simultaneously support livelihoods and improve the environment under the corporate social responsibility:** While the challenges that villagers ascribed to industry are not necessarily because of the HZL Ltd. itself, yet the perception of local population is crucial for long-term sustainability of business and environment. In addressing the conflicts in which there is no clear evidence that mining or industrial activity is harming the people or environment, a generic presumption can nevertheless be made that the people living in close proximity to industrial production plants or mines may be comparatively more affected by the industrialization, and thus, they may have genuine CSR expectations

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from the industry. Therefore, HZL Ltd. should identify most appropriate CSR activities and implement in the field. The "thumb rule" that should be followed in identification and implementation of socially-relevant and context-specific CSR initiatives is that the activities must contribute simultaneously to livelihoods improvement as well as environmental protection.

The compliance report may kindly be taken on record and may pass appropriate order.

DEPONENT

VERIFICATION

Verified at Jaipur, on this 16 day of November, 2014. I the above mentioned deponent do hereby verify that the contents of the above affidavit are true and correct, no part of it is false and nothing material has been concealed therefrom.

16/11/14

DEPONENT

ATTESTED

NOTARY

Sandeep Singh

Attested

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Annexure R-6

Inspection Report

Reference :-

In compliance to RSPCB Head office CPM Cell letter dated 10.01.2019, under signed Board Official inspected the unit named as M/s Hindustan Zinc Limited., Rampura Agucha Mine, P.O. Agucha, Tehsil- Hurda, District- Bhilwara on dated 16.01.2019.

1. That during the course of inspection, Dinesh Kumar Paliwal (Head Environment) was present at site.
2. Details and findings of the inspection are detailed as under:-

1	a. Name of the Industry:	M/s Hindustan Zinc Limited
	b. Address of the Industry:	C/o Hindustan Zinc Limited Rampura Agucha Mine, P.O. Agucha, Tehsil- Hurda District : Bhilwara 311022
	c. E-mail:	Dineshkumar.Paliwal@vedanta.co.in
	d. Fax:	01483-229012
	e. Mobile:	8003097088
	f. Telephone:	01483-229011
2	Date of Inspection:	16/01/2019
3	Name and Designation of the Person Contacted	Dinesh Kumar Paliwal (Head Environment)
4	Date of commencement of production	1991
5	Type of Industry:	Mining & Beneficiation
6	Nature of Industry:	AWH Polluting (Non-ferrous Mineral Beneficiation)
7	Size of Industry: Large/ Medium/ Small	Large
8	Category of Industry: Red/ Orange/ Green/ Others	Red
9	Status of Operation: Operational/ Non-operational/ Closed/ Any other	Operational
10	List of Partners/ Directors/ proprietor with addresses:	List attached as annexure-I
11	Status of consent under the Water Act, 1974	(i) Earlier combined (Mine & Beneficiation) consent to operate issued under Air & Water Act by Head Office vide letter no. F(Mines) /Bhilwara (Hurda)/12(1)2015-2016/ 2555-2559 Order No. 2015-2016/ Mines/6781 issued on 24/09/2015 for production of Lead & Zinc ore Mining 6.15 Million MTPA and Beneficiation plant for Lead & Zinc 6.500 Million MTPA same was valid up to 28.02.2018 (ii) Renewal Consent to Operate has applied under Air & Water Act vide application id-197864 (for CPM) dated 30.10.2017 and same is under consideration at H.O.
12	Status of Consent under Air Act- 81	

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13	Status of Authorization under H.W. (M and H) Rules- 2009	Hazardous waste Authorization common for Mines. Beneficiation plant granted vide authorization no RPCB/HWM/2015-2016/SWMC/HSW /39 dated 09/07/2015, same is valid up to 30.11.2019.
14	Name of Raw materials with quantity (per day or month or annum)	Lead Zinc Ore- 6.5 Million MTPA and other chemicals mainly used i.e. Copper Sulphate, Nigrosine, Pot Ethyl Xanthate, Sod Isopropyl Xanthate, MIBC/Frother, Sodium Cyanide, Hydrated Lime, Sodium Metabisulphite etc. list/ consumption from April-2017 to December-2018 attached as annexure-II
15	Name of product(s) and By-Products manufactured with quantity (per day or month or annum)	Beneficiation of Lead & Zinc Ore- 6.500 Million MTPA.
16	Water related:	
	1. Source of Water	Ground Water (Radial Well at Banas River)
	2. Status of metering arrangement on sources	19353592
	3. Meter reading (if meter provided)	Meter Reading at source (As reported) 1. Mill water meter -9317971 2. Mine water meter- 8297 3. Colony drinking - 18442 4. Office drinking -152426 5.Mine project -10974
	4. Metering arrangement for water consumption in various process/use	Industrial – Water flow meter Provided Domestic –Water flow meter Provided
	5. Water consumption process/ purpose wise	Industrial – 9500 KLD max. Domestic -1950 KLD max.(included in mines also)
	6. Status of log book of water drawl and consumption	Log book maintained
17	Waste water generation (Stream wise) Per day:	Domestic- Nil (Water treated in STP's 2 Nos. having capacities- 425 KLD at Colony and 300 KLD at Industrial premises and treated water generated from those STP's is approx. 510 KLD is utilize in plantation and horticulture, "Zero liquid discharge" status maintained.
18.	Whether the Industry is connected with CETP or has provided Effluent Treatment Plant or treatment not required?	No, the waste water generated in beneficiation process is recycle in the process through tailing dam. Water balance enclosed as annexure-III.
19	In case Effluent Treatment Plant (ETP) provided, detail of same (In case of multiple ETP's or STP's, please	

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	provide details for all) : Not applicable			
20	Discharge of waste water (per day)	Discharge-Nil Industrial Waste Water- Recycled in process. Domestic- Recycle through STP's		
21	Point of discharge/disposal of waste water and ultimate receiving body. Adequacy of disposal:	At present Domestic- 510 KLD reuse in horticulture and plantation and on installed capacity- 725 KLD		
22	Recycle of treated effluent (if any)	As per details mentioned in point no.-18		
23	Details of recycling arrangements	Recycled through tailing dam		
24	Metering arrangements for recycling? If yes, then meter reading	S. No.	Source pipe line	Meter reading (in M^3)
		1.	Pumping from Pumping Station to Beneficiation Plant (400 M^3/ Hour)	4064095 M^3
		2.	Plant STP (300 KLD) outlet	96152 M^3
		3.	Colony STP (425 KLD)	55925 M^3
25	Whether industry is a member of CETP? Provide details.	No		
26	CETP inlet norms	N.A.		
27	Method of conveyance of waste water from industry to CETP:	N.A.		
28	Adequacy of the CETP for total effluent reaching CETP	N.A.		

29	Details of Air pollution:					
A	Process stacks					
Sr No	Stack attached to process	Stack height in meter & its adequacy	Probable pollutants	Details of APCM	Comment on adequacy of APCM	Whether adequate and safe infrastructural monitoring facility provided or not?
1.	Primary Crusher	Approx.33 Meter from G.L.	PM	Wet scrubber	-	Provided
2.	Primary Crusher New	Approx.34 Meter from G.L.	PM	Bag Filter	-	Provided
3.	Secondary Crusher	Approx.39 Meter from G.L.	PM	Wet scrubber	-	Provided
i)	Status of energy meter & hour meter			Energy meter provided		
ii)	Status of log book of operation and meter			Being maintained in system		
B	Source of fugitive emission and measures taken to control, if any with details &adequacy:			Source- Materials transfer points, storage handling of material and Transportation Control Measures.- 1. Water spray system has been provided at		

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		crusher. 2. For the control of fugitive emission, industry has provided dust extraction system interlinked with crushers 3. Concreted road has been made inside plant premises and sweeping is being done by two truck mounted sweeping machines. 4. For storage of crushed ore fine ore bin provided.
D	Details of incinerator:	N.A.
E	Details of D.G. Sets :-D.G. Sets are kept ready for emergency operations.	

S. No.	Rating	Status of Acoustic enclosure	Details of Stack	Adequacy of stack and acoustic enclosure	Whether adequate and safe infrastructural monitoring facility provided or not?
1.	D.G. set no. I & II (5 MW each)	Installed in separated building	Common stack Approx. 30 Meter from ground level	Adequate	Provided

F	Source of foul odour and measures taken to control, if any.	No
30	Fly ash management with all details, if applicable.	Not applicable
31	A	Details about hazardous waste management:

Sr No	Source of Hazardous Waste	Category of Hazardous waste	Quantity of Hazardous Waste generated/ storage at the time of inspection	Facility for Collection, storage, treatment, Transportation and Disposal
1.	Mining Equipment ,Gear box, machineries etc.	Used Oil /Spent oil (5.1)	90.96 MT	5.1 Sold to registered recycler Lastly, Used oil (14.756 KL) sold, authorized vendor on dated 10.01.2019
2.	In beneficiation process	NaCN Discarded container (33.3)	642.0 Nos	CTDF Udaipur on dated 18.12.2018 (154Nos.)

32	Verification and irregularities/ gap found in manifests	Annual report in form -4 is being sent as per given schedule.
33	Management / Disposal of Spent Acid/ Solvent/ Waste Oils, If applicable	The waste oil /used oil was found collected in MS Drums and stored at designated place with sign board. Used oil/ waste oil is

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		sold to registered recyclers.
34	Whether industry is a member of TSDF site or not?	Yes
35	A — Status of logbook for hazardous waste:	Being maintained
	B — Status of display board of size 4' x 6' at the main gate	Displayed
	C — Status of display board at the storage area	Displayed
36	Electric service number	K No: 110232002004 / AVVNL
37	Water service number	N.A.
38	Other relevant information regarding the industry, including Complaints	Nil
39	Details of water/waste water sample collected during inspection	Not collected
40	Details of air/emission sample collected during inspection	Not collected
41	Compliance of CTE/ CTO / Authorization/ Registration/ Undertaking/Bank Guarantee if any, EC- conditions, if applicable	Complied except status mentioned herein above points.

Other observations-

1. There are four streams of beneficiation plants which were installed in phase manner during various expansions i.e. Stream-1 (Flotration cell- 68, Rod Mill- 3, Sag Mill- 0, Ball Mill- 3, Regrind Mill- 2), Stram-2 (Flotration cell- 32, Rod Mill- 0, Sag Mill- 1, Ball Mill- 1, Regrind Mill- 1), Stream- 3 (Flotration cell- 31, Rod Mill- 0, Sag Mill- 1, Ball Mill- 1, Regrind Mill- 1), Stream-4 (Flotration cell- 34, Rod Mill- 0, Sag Mill- 1, Ball Mill- 1, Regrind Mill- 1).
2. To carry the seepage from tailing dam to plant unit has provided following arrangements i.e.- Pumping from tailing dam to pump house (Pump capacity- 300 M^3/Hr), Pumping from Pumping Station to Beneficiation Plant (Pump capacity- 800 M^3/Hr).
3. In case of non operational period of plant or rainy season Pumping Station to Tailing Dam (Pump capacity- 2800 M3/Hr).
4. Source of the fresh water in the unit is radial well at banas river, permission of CGWA was valid up to 07.07.2018 for abstraction of ground water 11,700 M^3/Day. Unit has applied for renewal of permission on 05.04.2018 and same is under consideration of CGWA (Annexure-IV).
5. Earlier samples of the pizeometric wells and nearby water bodies were collected by this office on 13.11.2018 i.e.- Piezometer Well No. H1, Piezometer Well No. I1, Piezometer Well No. A, Piezometer Well No. K, Piezometer Well No. P, Piezometer Well near Admin Building, Garland Drain, Tailing Dam, Hand Pump Near Bherukheda-II Ki Nadi, Hand Pump in front of Patwar House, Liha Talab, Agucha Talab, Agucha, Hurda Talab, Mai Talab, Hand Pump in Bhilo Ki Basti, Kheda Palola, Thikadiya Ki Nadi, Hand Pump in Government Primary School, Bherukheda II and deposited in Board's laboratory for the analysis of parameters Zinc, Lead, Iron and Cadmium, results are awaited till the date.
6. The seepage from tailing dam was discussed with the representative and he informed that tailing dam construction height rising was done as designed by IIScBanglore. As per design, seepage cannot be eliminated completely in earthen and rock fill dam as plugging

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NOTARY RAJESH KUMAR MEHTA GULABPURA REG NO. 936/2008 EXP.DATE 02-07-2023 GOVT OF RAJASTHAN

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

RAMPURA AGUCHA MINE HZL

of seepage may lead to the excess pressure development on embankments. As suggested, HZL has taking sufficient control measures to channelize the seepage water through lined toe drain, lined collection sumps and pumping station at downstream of the tailing dam. The seepage water collected and stored in these sumps is recycled back to the beneficiation plant regularly. The tailing dam is lined with clay at first phase and HDPE liners in subsequent phases. During inspection seepage water was observed in lined drains and collection sumps and pumping was also going on.

7. The copy of the above mentioned report is not available with this office, however H.O. may also suggest some further action required in this matter.

(K.B.Paliwal)	(Rajeev Pareek)
JSO	Regional Officer
RPCB, Bhilwara	RPCB, Bhilwara

Recommendations: - In view of above, renewal of consent to operate may be considered subject to adequacy of fee and documents.

सूचना का अधिकार अधिनियम, 2005
के तहत जारी दस्तावेज
प्र. प्र. नि. मं. भीलवाड़ा

Regional Officer

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 996/2008
EXP.DATE 02-07-2023
GOVT OF RAJASTHAN

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Gulabpura (Bhilwara)

HZL • RAMPURA AGUCHA MINE

Inspection Report – Mining

1	a. Name of the Mine:	M/s Hindustan Zinc Limited
	b. Communication address:	C/o Hindustan Zinc Limited Rampura Agucha Mine, P.O. Agucha Tehsil Hurda District : Bhilwara 311022
	c. E-mail:	Dineshkumar.Paliwal@vedanta.co.in
	d. Fax:	01483-229012
	e. Mobile:	8003097088
	f. Telephone:	01483-229011
	g. Mining lease number	1/2000
	h. Village & Tehsil	Agucha P.O. Agucha Tehsil Hurda
	i. District	Bhilwara, 311022
2	Date of Inspection:	16/01/2019
3	Name and Designation of the Person Contacted:	Dinesh Kumar Paliwal (Head Environment)
4	Date of commencement of production	1991
5	Validity of Lease	12/03/2030
6	Name of Minerals (s)	Lead and Zinc
7	Type of Minerals (s) Major (Scheduled/non-scheduled)/ Minor	Major minerals (Lead and Zinc)
8	Category of Mine: Red/ Orange/ Green	Red
9	Status of Operation: Operational/ Non-operational/ Closed/ Any other-if non-operation reason and period of non-operation	Operational
10	List of Partners/ Directors/ proprietor with addresses	List attached as annexure-I
11	Status of consent under the Water Act, 1974:	(i) Earlier combined (Mine & Beneficiation) consent to operate issued under Air & Water Act by Head Office vide letter no. F(Mines) /Bhilwara (Hurda)/12(1)2015-2016/ 2555-2559, Order No. 2015-2016/ Mines/6781 issued on 24/09/2015 for production of Lead & Zinc ore Mining 6.15 Million MTPA and Beneficiation plant for Lead & Zinc 6.500 Million MTPA same was valid up to 28.02.2018. (ii) Renewal Consent to Operate has applied under Air & Water Act vide application Id 197514 (Mine) dated 30.10.2017 and same is under consideration at H.O.
12	Status of Consent under Air Act- 81	
13	Status of Environmental Clearance Under EIA notification/ Aravali notification	EC No J-11015 /267 /2008- IA II(M) dated 11.12.2009.

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14	**Status of Mining Plan/ mining scheme**	Mining plan has been approved vide letter No. S.584(4)(3)(1724)/2018-RCM-AJMER dated 27/03/18
15	Consented production capacity	Lead & Zinc ore production - 6.15 MTPA .
16	**Type of mining operation:** Opencast/ Under Ground	Opencast & Underground mine
17	**Mechanized mining/ semi mechanized mining/ manual mining**	Mechanized mining
18	Number of mining pits with dimensions	As per information given by representative. Open Pit dimensions : Approx. L-2000m. B-1200m. D-400m (Presently no production but pit is live) Strike length of ore body – Approx. 1550m. width- 5-70m. depth- 1490m Present depth of Shaft bottom – Approx. 950 m
19	Status of water table and its intersection with present mining depth	Water table - 20 meter bgl. Present depth of Shaft bottom – 950mbgl. Mining is intersect the ground water therefore unit has obtained the permission from CGWA for dewatering of 250.0 M^3/ Day was valid up to 07.07.2016. water meter installed in dewatering line. Unit has applied for renewal of permission on 28.04.2016 and same is under consideration of CGWA (Annexure- II).
20	Number of over burden dumps with dimensions	One O.B. dump having area –approx. 316.00 ha
21	**Status** and **verification of retaining wall constructed around over burden** dumps	Yes provided
22	**Status and** verification of siltation pond constructed around over burden dumps	Yes provided (7 Nos.)
23	**Status and verification** of garland drain and siltation pond around pits	Yes provided
24	Whether top soil is available? If yes, how is it stacked? Its location and quantity.	Not available
25	Status and verification of plantation around the dumps, boundary of lease, road side and other locations. Please specify detail of plantation and overall quantum.	Details provided by management are attached as Annexure-III
26	**Water related:**	
	a) Source of Water	Ground Water (Radial Well at Banas River)
	b) **Status of metering** arrangement on sources	Yes
	c) Meter **reading (if meter provided)**	19353592
	d) **Metering** arrangement for water **consumption** in various process/use	Meter Reading at source (As reported) 1. Mill water meter -9317971 2. Mine water meter- 8297 3. Colony drinking - 18442 4. Office drinking -152426 5.Mine project -10974

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	e) Water consumption process/ purpose wise	Domestic 1950 and sprinkling 250 KLD.
	f) Status of log book of water drawl and consumption	Maintained
27	Waste water generation (Stream wise) Per day:	Colony STP 275 KLD per day and Plant STP 235 KLD per/day
28	In case Sewage Treatment Plant (STP) provided, detail of same (In case of multiple STP's, please provide details for all) :	
	A Sewage Treatment plant (STP) unit operation/ process with details and status (Enclose flow sheet):	2 STP plant one at colony premise 425KLD and another Plant premise 300KLD
	B Operational status of STP units at the time of inspection:	Both STP's
	C Status and verification of separate electric meter for STP and the reading thereof	Electric Meter Reading- Plant STP (300 KLD) – 147403 kwh Colony STP (425 KLD)- 127520 kwh
	D Status and verification of water meter at inlet, outlet and recycle and reading thereof	see table below
	E Status and verification logbook for operation, electric meter/ water meters/ chemicals consumption	Yes
	F Characteristics of waste water (as per site observation) pH, Temperature, Conductivity, Dissolved Oxygen	No test carried out at site.
29	Discharge of waste water (per day)	Colony STP 275 KLD per day and Plant STP 235 KLD per/day(for Plantation and gardening)
30	Point of discharge/disposal of waste water and ultimate receiving body along with adequacy of disposal:	NA
31	Recycle of treated effluent	NA
32	Details of recycling arrangements	
33	Status and verification of metering arrangement for recycle	Mine water recycles
34	Details of Air pollution:	
A	Source of fugitive emission and measures taken to control, if any with details & adequacy: Dust generated from vehicular movement and loading/ unloading activity are being controlled by regular water sprinkling on the haul roads and loading/unloading points.	
B	Details of D.G. Sets :- Not applicable	
C	Source of foul odour and measures taken to control, if any,	Not applicable

Item 28 D:

S. No	Source	Inlet Meter Reading	Outlet Meter Reading
1.	Plant STP (300 KLD) outlet	107823 M³	96152 M³
2.	Colony STP (425 KLD)	252551 M³	55925 M³

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35	Management / Disposal of used/ Waste Oils, If applicable	Sale to registered recycler
36	Status of logbook for used/ waste oil, if applicable:	Maintained
37	Other relevant information regarding the mine, including complaints	No
38	Details of water/ waste water sample collected during inspection:	Earlier samples of the piezometric wells and nearby water bodies were collected by this office on 13.11.2018 i.e. - Piezometer Well No. H1, Piezometer Well No. I1, Piezometer Well No. A, Piezometer Well No. K, Piezometer Well No P, Piezometer Well near Admin Building, Garland Drain, Tailing Dam, Hand Pump Near Bherukheda-II Ki Nadi, Hand Pump in front of Patwar House, Liha Talab, Agucha Talab, Hurda Talab, Mai Talab, Hand Pump in Bhilo Ki Basti Kheda Palola, Thikadiya Ki Nadi, Hand Pump in Government Primary School, Bherukheda & and deposited in Board's laboratory for the analysis of parameters Zinc, Lead, Iron and Cadmium, results are awaited till the date.
39	Details of air sample collected during inspection:	Not collected
40	Compliance of CTE/CTO/Authorization/Undertaking/Bank Guarantee if any, EC-condition, if any, EC-conditions, if applicable:	Conditions were being complied as mentioned in the above points.
41	Specific non- compliances if any, observed during inspection:	As per status mentioned herein above.

(K.B.Paliwal)
JSO
RPCB, Bhilwara

C/s
(Rajeev Pareek)
Regional Officer
RPCB, Bhilwara

Recommendations: - In view of above, renewal of consent to operate may be considered subject to adequacy of fee and documents.

Regional Officer

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HZL RAMPURA AGUCHA MINE

Phone: 2491269

REGIONAL OFFICE & LABORATORY
RAJASTHAN STATE POLLUTION CONTROL BOARD
470, Near UCCI Building, M.I.A. UDAIPUR

Date:- 22/2/19

No. RPCB/ROU/Gen-lab/100

Regional Officer
Rajasthan State Pollution Control Board,
Kota

Sub:- Metal analysis report of Samples

Ref. Your letter No. 2602 dated 16.01.2019

Sir,

With reference to above please find enclosed the Metal analysis report of Samples received on dated17.01.2019.

submitted for information & further necessary action.

Encl. : As above.

Yours faithfully,

(L.R.MAURYA)
Lab Incharge

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RAMPURA AGUCHA MINE HZL

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S.No.	Bottle No.	Date Of Collection	Unit Id	Name & Address Of Surface Water Body/Industry	Point Of Collection	Zinc	Lead	Total Chromium	Copper	Nickel	Iron	Cadmium
1	629	23.09.2018	1680	Triveni Sangam, Tehsil- Mandalgarh, District- Bhilwara	Immersion Spot Of Ganesh Pratima At Triveni Near Mandalgarh (During Immersion)	1.846	NT	0.022	NT	-	-	-
2	630	23.09.2018	1680	Triveni Sangam, Tehsil- Mandalgarh, District- Bhilwara	Approximate 1.0 K.M. Away (Down Stream) From Immersion Spot Of Ganesh Pratima At Triveni Near Mandalgarh (During Immersion)	1.822	NT	0.013	NT	-	-	-
3	631	23.09.2018	706	Gandhi Sagar Taalab, Tehsil & District- Bhilwara	Immersion Spot Of Ganesh Pratima Near Tejaji Chowk At Gandhi Sagar Talab (During Immersion)	1.744	NT	0.074	NT	-	-	-
4	632	23.09.2018	706	Gandhi Sagar Taalab, Tehsil & District- Bhilwara	Approximately 100 Meters Away From Immersion Spot Of Ganesh Pratima Near Tejaji Chowk At Gandhi Sagar Talab (During Immersion)	1.642	NT	0.008	NT	-	-	-
5	633	24.09.2018	721	Rajsamand Lake, Tehsil & District- Rajsamand	Immersion Spot Of Ganesh Pratima Near No-Chowki At Rajsamand Lake (After Immersion)	2.646	0.002	0.014	NT	-	-	-
6	634	24.09.2018	721	Rajsamand Lake, Tehsil & District- Rajsamand	Approximate 100 Meters Away From Immersion Spot Of Ganesh Pratima Near No-Chowki At Rajsamand Lake (After Immersion)	2.121	NT	0.073	NT	-	-	-
7	635	24.09.2018	1718	Mansarovar Lake, Patel Nagar, Tehsil & District- Bhilwara	Immersion Spot Of Ganesh Pratima At Mansarovar Lake (After Immersion)	1.655	NT	0.014	NT	-	-	-
8	636	24.09.2018	1718	Mansarovar Lake, Patel Nagar, Tehsil & District- Bhilwara	Approximately 100 Meters Away From Immersion Spot Of Ganesh Pratima At Mansarovar Lake (After Immersion)	1.442	NT	0.038	NT	-	-	-
9	637	24.09.2018	1680	Triveni Sangam, Tehsil- Mandalgarh, District- Bhilwara	Immersion Spot Of Ganesh Pratima At Triveni Near Mandalgarh (After Immersion)	2.121	NT	0.006	NT	-	-	-
10	638	24.09.2018	1680	Triveni Sangam, Tehsil- Mandalgarh, District- Bhilwara	Approximate 1.0 K.M. Away (Down Stream) From Immersion Spot Of Ganesh Pratima At Triveni Near Mandalgarh (After Immersion)	1.884	NT	0.024	NT	-	-	-
11	639	24.09.2018	706	Gandhi Sagar Taalab, Tehsil & District- Bhilwara	Immersion Spot Of Ganesh Pratima Near Tejaji Chowk At Gandhi Sagar Talab (After Immersion)	1.144	NT	0.02	NT	-	-	-
12	640	24.09.2018	706	Gandhi Sagar Taalab, Tehsil & District- Bhilwara	Approximately 100 Meters Away From Immersion Spot Of Ganesh Pratima Near Tejaji Chowk At Gandhi Sagar Talab (After Immersion)	1.233	NT	0.004	NT	-	-	-

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स./प्र. नि. मं. भीलवाड़ा

RO Bhilwara

RAMPURA AGUCHA MINE HZL

NOTARY RAJESH KUMAR MEHTA GULABPURA REG.NO 995 2008 EXP.DATE 02-07-2023 GOVT OF RAJASTHAN

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Gulabpura (Bhilwara)

[illegible]	[illegible]	26.10.2018	706	Gandhi Sagar Talab, Tehsil & District-Bhilwara	Immersion Spot Of Durga Pratima Near Tejaji Chowk At Gandhi Sagar Talab (After 7 Days Of Immersion)	1.78	NT	1.11	NT			-	
[illegible]	921	26.10.2018	706	Gandhi Sagar Talab, Tehsil & District-Bhilwara	Approximately 100 Meters Away From Immersion Spot Of Durga Pratima Near Tejaji Chowk At Gandhi Sagar Talab (After 7 Days Of Immersion)	1.98	NT	0.27	NT				-
[illegible]	[illegible]	13.11.2018	11060	M/S Hindustan Zinc Limited, Rampura-Agucha Mine, Post Office- Agucha, Hurda, Tehsil- Hurda, District- Bhilwara (Unit Id-11060)	Piezometer Well No. HI	1.6	0.01					0.22	0.001
[illegible]	941	13.11.2018	11060	M/S Hindustan Zinc Limited, Rampura-Agucha Mine, Post Office- Agucha, Hurda, Tehsil- Hurda, District- Bhilwara (Unit Id-11060)	Piezometer Well No. 11	1.88	0.01					0.18	0.001
116	942	13.11.2018	11060	M/S Hindustan Zinc Limited, Rampura-Agucha Mine, Post Office- Agucha, Hurda, Tehsil- Hurda, District- Bhilwara (Unit Id-11060)	Piezometer Well No. A	1.42	0.01	-		-		0.26	0.002
[illegible]	[illegible]	13.11.2018	11060	M/S Hindustan Zinc Limited, Rampura-Agucha Mine, Post Office- Agucha, Hurda, Tehsil- Hurda, District- Bhilwara (Unit Id-11060)	Piezometer Well No. K	1.47	0.008	-				[illegible]	[illegible]
[illegible]	[illegible]	13.11.2018	11060	M/S Hindustan Zinc Limited, Rampura-Agucha Mine, Post Office- Agucha, Hurda, Tehsil- Hurda, District- Bhilwara (Unit Id-11060)	Piezometer Well No. F	1.44	0.006			-		[illegible]	[illegible]
[illegible]	[illegible]	13.11.2018	11060	M/S Hindustan Zinc Limited, Rampura-Agucha Mine, Post Office- Agucha, Hurda, Tehsil- Hurda, District- Bhilwara (Unit Id-11060)	Piezometer Well Near Admin Building	1.26	0.004			-	-	0.24	NT
[illegible]	[illegible]	13.11.2018	11060	M/S Hindustan Zinc Limited, Rampura-Agucha Mine, Post Office- Agucha, Hurda, Tehsil- Hurda, District- Bhilwara (Unit Id-11060)	Garland Drain	2.22	0.004					[illegible]	NT
[illegible]	947	13.11.2018	11060	M/S Hindustan Zinc Limited, Rampura-Agucha Mine, Post Office- Agucha, Hurda, Tehsil- Hurda, District- Bhilwara (Unit Id-11060)	Tailing Dam	3.64	0.088			-		1.76	2.006
122	948	13.11.2018	2047	Hand Pump Near Bherukheda-Ii Ki Nadi, Tehsil- Hurda, District- Bhilwara	Hand Pump Near Bherukheda-Ii Ki Nadi	1.12	0.004	-		-		0.41	NT
[illegible]	949	13.11.2018	2046	Hand Pump In Front Of Patwar House, Kotdiya, Tehsil- Phuliya Kalan, District-Bhilwara	Hand Pump In Front Of Patwar House	1.14	0.002					[illegible]	NT
124	950	13.11.2018	2045	Lha Talab, Bhariya, Tehsil- Hurda, District-Bhilwara	Lha Talab	0.85	0.003			-		0.15	NT

सूचना क. अधिकार अधिनियम, 2005 के तहत जारी दस्तावेज

(3)

प्रिज्ञाराम [illegible]

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RAMPURA AGUCHA MINE · HZL

S No 125 to 130 RO Bhilwara	125	951	13.11.2018	2044	Agucha Talab, Agucha, Tehsil- Hurda, District- Bhilwara	Agucha Talab, Agucha	1.14	0.008	-		-	0.14	NT
	126	952	13.11.2018	2043	Hurda Talab, Tehsil- Hurda, District- Bhilwara	Hurda Talab	0.66	0.006	-	-	-	0.18	NT
	127	953	13.11.2018	2041	Mai Talab, Koshiya, Tehsil- Phuliya Kalan, District- Bhilwara	Mai Talab	1.13	0.006	-	-		0.10	NT
	128	954	13.11.2018	2040	Hand Pump In Bhilo Ki Basti, Kheda Palola, Tehsil- Phuliya Kalan, District- Bhilwara	Hand Pump In Bhilo Ki Basti, Kheda Palola	1.44	0.004	-	-		0.12	NT
	129	955	13.11.2018	2038	Thikadiya Ki Nadi, Bherukheda Ii, Tehsil- Hurda, District- Bhilwara	Thikadiya Ki Nadi	0.54	0.002	-	-	-	0.13	NT
	130	956	13.11.2018	2037	Hand Pump In Government Primary School, Bherukheda Ii, Tehsil- Hurda, District- Bhilwara	Hand Pump In Government Primary School, Bherukheda Ii	1.12	0.004	-	-	-	0.14	NT
S No 131 RO, Bikaner	131	979	23/11/2018	1981	Indra Gandhi Feeder At Rajasthan Border, Tehsil- Tibbi, Distt.- Hanumangarh	Indra Gandhi Feeder At Rajasthan Border, Tehsil- Tibbi, Distt.- Hanumangarh	0.86	0.002	NT	0.024	0.03	0.14	0.022
SN 132 RO Kota	132	1059	20/12/2018	16513	M/S Adani Power Rajasthan Ltd., Kawai, Baran	Final Outlet Of Etp	0.04	-	-	NT	NT	-	-
S No 133 RO Bikaner	133	1068	22/12/2018	1981	Indra Gandhi Feeder At Rajasthan Border, Tehsil- Tibbi, Distt.- Hanumangarh	Indra Gandhi Feeder At Rajasthan Border, Tehsil- Tibbi, Distt.- Hanumangarh	0.94	0.004	NT	0.021	0.01	0.14	0.022

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HZL RAMPURA AGUCHA MINE

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Gulabpura (Bhilwara)

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S.No.	Bottle No.	Date of Collection	Unit Id	Name & Address Of Surface Water Body/Industry	Point Of Collection	Zinc	Lead	Total Chromium	Copper	Nickel	Iron	Cadmium
1	629	23.09.2018	1680	Triveni Sangam, Tehsil-Mandalgarh, District-Bhilwara	Immersion Spot Of Ganesh Pratima At Triveni Near Mandakgarh (During Immersion)	1.846	NT	0.022	NT	-	-	-
2	630	23.09.2018	1680	Triveni Sangam, Tehsil-Mandalgarh, District-Bhilwara	Approximate 1.0 KM Away (Down Stream) From Immersion Spot Of Ganesh Pratima At Triveni Near Mandalgarh (During Immersion)	1.822	MT	0.011	NT	-	-	-
3	631	23.09.2018	706	Gandhi Sagar Talab, Tehsil & District-Bhilwara	Immersion Spot Of Ganesh Pratima Near Tejaji Chowk At Gandhi Sagar Talab (During Immersion)	1.744	NT	0.024	NT	-	-	-
4	632	23.09.2018	706	Gandhi Sagar Talab, Tehsil & District-Bhilwara	Approximate 100 Meters Away From Immersion Spot Of Ganesh Pratima Near Tejaji Chowk At Gandhi Sagar Talab (During Immersion)	1.642	NT	0.008	NT	-	-	-
5	633	24.09.2018	731	Rajsamand Lake, Tehsil & District - Rajsamand	Immersion Spot Of Ganesh Pratima Near No-Chowki At Rajsamand Lake (After Immersion)	2.646	0.002	0.014	NT	-	-	-
6	634	24.09.2018	731	Rajsamand Lake, Tehsil & District - Rajsamand	Approximate 100 Meters Away From Immersion Spot Of Ganesh Pratima Near No-Chowki At Rajsamand Lake (After Immersion)	2.121	NT	0.012	NT	-	-	-
7	635	24.09.2018	1718	Mansarovar Lake,Patel Nagar,Tehsil & District-Bhilwara	Immersion Spot Of Ganesh Pratima At Mansarovar Lake (After Immersion)	1.655	NT	0.014	NT	-	-	-
8	636	24.09.2018	1718	Mansarovar Lake,Patel Nagar,Tehsil & District-Bhilwara	Approximate 100 Meters Away From Immersion Spot Of Ganesh Pratima At Mansarovar Lake (After Immersion)	1.442	NT	0.038	NT	-	-	-
9	637	24.09.2018	1680	Triveni Sangam, Tehsil-Mandalgarh, District-Bhilwara	Immersion Spot Of Ganesh Pratima At Triveni Near Mandalgarh (After Immersion)	2.121	NT	0.036	NT	-	-	-
10	638	24.09.2018	1680	Triveni Sangam, Tehsil-Mandalgarh, District-Bhilwara	Approximate 1.0 KM Away (Down Stream) From Immersion Spot Of Ganesh Pratima At Triveni Near Mandalgarh (After Immersion)	1.884	NT	0.024	NT	-	-	-
11	639	24.09.201	706	Gandhi Sagar Talab, Tehsil & District-Bhilwara	Immersion Spot Of Ganesh Pratima Near Tejaji Chowk At Gandhi Sagar Talab (After Immersion)	1.144	NT	0.02	NT	-	-	-
12	640	24.09.2018	706	Gandhi Sagar Talab, Tehsil & District-Bhilwara	Approximate 100 Meters Away from Immersion Spot Of Ganesh Pratima Near Tejaji Chowk At Gandhi Sagar Talab (After Immersion)	1.233	NT	0.004	NT	-	-	-

RAMPURA AGUCHA MINE HZL

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

NOTARY GOVT OF RAJASTHAN
RAJESH KUMAR MEHTA GULABPURA
REG.NO. 556/2008
EXP.DATE 02-07-2023

112	920	26.10.2018	706	Gandhi Sagar Talab, Tehsil & District-Bhilwara	Immersion Spot Of Ganesh Pratima Near Tejaji Chowk At Gandhi Sagar Talab (After 7 Days Of Immersion)	1.78	NT	0.11	NT	-	-	-
113	921	26.10.2018	706	Gandhi Sagar Talab, Tehsil & District-Bhilwara	Approximate 100 Meters Away from Immersion Spot Of Ganesh Pratima Near Tejaji Chowk At Gandhi Sagar Talab (After 7 Days Of Immersion)	1.98	NT	0.27	NT	-	-	-
114	940	13.11.2018	11060	M/S Hindustan Zinc Limited, Rampura Aagucha Mine, Post Office-Aagucha, Hurda, Tehsil-Hurda, District-Bhilwara(Unit Id-11060)	Piezometer well No.111	1.6	0.91	-	-	-	0.22	0.001
115	941	13.11.2018	11060	M/S Hindustan Zinc Limited, Rampura Aagucha Mine, Post Office-Aagucha, Hurda, Tehsil-Hurda, District-Bhilwara(Unit Id-11060)	Piezometer well No.11	1.88	0.01	-	-	-	0.18	0.001
116	942	13.11.2018	11060	M/S Hindustan Zinc Limited, Rampura Aagucha Mine, Post Office-Aagucha, Hurda, Tehsil-Hurda, District-Bhilwara(Unit Id-11060)	Piezometer well No. A	1.42	0.01	-	-	-	0.26	0.002
117	943	13.11.2018	11060	M/S Hindustan Zinc Limited, Rampura Aagucha Mine, Post Office-Aagucha, Hurda, Tehsil-Hurda, District-Bhilwara(Unit Id-11060)	Piezometer well No. K	1.47	0.008	-	-	-	0.22	0.001
118	944	13.11.2018	11060	M/S Hindustan Zinc Limited, Rampura Aagucha Mine, Post Office-Aagucha, Hurda, Tehsil-Hurda, District-Bhilwara(Unit Id-11060)	Piezometer well No. P	1.44	0.006	-	-	-	0.18	0.001
119	945	13.11.2018	11060	M/S Hindustan Zinc Limited, Rampura Aagucha Mine, Post Office-Aagucha, Hurda, Tehsil-Hurda, District-Bhilwara(Unit Id-11060)	Piezometer well Near Admin Building	1.26	0.004	-	-	-	0.24	NT
120	946	13.11.2018	11060	M/S Hindustan Zinc Limited, Rampura Aagucha Mine, Post Office-Aagucha, Hurda, Tehsil-Hurda, District-Bhilwara(Unit Id-11060)	Garland Drain	2.22	0.004	-	-	-	0.14	NT
121	947	13.11.2018	11060	M/S Hindustan Zinc Limited, Rampura Aagucha Mine, Post Office-Aagucha, Hurda, Tehsil-Hurda, District-Bhilwara(Unit Id-11060)	tailing Dam	3.64	0.088	-	-	-	1.26	0.006
122	948	13.11.2018	2047	Hand Pump Near Bherukheda -II Ki Nadi, Tehsil-Hurda,District-Bhilwara	Hand Pump Near Bherukheda-II Ki Nadi	1.12	0.004	-	-	-	0.44	NT
123	949	13.11.2018	2046	Hand Pump In Front Of Patwar House,Kothia, Tehsil- Phuliya Kalan, District- Bhilwara	Hand Pump in Front Of Patwar House	1.14	0.002	-	-	-	0.36	NT
124	950	13.11.2018	2045	Liha Talab, Barantiya, Tehsil-Hurda, District - Bhilwara	Liha Talab	0.85	0.002	-	-	-	0.18	NT

RAMPURA AGUCHA MINE HZL

NOTARY GOVT OF RAJASTHAN RAJESH KUMAR MEHTA GULABPURA REG.NO. 996/2008 EXP.DATE 02-07-2023

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

125	951	13.11.2018	2044	Agucha Talab, Agucha,Tehsil-Hurda,District - Bhilwara	Agucha talab,Agucha	1.14	0.008	-	-	-	0.14	NT
126	952	13.11.2018	2043	Hurda Talab,Tehsil-Hurda,District-Bhilwara	Hurda Talab	0.66	0.006	-	-	-	0.08	NT
127	953	13.11.2018	2041	Mai Talab Kothiya Tehsil-Phuliya Kalan,District - Bhilwara	Mai Talab	1.14	0.006	-	-	-	0.02	NT
128.	954	13.11.2018	2040	Hand Pump In Bhilo Ki Basti,Khera Palola,Tehsil-Phuliya Kalan, District-Bhilwara	Hand Pump In Bhilo Ki Basti,Khera Palol	1.44	0.004	-	-	-	0.44	NT
129	955	13.11.2018	2038	Thikariya Ki Nadi Bherukheda II, Tehsil - Hurda, District- Bhilwara	Thikariya ki nadi	0.54	0.002	-	-	-	0.12	NT
130	956	13.11.2018	2037	Hand Pump In Government Primary School,Bherukheda-II, Tehsol-Hurda,District-Bhilwara	Hand Pump In Government Primary School,Bherukheda-II	1.19	0.004	-	-	-	0.34	NT
131	979	23.11.2018	1981	Indra Gandhi Feeder At Rajasthan Border,Tehsil-Tibbi, Distt- Hanumangarh	Indra Gandhi Feeder At Rajasthan Border,Tehsil-Tibbi, Distt- Hanumangarh	0.86	0.002	NT	0.024	0.01	0.34	0.002
132	1059	20.12.2018	16513	M/S Adani Power Rajasthan Ltd,Kawai,Baran	Final Outlet Of ETP	0.04	-	-	NT	NT	-	-
133	1068	22.12.2018	1981	Indra Gandhi Feeder At Rajasthan Border,Tehsil-Tibbi, Distt- Hanumangarh	Indra Gandhi Feeder At Rajasthan Border,Tehsil-Tibbi, Distt- Hanumangarh	4.94	0.004	NT	0.021	0.01	0.38	0.002

RAMPURA AGUCHA MINE HZL

NOTARY RAJESH KUMAR MEHTA GULABPURA REG NO. 995/2008 EXP.DATE 02-07-2023 GOVT OF RAJASTHAN

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

Annexure R-7

Location->	Air Monitoring Kothiya village											
	SPM	Norms	PM_{10}	Norms	$PM_{2.5}$	Norms	SO_2	Norms	NO_x	Norms	CO	Norms
year	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)	(µg/m3)
Apr-15	135.59	500.00	56.66	100.00	24.60	60.00	7.80	80.00	9.60	80.00	372.00	5000.00
	136.51	500.00	57.60	100.00	25.00	60.00	7.40	80.00	9.40	80.00	348.00	5000.00
May-15	135.18	500.00	57.58	100.00	25.00	60.00	7.30	80.00	9.50	80.00	384.00	5000.00
	138.96	500.00	59.27	100.00	29.11	60.00	7.70	80.00	9.70	80.00	360.00	5000.00
Jun-15	134.46	500.00	55.96	100.00	25.00	60.00	7.60	80.00	9.60	80.00	371.00	5000.00
	130.34	500.00	53.69	100.00	24.63	60.00	7.20	80.00	9.40	80.00	343.00	5000.00
Jul-15	128.24	500.00	·51.04	100.00	25.00	60.00	7.30	80.00	9.70	80.00	360.00	5000.00
	124.53	500.00	48.94	100.00	20.55	60.00	7.10	80.00	9.10	80.00	332.00	5000.00
Aug-15	125.68	500.00	49.56	100.00	24.60	60.00	7.20	80.00	9.30	80.00	331.00	5000.00
	130.91	500.00	52.19	100.00	25.00	60.00	7.40	80.00	9.70	80.00	353.00	5000.00
Sep-15	131.88	500.00	53.53	100.00	28.70	60.00	7.60	80.00	9.80	80.00	360.00	5000.00
	126.32	500.00	50.33	100.00	24.63	60.00	7.20	80.00	9.40	80.00	338.00	5000.00
Oct-15	134.49	500.00	54.59	100.00	28.94	60.00	7.60	80.00	9.80	80.00	360.00	5000.00
	128.78	500.00	51.31	100.00	24.73	60.00	7.20	80.00	9.40	80.00	338.00	5000.00
Nov-15	131.61	500.00	53.80	100.00	28.71	60.00	8.10	80.00	9.90	80.00	365.00	5000.00
	131.74	500.00	52.60	100.00	24.64	60.00	7.40	80.00	9.10	80.00	348.00	5000.00
Dec-15	132.63	500.00	52.10	100.00	24.88	60.00	7.20	80.00	9.10	80.00	365.00	5000.00
	130.78	500.00	53.50	100.00	29.15	60.00	7.60	80.00	8.90	80.00	345.00	5000.00
Jan-16	132.28	500.00	52.10	100.00	24.58	60.00	7.50	80.00	9.70	80.00	355.00	5000.00
	127.76	500.00	53.50	100.00	24.99	60.00	7.20	80.00	8.40	80.00	335.00	5000.00
Feb-16	130.16	500.00	52.10	100.00	20.83	60.00	7.90	80.00	9.40	80.00	346.00	5000.00
	130.38	500.00	53.50	100.00	24.64	60.00	7.40	80.00	8.80	80.00	324.00	5000.00
Mar-16	138.48	500.00	56.72	100.00	24.84	60.00	8.10	80.00	9.80	80.00	370.00	5000.00
	133.73	500.00	53.77	100.00	24.88	60.00	7.60	80.00	8.40	80.00	364.00	5000.00
Apr-16	137.80	500.00	56.85	100.00	24.65	60.00	7.80	80.00	9.40	80.00	378.00	5000.00
	137.81	500.00	57.58	100.00	24.85	60.00	7.60	80.00	9.00	80.00	380.00	5000.00
May-16	138.34	500.00	58.28	100.00	28.79	60.00	7.50	80.00	9.60	80.00	388.00	5000.00
	137.61	500.00	57.31	100.00	24.84	60.00	7.30	80.00	9.20	80.00	362.00	5000.00
Jun-16	135.76	500.00	55.35	100.00	24.80	60.00	7.50	80.00	9.20	80.00	366.00	5000.00
	130.93	500.00	52.39	100.00	20.52	60.00	7.30	80.00	9.00	80.00	350.00	5000.00
Jul-16	130.14	500.00	52.35	100.00	20.73	60.00	7.40	80.00	9.40	80.00	350.00	5000.00
	132.15	500.00	53.20	100.00	20.67	60.00	7.60	80.00	9.00	80.00	355.00	5000.00
Aug-16	127.80	500.00	53.55	100.00	20.73	60.00	7.20	80.00	9.10	80.00	360.00	5000.00
	135.79	500.00	54.75	100.00	25.11	60.00	8.10	80.00	9.80	80.00	392.00	5000.00
Sep-16	134.88	500.00	55.49	100.00	24.87	60.00	7.50	80.00	9.80	80.00	426.00	5000.00
	137.39	500.00	56.03	100.00	29.26	60.00	8.00	80.00	9.60	80.00	408.00	5000.00
Oct-16	174.35	500.00	53.35	100.00	24.92	60.00	6.50	80.00	11.20	80.00	250.00	5000.00
	178.02	500.00	55.02	100.00	25.57	60.00	7.40	80.00	9.70	80.00	326.00	5000.00
Nov-16	181.82	500.00	53.55	100.00	24.67	60.00	6.10	80.00	10.40	80.00	320.00	5000.00
	189.81	500.00	58.14	100.00	24.63	60.00	7.30	80.00	11.50	80.00	374.00	5000.00
Dec-16	191.01	500.00	55.42	100.00	24.99	60.00	7.20	80.00	10.00	80.00	368.00	5000.00
	185.76	500.00	53.29	100.00	24.51	60.00	6.40	80.00	12.40	80.00	380.00	5000.00
Jan-17	193.08	500.00	57.80	100.00	20.70	60.00	6.50	80.00	8.80	80.00	390.00	5000.00
	160.93	500.00	57.19	100.00	18.07	60.00	5.08	80.00	11.27	80.00	240.00	5000.00
Feb-17	193.10	500.00	57.24	100.00	24.78	60.00	6.40	80.00	9.82	80.00	280.00	5000.00
	173.92	500.00	62.98	100.00	25.35	60.00	5.88	80.00	10.10	80.00	190.00	5000.00
Mar-17	197.32	500.00	56.16	100.00	20.83	60.00	6.90	80.00	10.20	80.00	246.00	5000.00
	185.77	500.00	61.17	100.00	25.10	60.00	5.41	80.00	11.61	80.00	190.00	5000.00
Apr-17	206.48	500.00	61.11	100.00	24.87	60.00	6.40	80.00	11.40	80.00	310.00	5000.00
	187.82	500.00	60.03	100.00	24.83	60.00	6.33	80.00	10.88	80.00	230.00	5000.00
May-17	201.92	500.00	60.70	100.00	28.77	60.00	6.90	80.00	10.40	80.00	280.00	5000.00
	196.56	500.00	60.73	100.00	24.92	60.00	6.50	80.00	9.90	80.00	210.00	5000.00
Jun-17	203.66	500.00	60.70	100.00	24.74	60.00	6.20	80.00	9.40	80.00	310.00	5000.00
	228.10	500.00	63.32	100.00	17.73	60.00	17.73	80.00	8.24	80.00	450.00	5000.00
Jul-17	190.33	500.00	60.70	100.00	20.46	60.00	6.80	80.00	7.50	80.00	364.00	5000.00
	127.16	500.00	51.32	100.00	18.20	60.00	5.41	80.00	11.39	80.00	190.00	5000.00
Aug-17	167.00	500.00	59.84	100.00	20.00	60.00	6.21	80.00	9.82	80.00	280.00	5000.00
	129.06	500.00	50.32	100.00	22.10	60.00	4.85	80.00	13.56	80.00	250.00	5000.00
Sep-17	214.01	500.00	59.50	100.00	24.87	60.00	4.12	80.00	9.11	80.00	310.00	5000.00
	213.34	500.00	63.13	100.00	26.88	60.00	4.49	80.00	13.61	80.00	260.00	5000.00

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 936/2008
EXP.DATE 02-07-2023
GOVT OF RAJASTHAN

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

HZL
AGUCHA MINE

Oct-17	190.03	500.00	54.55	100.00	20.12	60.00	4.47	80.00	12.61	80.00	310.00	5000.00
	205.06	500.00	55.02	100.00	20.63	60.00	5.10	80.00	9.40	80.00	340.00	5000.00
Nov-17	214.60	500.00	62.02	100.00	24.57	60.00	5.20	80.00	6.50	80.00	290.00	5000.00
	275.97	500.00	74.79	100.00	27.67	60.00	4.12	80.00	22.31	80.00	330.00	5000.00
Dec-17	204.22	500.00	59.87	100.00	28.94	60.00	4.20	80.00	5.10	80.00	310.00	5000.00
	190.21	500.00	50.40	100.00	21.81	60.00	4.75	80.00	11.58	80.00	190.00	5000.00
Jan-18	187.36	500.00	56.24	100.00	24.87	60.00	6.50	80.00	8.40	80.00	290.00	5000.00
	159.83	500.00	59.70	100.00	27.80	60.00	7.92	80.00	12.88	80.00	160.00	5000.00
Feb-18	193.94	500.00	52.73	100.00	24.31	60.00	6.00	80.00	10.68	80.00	250.00	5000.00
	185.14	500.00	55.42	100.00	24.85	60.00	4.50	80.00	8.40	80.00	330.00	5000.00
Mar-18	195.73	500.00	59.94	100.00	28.95	60.00	6.10	80.00	8.80	80.00	320.00	5000.00
	186.52	500.00	68.80	100.00	26.17	60.00	5.08	80.00	11.26	80.00	260.00	5000.00
Apr-18	214.74	500.00	71.78	100.00	20.46	60.00	6.60	80.00	8.90	80.00	310.00	5000.00
	230.98	500.00	64.40	100.00	20.56	60.00	5.09	80.00	11.85	80.00	230.00	5000.00
May-18	207.87	500.00	67.57	100.00	24.87	60.00	7.00	80.00	8.40	80.00	340.00	5000.00
	209.27	500.00	69.88	100.00	26.83	60.00	7.67	80.00	11.80	80.00	220.00	5000.00
Jun-18	188.76	500.00	60.38	100.00	24.79	60.00	5.20	80.00	7.60	80.00	230.00	5000.00
	176.00	500.00	61.25	100.00	25.72	60.00	5.68	80.00	10.53	80.00	170.00	5000.00
Jul-18	187.71	500.00	79.44	100.00	28.68	60.00	10.70	80.00	14.10	80.00	260.00	5000.00
	114.58	500.00	54.51	100.00	23.48	60.00	4.33	80.00	11.31	80.00	150.00	5000.00
Aug-18	175.60	500.00	73.68	100.00	20.64	60.00	6.80	80.00	14.10	80.00	360.00	5000.00
	109.83	500.00	61.21	100.00	11.94	60.00	3.05	80.00	12.27	80.00	190.00	5000.00
Sep-18	186.16	500.00	63.06	100.00	24.73	60.00	6.10	80.00	9.40	80.00	240.00	5000.00
	253.83	500.00	72.17	100.00	33.06	60.00	4.64	80.00	16.90	80.00	360.00	5000.00
Oct-18	203.33	500.00	65.64	100.00	20.68	60.00	5.11	80.00	11.20	80.00	200.00	5000.00
	170.10	500.00	54.00	100.00	17.64	60.00	4.93	80.00	9.58	80.00	210.00	5000.00
Nov-18	206.80	500.00	65.64	100.00	24.87	60.00	5.00	80.00	7.20	80.00	255.00	5000.00
	278.16	500.00	71.99	100.00	25.36	60.00	5.75	80.00	11.11	80.00	310.00	5000.00
Dec-18	194.85	500.00	61.42	100.00	24.66	60.00	4.50	80.00	6.20	80.00	210.00	5000.00
	142.16	500.00	55.24	100.00	22.52	60.00	5.89	80.00	11.37	80.00	190.00	5000.00
Jan-19	189.00	500.00	68.22	100.00	24.55	60.00	5.20	80.00	8.20	80.00	230.00	5000.00
	183.26	500.00	57.59	100.00	28.19	60.00	4.40	80.00	11.03	80.00	180.00	5000.00
Feb-19	187.00	500.00	67.20	100.00	26.80	60.00	6.55	80.00	12.30	80.00	190.00	5000.00
	210.47	500.00	67.51	100.00	24.85	60.00	5.20	80.00	7.50	80.00	246.00	5000.00
Mar-19	191.11	500.00	67.08	100.00	24.88	60.00	6.40	80.00	8.50	80.00	240.00	5000.00
	177.00	500.00	64.58	100.00	23.47	60.00	5.22	80.00	12.83	80.00	210.00	5000.00
Apr-19	191.21	500.00	67.08	100.00	24.75	60.00	6.40	80.00	8.50	80.00	240.00	5000.00
	177.00	500.00	64.58	100.00	23.60	60.00	5.22	80.00	12.83	80.00	210.00	5000.00
May-19	199.52	500.00	66.24	100.00	28.89	60.00	7.60	80.00	6.40	80.00	240.00	5000.00
	179.61	500.00	64.96	100.00	26.08	60.00	7.86	80.00	11.08	80.00	170.00	5000.00
Jun-19	207.41	500.00	67.59	100.00	33.01	60.00	6.00	80.00	8.50	80.00	265.00	5000.00
	201.91	500.00	67.66	100.00	24.37	60.00	14.10	80.00	12.38	80.00	190.00	5000.00
Jul-19	186.30	500.00	60.23	100.00	28.78	60.00	5.30	80.00	7.40	80.00	265.00	5000.00
	204.77	500.00	57.67	100.00	29.64	60.00	7.96	80.00	17.93	80.00	320.00	5000.00
Aug-19	125.52	500.00	43.74	100.00	16.36	60.00	5.12	80.00	10.25	80.00	190.00	5000.00
	168.27	500.00	57.76	100.00	21.87	60.00	6.00	80.00	8.50	80.00	190.00	5000.00
Sep-19	166.01	500.00	49.34	100.00	20.45	60.00	5.20	80.00	6.40	80.00	215.00	5000.00
	99.45	500.00	41.21	100.00	21.81	60.00	4.19	80.00	8.28	80.00	150.00	5000.00
Oct-19	209.33	500.00	74.85	100.00	28.90	60.00	6.60	80.00	12.40	80.00	340.00	5000.00
	231.41	500.00	81.62	100.00	37.87	60.00	4.98	80.00	13.03	80.00	320.00	5000.00
Nov-19	210.85	500.00	69.78	100.00	28.90	60.00	6.20	80.00	11.40	80.00	350.00	5000.00
	187.93	500.00	74.24	100.00	28.88	60.00	5.30	80.00	14.40	80.00	320.00	5000.00
Dec-19	213.23	500.00	74.27	100.00	33.03	60.00	4.20	80.00	10.20	80.00	330.00	5000.00
	199.23	500.00	69.62	100.00	39.21	60.00	2.75	80.00	14.54	80.00	260.00	5000.00
Jan-20	203.99	500.00	68.91	100.00	32.89	60.00	5.30	80.00	8.80	80.00	320.00	5000.00
	205.78	500.00	84.04	100.00	29.89	60.00	3.94	80.00	9.46	80.00	270.00	5000.00
Feb-20	212.92	500.00	71.13	100.00	34.14	60.00	5.20	80.00	7.20	80.00	330.00	5000.00
	252.90	500.00	84.03	100.00	36.53	60.00	5.02	80.00	14.93	80.00	370.00	5000.00
Mar-20	289.17	500.00	68.43	100.00	33.15	60.00	5.40	80.00	11.40	80.00	330.00	5000.00
	294.40	500.00	67.31	100.00	28.76	60.00	8.40	80.00	8.30	80.00	290.00	5000.00

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 996/2008
EXP.DATE 02-07-2023
GOVT OF RAJASTHAN

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

RAMPURA AGUCHA MINE
HZL

Annexure R-8 colly

TEAM TEST HOUSE

(Unit of Team Institute of Science & Technology Pvt. Ltd.)

TEAM

Approved by Ministry of Environment and Forest, Government of India as Environmental Laboratory

NABL RSPCB ISO 9001:2008 OHSAS 18001:2007 JDA/UDH

Office : E-65, Chitranjan Marg,
C-Scheme, Jaipur-302001
Phone : 0141-2369980, 2771865
Website : www.teamtesthouse.com

Lab : G1-584, Sitapura Industrial Area
Tonk Road, JAIPUR-302022 Raj.
Ph : 94602-22039, 94602-22049
E-mail : teamtesthouse@gmail.com
E-mail : teamtest@rediffmail.com

TEST REPORT

Report No. :	A/333
Job Identification :	242
Date :	07-05-2015
Issued To :	M/S Hindustan Zinc Ltd (Agucha) Rampura Agucha Mines PO : Agucha 311029, Gulabpura District : Bhilwara (Rajasthan)
Type of Unit :	Mines
Type of Sample :	Ambient Air Quality Monitoring
Date of Sample Collection/Monitoring :	07-04-2015
Date of Sample Receipt :	09-04-2015
Date of Test :	09-04-2015 to 07-05-2015
Sample Collected By :	Darwesh Kumar
Point of Collection :	Kothya Village

RESULTS

S.No	Parameters	Observed Value	Testing Protocol	Limits as per National Ambient Air Quality Standard, 2009
1	Carbon Monoxide [microgram/m3]	240	IS 5182 (Part 10) : 1999	4000
2	Lead [microgram/m3]	0.09	IS 5182 (Part 22) : 2004	1.00
3	Nitrogen Dioxide as NO2 [microgram/m3]	16.2	IS 5182 (Part 6) : 2006	80.00
4	Particulate Matter (PM2.5) [microgram/m3]	20.81	CPCB Guidelines	60.00
5	Sulphur Dioxide [microgram/m3]	7.5	IS 5182 (Part 2) : 2001	80.00
6	Particulate Matter (PM 10) [microgram/m3]	69.8	IS 5182 (Part 23)	100.00
7	Arsenic [ng/m3]	BDL (< 2.0)	IS 5182 (Part 23)	6.00
8	Nickel [ng/m3]	Less than 1	IS 5182 (Part 23)	20.00

Notes :-

The results listed refer only to the tested sample (s) & parameters (s). Endorsement of products is neither inferred nor implied.

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The samples will be destroyed after 15 days from the date of issue of test report unless otherwise specified.

Technical Manager

Authorized Signatory
(Report No: A/333)

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 936/2008
EXP.DATE 02-07-2023
GOVT OF RAJASTHAN

Attested
21/5
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

RAMPURA AGUCHA MINE
HZL

Printed on 07 May 2015 03:22:48 pm
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TEAM TEST HOUSE

(Unit of Team Institute of Science & Technology Pvt. Ltd.)

TEAM

Approved by Ministry of Environment and Forest, Government of India as Environmental Laboratory

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Office : E-65, Chitranjan Marg, C-Scheme, Jaipur-302001
Phone : 0141-2369980, 2771865
Website : www.teamtesthouse.com

Lab : G1-584, Sitapura Industrial Area Tonk Road, JAIPUR-302022 Raj.
Ph.: 94602-22039, 94602-22049
E-mail : teamtesthouse@gmail.com
E-mail : director@teamtesthouse.com

TEST REPORT

Report No : A/3424
Job Identification. : 6792
Date : 19-11-2015
Issued To : M/S Hindustan Zinc Ltd (Agucha)
Rampura Agucha Mines PO : Agucha 311029, Gulabpura
District : Bhilwara (Rajasthan)
Type of Unit : Mines
Type of Sample : Ambient Air Quality Monitoring
Date of Sample Collection/Monitoring : 30-10-2015
Date of Sample Receipt : 31-10-2015
Date of Test : 31-10-2015 to 19-11-2015
Sample Collected By : Banwari lal
Point of Collection : Kothya Village

RESULTS

S.No	Parameters	Observed Value	Testing Protocol	Limits as per National Ambient Air Quality Standard, 2009
1	Carbon Monoxide [microgram/m3]	230	IS 5182 (Part 10) : 1999	4000
2	Lead [microgram/m3]	0.08	IS 5182 (Part 22) : 2004	1.00
3	Nitrogen Dioxide as NO2 [microgram/m3]	16.9	IS 5182 (Part 6) : 2006	80.00
4	Suspended Particulate Matter (SPM) [microgram/m3]	252.37	IS 5182 (Part 4) : 1999	500
5	Particulate Matter (PM2.5) [microgram/m3]	26.76	CPCB Guidelines	60.00
6	Sulphur Dioxide [microgram/m3]	6.29	IS 5182 (Part 2) : 2001	80.00
7	Particulate Matter (PM 10) [microgram/m3]	71.71	IS 5182 (Part 23)	100.00
8	Arsenic [ng/m3]	BDL(<2.0)	IS 5182 (Part 22) : 2004	6.00
9	Nickel [ng/m3]	1.1	IS 5182 (Part 22) : 2004	20.00

Notes :-

The results listed refer only to the tested sample (s) & parameters (s). Endorsement of products is neither inferred nor implied.

This report is not to be reproduced wholly or in part and can not be used as evidence in the court of law and should not be used in any advertising media without our special permission in writing.

The samples will be destroyed after 15 days from the date of issue of test report unless otherwise specified.

Puran Mal Yogi
Senior Analyst

Rajesh Maheshwari
Authorized Signatory
(Report No: A/3424)

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 996/2008
EXP.DATE 02-07-2023
GOVT OF RAJASTHAN

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

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RAMPURA AGUCHA MINE HZL

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TEAM

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Office : E-65, Chitranjan Marg, C-Scheme, Jaipur-302001
Phone : 0141-2369980, 2771865
Website : www.teamtesthouse.com

Lab.: G1-584, Sitapura Industrial Area Tonk Road, JAIPUR-302022 Raj.
Ph.: 94602-22039, 94602-22049
E-mail : teamtesthouse@gmail.com
E-mail : director@teamtesthouse.com

TEST REPORT

Report No. : A/376
Job Identification. : 1057/16-17
Date : 20-05-2016
Issued To : M/S Hindustan Zinc Ltd (Agucha)
Rampura Agucha Mines PO : Agucha 311029, Gulabpura
District : Bhilwara (Rajasthan)
Type of Unit : Mines
Type of Sample : Ambient Air Quality Monitoring
Date of Sample Collection/Monitoring : 29-04-2016
Date of Sample Receipt : 02-05-2016
Date of Test : 02-05-2016 to 20-05-2016
Sample Collected By : kishan murari
Point of Collection : Kothya Village

RESULTS

S.No	Parameters	Observed Value	Testing Protocol	Limits as per National Ambient Air Quality Standard, 2009
1	Carbon Monoxide [microgram/m3]	260	IS 5182 (Part 10) : 1999	4000
2	Lead [microgram/m3]	0.03	IS 5182 (Part 22) : 2004	1.00
3	Nitrogen Dioxide as NO2 [microgram/m3]	11.04	IS 5182 (Part 6) : 2006	80.00
4	Suspended Particulate Matter (SPM) [microgram/m3]	254.51	IS 5182 (Part 4) : 1999	500
5	Particulate Matter (PM2.5) [microgram/m3]	26.47	CPCB Guidelines	60.00
6	Sulphur Dioxide [microgram/m3]	7.73	IS 5182 (Part 2) : 2001	80.00
7	Particulate Matter (PM 10) [microgram/m3]	53.99	IS 5182 (Part 23)	100.00
8	Arsenic [ng/m3]	BDL (<2.0)	IS 5182 (Part 22) : 2004	6.00
9	Nickel [ng/m3]	5.8	IS 5182 (Part 22) : 2004	20.00

Notes :-

The results listed refer only to the tested sample (s) & parameters (s). Endorsement of products is neither inferred nor implied.

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The samples will be destroyed after 15 days from the date of issue of test report unless otherwise specified

Puran Mal Yogi
Senior Analyst

Rajesh Maheshwari
Authorized Signatory
(Report No: A/376)

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 996/2008
EXP.DATE 02-07-2023
GOVT OF RAJASTHAN

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

RAMPURA AGUCHA MINE HZL

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TEAM TEST HOUSE

(Unit of Team Institute of Science & Technology Pvt. Ltd.)

TEAM

Approved by Ministry of Environment and Forest, Government of India as Environmental Laboratory

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Office : E-65, Chitranjan Marg, C-Scheme, Jaipur-302001
Phone : 0141-2369980, 2771865
Website: www.teamtesthouse.com

Lab : G1-584, Sitapura Industrial Area Tonk Road, JAIPUR-302022 Raj.
Ph : 94602-22039, 94602-22049
E-mail : teamtesthouse@gmail.com
E-mail : director@teamtesthouse.com

TEST REPORT

Report No. :	A/1754
Job Identification. :	6739/16-17
Date :	02-11-2016
Issued To :	M/S Hindustan Zinc Ltd (Agucha) Rampura Agucha Mines PO : Agucha 311029, Gulabpura District : Bhilwara (Rajasthan)
Type of Unit :	Mines
Type of Sample :	Ambient Air Quality Monitoring
Date of Sample Collection/Monitoring :	22-10-2016
Date of Sample Receipt :	24-10-2016
Date of Test :	24-10-2016 to 02-11-2016
Sample Collected By :	kishan murari
Point of Collection :	Kothya Village

RESULTS

S.No	Parameters	Observed Value	Testing Protocol	Limits as per National Ambient Air Quality Standard, 2009
1	Carbon Monoxide [microgram/m3]	220	IS 5182 (Part 10) : 1999	4000
2	Lead [microgram/m3]	0.07	IS 5182 (Part 22) : 2004	1.00
3	Nitrogen Dioxide as NO2 [microgram/m3]	15.43	IS 5182 (Part 6) : 2006	80.00
4	Suspended Particulate Matter (SPM) [microgram/m3]	214.19	IS 5182 (Part 4) : 1999	500
5	Particulate Matter (PM2.5) [microgram/m3]	27.61	CPCB Guidelines	60.00
6	Sulphur Dioxide [microgram/m3]	5.21	IS 5182 (Part 2) : 2001	80.00
7	Particulate Matter (PM 10) [microgram/m3]	70.52	IS 5182 (Part 23)	100.00
8	Arsenic [ng/m3]	BDL (<2.0)	IS 5182 (Part 22) : 2004	6.00
9	Nickel [ng/m3]	7.2	IS 5182 (Part 22) : 2004	20.00

Notes :-

The results listed refer only to the tested sample (s) & parameters (s). Endorsement of products is neither inferred nor implied.

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The samples will be destroyed after 15 days from the date of issue of test report unless otherwise specified

Puran Mal Yogi
Senior Analyst

Rajesh Maheshwari
Authorized Signatory
(Report No: A/1754)

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG.NO. 996/2008
EXP.DATE 02-07-2023
GOVT OF RAJASTHAN

Attested
21/5
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

RAMPURA AGUCHA MINE

Printed on 02 November, 2016 10:19:12 am
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FORM - X
RAJASTHAN STATE POLLUTION CONTROL BOARD
REPORT OF THE STATE BOARD ANALYST
(See Rule - 10)

Final Report

Report No. : **5141**

Report On : **06/04/2017**

I hereby certify that I **R P Verma**, State Board Analyst duly appointed **under sub Section(2) of Section 29 of the Air (Prevention & Control of Pollution) Act, 1981** received on the **27/03/2017** from **Shri Om Prakash Shardul, JSO, Central Laboratory ,RSPCB Central Laboratory** a sample of **Ambient Air Quality** of **M/S Hindustan Zinc Limited , Plant - , , City- Agucha Tehsil- Hurda , District- Bhilwara M.L No- 1/2000** Collected from **Ambient Air Quality Monitoring near Kothiya Pond, Kothiya** Collected on **21/03/2017**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **06/04/2017** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	Respirable Suspended Particulate Matter μg/M3	68
2	Sulphur Dioxide as SO2 ug/m3	7.59
3	Oxides of Nitrogen as NOx μg/m3	30.15
4	Suspended Particulate Matter μg/m3	140

The condition of the seals. fastening and container on receipt was as follows : **Intact**

Signed This On **06/04/2017**

BOARD ANALYST

Rajasthan State Pollution Control Board
Head Office (Central Laboratory)
4, Institutional Area, Jhalana Doongari,
Jaipur-302 004
Phone: 0141-5159648,5159607
Fax: 0141-5159665

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 956/2008
EXP.DATE 02-07-2023
GOVT OF RAJASTHAN

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

HZL • RAMPURA AGUCHA MINE

TEAM TEST HOUSE

(Unit of Team Institute of Science & Technology Pvt. Ltd.)

TEAM

TC-5025

Approved by Ministry of Environment and Forest, Government of India as Environmental Laboratory

NABL RSPCB ISO 9001:2008 OHSAS 18001:2007 JDA/UDH

Office : E-65, Chitranjan Marg
C-Scheme, Jaipur-302001
Phone : 0141-2369980, 2771865
Website : teamtesthouse.com

Lab.: G1-584, Sitapura Industrial Area
Tonk Road, JAIPUR-302022 Raj.
Ph.: 94602-22039, 94602-22049
E-mail : teamtesthouse@gmail.com
E-mail : director@teamtesthouse.com

TEST REPORT

Report No	A/2234
Job Identification :	6731/17-18
Date :	15-12-2017
Issued To :	M/S Hindustan Zinc Ltd (Agucha) Rampura Agucha Mines PO : Agucha 311029, Gulabpura District : Bhilwara (Rajasthan)
Type of Unit :	Mines
Type of Sample :	Ambient Air Quality Monitoring
Date of Sample Collection/Monitoring :	23-11-2017
Date of Sample Receipt :	25-11-2017
Date of Test :	25-11-2017 to 06-12-2017
Sample Collected By :	Rakesh Sharma
Point of Collection :	Kothya Village (25°52,11.3" N 74°45.44.8"E)

RESULTS

S.No	Parameters	Observed Value	Testing Protocol	Limits as per National Ambient Air Quality Standard, 2009
1	Carbon Monoxide [microgram/m3]	330	IS 5182 (Part 10) : 1999	4000
2	Lead [microgram/m3]	0.36	IS 5182 (Part 22) : 2004 Reaffirmed 2014	1.00
3	Nitrogen Dioxide as NO2 [microgram/m3]	22.31	IS 5182 (Part 6) : 2006 Reaffirmed 2012	80.00
4	Suspended Particulate Matter (SPM) [microgram/m3]	275.97	IS 5182 (Part 4) : 1999 Reaffirmed 2014	-
5	Particulate Matter (PM2.5) [microgram/m3]	27.67	CPCB Guidelines	60.00
6	Sulphur Dioxide [microgram/m3]	4.12	IS 5182 (Part 2) : 2001 Reaffirmed 2012	80.00
7	Particulate Matter (PM 10) [microgram/m3]	74.79	IS 5182 (Part 23)-2006 Reaffirmed 2012	100.00
8	Arsenic [ng/m3]	BDL(<2.0)	IS 5182 (Part 22) : 2004 Reaffirmed 2014	6.00
9	Nickel [ng/m3]	17.5	IS 5182 (Part 22) : 2004 Reaffirmed 2014	20.00

Notes -

The results listed refer only to the tested sample (s) & parameters (s). Endorsement of products is neither inferred nor implied.

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The samples will be destroyed after 15 days from the date of issue of test report unless otherwise specified.

Balram Agarwal
Senior Analyst

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 996/2008
EXP.DATE 02-07-2023
GOVT OF RAJASTHAN

Rajesh Maheshwari
Authorized Signatory
(Report No. A/2234)

Printed on 15 December, 2017 09:34:44 am
This is computer generated report

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

HZL RAMPURA AGUCHA MINE

TEAM TEST HOUSE

(Unit of Team Institute of Science & Technology Pvt. Ltd.)

TEAM

Approved by Ministry of Environment and Forest, Government of India as Environmental Laboratory

NABL RSPCB ISO 9001:2008 OHSAS 18001:2007 JDA/UDH

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Phone : 0141-2369980, 2771865
Website : www.teamtesthouse.com

Lab : G1-584, Sitapura Industrial Area
Tonk Road, JAIPUR-302022 Raj
Ph.: 94602-22039, 94602-22049
E-mail : teamtesthouse@gmail.com
E-mail : director@teamtesthouse.com

TEST REPORT

Report No. :	A/1029
Job Identification. :	2971/17-18
Date :	03-08-2017
Issued To :	M/S Hindustan Zinc Ltd (Agucha) Rampura Agucha Mines PO : Agucha 311029, Gulabpura District : Bhilwara (Rajasthan)
Type of Unit :	Mines
Type of Sample :	Ambient Air Quality Monitoring
Date of Sample Collection/Monitoring :	20-07-2017
Date of Sample Receipt :	22-07-2017
Date of Test :	22-07-2017 to 03-08-2017
Sample Collected By :	Kishan Gurjar
Point of Collection :	Kothya Village

RESULTS

S.No	Parameters	Observed Value	Testing Protocol	Limits as per National Ambient Air Quality Standard, 2009
1	Carbon Monoxide [microgram/m3]	190	IS 5182 (Part 10) : 1999	4000
2	Lead [microgram/m3]	0.09	IS 5182 (Part 22) : 2004 Reaffirmed 2014	1.00
3	Nitrogen Dioxide as NO2 [microgram/m3]	11.39	IS 5182 (Part 6) : 2006 Reaffirmed 2012	80.00
4	Suspended Particulate Matter (SPM) [microgram/m3]	127.16	IS 5182 (Part 4) : 1999 Reaffirmed 2014	500
5	Particulate Matter (PM2.5) [microgram/m3]	18.2	CPCB Guidelines	60.00
6	Sulphur Dioxide [microgram/m3]	5.41	IS 5182 (Part 2) : 2001 Reaffirmed 2012	80.00
7	Particulate Matter (PM 10) [microgram/m3]	51.32	IS 5182 (Part 23)-2006 Reaffirmed 2012	100.00
8	Arsenic [ng/m3]	BDL(<2.0)	IS 5182 (Part 22) : 2004 Reaffirmed 2014	6.00
9	Nickel [ng/m3]	7.6	IS 5182 (Part 22) : 2004 Reaffirmed 2014	20.00

Notes :-

- # The results listed refer only to the tested sample (s) & parameters (s). Endorsement of products is neither inferred nor implied.
- # This report is not to be reproduced wholly or in part and can not be used evidence in the court of law and should not be used in any advertising media without our special permission in writing.
- # The samples will be destroyed after 15 days from the date of issue of test report unless otherwise specified.

Puran Mal Yogi
Senior Analyst

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 996/2008
EXP.DATE 02-07-2023
GOVT OF RAJASTHAN

Rajesh Maheshwari
Authorized Signatory
(Report No: A/1029)

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

HZL RAMPURA AGUCHA MINE

Printed on 03 August, 2017 08:48:41 am
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TEAM TEST HOUSE

(Unit of Team Institute of Science & Technology Pvt. Ltd.)

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Office : E-65, Chitranjan Marg, C-Scheme, Jaipur-302001
Phone : 0141-2369980, 2771865
Website : www.teamtesthouse.com

Lab.: G1-584, Sitapura Industrial Area Tonk Road, JAIPUR-302022 Raj.
Ph.: 94602-22039, 94602-22049
E-mail : teamtesthouse@gmail.com
E-mail : director@teamtesthouse.com

TEST REPORT

Report No. :	A/1147
Job Identification. :	A883/18-19
Date :	01-08-2018
Issued To :	M/S Hindustan Zinc Ltd (Agucha) Rampura Agucha Mines PO : Agucha 311029, Gulabpura District : Bhilwara (Rajasthan)
Type of Unit :	Mines
Type of Sample :	Ambient Air Quality Monitoring
Date of Sample Collection/Monitoring :	20-07-2018
Date of Sample Receipt :	23-07-2018
Date of Test :	23-07-2018 to 01-08-2018
Sample Collected By :	Rakesh Sharma
Point of Collection :	Kothya Village (25°52,11.3" N 74°45,44.8"E)

RESULTS

S.No	Parameters	Observed Value	Testing Protocol	Limits as per National Ambient Air Quality Standard, 2009
1	Carbon Monoxide [microgram/m3]	150	IS 5182 (Part 10) : 1999	4000
2	Lead [microgram/m3]	Less than 0.01	IS 5182 (Part 22) : 2004 Reaffirmed 2014	1.00
3	Nitrogen Dioxide as NO2 [microgram/m3]	11.31	IS 5182 (Part 6) : 2006 Reaffirmed 2012	80.00
4	Suspended Particulate Matter (SPM) [microgram/m3]	114.58	IS 5182 (Part 4) : 1999 Reaffirmed 2014	500
5	Particulate Matter (PM2.5) [microgram/m3]	23.48	CPCB Guidelines	60.00
6	Sulphur Dioxide [microgram/m3]	4.33	IS 5182 (Part 2) : 2001 Reaffirmed 2012	80.00
7	Particulate Matter (PM 10) [microgram/m3]	54.51	IS 5182 (Part 23)-2006 Reaffirmed 2012	100.00
8	Arsenic [ng/m3]	BDL(<2.0)	IS 5182 (Part 22) : 2004 Reaffirmed 2014	6.00
9	Nickel [ng/m3]	5.8	IS 5182 (Part 22) : 2004 Reaffirmed 2014	20.00

Notes :-

The results listed refer only to the tested sample (s) & parameters (s). Endorsement of products is neither inferred nor implied.

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The samples will be destroyed after 15 days from the date of issue of test report unless otherwise specified.

Pooran Mal Yogi
Senior Analyst

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 996/2008
EXP.DATE 02-07-2023
GOVT OF RAJASTHAN

Rajesh Maheshwari
Authorized Signatory
(Report No. A/1147)

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

RAMPURA AGUCHA MINE HZL

Printed on 01 August, 2018 11:24:48 am
This is computer generated report

TEAM TEST HOUSE

(Unit of Team Institute of Science & Technology Pvt. Ltd.)

TEAM

Approved by Ministry of Environment and Forest, Government of India as Environmental Laboratory

NABL RSPCB ISO 9001:2008 OHSAS 18001:2007 JDA/UDH

Office : E-65, Chitranjan Marg,
C-Scheme, Jaipur-302001
Phone : 0141-2369980, 2771865
Website : www.teamtesthouse.com

Lab : G1-584, Sitapura Industrial Area
Tonk Road, JAIPUR-302022 Raj.
Ph.: 94602-22039, 94602-22049
E-mail : teamtesthouse@gmail.com
E-mail : director@teamtesthouse.com

TEST REPORT

Report No. :	A/2383
Job Identification. :	ULR-TC502518400000692
Date :	11-12-2018
Issued To :	M/S Hindustan Zinc Ltd (Agucha) Rampura Agucha Mines PO : Agucha 311029, Gulabpura District : Bhilwara (Rajasthan)
Type of Unit :	Mines
Type of Sample :	Ambient Air Quality Monitoring
Date of Sample Collection/Monitoring :	28-11-2018
Date of Sample Receipt :	30-11-2018
Date of Test :	30-11-2018 to 08-12-2018
Sample Collected By :	Sitaram jangid
Point of Collection :	Kothya Village [25°52'11.3"N, 74°45'44.8"E]

RESULTS

S.No	Parameters	Observed Value	Testing Protocol	Limits as per National Ambient Air Quality Standard, 2009
1	Carbon Monoxide [microgram/m3]	310	IS 5182 (Part 10) : 1999	4000
2	Lead [microgram/m3]	0.38	IS 5182 (Part 22) : 2004 Reaffirmed 2014	1.00
3	Nitrogen Dioxide as NO2 [microgram/m3]	11.11	IS 5182 (Part 6) : 2006 Reaffirmed 2012	80.00
4	Suspended Particulate Matter (SPM) [microgram/m3]	278.16	IS 5182 (Part 4) : 1999 Reaffirmed 2014	-
5	Particulate Matter (PM2.5) [microgram/m3]	25.36	CPCB Guidelines	60.00
6	Sulphur Dioxide [microgram/m3]	5.75	IS 5182 (Part 2) : 2001 Reaffirmed 2012	80.00
7	Particulate Matter (PM 10) [microgram/m3]	71.99	IS 5182 (Part 23)-2006 Reaffirmed 2012	100.00
8	Arsenic [ng/m3]	BDL(<2.0)	IS 5182 (Part 22) : 2004 Reaffirmed 2014	6.00
9	Nickel [ng/m3]	3.1	IS 5182 (Part 22) : 2004 Reaffirmed 2014	20.00

Notes :-

- # The results listed refer only to the tested sample (s) & parameters (s). Endorsement of products is neither inferred nor implied.
- # This report is not to be reproduced wholly or in part and can not be used evidence in the court of law and should not be used in any advertising media without our special permission in writing.
- # The samples will be destroyed after 15 days from the date of issue of test report unless otherwise specified.

Puran Mal Yogi
Senior Analyst

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 956/2008
EXP.DATE 02-07-2023
GOVT OF RAJASTHAN

Rajesh Maheshwari
Authorized Signatory
(Report No: A/2383)

Printed on 11 December, 2018 07:12:23 am
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RAMPURA AGUCHA MINE
HZL

Attested
2/9
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

TEAM TEST HOUSE

(Unit of Team Institute of Science & Technology Pvt. Ltd.)

TC-5025

Approved by Ministry of Environment and Forest, Government of India as Environmental Laboratory

NABL **RSPCB** ISO 9001:2015 OHSAS 18001:2007 **JDA/UDH**

Office : E-65, Chitranjan Marg,
C-Scheme, Jaipur-302001
Phone : 0141-2369980, 2771865
Website : www.teamtesthouse.com

Lab.: G1-584, Sitapura Industrial Area
Tonk Road, JAIPUR-302022 Raj.
Ph.: 94602-22039, 94602-22049
E-mail : teamtesthouse@gmail.com
E-mail : director@teamtesthouse.com

TEST REPORT

Report No./ULR No. :	TC502519400003303P	Date :	05-12-2019
Issued To :	M/S Hindustan Zinc Ltd (Agucha) Rampura Agucha Mines PO : Agucha 311029, Gulabpura, District : Bhilwara (Rajasthan).	Type of Unit :	Mines
Type of Sample :	Ambient Air Quality Monitoring	Date of Sample Collection/Monitoring :	28-11-2019
Point of Collection :	Kothya Village [25°52'11.3"N, 74°45'44.8"E]	Date of Receipt :	02-12-2019
Date of Test/Analysis :	02-12-2019 to 05-12-2019	Sampling Plan :	IS 5182:2000(Part 14)RA 2014
Quantity of Sample :	-	Sample Collected By :	Prahlad yogi
Unit's representative :	Dinesh Kumar Paliwal	Condition of Sample :	Fit for testing

RESULTS

S.No	Parameters	Observed Value	Testing Protocol	Limits as per National Ambient Air Quality Standard, 2009
1	Ammonia [microgram/m3]	BDL (<10.0)	CPCB Guidelines	400.00
2	Carbon Monoxide [microgram/m3]	180	IS 5182 (Part 10) : 1999	4000
3	Lead [microgram/m3]	0.02	IS 5182 (Part 22) : 2004 Reaffirmed 2014	1.00
4	Nitrogen Dioxide as NO2 [microgram/m3]	9.28	IS 5182 (Part 6) : 2006 Reaffirmed 2012	80.00
5	Ozone [microgram/m3]	BDL (<20.0)	APHA 1977,Part 819	100.00
6	Suspended Particulate Matter (SPM) [microgram/m3]	112.31	IS 5182 (Part 4) : 1999 Reaffirmed 2014	-

Note:

Continue to next page...

NOTARY RAJESH KUMAR MEHTA GULABPURA REG. NO. 956/2008 EXP.DATE 02-07-2023 GOVT OF RAJASTHAN

TEAM TEST HOUSE CHECKED

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

RAMPURA AGUCHA MINE HZL

TEAM TEST HOUSE

(Unit of Team Institute of Science & Technology Pvt. Ltd.)

Approved by Ministry of Environment and Forest, Government of India as Environmental Laboratory

NABL **RSPCB** **ISO 9001:2015** **OHSAS 18001:2007** **JDA/UDH**

Office : E-65, Chitranjan Marg,
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Phone : 0141-2369980, 2771865
Website : www.teamtesthouse.com

Lab.: G1-584, Sitapura Industrial Area
Tonk Road, JAIPUR-302022 Raj.
Ph.: 94602-22039, 94602-22049
E-mail : teamtesthouse@gmail.com
E-mail : director@teamtesthouse.com

RESULTS

S.No	Parameters	Observed Value	Testing Protocol	Limits as per National Ambient Air Quality Standard, 2009
7	Particulate Matter (PM2.5) [microgram/m3]	22.2	CPCB Guidelines	60.00
8	Sulphur Dioxide [microgram/m3]	8.15	IS 5182 (Part 2) : 2001 Reaffirmed 2012	80.00
9	Particulate Matter (PM 10) [microgram/m3]	57.32	IS 5182 (Part 23)-2006 Reaffirmed 2012	100.00
10	Benzo-alfa- Pyrene [ng/m3]	BDL(<0.5)	CPCB Guidelines	1.00
11	Arsenic [ng/m3]	BDL(<2.0)	IS 5182 (Part 22) : 2004 Reaffirmed 2014	6.00
12	Nickel [ng/m3]	Less than 1	IS 5182 (Part 22) : 2004 Reaffirmed 2014	20.00

Notes :-

- # Parameter No 1,2,3,4,5,6,7,8,9,11,12 covered under NABL scope and Parameter No. 10 does not cover under NABL scope
- # Parameter No. NONE outsourced for testing
- # The results listed refer only to the tested sample (s) & parameters (s) Endorsement of products is neither inferred nor implied.
- # This report is not to be reproduced wholly or in part and can not be used evidence in the court of law and should not be used in any advertising media without our special permission in writing
- # The samples will be destroyed after 15 days from the date of issue of test report unless otherwise specified

Puran Mal Yogi
Senior Analyst

Rajesh Maheshwari
Authorized Signatory
(Report No: TC5025194000003303P)

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 996/2008
EXP.DATE 02-07-2023
GOVT OF RAJASTHAN

TEAM TEST HOUSE
CHECKED

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

HZL
RAMPURA AGUCHA MINE

TEAM TEST HOUSE

(Unit of Team Institute of Science & Technology Pvt. Ltd.)

TC-5025

Approved by Ministry of Environment and Forest, Government of India as Environmental Laboratory

NABL RSPCB ISO 9001:2015 OHSAS 18001:2007 JDA/UDH

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Ph.: 94602-22039, 94602-22049
E-mail : teamtesthouse@gmail.com
E-mail : director@teamtesthouse.com

TEST REPORT

Report No./ULR No. :	TC502519400002155F	Date :	07-08-2019
Issued To :	M/S Hindustan Zinc Ltd (Agucha) Rampura Agucha Mines PO : Agucha 311029, Gulabpura, District : Bhilwara (Rajasthan),	Type of Unit :	Mines
Type of Sample :	Ambient Air Quality Monitoring	Date of Sample Collection/Monitoring :	24-07-2019
Point of Collection	Kothya Village [25°52'11.3"N, 74°45'44.8"E]	Date of Receipt :	30-07-2019
Date of Test/Analysis :	30-07-2019 to 06-08-2019	Sampling Plan :	IS 5182:2000(Part 14)RA 2014
Quantity of Sample :	N/A	Sample Collected By :	Rakesh Sharma
Unit's representative :	Dinesh Kumar Paliwal	Condition of Sample :	Fit for testing

RESULTS

S.No	Parameters	Observed Value	Testing Protocol	Limits as per National Ambient Air Quality Standard, 2009
1	Carbon Monoxide [microgram/m3]	320	IS 5182 (Part 10) : 1999	4000
2	Lead [microgram/m3]	0.52	IS 5182 (Part 22) : 2004 Reaffirmed 2014	1.00
3	Nitrogen Dioxide as NO2 [microgram/m3]	17.93	IS 5182 (Part 6) : 2006 Reaffirmed 2012	80.00

Note:

Continue to next page...

NOTARY RAJESH KUMAR MEHTA GULABPURA REG. NO. 996/2008 EXP.DATE 02-07-2023 GOVT OF RAJASTHAN

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

HZH • RAMPURA AGUCHA MINE

TEAM TEST HOUSE

(Unit of Team Institute of Science & Technology Pvt. Ltd.)

TC-5025

Approved by Ministry of Environment and Forest, Government of India as Environmental Laboratory

NABL RSPCB ISO 9001:2015 OHSAS 18001:2007 JDA/UDH

Office : E-65, Chitranjan Marg, C-Scheme, Jaipur-302001
Phone : 0141-2369980, 2771865
Website : www.teamtesthouse.com

Lab.: G1-584, Sitapura Industrial Area Tonk Road, JAIPUR-302022 Raj.
Ph.: 94602-22039, 94602-22049
E-mail : teamtesthouse@gmail.com
Email : director@teamtesthouse.com

RESULTS

S.No	Parameters	Observed Value	Testing Protocol	Limits as per National Ambient Air Quality Standard, 2009
4	Suspended Particulate Matter (SPM) [microgram/m3]	204.77	IS 5182 (Part 4) : 1999 Reaffirmed 2014	
5	Particulate Matter (PM2.5) [microgram/m3]	29.64	CPCB Guidelines	60.00
6	Sulphur Dioxide [microgram/m3]	7.96	IS 5182 (Part 2) : 2001 Reaffirmed 2012	80.00
7	Particulate Matter (PM 10) [microgram/m3]	57.67	IS 5182 (Part 23)-2006 Reaffirmed 2012	100.00
8	Arsenic [ng/m3]	BDL(<2.0)	IS 5182 (Part 22) : 2004 Reaffirmed 2014	6.00
9	Nickel [ng/m3]	9.5	IS 5182 (Part 22) : 2004 Reaffirmed 2014	20.00

Notes :-

- # Parameter No. 1,2,3,4,5,6,7 8,9 covered under NABL scope and Parameter No. NONE does not cover under NABL scope
- # Parameter No. NONE outsourced for testing.
- # The results listed refer only to the tested sample (s) & parameters (s). Endorsement of products is neither inferred nor implied.
- # This report is not to be reproduced wholly or in part and can not be used evidence in the court of law and should not be used in any advertising media without our special permission in writing.
- # The samples will be destroyed after 15 days from the date of issue of test report unless otherwise specified.

Puran Mal Yogi
Senior Analyst

Rajesh Maheshwari
Authorized Signatory
(Report No: TC502519400002155F)

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 996/2008
EXP.DATE 02-07-2023
GOVT OF RAJASTHAN

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

RAMPURA AGUCHA MINE • HZL

FORM - X

RAJASTHAN STATE POLLUTION CONTROL BOARD

REPORT OF THE STATE BOARD ANALYST

(See Rule - 10)

Final Report

Report No. : **6065**

Report On : **04/09/2018**

I hereby certify that I **S. N. Tikkiwal**, State Board Analyst duly appointed under sub **Section(2)** of **Section 29 of the Air (Prevention & Control of Pollution) Act, 1981** received on the **14/08/2018** from **Shri Om Prakash Shardul, JSO, Central Laboratory ,RSPCB Central Laboratory** a sample of **Ambient Air Quality of Kothiya Village , Tehsil-Shahpura , District-Bhilwara**, Collected from **Ambient Air Quality Monitoring near Kothiya Pond,/Kothiya** Collected on **06/08/2018**. The Sample was in a condition fit for analysis as reported below :-

I further certify that I have analyzed the aforementioned sample on **04/09/2018** and declare the result of the analysis to be as below :-

S. No.	Parameters	Result
1	Particulate Matter (PM10) µg/m3	52
2	Sulphur Dioxide as SO2 ug/m3	7.4
3	NO2 ug/m3	30.0

The condition of the seals, fastening and container on receipt was as follows : **Intact**

Signed This On **04/09/2018**

BOARD ANALYST

Rajasthan State Pollution Control Board

Head Office (Central Laboratory)

4, Institutional Area, Jhalana Doongari,

Jaipur-302 004

Phone: 0141-5159648,5159607

Fax: 0141-5159665

सूचना का अधिकार अधिनियम 2005 के तहत जारी दस्तावेज

क्षे. प्र. नि. मं. भीलवाड़ा

NOTARY GOVT OF RAJASTHAN RAJESH KUMAR MEHTA GULABPURA

Attested

NOTARY

Rajesh Kumar Mehta

Gulabpura (Bhilwara)

RAMPURA AGUCHA MINE HZL

Annexure R-9

Kothiya Village from Waste Dump

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 996/2008
EXP.DATE 02-07-2023
GOVT OF RAJASTHAN

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

RAMPURA AGUCHA MINE • HZL

Plantation on waste Dump

Plantation on Mine Boundary and Waste Dump

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 996/2008
EXP.DATE 02-07-2023
GOVT OF RAJASTHAN

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

RAMPURA AGUCHA MINE • HZL •

Agricultural Land along mines boundary with plantation

Agricultural Land along mines boundary with plantation

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG.NO. 996/2008
EXP.DATE 02-07-2023
GOVT OF RAJASTHAN

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

RAMPURA AGUCHA MINE • HZL

Agricultural Land around Village Bherukheda

Stabilised Waste Dump With plantation

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 996/2008
EXP.DATE 02-07-2023
GOVT. OF RAJASTHAN

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

RAMPURA AGUCHA MINE • HZL •

Photo Taken from Mine Boundary

Dust Supression using 40KL water sprinkler

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 956/2008
EXP.DATE 02-07-2023
GOVT OF RAJASTHAN

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

HZL RAMPURA AGUCHA MINE

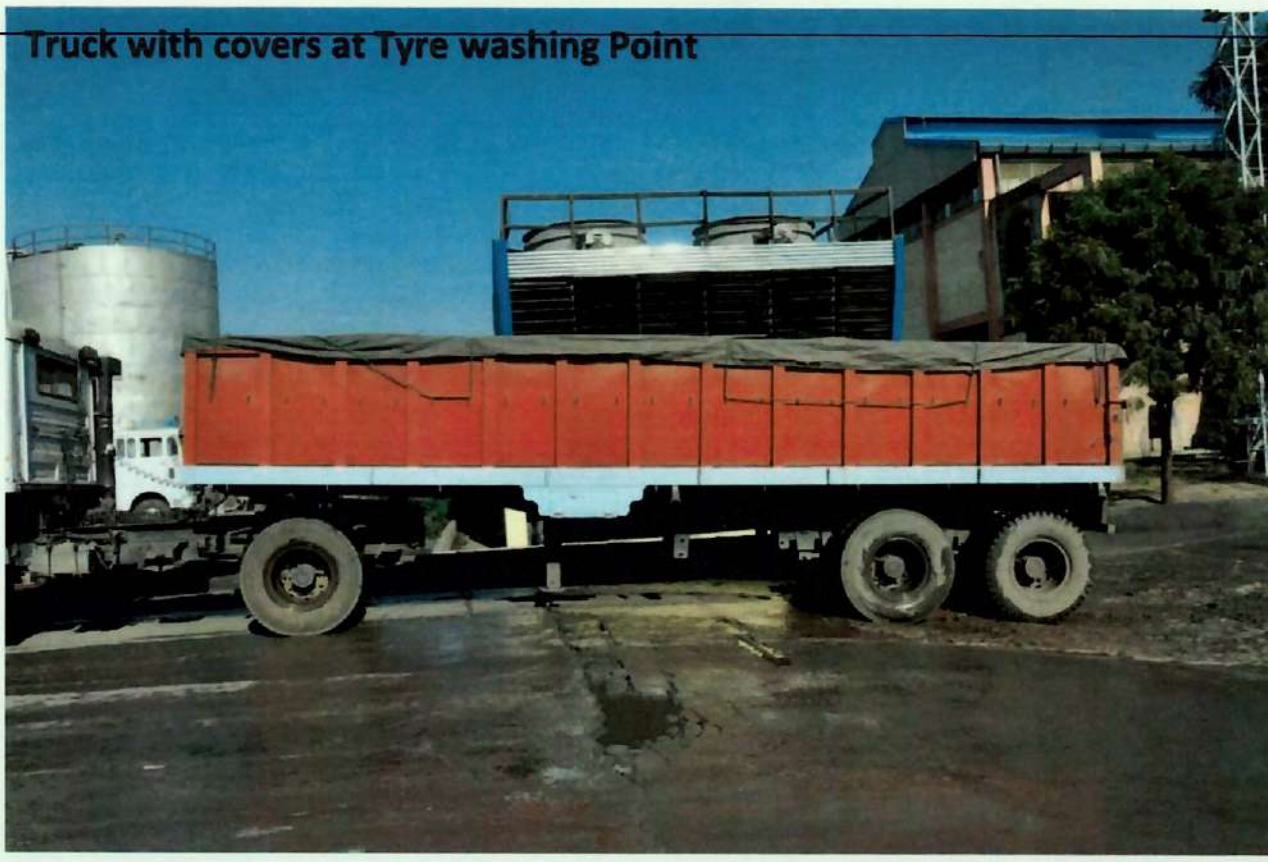
Rain water Harvesting project -HZL

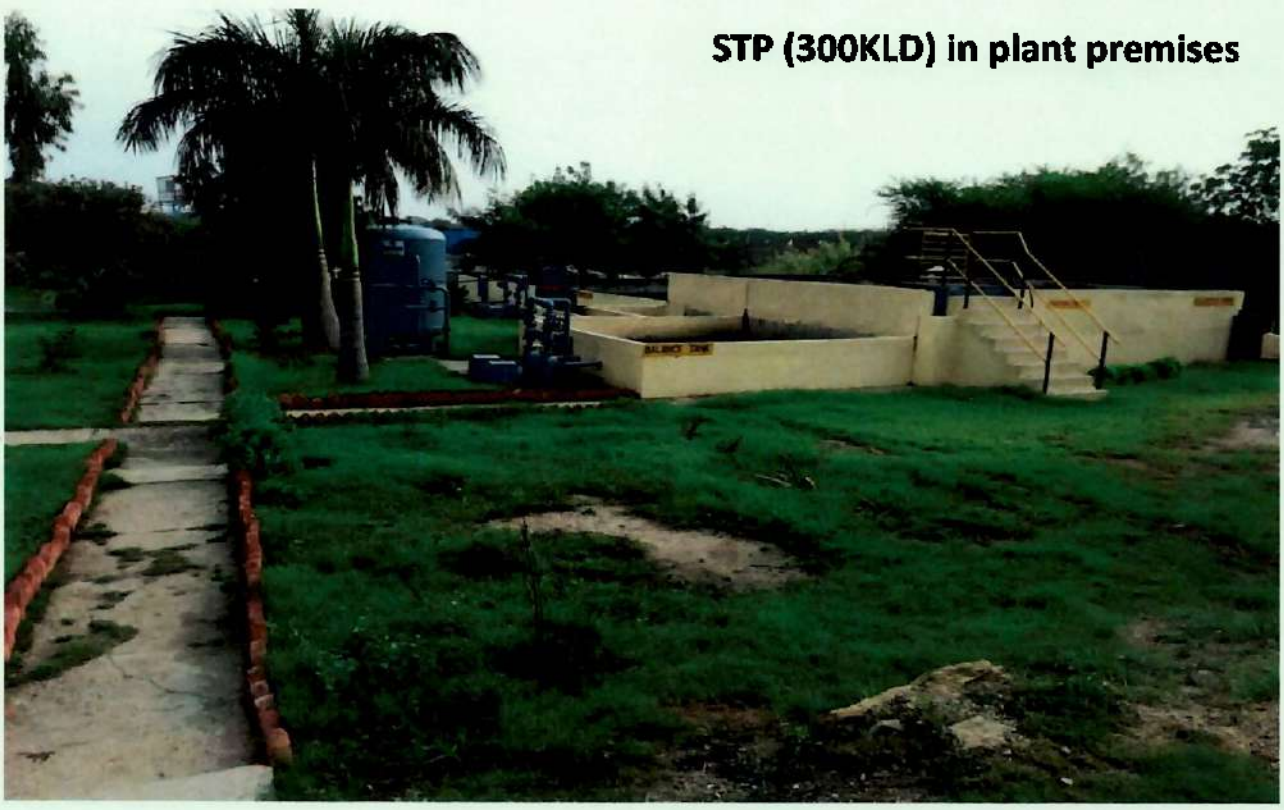
Water Reservoir for Rain water collection

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 996/2008
EXP.DATE 02-07-2023
GOVT. OF RAJASTHAN

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

RAMPURA AGUCHA MINE


Truck with covers at Tyre washing Point

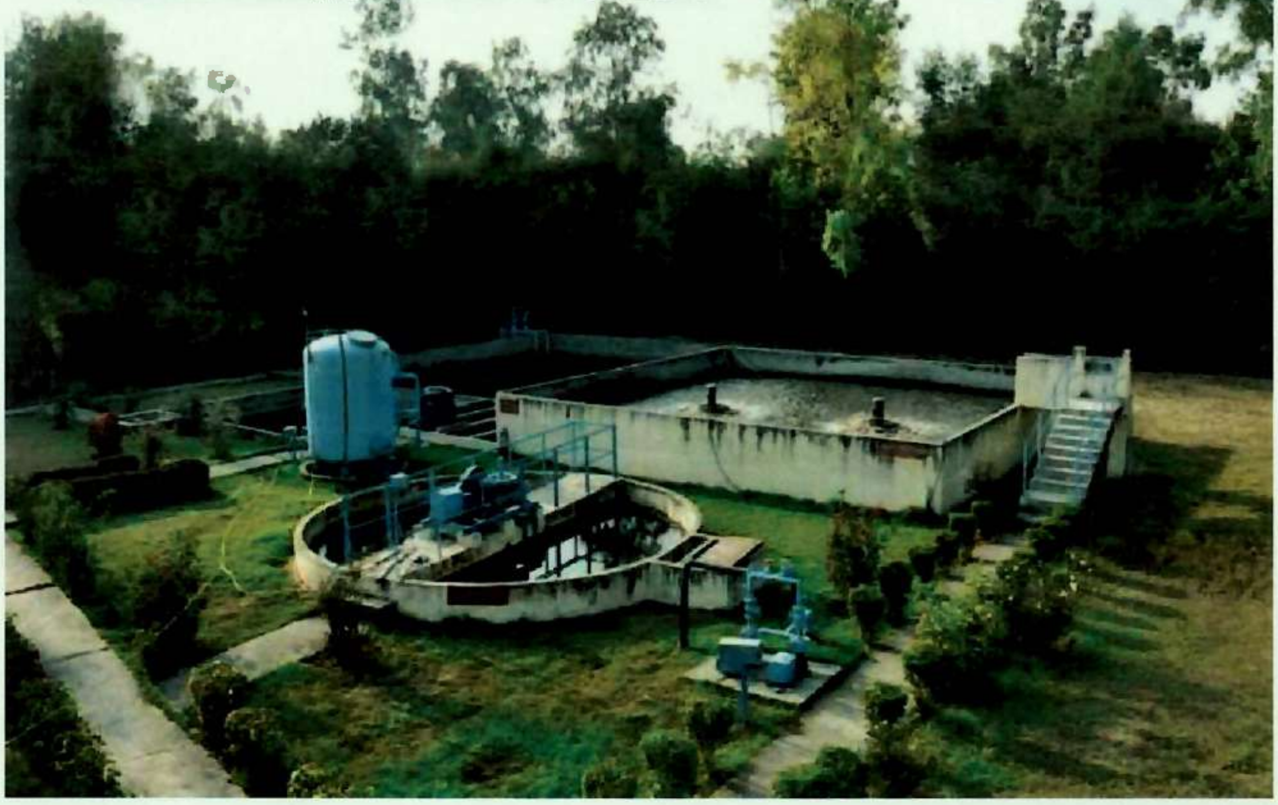

STP (300KLD) in plant premises

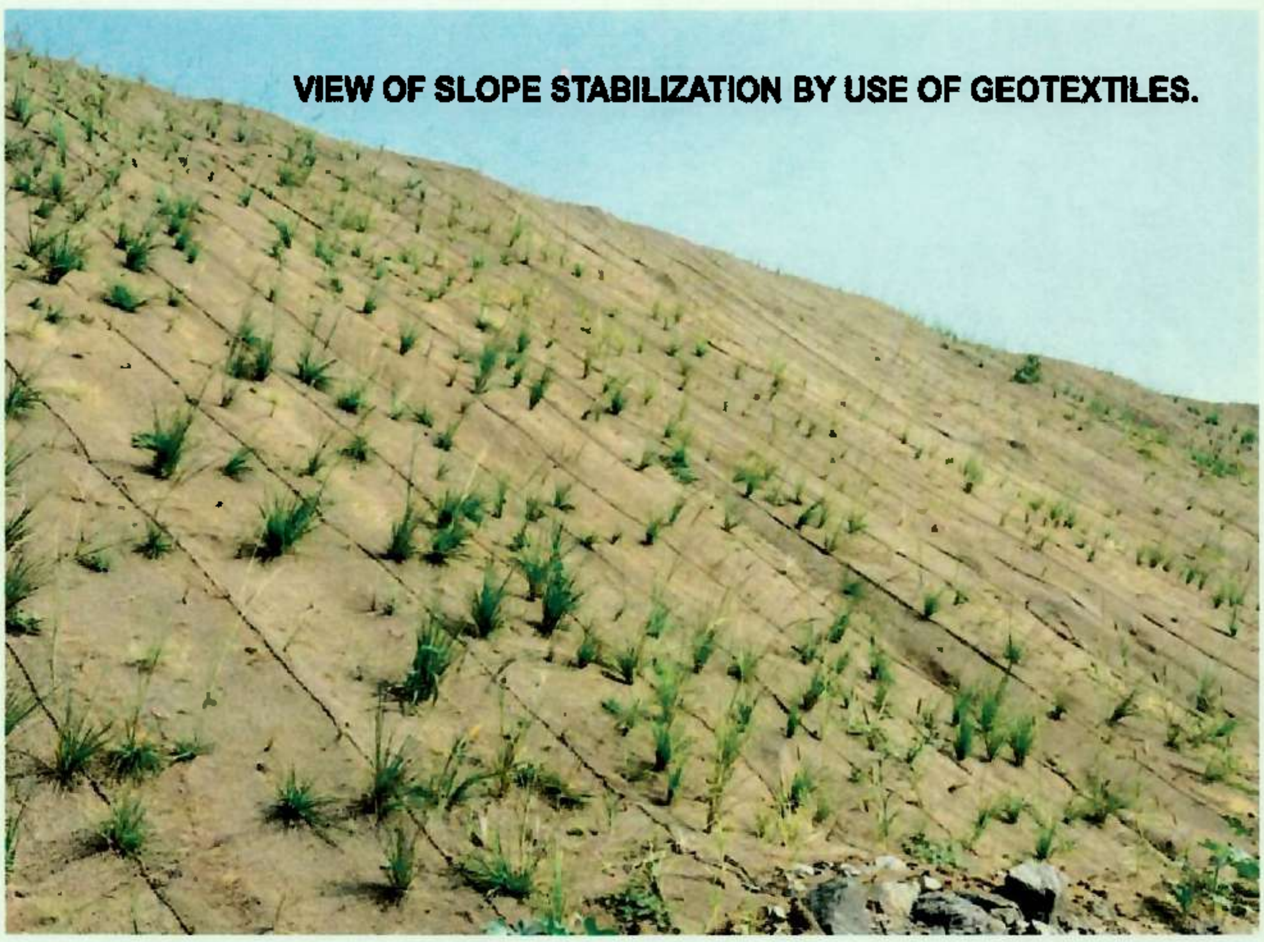
NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 996/2008
EXP.DATE 02-07-2023
GOVT. OF RAJASTHAN

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

RAMPURA AGUCHA MINE
HZL

SEWAGE TREATMENT PLANT AT COLONY.





VIEW OF SLOPE STABILIZATION BY USE OF GEOTEXTILES.

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG NO. 996/2008
EXP.DATE 02-07-2023
GOVT. OF RAJASTHAN

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

RAMPURA AGUCHA MINE
HZL

Road Sweeper

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 996/2008
EXP.DATE 02-07-2023
GOVT. OF RAJASTHAN

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

HZL • RAMPURA AGUCHA MINE •

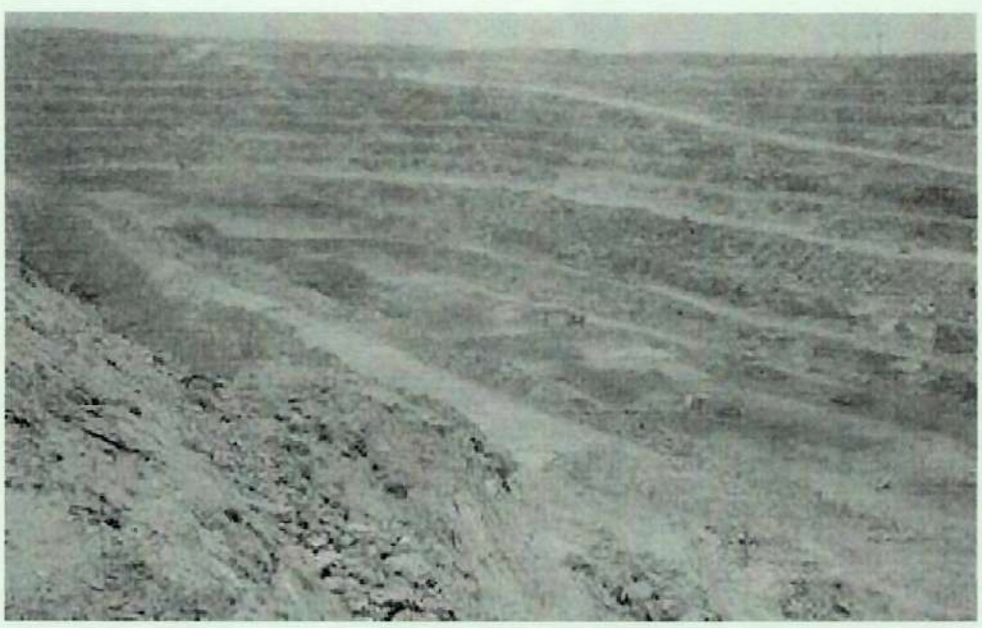
Annexure R-10

Confidential

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

REPORT ON

Study and advice for opimisation of blast design parameters for improved fragmentation at Rampura Agucha Mine



Project No.: GC/MT/170/2007-08 **March 2008**

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 996/2008
EXP.DATE 02-07-2023
GOVT OF RAJASTHAN

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

RAMPURA AGUCHA MINE
HZL

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

REPORT ON

Study and advice for opimisation of blast design parameters for improved fragmentation at Rampura Agucha Mine

BY

Dr. P. K. Singh,	**Scientist EII & Project Leader**
Mr. M. P. Roy,	**Scientist C**
Md. I. Ansari,	**Technical Officer**
Dr. P. Pal Roy,	**Head & Co-ordinator**
Dr. A. Sinha,	**Acting Director**

PROJECT NO.: GC/MT/170/2007-08 **MARCH 2008**

NOTARY RAJESH KUMAR MEHTA GULABPURA REG. NO. 996/2008 EXP.DATE 02-07-2023 GOVT OF RAJASTHAN

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

RAMPURA AGUCHA MINE HZL

NOTE

This report is meant for internal use of the sponsor of the study only and it should not be published in full or part by the sponsor. It should not be communicated or circulated to outside parties except concern departments. However, CIMFR reserves the right to publish the results of the investigation for the benefit of the mining industry.

The recommendations are based on the results of investigation carried out at Rampura Agucha Mine, Hindustan Zinc Limited. It is hoped that the existing practice of blasting will be continued to get the optimum results without hampering production, productivity of the mine and safety to the surrounding villagers.

Since, the day-to-day blasting operations are not in the control of CIMFR, the research team will not be held responsible for any untoward incident caused due to blasting.

P.K. Singh
24.03.08
(Dr. P. K. Singh)
Project Leader

24/3/10
(Dr. P. Pal Roy)
Head & Co-ordinator

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 996/2008
EXP.DATE 02-07-2023
GOVT OF RAJASTHAN

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

RAMPURA AGUCHA MINE
HZL

EXECUTIVE SUMMARY

This report relates to the study conducted by Central Institute of Mining & Fuel Research (erstwhile CMRI). Dhanbad to optimise the blast design parameters at Rampura Agucha Mine for better fragmentation while controlling ground vibration, air overpressure/noise within safe limit for the safety of houses/dwelling nearby the mine. The study involved monitoring of blasts with varying blast designs and charging patterns and monitoring of ground vibration & air over-pressure/noise in Bherukheda and Agucha villages. The results of investigation, analyses of data and recommendations, made thereof, are summarised below:

- Fifteen blasts were monitored and sixty vibration data were recorded nearby the mine boundary and at various locations in Bherukheda and Agucha villages. The blast conducted at 390/80 HW-N-ALG bench with explosives weight per delay of 495 kg generated the maximum level of vibration of 4.22 mm/s with dominant frequency of 10.5 Hz at 325 m at mine boundary of Bherukheda village. The vibration recorded near the house of Sri Banni Jee Nayak in Bherukheda village from the same blast was only 2.03 mm/s with dominant peak frequency of 10.4 Hz.
- The maximum vibration recorded at first floor of the house with RCC structure was 7.47 mm/s with associated frequency of 12.6 Hz. The natural frequency of the said house was 12 Hz. The incoming blast vibration has frequency very close to natural frequency of the house and resonance occurred, the resultant amplitude of the vibration in the house got amplified.
- The maximum level of air over-pressure of 124.1 dB(L) was recorded near the mine boundary of Bherukheda village, while the recorded maximum level of air over-pressure in the village was 123.2 dB(L).
- The recorded dominant peak frequencies of vibrations were in the range of 8.38-126 Hz. The Fast Fourier Transform (FFT) analyses of vibration data revealed that the concentrations of vibration energy are in the range of 8.38 to 33.9 Hz. The natural frequencies of a few structures were determined and were in the range of 7.63-12.9 Hz. Thus, the safe level of vibration has been taken as 10 mm/s for the safety of houses/structures of the Bherukheda and Agucha villages as per DGMS standard.
- All the recorded vibration and air overpressure data in the villages were well within the safe limit. There was no ejection of flyrocks during to study period.
- Blast induced ground vibration and noise/air over-pressure are not causing any damage to the structures and the houses of Bherukheda and Agucha villages.
- The propagation equation for the prediction of blast vibration has been established and is given as Equation 1. The permissible explosive weight per delay may be computed from the Equation to contain vibration within safe limit for distances of houses/structures concerned. For convenience, the predicted PPV level for detonation of varying explosive weight per delay is presented in Table A4.
- The monitored blast designs yielded excellent blast results. However, the blast designs are given in Annexure as Figures A1-A2, which should be followed in day-to-day blasting operations with judicious modifications.

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Gulabpura (Bhilwara)

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1. Introduction

The Assistant General Manager (Mines), Rampura Agucha Mine, Hindustan Zinc Limited entrusted Central Institute of Mining & Fuel Research (erstwhile CMRI), Dhanbad, vide e-mail letter dated 22.02.2008 for a scientific study and advice for optimization of blast design parameters at Rampura Agucha Mine to control ground vibration, air overpressure/noise and flyrocks within safe limit for the safety of houses/dwelling nearby the mine with improved production and productivity.

The Blasting Research team of Central Institute of Mining & Fuel Research Dhanbad carried out field investigations during February 29-March 06, 2008. Altogether, fifteen production blasts were monitored. Blast induced ground vibration and air over-pressure/noise were monitored at various locations in the periphery of the Rampura Agucha Mine. The monitoring locations were backside of the blast free face and at various locations in the Bherukheda and Agucha villages.

2. Location and geology

Rampur Agucha mine is the India's largest Lead-Zinc opencast mine of M/s Hindustan Zinc Limited. The mine had the initial reserves of 96.0 million tonnes of Pb-Zn composite sulphide ore containing 13.54% of Zn & 1.97% of Pb.

The rocks of the area form a part of Mangalwar complex of Bhilwara geological cycle (3.2-2.5 billion years) belonging to Archean age and comprising of magmatites, gneiss, graphite mica schist, pegmatites and impure marbles. The rocks have been subjected to polyphase deformations and high-grade metamorphism. The deposit lies in the contact zone of Mangalwar - Sandmata complex and along the major NE trending Delwara lineament. The deposit is volcanogenic, stratiform sediment hosted massive sulphide ore body, affected by dynamic, regional metamorphism and tectonic disturbances, which produces remobilize granulated ore. The sequence of rocks from hang wall to footwall is:

1. Garnet-biotite-sillimanite gneiss with its variants (GBSG),
2. Graphite-mica-sillimanite gneiss/shiest (GBSG & GBSS as host rock)
3. Garnet-biotite-sillimanite gneiss with the lenses of quartzofeldspathic bands
4. Calc-silicate 5. Amphibolite 6. Pegmatite 7. Granite gneiss 8. Mylonite

General strike of the orebody is N50°E and dipping at 60-70°SE. Both hanging wall and footwall contacts of the mineralisation are sheer contacts. The ore body is hosted by graphite mica sillimanite gneiss in lens shaped doubly plunging synform with strike length of 1550 m and width varying from a few meters in the NE to 100 m in the central and SW section. The average width of ore body is 58 m over a strike length of 1550 m. The over view of the mine is shown in the Photograph 1.

Photograph 1. Overview of the Rampur-Agucha mine.

3. Instrumentations

Blast induced vibrations were monitored by seismographs namely MiniMate Plus and MiniMate Blaster (Made in Canada by M/s Instantel Inc.). MiniMate plus are eight channel seismographs provided with two tri-axial transducer(s) for monitoring vibration (in mm/s) and two channel(s) for monitoring air over-pressure/noise in dB(L). MiniMate Blaster is four channel seismographs provided with one tri-axial transducer for monitoring of vibration (in mm/s) and one channel for monitoring of air over-pressure/noise in dB(L). All the seismographs record vibration in three directions i.e. Longitudinal (L), Vertical (V) and Transverse (T). They also record principal frequency of vibration and compute the peak vector sum of the vibration.

Blast face profiling was performed with Burden Ace before blasting. The Burden Ace is capable of profiling the blast face in two dimensions. Video camera was deployed to document the ejection of flyrocks and blast detonation sequences.

4. Experimental blasts

Fifteen production blasts were monitored. The number of holes detonated in a blasting round varied from 34 to 230. The diameters of blast holes were of 115 mm and 165 mm. The depth of holes varied from 4.2 to 12.2 m and the explosives loaded in a hole ranged from 80 to 200 kg. The explosives weight per delay ranged between 84 and 498 kg. Total explosive weight detonated in a blast round varied between 700 and 40,708 kg. All the blasts were conducted with Nonel initiation system. The vibration measuring distances varied from 300 to 1600 m. Details of blast design parameters monitored during the period of investigation are given in Annexure as Table A1.

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Vibrations were monitored in terms of peak particle velocity (PPV) that varied from 0.539 mm/s to 4.22 mm/s depending upon the distance of measuring transducers of seismographs from the blasting face and the amount of explosives detonated in a particular delay of the blast. The maximum vibration recorded at first floor of the RCC house was 7.47 mm/s with associated frequency of 12.6 Hz. The recorded levels of air over-pressure ranged from 91.5-124.1 dB(L). Recorded blast induced ground vibrations and air over-pressure are presented in Annexure as Table A2.

5. Analysis of recorded vibration data

Ground vibrations data recorded were grouped together for statistical analysis. An empirical relationship has been established correlating the maximum explosive weight per delay (Q_{max} in kg), distance of vibration measuring transducers from the blasting face (R in m) and recorded peak particle velocity (v in mm/s). The established equation for the mine is:

$$v = 179.56 * \left(\frac{R}{\sqrt{Q_{\max}}} \right)^{-1.197} \quad (1)$$

Correlation co-efficient = 84.1 %

Where,

v = Peak particle velocity (mm/s)
R = Distance between vibration monitoring point and blasting face (m)
Q_{max} = Maximum explosive weight per delay (kg)

The above equation is site specific and applicable only for Rampura Agucha Mine. It may be used to compute the maximum explosive weight to be detonated in a delay for distances of concerned from the blasting site. The regression plot of vibration data recorded at their respective scaled distances is presented in Figure 1.

5.1 Frequency of blast vibration

The dominant peak frequencies of ground vibrations recorded were in the range of 8.38-126 Hz. Most of the vibration measuring stations were on compact ground surfaces. The blast wave signature recorded at 325 m at Mine boundary of Bherukheda village is depicted in Figure 2. The blast wave signature recorded at 440 m near the house of Shri Banni Jee Nayak from the same blast is shown in Figure 3. Fast Fourier Transform (FFT) analysis of frequencies of the vibration (blast wave signature shown in Figure 3) is depicted in Figure 4. The views of blast vibration monitoring at different locations of the Bherukheda village are presented in Photograph 2. Photograph 3 shows the vibration monitoring locations at Agucha village.

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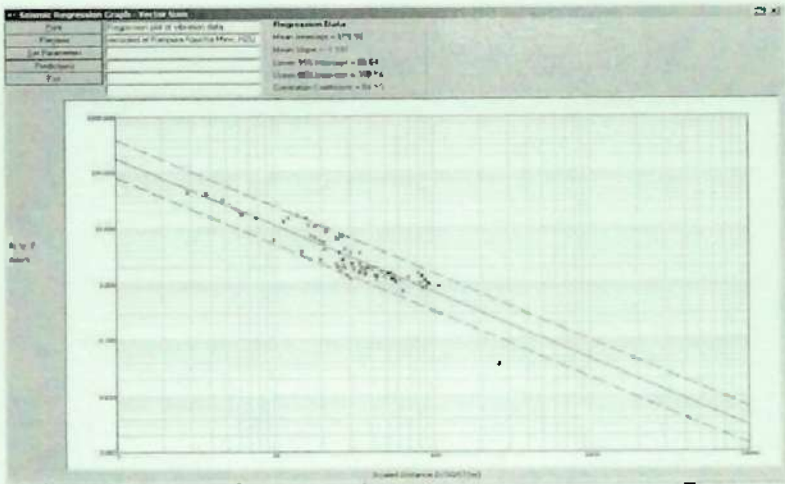


Figure 1. Regression plot of recorded PPV with their respective scaled distances.

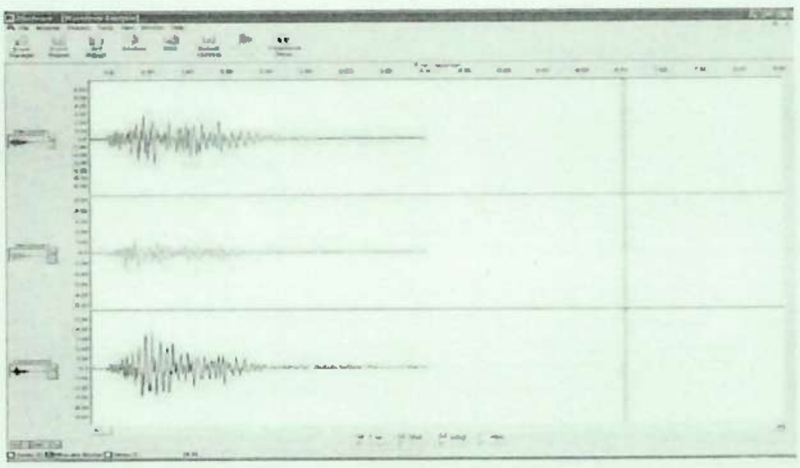


Figure 2. Blast wave signature recorded at 325 m near the Mine boundary at Bherukhda village from the blast conducted at 390/80 HW-N-ALG.

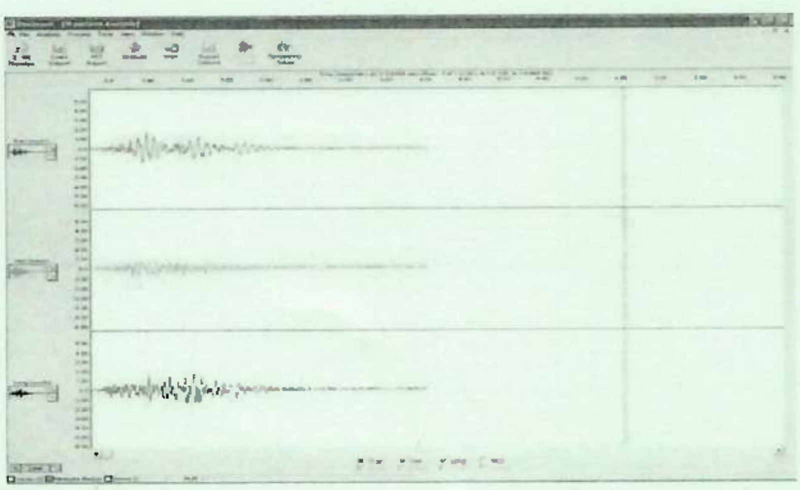


Figure 3. Blast wave signature recorded at 440 m (near the house of Shri Banni Jee Nayak) from the blast conducted at 390/80 HW-N-ALG.

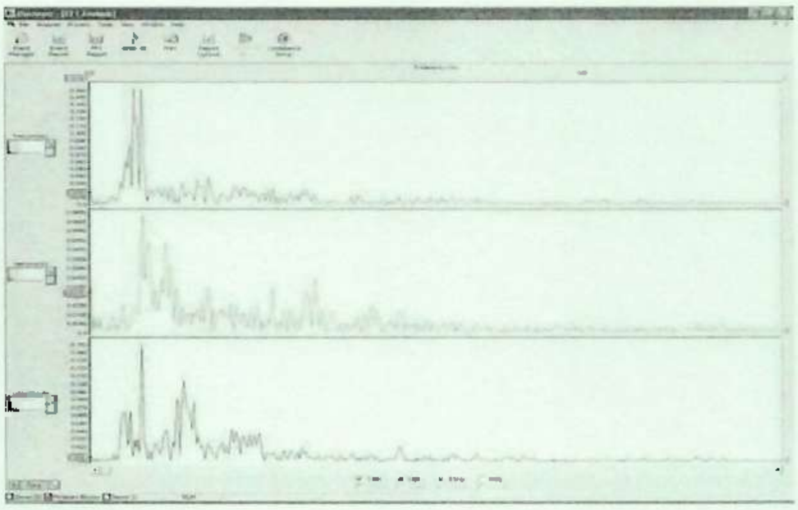
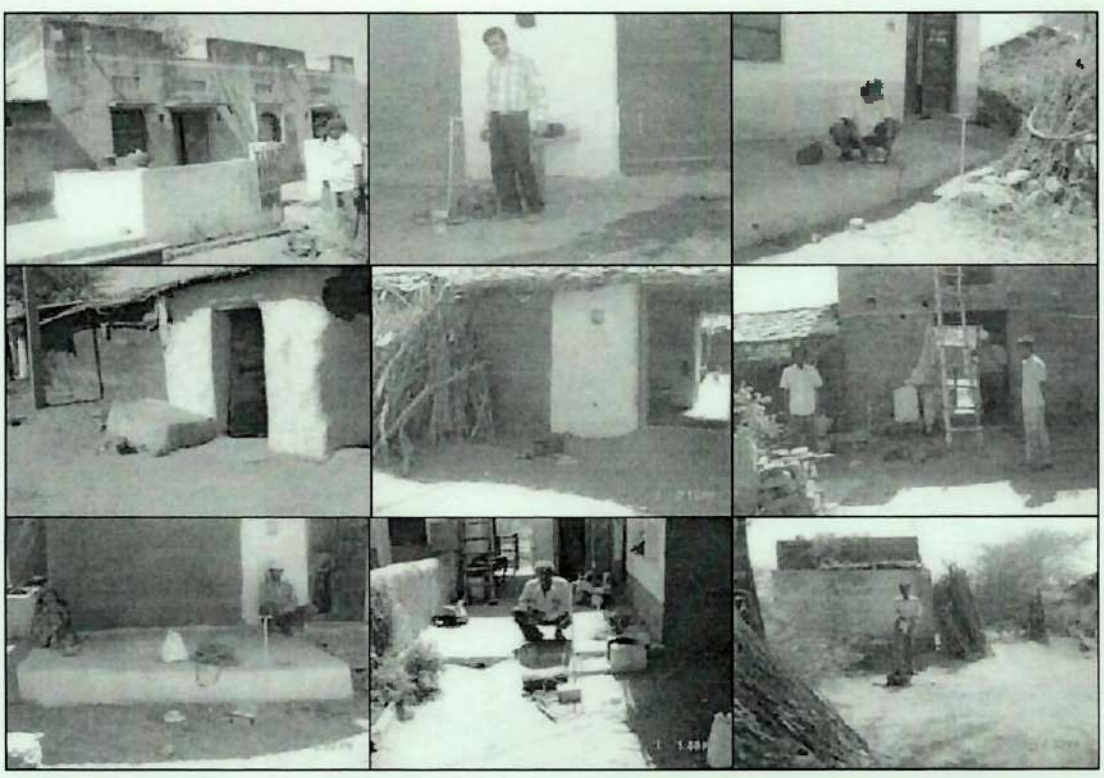


Figure 4. FFT analysis of frequencies of blast wave signature shown in Figure 3.



Photograph 2. Monitoring of blast vibration at different locations in the Bherukheda village due to the blast conducted at Rampura Agucha Mine.

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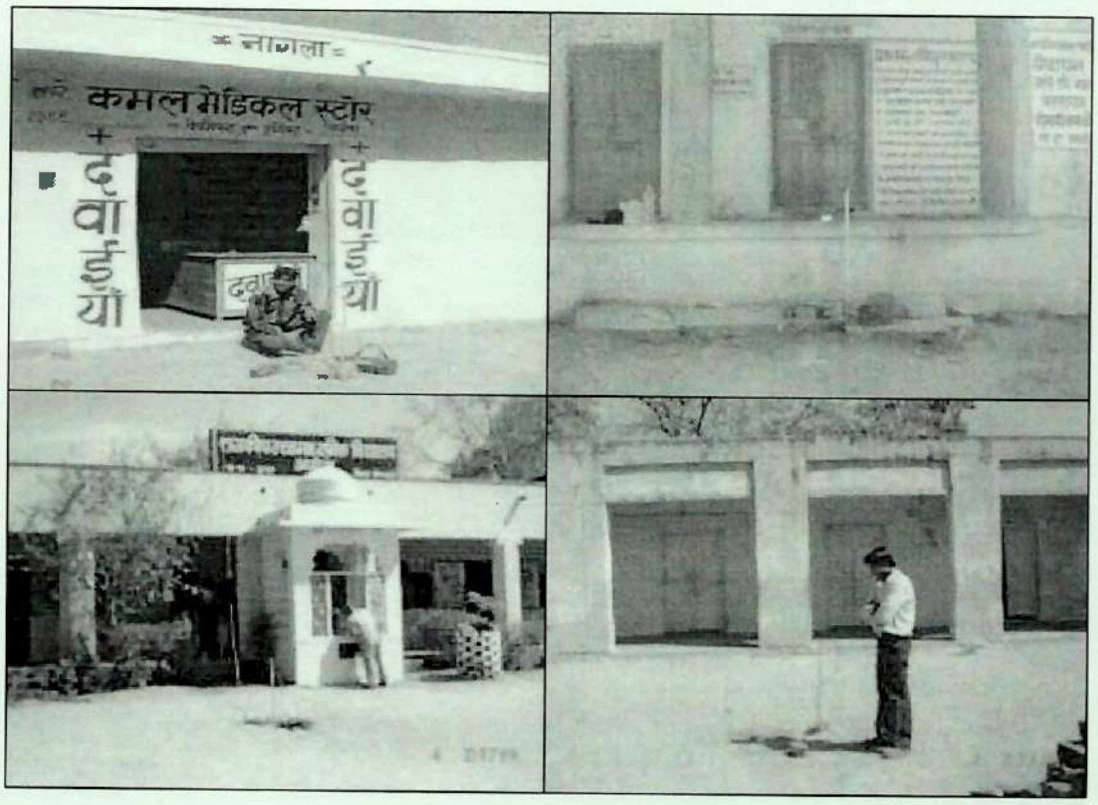

Photograph 3. Monitoring of blast vibration at different locations in the Agucha village due to the blast conducted at Rampura Agucha Mine.

5.2. *Structural responses to ground vibration and their natural frequencies*

The real cause of public complain about blasting is structural response. All blast vibration complains is due to how much the house shakes, not how much the ground shakes. The ground motion resulting from blast induced waves is transmitted to the structure upside through the foundation, which causes the structure to vibrate. There are three factors of ground vibrations that determine how much structure vibrates. They are ground vibration amplitude, ground vibration duration and ground vibration frequency.

The responses of a few structures of the Bherukheda village were monitored. The recorded natural frequencies of the houses were in the range of 7.63-12.9 Hz. The amplification of vibrations (PPV at roof/wall and to that on the ground) of 1.55–3.25 times were recorded in the concerned structures. The incoming blast vibration has frequency in the range of natural frequency of the houses and resonance occurred, the resultant amplitude of the vibration in the houses got amplified. The maximum amplification were recorded when incoming blast wave has dominant frequency very close to the natural frequency of the house. The process involved in determination of natural frequency of house of Shri Banni Jee Nayak at Bherukheda village is shown in Figure 5. The natural frequencies of few houses of Bherukheda village are presented in Table 1.

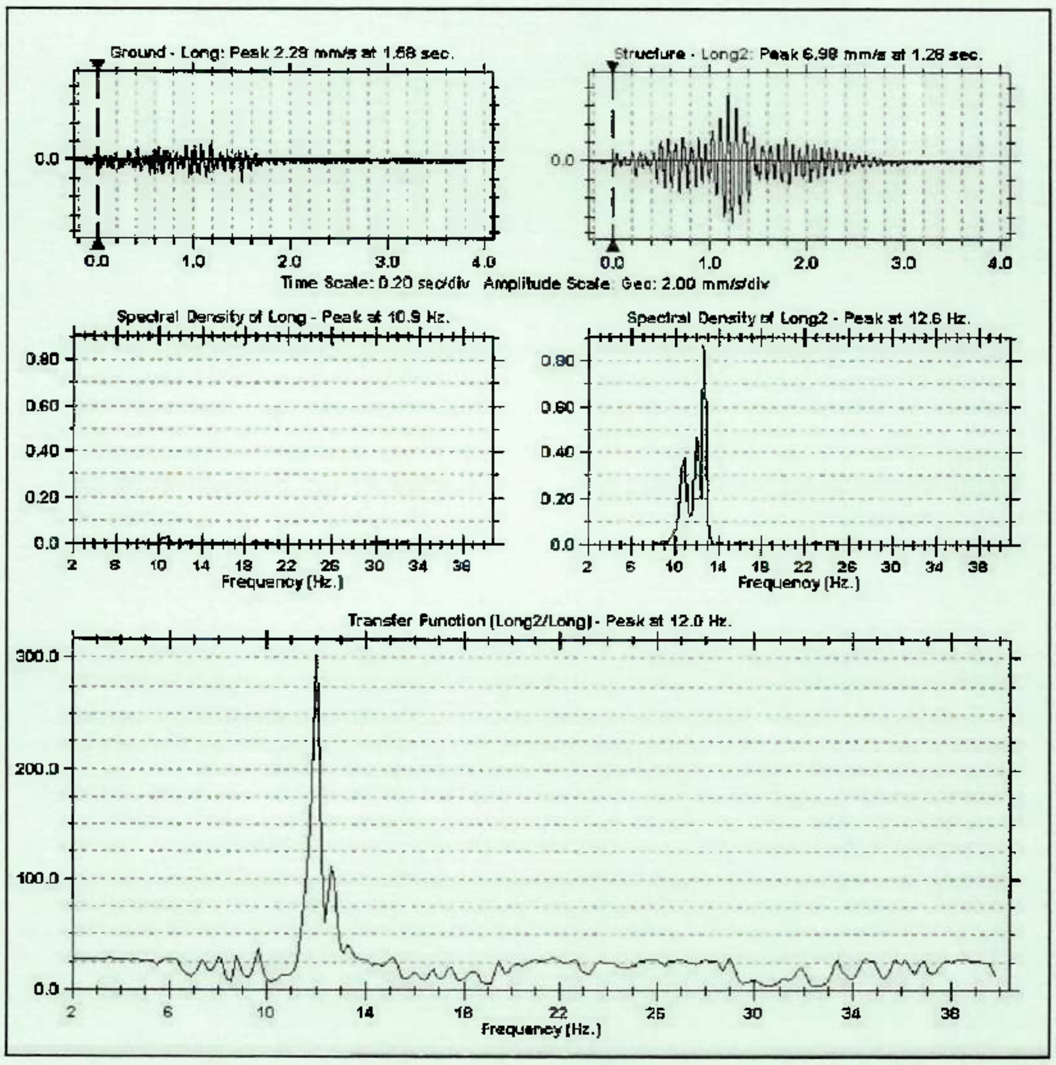

Figure 5. Processing of blast wave signature for determination of natural frequency of the house of Shri Banni Jee Nayak of Bherukheda village. The recorded natural frequency is 12 Hz.

Table 1. Natural frequency of few mud/brick wall and reinforced concrete houses at Bherukheda village.

Sl. No.	Owner name and type of the structure	Natural frequency of the house (Hz)	Amplification of vibration in the structure at different levels
1.	Shri Banni Jee Nayak, Bherukheda village (RCC Structure, Height-3 m)	12-12.9	2.18-3.25
2.	Shri Udai Lal Nayak, Bherukheda village (RCC Structure, Height-3 m)	12	1.55-2.7
3.	Shri Madan Jee Nayak, Bherukheda village (RCC Structure, Height-3.2 m)	7.63-7.75	2.67-2.72

6. Existing vibration standard and criteria to prevent damage

Peak particle velocity (PPV) has been globally used in practice for assessment of blast induced damage to the structures. Different countries adopt different standards depending on their type of industrial/residential buildings. In India, presently DGMS technical circular 7 of 1997 is considered as vibration standard for the safety of surface structures in mining areas. The DGMS standard is given in Table 1.

Table 1. DGMS technical circular 7 of 1997 concerning to blast vibration standard in mm/s.

Type of structure	Dominant excitation frequency, Hz		
	< 8 Hz	8-25 Hz	> 25 Hz
(A) Buildings/structures not belong to the owner			
1. Domestic houses/structures (Kuchcha, brick & cement)	5	10	15
2. Industrial buildings	10	20	25
3. Objects of historical importance and sensitive structures	2	5	10
(B) Buildings belonging to owner with limited span of life			
1. Domestic houses/structures	10	15	25
2. Industrial buildings	15	25	50

7. Air over-pressure/noise

Air overpressure in the mining or quarrying context is the superposition of a number of impulsive air pressures as a result of the detonation of explosive. Air over-pressure can be measured in pressure unit as well as sound pressure level (SPL).

SPL (dB) = 20 log (p/p_o)

Where, p = measured over-pressure in Pascal (pa)

p_o = reference pressure level of the lowest sound that can be heard, i.e., zero dB = 2×10^{-5} pa.

United State Bureau of Mines (USBM) has correlated the damage due to air over-pressure. The recommended values are given below:

Over-pressure [dB(L)]	Over-pressure [Kpa]	Air Blast Effects
177	14	All windows break
170	6	Most windows break
150	0.63	Some windows break
140	0.20	Some large plate glass windows may break, desk and windows rattle
136	0.13	USBM interim limit for allowable air blast
126	0.05	Complaints likely

The maximum level of air over-pressure recorded at Mine boundary was 124.1 dB(L) due to blast conducted at 390/80 HW-N-ALG. The explosive detonated in this blast round was

21,946 kg and explosive weight per delay was 495 kg. While in the village the maximum level of air over-pressure recorded was 123.2 dB(L) near the house Shri Banni Jee Nayak at Bherukheda village. The threshold level of air over pressure/noise is 136 dB(L) as per USBM standard.

8. Evolution of effective charge weight per delay

The existing practice for calculation of maximum explosive weight in a delay for a blast is by simply adding the explosives detonated in a delay (less than 8 ms) within one hole or in several holes. The recorded data at number of mines revealed that the concentration of explosives per delay in one hole and the same charge distributed in several holes generated different vibration characteristics and magnitude of vibrations. An extensive study and rigorous analyses of recorded vibration data were carried out under the S&T project titled "Study on the effect of total charge, delay interval and directions of initiation on blast induced ground vibration" to find out scientific conclusion of this long pending issue.

To illustrate the one of the experimental set-ups, 500 kg of explosive charge in a hole was detonated. In another blast the same 500 kg was distributed in 5 holes and fired instantaneously. The recorded vibration magnitudes from both the blasts were different at similar monitoring locations. The vibrations generated in the latter were lower than the former. It indicates that the existing practice of fixing the charge per delay is not adequate. Altogether, 860 vibration data were recorded and classified in two groups of blasts. The first one in which the charge per delay was the amount of maximum explosive detonated in a single hole. The second group was that in which the same charge per delay was distributed in two or more holes. The result revealed that effective charge per delay was scaling of number of holes and multiple of the average distributed weight of explosive in a hole.

The effective charge per delay was computed as $(N^{1/3})*Q_{avg}$, kg which was in agreement to the recorded vibration magnitude. The N is the number of holes fired in a delay and Q_{avg} is the amount of explosive in a hole.

9. Human response to blasting

The tolerance and reactions of human beings to vibrations are important when standards are based on annoyance, interference, work proficiency and health. Human beings notice and react to blast induced vibrations at levels that are lower than the damage thresholds. It is impossible to establish a vibration level where nobody will complain. There are always some persons in a population who will complain no matter how small the disturbance is. Several researchers recognized that the duration of the vibration was critical. Most evident was that a higher level could be tolerated if the event was of short duration. Consequently steady state vibration data could not be realistically applied to blasting except for events that exceed several seconds duration.

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10. Results and discussions

The maximum vibration recorded in terms of peak particle velocity (PPV) was 4.22 mm/s at 325 m on the ground surface near mine boundary. The associated dominant peak frequency was 10.5 Hz. This magnitude of vibration was due to detonation of 115 holes loaded with 21,946 kg of explosives. The maximum explosive detonated in a delay was 495 kg. The PPV recorded at 440 m from the same blast was 2.02 mm/s with dominant peak frequency of 10.4 Hz. It indicates that attenuation of vibration is very fast.

The magnitude of vibration recorded at different locations of Bherukheda and Agucha villages were between 0.539 and 2.36 mm/s. The vibration monitoring distances ranged between 300 and 1600 m. A few recorded blast waveforms at different locations are given in the Annexure, which indicates low amplitude and short duration blast events.

The dominant peak frequencies of the vibrations ranged between 8.38 and 126 Hz. The FFT analyses of frequency of vibration revealed that the concentration of vibration energy is in the range of 8.38–33.9 Hz. The safe limit of vibration for the houses/dwellings of surrounding villages is taken as 10 mm/s based on DGMS standard. The maximum explosives to be fired in a delay for the safety of residential houses at various distances from the blasting site may be computed from the Equation 1. For ready references, the maximum permissible explosive weight per delay to be detonated in blast round has been computed and is Annexured as Table A3. The predicated PPV levels at various distances by detonation of explosives weight per delay of 300 kg, 400 kg and 500 kg are presented in Table A4.

The maximum level of air over-pressure recorded at Mine boundary was 124.1 dB(L) due to blast conducted at 390/80 HW-N-ALG. The explosive detonated in the blast round was 21,946 kg. The explosive weight per delay was 495 kg. Maximum level of air over-pressure recorded in the village was 123.2 dB(L). The threshold level of air over pressure/noise is 136 dB(L) as per USBM standard for the safety and stability of window glass etc of the houses/dwellings. All the blasts were initiated with Nonel initiation system that generates significantly lower level of air over-pressure.

The existing practice for computation of maximum explosive weight in a delay for a blast is by simply adding the explosives detonated in a delay (less than 8 ms). The result revealed that concept of computing of effective charge per delay should be implemented to accurately predict the level of vibration at concerned locations.

The practice of use of stone chips as stemming material resulted into increase in the efficiency of explosive energy into rock fragmentation in stemming zone. The size of the stone chips should be maintained as 17-24 per cent of the diameter of the drill holes. Delay intervals between the rows were modified which resulted into excellent fragmentation and elimination of back-breaks. The minimum time needed to start of the rock movement for the top formation at the Rampur Agucha mine is 22-26 ms. The minimum delay interval between the first two rows should be 59 ms and should be successively increased by 15-25 % depending upon the number of rows but it should not be more than 184 ms between the successive rows. The blasts designs experimented during the period of the study yielded excellent blast results.

11. Conclusions and recommendations

- Maximum level of vibration recorded was 4.22 mm/s with associated dominant peak frequency of 10.5 Hz at 325 m near mine boundary. The explosives weight per delay was 495 kg. The PPV recorded at 440 m from the same blast was 2.02 mm/s with dominant peak frequency of 10.4 Hz near the house of Shri Banni Jee Nayak of Bherukheda village.

- The maximum level of air over-pressure recorded was 124.1 dB(L) at the mine boundary due to blast conducted at 390/80 HW-N-ALG. The maximum level of air over-pressure recorded in the village was 123.2 dB(L. The Nonel initiation system reduces the air over-pressure to a greater extent and improves the blasting performance too. The use of Nonel initiation system should be continued.

- The FFT analysis of blast vibration frequencies confirmed that the concentration of frequencies of blast vibration is in the band of 8.38-33.9 Hz. So, the safe level of vibration has been taken as 10 mm/s for the safety of houses/structures of the surrounding villages as per DGMS standard.

- All the recorded data (blast vibrations, air overpressures, flyrocks) were well within the safe limit at the houses/structures concerned.

- Propagation equation for the prediction of blast vibration has been established and is given as Equation 1. The permissible explosive weight per delay may be computed from the Equation to contain vibration within safe limit for distances of houses/structures concerned.

- The concept of computation of effective charge weight per delay should be implement for accurate prediction of vibration at concerned locations.

- The delay intervals between the holes in a row of 17 ms or 25 ms were used which resulted into excellent fragmentation. The intra rows delay interval was 59 ms, 65 ms, 84 ms, 107 ms, 125 ms, 142 ms, 165 ms and 184 ms which also contributed in achieving excellent blast results. The delay intervals used between the holes in a row and intra-rows should be continued in future blasting operations too.

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- It is recommended that the existing practice of use of stone chips as stemming material should be continued. Attempt should be made to use required size of stone chips.

- The recommended blast designs (Figures A1-A2) should be followed for day-to-day blasting operations efficient blasting operations. The blast designs will also ensure the safety of the houses/dwellings, life of human beings and other property in the periphery of the mine.

Acknowledgements

The research team expresses gratitude to the inhabitants of Bherukheda and Agucha villages for their co-operation in blast vibration and air overpressure monitoring. The research team also put on record the support provided by the mine officials in documenting the blasting details.

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Table A1. Summary of trial blasts conducted at Rampura-Agucha Mine, Hindustan Zinc Limited.

Blast No.	Date of blast	Location of blast	Hole dia. [mm]	No. of holes	Hole depth [m]	Burden [m] × Spacing [m]	Top stemming [m]	Average explosive weight [kg]	Total explosives weight [kg]	Initiation system
1	29-02-08	390/80 HW-N- ALG	165	87	9.7	• Production row – 4 × 6	3.75	135	13,475 (SME of M/s IOC Ltd)	DTH – 450 ms & TLD - 25, 42, 65 & 100 ms
2	29-02-08	360/50 FW-S-ALG	165	142	9.5 & 4.2 m	• Production row - 4 × 6 • Buffer row - 4 × 4.5 • Batter row - 3 × 3	• Production -3.5 • Buffer - 4.5 • Batter - 2.0	• Production -150 • Buffer - 130 • Batter - 40	25,518 (SME of M/s IOC Ltd)	DTH – 450 ms and TLD-25, 42, 65 & 100 ms
3	01-03-08	290/80 HW - S-ALG	165 & 115	136	12.2	• Production row - 4 × 5.5 • Buffer row - 3 × 4	• Production -3.5 • Buffer - 5.5	• Production-200 • Buffer - 80	22,660 (SME of M/s IOC Ltd)	DTH – 450 ms and TLD-25, 42 & 65 ms
4	01-03-08	310/00 HW - N-ALG Pre-Split	115	84	11.3	• Spacing – 1.2 m	Air stemming	8.3	700 (SME of M/s IOC Ltd)	DTH – 450 ms, TLD-25ms
5	02-03-08	390/80 HW - N-ALG	165	115	10	• Production row – 4 × 6	3.75	160	21,946 (SME of M/s IOC Ltd)	DTH – 450 ms and TLD-25, 42, 65 & 100 ms
6	02-03-08	360/50 FW-S-ALG	165	111	10 & 5	• Production row - 4 × 6 • Buffer row - 4 × 4.5 • Batter row - 3 × 3	• Production -3.5 • Buffer - 4.5 • Batter - 2.0	• Production -170 • Buffer - 140 • Batter - 40	15,000 (SME of M/s IOC Ltd)	DTH – 450 ms and TLD-17, 25, 42, 65 & 100 ms
7	03-03-08	390/80 HW-N-ALG	165	78	10.5	• Production row – 4 × 6	4	140	11,431 (SME of M/s IOC Ltd)	DTH – 450 ms and TLD-25, 42, 65 & 100 ms
8	03-03-08	250/40 Ore-N-ALG	165	121	11	• Production row – 2.75 × 3.25	3.5	170	21,581 (SME of M/s IOC Ltd)	DTH – 450 ms and TLD-17, 25, 65 & 100 ms
9	04-03-08	250/40 Ore-S-ALG + 245/240 Ore-S- ACR	165	107	6.3 & 11	• Production row – 2.75 × 3.25	2.75 & 3.25	90 & 80	10,469 (SME of M/s IOC Ltd)	DTH – 450 ms and TLD-25, 42, 65 & 100 ms
10.	04-03-08	380/70 FW-N-ALG	165	39	11.2	• Production row - 4 × 6 • Buffer row - 3 × 4	• Production -4 • Buffer - 5.5	• Production-160 • Buffer - 100	6416 (SME of M/s IOC Ltd)	DTH – 450 ms and TLD-25, 42 & 65 ms

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11	05-03-08	290/280 HW-S-ALG	165 & 115	230	11	• Production row – 4.2 × 5.5 • Buffer row - 3 × 4	• Production -3.5 • Buffer - 5 5	• Production-180 • Buffer - 80	40,708 (SME of M/s IOC Ltd)	DTH – 450 ms and TLD-17, 25, 42, 65 & 100 ms
12.	05-03-08	380/370 HW-N-ACR	165 & 115	59	10.6	• Production row – 4.2 × 5 5 • Buffer row - 3 × 4	• Production -4 • Buffer - 5 5	• Production-160 • Buffer - 110	9284 (SME of M/s IOC Ltd)	DTH – 450 ms and TLD-17. 25, 42, 65 & 100 ms
13	05-03-08	390/380 HW-N-ACR	165	34	10 5	• Production row – 4 × 6	4	150	5314 (SME of M/s IOC Ltd)	DTH – 450 ms and TLD-25, 42, 65 & 100 ms
14.	06-03-08	380/370 HW-N-ACR	165 & 115	58	10 7	• Production row – 4.2 × 5 5 • Buffer row - 3 × 4	• Production -4 • Buffer - 5	• Production-170 • Buffer - 70	9283 (SME of M/s IOC Ltd)	DTH – 450 ms and TLD-25, 42, 65 & 100 ms
15.	06-03-08	380/370 HW+FW ACR (FW Side)	165	42	10	• Production row – 4 × 6 • Buffer row - 3 × 4	• Production -4 • Buffer - 5	• Production-140 • Buffer - 100	5477 (SME of M/s IOC Ltd)	DTH – 450 ms and TLD-25, 42 &. 65ms

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Gulabpura (Bhilwara)

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Table A2. Blast induced vibration and air over pressure recorded at Bherukheda and Agucha villages due to the blast conducted at Rampura Agucha Mine, Hindustan Zinc Limited.

Blast No.	Date of blast	Location of blast	Total explosives fired in the blast round [kg]	Charge weight per delay within 8 ms delay interval [kg]	Effective charge per delay [kg]	Location of vibration measuring transducers	Distance of monitoring point from the blasting face [m]	Peak particle velocity (PPV) [mm/s]	Dominant Peak frequency [Hz]	Air over-pressure dB(L)
1.	29-02-08	390/80 HW-N-ALG	13,475	256	161	❖ Mine Boundary (Bherukheda village) ❖ House of Sri Banni Jee Nayak ❖ Structure height (3 0 m) ❖ House of Sri Gopal Jee Nayak ❖ Structure height – 2 8 m	346 398 398 445 445	2.82 2.30 7.47 1.71 1.77	11 10.9 12 6 11 19	118.7 121.3 - 118.3 117.2
2.	29-02-08	360/50 FW-S-ALG	25,518	426	204	❖ Mine Boundary (Bherukheda village) ❖ House of Sri Banni Jee Nayak ❖ Structure height (3.0 m) ❖ House of Sri Gopal Jee Nayak ❖ Structure height – 2 8 m	1501 1553 1553 1600 1600	<1.0 0 960 2.09 <1.0 <1 0	- 36 9.63 - -	- 106.5
3.	01-03-08	290/80 HW-S-ALG	22,660	498	239	❖ Mine Boundary (Bherukheda village) ❖ House of Sri Udai Jee Nayak ❖ House of Sri Prem Jee Nayak ❖ House of Sri Udai lal Nayak ❖ Structure height – 3 0	1325 1385 1435 1470 1470	1.47 1.22 1.08 1.03 1.60	61.8 25.6 49.4 8 38 33.8	- 100.0 95.9 95.9 -
4.	01-03-08	310/00 HW-N-ALG (Pre-Split)	700	84	84	❖ Mine Boundary (Bherukheda village) ❖ House of Sri Udai Jee Nayak ❖ House of Sri Prem Jee Nayak ❖ House of Sri Udai lal Nayak ❖ Structure height – 3.0	646 706 756 791 791	1.37 <1.0 1.07 0 852 2 30	126 - 126 12.5 27.4	106.0 - 106.0 105.5 -
5.	02-03-08	390/80 HW-N-ALG	21,946	495	237	❖ Mine Boundary (Bherukheda village) ❖ House of Sri Banni Jee Nayak	325 440	4.22 2 02	10.5 10 4	124.1 123.2

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6.	02-03-08	360/50 FW-S-ALG	15,000	457	219	❖ Kamal Medical Hall (Agucha village) ❖ Primary Health Centre, Agucha village ❖ Structure height – 0 8 m	640 660 660	1.49 1.26 1.53	8.7 8.5 9.1	121.6 120.4 -
7.	03-03-08	390/80 HW-N-ALG	11,431	470	225	❖ Mine Boundary (Bherukheda village) ❖ House of Sri Kanhaiya Lal Nayak ❖ House of Sri Sohal Lal Nayak ❖ House of Sri Madan Jee Nayak ❖ Structure height – 3.2	300 372 385 400 400	2.76 2 36 2.11 1.84 5.00	9.88 9.88 10 10.4 10	120.0 120.2 109.2 123.2 -
8.	03-03-08	250/40 Ore-N-ALG	21,581	458	219	❖ Mine Boundary (Bherukheda village) ❖ House of Sri Kanhaiya Lal Nayak ❖ House of Sri Sohal Lal Nayak ❖ House of Sri Madan Jee Nayak ❖ Structure height – 3.2	770 842 855 870 870	1.62 1.35 1.20 1.09 2.91	33.9 19.4 11 60.4 19.4	118.3 105.5 117.8 120.7 -
9	04-03-08	250/40 Ore-S-ALG + 245/240 Ore-S- ACR	10,469	371	178	❖ Govt Sec High School (Agucha village) ❖ Structure height – 3.2 ❖ Govt. G S High School (Agucha village)	1460 1460 1470	<0.7 <1.0 0.539	- - 13	- - 119.2
10.	04-03-08	380/70 FW-N-ALG	6416	331	159	❖ Mine Boundary (Bherukheda village) ❖ House of Sri Gopal Jee Nayak	695 785	1 65 1 20	9.88 9.63	118.8 117.9
11.	05-03-08	290/280 HW-S- ALG	40,708	480	230	❖ Mine Boundary (Bherukheda village) ❖ House of Sri Udai Jee Nayak ❖ House of Sri Hiralal Nayak ❖ Temple of village	1230 1290 1325 1370	1.63 1 38 1.17 0 925	24 33 9 10.5 23.6	123.1 122 1 120.2 104.9
12.	05-03-08	380/370 HW-N-ACR	9284	303	190	❖ Mine Boundary (Bherukheda village) ❖ House of Sri Udai Jee Nayak ❖ House of Sri Hiralal Nayak ❖ Temple of village	480 540 575 620	2.39 2.07 1 91 1 42	24 9 25 21 8 17.5	103.5 104.2 106 0 91.5
13.	05-03-08	390/380 HW-N-ACR	5314	320	201	❖ Mine Boundary (Bherukheda village) ❖ House of Sri Udai Jee Nayak ❖ House of Sri Hiralal Nayak ❖ Temple of village	395 455 490 535	2 83 1.94 1 65 1 53	33.9 8.63 26 20.8	123.1 113.2 108 4 107.0

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14	06-03-08	380/370 HW-N-ACR	9283	302	190	❖ Mine Boundary (Bherukheda village) ❖ House of Sri Udai Jee Nayak ❖ House of Sri Gopal Jee Nayak ❖ House of Sri Hiralal Nayak	430 490 520 525	2.36 2.04 1.93 1.65	13 39 88.6 21	122.1 121.0 120.6 120.7
15	06-03-08	380/370 HW+FW ACR (FW Side)	5477	309	148	❖ Mine Boundary (Bherukheda village) ❖ House of Sri Udai Jee Nayak ❖ House of Sri Gopal Jee Nayak ❖ House of Sri Hiralal Nayak	580 640 670 675	1.71 1.58 1.31 1.21	21 24 32 24	112.0 111.2 100.0 114.4

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Table A3. Recommended explosives weight to be detonated in a delay at Rampura Agucha Mine, Hindustan Zinc Limited taking 10 mm/s as safe limit of vibration for the safety of houses/structures concerned.

Distance of structures from the blast face [m]	Maximum explosive weight to be detonated in a delay [kg]
200	321
300	722
400	1284
500	2006
600	2889
700	3932
800	5136
900	6500
1000	8024
1100	9710
1200	11555
1300	13561
1400	15728
1500	18055
1600	20542

Table A4. Predicted peak particle velocity levels at various distances from the blasting face due to detonation of 200 kg, 300 kg, 400 kg and 500 kg of explosive in a delay at Rampura Agucha Mine, Hindustan Zinc Limited.

Distance of structure from the blast face [m]	Predicted peak particle velocity level [mm/s]			
	Q_{max} = 200 kg	Q_{max} =300 kg	Q_{max} = 400kg	Q_{max} = 500 kg
200	7.53	9.60	11.41	13.04
300	4.64	5.91	7.02	8.02
400	3.29	4.19	4.98	5.69
500	2.52	3.21	3.81	4.35
600	2.02	2.58	3.06	3.50
700	1.68	2.14	2.55	2.91
800	1.43	1.83	2.17	2.48
900	1.24	1.59	1.89	2.15
1000	1.10	1.40	1.66	1.90
1100	0.98	1.25	1.48	1.69
1200	0.88	1.12	1.34	1.53
1300	0.80	1.02	1.21	1.39
1400	0.73	0.94	1.11	1.27
1500	0.68	0.86	1.02	1.17
1600	0.63	0.80	0.95	1.08

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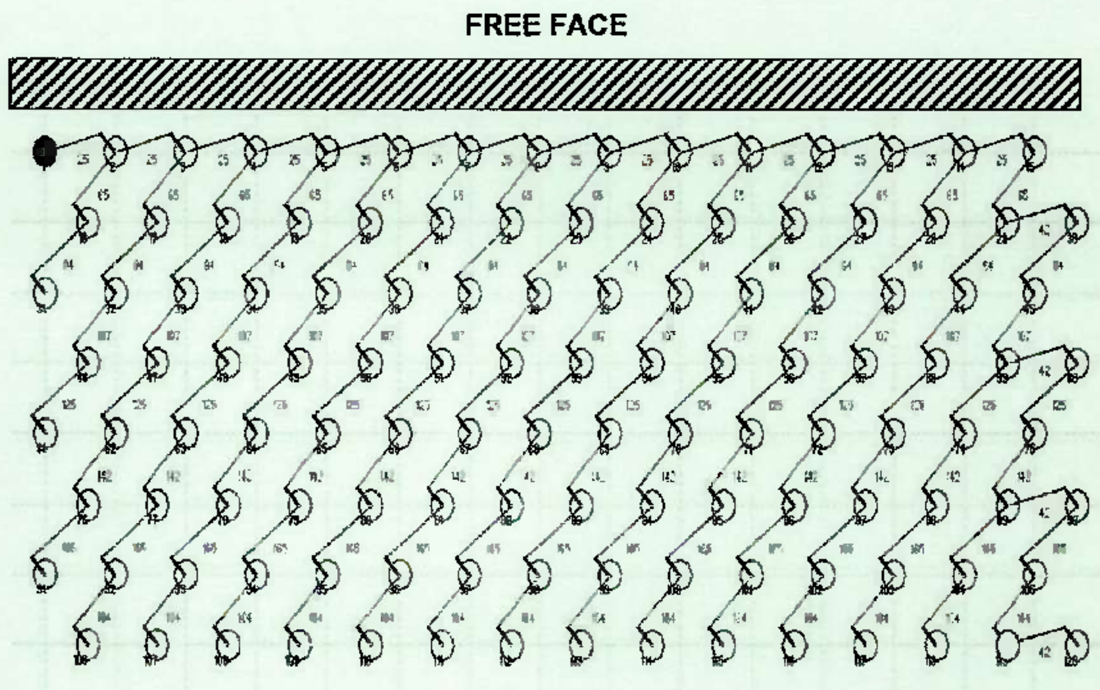

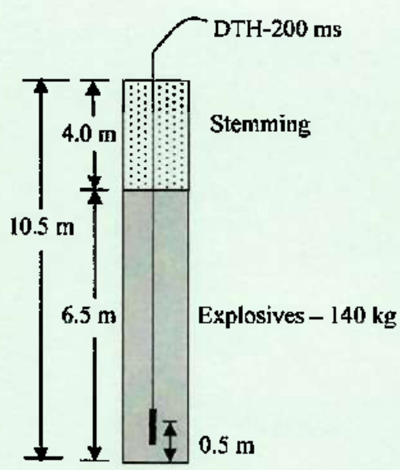

BLAST GEOMETRY

Hole diameter	: 165 mm
No. of holes	: 120
Hole depth	: 10.5 m
Bench height	: 10 m
Burden	: 4.0 m
Spacing	: 6.0 m
Explosive per hole	: 140 kg
Total charge	: 16,800 kg
Charge per delay within 8 ms	: 420 kg (3×140)
Effective charge per delay	: 202 kg (3^1/3×140)
Designed charge factor	: 0.58 kg/m^3
Duration of the blast	: 1590 ms

Figure A1. Recommended blast design and charging pattern of holes for 10 m bench at Rampura Agucha Mine.

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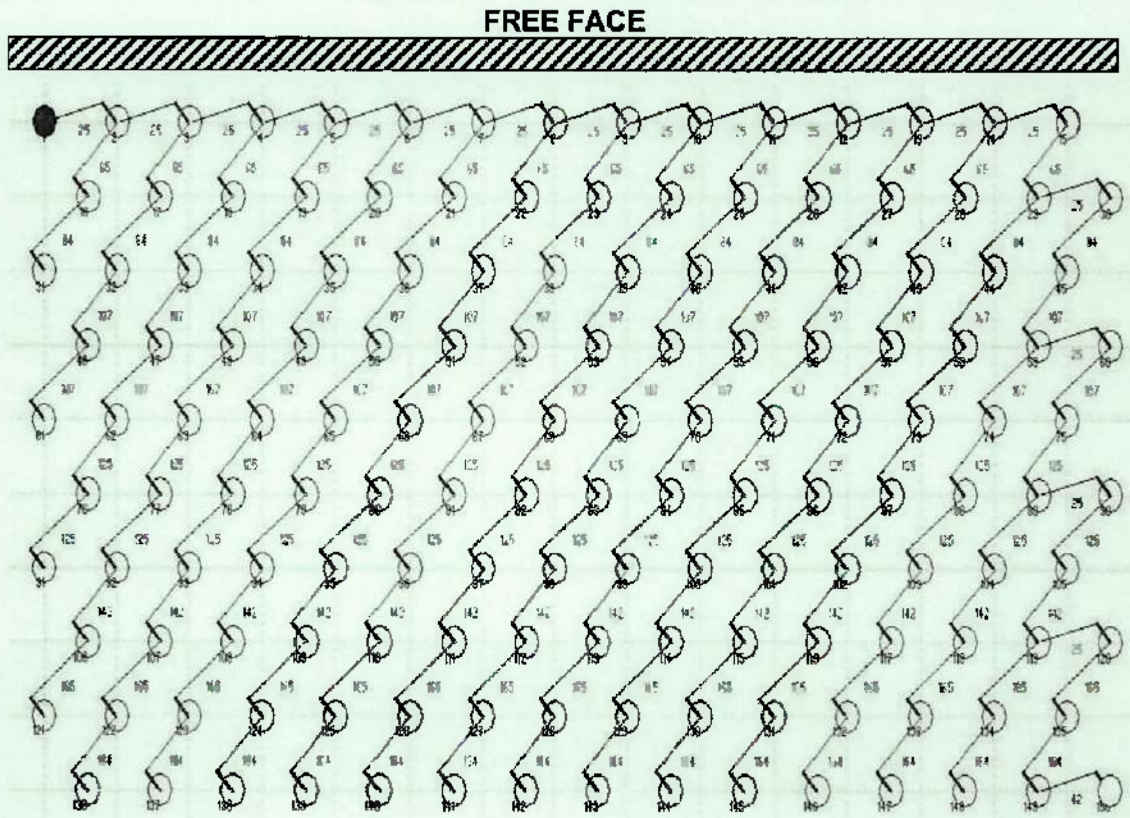

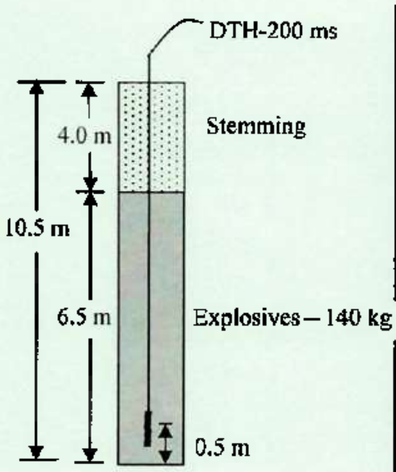

BLAST GEOMETRY	
Hole diameter	: 165 mm
No. of holes	: 150
Hole depth	: 10.5 m
Bench height	: 10 m
Burden	: 4.0 m
Spacing	: 6.0 m
Explosive per hole	: 140 kg
Total charge	: 21,000 kg
Charge per delay within 8 ms	: 420 kg (3×140)
Effective charge per delay	: 202 kg (3^1/3×140)
Designed charge factor	: 0.58 kg/m^3
Duration of the blast	: 1796 ms

Figure A2. Recommended blast design and charging pattern of holes for 10 m bench at Rampura Agucha Mine for more than 8 rows.

Annexure R-11

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(Council of Scientific & Industrial Research)
Barwa Road, Dhanbad – 826 015

REPORT ON

Advice for opimisation of blast design parameters for pre-split and production blasts at Rampura Agucha Mines for improved production, productivity with greater safety

PROJECT NO.: CNP/4084/2014-15

OCTOBER 2014

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NOTARY
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Gulabpura (Bhilwara)

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(Council of Scientific & Industrial Research)
Barwa Road, Dhanbad – 826 015

REPORT ON

Advice for opimisation of blast design parameters for pre-split and production blasts at Rampura Agucha Mines for improved production, productivity with greater safety

BY

Dr. M. P. Roy,	**Sr. Scientist & Project Leader**
Dr. P. K. Singh,	**Sr. Principal Scientist & Project Co-ordinator**
Dr. P. Pal Roy,	**Scientist In-charge**
Dr. A. Sinha,	**Director**

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Gulabpura (Bhilwara)

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NOTE

This report is meant for internal use of the sponsor of the study and it should not be published in full or part by the sponsor. It should not be communicated or circulated to outside parties except concern departments. However, CSIR-CIMFR reserves the right to publish the results of the investigation for the benefit of the mining industry.

The recommendations are based on the results of investigation carried out at Rampura Agucha Mines, Hindustan Zinc Limited. It is hoped that the recommendations will be implemented to get the optimum results without hampering production, productivity and safety of the mine. The recommendations are guidelines, which should be implemented in letter and spirit.

Since, the day-to-day blasting operations are not in the control of CSIR-CIMFR, the research team will not be held responsible for any untoward incident caused due to blasting.

Murari Prasad Roy 31/10/14
(Dr. M. P. Roy)
Senior Scientist &
Project Leader

P K Singh 31.10.2014
(Dr. P. K. Singh)
Senior Principal Scientist &
Project Co-ordinator

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EXECUTIVE SUMMARY

This report relates to the study conducted by CSIR-Central Institute of Mining & Fuel Research, Dhanbad to advice on controlled blasting pattern for pre-split and production blasts at Rampura Agucha Mines to control ground vibration, air overpressure/noise and flyrocks within safe limits for the safety & long term stability of pit-walls and houses/dwellings situated nearby the mine while ensuring improved production and productivity. The study involved monitoring of impact of blasts conducted with varying blast designs and charging patterns on the nearby structures. The results of investigation, analyses of data and recommendations, made thereof, are summarised below:

- Fifteen blasts were conducted and attempts were made to record 64 ground vibration data at different locations of Bherukehda village-1 and Bherukheda village-2.

- The maximum vibration recorded at Turning point of Bherukheda village -1 was 3.78 mm/s with dominant peak frequency of 32.5 Hz. The blast was conducted at 197/83 HW & FW Ore N ACR and was detonated with explosive weight per delay of 883 kg. The total explosive weight fired was 59,260 kg. The computed effective explosives weight per delay was 423 kg. The trigger level of the seismographs deployed at Bherukheda village-2 to record vibration were pre-set at 0.5 mm/s but none of them recorded any data. Hence, it is presumed that the incoming blast vibration in the Bherukheda village-2 were less than 0.5 mm/s.

- The recorded frequencies of vibrations were in the range of 10.1- 91.1 Hz. The Fast Fourier Transform (FFT) analyses of vibration data revealed that the concentrations of vibration energy were in the range of 13.4 – 26.5 Hz. Thus, the safe level of vibration has been taken as 10 mm/s for the safety of houses/structures not belonging to the mine and 15 mm/s for the safety of structures belonging to the mine as per DGMS standard.

- The maximum level of air over-pressure recorded at Bherukheda village-2 road was 126.3 dB(L) due to blast conducted at 197/83 HW & FW Ore N ACR. The blast was initiated with Nonel initiation system and explosive detonated in this blast round was 59,260 kg and explosive weight per delay was 883 kg.

- All the recorded vibration and air overpressure data at concerned locations were well within the safe limits. There was no ejection of flyrocks during the study period. The rock fragmentations achieved during the study period were excellent.

- The blast designs practiced during the study period resulted into excellent blast results. The suggested blast designs given in Annexure A1-A3 should be followed in day-to-day blasting operations with judicious modifications, if required.

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RAMPURA AGUCHA MINE

1. Introduction

The Senior Manager (Commercial), Rampura Agucha Mines, Hindustan Zinc Limited entrusted CSIR-Central Institute of Mining & Fuel Research (CIMFR), Dhanbad vide Service order no. 2014.1015/5100015207 dated 24.05.2014 for a scientific study and advice for optimization of blast design parameters for pre-split and production blasts at Rampura Agucha Mines to control ground vibration, air overpressure/noise and flyrocks within safe limits for the safety of houses/dwelling nearby the mine with improved production and productivity.

The Blasting Research team of CSIR-CIMFR carried out field investigations during October 18-22, 2014. Altogether, 15 blasts were conducted at overburden benches of Hang wall, Foot wall and at Ore benches. Blast induced ground vibration and air over-pressure/noise were monitored at various locations in the periphery of the Rampura Agucha Mines. The monitoring locations were at the boundary and in the Bherukheda-1 and Bherukheda-2 villages.

2. Location and geology

Rampura Agucha Mine is located at 225 km North-Northeast of Udaipur, Rajasthan and is the largest & richest Lead Zinc deposit in India containing ore reserves and resources of 107.33 million tonnes grade of 13.9 % zinc & 2 % lead. Rampura Agucha is a stratiform, sediment-hosted Lead Zinc deposit, occurs in Pre-Cambrian Banded Gneissic complex and forms a part of Mangalwar complex of Bhilwara geological cycle (3.2-2.5 billion years) of Archean age and comprising of magmatites, gneisses, graphite mica schist, pegmatite and impure marble. The rocks have been subjected to polyphase deformations and high-grade metamorphism. The Rampura-Agucha mixed sulphide deposit is a massive lens shaped ore body with a NE-SW strike length of 1500 m and a width varying from a few metres in the NE direction widening to as much as 120 m in the central to SW section.

The area is geologically complex. The majority of the country rock is a gneiss of moderate strength, with a pervasive foliation and lenses of minor rock units (intrusions of stronger amphibolites and pegmatite) uniformly dipping at approximately 70° to 90° to the east at upper elevations and, in the northern part of the pit, down to about 50° to the east at lower elevations. The massive sulphidic mineralized unit is broadly conformable with the host rock units and foliation. Along the footwall side of the ore body, a major mylonite zone occurs. This is wide in the northern part of the pit and moves out of the pit in the south. The ore body, which dips from 50° to 70° towards SE has been drilled and proved to a depth of 1065 m from surface. The overview of benches of Rampura Agucha Mines is presented in Photograph 1.

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Photograph 1. Overview of the Rampura Agucha Mines.

3. Instrumentations

Blast induced vibrations were monitored by seismographs namely MiniMate Plus and MiniMate DS-077 (Made in Canada by M/s Instantel Inc.). The MiniMate plus is an eight/four channel seismograph provided with two/one tri-axial transducer for monitoring vibration (in mm/s) and two/one channel for monitoring air over-pressure/noise in dB(L) or Pa. MiniMate DS-077 is a four channel seismograph provided with one tri-axial transducer for monitoring vibration (in mm/s) and one channel for monitoring air over-pressure/noise in dB(L) or Pa . All the seismographs record vibration in three directions i.e. Longitudinal (L), Vertical (V) and Transverse (T). They also record peak frequency of vibration and compute the peak vector sum of the vibration. Blast face profiling was performed with Leica DISTO D810 touch (Made in Switzerland by M/s Leica Geosystems AG Pvt. Limited) before blasting. The Leica DISTO D810 touch is capable of profiling the blast face in two dimensions.

4. Blasting details

Altogether, 15 blasts were conducted at Hang wall, Foot wall and ore benches of the mine. Out of 15 blasts, nine blasts were conducted at hang wall benches, one blast at foot wall bench and rest five blasts at ore benches. The number of holes detonated in a blasting round varied from 11 to 352. The diameters of blast holes were of 115 and 165 mm. The depth of holes varied from 10 to 18 m and the explosives loaded in a hole ranged from 5.4 to 555 kg. The explosives weight per delay ranged in between 70 and 883 kg. Total explosive weight detonated in a blast round varied between 70 and 69,300 kg. The cast boosters of 400 to 500 gm were provided in each hole for hole depth of 10 m or more. Unitronic electronic delay detonators were used in three blasts, whereas nine blasts were conducted with Nonel initiation systems. The down-the-hole timing was 450 ms in Nonel tubes. Trunk line delays of 17, 25,

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42, 65 and 100 ms were used for surface connections. The pre-split blasts were initiated with D-cord.

Details of blast design parameters experimented are given in Annexure as Table A1. Vibrations were monitored in terms of peak particle velocity (PPV) that varied from 0.587 mm/s to 3.78 mm/s depending upon the distance of measuring transducers of seismographs from the blasting face and the amount of explosives detonated in a particular delay of the blast. The vibration measuring distances varied from 964 to 2638 m. The recorded levels of air over-pressure ranged from 91.5 to 126.3 dB(L). Recorded blast induced ground vibrations and air over-pressure data are presented in Annexure as Table A2. Blast detonation sequences were photographed for each blast to document the ejection of flyrocks.

5. Blast vibration monitoring and analyses

The vibration monitoring locations were finalised in consultation with mine officials. The blast induced ground vibrations recorded were in the range of 0.587 - 3.78 mm/s. The maximum vibration recorded was 3.78 mm/s at turning point of Bherukheda village - 1 with associated dominant peak frequency of 32.5 Hz from the blast conducted at 197/83 HW & FW Ore N ACR bench. The total explosives detonated in this blast round and the explosive weight per delay was 59,260 kg and 883 kg respectively. The maximum vibration recorded in or nearby Bherukheda village -2 was 3.64 mm/s with dominant peak frequency of 25.9 Hz at Bherukheda village -2 Road from the above mentioned blast. The maximum vibration recorded in the house of Mr. Maangu ji in Bherukheda village - 1 was 1.43 mm/s with dominant peak frequency of 45 Hz from the blasts conducted at 150/40 HW S ALG CUT-01, and pre-split bench 160/50 HW S ALG P/S. The total explosives detonated in this blast round and the explosive weight per delay was 24,178 kg and 548 kg respectively. The blast conducted at 197/83 HW & FW Ore N ACR bench produced the maximum level of air over-pressure/noise in Bherukheda village -2 and was 126.3 dB(L) from the blast conducted at a distance of 1134 m. The blast wave signature recorded near Turning point of Bherukheda village-1 is presented in Figure 1 and its Fast Fourier Transform analyses of their frequencies are presented in Figure 2. The blast wave signature of maximum peak particle velocity recorded at the house of Mr. Maangu Ji of Bherukheda village - 1 is depicted in Figure 3 and the Fast Fourier Transform (FFT) analyses of their frequencies are presented in Figure 4. It is evident from the recorded blast vibration data at different locations that concentration of vibration energy is within 10.1-91.1 Hz and the most common range is 13.4-26.5 Hz. The view of vibration monitoring locations in the periphery of the mine is presented in Photograph 2. Figure 5 depicts the dominant peak frequencies recorded with their corresponding monitoring points.

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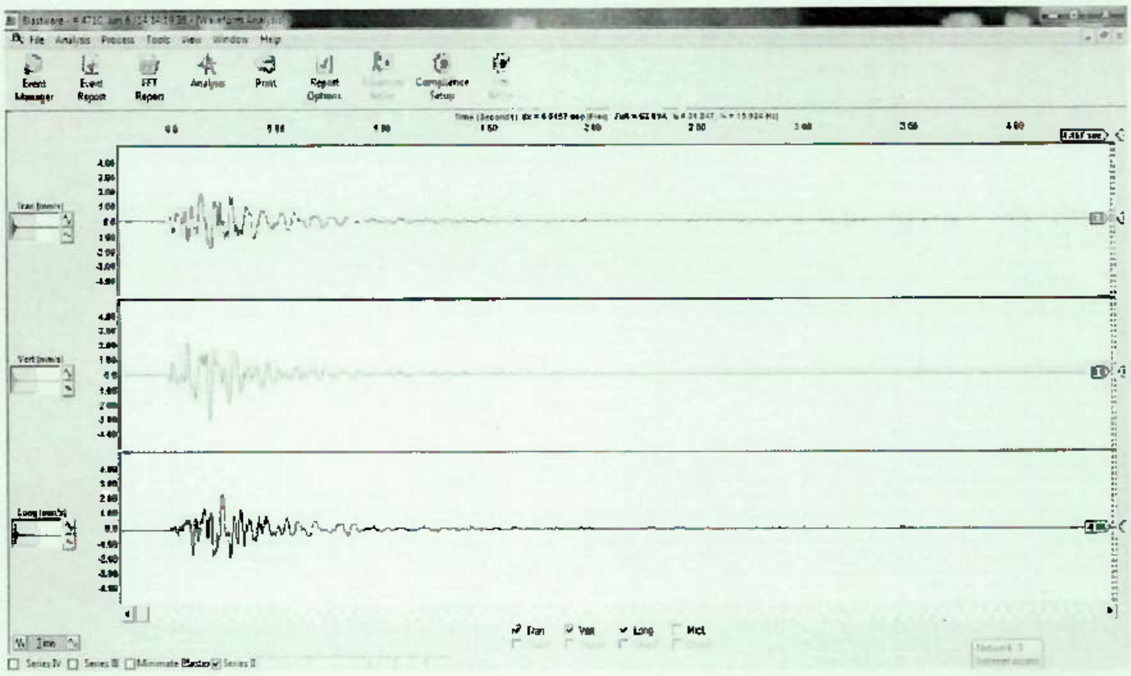

Figure 1. Blast time history recorded at the turning point of Bherukheda village – 1 at 974 m from the blast conducted at 197/83 HW & FW Ore N ACR bench on 18.10.2014.

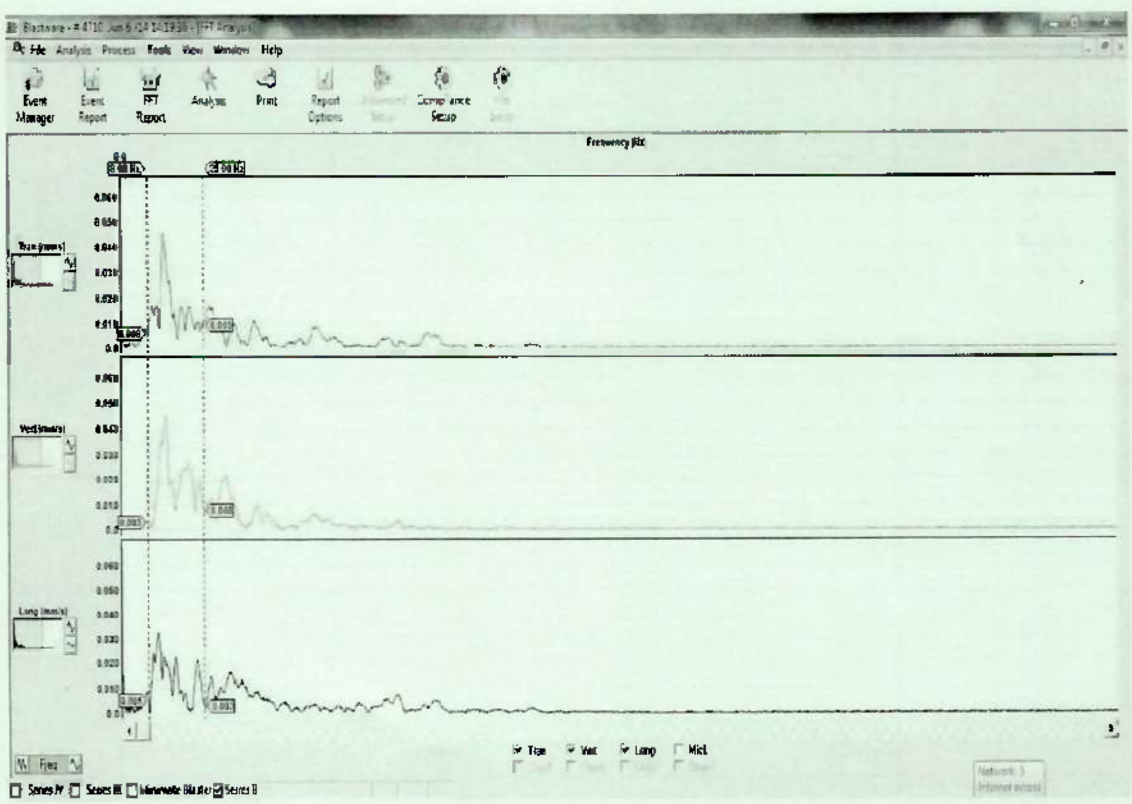

Figure 2. FFT analyses of frequency of vibration signature shown in Figure 1.

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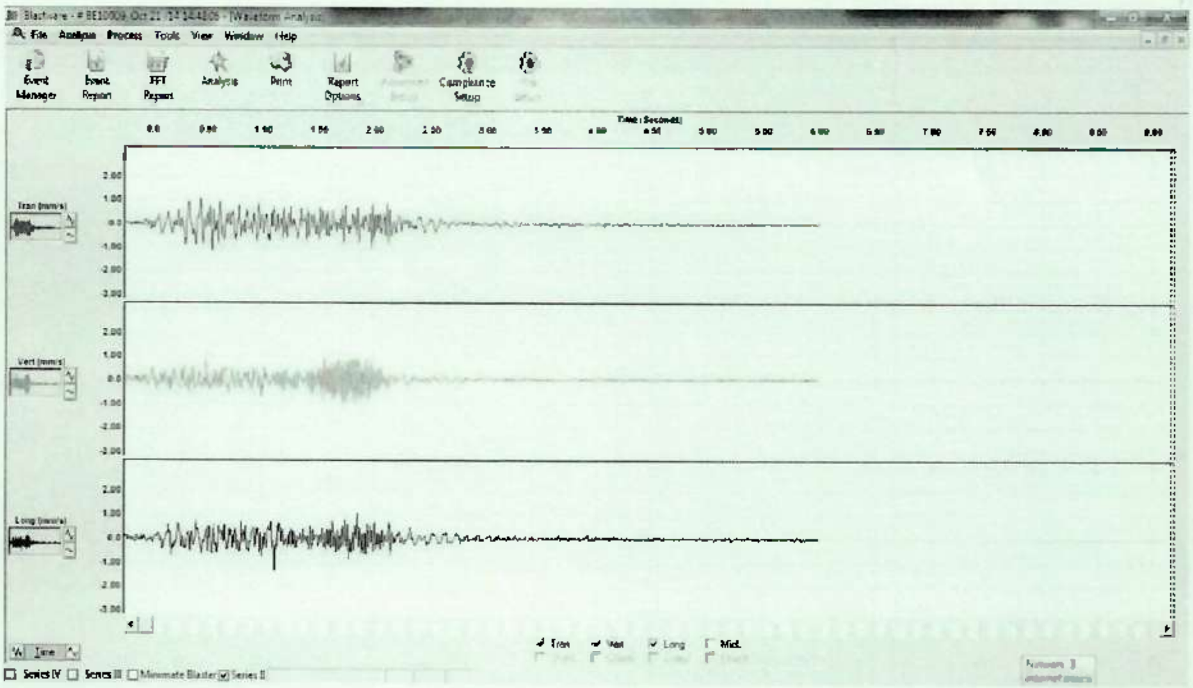

Figure 3. Blast time history recorded at the house of Mr. Maangu ji in Bherukheda village–1 at 1093 m from the blast conducted at 150/40 HW S ALG CUT-01, and 160/50 HW S ALG P/S benches on 21.10.2014.

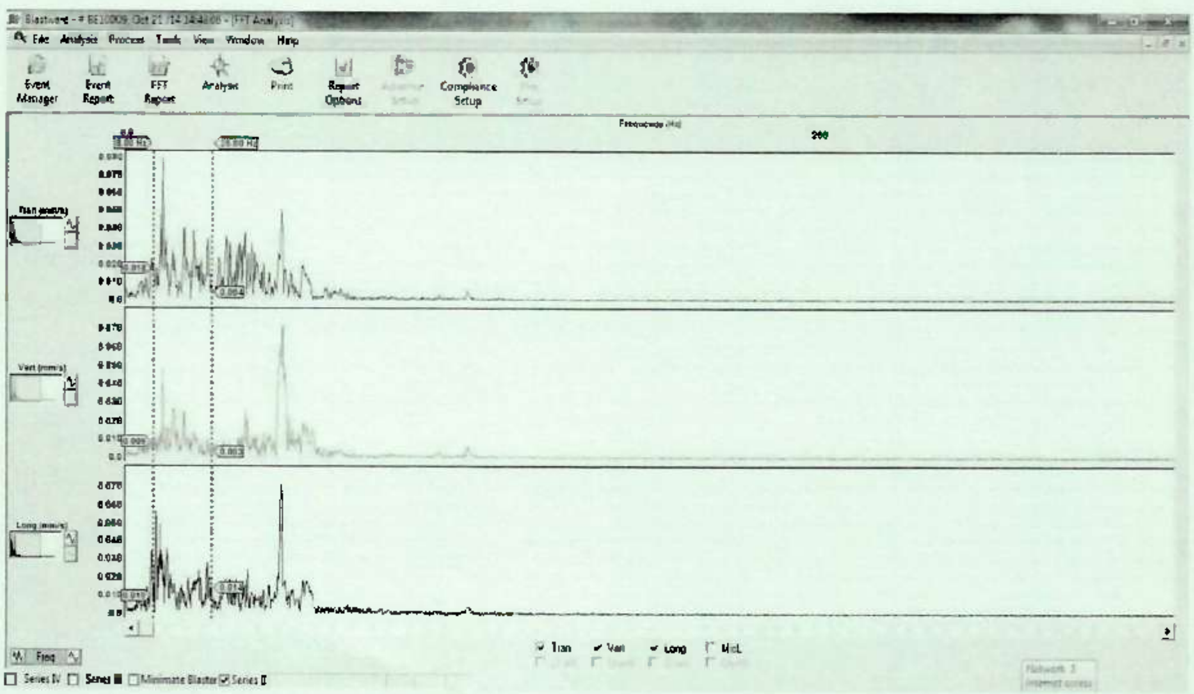

Figure 4. FFT analyses of frequency of vibration signature shown in Figure 3.

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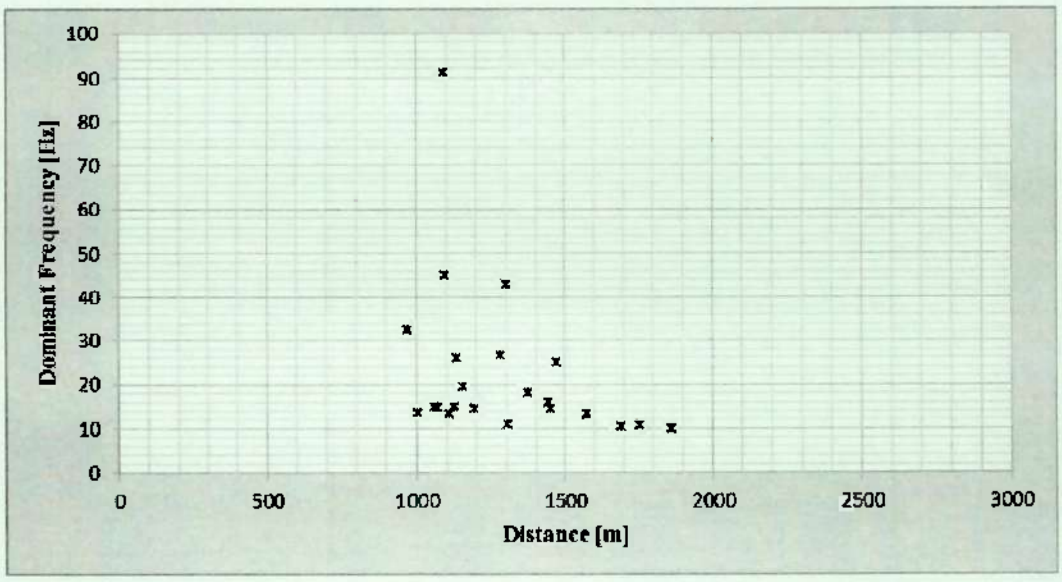
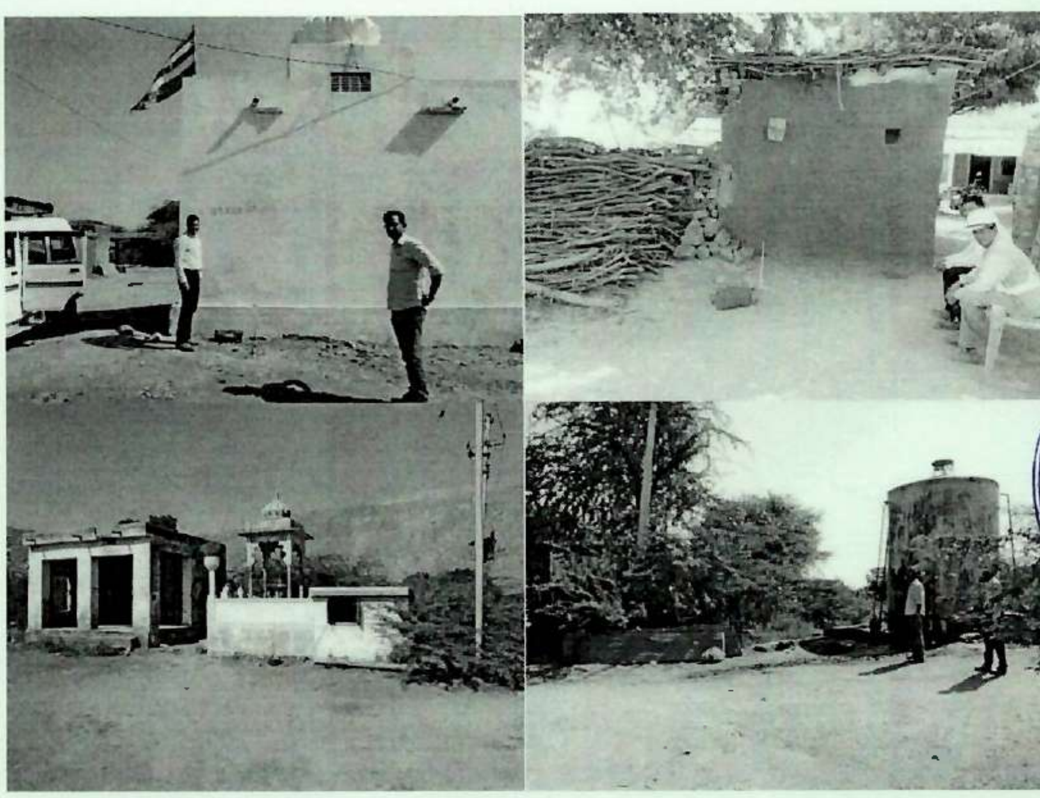


Figure 5. Plot of dominant peak frequencies recorded with their corresponding monitoring points at Rampura Agucha Mine, HZL, Rajasthan.



Photograph 2. Monitoring of vibration at different Locations of Bherukheda village - 1 and Bherukheda village - 2.

Statistical analysis of ground vibration data were accomplished by grouping the data together. An empirical relationship has been established correlating the maximum explosive weight per delay (Q_{max} in kg), distance of vibration measuring transducers from the blasting face (R in m) and recorded peak particle velocity (v in mm/s). The existing practice for calculation of maximum explosive weight in a delay for a blast is by simply adding the explosives detonated in a delay (less than 8 ms) within one hole or in several holes. The concept of effective charge per delay was accomplished for analysis of the vibration data. The concept the effective charge per delay has been explained in previous reports and is as follows:

$$Q_{\max(Effetive)} = N^{1/3} * Q_{avg}$$

Where, N is the number of holes fired in a delay and

Q_{avg} is the average amount of explosive in a hole.

In this study, both the concepts of calculation of maximum explosive weight per delay were taken into consideration. The established equation for the mine considering the concept of simply adding the explosives detonated within 8ms of delay interval in single or in multi holes is given in equation 1. Regression equation 2 has been established based on considering the concept of effective charge per delay:

$$v = 110.34 * \left(\frac{R}{\sqrt{Q_{\max}}} \right)^{-1.076} \quad (1)$$

Coefficient of determination (R^2) = 0.762

Where,

v = Peak particle velocity (mm/s)

R = Distance between vibration monitoring point and blasting face (m)

Q_{max} = Maximum explosive weight per delay (kg)

$$v = 120.37 * \left(\frac{R}{\sqrt{Q_{\max-effective}}} \right)^{-1.034} \quad (2)$$

Coefficient of determination (R^2) = 0.751

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Where,

v = Peak particle velocity (mm/s)

R = Distance between vibration monitoring point and blasting face (m)

$Q_{max-effective}$ = Effective maximum explosive weight per delay (kg)

The above equations are site specific and applicable only for Rampura Agucha Mine. It may be used to compute the conventional maximum explosive weight and effective maximum explosive weight to be detonated in a delay for distances of concerned from the blasting site. However, for convenience the explosive weight to be detonated in a delay for various distances is given as Table A3. The regression plot of vibration data considering both the concept of calculation of explosive weight per delay recorded at their respective scaled distances is presented in Figures 6 & 7.

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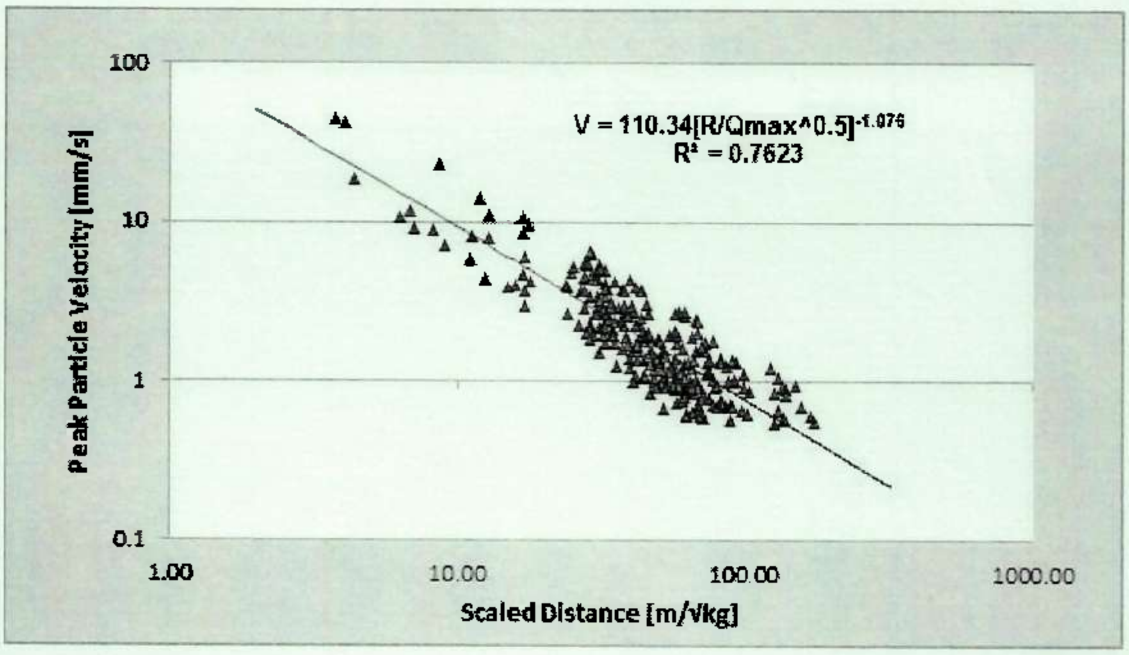

Figure 6. The regression plot of the vibration data considering conventional explosive weight per delay within 8 ms delay interval.

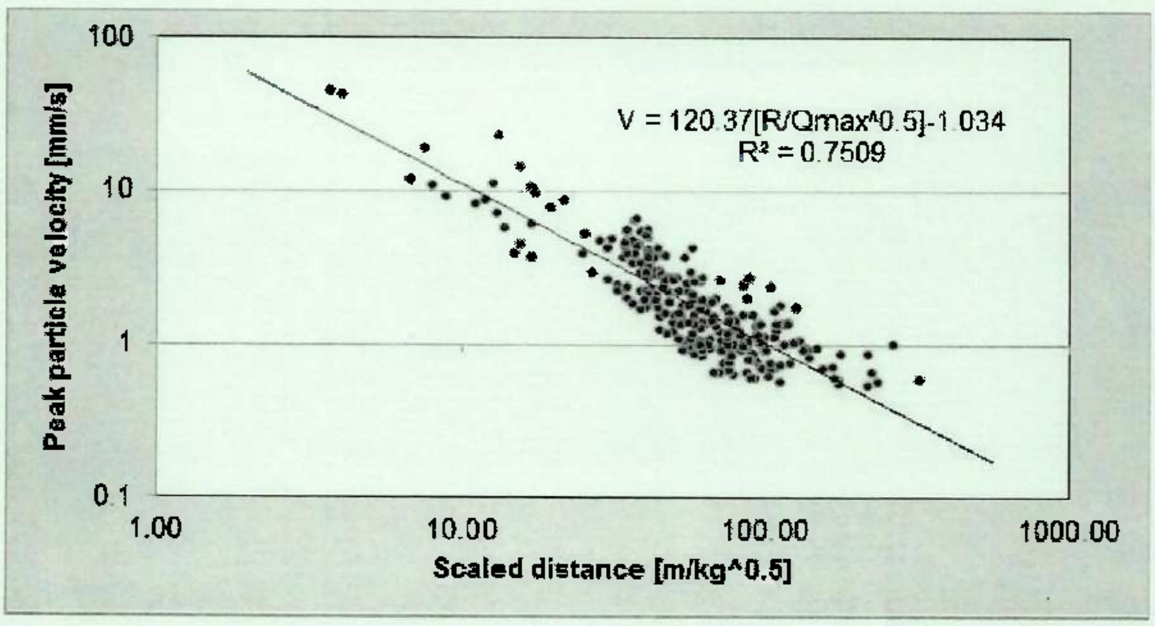

Figure 7. The regression plot of the vibration data considering effective explosive weight per delay.

6. Existing vibration standard and criteria to prevent damage

Peak particle velocity (PPV) has been globally used in practice for assessment of blast induced damage to the structures. Different countries adopt different standards depending on their type of industrial/residential buildings. In India, presently DGMS technical circular 7 of 1997 is considered as vibration standard for the safety of surface structures in mining areas. The DGMS standard is given in Table 1.

Table 1. DGMS technical circular 7 of 1997 concerning to blast vibration standard in mm/s.

Type of structure	Dominant excitation frequency, Hz		
	< 8 Hz	8-25 Hz	> 25 Hz
(A) Buildings/structures not belong to the owner			
1. Domestic houses/structures (Kuchcha, brick & cement)	5	10	15
2. Industrial buildings	10	20	25
3. Objects of historical importance and sensitive structures	2	5	10
(B) Buildings belonging to owner with limited span of life			
1. Domestic houses/structures	10	15	25
2. Industrial buildings	15	25	50

7. Air over-pressure/noise

Air overpressure in the mining or quarrying context is the superposition of a number of impulsive air pressures as a result of the detonation of explosive. Air over-pressure can be measured in pressure unit as well as sound pressure level (SPL).

$$SPL(dB) = 20\log\left({p}/{p_0} \right)$$

Where, p = measured over-pressure in Pascal (pa)

p_0 = reference pressure level of the lowest sound that can be heard, i.e., zero dB = 2 x 10^{-5} pa.

United State Bureau of Mines (USBM) has correlated the damage due to air over-pressure. The recommended values are given below:

Over-pressure [dB(L)]	Over-pressure [Kpa]	Air Blast Effects
177	14	All windows break
170	6	Most windows break
150	0.63	Some windows break
140	0.20	Some large plate glass windows may break, desk and windows rattle
136	0.13	USBM interim limit for allowable air blast
126	0.05	Complaints likely

The recorded levels of air over-pressure were in between 91.5 to 126.3 dB(L). The maximum level of air over-pressure recorded in Bherukheda village-2 Road and was 126.3 dB(L) due to blast conducted at 197/83 HW & FW Ore N ACR bench. The explosive detonated in this blast round was 59,260 kg and explosive weight per delay was 883 kg. Unitronic electronic delay detonator and nonel delay detonator were used to initiate the production blasts while D-cord was only used to initiate pre-split blasts.

8. Study report on blast vibration effects on structures

Generation and propagation of ground vibrations have been studied extensively to determine the effects of blast design and geology on vibration amplitude and frequency. The impact of vibration on the structures has been studied by many researchers. The guidelines for threshold limit of vibration for the safety of structures have been stipulated by many countries. Traditionally, peak particle velocity (PPV) and its corresponding frequency have been used in practice for the measurement of blast damage to the structures. In this criterion the shape of the waveform and duration of dynamic loading are not taken into account. However, the energy input to the rock mass is determined not only from the amplitude but also from the time duration of the vibration pulse.

A S&T Project study entitled "Standardisation of blast vibration damage threshold for the safety of residential structures in mining area" of Ministry of Coal, Govt. of India was carried out by the authors of this report during 2002-2006. In this study an attempt was made to document the initiation of cracks due to blasting in the three types of structures constructed for the study purpose at two mine site in India. Measurements were made of motions in the structure produced by the ground borne vibration for assessment of potentially damaging blasts. Not only the crack initiations were documented but the continued study of about twenty months helped enable to record the cosmetic cracks, minor damage and major damage to the structures due to blasting at both the experimental sites.

The brick-mud wall with cement plaster and RCC test structures were whitewashed with distemper so that the cosmetic cracks can be visually observed. The test structures were closely inspected visually. Photographs were also taken with the help of digital and video camera for the existing cracks and newly formed cracks in the structures after each of the blasts. In all the test structures made for the purpose at Sonepur Bazari and Kusmunda opencast mines, damages were observed. In total, 341 blasts were conducted and 1871 vibrations data were recorded along with damages, if any, at both the experimental sites. The level of damage in the test structures were influenced by peak particle velocity and its associated frequency. The effects of repeated blasting also played significant role in extending the existing cracks in the structures.

Based on the observed damages an attempt has been made to classify them based on the peak particle velocity with associated dominant peak frequency. The damages were classified in four categories. These are No damage, Cosmetic damage, Minor damage and Major damage. No damage was below the cosmetic damage level and reported as threshold limit of vibrations for the safety of residential buildings/ structures in mining areas.

Table 2. Damage classification.

Uniform Classification	Description of damage
Threshold limit	Visually no crack/deformation in the wall of the structure due to blasting.
Cosmetic damage	Loosening of paint; small plaster cracks at joints between construction elements; initiation of hairline cracks, lengthening of old cracks.
Minor damage	Loosening and falling of plaster; cracks in masonry around openings near partitions; hairline to 3- mm cracks, falls of loose mortar/plaster.
Major damage	Cracks of several mm in walls; rupture of opening vaults; structural weakening; fall of masonry; detachment of bricks from the walls etc.

Table 3. Details of damage levels in different types of structures at Sonepur Bazari and Kusmunda opencast mines.

Type of structure	**Cosmetic cracks with dominant peak frequency**	**Minor damage level with dominant peak frequency**	**Major damage level with dominant peak frequency**	**Maximum Amplification of vibration**
Sonepur Bazari Project, ECL				
Mud structure	-	55.0 mm/s, 4.38 Hz	87.1 mm/s, 6.13 Hz	1.74
Brick-mud structure	56.3 mm/s, 6 Hz	81.0 mm/s, 8.4 Hz	99.6 mm/s, 7.4 Hz	2.75
Ground floor of the RCC structure	71.3 mm/s, 5.0 Hz	No minor cracks	No major cracks	3.08
First floor of the RCC structure	71.2 mm/s, 6.2 Hz	98.3 mm/s, 5.6 Hz	128.9 mm/s, 14.1 Hz	5.21
Kusmunda Project, SECL				
Mud structure	-	56.1 mm/s, 21.1 Hz	104 mm/s, 18.9 Hz	1.95
Brick-mud structure	51.6 mm/s, 19.8 Hz	89.7 mm/s, 19.5 Hz	113 mm/s, 7.5 Hz	2.63
Ground floor of the RCC structure	68.6 mm/s, 18.1 Hz	104 mm/s, 6.0 Hz	122 mm/s, 13.4 Hz	2.95
First floor of the RCC structure	72.2 mm/s, 17.3 Hz	118 mm/s, 19.5 Hz	161 mm/s, 14.0 Hz	5.03

9. Human response to blast vibration

The responses of human beings to vibrations are important when standards are based on annoyance, interference, work proficiency and health. Human beings notice and react to blast induced vibrations at levels that are lower than the damage thresholds. It is impossible to establish a vibration level where nobody will complain. There are always some persons in a population who will complain no matter how small the disturbance is. Several researchers

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Rajesh Kumar Mehta
Gulabpura (Bhilwara)

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recognised that the duration of the vibration was critical. Most evident was that a higher level could be tolerated if the event was of short duration. Consequently, steady state vibration data could not be realistically applied to blasting except for events that exceed several seconds.

10. Causes for cracks other than blasting

Most structures have cracks of some kind unusually due to normal environmental stress. When blasting comes in to the area, it usually gets credit for these environmentally induced cracks.

Cracking is a normal occurrence in the walls and ceilings of structures, and the causes are multiple, ranging from poor construction to normal environmental stress, such as thermal stress, wind etc. The Small Home, Published by the Architects Small Home Services Bureau of the United States, USA gave a list of reasons for the development of cracks in the buildings other than blasting. These are as follows.

- Failure to make the footings wide enough.
- Width of footings not made proportional to loads to carry.
- The posts in the basement not provided with separate footings.
- Not enough cement used in the concrete.
- Dirty sand or gravel used in the concrete.
- Failure to protect beams and sills from rotting through dampness.
- Setting floor joists one end on masonry and the other end on wood.
- Wooden beams used to support masonry over openings.
- Braces omitted in wooden walls.
- Drainage water from roof not carried away from foundations.
- Sub-flooring omitted.
- Poor materials used in plasters.
- Plaster applied too thin.
- Metal reinforcement omitted in plaster at corner.
- Sub-soil drainage not carried away from walls.
- First coat of plaster not properly keyed to backing.
- Floor joints placed too far apart.
- Wood beams spanned too long between posts.
- Failure to use double joists under unsupported partitions.
- Failure to erect trusses over wide wooden openings.

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11. Conclusions and recommendations

- Altogether, 15 blasts were conducted and 64 ground vibration data were recorded at different locations of Bherukheda village-1 and Bherukheda village-2.

- The blast conducted at 197/83 HW & FW Ore N ACR bench with explosives weight per delay of 883 kg generated the maximum level of vibrations at Bherukheda village-1 and Bherukheda village -2. The maximum vibration recorded at Bherukheda village -1was

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3.78 mm/s with dominant peak frequency of 32.5 Hz and in Bherukheda village-2 Road side the maximum vibration recorded was 3.64 mm/s with dominant peak frequency of 25.9 Hz.

- ❖ The maximum level of air over-pressure recorded in Bherukheda village- 2 near road was 126.3 dB(L) due to blast conducted at197/83 HW & FW Ore N ACR bench. The explosive detonated in this blast round was 59,260 kg and explosive weight per delay was 883 kg. Electronic delay detonators, Nonel initiation system and proper stemming reduces the amplitude air over-pressure to a greater extent and improve the blasting performance too. The threshold level of air over pressure/noise is 136 dB(L) as per USBM standard.

- ❖ The recorded frequencies of vibrations were in the range of 10.1-91.1 Hz. The Fast Fourier Transform (FFT) analyses of vibration data revealed that the concentrations of vibration energy were in the range of 13.4-26.5 Hz. Thus, the safe level of vibration has been taken as 10 mm/s for the safety of houses/structures not belonging to the mine and 15 mm/s for the safety of houses/structures belonging to the mine as per DGMS standard.

- ❖ All the recorded blast vibration and air overpressure data at concerned locations were well within the safe limits. There was no ejection of flyrocks during the study period. The rock fragmentations achieved during the trial blasts were excellent.

- ❖ The propagation equation for the prediction of blast vibration by applying the concept of effective charge weight per delay has been established. The permissible explosive weight per delay for various distances of houses/structures concerned may be computed from the equation given in the text. However, for ready reference, the explosive weight to be detonated in a delay for various distances is given as Table A3.

- ❖ The delay interval for the last two end holes of each rows (both sides) must be twice of the normal delay interval between the holes in order to avoid end breaks. The delay interval between the rows should be increased successively by 10-15% to avoid back breaks.

- ❖ The blast designs practiced during the study period yielded excellent blast results. However, the blast designs given in Annexure as Figures A1-A3 will further ensure the safety and long term stability of the pit walls and surrounding structures. The suggested blast designs should be followed in day-to-day blasting operations with judicious modifications.

Acknowledgements

The research team expresses his gratitude to the inhabitants of Bherukheda village-1 and Bherukheda village-2 for their co-operation in blast vibration and air overpressure monitoring. The research team also put on record the excellent support and help provided by the mine officials in field experiments.

Table A1. Summary of the blasts conducted at Rampura Agucha Mines, Hindustan Zinc Limited.

Blast No.	Date of blast	Location of blast	Hole dia. [mm]	No. of holes	Hole depth [m]	Burden [m]× Spacing [m]	Top stemming [m]	Avg. explosive in hole [kg]	Total explosives weight [kg]	Initiation system
1.	18.10.14	103/90 ORE S	152	49	13	3×4	3.5	171.4	8400	TLD-17,25,42 & 65ms & DTH- 450ms
2.	18.10.14	140/30 HW S ALG CUT-1+2	165	120	11	4×5.5	4.2	183	21960	TLD-17,25,42 & 65ms & DTH- 450ms
3.	18.10.14	150/40 HW S ALG P/S	115	15	12	Spacing- 1.2 m	2.0 m (without explosives)	10.4	156	D-cord
4.	18.10.14	340/30 HW N ALG	165	275	10.5	4×6	4.5	171.5	69300	Electronic delay detonator (EDD)
5.	18.10.14	197/83 HW + FW ORE N ACR	165	187	18	4×5	4.5	294.4	59260	TLD-17,25,42, 65 & 100ms & DTH- 450ms
6.	19.10.14	130/20 FW N ALG P/S	115	11	12.5	Spacing- 1.2 m	2.5 m (without explosives)	6.4	70	D-cord
7.	19.10.14	160/50 HW N ALG P/S	115	28	12	Spacing- 1.2 m	2.5 m (without explosives)	5.5	153	D-cord with cord relay of 25 ms
8.	19.10.14	150/40 HW S ALG P/S	115	13	12	Spacing- 1.2 m	2.5 m (without explosives)	5.4	70	D-cord
9.	20.10.14	100/90 ORE S ALG+ACR	165	65	11.5	4×4	3.5	180.8	11750	TLD-17,25,42, 65 & 100ms & DTH- 450ms

10.	20.10.14	140/30 HW S ALG Cut-1 + 140/30 HW S ALG P/S	165& 115	75+ 39	11.5& 12	4 ×5.5&spacing-1.2	4.2 & 2.5 m (without explosives)	203 &7	15505 (15230 + 275)	TLD-17,25,42, 65 & 100ms & DTH- 450ms+ D-cord
11.	20.10.14	150/40 HW S ALG TRIM + 150/40 HW S ALG P/S	165&115	68 + 7	11.5& 11.5	3-4×5.5 &spacing-1.2 m	4.2 & 2.5 m (without explosives)	166.7& 8.1	11397 (11340+ 57)	TLD-17,25,42, 65 & 100ms & DTH- 450ms+ D-cord
12.	21.10.14	100/90 ORE S ACR	165	78	12	3×4	3.5	179.6	14010	TLD-17,25,42, 65 & 100ms & DTH- 450ms
13.	21.10.14	150/40 HW S ALG CUT-01 +160/50 HW S ALG P/S	165 &115	131 + 40	11.5-12	4×5.5, & spacing-1.2 m	4.2 & 2.5 m (without explosives)	182.7, & 5.9	24,178 (23940+ 238)	TLD-17,25,42, 65 & 100ms & DTH- 450ms +D-cord
14.	22.10.14	100/90 ORE S ACR+ 100/90 S ACR P/S	165 & 115	50 + 27	11.5 &11.5	3×4&spacing-1.2 m	3.5 & 2.5 m (without explosives)	188.4 &6.7	9600 (9420 + 180)	TLD-17,25,42, 65 & 100ms & DTH- 450ms+ D-cord
15.	22.10.14	350/40 HW S ACR CUT-01 +340/30 HW S ALG P/S	165& 115	36 & 27	10 &11.5	4×6 &spacing-1.2 m	4.5 & 2.5 m (without explosives)	165 &6.7	6120 (5940 + 180)	EDD +D-cord

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Table A2. Blast induced vibration and air over pressure recorded in Bherukheda-1 and Bherukheda-2 villages due to the blast conducted at Rampura Agucha Mines, Hindustan Zinc Limited.

Blast No.	Date of blast	Location of blast	Total explosives fired in the blast round [kg]	Explosive weight per delay within 8 ms delay interval [kg]	Effective explosive weight per delay [kg]	Location of vibration measuring transducers	Distance of monitoring point from the blasting face [m]	Peak particle velocity (PPV) [mm/s]	Dominant Peak frequency [Hz]	Air over-Pressure dB(L)
1.	18.10.14	103/90 ORE S	8400	514 (3×171.4)	246 ($3^{1/3}$×171.4)	❖ Turning point of Bherukheda village-1	1338	< 0.5	-	-
						❖ Bherukheda village -2 Road	1550	< 0.5	-	-
						❖ Towards Bherukheda village -2 Road	1785	< 0.5	-	-
2.	18.10.14	140/30 HW S ALG CUT-1+2	21960	549 (3×183)	254 ($3^{1/3}$×183)	❖ Turning point of Bherukheda village I	1110	1.29	13.4	106
						❖ Bherukheda village -2 Road	1290	< 0.5	-	-
						❖ Towards Bherukheda village -2 Road	1417	< 0.5	-	-
3.	18.10.14	150/40 HW S ALG P/S	156	156	25 $15^{1/3}$×10.4)	❖ Turning point of Bherukheda village-1	1414	< 0.5	-	-
						❖ Bherukheda village -2 Road	1286	< 0.5	-	-
						❖ Towards Bherukheda village -2 Road	1691	< 0.5	-	-
4.	18.10.14	340/30 HW N ALG	69300	343 (2×171.5)	216 ($2^{1/3}$×171.5)	❖ Turning point of Bherukheda village-1	1061	2.63	14.9	115.6
						❖ Bherukheda village -2 Road	1124	1.11	14.9	114.0
						❖ Towards Bherukheda village - 2 Road	1321	< 0.5	-	-
5.	18.10.14	197/83 HW + FW ORE N ACR	59260	883 (3×294.4)	423 ($3^{1/3}$×294.4)	❖ Turning point of Bherukheda village-1	974	3.78	32.5	100.0
						❖ Bherukheda village -2 Road	1134	3.64	25.9	126.3
						❖ Towards Bherukheda village -2 Road	1301	1.95	42.9	120.0
6.	19.10.14	130/20 FW N ALG P/S	70	70	14 $11^{1/3}$×6.4)	❖ Bherukheda village -1 Temple	964	<0.5	-	-
						❖ Mr. Maangu Ji house Bherukheda -1	1031	<0.5	-	-
						❖ Turning point of Bherukheda village I	1104	< 0.5	-	-
						❖ Bherukheda village -2 Road	1289	< 0.5	-	-
						❖ Towards Bherukheda village -2 Road	1541	<0.5	-	-

7.	19.10.14	160/50 HW N ALG P/S	153	153	17 ($28^{1/3}$×5.5)	❖ Bherukheda village -1 Temple	1090	1.0	91.1	100.0
						❖ Mr. Maangu Ji house, Bherukheda -1	1144	< 0.5	-	-
						❖ Turning point of Bherukheda village-1	1283	< 0.5	-	
						❖ Bherukheda village -2 Road	1554	< 0.5	-	
						Towards Bherukheda village -2 Road	1764	< 0.5	-	
8.	19.10.14	150/40 HW S ALG P/S	70	70	13 ($13^{1/3}$×5.4)	❖ Bherukheda villag e-1 Temple	1155	0.587	19.4	106.0
						❖ Mr.Maangu Ji house Bherukheda -1	1179	< 0.5	-	-
						❖ Turning point of Bherukheda village-1	1356	< 0.5	-	-
						❖ Bherukheda village -2 Road	1634	< 0.5	-	-
						❖ Towards Bherukheda village -2 Road	1859	< 0.5	-	-
9.	20.10.14	100/90 ORE S ALG+ACR	11750	542 (3×180.8)	260 ($3^{1/3}$×180.8)	❖ Bherukheda village -1 Temple	1451	1.04	14.5	91.5
						❖ Mr. Maangu Ji house Bherukheda -1	1471	0.6	25	122.4
						❖ Bherukheda village -2 Road	1973	< 0.5	-	-
						❖ Towards Bherukheda village -2 Road	2124	< 0.5	-	-
						❖ Bherukheda village -2 Water Tank	2316	< 0.5	-	-
						❖ Bherukheda village -2 Temple	2522	< 0.5		-
10.	20.10.14	140/30 HW S ALG Cut-1 + 140/30 HW S ALG P/S	15505 (15230 + 275)	609 (3×203)	282 ($3^{1/3}$×203)	❖ Bherukheda villag e-1 Temple	1279	1.16	26.5	100.
						❖ Mr. Maangu Ji house Bherukheda -1	1304	0.667	11	0
						❖ Bherukheda village -2 Road	1800	< 0.5	-	122.
						❖ Towards Bherukheda village - 2 Road	1974	< 0.5	-	3
						❖ Bherukheda village -2 Water Tank	2148	< 0.5	-	-
						❖ Bherukheda village -2 Temple	2354	< 0.5	-	--
11.	20.10.14	150/40 HW S ALG TRIM + 150/40 HW S ALG P/S	11397 (11340+ 57)	500 (3×166.7)	240 ($3^{1/3}$×166.7)	❖ Bherukheda village -1 Temple	1069	1.52	14.6	100.0
						❖ Mr. Maangu Ji house Bherukheda -1	1192	1.43	14.5	91.5
						❖ Bherukheda village -2 Road	1691	1.35	10.5	112.0
						❖ Towards Bherukheda village -2 Road	1861	1.33	10.1	115.6
						❖ Bherukheda village -2 Water Tank	2037	< 0.5	-	-
						❖ Bherukheda village -2 Temple	2243	< 0.5	-	--

12.	21.10.14	100/90 ORE S ACR	14010	539 (3×179.6)	258 ($3^{1/3}$×179.6)	❖ Bherukheda village -1 Temple	1373	0.953	18.1	100.0
						❖ Mr. Maangu Ji Bherukheda -1	1444	0.801	16	< 88
						❖ Bherukheda village -2 Road	1945	< 0.5	-	-
						❖ Towards Bherukheda village -2 Road	2056	< 0.5	-	-
						❖ Bherukheda village -2 Water Tank	2289	< 0.5	-	-
						❖ Bherukheda village - 2 Temple	2495	< 0.5	-	-
13.	21.10.14	150/40 HW S ALG CUT-01 + 160/50 HW S ALG P/S	24178 (23940+ 238)	548 (3×182.7)	263 ($3^{1/3}$×182.7)	❖ Bherukheda village -1 Temple	1002	1.68	13.6	106.0
						❖ Mr. Maangu Ji house Bherukheda -1	1093	1.43	45	114.0
						❖ Bherukheda village -2 Road	1575	1.34	13.4	91.5
						❖ Towards Bherukheda village - 2 Road	1753	1.10	10.8	114.0
						❖ Bherukheda village -2 Water Tank	1930	< 0.5	-	-
						❖ Bherukheda village - 2 Temple	2136	< 0.5	-	-
14.	22.10.14	100/90 ORE S ACR + 100/90 S ACR P/S	9600 (9420 + 180)	565 (3×188.4)	271 ($3^{1/3}$×188.4)	❖ Bherukheda village - 2 Water Tank	2432	< 0.5	-	-
						❖ Bherukheda village - 2 Temple	2638	< 0.5	-	-
15.	22.10.14	350/40 HW S ACR CUT-01 + 340/30 HW S ALG P/S	6120 (5940 + 180)	330 (2×165)	207 ($2^{1/3}$×165)	❖ Bherukheda village - 2 Water Tank	1980	< 0.5	-	-
						❖ Bherukheda village - 2 Temple	2185	< 0.5	-	-

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Table A3. Recommended explosives weight to be detonated in a delay at Rampura Agucha Mines, Hindustan Zinc Limited taking 10 mm/s as safe limit of vibration for the safety of houses/structures concerned.

Distance of structures from the blast face [m]	Conventionally computed maximum explosive weight to be detonated in a delay within 8 ms [kg]	Effective maximum explosive weight to be detonated in a delay within 8 ms [kg]
300	1038	732
400	1845	1301
500	2883	2032
600	4151	2926
700	5650	3983
800	7379	5202
900	9339	6584
1000	11530	8129
1100	13951	9836
1200	16603	11705
1300	19486	13738
1400	22599	15932
1500	25943	18290
2000	46121	32515
2500	72063	50805

Table A4. Predicted peak particle velocity levels at various distance from the blasting face considering explosive weight per delay of 200, 300, 500 & 800 kg for different benches of Hang wall, Ore & Foot wall benches of Rampura Agucha Mines, HZL.

Distance of structures from the blast face [m]	Predicted peak particle velocity levels [mm/s]			
	200 kg	*300 kg*	*500 kg*	*800 kg*
300	4.12	5.13	6.75	8.69
400	3.03	3.76	4.95	6.38
500	2.38	2.96	3.90	5.02
600	1.96	2.43	3.20	4.12
700	1.66	2.06	2.71	3.49
800	1.44	1.79	2.35	3.03
900	1.26	1.57	2.07	2.67
1000	1.13	1.40	1.85	2.38
1100	1.02	1.27	1.67	2.15
1200	0.93	1.15	1.52	1.96
1300	0.85	1.06	1.39	1.79
1400	0.79	0.98	1.29	1.66
1500	0.73	0.91	1.19	1.54
2000	0.54	0.67	0.88	1.13
2500	0.42	0.52	0.69	0.89

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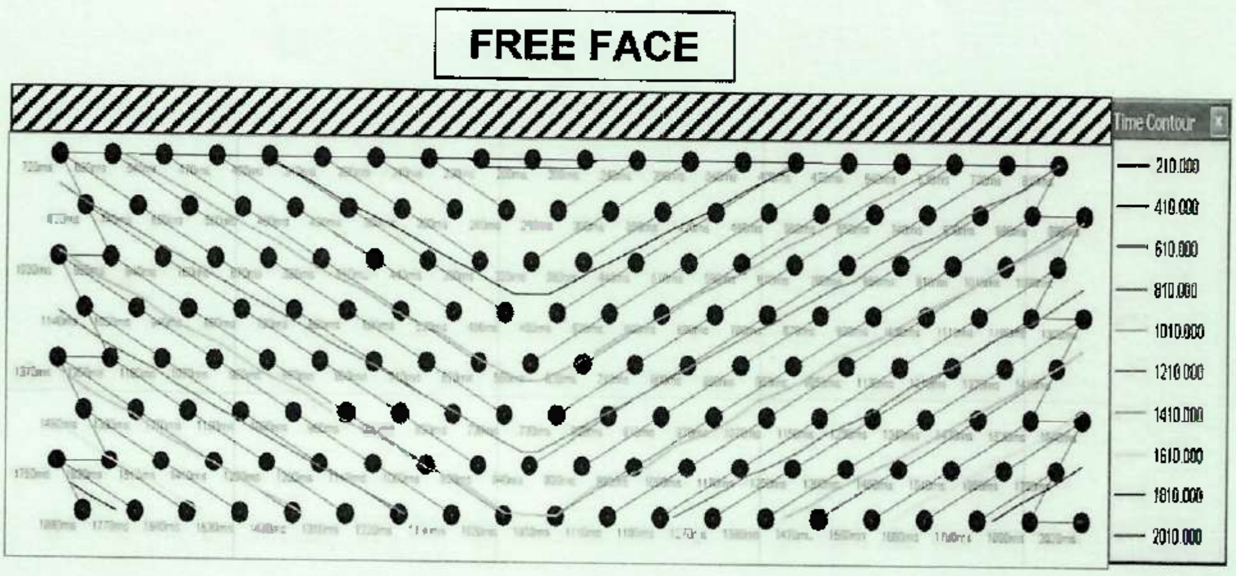
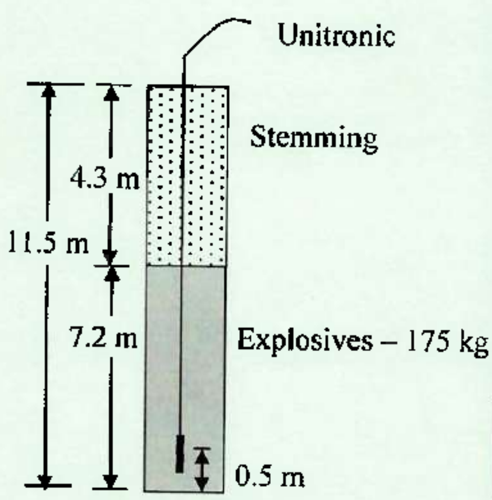
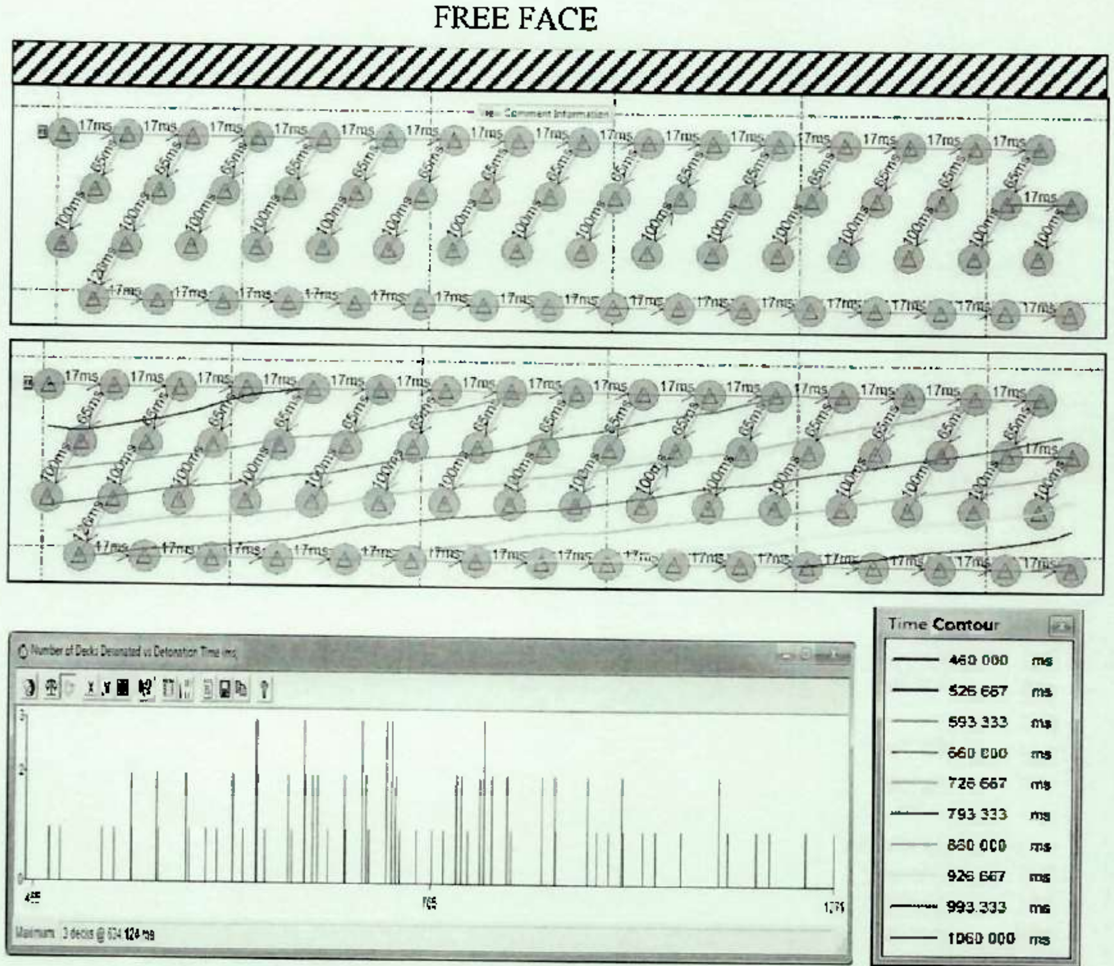


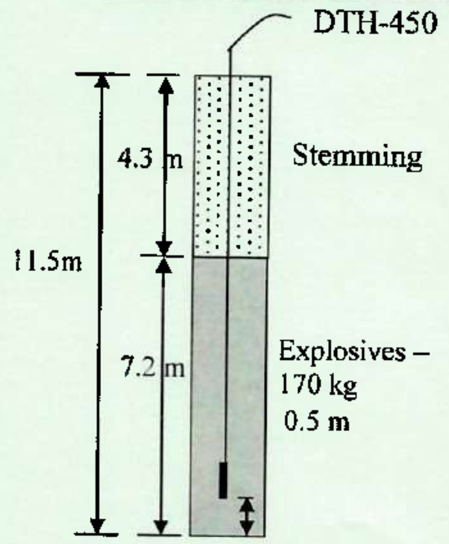


BLAST GEOMETRY

Hole diameter	: 165 mm
No. of holes	: 150
Hole depth	: 11.5 m
Bench height	: 11 m
Burden	: 4 m
Spacing	: 5 m
Explosive per hole	: 175 kg
Total charge	: 26,250 kg
Charge per delay within 8 ms	: 525 kg (3×175)
Effective charge per delay	: 252 kg (3^1/3×175)
Designed charge factor	: 0.79 kg/m^3

Figure A1. Recommended blast design and charging pattern of holes for HW benches at Rampura Agucha Mines.





BLAST GEOMETRY	
Hole diameter	: 165 mm
No. of holes	: 64
Hole depth	: 11.5 m
Bench height	: 11 m
Burden	: 3.0m
Spacing	: 3.5 m
Explosive per hole	: 170kg
Total charge	: 10880 kg
Charge per delay within 8 ms	: 510 kg (3×170)
Effective charge per delay	: 245kg (3^1/3×170)
Designed charge factor	: 1.47 kg/m^3

Figure A2. Recommended blast design and charging pattern of holes for ore benches at Rampura Agucha Mines.

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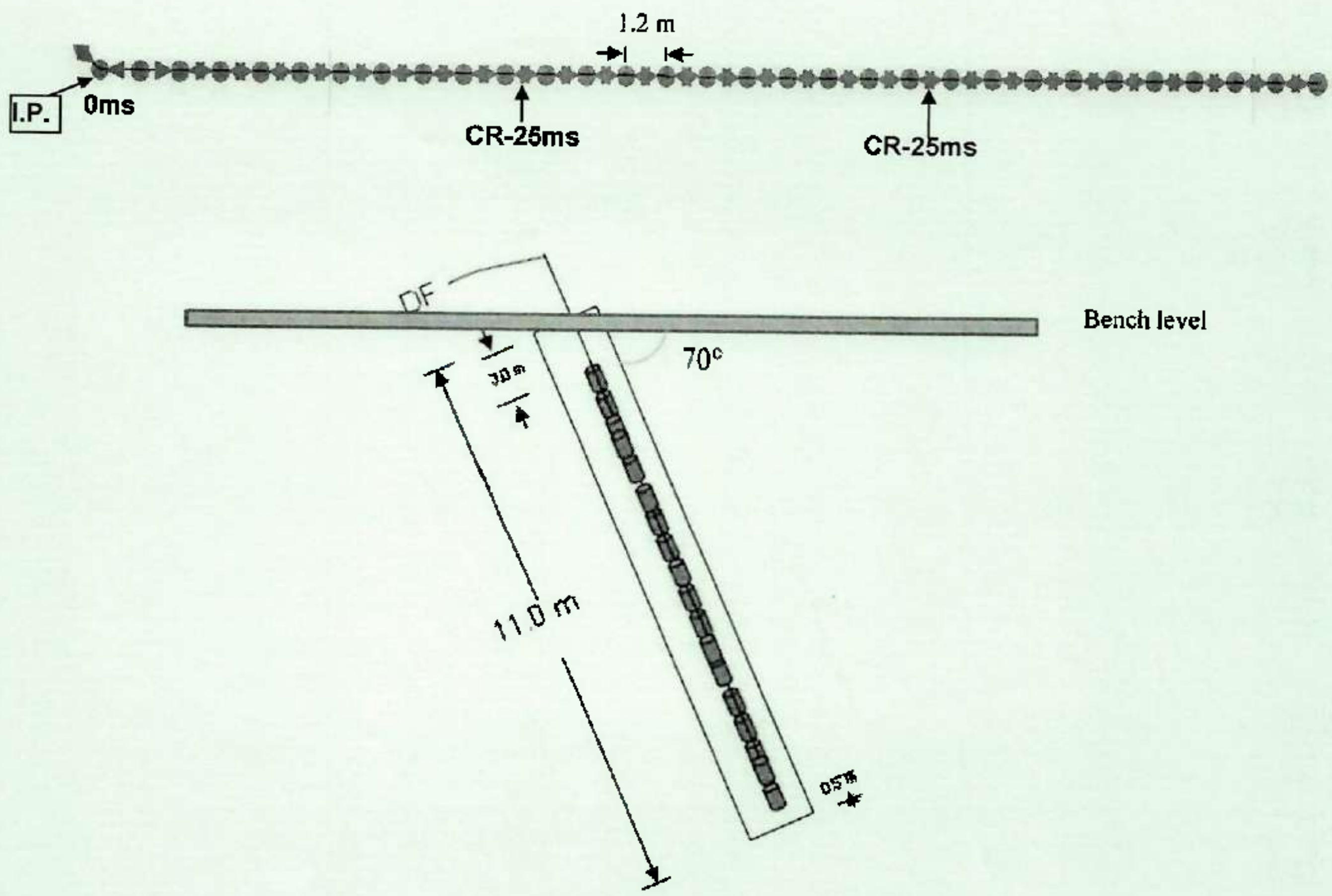

BLAST GEOMETRY

Hole diameter	: 115 mm
No. of holes	: 31
Hole depth	: 11 m
Spacing	: 1.2 m
Explosive per hole	: 6 to 7.2 kg [15 to 18 cartridge × 400gm (32mm dia . cartridge)]
Charge per delay within 8 ms	: 66 to 79 kg (11 holes × 6 to 7.2 kg)
Charging length	: 8 m

Figure A3. Recommended blast design and charging pattern of holes for pre-split blast at Rampura Agucha Mine, HZL.

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Event Report

Date/Time	Tran at 14 56 32 October 23, 2014
Trigger Source	Geo 0 510 mm/s
Range	Geo 31 7 mm/s
Record Time	8 0 sec at 1024 sps

Notes

Location: On ground surface

client: Rampura Agucha Mine, HZL

Name: Blasting Department,CSIR-CIMFR, Dhanbad

General:

Serial Number	BE13009 V 10 30-1.1 Minimate Blaster
Battery Level	6 3 Volts
Unit Calibration	January 9, 2014 by CIMFR, Dhanbad
File Name	L009FJWF 180

Extended Notes

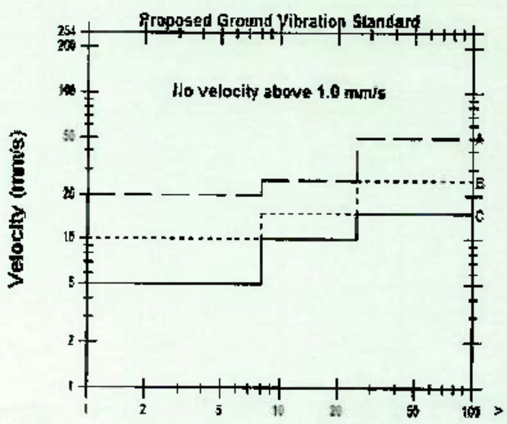
Blast optimisation study at Rampura Agucha Mine,HZL Vis-a-Vis Control of Blast Vibration in the periphery of the mine

Microphone	Linear Weighting
PSPL	112 0 dB(L) at 4 253 sec
ZC Freq	4 5 Hz
Channel Test	Passed (Freq = 20 5 Hz Amp = 603 mv)

	Tran	Vert	Long	
PPV	0 984	0.952	0 984	mm/s
ZC Freq	15	27	11	Hz
Time (Rel. to Trig)	0 144	0 258	0 261	sec
Peak Acceleration	0 0186	0 0215	0.0232	g
Peak Displacement	0 0113	0 00782	0 0137	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7 5	7.5	7.4	Hz
Overswing Ratio	3 6	3.6	3.7	

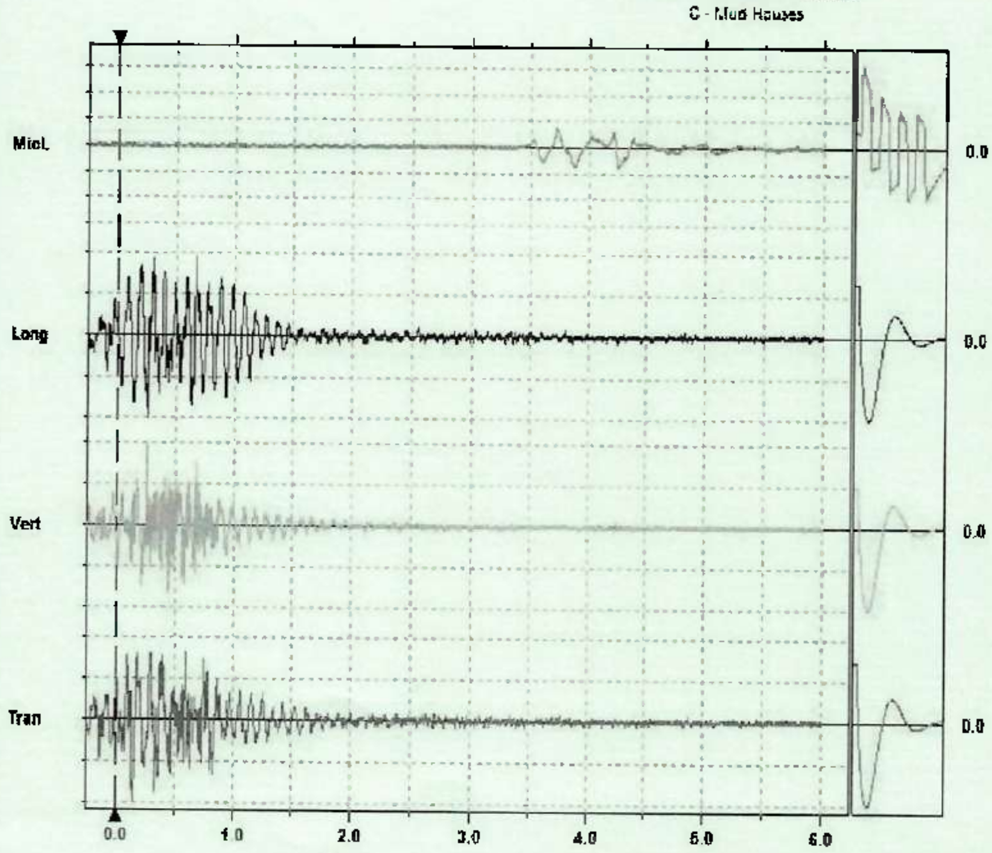
Peak Vector Sum 1.35 mm/s at 0.259 sec

Indian Bureau of Standards



Tran Vert Long

A - RCC Frame Structures
B - Brick and Plastered Houses
C - Mud Houses



Time Scale: 0 50 sec/div Amplitude Scale: Geo: 0 500 mm/s/div Mic: 10 00 pa (L)/div

Sensor Check

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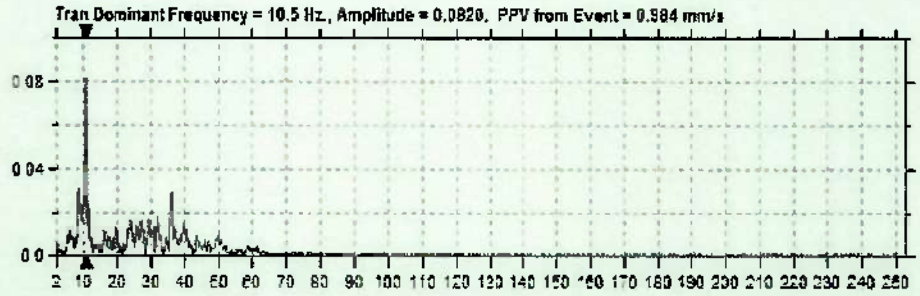
FFT Report

Date/Time	Tran at 14:56:32 October 20, 2014	**Serial Number**	BE10009 V 10.30-1.1 Minimate Blaster
Trigger Source	Geo: 0.510 mm/s	**Battery Level**	6.3 Volts
Range	Geo: 31.7 mm/s	**Unit Calibration**	January 9, 2014 by CIMFR, Dhanbad
Record Time	6.0 sec at 1024 sps	**File Name**	L009FJWP.I80

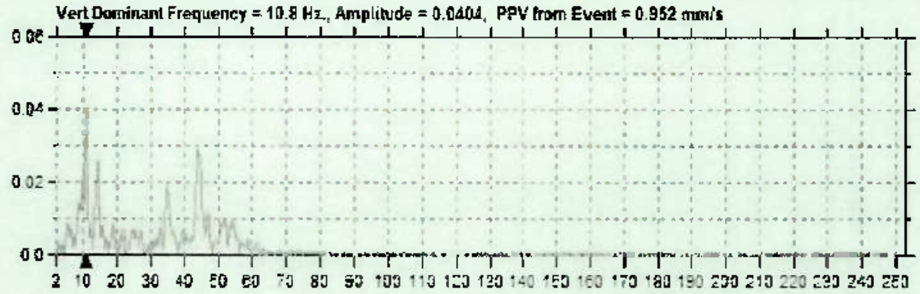
Notes
Location: On ground surface
client: Rampura Agucha Mine, HZL
Name: Blasting Department CSIR-CIMFR, Dhanbad
General:

Extended Notes
Blast optimisation study at Rampura Agucha Mine,HZL Vis-a-Vis Control of Blast Vibration in the periphery of the mine.

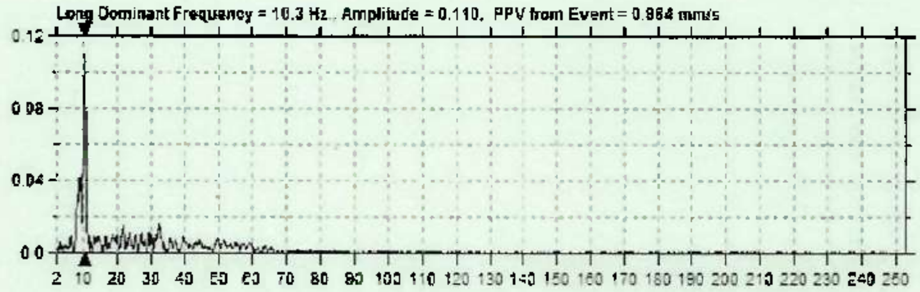
Tran Dominant Frequency = 10.5 Hz., Amplitude = 0.0820, PPV from Event = 0.984 mm/s



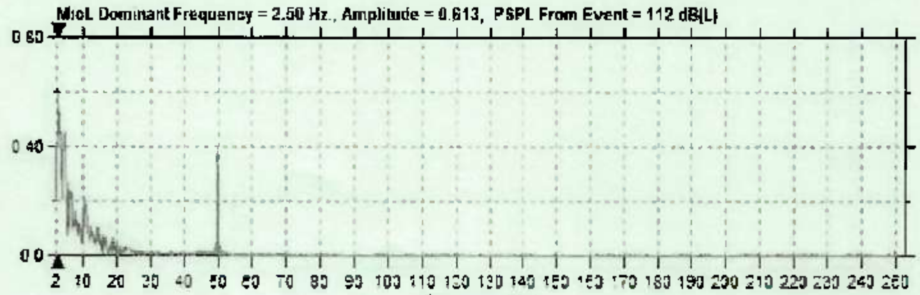
Vert Dominant Frequency = 10.8 Hz., Amplitude = 0.0404, PPV from Event = 0.952 mm/s



Long Dominant Frequency = 10.3 Hz., Amplitude = 0.110, PPV from Event = 0.984 mm/s



MicL Dominant Frequency = 2.50 Hz., Amplitude = 0.613, PSPL From Event = 112 dB(L)



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Event Report

Date/Time	Tran at 14 48 34 October 21, 2014
Trigger Source	Geo 0 492 mm s
Range	Geo 127 mm s
Record Time	5.0 sec at 1024 sps
Notes	
Location:	On ground surface
Client:	RAMPURA Agucha Mine HZL
User Name	Blasting Department
Converted	October 21, 2014 21 48 06 (V 10 06)

Serial Number	5370 V 2 61 MiniMate
Battery Level	6 3 Volts
Unit Calibration	July 10, 2014 by CIMFR, Dhanbad
File Name	G370FK0E GYD

Extended Notes

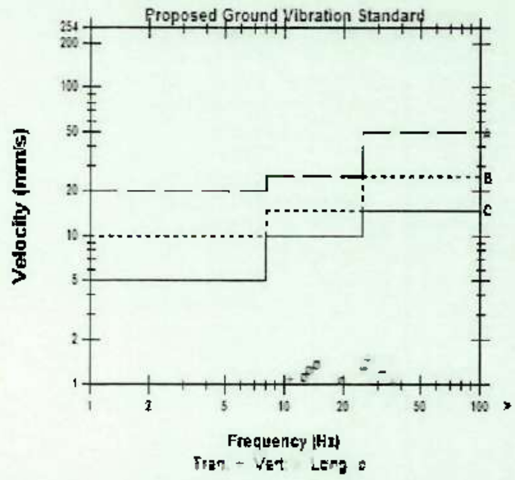
Blast optimisation study at Rampura Agucha Mine HZL Vis-a-Vis Control of Blast Vibration in the periphery of the mine

Microphone	Linear Weighting
PSPL	106 0 dB L) at 4 582 sec
ZC Freq	3 0 Hz
Channel Test	Passed (Freq = 20 0 Hz Amp = 201 mv)

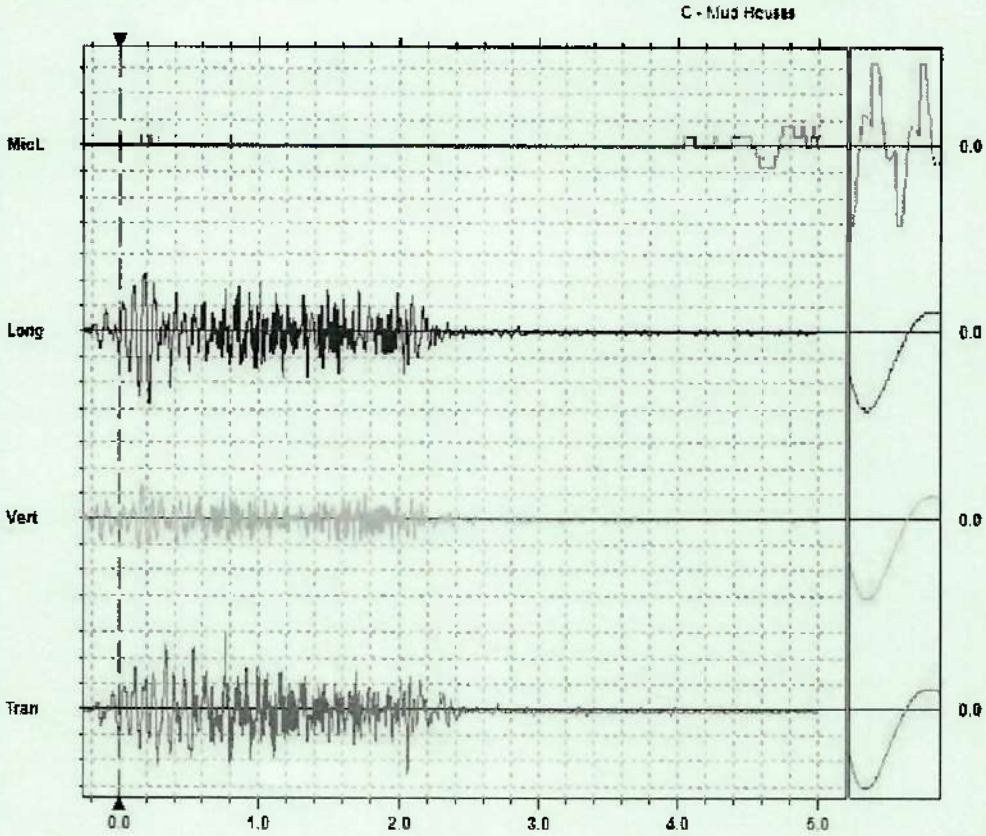
	Tran	Vert	Long	
PPV	1 46	0 659	1 40	mm s
ZC Freq	27	16	15	Hz
Time (Rel. to Trig)	0 771	0 169	0 219	sec
Peak Acceleration	0 0265	0 0133	0 0265	g
Peak Displacement	0 0132	0 00719	0 0159	mm
Sensor Check	Passed	Passed	Passed	
Frequency	8 1	8 0	7 7	Hz
Overswing Ratio	3 8	3 4	4 1	

Peak Vector Sum 1 68 mm s at 0 771 sec

Indian Bureau of Standards



A - RCC Frame Structures
B - Brick and Plastered Houses
C - Mud Houses



Time Scale: 0 20 sec/div **Amplitude Scale:** Geo 0 500 mm/s/div Mic 5 00 pa (L)/div

Sensor Check

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FFT Report

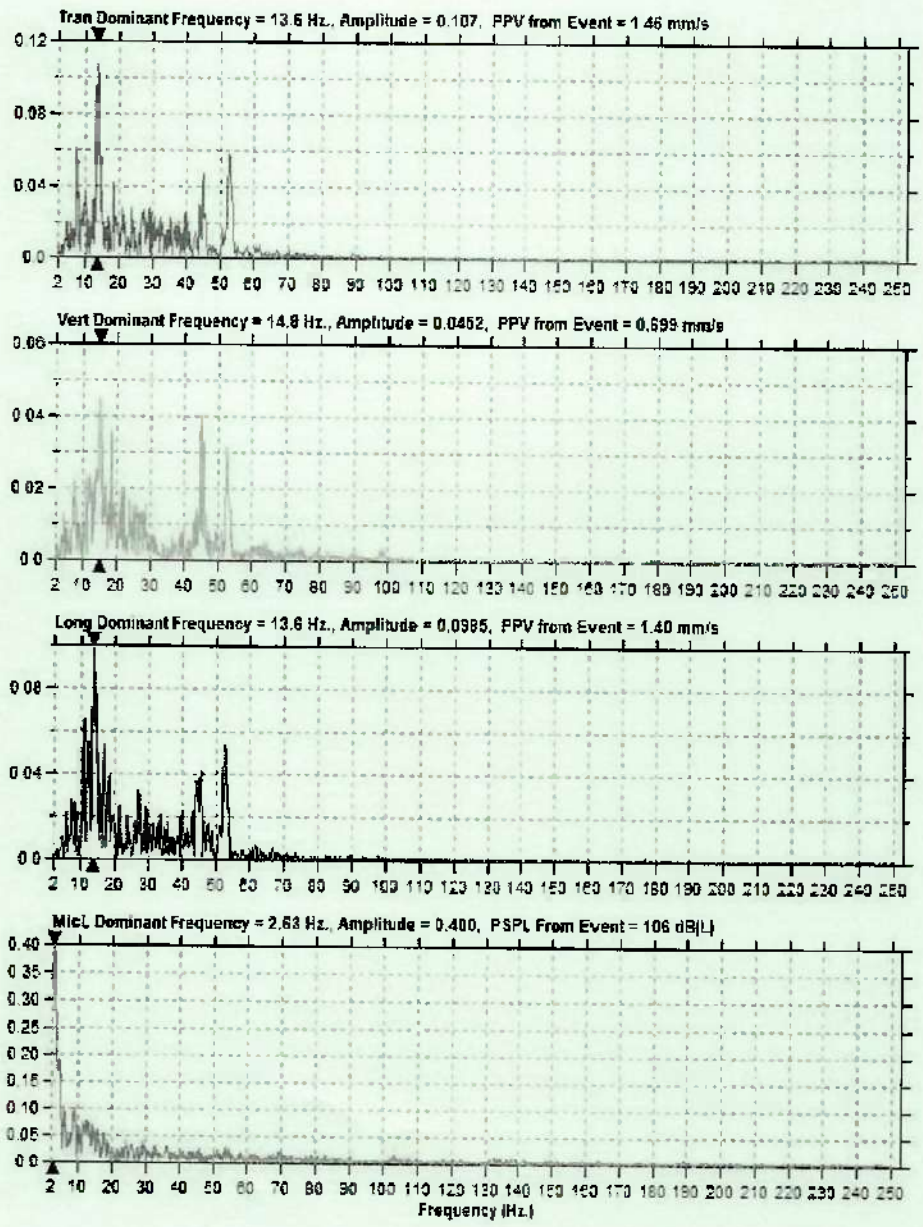
Date/Time	Tran at 14 48 34 October 21, 2014	**Serial Number**	5370 V 2 61 MiniMate
Trigger Source	Geo 0 492 mm s	**Battery Level**	6 2 Volts
Range	Geo: 127 mm s	**Unit Calibration**	July 10, 2014 by CIMFR, Dhanbad
Record Time	5 0 sec at 1024 sps	**File Name**	3370FK3E GY0

Notes

Location: On ground surface
Client: RAMPURA Agucha Mine HZL
User Name: Blasting Department
Converted: October 21, 2014 21:48:05 (V10.05)

Extended Notes

Blast optimisation study at Rampura Agucha Mine HZL Vis-a-Vis Control of Blast Vibration in the periphery of the mine.



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Annexure R-12

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CSIR-CENTRAL INSTITUTE OF MINING & FUEL RESEARCH
(Council of Scientific & Industrial Research)
Barwa Road, Dhanbad – 826 015

Blast Vibration Report
(Study period: May 18 - June 11, 2020)

Advice for optimization of blast design parameters at Rampura Agucha Mine for safe and efficient exploitation of minerals

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PROJECT No. CNP/4833/19-20 **August 2020**

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Introduction

M/s Hindustan Zinc Limited entrusted CSIR-Central Institute of Mining and Fuel Research, Dhanbad vide order no. 2000049191/5100022713 dated 05.04.2018 for conducting blast optimization study at development faces as well as at production blast (slot/ring) faces for safe and efficient exploitation of minerals at Rampura Agucha underground mine.

The mine management of Rampura Agucha underground mine has requested REE Research Group of CSIR-CIMFR vide letter dated 03.05.2020 for assessment of blast vibration impact on surface due to the blast conducted at Rampura Agucha Underground Mine. Accordingly, CSIR-CIMFR officials working at Kayad UG Mine immediately visited Rampura Agucha and recorded blast vibration data at surface i.e. above the UG Mine during 18.05.2020 to 11.06.2020 along with associated blasting parameters. In this report, data recorded by the officials of HZL working at Rampura Agucha Mine are also included.

Blast vibration monitoring and associated blast details

Blast vibration was monitored by CIMFR representative at surface level near Opencast view point, WMM plant, north station and south station during 18.05.2020 to 11.06.2020. The blast was conducted at -255 mRL N562 stope, -255 mRL S raise, -5 mRL N637 stope , -280 mRL N330 stope, -255 mRL N487 Stope, -255 mRL S270 Stope, -280 mRL N397 Stope, -80 mRL N472 stope , -280 mRL N127 stope, -80 mRL N547 Stope, -280mRL N300 stope, -280mRL S240 stope and -255 mRL N67 stope. Total 16 numbers of blast with slot hole having combination of diameter 89 mm & 102 mm and reamer hole of 152 mm was charged with Site Mixed Emulsion (SME) explosives of M/s IEPL Orica. The depth of the blast holes during the study period varied from 6 to 40 m. Total explosive charge blasted in a round varied between 219 kg and 5500 kg keeping maximum explosive charge per delay (MCPD) between 90 kg and 288 kg. The charged holes were initiated with electronic detonators (IKON, M/s ORICA) keeping delay gap in the range of 100 ms to 8435 ms. Blast vibration was monitored at different location on the surface. The monitoring points of surface locations were at a radial distance of 656 m to 1710 m from the blasting faces. A view of blast vibration monitoring at surface in the nearby of Opencast view point is shown in Photograph 1. The trigger level of vibration monitoring transducer was set at the minimum level in most of the blast i.e. 0.128 ≈ 0.13 mm/s. The seismograph didn't trigger due to blast shows that the vibration level was less than the minimum vibration magnitude to trigger the seismograph.

Existing vibration standard and criteria to prevent damage

Peak particle velocity (PPV) has been globally used in practice for assessment of blast induced damage to the structures. Different countries adopt different standards depending on their type of industrial/residential buildings. In India, presently DGMS technical circular 7 of 1997 is considered as vibration standard for the safety of surface structures ~~in mining~~ areas. The DGMS

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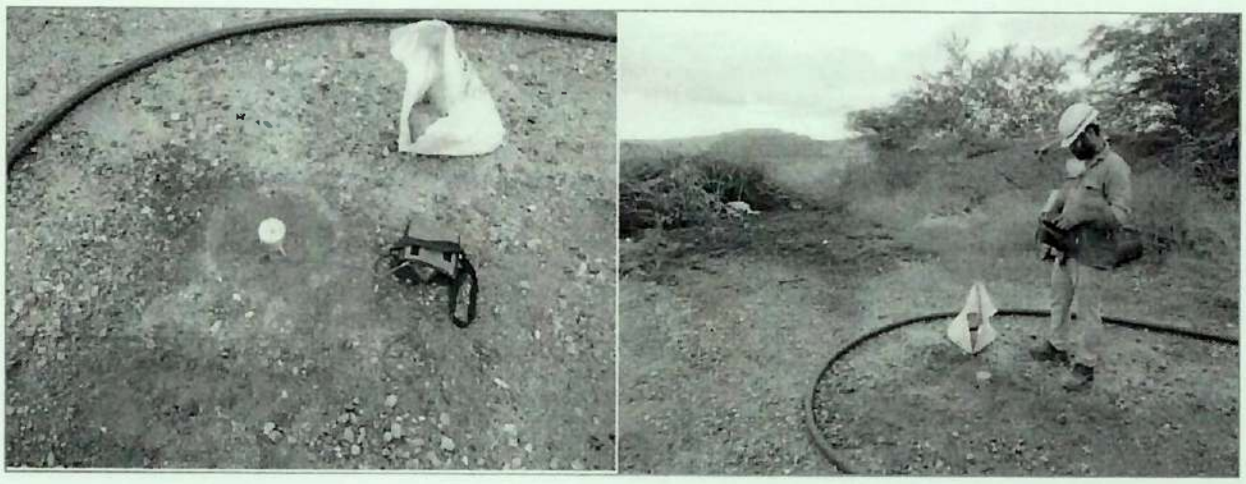
standard is given in Table 1. The recorded frequency of blast vibration was in the range of 16.56 Hz to 36.13 Hz. So, the threshold limit of vibration should be taken as 10 mm/s for safety of surface domestic structures and 20 mm/s for the safety of industrial establishments in the nearby of the blasting site.



Photograph 1. View of Installation of seismograph at surface near opencast view point for monitoring of blast induced ground vibration.

Table 1. DGMS technical circular 7 of 1997 concerning to blast vibration standard in mm/s.

Type of structure	**Dominant excitation frequency, Hz**		
	< 8 Hz	**8-25 Hz**	**> 25 Hz**
(A) Buildings/structures not belong to the owner			
1. Domestic houses/structures (Kuchcha, brick & cement)	5	10	15
2. Industrial buildings	10	20	25
3. Objects of historical importance and sensitive structures	2	5	10
(B) Buildings belonging to owner with limited span of life			
1. Domestic houses/structures	10	15	25
2. Industrial buildings	15	25	50

Analysis of the recorded vibration data

Altogether, ten blast vibration data were recorded from the sixteen blasts. In six number of blasts, the magnitude of recorded vibration was less than 0.13 mm/s. The details of the recorded vibration at the surface during this period along with the associate blasting parameters is shown in Table 2. The maximum magnitude of vibration recorded due to blast during this period was 2.8 mm/s at peak dominant frequency of 19.88 Hz. The blast was conducted at -255 mRL N67 stope blast face on 11.06.2020 keeping maximum charge per delay of 252 kg. The total explosive charge fired in the blasting round for this blast was 1200 kg. The vibration was recorded at surface near Open cast (OC) view point. The monitoring point was at a radial distance of 1244 m from the blasting face.

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Table 2. Details of blast vibration recorded at different location due to blast conducted at different locations of Rampura Agucha UG mine during 18.05.2020 to 11.06.2020.

Date	Blasting location	Instrument location	Maximum Charge weight per delay (Kg)	Total Explosive Charge in a blasting round (Kg)	Radial distance of monitoring point from the blast face (m)	Trigger level of seismo-graph (mm/s)	Measured ground vibration magnitude (mm/sec)	Frequency of the recorded blast vibration (Hz)
18.05.2020	-255N562	North station	90	219	719	0.13	Not triggered	NA
19.05.2020	-255S raise	South station	100	400	1097	0.13	Not triggered	NA
20.05.2020	-5N637	North station	159	4800	1710	0.13	Not triggered	NA
22.05.2020	-280N330	North station	132	1300	1276	0.13	Not triggered	NA
23.05.2020	-255N487	OC view point	192	4215	955	0.13	1.323	35.9
24.05.2020	-255S270	South station	150	2010	1126	0.13	Not triggered	NA
26.05.2020	-5N637	OC view point	100	400	657	0.13	Not triggered	NA
27.05.2020	-280N397	OC view point	90	2300	1087	0.13	0.326	19
29.05.2020	-80N472	OC view point	168	5500	825	0.13	0.605	21.38
29.05.2020	-280N127	OC view point	192	2500	1226	0.13	1.016	17.38
30.05.2020	-5N637	OC view point	180	3500	656	0.13	1.159	23.44
30.05.2020	-80N547	OC view point	108	2000	799	0.13	0.209	16.56
03.06.2020	-280N300	OC view point	288	4800	1126	0.13	0.160	36.13
03.06.2020	-255N487	OC view point	144	4580	1011	0.13	1.595	18.69
05.06.2020	-280S240	WMM plant	186	3125	1170	0.13	1.071	19.50
11.06.2020	-255N67	OC view point	252	1200	1244		2.800	19.88

The vibration recorded near the same OC view point location for the blast conducted at -255 mRL N487 stope on 03.06.2020 was 1.595 mm/s. The peak dominant frequency of the vibration was 18.69 Hz. The monitoring point was at radial distance of 1011 m from the blast face. The blast was conducted with total explosive charge of 4580 kg keeping MCPD of 144 kg. The waveform analysis of the recorded ground vibration for this blast is shown in Figure 1. The FFT analysis of the waveform is shown in Figure 2. The vibration was also recorded near

WMM plant for the blast conducted on 05.06.2020. The plant was at a radial distance of 1170 m from -280 mRL S240 stope. The recorded vibration was 1.07 mm/s at peak dominant frequency of 19.5 Hz. The blast was conducted with total explosive charge of 3125 kg keeping MCPD of 186 kg. The other surface locations were north and south stations. These locations were at radial distance of 719 to 1276 m from the blast faces of five blast as mentioned in Table 2. All the recorded vibration near these locations was less than 0.13 mm/s.

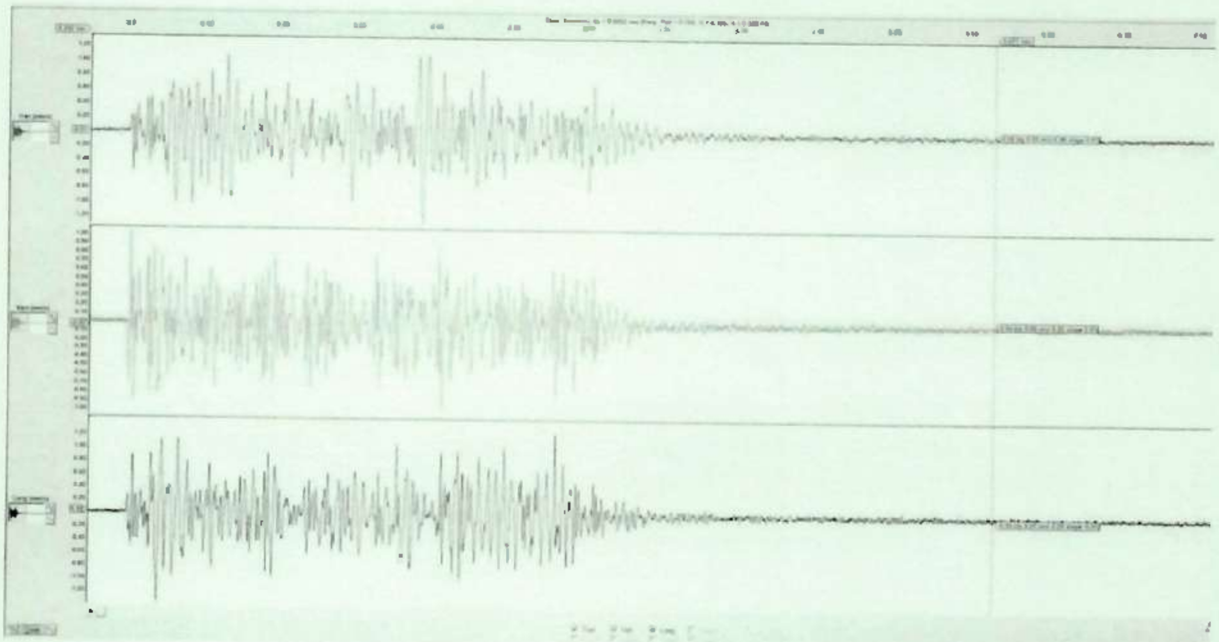

Figure 1. Waveform analysis of the recorded vibration for blast conducted at -255 mRL N487 stope on 03.06.2020.

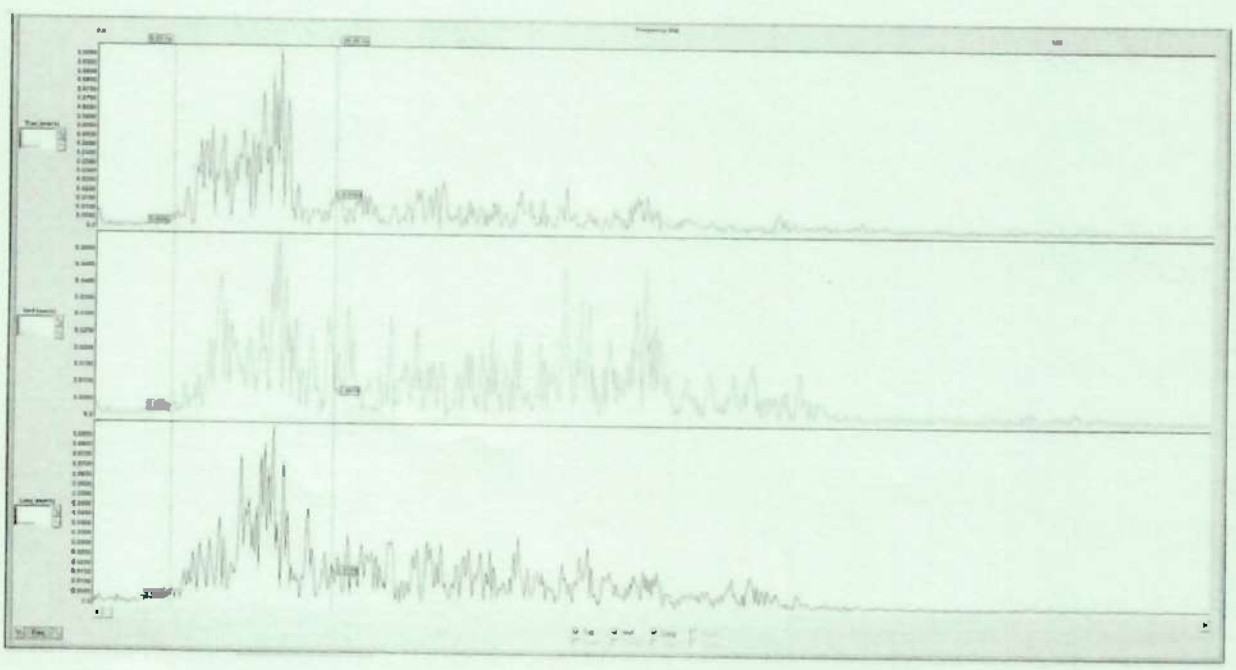

Figure 2. FFT analysis of the recorded vibration for blast conducted at -255 mRL N487 stope on 03.06.2020.

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Conclusions

- Blast vibration was monitored for the blast conducted during 18.05.2020 to 11.06.2020. During this period, the blasts were conducted at -255 mRL N562 stope, -255 mRL S raise, -5 mRL N637 stope , -280 mRL N330 stope, -255 mRL N487 Stope, -255 mRL S270 Stope, -280 mRL N397 Stope, -80 mRL N472 stope , -280 mRL N127 stope, -80 mRL N547 Stope, -280mRL N300 stope, -280mRL S240 stope and -255 mRL N67 stope of Rampura Agucha Underground Mine.

- The blast vibration was recorded near surface features by placement of seismographs. The trigger level of vibration monitoring transducer was set at the minimum level in most of the blast i.e. 0.128 ≈ 0.13 mm/s. The seismograph didn't trigger shows that the vibration level was below the trigger level of the seismograph.

- Altogether, ten blast vibration data were recorded from the sixteen blasts. In six number of blasts, the magnitude of recorded vibration was less than 0.13 mm/s.

- The maximum magnitude of vibration recorded due to blast during this period was 2.8 mm/s at peak dominant frequency of 19.88 Hz. The blast was conducted at -255 mRL N67 stope blast face on 11.06.2020 keeping maximum charge per delay of 252 kg. The total explosive charge fired in the blasting round for this blast was 1200 kg. The vibration was recorded at surface near OC view point. The monitoring point was at a radial distance of 1244 m from the blasting face.

- The vibration recorded near the same OC view point location for the blast conducted at -255 mRL N487 stope on 03.06.2020 was 1.595 mm/s. The peak dominant frequency of the vibration was 18.69 Hz. The monitoring point was at radial distance of 1011 m from the blast face. The blast was conducted with total explosive charge of 4580 kg keeping MCPD of 144 kg.

- The vibration was also recorded near WMM plant for the blast conducted on 05.06.2020. The plant was at a radial distance of 1170 m from -280 mRL S240 stope. The recorded vibration was 1.07 mm/s at peak dominant frequency of 19.5 Hz. The blast was conducted with total explosive charge of 3125 kg keeping MCPD of 186 kg.

- The other surface locations were north and south stations. These locations were at radial distance of 719 to 1276 m from the blast faces. All the recorded vibration near these locations was less than 0.13 mm/s.

- The recorded frequency of blast vibration was in the range of 16.56 Hz to 36.13 Hz. So, the threshold limit of vibration should be taken as 10 mm/s for safety of surface domestic

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structures and 20 mm/s for the safety of industrial establishments in the nearby of the blasting site.

❖ All the recorded blast vibration data near surface features viz. opencast view point, WMM plant, north station and south station due to the blasts conducted at underground locations are well within the safe limits as per DGMS standard.

31/08/2020

(V. K. Himanshu)
Scientist
Rock Excavation Engineering Division
CSIR-CIMFR, Dhanbad

M. P. Roy
31/08/2020

(Dr. M. P. Roy)
Sr. Principal Scientist & Project Leader
Rock Excavation Engineering Division
CSIR-CIMFR, Dhanbad

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Gulabpura (Bhilwara)

HZL • RAMPURA AGUCHA MINE •

Instantel — Event Report

Date/Time	Vert at 18 48 53 May 29, 2020
Trigger Source	Geo 0 128 mm/s
Range	Geo 254 0 mm/s
Record Time	15 0 sec (Auto=3Sec) at 4096 sps
Operator/Setup:	Operator factory MMB

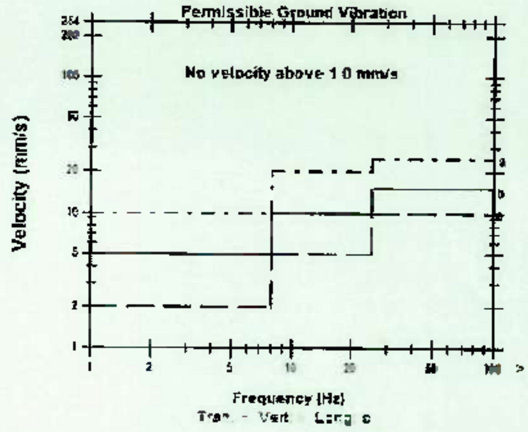
Serial Number	UM12336 V 10-87 Micromate ISEE
Battery Level	2 6 Volts
Unit Calibration	June 17, 2019 by UES New Delhi
File Name	UM12336_20200529184953 IDFW

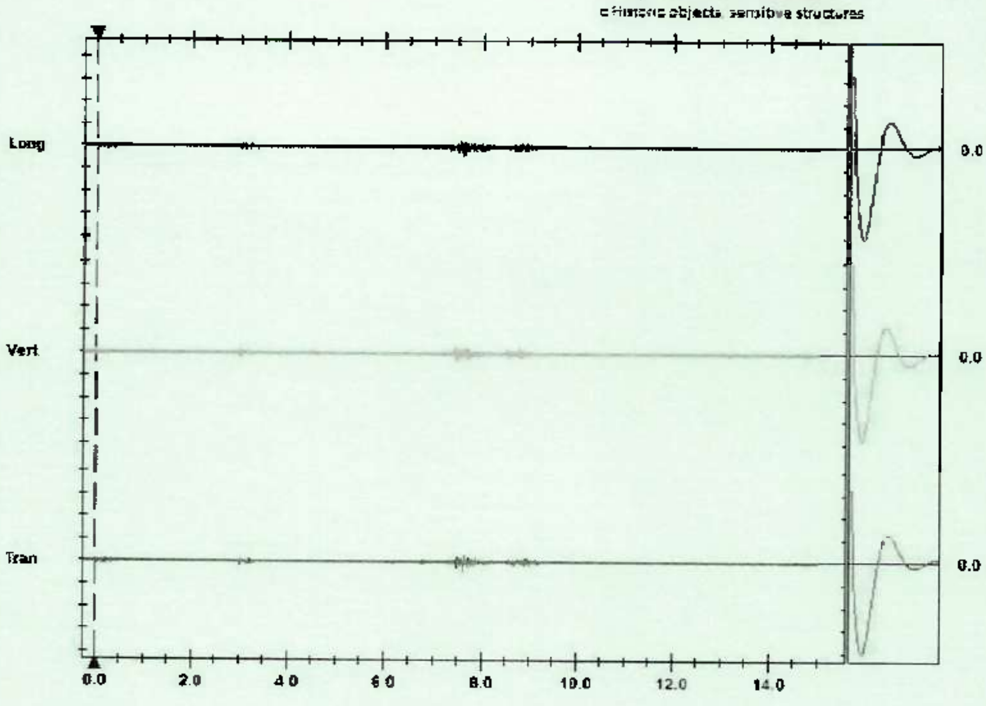
Notes

Location: 233N240
Client: RAM geotech
User Name: HZL
General:

	Tran	Vert	Long	
PPV	0 914	0 686	0 888	mm/s
ZC Freq	20 7	29 7	23 5	Hz
Time (Rel. to Trig)	7 617	7 454	7 587	sec
Peak Acceleration	0 023	0 023	0 020	g
Peak Displacement	0 005	0 004	0 004	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7 5	7 8	7 5	Hz
Overswing Ratio	3 4	3 3	3 5	

Peak Vector Sum 1 016 mm/s at 7 617 sec





Time Scale: 0 50 sec/div Amplitude Scale: Geo 2 000 mm/s/div

Sensor Check

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Gulabpura (Bhilwara)

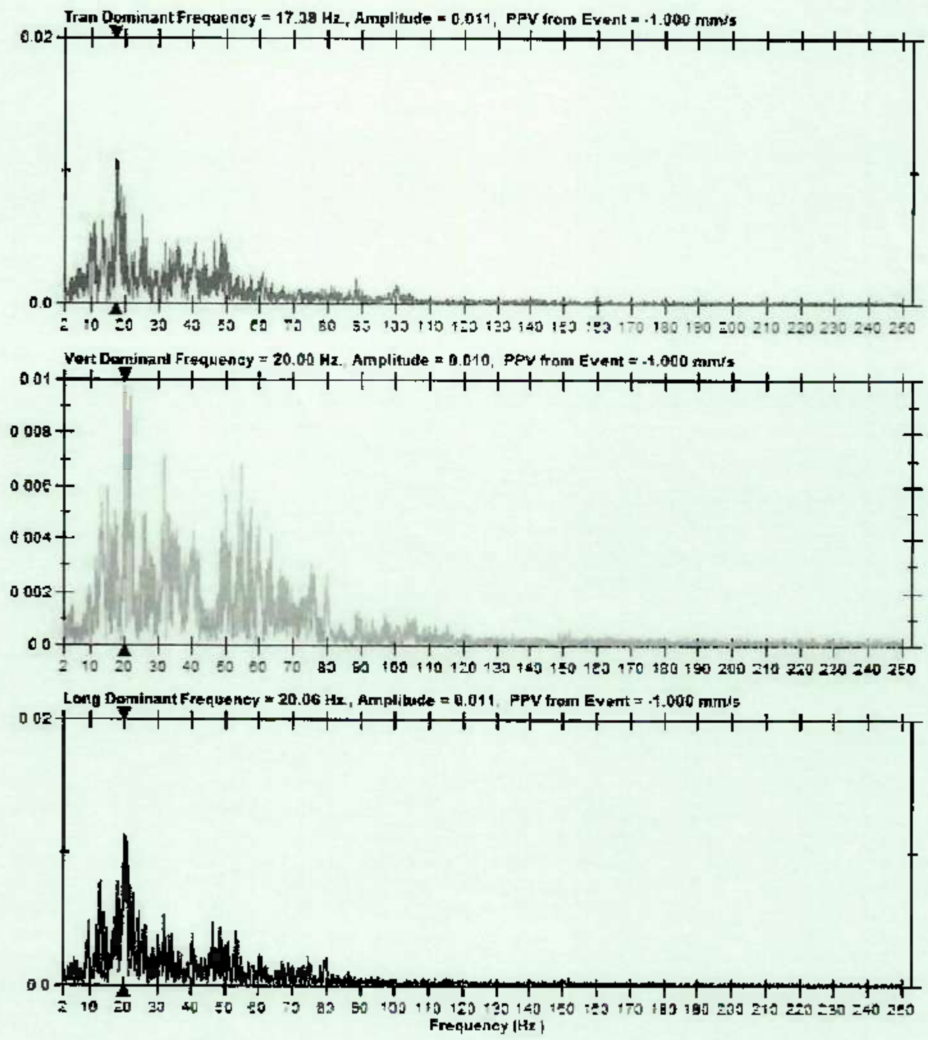
Instantel

FFT Report

Date/Time	Vert at 18 49 53 May 29, 2020	**Serial Number**	UM12339 V 10-87 Micromate ISEE
Trigger Source	Geo 0 128 mm/s	**Battery Level**	3 8 Volts
Range	Geo 254 0 mm/s	**Unit Calibration**	June 17, 2019 by UES New Delhi
Record Time	15 0 sec (Auto=3Sec) at 4096 sps	**File Name**	UM12339_20200529184953 IDFW
Operator/Setup:	Operator/factory MMB		

Notes

Location:	230N240
Client:	RAM geotech
User Name	HZL
General:	



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RAMPURA AGUCHA MINE
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Gulabpura (Bhilwara)

Instantel

Event Report

Date/Time Ven at 18 33 18 May 30, 2020
Trigger Source Geo 0 128 mm/s
Range Geo 254 0 mm/s
Record Time 15 0 sec (Auto=3Sec) at 4096 sps
Operator/Setup: Operator/factory MMB

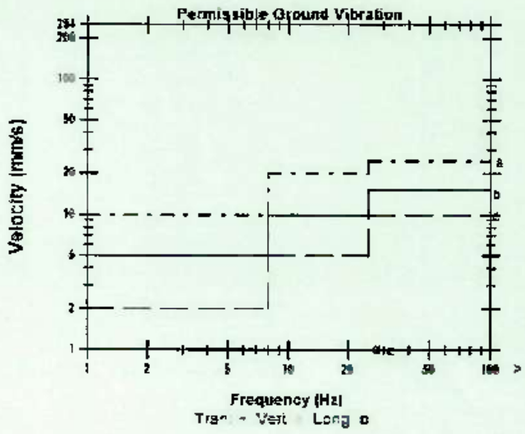
Serial Number UM12336 V 10-87 Micromate ISEE
Battery Level 3 8 Volts
Unit Calibration June 17, 2019 by UES New Delhi
File Name UM12336_20200530183318 IDFW

Notes
Location: 230N240
Client: RAM geotech
User Name: HZL
General:

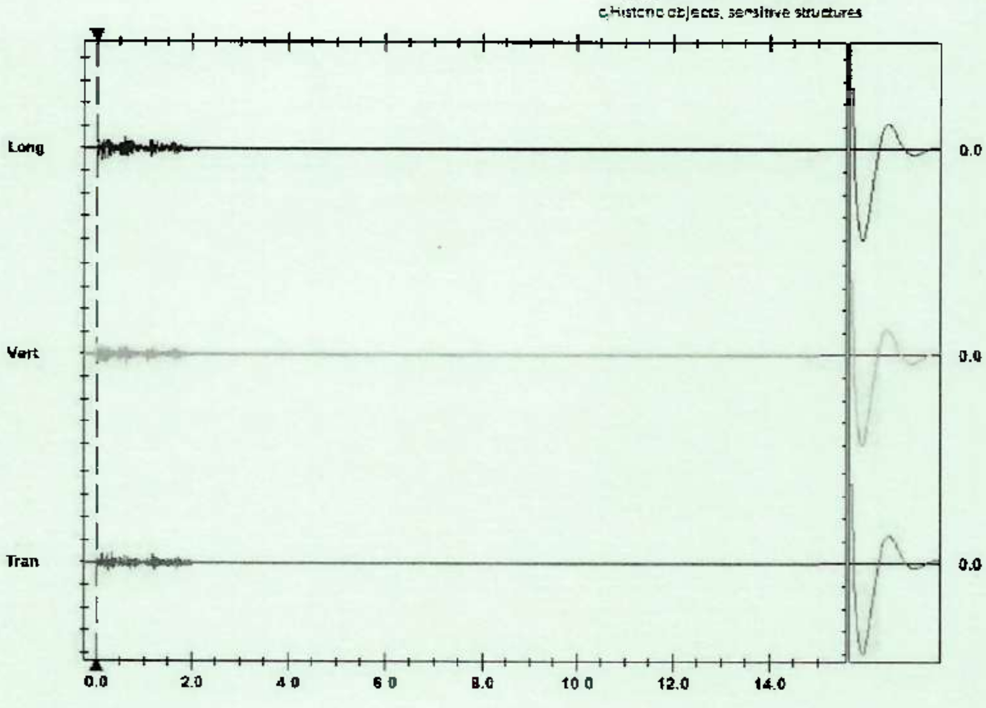
	Tran	Vert	Long	
PPV	0 936	0 954	1.025	mm/s
ZC Freq	25 9	51	27.7	Hz
Time (Rel. to Trig)	0 328	0 012	0 000	sec
Peak Acceleration	0 033	0 038	0 043	g
Peak Displacement	0 005	0 004	0 008	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.5	7.7	7.6	Hz
Overswing Ratio	3 4	3.7	3 6	

Peak Vector Sum 1.159 mm/s at 0 035 sec

DGMS India (A)



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time Scale: 0 50 sec/div   Amplitude Scale: Geo 2 000 mm/s/div   Sensor Check

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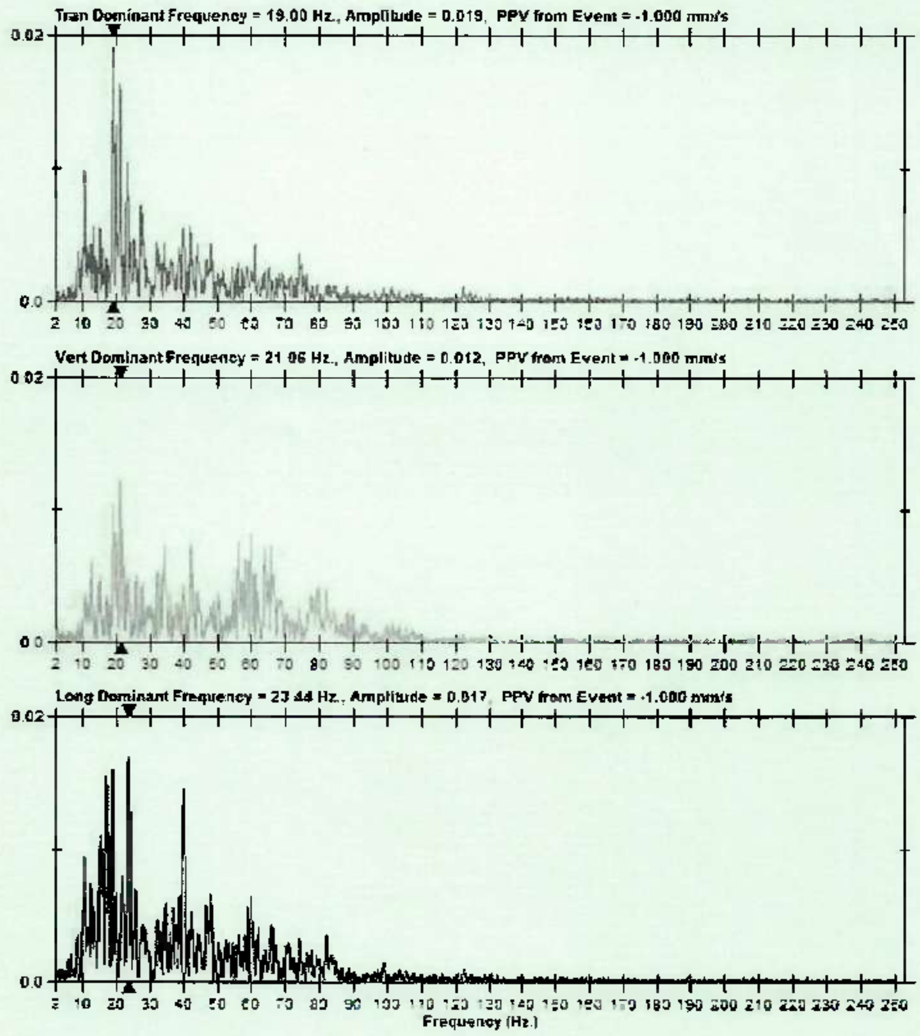
FFT Report

Instantel

Date/Time	Vert at 18:33:18 May 30, 2020	Serial Number	UM12336 V 10-67 Micromate ISEE
Trigger Source	Geo: 0.128 mm/s	Battery Level	3.8 Volts
Range	Geo: 254.0 mm/s	Unit Calibration	June 17, 2019 by UES New Delhi
Record Time	15.0 sec (Auto=3Sec) at 4096 sps	File Name	UM12336_20200530183318.IDFW
Operator/Setup:	Operator factory MMB		

Notes
Location: Z30N240
Client: RAM geotech
User Name: HZL
General:



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Event Report

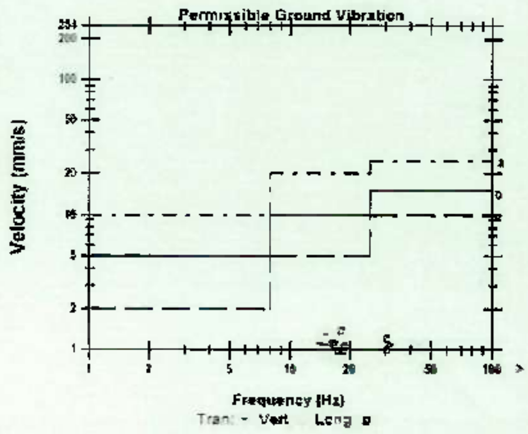
Date/Time	Vert at 18:48:41 June 3, 2020	**Serial Number**	UM12338 V 10-87 Micromate ISEE
Trigger Source	Geo: 0.128 mm/s	**Battery Level**	3.7 Volts
Range	Geo: 254.0 mm/s	**Unit Calibration**	June 17, 2019 by UES New Delhi
Record Time	15.0 sec (Auto=3Sec) at 4096 sps	**File Name**	UM12336_20200603184841.IDFW
Operator/Setup:	Operator/factory MMB		

Notes
Location: 230N240
Client: RAM geotech
User Name: HZL
General:

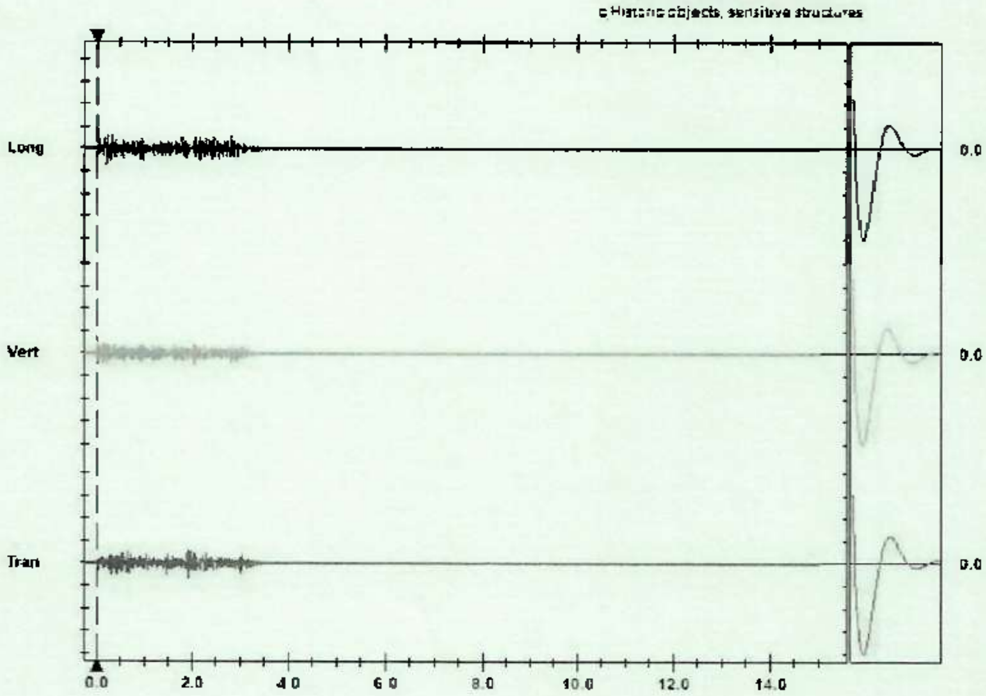
	Tran	Vert	Long	
PPV	1.301	1.048	1.403	mm/s
ZC Freq	15.2	43	18.3	Hz
Time (Rel. to Trig)	1.924	0.015	0.205	sec
Peak Acceleration	0.039	0.046	0.043	g
Peak Displacement	0.014	0.007	0.012	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.9	7.5	Hz
Overswing Ratio	3.5	3.8	2.9	

Peak Vector Sum 1.595 mm/s at 2.056 sec

DGMS India (A)



a)Industrial Buildings
b)Domestic houses/structures
c)Historic objects, sensitive structures



Time Scale: 0.50 sec/div Amplitude Scale: Geo: 2.000 mm/s/div Sensor Check

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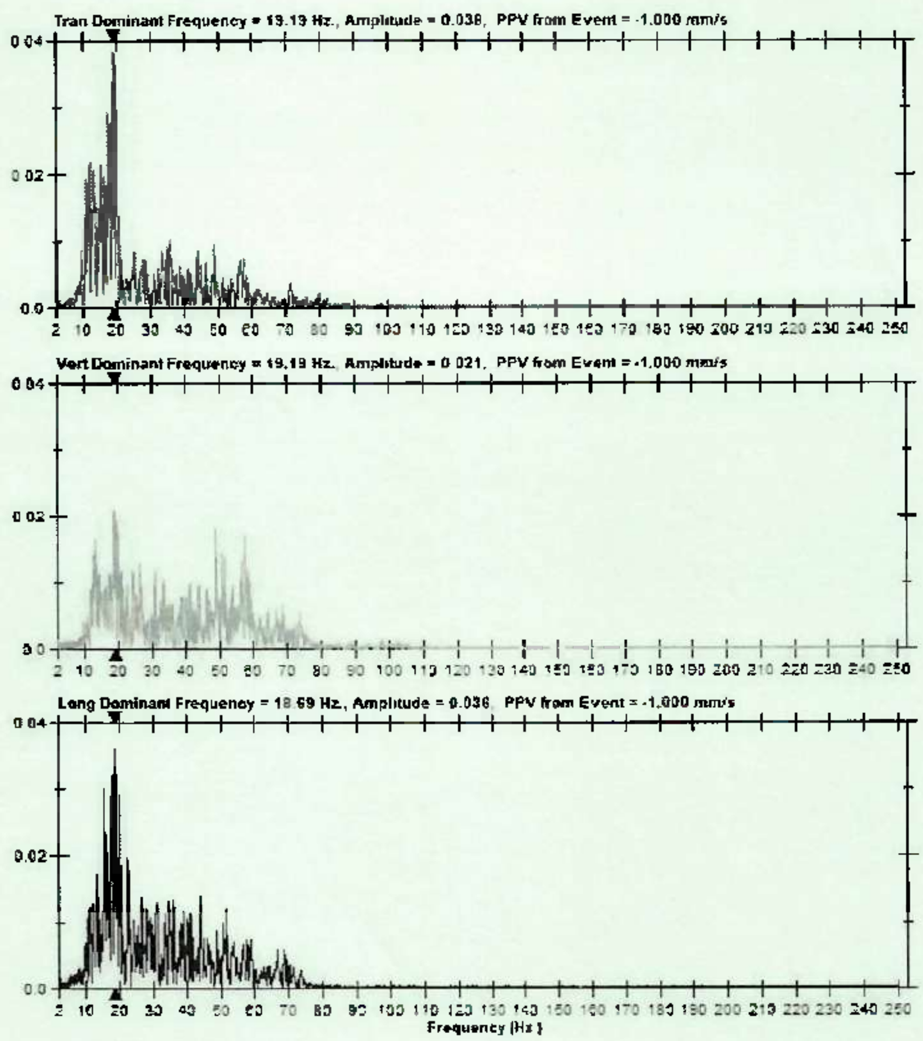
FFT Report

Date/Time	Vert at 18:48:41 June 3, 2020
Trigger Source	Geo: 0.128 mm/s
Range	Geo: 254.0 mm/s
Record Time	15.0 sec (Auto=3Sec) at 4096 sps
Operator/Setup:	Operator factory MMB
Serial Number	UM12339 V 10-87 Micromate ISEE
Battery Level	3.7 Volts
Unit Calibration	June 17, 2019 by DES New Delhi
File Name	UM12339_20200603184841.IDFW

Notes

Location:	220N240
Client:	RAM geotech
User Name:	HZL
General:	



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Event Report

Date/Time	Long at 18:33:43 June 5, 2020
Trigger Source	Geo: 0.128 mm/s
Range	Geo: 254.0 mm/s
Record Time	16.0 sec (Auto=3Sec) at 4096 sps
Operator/Setup:	Operator factory MMB

Serial Number	UM12336 V 10-87 Micromate ISEE
Battery Level	3.6 Volts
Unit Calibration	June 17, 2019 by UES New Delhi
File Name	UM12336_20200605183343.IDFW

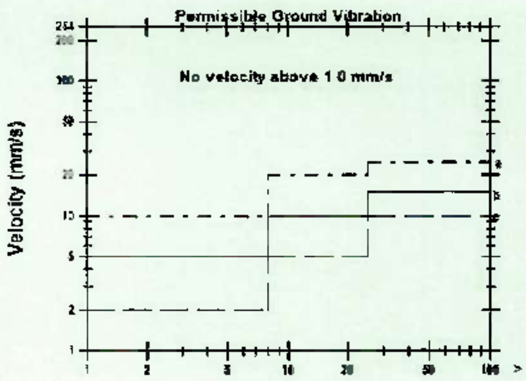
Notes

Location:	230N240
Client:	RAM geotech
User Name:	HZL
General:	

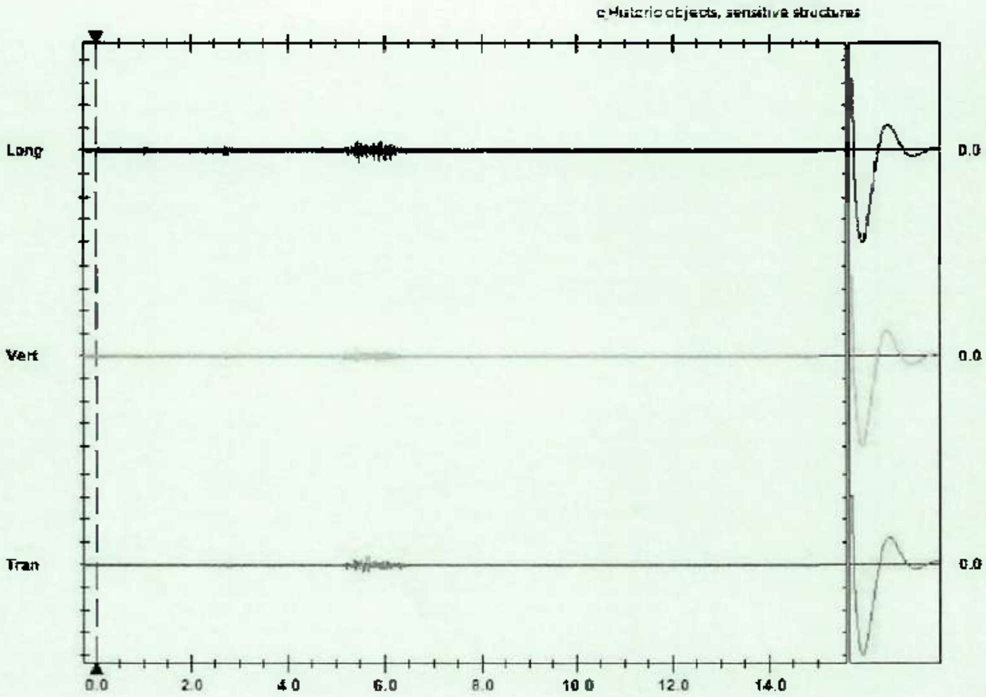
	Tran	Vert	Long	
PPV	0.612	0.708	0.993	mm/s
ZC Freq	17.7	30.5	35.9	Hz
Time (Rel. to Trig)	5.585	5.424	5.493	sec
Peak Acceleration	0.023	0.022	0.035	g
Peak Displacement	0.007	0.003	0.006	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.3	7.7	7.5	Hz
Overswing Ratio	3.6	3.8	3.6	

Peak Vector Sum 1.071 mm/s at 5.493 sec

DGMS India (A)



a:Industrial Buildings
b:Domestic houses/structures
c:Historic objects, sensitive structures



Time Scale: 0.50 sec/div Amplitude Scale: Geo: 2.000 mm/s/div

Sensor Check

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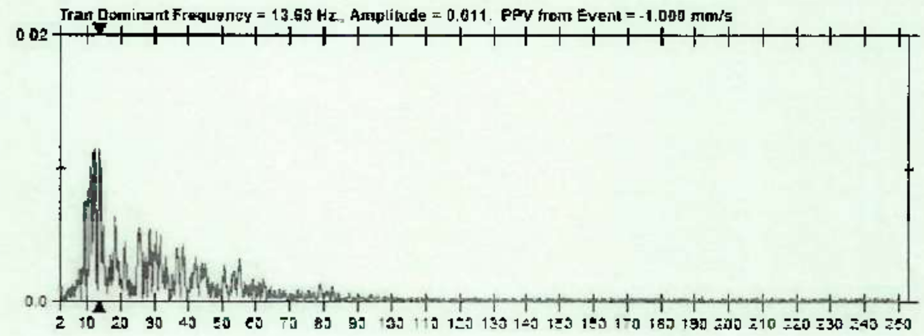
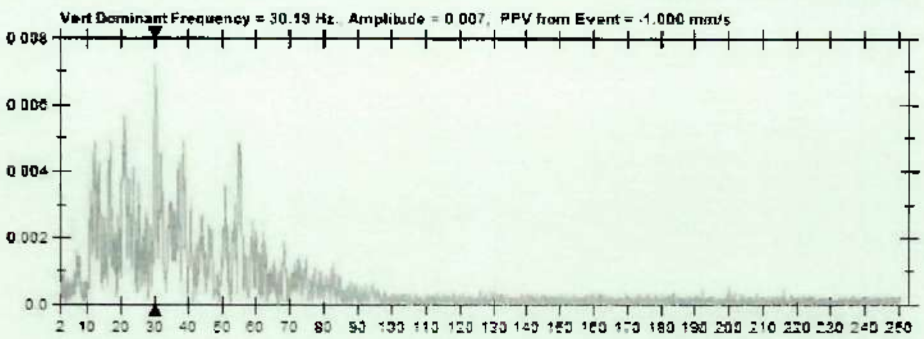
FFT Report

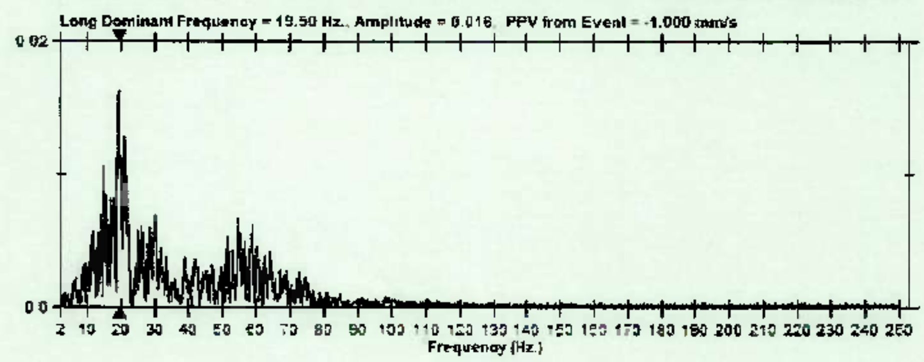
Date/Time	Long at 18:33:43 June 5, 2020	**Serial Number**	UM12336 V 10-87 Micromate ISEE
Trigger Source	Geo: 0.128 mm/s	**Battery Level**	3.5 Volts
Range	Geo: 254.0 mm/s	**Unit Calibration**	June 17, 2019 by UES New Delhi
Record Time	15.0 sec (Auto=3Sec) at 4096 sps	**File Name**	UM12336_20200605183343.IDFW
Operator/Setup:	Operator factory MMB		

Notes

Location:	220H240
Client:	RAM geotech
User Name:	HZL
General:	







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Event Report

Date/Time	Tran at 16:28:02 June 11, 2020
Trigger Source	Geo: 1.500 mm/s
Range	Geo: 254.0 mm/s
Record Time	12.0 sec (Auto=1Sec) at 2048 sps
Operator/Setup:	BLA/factory MMB

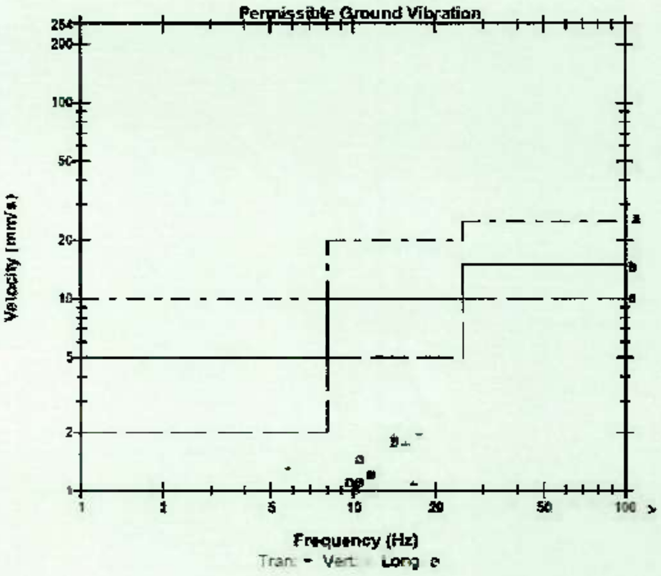
Serial Number	UM12338 V 10-87 Micromate ISEE
Battery Level	3.8 Volts
Unit Calibration	June 18, 2019 by UES New Delhi
File Name	__TEMP EVT

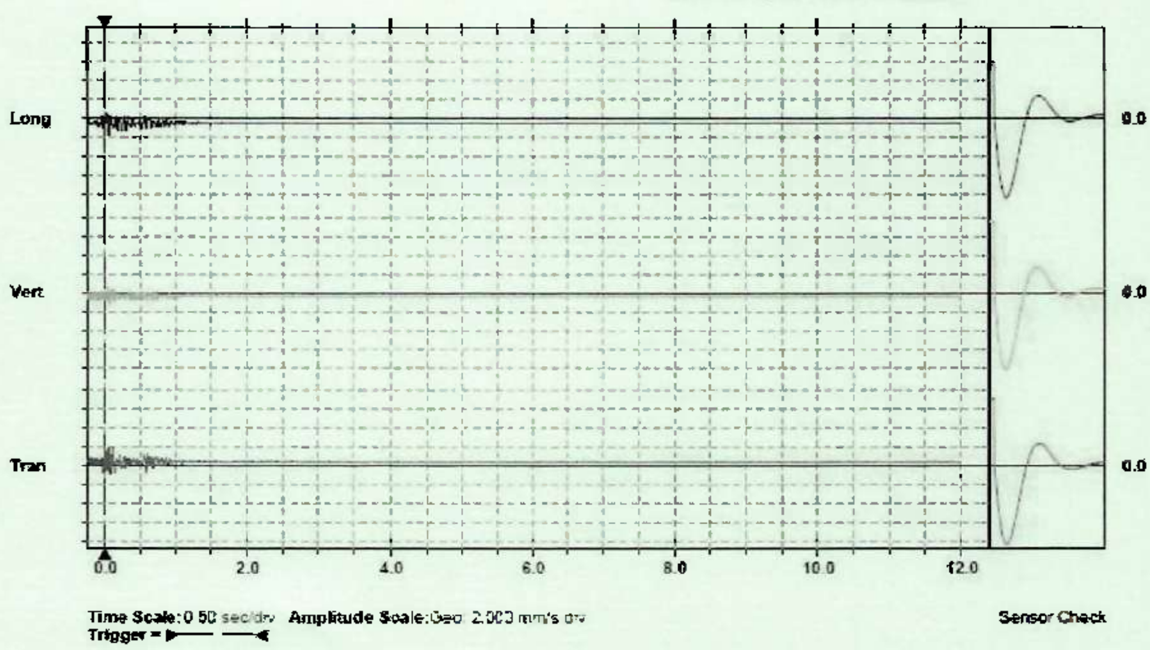
Notes

Location:	206 S
Client:	RA UG GEOTECH
User Name:	HZL
General:	STOPE

	Tran	Vert	Long	
PPV	1.047	1.119	1.913	mm/s
ZC Freq	17.4	9.4	14.0	Hz
Time (ReL to Trig)	0.055	0.058	0.052	sec
Peak Acceleration	0.031	0.018	0.025	g
Peak Displacement	0.065	0.071	0.063	mm
Sensor Check	Passed	Passed	Passed	
Frequency	7.5	7.9	7.7	Hz
Overswing Ratio	3.5	3.0	3.4	

Peak Vector Sum 2.800 mm/s at 0.055 sec





Time Scale: 0.50 sec/div Amplitude Scale: Geo: 2.000 mm/s/div
Trigger = ▶—— ——◀

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RAMPURA AGUCHA MINE
HZL

Instantel

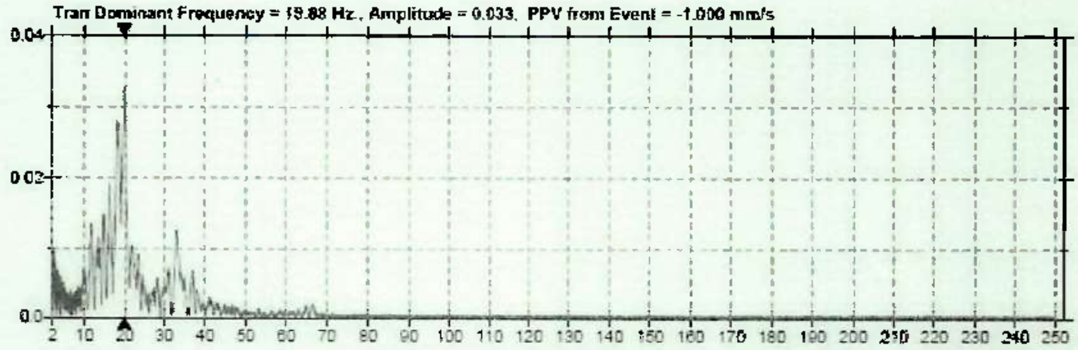
FFT Report

Date/Time	Tran at 18:28:02 June 11, 2020	**Serial Number**	UM12338 V 10-87 Micromate ISEE
Trigger Source	Geo: 1.500 mm/s	**Battery Level**	3.8 Volts
Range	Geo: 254.0 mm/s	**Unit Calibration**	June 18, 2019 by UES New Delhi
Record Time	12.0 sec (Auto=1Sec) at 2048 sps	**File Name**	__TEMP.EVT
Operator/Setup:	ELA/factory.MMB		

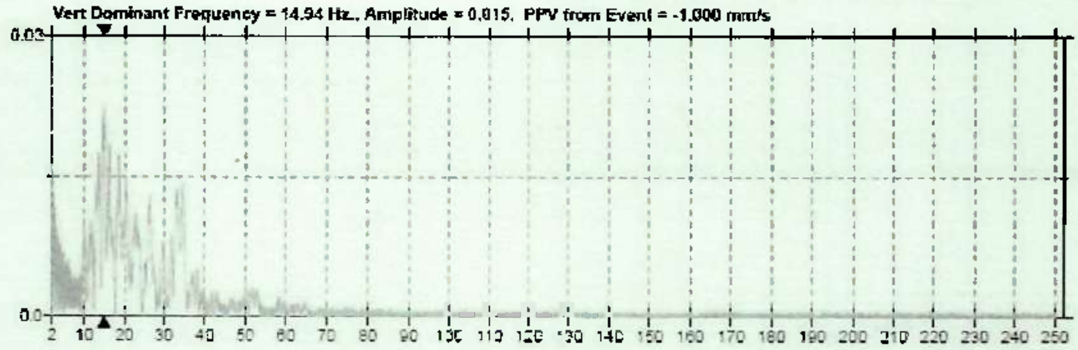
Notes

Location:	205 S
Client:	RA UG GEOTECH
User Name:	HZL
General:	STOPE

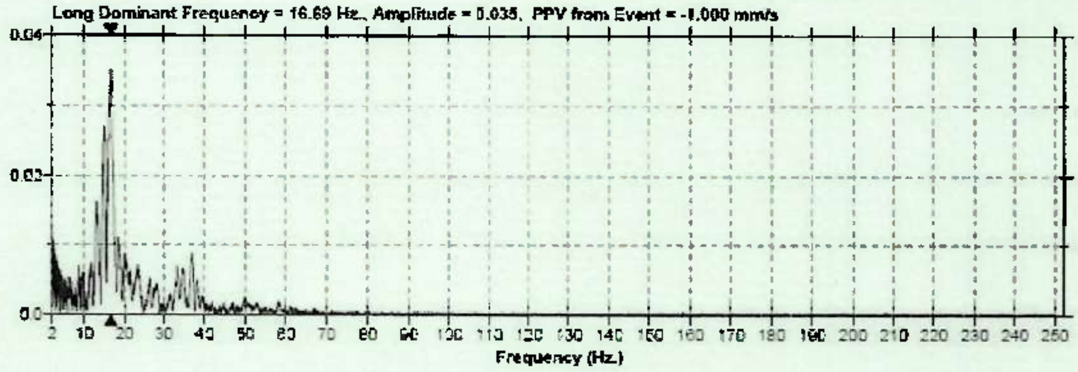
Tran Dominant Frequency = 19.88 Hz., Amplitude = 0.033, PPV from Event = -1.000 mm/s



Vert Dominant Frequency = 14.94 Hz., Amplitude = 0.015, PPV from Event = -1.000 mm/s



Long Dominant Frequency = 16.69 Hz., Amplitude = 0.035, PPV from Event = -1.000 mm/s



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Gulabpura (Bhilwara)

CHA MINE
HZL

Annexure R-13

कार्यालय
प्रभारी कनिष्ठ भू-जल वैज्ञानिक
(सर्वे एवं अनुसंधान) भू-जल विभाग
भीलवाड़ा

WATER LEVEL TREND AROUND PERIPHERY OF RAMPURA AGUCHA HZL MININING AREA FROM PREMONSC

District	Block	Name of villages	Well_Type	Owner_Name	Address/Location	D	M	S	D	M	S	RL (m)	Hyd_Formation	Zone	Total_Depth_bgl	WL_post_13	Flu_pre_post 2013	WL_pre_14	WL_post_14	Flu_pre_post 2014	WL_pre_15	WL_post_15
Bhilwara	Hurda	Agoocha	DW	[illegible]	Way To [illegible]	25	49	18.99	74	43	53.02	384.65	Gneiss	GN01	16.00	Dry	-	11.80	11.70	0.10	11.70	13.50
Bhilwara	Hurda	Agoocha	PZ	GWD (RWSRP)	Near Hzl Premises	25	49	36.61	74	43	45.25	387.00	Gneiss	GN01	73.00	2.47	3.48	5.90	1.45	4.45	5.75	3.60
Bhilwara	Hurda	Bhairoon Khera	PZ	GWD (NABA I phase)	D/s of pond near Devra	25	49	0.70	74	45	50.90	383.13	Gneiss	GN01	90.00	-	-	-	-	-	-	-
Bhilwara	Hurda	Hurda Seja	DW	Public Well	Near Girls School	25	54	9.47	74	40	59.70	400.31	Gneiss	GN01	21.00	7.80	2.40	15.60	7.60	8.00	10.00	8.75
Bhilwara	Shahpura	Kothiya	DW	Public Well	South Of Village	25	52	18.12	74	46	2.66	298.59	Gneiss	GN01	16.05	6.20	7.35	15.15	5.35	9.80	14.15	13.55

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प्रभारी कनिष्ठ भू-जल वैज्ञानिक
(सर्वेक्षण एवं अनुसंधान)
भू-जल विभाग,
भीलवाड़ा

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 996/2008
EXP.DATE 02-07-2023
GOVT. OF RAJASTHAN

RAMPURA AGUCHA MINE
HZL

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

कार्यालय
प्रभारी कनिष्ठ भू-जल वैज्ञानिक
(सर्वे एवं अनुसंधान) भू-जल विभाग
भीलवाड़ा

WATER LEVEL TREND AROUND PERIPHERY OF RAMPURA AGUCHA HZL MININING AREA FROM PREMONSC

District	Block	Name of villages	Well_Type	Owner_Name	Address/Location	D	M	S	D	M	S	RL (m)	Hyd_Formation	Zone	Total_Depth_bgl	Flu_pre_post 2015	WL_pre_16	WL_post_16	Flu pre_post_16
Bhilwara	Hurda	Agoocha	DW	[illegible]	Way To Bhairukheda	25	49	18.99	74	43	53.02	384.65	Gneiss	GN01	16.00	-1.80	14.60	9.00	5.60
Bhilwara	Hurda	Agoocha	PZ	GWD (RWSRP)	Near Hzl Premises	25	49	36.61	74	43	45.25	387.00	Gneiss	GN01	73.00	2.15	14.35	2.15	12.20
Bhilwara	Hurda	Bhairoon Khera	PZ	GWD (MISA Iphase)	D/s of pond near Devra	25	49	0.70	74	45	50.90	383.13	Gneiss	GN01	90.00	-	-	-	-
Bhilwara	Hurda	Hurda Soja	DW	Public Well	Near Girls School	25	54	9.47	74	40	59.70	400.31	Gneiss	GN01	21.00	1.25	10.40	7.60	2.80
Bhilwara	Shahpura	Kothiya	DW	Public Well	South Of Village	25	52	18.12	74	46	2.66	298.59	Gneiss	GN01	16.05	0.60	Dry	3.15	-

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भीलवाड़ा

WATER LEVEL TREND AROUND PERIPHERY OF RAMPURA AGUCHA HZL MINING AREA FROM PREMONSC

District	Block	Name of villages	Well_Type	Owner_Name	Address/Location	D	M	S	D	M	S	RL (m)	Hyd_Formation	Zone	Total_Depth_bgl	WL_pre_17	WL_post_17	Flu pre_post_17	WL_pre_18	WL_post_18	Flu pre_post_18	WL_pre_19
Bhilwara	Hurda	Agoocha	DW	[illegible]	Way To Bharukheda	25	49	18.99	74	43	53.02	384.65	Gneiss	GN01	16.00	11	12.60	-1.60	15.00	13.00	2.00	12.80
Bhilwara	Hurda	Agoocha	PZ	GWD (RWSRP)	Near Hzl Premises	25	49	36.61	74	43	45.25	387.00	Gneiss	GN01	73.00	5.65	8.65	-3.00	13.65	4.35	9.30	filled
Bhilwara	Hurda	Bhairoon Khera	PZ	GWD (MJSA Iphase)	D/s of pond near Devra	25	49	0.70	74	45	50.90	383.13	Gneiss	GN01	90.00	-	-	-	-	2.30		4.90
Bhilwara	Hurda	Hurda Seja	DW	Public Well	Near Girls School	25	54	9.47	74	40	59.70	400.31	Gneiss	GN01	21.00	9.2	7.20	2.00	8.90	4.20	4.70	10.00
Bhilwara	Shahpura	Kothiya	DW	Public Well	South Of Village	25	52	18.12	74	46	2.66	298.59	Gneiss	GN01	16.05	11.5	12.45	-0.95	12.25	10.80	1.45	12.80

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Rajesh Kumar Mehta
Gulabpura (Bhilwara)

RAMPURA AGUCHA MINE
HZL

कार्यालय
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(सर्वे एवं अनुसंधान) भू-जल विभाग
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WATER LEVEL TREND AROUND PERIPHERY OF RAMPURA AGUCHA HZL MINING AREA FROM PREMONSC

District	Block	Name of villages	Well_Type	Owner_Name	Address/Location	D	M	S	D	M	S	RL (m)	Hyd_Formation	Zone	Total_Depth_bgl	WL_post_19	Flu pre_post_19	WL_pre_20	Fluct. pre 2011_pre 2020_	Fluct. pre 2012_pre 2020_	Remarks
Bhilwara	Hurda	Agoocha	DW	[illegible]	Way To Shamukheda	25	49	18.99	74	43	53.02	384.65	Gneiss	GN01	16.00	1.80	11.00	9.60	-	-	
Bhilwara	Hurda	Agoocha	PZ	GWD (RWSRP)	Near Hzl Premises	25	49	36.61	74	43	45.25	387.00	Gneiss	GN01	73.00	0.35	-	2.85	6.30	1.10	
Bhilwara	Hurda	Bhairoon Khera	PZ	GWD (MJSA I phase)	D/s of pond near Devra	25	49	0.70	74	45	50.90	383.13	Gneiss	GN01	90.00	0.80	4.10	1.30	-	-	
Bhilwara	Hurda	Hurda Seja	DW	Pubilc Well	Near Girls School	25	54	9.47	74	40	59.70	400.31	Gneiss	GN01	21.00	4.90	5.10	6.50	3.45	4.35	
Bhilwara	Shahpura	Kothiya	DW	Public Well	South Of Village	25	52	18.12	74	46	2.66	298.59	Gneiss	GN01	16.05	2.40	10.40	3.05	-	9.20	

प्रभारी कनिष्ठ भू-जल वैज्ञानिक
(सर्वेक्षण एवं अनुसंधान)
भू-जल विभाग
भीलवाड़ा

132
03/09/2020

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 996/2008
EXP.DATE 02-07-2023
GOVT. OF RAJASTHAN

RAMPURA AGUCHA MINE HZL

Attested
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Rajesh Kumar Mehta
Gulabpura (Bhilwara)

Typed Copy of Annexure – R13

WATER LEVEL TREND AROUND PERIPHERY OF RAMPURA AGUCHA HZL MINING AREA FROM PREMONSOON

District	Block	Name of villages	Well_Type	Owner_Name	Address/Location	D	M	S	D	M	S	RL(m)	Hyd_Formation	Zone	Total_Depth_bgl	WL_pre_17	WL_post_17	Flu_pre_post_17	WL_pre_18	WL_post_18	Flu_pre_post_18	WL_pre_19
Bhilwara	Hurda	Agoocha	DW	Keshar/Jaganath Upadhya	Way to Bhairukheda	25	49	18.99	74	43	53.02	384.65	Gneiss	GN01	16.00	11.00	12.60	-1.60	15.00	13.00	2.00	12.80
Bhilwara	Hurda	Agoocha	PZ	GWD (RWSRP)	Near HZL Premises	25	49	36.61	74	43	45.25	387	Gneiss	GN01	73.00	5.65	8.65	-3.00	13.65	4.35	9.30	filled
Bhilwara	Hurda	Bhairoon Khera	PZ	GWD (MJSA II phase)	D/s of pond near Devra	25	49	0.7	74	45	50.9	383.13	Gneiss	GN01	90.00	-	-	-	-	2.30	-	4.90
Bhilwara	Hurda	Hurda Seja	DW	Public Well	Near Girls School	25	54	9.47	74	40	59.7	400.31	Gneiss	GN01	21.00	9.20	7.20	2.00	8.90	4.20	4.70	10.00
Bhilwara	Hurda	Kothiya	DW	Public Well	South Of Village	25	52	18.12	74	46	2.66	298.59	Gneiss	GN01	16.05	11.50	12.45	-0.95	12.25	10.80	1.45	12.80

WATER LEVEL TREND AROUND PERIPHERY OF RAMPURA AGUCHA HZL MINING AREA FROM PREMONSOON

District	Block	Name of villages	Well_Type	Owner_Name	Address/Location	D	M	S	D	M	S	RL(m)	Hyd_Formation	Zone	Total_Depth_bgl	WL_post_13	Flu_pre_post 2013	WL_pre_14	WL_post_14	Flu_pre_post 2014	WL_pre_15	WL_post_15
Bhilwara	Hurda	Agoocha	DW	Keshar/Jaganath Upadhya	Way to Bhairukheda	25	49	18.99	74	43	53.02	384.65	Gneiss	GN01	16	Dry	-	11.8	11.7	0.1	11.7	13.5
Bhilwara	Hurda	Agoocha	PZ	GWD (RWSRP)	Near HZL Premises	25	49	36.61	74	43	45.25	387	Gneiss	GN01	73	2.47	3.48	5.9	1.45	4.45	5.75	3.6
Bhilwara	Hurda	Bhairoon Khera	PZ	GWD (MJSA II phase)	D/s of pond near Devra	25	49	0.7	74	45	50.9	383.13	Gneiss	GN01	90	-	-	-	-	-	-	-
Bhilwara	Hurda	Hurda Seja	DW	Public Well	Near Girls School	25	54	9.47	74	40	59.7	400.31	Gneiss	GN01	21	7.8	2.4	15.6	7.6	8	10	8.75
Bhilwara	Hurda	Kothiya	DW	Public Well	South Of Village	25	52	18.12	74	46	2.66	298.59	Gneiss	GN01	16.05	6.2	7.35	15.15	5.35	9.8	14.15	13.55

WATER LEVEL TREND AROUND PERIPHERY OF RAMPURA AGUCHA HZL MINING AREA FROM PREMONSOON

District	Block	Name of villages	Well_Type	Owner_Name	Address/Location	D	M	S	D	M	S	RL(m)	Hyd_Formation	Zone	Total_Depth_bgl	Flu_pre_post 2015	WL_pre_16	WL_post_16	Flu_pre_post_16
Bhilwara	Hurda	Agoocha	DW	Keshar/Jaganath Upadhya	Way to Bhairukheda	25	49	18.99	74	43	53.02	384.65	Gneiss	GN01	16.00	-1.80	14.60	9.00	5.60
Bhilwara	Hurda	Agoocha	PZ	GWD (RWSRP)	Near HZL Premises	25	49	36.61	74	43	45.25	387	Gneiss	GN01	73.00	2.15	14.35	2.15	12.20
Bhilwara	Hurda	Bhairoon Khera	PZ	GWD (MJSA II phase)	D/s of pond near Devra	25	49	0.7	74	45	50.9	383.13	Gneiss	GN01	90.00	-	-	-	-
Bhilwara	Hurda	Hurda Seja	DW	Public Well	Near Girls School	25	54	9.47	74	40	59.7	400.31	Gneiss	GN01	21.00	1.25	10.40	7.60	2.80
Bhilwara	Hurda	Kothiya	DW	Public Well	South Of Village	25	52	18.12	74	46	2.66	298.59	Gneiss	GN01	16.05	0.60	Dry	3.15	-

WATER LEVEL TREND AROUND PERIPHERY OF RAMPURA AGUCHA HZL MINING AREA FROM PREMONSOON

District	Block	Name of villages	Well_Type	Owner_Name	Address/Location	D	M	S	D	M	S	RL(m)	Hyd_Formation	Zone	Total_Depth_bgl	WL_post_19	Flu_pre_post_19	WL_pre_20	Fluct. Pre 2011_pre2020_	Fluct. Pre2012_pre2020_	Remarks
Bhilwara	Hurda	Agoocha	DW	Keshar/Jaganath Upadhya	Way to Bhairukheda	25.00	49.00	18.99	74.00	43.00	53.02	384.65	Gneiss	GN01	16.00	1.80	11.00	9.60	-	-	
Bhilwara	Hurda	Agoocha	PZ	GWD (RWSRP)	Near HZL Premises	25.00	49.00	36.61	74.00	43.00	45.25	387.00	Gneiss	GN01	73.00	0.35	-	2.85	6.30	1.10	
Bhilwara	Hurda	Bhairoon Khera	PZ	GWD (MJSA II phase)	D/s of pond near Devra	25.00	49.00	0.70	74.00	45.00	50.90	383.13	Gneiss	GN01	90.00	0.80	4.10	1.30	-	-	
Bhilwara	Hurda	Hurda Seja	DW	Public Well	Near Girls School	25.00	54.00	9.47	74.00	40.00	59.70	400.31	Gneiss	GN01	21.00	4.90	5.10	6.50	3.45	4.35	
Bhilwara	Hurda	Kothiya	DW	Public Well	South Of Village	25.00	52.00	18.12	74.00	46.00	2.66	298.59	Gneiss	GN01	16.05	2.40	10.40	3.05	-	9.20	

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

Annexure R-14 colly

Annexure- I (1/3)

HINDUSTAN ZINC LIMITED
RAMPURA AGUCHA MINE
WELL WATER ANALYSIS REPORT-Oct-19 to Mar-2020

S. No	1		2		3		4		5		6	
Code	WW-10		ww-22		GWD		WW-13		HP-1		WW-15	
Month	Nov-19	Feb-20	Nov-19	Feb-20	Nov-19	Feb-20	Nov-19	Feb-20	Nov-19	Feb-20	Nov-19	Feb-20
pH	7.80	7.90	7.80	7.80	7.90	8.00	7.80	8.20	7.60	8.10	7.80	8.10
Alkalinity	396	410	264	310	354	370	260	190	252	270	347	396
Chlorides	56	62	62	51	150	159	55	62	102	99	63	54
Sulphate	310	396	60	89	181	120	167	121	96	103	74	69
CN	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb	0.008	0.008	0.007	0.006	0.008	0.007	0.007	0.005	0.008	0.007	0.008	0.008
Zn	0.090	0.100	0.070	0.080	0.100	0.100	0.090	0.080	0.100	0.090	0.070	0.080
Fe	0.080	0.070	0.070	0.080	0.110	0.090	0.110	0.090	0.070	0.080	0.090	0.100
Cd	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.001
Cu	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
Ni	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

S. No	7		8		9		10		11	
Code	WW-16		WW-23		PRK-1		KOT-1		WW-14	
Month	Nov-19	Feb-20	Nov-19	Feb-20	Nov-19	Feb-20	Nov-19	Feb-20	Nov-19	Feb-20
pH	7.90	8.40	7.40	7.90	7.40	8.10	7.90	8.20	7.10	7.40
Alkalinity	341	321	369	376	290	310	370	340	340	390
Chlorides	222	179	72	62	181	191	168	157	74	60
Sulphate	142	106	60	51	194	174	198	169	88	81
CN	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb	0.009	0.007	0.009	0.008	0.006	0.006	0.007	0.008	0.007	0.007
Zn	0.100	0.110	0.090	0.110	0.080	0.080	0.110	0.100	0.090	0.080
Fe	0.110	0.120	0.090	0.100	0.090	0.100	0.100	0.120	0.110	0.100
Cd	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
Co	BDL	BDL	BDL	BDL	BDL	BDL	BDL	HDL	BDL	BDL
Ni	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

All figures are in mg/l except pH

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RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 996/2008
EXP.DATE 02-07-2023
GOVT. OF RAJASTHAN

Attested
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Rajesh Kumar Mehta
Gulabpura (Bhilwara)

RAMPURA AGUCHA MINE
HZL

HINDUSTAN ZINC LIMITED

Annexure I (2/3)

RAMPURA AGUCHA MINE

PIEZOMETER WATER ANALYSIS REPORT October -19 to March-2020

S. No.	1		2		3		4		5		6		7		8	
Code	P		H		E1		G1		I1		K1		A		Adm	
Months	Nov-19	Feb-20	Nov-19	Feb-20	Nov-19	Feb-20	Nov-19	Feb-20	Nov-19	Feb-20	Nov-19	Feb-20	Nov-19	Feb-20	Nov-19	Feb-20
pH	7.40	7.80	7.60	7.80	7.60	7.90	7.60	7.90	7.40	8.00	7.40	7.90	7.60	8.10	7.90	7.80
Alkalinity	314	319	342	301	310	348	421	370	555	590	420	410	260	239	390	370
Chlorides	147	171	160	151	191	204	168	187	139	170	160	171	201	240	162	145
Sulphate	102	119	372	351	360	378	490	460	430	410	146	135	207	213	410	492
CN	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Pb	0.007	0.007	0.009	0.008	0.009	0.008	0.009	0.007	0.008	0.007	0.008	0.007	0.009	0.008	0.010	0.009
Zn	0.100	0.100	0.100	0.110	0.080	0.070	0.070	0.090	0.090	0.090	0.100	0.090	0.090	0.100	0.090	0.100
Fe	0.090	0.100	0.070	0.080	0.100	0.100	0.090	0.100	0.070	0.080	0.100	0.080	0.070	0.080	0.100	0.110
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	81	78	72	81	97	101	88	70	72	60	31	37	81	70	60	57
Mg	30	34	34	30	37	40	40	33	41	39	40	31	52	40	38	33

All figures are in mg/l except pH

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RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 996/2008
EXP.DATE 02-07-2023
GOVT OF RAJASTHAN

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

RAMPURA AGUCHA MINE
HZL

TEAM TEST HOUSE
(Unit of Team Institute of Science & Technology Pvt. Ltd.)

TC-5625

Approved by Ministry of Environment and Forest, Government of India as Environmental Laboratory

RSPCB ISO 9001:2015 OSHAS 18001:2007 JDA/UDH

Office : E-65 Chitranjan Marg,
C-Scheme, Jaipur - 302001, Rajasthan
Phone : 0141-2369980, 9414077379
Website : www.teamtesthouse.com
Email : team.bdhead@gmail.com

Lab : G1-584, RIICO Industrial Area,
Sitapura, Jaipur - 302022, Rajasthan
Phone : 9460222039, 9460222049
Email : director@teamtesthouse.com
marketinglab@teamtesthouse.com

TEST REPORT

Report No./ULR No. :	TC502520100000270F	Date :	07-05-2020
Issued To :	M/S Hindustan Zinc Ltd (Agucha) Rampura Agucha Mines PO : Agucha 311029, Gulabpura, District : Bhilwara (Rajasthan),	Type of Unit :	Mines
Type of Sample :	Borewell Water	Date of Sample Collection/Monitoring :	26-02-2020
Point of Collection :	WW - 14	Date of Receipt :	29-02-2020
Date of Test/Analysis :	29-02-2020 to 27-04-2020	Sampling Plan :	IS 3025:1987(Part 1)RA 2014
Quantity of Sample :	2 Ltr.	Sample Collected By :	Prahlad yogi
Unit's representative :	Dinesh Kumar Paliwal	Condition of Sample :	Fit for testing

RESULTS

S.No	Parameters	Observed Value	Testing Protocol
1	pH	7.41	IS 3025 (Part 11) : 1983 RA 2017
2	Hardness (total) [mg/l]	240	IS 3025 (Part 21) : 2009 RA 2019
3	Iron [mg/l]	BDL (<0.01)	IS 3025 (Part 53) : 2003 RA 2019
4	Chloride [mg/l]	95.97	IS 3025 (Part 32) : 1988 RA 2019
5	Total Dissolved Solids [mg/l]	520	IS 3025 (Part 16) : 1984 RA 2017
6	Calcium [mg/l]	51.2	IS 3025 (Part 40) : 1991 RA 2019
7	Magnesium [mg/l]	27.22	IS 3025 (Part 46) : 1994 RA 2019
8	Copper [mg/l]	BDL (<0.01)	IS 3025 (Part 42) : 1992 RA 2019

Note:

Continue to next page...

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 996/2008
EXP.DATE 02-07-2023
GOVT OF RAJASTHAN

RAMPURA AGUCHA MINE

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

TEAM TEST HOUSE

(Unit of Team Institute of Science & Technology Pvt. Ltd.)

TC-5025

Approved by Ministry of Environment and Forest, Government of India as Environmental Laboratory

RSPCB **ISO 9001:2015** **OSHAS 18001:2007** **JDA/UDH**

Office : E-65 Chitranjan Marg,
C-Scheme, Jaipur - 302001, Rajasthan
Phone : 0141-2369980, 9414077379
Website : www.teamtesthouse.com
Email : team.bdhead@gmail.com

Lab : G1-584, RIICO Industrial Area,
Sitapura, Jaipur - 302022, Rajasthan
Phone : 9460222039, 9460222049
Email : director@teamtesthouse.com
marketinglab@teamtesthouse.com

RESULTS

S.No	Parameters	Observed Value	Testing Protocol
9	Sulphate [mg/l]	83.6	IS 3025 (Part 24) : 1986 RA 2019
10	Cadmium [mg/l]	BDL (<0.001)	IS 3025 (Part 41) : 1992 RA 2019
11	Arsenic [mg/l]	BDL (<0.001)	IS 3025 (Part 37) : 1988 RA 2019
12	Lead [mg/l]	BDL (<0.01)	IS 3025 (Part 47) : 1994 RA 2019
13	Zinc [mg/l]	BDL (<0.01)	IS 3025 (Part 49) : 1994 RA 2019
14	Alkalinity - T [mg/l]	276	IS 3025 (Part 23) : 1986 RA 2019
15	Mercury [mg/l]	BDL (<0.001)	APHA:2017 : 4500-Cl B
16	Cyanide as CN [mg/l]	BDL (<0.01)	IS 3025 (Part 27) : 1986 RA 2019
17	Cobalt [mg/l]	BDL (<0.01)	APHA :2017 :3111- B
18	Nickel [mg/l]	BDL (<0.01)	IS 3025 (Part 54) : 2003 RA 2019

Notes :-

- # Parameter No. 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18 covered under NABL scope and Parameter No. NONE does not cover under NABL scope
- # Parameter No. NONE outsourced for testing.
- # The results listed refer only to the tested sample (s) & parameters (s). Endorsement of products is neither inferred nor implied.
- # This report is not to be reproduced wholly or in part and can not be used evidence in the court of law and should not be used in any advertising media without our special permission in writing.
- # The samples will be destroyed after 15 days from the date of issue of test report unless otherwise specified.

Puran Mal Yogi
Senior Analyst

Rajesh Maheshwari
Authorized Signatory
(Report No: TC502520100000270F)

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 996/2008
EXP.DATE 02-07-2023
GOVT OF RAJASTHAN

RAMPURA AGUCHA MINE

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

TEAM TEST HOUSE

(Unit of Team Institute of Science & Technology Pvt. Ltd.)

TC-5025

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Office : E-65, Chitranjan Marg, C-Scheme, Jaipur - 302001, Rajasthan
Phone : +91 6377210064, 9414077379,
Website : www.teamtesthouse.com
Email : team.bdhead@gmail.com

Laboratory : G1-584, RIICO Industrial Area, Sitapura, Jaipur - 302022, Rajasthan
Phone : +91 9460222039, 9460222049,
Email : director@teamtesthouse.com,
Email : marketinglab@teamtesthouse.com

TEST REPORT

Report No./ULR No. :	TC502520100000844F	Date :	05-09-2020
Issued To :	M/S Hindustan Zinc Ltd (Agucha) Rampura Agucha Mines PO : Agucha 311029, Gulabpura, District : Bhilwara (Rajasthan),	Type of Unit :	Mines
Type of Sample :	Borewell Water	Date of Sample Collection/Monitoring :	21-08-2020
Point of Collection :	WW - 14	Date of Receipt :	21-08-2020
Date of Test/Analysis :	21-08-2020 to 04-09-2020	Sampling Plan :	IS 3025:1987(Part 1)RA 2014
Quantity of Sample :	2 ltr	Sample Collected By :	Prahlad yogi
Unit's representative :	Dinesh Kumar Paliwal	Condition of Sample :	Fit for testing

RESULTS

S.No	Parameters	Observed Value	Testing Protocol
1	pH	7.45	IS 3025 (Part 11) : 1983 RA 2017
2	Hardness (total) [mg/l]	460	IS 3025 (Part 21) : 2009 RA 2019
3	Iron [mg/l]	BDL (<0.01)	IS 3025 (Part 53) : 2003 RA 2019
4	Chloride [mg/l]	275.91	IS 3025 (Part 32) : 1988 RA 2019
5	Total Dissolved Solids [mg/l]	1255	IS 3025 (Part 16) : 1984 RA 2017
6	Calcium [mg/l]	112	IS 3025 (Part 40) : 1991 RA 2019
7	Magnesium [mg/l]	43.74	IS 3025 (Part 46) : 1994 RA 2019
8	Copper [mg/l]	BDL (<0.01)	IS 3025 (Part 42) : 1992 RA 2019
9	Copper [mg/l]	BDL (<0.01)	IS 3025 (Part 42) : 1992 RA 2019
10	Sulphate [mg/l]	128.75	IS 3025 (Part 24) : 1986 RA 2019

Note:

Continue to next page...

HZL • RAMPURA AGUCHA MINE •

NOTARY RAJESH KUMAR MEHTA GULABPURA REG. NO. 996/2008 EXP.DATE 02-07-2023 GOVT. OF RAJASTHAN

Printed on 05 September 2020

Attested

NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

TEAM TEST HOUSE

(Unit of Team Institute of Science & Technology Pvt. Ltd.)

TC-5025

Approved by Ministry of Environment and Forest, Government of India as Environmental Laboratory

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Phone : +91 9460222039, 9460222049,
Email : director@teamtesthouse.com,
Email : marketinglab@teamtesthouse.com

RESULTS

S.No	Parameters	Observed Value	Testing Protocol
11	Cadmium [mg/l]	BDL (<0.001)	IS 3025 (Part 41) : 1992 RA 2019
12	Arsenic [mg/l]	BDL (<0.001)	IS 3025 (Part 37) : 1988 RA 2019
13	Lead [mg/l]	BDL (<0.01)	IS 3025 (Part 47) : 1994 RA 2019
14	Zinc [mg/l]	BDL (<0.01)	IS 3025 (Part 49) : 1994 RA 2019
15	Alkalinity - T [mg/l]	350	IS 3025 (Part 23) : 1986 RA 2019
16	Mercury [mg/l]	BDL (<0.001)	IS 3025 (Part 48) : 1994 RA 2019
17	Cyanide as CN [mg/l]	BDL (<0.01)	IS 3025 (Part 27) : 1986 RA 2019
18	Cobalt [mg/l]	BDL (<0.01)	APHA :2017 :3111- B
19	Nickel [mg/l]	BDL (<0.01)	IS 3025 (Part 54) : 2003 RA 2019

Notes :-

- # Parameter No. 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19 covered under NABL scope and Parameter No. NONE does not cover under NABL scope
- # Parameter No. NONE outsourced for testing.
- # The results listed refer only to the tested sample (s) & parameters (s). Endorsement of products is neither inferred nor implied.
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- # The samples will be destroyed after 15 days from the date of issue of test report unless otherwise specified.

Puran Mal Yogi
Senior Analyst

Rajesh Maheshwari
Authorized Signatory
(Report No: TC502520100000844F)

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG.NO. 996/2009
EXP.DATE 02-07-2023
GOVT OF RAJASTHAN

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

RAMPURA AGUCHA MINE
HZL

Annexure R-15

BEFORE THE PRINCIPAL BENCH, NATIONAL GREEN TRIBUNAL,

CENTRAL ZONAL BENCH, BHOPAL

M.A. No. 1/2020

IN

ORIGINAL APPLICATION NO. 187/2014 (CZ)

NOTARY GOVT. OF RAJASTHAN

APPLICANT IN M.A.:-

Govind Ram Soni

Vs

Hindustan Zinc Ltd. & Ors.

AFFIDAVIT CUM REPLY OF THE M.A. NO. 1/2020, ON BEHALF OF THE RAJASTHAN STATE POLLUTION CONTROL BOARD.

I, Mahaveer Mehta S/o Shri Sh. S. S. Mehta, aged about 57 years, presently working Regional Officer, Rajasthan State Pollution Control Board, Bhilwara, do hereby solemnly State and affirm as under:-

1. That I am presently working as Regional Officer, Rajasthan State Pollution Control Board, Bhilwara and am well conversant with the facts and circumstances of the matter and as such competent to swear this affidavit on behalf of the Rajasthan State Pollution Control Board (hereinafter referred as State Board).

सूचना का अधिकार अधिनियम, 2005 के तहत जारी दस्तावेज

रा. प्र. नि. मं. भीलवाड़ा

NOTARY RAJESH KUMAR MEHTA GULABPURA REG. NO. 998/2008 EXP.DATE 02-07-2023 GOVT. OF RAJASTHAN

2. That the contents of para 1 of the M.A. needs no reply.
3. That the contents of para 2 of the M.A. need no reply.
4. That the contents of para 3 of the M.A. are not admitted in the manner stated by the applicant and are denied. It is submitted

HZL

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

Regional Officer
Rajasthan State Pollution Control Board
Bhilwara (Raj.)

that the State Board has granted consent to operate to M/s Hindustan Zinc Ltd. Bhilwara vide letter dated 25.06.2019 having validity upto 28.02.2023 for Lead & Zinc Ore Mining with capacity 6.50 Milllion Tonnes Per Annum. And consent to operate for beneficiation of Lead Zince Ore with capacity of 6.50 Million Tonnes Per Annum vide letter dated 22.10.2019 having validity upto 28.02.2023. The photo copy of the consent to operate letters dated 25.6.2019 and 22.10.2019 are annexed herewith and marked as **Annexure-1 (Collectively)**.

The total waste water of the industry is 9500 KLD (Benificiation activity) & 2200 KLD (Mining activity). No waste water generated from mining activities although waste water generated from beneficiation process is stored in tailing dam and supernatant water is recycled in the process. To take care of any unforeseen condition/ rainy season/ design seepage unit has also provided in the form of retaining wall/ garland drains in the downstream of tailing dam followed by collection sump/siltation pond to collect seepage water and this seepage water is again pumped into tailing dam. Thus, the unit is maintaining zero discharge status outside the premises. Industry has provided 07 piezo-metric wells for monitoring of ground water quality/ contamination assessment in surrounding. Trend of metal concentration (Lead and Zinc) in past years (2017&2018) analysis results of piezo-meteric well samples are annexed herewith and marked as **Annexure-2 (Collectively)**.

5. That the State Board has compared the analysis results of piezo-meteric well with drinking water standards IS 10500, the inferences are mentioned herein under:-

5.1 Metals:-

A. **Concentration of Zinc (Zn)** were found within the require acceptable limit (5.0 mg/l) in all the samples collected in year 2017 & 2018. The photo copy of the comparative graphical

NOTARY RAJESH KUMAR MEHTA GULABPURA REG.NO.896/2008 EXP.DATE 02-07-2023 GOVT. OF RAJASTHAN

RAMPURA AGUCHA MINE HZL

सूचना का अधिकार अधिनियम 2005 के तहत जारी दस्तावेज
क्षे. प्र. नि. मं. भीलवाड़ा

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

Regional Officer
Rajasthan State Pollution Control Board
Bhilwara (Raj.)

representation is annexed herewith and marked as **Annexure -3**.

B. **Concentration of Copper (Cu), Nickel (Ni) and Cadmium (Cd)** were found Not- Traceable (NT) in the all 07 samples collected in year 2017. Further, these parameters were not analysed in samples collected in year 2018.

C. **Concentration of Lead** (Pb) was found ranging between 0.04 to 0.075 mg/l in 07 samples collected in year 2017, which is exceeding the required acceptable limit (0.01 mg/l). Subsequently, in year 2018, **concentration of Lead** were found ranging between 0.004 to 0.01 mg/l in 06 samples collected, which were found within the required acceptable limit (0.01 mg/l). The photo copy of the comparative graphical representation for Lead is annexed herewith and marked as **Annexure -4.**

5.2 Domestic Waste Water Management:-

For the domestic waste water unit has two STP's (having capacity of - 425 KLD at Colony and 300 KLD at Industrial premises), entire treated water generated from those STP's is utilized in plantation and horticulture.

It is submitted that from perusal of the above submissions it is evident that the applicant has filed the present M.A. without any study or evidence with respect to his allegations regarding rampant mining, continuous discharge of waste water causing agricultural loss and contamination of ground water. The issue has already been dealt by this Hon'ble Tribunal in detail in O. A. No. 128/2014 titled as Raghu Nath Vs Hindustan Zinc Ltd. & Ors. and O.A. No. 129/2014 titled as Davad Vs Hindustan Zinc Ltd. & Ors.

6. That the contents of para 4 of the M. A. needs no reply.

7. That the contents of para 5 of the M. A. needs no reply.

8. That the contents of para 6 of the M. A. needs no reply.

सूचना का अधिकार अधिनियम, 2005 के तहत जारी दस्तावेज
क्षे. अ. रा. प्र. नि. मं. भीलवाड़ा

क्षेत्रीय अधिकारी
राजस्थान प्रदूषण नियंत्रण मण्डल
भीलवाड़ा

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 598/2008
EXP.DATE 02-07-2023
GOVT. OF RAJASTHAN

HZL RAMPURA AGUCHA MINE

9. That the contents of para 7 of the M. A. needs no reply.

10. That due to COVID-19 pandemic, the deponent may be exempted from filing the notarised copy of this reply.

Prayer

In the light of submissions made herein above, it is requested that the affidavit cum reply to the M.A. on behalf of the Rajasthan State Pollution Control Board may kindly be taken on record and M.A. filed by the applicant may kindly be dismissed.

DEPONENT
Regional Officer
Rajasthan State Pollution Control Board
Bhilwara (Raj.)

VERIFICATION

Verified at Bhilwara, on this ......th day of June, 2020, I the above mentioned deponent do hereby verify that the contents of the above action taken report are true and correct, no part of it is false and nothing material has been concealed there from.

715

Solemnly affirmed before me & admitted the contents to be true

9.6.2020

PUSHPA ORDIA
NOTARY PUBLIC
REG. No. 206, BHILWARA

DEPONENT
Regional Officer
Rajasthan State Pollution Control Board
Bhilwara (Raj.)

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 996/2008
EXP.DATE 02-07-2023
GOVT. OF RAJASTHAN

सूचना का अधिकार अधिनियम 2005
के तहत जारी दस्तावेज
रा. प्र. नि. मं. भीलवाड़ा

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

BEFORE THE PRINCIPAL BENCH, NATIONAL GREEN TRIBUNAL,

CENTRAL ZONAL BENCH, BHOPAL

I.A. No. 1/2020

IN

ORIGINAL APPLICATION NO. 187/2014 (CZ)

APPLICANT IN I.A. :-

Govind Ram Soni

Vs

Hindustan Zinc Ltd. & Ors.

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2.	**ANNEXURE**	
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	Annexure-2 Trend of metal concentration (Lead and Zinc) in past years (2017&2018) analysis results of piezo-meteric well samples	
	Annexure-3 Photo copy of the comparative graphical representation	
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NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 996/2008
EXP.DATE 02-07-2023
GOVT. OF RAJASTHAN

Counsel for the Respondent State Board

Arvind Soni, Advocate

सूचना का अधिकार अधिनियम 2005
के तहत जारी दस्तावेज

प्र. प्र. नि. मं. भीलवाड़ा

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

HZL RAMPURA AGUCHA MINE

Annexure- I

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 under 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.

सूचना का अधिकार अधिनियम 2005 के तहत जारी दस्तावेज

रा. प्र. नि. म. भीलवाड़ा

HZL RAMPURA AGUCHA MINE

Attested

NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 996/2008
EXP.DATE 02-07-2023
GOVT. OF RAJASTHAN

Annexure R-16

TEAM TEST HOUSE

(Unit of Team Institute of Science & Technology Pvt. Ltd.)

Approved by Ministry of Environment and Forest, Government of India as Environmental Laboratory

RSPCB ISO 9001:2015 OHSAS 18001:2007 JDA/UDH

Office : E-65, Chitranjan Marg, C-Scheme, Jaipur - 302001, Rajasthan
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Phone : +91 9460222039, 9460222049,
Email : director@teamtesthouse.com,
Email : marketinglab@teamtesthouse.com

TEST REPORT

Report No./ULR No. :	TC502520100000250F	Date :	22-05-2020
Issued To :	M/S Hindustan Zinc Ltd (Agucha) Rampura Agucha Mines PO : Agucha 311029, Gulabpura, District : Bhilwara (Rajasthan),	Type of Unit :	Mines
Type of Sample :	Potable and Domestic Water	Date of Sample Collection/Monitoring :	26-02-2020
Point of Collection :	CSR Tankar Suply Agucha Village	Date of Receipt :	29-02-2020
Date of Test/Analysis :	29-02-2020 to 22-05-2020	Sampling Plan :	IS 3025:1987(Part 1)RA 2014
Quantity of Sample :	2 Ltr.	Sample Collected By :	Prahlad yogi
Unit's representative :	Dinesh Kumar Paliwal	Condition of Sample :	Fit for testing

RESULTS

S.No	Parameters	Observed Value	Testing Protocol	Requirement (Acceptable Limit) as per IS 10500 : 2012 (RA 2018) Max.	Standard Permissible limits in the absence of Alternate Sources as per IS 10500 : 2012
1	Color [Hazen]	Less than 5	IS 3025 (Part 4) : 1983 RA 2017	5.00	15.00
2	Odour	Agreeable	IS 3025 (Part 5) : 2018	Agreeable	-
3	Taste	Agreeable	IS 3025 (Part 7) : 2017 & (Part8) : 1984 RA 2017	Agreeable	-
4	Turbidity [NTU]	BDL (<0.1)	IS 3025 (Part 10) : 1984 RA 2017	1.00	5.00
5	pH	7.87	IS 3025 (Part 11) : 1983 RA 2017	6.50 - 8.50	-
6	Hardness (total) [mg/l]	240	IS 3025 (Part 21) : 2009 RA 2019	200.00	600.00
7	Iron [mg/l]	BDL(<0.01)	IS 3025 (Part 53) : 2003 RA 2019	0.3	-
8	Chloride [mg/l]	37.99	IS 3025 (Part 32) : 1988 RA 2019	250.00	1000.00

Note:

Continue to next page...

NOTARY RAJESH KUMAR MEHTA GULABPURA REG.NO.996/2008 EXP.DATE 02-07-2023 GOVT OF RAJASTHAN

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

HZL RAMPURA AGUCHA MINE

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Sitapura, Jaipur - 202022, Rajasthan
Phone : +91 9460222039, 9460222049,
Email : director@teamtesthouse.com,
Email : marketinglab@teamtesthouse.com

RESULTS

S.No	Parameters	Observed Value	Testing Protocol	Requirement (Acceptable Limit) as per IS 10500 : 2012 (RA 2018) Max.	Standard Permissible limits in the absence of Alternate Sources as per IS 10500 : 2012
9	Total Dissolved Solids [mg/l]	342	IS 3025 (Part 16) : 1984 RA 2017	500.00	2000.00
10	Calcium [mg/l]	60.8	IS 3025 (Part 40) : 1991 RA 2019	75.00	200.00
11	Magnesium [mg/l]	21.38	IS 3025 (Part 46) : 1994 RA 2019	30.00	100.00
12	Copper [mg/l]	BDL(<0.01)	IS 3025 (Part 42) : 1992 RA 2019	0.05	1.50
13	Manganese [mg/l]	BDL(<0.01)	IS 3025 (Part 59) : 2006 RA 2017	0.1	0.3
14	Sulphate [mg/l]	20.3	IS 3025 (Part 24) : 1986 RA 2019	200.00	400.00
15	Nitrate [mg/l]	8.95	IS 3025 (Part 34) : 1988 RA 2019	45.00	-
16	Fluoride [mg/l]	0.19	IS 3025 (Part 60) : 2008 RA 2019	1.00	1.50
17	Cadmium [mg/l]	BDL(<0.001)	IS 3025 (Part 41) : 1992 RA 2019	0.003	-
18	Arsenic [mg/l]	BDL(<0.001)	IS 3025 (Part 37) : 1988 RA 2019	0.01	-
19	Lead [mg/l]	BDL(<0.01)	IS 3025 (Part 47) : 1994 RA 2019	0.01	-
20	Zinc [mg/l]	0.08	IS 3025 (Part 49) : 1994 RA 2019	5.00	15.00
21	Alkalinity - T [mg/l]	148	IS 3025 (Part 23) : 1986 RA 2019	200.00	600.00
22	Aluminum [mg/l]	BDL(<0.01)	IS 3025 (Part 55) : 2003 RA 2019	0.03	0.2
23	Boron [mg/l]	0.30	IS 13428 (Annexure H)	0.5	1.0
24	sulphide [mg/l]	Less than 0.05	IS 3025 (Part 29) : 1986 RA 2019	0.05	-
25	Total Chromium [mg/l]	BDL(<0.01)	APHA :2017 :3111- B	0.05	-
26	Anionic Detergents as MBA's [mg/l]	BDL (<0.1)	IS 13428 (Annexure K)	0.2	1.00
27	Mercury [mg/l]	BDL(<0.001)	IS 3025 (Part 48) : 1994 RA 2019	0.001	-
28	Mineral oil [mg/l]	BDL (<0.5)	IS 3025 (Part 39) : 1991 RA 2019	0.5	-

Note:

Continue to next page...

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 996/2008
EXP.DATE 02-07-2023
GOVT OF RAJASTHAN

TEAM TEST HOUSE
(Unit of Team Institute of Science & Technology Pvt. Ltd.)

TC-5025

Approved by Ministry of Environment and Forest, Government of India as Environmental Laboratory

RSPCB ISO 9001:2015 OHSAS 18001:2007 JDA/UDH

Office : E-65, Chitranjan Marg, C-Scheme, Jaipur - 302001, Rajasthan
Phone : +91 6377210064, 9414077379,
Email : team.bdhead@gmail.com
Website : www.teamtesthouse.com

Laboratory : G1-584, RIICO Industrial Area, Sitapura, Jaipur - 302022, Rajasthan
Phone : +91 9460222039, 9460222049,
Email : director@teamtesthouse.com,
Email : marketinglab@teamtesthouse.com

RESULTS

S.No	Parameters	Observed Value	Testing Protocol	Requirement (Acceptable Limit) as per IS 10500 : 2012 (RA 2018) Max.	Standard Permissible limits in the absence of Alternate Sources as per IS 10500 : 2012
29	Cyanide [mg/l]	BDL (<0.01)	IS 3025 (Part 27) : 1986 RA 2019	0.05	-
30	Phenolic Compound [mg/l]	BDL (<0.001)	IS 3025 (Part 43) : 1992 RA 2019	0.001	-
31	Free residual chlorine [mg/l]	BDL (<0.1)	IS 3025 (Part 26) : 1986 RA 2019	0.2	1.0
32	Barium as Ba++ [mg/l]	BDL (<0.5)	IS 13428 (Annexure F)	0.7	-
33	Ammonia as NH3 [mg/l]	BDL (<0.1)	APHA 2017 : 4500-NH3 C	0.5	-
34	Silver as Ag [mg/l]	BDL(<0.01)	APHA :2017 :3111- B	0.1	-
35	Chloramines [mg/l]	BDL (<0.1)	APHA 2017 : 4500- Cl- B	4.0	-
36	Total coliform [MPN/100ml]	BDL	IS 5401 (Part 2) : 2012 RA 2018	Shall not be detectable in 100ml Sample	-
37	E. Coli [MPN/100ml]	BDL	IS 5887 (Part 1) : 1976 RA 2018	Shall not be detectable in 100ml Sample	-
38	Selenium [mg/l]	BDL(<0.01)	APHA :2017 :3111- B	0.01	-

Notes :-

- # Parameter No. 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38 covered under NABL scope and Parameter No. NONE does not cover under NABL scope
- # Parameter No. NONE outsourced for testing.
- # The results listed refer only to the tested sample (s) & parameters (s). Endorsement of products is neither inferred nor implied.
- # This report is not to be reproduced wholly or in part and can not be used evidence in the court of law and should not be used in any advertising media without our special permission in writing.
- # The samples will be destroyed after 15 days from the date of issue of test report unless otherwise specified.

Puran Mal Yogi
Senior Analyst

Rajesh Maheshwari
Authorized Signatory
(Report No: TC502520100000250F)

HZL • RAMPURA AGUCHA MINE •

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

NOTARY • RAJESH KUMAR MEHTA GULABPURA REG. NO. 996/2008 EXP.DATE 02-07-2023 • GOVT OF RAJASTHAN

Annexure R-17

(71)

ANNEXURE – G

Section DEV
D
Date 20.1.15
O/c
OS
Inward No.

129
21/1/15

82

राजस्थान–सरकार

कार्यालय उप निदेशक कृषि (विस्तार) जिला परिषद् भीलवाड़ा

(दूरभाष नं.–01482–232727, फैक्स नं.–01482–232997 E-Mail-ddagr_bhi@rediffmail.com)

क्रमांकः एफ( )/2014–15/538।   दिनांक : 16-01-2015

श्रीमान् जिला कलक्टर महोदय,
भीलवाड़ा

विषयः–नेशनल ग्रीन ट्रिब्यूनल सेन्टर जोन ब्रांच भोपाल के पारित आदेश दिनांक 18.12.2014 प्रारम्भिक जांच नं. 128/2014 द्वारा रघुनाथ करण एवं हिन्दुस्तान जिंक लि. एवं 129/2014 दावद नीलगर बनाम हिन्दुस्तान जिंक लि. एवं अन्य बनाम हिन्दुस्तान जिंक लि. में दायर प्रकरण में मा. न्यायालय आदेश की पालना के सम्बन्ध में।

प्रसंगः–श्रीमान् का पत्रांक एफ – 25 – 2 (7) (3) वि./2015/44032 दिनांक 12.01.2015 के क्रम में।

महोदय,

उपरोक्त विषयान्तर्गत निवेदन है कि दिनांक 13.01.2015 को क्षैत्रिय कार्यकर्ताओं द्वारा प्रार्थी दावद नीलगर के ग्राम कोटिया के आ.नं. 4563/3460, 4564/3460 किता 2 रकबा 0.64 है. में से मिट्टी के नमूनें लिये गये जिसकी जांच रिपोर्ट संतोषप्रद है एवं जॉच रिपोर्ट की फोटोप्रति संलग्न है।

प्रार्थी की जमीन में पानी का भराव नहीं होता है। रिपोर्ट वास्ते सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित है।

आदर सहित

संलग्न – उपरोक्तानुसार

(रामपाल खटीक)
उप निदेशक कृषि (विस्तार)
जिला परिषद् भीलवाड़ा

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 996/2008
EXP.DATE 02-07-2023
GOVT OF RAJASTHAN

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

HZL • RAMPURA AGUCHA MINE

Annexure R-18 colly

कार्यालय सामुदायिक स्वास्थ्यक केन्द्र – गुलाबपुरा, जिला–भीलवाड़ा

क्रमांक : संस्थापन / 2019-20/ 114   दिनांक : 11.03.2020

हेड सी०एस०आर,
हिन्दुस्तान जिंक लिमिटेड,
रामपुरा आगूंचा खान
पोस्ट – आगूंचा
तहसील – हुरड़ा, जिला – भीलवाड़ा
राजस्थान

विषय :– हिन्दुस्तान जिंक के आस–पास के परिधी में रोगियों की सूचना हेतु ।

सन्दर्भ :– आपके कार्यालय के पत्र क्रमांक 2752 दिनांक 11.03.2020

महोदय जी,

उपरोक्त विषय में निवेदन है कि हिन्दुस्तान जिंक रामपुरा–आगूंचा खान के आस–पास की परिधी क्षेत्र में कार्यालय के रिकार्ड के अनुसार विगत वर्षो में वायु प्रदुषण, जल प्रदुषण व लेड प्रदूषण से ग्रसित कोई मरीज ईलाज हेतु नहीं आये है । चिकित्सा रिकार्ड के अनुसार उपरोक्त कारणों से किसी की मृत्यु नहीं हुई है ।

वरिष्ठ चिकित्सा अधिकारी
सामुदायिक स्वास्थ्य केन्द्र
गुलाबपुरा – भीलवाड़ा

वरिष्ठ चिकित्सा अधिकारी प्रभारी
सामुदायिक स्वास्थ्य केन्द्र
गुलाबपुरा (भीलवाड़ा)

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 996/2008
EXP.DATE 02-07-2023
GOVT. OF RAJASTHAN

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

HZL RAMPURA AGUCHA MINE

कार्यालय सामुदायक स्वास्थ्यक केन्द्र – फुलिया कलॉ, जिला भीलवाड़ा

क्रमांक : संस्थापन / 1261 दिनांक 24/8/20

हेड सी. एस. आर,
हिन्दुस्थान जिंक लिमिटेड,
रामपुरा आगुचा खान
पोस्ट आगुचा
तहसिल– हुरडा, जिला– भीलवाड़ा
राजस्थान

विषयः– हिन्दुस्तान जिंक के आस– पास के परिधी मे रोगियो की सूचना हेतु।

सन्दर्भः– आपके कार्यालय के पत्र क्रमांक 2762 दिनांक 15/4/2020

महोदय जी,

उपरोक्त विषय मे निवेदन है कि हिन्दुस्तान जिंक रामपुरा–आगुचा खान के आस पास की परिधी क्षैत्र में कार्यालय के रिकार्ड के अनुसार विगत वर्षो मे वायु प्रदुषण जल प्रदुषण व लेड प्रदुषण से ग्रसित कोई मरीज ईलाज हेतु नही आये है। चिकित्सा रिकार्ड के अनुसार उपरोक्त कारणो से किसी की मृत्यु नही हुई है।

NOTARY RAJESH KUMAR MEHTA GULABPURA REG.NO. 996/2008 EXP.DATE 02-07-2023 GOVT. OF RAJASTHAN

वरिष्ठ चिकित्सा अधिकारी
सामुदायिक स्वास्थ्य केन्द्र
फुलिया कलॉ– भीलवाड़ा

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

RAMPURA AGUCHA MINE HZL

कार्यालय सेटेलाइट हॉस्पीटल शाहपुरा , जिला भीलवाड़ा

दिनांक 29/08/2020

कमांक : ~~संस्थापन~~ / 857
सामान्य

हेड सी. एस. आर
हिन्दुस्तान जिंक लिमिटेड,
रामपुरा आगुचा खान
पोस्ट आगुचा
तहसील – हुरडा , जिला – भीलवाडा

विषय :– हिन्दुस्तान जिंक के आस पास की परिधि में रोगियों की सूचना हेतु

सन्दर्भ :– आपके कार्यालय के पत्र कमांक 854 दिनांक 16 Jul 2020

महोदय जी ,

उपरोक्त विषय में निवेदन है कि हिन्दुस्तान जिंक रामपुरा आगुचा खान के आस पास की परिधि क्षेत्र में कार्यालय के रिकार्ड के अनुसार विगत बर्षो में वायु प्रदूषण , जल प्रदूषण व लेड प्रदूषण से ग्रसित कोई मरीज ईलाज हेतु नहीं आये है। चिकित्सा रिकार्ड के अनुसार उपरोक्त कारणो से किसी की मृत्यु नहीं हुई है।

वरिष्ठ चिकित्सा अधिकारी
सामुदायिक स्वास्थ्य केन्द्र
शाहपुरा – भीलवाड़ा

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 996/2008
EXP.DATE 02-07-2023
GOVT. OF RAJASTHAN

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

HZL • RAMPURA AGUCHA MINE

Annexure R-19

राजस्थान सरकार

कार्यालय संयुक्त निदेशक पशुपालन विभाग,भीलवाड़ा(राज.)

क्रमांक: 2048

दिनांक : 03.03.2020

हेड प्रशासन
हिन्दुस्तान जिंक लिमिटेड,
रामपुरा आगूंचा खान
पोस्ट – आगूंचा
तहसील – हुरडा, जिला भीलवाड़ा (राजस्थान)

विषय :— हिन्दुस्तान जिंक लिमिटेड रामपुरा आगूंचा की परिधि में पशुओ में संक्रामक रोग और पर्यावरण अशुद्धि (वायु जल एवं लेड प्रदुषण) की जानकारी बाबत।

सन्दर्भ :— आपका पत्रांक 2040 / दिनांक 14.02.2020 के क्रम में ।

उपरोक्त विषयान्तर्गत प्रमाणित किया जाता है कि स्थानीय विभागीय सस्थाओ की रिपोर्टिंग एवं रिकार्ड अनुसार हिन्दुस्तान जिंक के कार्य क्षेत्र में पशु चिकित्सा एवं टीकाकरण शिविरो का आयोजन किया जा रहा है। इस क्षैत्र में विगत कई वर्षो में किसी संक्रामक रोग का प्रकोप और पर्यावरण अशुद्धि (वायु जल एवं लेड प्रदुषण)से पशुधन हानि की कोई रिपोर्ट प्राप्त नही हुई है।

संयुक्त निदेशक
पशुपालन विभाग
भीलवाड़ा

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG.NO. 956/2008
EXP.DATE 02-07-2023
GOVT. OF RAJASTHAN

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

HZL • RAMPURA AGUCHA MINE

Annexure R-20

राजस्थान सरकार
कार्यालय तहसीलदार फूलियाकलां जिला भीलवाड़ा

क्रमांक / रीडर / 2020 / 354 दिनांक 11.09.2020

प्रबंधक,
हिन्दुस्तान जिंक लिमिटेड,
रामपुरा आगूंचा खान

विषय – कोठिया क्षेत्र मे जमीन धसने की जानकारी बाबत।

आप द्वारा हिन्दुस्तान जिंक लिमिटेड, रामपुरा आगूंचा खान द्वारा खनन करने से ग्राम कोठिया क्षेत्र मे पिछले 05 वर्षो में जमीन धसने की जानकारी चाही गई है।

इस सम्बन्ध में लेख है कि ग्राम कोठिया क्षेत्र में पिछले 05 वर्षो में जमीन धसने की कोई जानकारी / शिकायत इस कार्यालय के रिकार्ड में नहीं है।

तहसीलदार
तहसीलदार फूलियाकलां
फूलियाकलां, जिला–भीलवाड़ा

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 996/2008
EXP.DATE 02-07-2023
GOVT. OF RAJASTHAN

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

HZL • RAMPURA AGUCHA MINE

राजस्थान–सरकार

कार्यालय तहसीलदार हुरडा, जिला भीलवाडा (राज0)

कमांक / रीजस्व / 2020 / 5451 दिनांक– 22.09.2020

प्रेषिति

प्रबन्धक
हिन्दूस्तान जिंक लिमिटेड
रामपुरा आगूचा खान

विषय– आगूचा क्षैत्र में जमीन धसने की जानकारी उपलब्ध करवाने के बाबत।

प्रसंग– आपका पत्र कमांक / 4 / 2020 दिनांक 16.09.2020 के कम में

उपर्युक्त विषयान्तर्गत प्रासंगिक पत्र के संबंध में लेख है कि आप द्वारा पिछले 05 वषो में ग्राम आगूचा में खनन कार्य करने से आगूचा क्षैत्र में जमीन धसने के संबंध में रिपोर्ट चाही गई थी।

इस संबंध में पटवारी हल्का आगूचा से रिपोर्ट ली गई जिसके अनुसार ग्राम आगूचा में पिछले 05 वर्षो में हिन्दूस्तान जिंक लिमिटेड रामपुरा आगूचा द्वारा ब्लास्टिंक करने से जमीन धसने / गडडे होने की जानकारी का कोई प्रकरण सामने नही आया है।

अत पटवारी हल्का आगूचा द्वारा प्रस्तुत रिपोर्ट मौका पर्चा की छाया प्रति इसी पत्र के साथ संलग्न कर प्रेषित है।

संलग्न–किता–02

तहसीलदार हुरडा
जिला भीलवाडा

NOTARY
DINESH MEHTA
GULABPURA-HURDA
REG. NO. 1533/18
EXP.DATE 20-06-2023
GOVT. OF RAJASTHAN

Attested
NOTARY
Dinesh Mehta
Gulabpura-Hurda

RAMPURA AGUCHA MINE
HZL

RAMPURA AGUCHA MINE
HZL

Annexure R-21

ANNUAL REPORT C.S.R
F.Y. 2018-2019

Prepared By	D.S.Chouhan (Community Development Manager)	
Reviewed & Approved By	Mahitosh Deo (Head Admin & External Affairs)	

Attested
NOTARY
Rajesh Kumar Mehta
Gulabpura (Bhilwara)

HZL • RAMPURA AGUCHA MINE •

NOTARY
RAJESH KUMAR MEHTA
GULABPURA
REG. NO. 996/2008
EXP.DATE 02-07-2023
GOVT. OF RAJASTHAN

Health Water & Sanitation

Health Projects-

- **Smile on Wheels:** The villages lack affordable, accessible and reliable health services leading to increased vulnerability towards poverty. Realizing this gap, Hindustan Zinc initiated Mobile Health Unit, Smile On wheels with Smile Foundation to provide doorstep preventive and curative health services. The van was inaugurated in October by Director-RAM, Mr. Rajendra Dashora. The health van provides free medicines and rapid tests to the patients and referral services to villagers.
- The van had its operations in 30 villages across RAM covering 15231 beneficiaries through 500 OPDs.
- To promote hygiene and health amongst villages, 36 Health awareness programs covering 2766 beneficiaries were organized in villages, schools etc.
- **Shubham Seva Sansthan-** Along with this, we also support Shubham Seva Naturopathy and homeopathy centre where 22103 patients received benefits for the same.
- To support the Shubham Naturopathy and Homeopathy centre, we installed solar system so that expenditure on electricity can be reduced.

Water –

- Due to lack of potable drinking water in nearby area of Rampura Agucha Mines throughout the year. Drinking water is supplied through tankers in nearby 7 villages benefitting 12218 villagers per day.

Sanitation

- In our efforts to promote Sanitation and cleanliness in nearby areas, supported Kotdi and Hurda school.

RAMPURA AGUCHA MINE HZL

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Gulabpura (Bhilwara)

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Education

Khushi –

- A unique Public–Private–People initiative to strengthen effectiveness of the government's ICDS Program to improve health and well-being of children below 6 years of age. Khushi has reached 11000 children, spread over 504 Anganwadi centres (AWCs) covering 123 AWCs in Hurda, 214 AWCs in Shahpura, and 167 AWCs in Suwana Blocks in Bhilwara district.
- Activities related to pre-school like Bal-melas, teachers' day celebration, development of Teachers learning material and summer camps were done etc were done.
- To promote health, 252 Anganwadi health camps, recipe trials and awareness of THR usage and consumption, establishment of kitchen gardens in 360 AWCs
- 464 aanganwadi workers from the district underwent training on preschool education and Health along with quarterly meetings with LS and CDPO .
- All the activities helped in increased opening of Anganwadi centres (AWCs) to 86%. All the children form AWCs were mainstreamed to school education.
- Khushi Baatiye event had been launched wherein HZL employees financially contributed for providing uniforms and sandals to Anganwadi children. In the event, Rs. 22600 was contributed by HZL and business partners supporting 460 Anganwadi children.

Nandghar –

- Nand Ghars are a network of modern Anganwadis with an integrated approach to child welfare and skill development for women. In line with Prime Minister's vision of Swatch Bharat, women skill development, digital literacy and improving maternal and child health across the country; Apart from the ample space and thermal insulated these Nand Ghars offer amenities like solar power electricity, uniqe prefabricated structure, health care facilities, e learning, skill development programs.
- In Bhilwara,15 Greenfield Nandghar were constructed and rest 10 are in initial phase.
- A child Care center is being running at Bherukheda2nd benefitting 35 children.

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Siksha Sambal –

- Science, English and Mathematics (SEM) are the 3 subjects that students in government schools most frequently face difficulty in. To address this, HZL started Shiksha Sambal project in 2016-2017.
- Shiksha Sambal has placed Field Instructors of SEM in 7 government schools to improve results of class 9-12 students through extra classes and learning camps.
- Residential summer camp at Vidya Bhawan society, Udaipur non residential summer and winter camps at Agucha was organized for Class Xth and XII students in which 23, 132 and 197 students participated respectively.. 8 of our employees took classes on subjects of their expertise and motivated students. Training of field personnel, meetings with Principal and DEO was organized. Lab material was provided in all the schools and focussed on increase library usage amongst students
- To felicitate meritorious students of our Shiksha Sambal schools, felicitation program was organized at Rampura club, Zinc Colony. Students along with their parents were rewarded for their excellent performance. Best schools and best teacher awards were given. Top 3 students were awarded with Cash prize. SDM, Gulabpura, HEAD CSR, and Director-RAM ere chief guests of the event.

Jeevan Tarang-

- Jeevan Tarang is an initiative launched on 51st Foundation Day of HZL for engaging and mainstreaming differently able persons of all age groups.
- Android phones and Indian SIGN Language trained teachers are provided for blind and deaf children respectively to enhance their learning level.
- We are reaching to around 140 students through Muk badhir School, Bhilwara.
- With an attempt to mainstream the children audio described with subtitle Movie Hitchki was screened where are employees, students of Zinc school and children and other people participated. CEO-Zila Parishad was our Chief Guest and appreciated efforts of Hindustan Zinc. During Diwali, children from special schools prepared beautiful diyas. Employees supported the students and purchased diyas.

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Unchi Udaan –

- An initiative for providing IIT-JEE and NEET coaching to rural students. More than 150 students are selected from our nearby villages after rigorous screening system. Residential and non residential coachings are provided with Resonance and Avanti respectively.

Higher Education among Rural Girls –

- To promote higher education among girls, we support higher education of girls through this project. 43 Meritorious and needy girls from our nearby villages are availing higher education from Vedanta PG College - Ringus. The girls who scored the required marks were selected and also priority has been given to the needy especially socially and economically deprived ones.

- HZL – Rampura Agucha Mines rewarded Bhamashah Award for Various works implemented under CSR in the field of Education in Govt. schools and Anganwadi of Bhilwara District. It was awarded by hon'ble Chief Minister of Rajasthan, Mr. Ashok Gehlot.

Agriculture and Animal Husbandry (SAMADHAN)

Addresses the backbone of the economy in most of our neighboring communities by trying to encourage sustainable livelihood opportunities through integrated farming systems and livestock development.

Animal Husbandry

- To improve the breed, Artificial insemination (AI) of 1574 cattle was done whereas 27 cattle camps were organized benefitting 22398 cattle.
- Total 997 farmers were benefitted through our livelihood initiative.

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❖ **Agriculture**

- Under our agriculture project, various initiatives like Package of practices, rainfed to impart training of modern techniques. To increase income, we also promote vegetable and wadi cultivations among farmers
- 1345 farmers were covered under agriculture initiative like POP , rainfed etc. 306 farmers were covered under vegetable and wadi cultivation. . 1 vermicompost unit was set up at the location.
- 3 farmer exposure trips were organized, and 35 farmers were trained on best agriculture practices96 farmer groups covering 1634 farmers have been formed.
- Farmers' Day was celebrated in December in the fond memory of our 5th Prime Minister Choudhary Charan Singh. Organized in Rampura village where more than 650 farmers participated. Farmers were made aware about various government schemes and best practices.

Skill Development Program

Unemployment is a burning issue of the nation. Considering the remoteness, lack of exposure and opportunities in the communities around HZL locations, HZL has ventured into space of skill development to develop and enhance skills of youth and provide them employment opportunities. HZL has partnered with various organizations having expertise in developing skills over the years.

- ❖ Almost 27 youth from across HZL locations went to Gurugram under Maruti Suzuki ITI program under CTS scheme.
- ❖ 13 youth were sent to SEDI centre run by Ambuja cement Foundation (Jaitaran) for training in different trades and provide employment opportunities
- ❖ 30 graduate students from nearby villages undergone training for BPO out of which 90% received placements with a salary range from 8000 to 25000
- ❖ HZL SEDI centre has been established in partnership with Ambuja Cement Foundation for 4 different trades, namely, retail sales, domestic data entry operator, unarmed security guard and electrician where students undergo short term training courses and employment opportunities are presented to youth.
- ❖ Job Fair was organized in which more than 500 local youth participated out of which 162 got shortlisted and 55 have recently joined jobs as well

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- **HZL Mining Academy :** While the future of mining industry rests on underground mining, India has a shortage of skilled workers to work in underground mines. Seeing this important gap, HZL has partnered with Skill Council of Mining Sector (SCMS) and Indian Institute of Skill Development (IISD) to start India's first intensive skill building training on underground mining. The first program launched was Jumbo Drill Operators (JDO) training program, followed by a training program for Winding Engine Drivers (WED) and Banksman/Bellman. Total of 221 trainees have been trained and mostly placed so far. Currently 38 students were undergoing training at Agucha Mining Academy. HZL provide free lodging and boarding facilities along with stipend to the trainees.

Women Empowerment

Sakhi – Women empowerment is important for the overall development of a family or a community. Sakhi ,our flagship project, promotes SHGs as sustainable grassroots for women run institutions. Sakhi is a 3 tier institution with SHGs, VO and Federation.

- Sakhi Federation was formed with a name of Sakhi Udaan
- In the year 2018-2019, 322 SHGs (approximately 3500 members) were formed to deepen economic, entrepreneurial and social engagement opportunities for women in the communities. The women generated a savings of Rs. 59.36 lacs and 2215 women availed loan amounting to Rs. 136.19 lakhs. 260 SHGs were linked with formal financial institutions. 420 women were linked to MGNREGA schemes.
- 20 VOs were formed and 12 Vos received training on capacity building while 105 SHGs received various other trainings on grading, financial management etc.
- Taking the project forward, initiatives have been taken for enhancing the skills of women, 2 stitching centers were started at Kothiya an and Gulabpura where 203 women honed their stitching skills. 56 microenterprises were initiated by women with the support of Sakhi to increase their incomes.
- During Swatchta week, Sakhi women organized a rally at Agucha for spreading awareness on cleanliness in the village taking in loop the PRIs and other Govt. officials.
- International womens' day was celebrated in which females of lady's club and our female executives were present. More than 300 rural women had showed tremendous zeal in playing

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various games such as Kabaddi, Tug of war, Matki race, spoon and marble race, Matki race etc and also cultural events were organized. The women also shared their experience of being part of SHGs. Our chief guest Addnl SP – Shahpura, President of lady's club shared their thoughts on Women Empowerment. The female executives of RAM showed tremendous sportsmanship and participation in the event.

Sports & Culture:

- **Zinc Football** - Hindustan Zinc Limited is setting up a World-class technology based Football Academy with an objective of providing a holistic platform whereby talented Footballers from Rajasthan, both boys and girls, will get an opportunity to train and play for the Indian National Team. The Vision of the project is to engage local communities and build an ambition ladder for Talented Football players. This project is a key initiative of Hindustan Zinc CSR's long term commitment for the upliftment of local communities in Rajasthan.
- At present, 10 community football centres are active in surrounding villages of RAM where 300+ students of 8 – 14 years are groomed by certified coaches. We are seeing an enthusiastic participation of girls and boys in these centers
- To promote sports in rural community, ground leveling was done in Govt. Girls' Sr. Sec. School, Hurda.

Environment & Safety

- **Safety** - We aim for zero harm in families living in surrounding villages. Road safety is one of the largest campaigns run by any corporate with an objective of Swach- Swasth- Surakshit Rajasthan.
- In partnership with Rajasthan Road safety society, organized various activities like drawing competitions etc in school and communities to create awareness amongst community. Road safety van conduct various safety sessions in the communities around. Helmets were provided to 250 youth of nearby communities. SHG members were also provided helmets to provide road safety.

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Community Asset Creation

To cater to the basic needs of community and other institutions, support is provided through asset creation.

- Rupaheli village was facing water crisis due to improper water storage and connections. GLR tank with cattle trough was constructed at Rupaheli village to support community.
- Street light become an important component in villages to ensure safety of women & children and other risks due to animals and thieves. To reduce the burden of electricity onn panchayats, 70 solar street lights were installed.
- Due to poor infrastructure, young students were facing difficulties. Government schools of Bherukheda 1st and Rampura were renovated
- Constructed community hall at Amarpura village
- Children of nearby villages face crisis of potable drinking water in schools which affects their health. 10 RO and water coolers were installed in nearby 10 govt. schools

Stakeholder Engagement

Our employees have always shown interest in various CSR activities. Finance team visited Samadhan project and Nandghar and Mindspark project at location.

- Blood camp was organized on 30th January in joint collaboration with local administration and other Civil Society organizations in which 100 people from nearby community donated blood
- In our drive to change the perception about mine operations amongst community and engorce our belief of ZERO HARM, ZERO WASTE & ZERO DAMAGAE. 30 SHG women from nearby villages visited mines
- Supported Hurda school for celebration of block level National Festivals.

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RAMPURA AGUCHA MINE

ANNUAL REPORT C.S.R

F.Y. 2019-2020

Prepared By	D.S.Chouhan (Community Development Manager)	
Reviewed & Approved By	Nishant N. (Head Admin & External Affairs)	

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NOTARY
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Gulabpura (Bhilwara)

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Health, Water & Sanitation

- Neuropathy and Homeopathic Hospitals is run by trust **"Shubham Seva Sansthan"** at Gulabpura and supported by HZL benefitted 21656 patients in the F.Y.2019-2020
- Smile on Wheels is reaching the Community across 30 villages through Mobile Health Unit and contributed to Increase accessibility to medical services. SOW is rendering Services like: OPD, Tests, Referrals, IEC Activities awareness sessions & special camps. Reached out to 17699 villagers through 547 OPD in FY 19-20.
- 48 IEC activities / Awareness camps were conducted on different topics covering, Diabetes, Skin Infection, Anemia & Women's Health, Nutrition week, hand washing, Personal Hygiene, Upper Respiratory Tract Infection, World Cancer Day in which total 3653 villagers/students benefitted.
- Organized EYE Camp at Agucha village, during the camp 134 patient examined and received the eye care services in which 38 glassed were also provided and 14 cataract patients were suggested to referred for further treatment.
- 24 IEC (Information Education and Communication) activities on **Corona Virus** took place in the month of February and March, covering 1354 people in total from 22 Villages.
- Potable water supplied through tankers in nearby villages: Rampura, Bherukheda 1st, Bherukheda 2nd, Kheda Palola, Agucha, Parasrampura, Jaisinghpura and Mun Ji ka Kheda – benefitted 2627 Families.
- Laying of pipeline was done at Chattarpura village for providing drinking water. Total 557 villagers benefitted from this activity.
- Dropout rate is high in girls due to lack of proper facilities at schools during menstruation. Provided Incinerators in 21 Govt. Schools of nearby villages to promote, Aware and Assure the menstrual hygiene Practices & facility to help them attend and reach their full potential in Govt. schools. 1990 female students and teachers benefitted from this initiative
- Provided 300 small and 15 Big dustbins to 33 Govt. Schools of nearby villages. 5245 students benefitted from this initiative.
- Cleanliness drive organized at Agucha panchayat and Hurda Govt. School in joint collaboration with Gram panchayat. Benefitted population of gram panchayat.

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Education projects

Khushi: -

- Appx. 10000 children of 1 to 5 years of age covered through 504 Anganwadis Under the Project with a view to enhance the effectiveness of government's ICDS program for child growth and nutrition. 256 Children recovered from SAM during the Year
- It covers Activities like Bal-Mela (Gathering of 10-15 AWC and other govt. officials & community people for showcasing in cognitive development through different Activities) Celebration of Breastfeeding Week Nutrition week, Recipe Competitions, floor painting, employee engagement, Poshan month takes place.
- Recipe competitions in the F.Y 2019-20 were organized among women from nearby villages to the district level to promote the use of the THR (Take Home Ration) Provided by Govt. to children, pregnant and lactic mothers where CSR team, Ladies club Members from Zinc colony, Employees of HZL attended the event.
- Balmela was organized at Hurda Panchayat Samiti where more than 10 AWCs from nearby Hurda participated and various competitions were organized. BDO Hurda, RCHO-Hurda participated in the Balmela along with CDPO and LS.

Siksha Sambal:-

- The Project covers Apx.1100 children Form Std. 9th to 12th with English, Math and Science subjects form 7 Govt. schools from nearby villages.
- Total enrolment In the F.Y. 2019-20 was 1076
- Extra classes for English, Math & science, Diwali classes & Summer camp for early preparation also is part of the project.

Nandghar:-

- Nand Ghar are a network of modern Anganwadis with an integrated approach to child welfare and skill development for women. In line with Prime Minister's vision of Swatch Bharat, women skill development, digital literacy and improving maternal and child health across the country; Apart from the ample space and thermal insulated these Nand Ghars offer amenities like solar power electricity, uniqe prefabricated structure, health care facilities, e learning, skill development programs.

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Jeevan Tarang :-

- Jeevan Tarang is an initiative launched on 51st Foundation Day of HZL for engaging and supporting differently able persons of all age groups. Benefiting Appx.140 Mute-Deaf as well blind Students of std. 1st to 8th of Bhilwara Badhir Vidyalaya Contributing to the improvement in education opportunities to teachers. by Training for ISL and to students by Introducing Indian Sign Language (ISL) Training, Basic Computer Education, English Literacy Development, Teachers Enabling Program, Value Education & Soft Skills.

Unchi Udaan

- An initiative for providing IIT Coaching to rural students. Preparing Appx. 145 Students from 7 Siksha Sambal Govt. Schools (std. 9 to 12) With the Project for competitive examinations like IIT, JEE and NEET through the regular classes plus Doubt classes at the time of exam & Extra Classes by faculty for Physics, Biology, Math & Chemistry are also arranged.

Support for Higher Education:-

- Project Ringus is another initiative in educational initiative for promoting higher education among girls, the girls who scored the required marks were selected and priority has been given to the needy especially socially and economically deprived ones. The project is to Support **the Higher Education** for Girls from Vedanta P.G. Girls college. Providing Learning Opportunities to **43 Girls** of nearby villages.

Award :

- Rampura Agucha rewarded Bhamashah Award by State Government for exemplary work in education area under CSR

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Women Empowerment:-

- Under **SAKHI** project, Woman Empowerment by HZL is done with the help of Manjari Foundation. Women also have Integration with Samadhan and SEDI project have conducted Awareness session on breast cancer to SHG women and created Grain bank and witnessed women accessing their rights
- Reached to 27 villages Covering 3711 women with 322 SHGs (300 SHGS-Bank A/C, 10 credited from banks), 30 VOs & 1 Federation.
- 93.75 Lacs Savings, 2.83 crores credit generated, and loan availed by 2743 women. In which 548 women got job with MNREGA & 23 women involved in 2 Microenterprises.

Agriculture & Animal Husbandry Project (SAMADHAN)

Agriculture:

- Reached to **2146 families** across 12 villages of nearby area
- From vegetable cultivation, adopting modern techniques like seed treatment and line sowing, Other activities include, wheat intensification, wadis, rainfed practices and floriculture, seed treatment.

Animal Husbandry:-

- Covered 871 farmer families across 30 villages of nearby area.
- Under the project, Artificial insemination, and Sorted Semen AI (To enhance the possibility of birth of female calve), Animal camps (Animal check-ups), Mineral Mixture component, Sirohi bucks (medium to large sized goat breed reared for both meat and milk production), Calf rally (Calf Health status, Motivation by awarding farmers for calf maintenance), supported under project yielded leading to economic benefits.

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Skill Development Project

Skill and Entrepreneurship Development Institute (SEDI) Provides livelihood skill training to the youth of nearby villages in major 4 trades: Electrician, Domestic data entry operator, Unarmed security guard & Retail sales also provides the employment opportunities.

- 320 students were covered in FY 2019-20
- 80% students got placements and 70% is the retention rate in F.Y 2019-20
- Different **activities** like ...Special Days celebration, Employers meet, Birthdays, Farewell day, Parents teacher meet, counselling for new batch Guest lectures, LAC meeting (Local Advisory Committee), Sweets distribution among the neighbors and family members of placed trainees are Practiced under the project.

Sports & Safety

Football Academy

- Hindustan Zinc Limited is setting up a World-class technology-based Football Academy with an objective of providing a holistic platform whereby talented Footballers from Rajasthan, both boys and girls, will get an opportunity to train and play for the Indian National Team. The Vision of the project is to engage local communities and build an ambition ladder for Talented Football players. This project is a key initiative of Hindustan Zinc CSR's long-term commitment for the upliftment of local communities in Rajasthan. HZL is supporting the sportsmanship by supporting the Football at 6 Centers at RAM Location. Through Training During & after school sessions for 200+ children of Age group of 8-14 years. U-15 Girls and Boys and U-12 Girls and Boys tournaments. Supported Govt. Sec. school for the block level sports tournament. football tournament and Games for parents on Gathering, Entry in Various State Level Competitions (15 children). Entry in National Level Matches (1 Girl). And Track suites distribution to 12 students of kotdi for volleyball.

Safety

- Conducted Fire Safety training & Road safety sessions at Govt. Schools, Villages & Other institutes.

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Community Asset Creation

Along with other community-based projects Developing the community Assets is equally Important & Essential identifying the requirements of the community when it comes to Strengthen the Amenities in community as a part of which HZL is working on different sorts of community Assets. i.e. Education Infra, Water Infra & Civil Infra.

- Community hall at Bk 1 & Bk 2 was constructed
- Boundary wall at Nai Arwad was renovated to make it useful for farmers
- Pacca Floor at Bherukheda 1
- Open Gym at Agucha, Rampura & BK1
- Fencing for Plantation in front of colony.
- More than 10000 Plants distributed in nearby villages during rainy season.

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