

Registered AD

HZL/CLZS/ENV/33/2020-21/

16 .11.2020

To,

Shri V K Singh, IFS  
Additional Principal Chief conservator of forest ( C )  
Ministry of Environment and Forests and climate change  
Regional officer( CZ) Kendiya Bhawan,  
5 Floor, Sector H – Aliganj,  
LUCKNOW – 226024,

Sub : Six monthly Environmental compliance report.

Ref : Environmental Clearance Letter No. J-11011/17//2005-IAII(I) DATED, 03.05.2005


Sir,

Please find enclosed herewith the six monthly compliance report with reference to above Environmental Clearances of Ausmelt Lead Plant for CLZS for Period 01.04. 2020 to 30.09.2020

With all the enclosures.

Thanking you,

Yours faithfully,

  
(T K MEGHWAL)  
Sr.Manager (Environment)

**Hindustan Zinc Limited**

Sensitivity: Internal (C3)

Chanderiya Lead Zinc Smelter P.O. Putholi, Chittorgarh (Rajasthan) - 312 021  
T +91-1472 254 017 F +91-1472 253 016 www.hzlindia.com

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

# AUSMELT LEAD PLANT

**Environment Compliance Report of Chanderiya Lead Zinc Smelter, Chittorgarh with reference to Environmental Clearance letter No. (No. J-11011/17/2005-IAII(I) dtd. 03/08/05)**

CONDITION	STATUS
<b>A. SPECIFIC CONDITIONS</b>	
<p>i. The gaseous emission from various process units shall conform to the standard prescribed by the concerned authority from time to time .The state Board may specify more stringent standards for the relevant parameters keeping in view the nature of the industry and its size and location .At no time the emission level should go beyond the prescribed standard in the event of failure of any pollution control system adopted by the unit, the respective unit should not be restarted until the control measures are rectified to achieve the desire efficiency,</p>	<p>(1)The gaseous emission from various process units is being conform to the standard prescribed by the concerned authority from time to time</p> <p>(2)At no time the emission level is high than the prescribed standard in the event of failure of any pollution control system adopted by the unit, the respective unit is not restarted until the control measures are rectified to achieve the desire efficiency,</p>
<p>ii. As reflected in the EIA /EMP, exiting DCDA plant for sulphuric acid plant recovery from SO<sub>2</sub> shall be upgraded by use of high active catalyst and high efficiency plate heat exchangers. The company shall ensure that SO<sub>2</sub> emission from the lead smelter plant are taken to existing Sulphuric acid plant properly and converted to H<sub>2</sub>SO<sub>4</sub>. The stack from the sulphuric acid plant shall be provided with online stack emission monitoring equipment for continuous monitoring of S<sub>0</sub>2.As per recommendation made in CREP for environment protection SO<sub>2</sub> emission limit shall be controlled less than 2 kg/t of H<sub>2</sub>SO<sub>4</sub> produced and Acid mist limit of 50 mg/NM<sub>3</sub> shall be achieved by 31 Dec.2006.</p>	<p>(1) The SO<sub>2</sub> from Ausmelt going to pyro acid plant mainly. Sometimes it goes to hydro acid plant.</p> <p>(2) In Pyro Plant :already installed tail gas treatment plant.</p> <ol style="list-style-type: none"> <li>1. Complying the condition</li> <li>2. Acid plant is followed by Tail gas Treatment plant for the always below SO<sub>2</sub> &amp; Mist as per norms.</li> <li>3. Online Analyzer is working properly and connected to SPCB/CPCB.</li> <li>4. Very high power catalyst use for increase efficiency of conversion. Basically, cesium based V<sub>2</sub>O<sub>5</sub> catalyst is being use in Acid Plant.</li> </ol> <p><b>Analysis report of Acid Plant is attached as Annexure I</b></p>
<p>iii. The company shall install continuous air quality monitoring station.one CAAQM shall be set up at Chittorgarh Fort to assess the impact of the lead smelter</p>	<p>(1)The company was installed continuous air quality monitoring station.</p> <p>(2).One CAAQM was set up at Chittorgarh Fort to assess the impact of the lead smelter</p>

	on the Fort .Data monitored shall be submitted to MOEF and CPCB/RPCB once in six month.	on the Fort. (3) Data monitored is been submitted to MOEF and CPCB/RPCB once in six month.  <b>Analysis report of CAAQM Station is attached as Annexure II</b>
iv.	Fugitive emissions, acid mist vapours, fumes and SO2 shall be controlled and work environment monitored for prevailing contaminants regularly. Fugitive dust emissions in the lead concentrate handling area and at various transfer points shall be minimized by provision of dust suppression system. The trucks carrying concentrate shall be fully covered. The Company shall improve overall house keeping by asphaltting the internal roads and to reduce the generation of fugitive dust from vehicle movements.	(1) In order to minimize fugitive emissions Lead Concentrate containing 8-10% moisture is being handled.  (2)Provision of water sprinkling at Pb concentrate stock yard has been provided and working satisfactorily.  (3) Dust control system has been provided at material transfer points.  (4)Mobile Vacuum dust sweeping system on industrial roads and vacuum dust cleaning system for plant area are exist at smelter to control airborne dust due to the vehicles movement.  (5 )Regular road washing is being done on industrial roads.  (6)Truck & truck tyre washing system has been provided and working satisfactorily.  (7) All roads are pakka and concreted  <b>Photographs for Road Vacuum Sweeper is attached as Annexure III</b>
v.	The company shall install fume extractors and bag filters to control the emission from all melting and casting units. The emission shall confirm to the prescribed standards of 50 mg/Nm3 . The particulate emission from captive power plant should be controlled by installation of ESP and controlled with in the stipulated limits of 50 mg/NM3.The low NOX burners shall be installed to control the NOX emission	All pollution control equipment installed properly and operated regularly . Monitoring of stacks are regularly carried out.by our team.
	As reflected in the EIA /Environment Management Plan, discharge of process effluent shall not exceed 19 m3/hr. The treated effluent shall conform to the prescribed standard and recycled to maintain zero discharge ,Reveres Osmosis plant shall be installed for desalination and reuse to effluent to achieve zero discharge .The rejects from RO Plant shall be	1)Process effluents are kept with in prescribed limits both qualitatively and quantitatively,  2)Zero discharge is being maintained from the premises of the industry. 3)Existing RO plant is being operational in order to maximize recycling of treated effluents. New RO 1250 M3/day commissioned in Sept.2015.

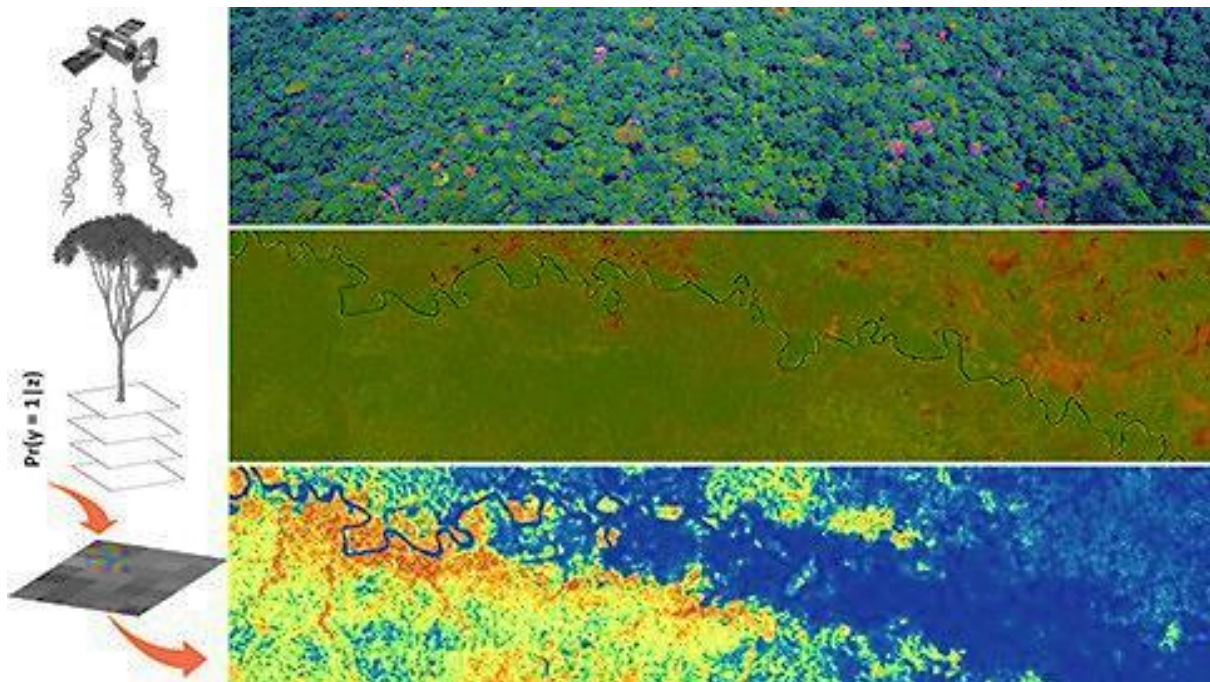
	evaporated in a solar evaporation pond to be constructed with in smelter premises .	4)RO reject is being evaporated in solar evaporation pond through Mist Evaporators / Foggers .
	The solid waste generated in the form of Slag shall be granulated and sold to cement manufacturing and also for use in road construction.	(1) The slag generated is granulated and disposed at the specific location in the slag storage yard. (2) Slag is being used by Cement Plants.
vi.	Green belt of adequate width and density in and around the captive power plant shall be developed as per Central pollution Control Board guidelines in 61.12 ha of area in addition to 106ha of existing area already brought under green belt. Around the periphery of plant and township canopy based green belt should be developed.	(1)Green belt of adequate width and density in and around the captive power plant is being developed as per Central pollution Control Board guidelines in 61.12 ha of area in addition to 106 ha of existing area already brought under green belt. (2) Canopy based greenbelt is already been developed around periphery of plant and township . (3) Presently 121.77 Ha. of green area is been developed inside CLZS Complex which is more than 33% of the Plant area.  <b>Details of green belt as attached as Annexure IV along with photographs.</b>
<b>B. GENERAL CONDITIONS:</b>		
i.	The project authorities must strictly adhere to the stipulations made by the Rajasthan State Pollution Control Board and the State Government.	Site is strictly following the stipulations made by the Rajasthan State Pollution Control Board and the State Government.
ii.	No expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment and Forests.	No expansion or modifications in the plant is being carried out without prior approval of the Ministry of Environment and Forests.
iii.	Adequate number of ambient air quality-monitoring stations shall be established in the downward direction as well as where maximum ground level concentration of SPM, SO <sub>2</sub> and NO <sub>x</sub> are anticipated in consultation with the Rajasthan State Pollution Control Board. Data on ambient air quality and stack emission should be regularly submitted to this Ministry including its Regional Office at Lucknow and the State Pollution Control Board/Central Pollution Control Board once in six months.	(1)Adequate number of ambient air quality-monitoring stations already established in the downward direction as well as where maximum ground level concentration of SPM, SO <sub>2</sub> and NO <sub>x</sub> are anticipated in consultation with the Rajasthan State Pollution Control Board.  (2)Data on ambient air quality and stack emission is being regularly submitted to this Ministry including its Regional Office at Lucknow and the State Pollution Control Board/Central Pollution Control Board once in six months.
iv.	Industrial waste water should be properly collected treated so as to conform to the standards prescribed under GSR 422 (E) dated 19 <sup>th</sup> May 1993 and 31 <sup>st</sup> December, 1993 or as	(1) Industrial waste water is being properly collected and treated is in ETP to to conform to the standards prescribed under GSR 422 (E) dated 19 <sup>th</sup> May 1993 and 31 <sup>st</sup> December, 1993 or as amended form time to time.

	amended form time to time. The treated wastewater should be recycled in the plant as well as utilization for plantation purposes.	(2)The treated wastewater should be recycled in the plant as well as utilization for plantation purposes.
v.	The project authorities must strictly comply with the rules and regulations with regard to handling and disposal of hazardous wastes in accordance with the Hazardous Wastes (Management and Handling) Rules 2003. Authorization from the State Pollution Control Board must be obtained for collection, storage, treatment and disposal of hazardous wastes.	(1) CLZS strictly complied with the rules and regulations with regard to handling and disposal of hazardous wastes in accordance with the Hazardous Wastes (Management and Handling) Rules 2003. (2) Authorization from the State Pollution Control Board is being obtained for collection, storage, treatment and disposal of hazardous wastes.
vi.	The overall noise levels in and around the plant area shall be kept well within the standards (85 dBA) by providing noise control measures including Silencers, enclosures etc on all sources of noise generation. The ambient noise levels should conform to the standards prescribed under EPA Rules, 1989 viz. 75 dBA (day time) and 70 dBA (nighttime).	The overall noise levels in and around the plant area always below within the standards (85 dBA) by providing noise control measures including Silencers, enclosures etc on all sources of noise generation.  The ambient noise levels should conform to the standards prescribed under EPA Rules, 1989 viz. 75 dBA (day time) and 70 dBA (nighttime).  <b>Analysis report of Noise Station is attached as Annexure V</b>
vii.	Occupational Health Surveillance of the workers Shall be done on a regular basis and records maintained as per the Factories Act.	Occupational Health Surveillance of the workers Shall be done on a regular basis and records maintained as per the Factories Act.
vii.	The project proponent shall also comply with all the environmental protection measures and safeguards recommended in the EIA/EMP/risk analysis and DMP report.	All the safety measures are in place along with the proper enforcement of PPEs
ix.	The project authorities will provide adequate funds both recurring and non-recurring to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so provided should not be directed for any other purposes.	The Plant authorities provide adequate funds both recurring and non-recurring to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government along with the implementation schedule for all the conditions stipulated herein.  The funds so provided is not directed for any other purposes.
x.	The Regional Office of this Ministry at Lucknow/Central Pollution Control Board/State Pollution control Board will monitor the stipulated conditions. A six	The Regional Office of this Ministry at Lucknow/Central Pollution Control Board/State Pollution control Board is being regularly monitored the stipulated conditions.

	monthly compliance report and the monitored data along with statistical interpretation should be submitted to them regularly.	A six monthly compliance report and the monitored data along with statistical interpretation is being submitted to Regional SPCB regularly.
xi.	The Project Proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the State Pollution Control Board/Committee and may also be seen at Website of the Ministry of Environment and Forests at <a href="http://envfor.nic.in">http://envfor.nic.in</a> . This should be advertised within seven days from the date of issue of the clearance letter at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same should be forwarded to the Regional Office.	The Plant was already informed the public that the project is the accorded environmental clearance by the Ministry and copies of the clearance letter are available with the State Pollution Control Board/Committee and may also be seen at Website of the Ministry of Environment and Forests at <a href="http://envfor.nic.in">http://envfor.nic.in</a> .  Our company advertised within seven days from the date of issue of the clearance letter at least in two local newspapers that are widely circulated in the region of which one is being in the vernacular language of the locality concerned and a copy of the same was forwarded to the Regional Office.
xii.	The project Authority shall inform the RO as well as MOEF the date of financial closures and final approval of the project by the concerned authority and the date of commencing and land development work.	Agreed and informed to RO & MoEF for all the details of plant activities.

# Greenbelt Estimation using GIS

## Chanderiya Lead Zinc Smelter, HZL



November 2020



**Terracon Ecotech Private Limited**

202, Kingston, Tejpal Road, Vile Parle (East), Mumbai, Maharashtra 400057

[www.terraconindia.com](http://www.terraconindia.com)



## Acknowledgement

We are thankful to Mr. Sachin Samar, Head, Environment, Chanderiya Lead Zinc Smelter (CLZS) for assigning us this opportunity to estimate greenbelt using GIS. We express our gratitude to thanks his unrelenting support, coordination, invaluable inputs and active involvement in the Project.

This project also involved various staff members from CLZS, we thank each and every one of them for their active involvement leading to successful and timely completion of the project.

A handwritten signature in blue ink that reads "Ashok Jain".



**Ashok Jain**  
Managing Director  
Terracon Ecotech Private Limited



## Executive Summary

A systematic mass plantation of pollution tolerant trees in order to mitigate air pollution by filtering, intercepting or absorbing air pollutants is known as ‘Greenbelt’. A greenbelt around industrial areas aims at creating pollution free, sustainable environment.

Greenbelt can be mapped using either remotely sensed data obtained from satellite, drones, or aircraft or digitization of green areas using GIS software like ArcGIS, ERDAS, QGIS, etc. The satellite data in form of multispectral imagery consist of data obtained on different wavelengths in an electromagnetic spectrum. These data can be used to calculate vegetation indices for obtaining the amount of green cover and tree cover.

For the estimation of green cover in Chanderia Lead Zinc Smelter (CLZS), Modified Soil Adjusted Vegetation Index (MSAVI-2), a modified version of the NDVI index was used. For calculation of Modified MSAVI-2, Pléiades 1 satellite imagery (29<sup>th</sup> February 2020) was procured. Pléiades 1 product has a spatial resolution of 0.5m. ‘Indices’ tool in unsupervised classification tab in ERDAS software was used.

Class	Area in Hectares	Percentage
Green cover	166	37

The total area of CLZS is 437 hectares. The MSAVI-2 analysis revealed that the total green cover area is 166 hectares i.e. 37% of total CLZS area. Out of 166 hectares, 34 hectare area has a new plantation of around 1-2 years old. The balance 132 hectares accounts to trees, shrubs, herbs and lawns.



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## Introduction

A systematic mass plantation of pollution tolerant trees in order to mitigate air pollution by filtering, intercepting or absorbing air pollutants is known as **'Greenbelt'**. A greenbelt around industrial areas aims at creating pollution free, sustainable environment.

Green belts are often recommended for Industries as a part of Environment management strategies. Green belt is recognized to provide multifunctional services and aid in sustainable development. Industrialized areas often face air pollution problems and higher atmospheric temperatures due to anthropogenic activities. The ambient air quality of an industrialized area can be restored by creating an effective greenbelt design. Many times, industries are located near settlements. In such scenario, restriction of pollutants near its source by creating vegetation buffer is the most suitable practice. Creation of such buffer zone needs systematic plantation of trees and shrubs.

Green belt is essential; in many ways that eventually lead to conservation of biodiversity. They are often safeguarded in the sense that developmental activities are prohibited in these selected areas and these locations will only be used for growing vegetation. An ideal greenbelt consists of diverse woody plants that aid in pollution mitigation as well as maintain the ecological balance of the surrounding environment, along with lawns, herbs and shrubs. Greenbelt development provides benefits such as –

- Overall improvement of the environmental conditions of a region.
- Mitigation of air pollution as well as enhancement of biodiversity and aesthetic value of a particular area
- Prevention of soil erosion and ultimately, land degradation
- Attenuates noise pollution as plants are efficient absorbers of noise
- Provides regulatory and supporting ecosystem services such as micro-climate regulation, carbon sequestration, etc.

## Greenbelt Benefits



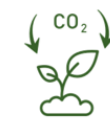
Environment  
condition  
improvement



Noise control



Soil erosion  
control



Carbon  
Sequestration



Air pollution  
control

## Profile for Study area

Chanderiya Lead Zinc Smelter (CLZS) is world's largest integrated smelter located in the Chittorgarh district of Rajasthan. CLZS, hereafter called study area, is situated on an area of 437 hectares. There are various units of hydro and pyro smelting processes. It also has several administrative buildings. A small residential colony, CSF is located near the main entrance.



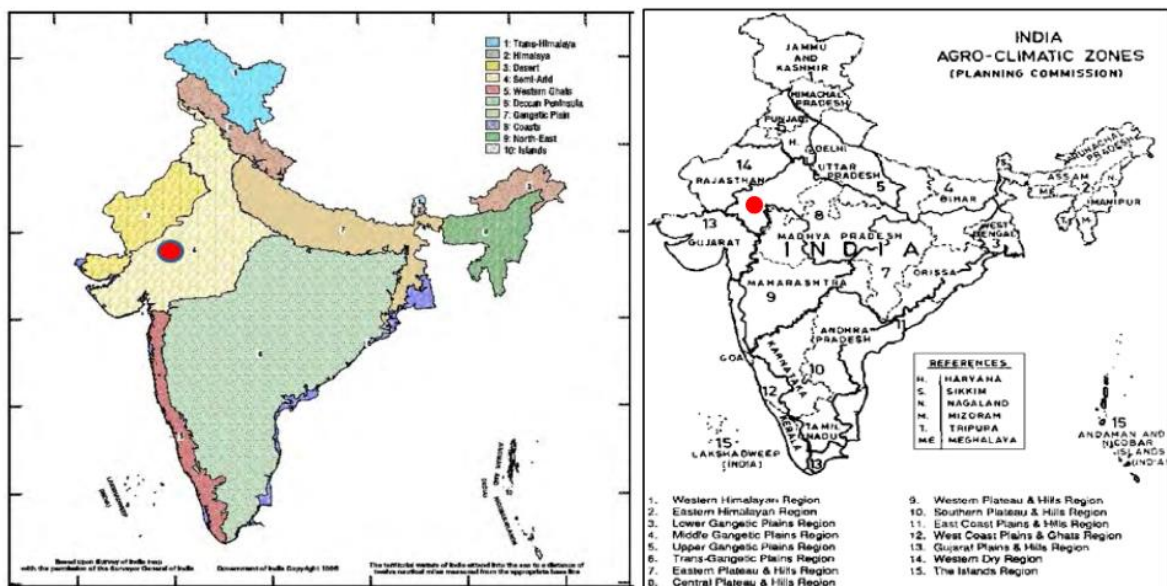
**Study area boundary**

The study area has an existing greenbelt zone which forms the major green cover of the factory area. It is surrounded by settlements like Billiya Khera, Putholi, agricultural fields, and other small marble industries. Vedanta formally began its commitment to biodiversity protection in 2011 by drafting its Biodiversity Policy. The current study has been carried out to observe the progress of the greenbelt developmental efforts and to monitor the extent of the increase in green cover.

## Geographical Details

The study area is located in the south-eastern part of Rajasthan. The major land use in this locality is agricultural fields and is followed by settlements and industries. It lies in the Central Plateau and Hills Agro-climatic zone.

<b>Agro climatic zone</b>	Central plateau and hills
<b>Biogeographic zone</b>	Semi-arid
<b>Biotic province</b>	Gujarat, Rajputana



Bio-geographic map (left) and agro-climatic zone map (right) of India with the factory area location

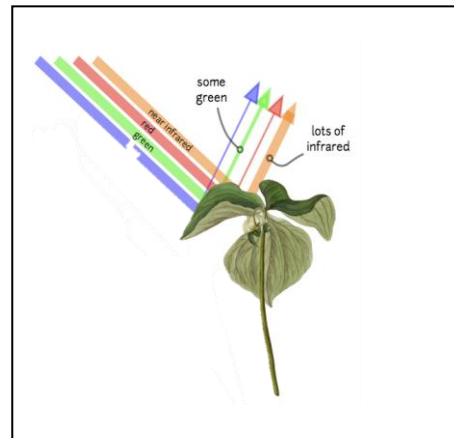
The Land-use map indicates that the study area is highly industrialized with around 58% built-up barren land area and areas covered by industrial operations. There are also some waterbodies present forming to around 3.20% of the total area. The table for landuse areas is given below.

Class	Area in Ha
<b>Built-up/barren land</b>	257
<b>Waterbody</b>	14
<b>Green cover</b>	166

## Methodology

Green cover or Greenbelt can be mapped using either remotely sensed data obtained from satellite, drones, or aircraft or digitization of green areas using GIS software like ArcGIS, ERDAS, QGIS, etc. The satellite data in form of multispectral imagery consist of data obtained on different wavelengths in an electromagnetic spectrum. These data can be used to calculate vegetation indices for obtaining the amount of green cover.

Vegetation indices are combinations or transformations of spectral bands in remote sensing to give prominence to spectral properties of plants and other types of vegetation. This makes them stand out from other features allowing us to calculate the cover of vegetation in a particular area. Vegetation indices are capable of providing us information like % green cover, biomass, and leaf area index. The calculations of these indices depend upon the difference between the reflectance and absorption capabilities of plants. Since plants reflect more in the near-infrared region and green region of the electromagnetic spectrum and absorb the rest of wavelengths like red, blue, the difference between NIR and red bands allowing us to extract vegetation features. Temporal analysis of vegetation indices allows us to track changes in the amount of green cover as well as its health. For the estimation of green cover in CLZS, MSAVI, a modified version of the NDVI index was used. MSAVI- 2 minimizes the effects of soil spectral signatures this assist in extraction of only vegetation pixel rather than mixed pixels of soil and vegetation which sometimes happens in case of NDVI.



For calculation of MSAVI-2, Pléiades 1 satellite imagery was procured. Pléiades 1 product has a spatial resolution of 0.5m dated 29<sup>th</sup> February 2020. ERDAS has a tool called as indices in its unsupervised classification tab. It has a collection of different vegetation indices among which MSAVI-2 will be selected. The input in the processing box was .img file of Pléiades 1 with required bands RED and NIR. The formula for the index is already integrated into the tool.

The formula for MSAVI-2 is as follows

$$MSAVI2 = \frac{(2 * NIR + 1 - \sqrt{(2 * NIR + 1)^2 - 8 * (NIR - RED)})}{2}$$

*Disclaimer: The green cover was calculated using 0.5m satellite imagery using vegetation indices. Due to travel restriction on account of covid situation the ground truthing has not been carried out to verify the results on the ground.*

## Green Cover of CLZS

A green cover is natural or planted vegetation covering a certain area of the terrain, functioning as protection against soil erosion, protecting the fauna, and balancing the temperature.

Green cover consists of total tree cover and total green cover. Total tree cover can be calculated by measuring the tree attributes but area occupied by lawns, herbs and shrubs cannot be estimated by the same method. Green cover of a greenbelt is carried out using Vegetation indices. It predicts the percentage of total area of the unit that is under vegetation. According to the CPCB guidelines, there is a prescribed percentage of green cover for a healthy society and determining the green cover allows understanding where the unit stands in developing its greenbelt.

The Green cover of study area is as follows:

<b>Green Cover in Hectares</b>	<b>166</b>
<b>Total study area in Hectares</b>	<b>437</b>



The total area of CLZS is 437 hectares. The MSAVI-2 analysis revealed that the total green cover area is 166 hectares i.e. 37% of total CLZS area. Out of 166 hectares, 34 hectare area has a new plantation of around 1-2 years old (Refer to 2<sup>nd</sup> map below). The balance 132 hectares accounts to trees, shrubs, herbs and lawns. This 1-2-year-old samplings will gradually grow to an extent which will get converted into thick vegetation.

# Green cover map

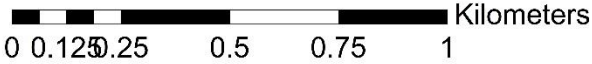
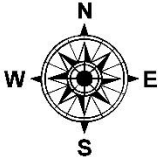


## Legend

 Project area

## Category

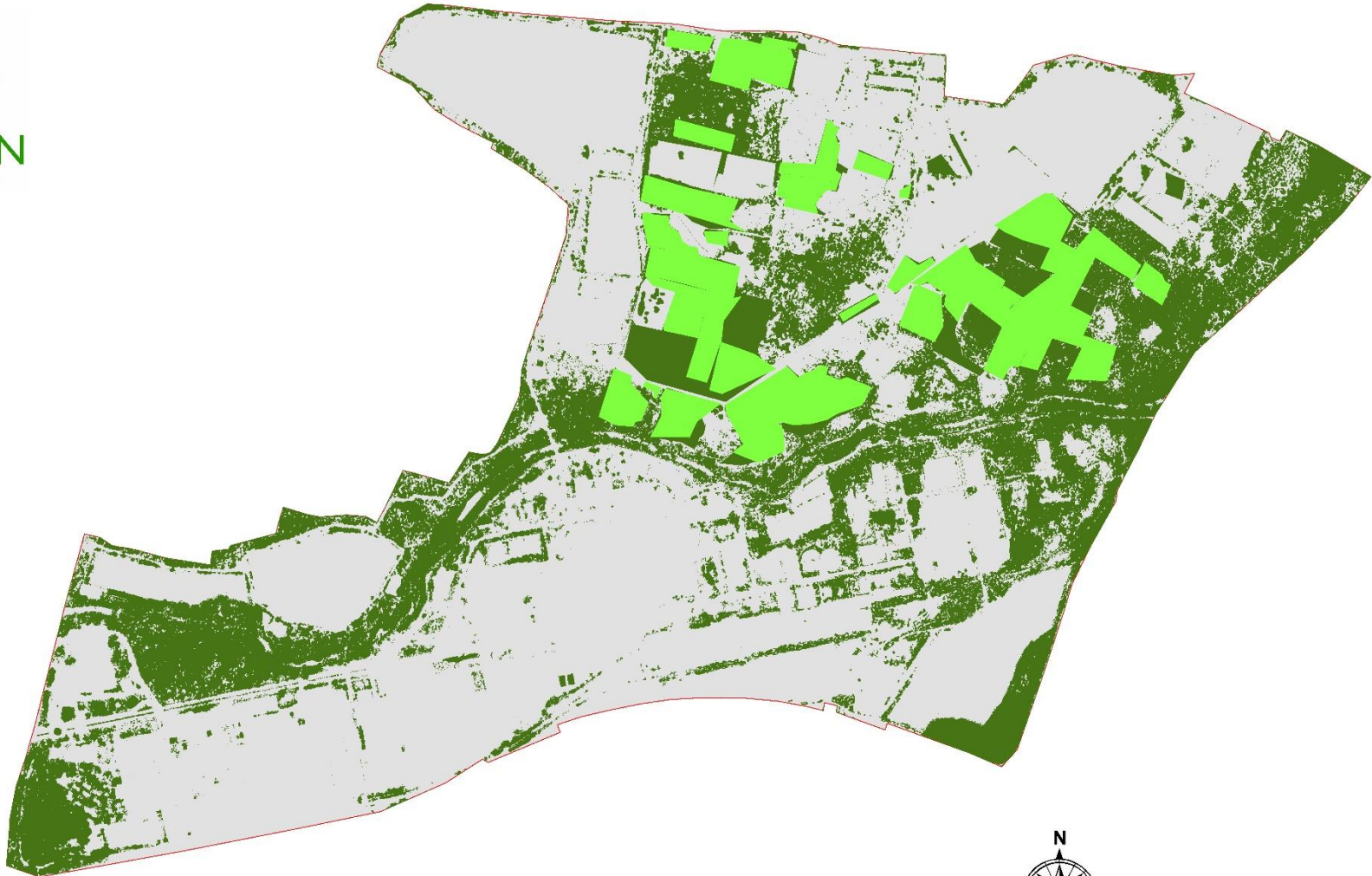
 Green cover



SATELLITE IMAGE : PLÉIADES-1. 29TH FEBRUARY 2020



# Green cover and new plantation map



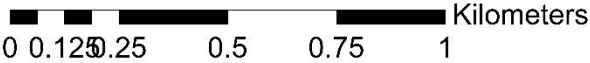
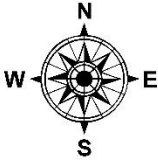
## Legend

 Project area

## Category

 Green cover

 New Plantation area





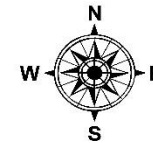
SATELLITE IMAGE : PLÉIADES-1. 29TH FEBRUARY 2020

## False colour composite image with 1km buffer



### Legend

- FCC- False colour composite image
-  1km Buffer around project area
-  Project area



SATELLITE IMAGE : PLÉIADES-1, 29TH FEBRUARY 2020

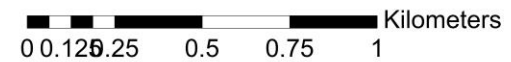
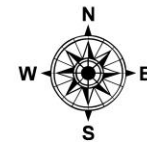
## False colour composite image



### Legend

FCC- False colour composite image

Class	Area in Ha
Builtup/Barren land	257
Waterbody	14
Green cover	166






SATELLITE IMAGE : PLÉIADES-1, 29TH FEBRUARY 2020

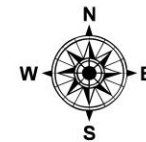
## Land use map



### Legend

-  Waterbody
-  Green cover
-  Builtup/ Barrenland

Class	Area in Ha
Builtup/Barren land	257
Waterbody	14
Green cover	166

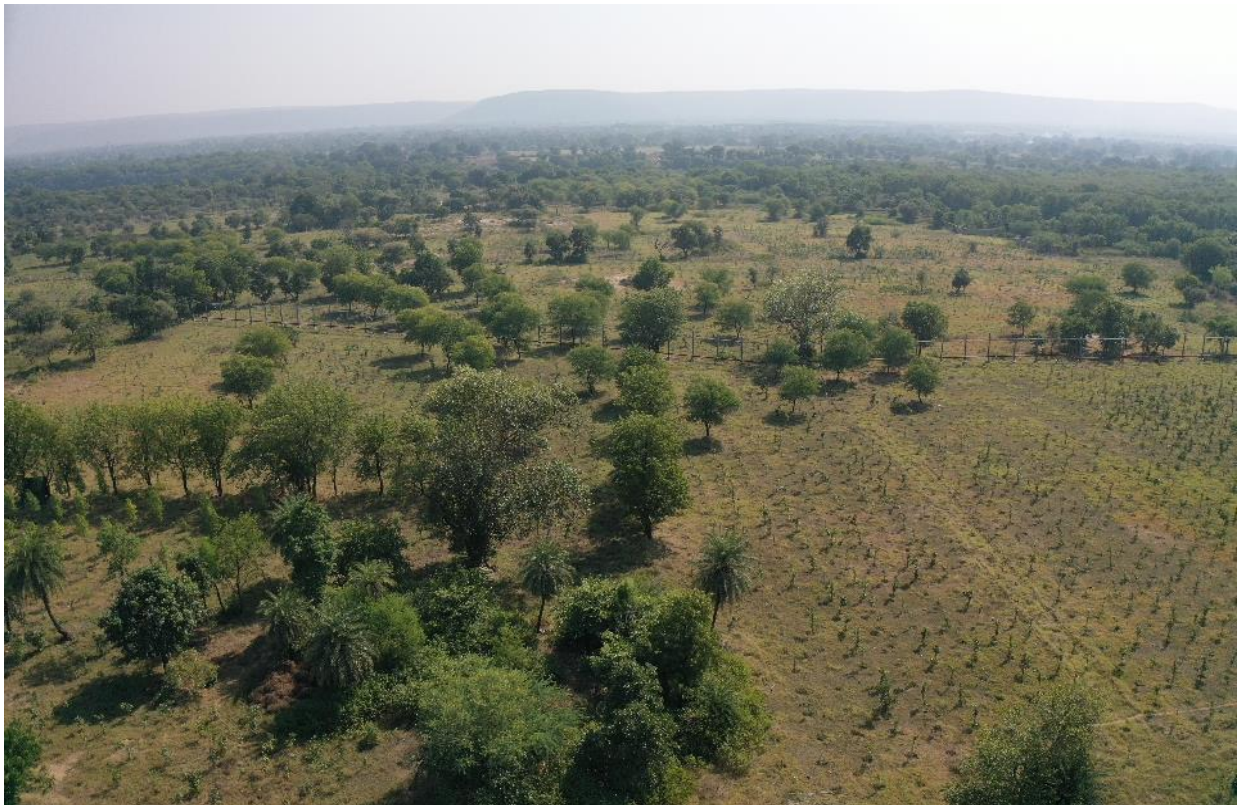


0 0.125 0.25 0.5 0.75 1 Kilometers


SATELLITE IMAGE : PLÉIADES-1, 29TH FEBRUARY 2020

## Plantation efforts by CZLS







<b>Project Name</b>	<b>Greenbelt Estimation Using GIS</b>
<b>Client</b>	<b>CHNADERIYA LEAD ZINC SMETLER, HINDUSTAN ZINC LIMITED</b>
<b>Contact Person</b>	<b>MR. SACHIN SAMAR</b>
<b>Consultant</b>	<b>Terracon Ecotech Private Limited 202, Kingston, Tejpal Road, Vile Parle (East), Mumbai 400057 www.terraconindia.com</b>
<b>Consultant Team</b>	<b>Dr. Ninad Raut, Lead, Ecology and Biodiversity Mr. Akshay Nachane, Co-Lead, Ecology and Biodiversity Ms. Pratiksha Chalke, Analyst, Biodiversity (GIS)</b>
<b>Project Co-ordinator</b>	 <b>Mr. Akshay Nachane Co-Lead, Ecology and Biodiversity Terracon Ecotech Private Limited</b>



**Terracon Ecotech Private Limited**

**202, Kingston, Tejpal Road, Vile Parle (East), Mumbai 400057**

**W: [www.terraconindia.com](http://www.terraconindia.com); E: [info@terraconindia.com](mailto:info@terraconindia.com)**

**P: +91 22 20863940/41**



**Annexure -**  
**HINDUSTAN ZINC LIMITED**  
**CHANDERIA LEAD ZINC SMELTER**  
**Work Zone (8 - Hours) Environment Monitoring Results**  
**(Apr'20 - Sept'20)**

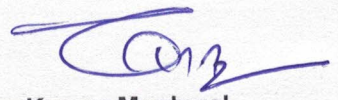
Month Location	Parameters/Unit	Prescribed Standards*	Apr'20	May'20	Jun'20	Jul'20	Aug'20	Sep'20
<b>Pyro, CPP, H-1 &amp; H-2 Plant</b>								
Pyro RMH	SPM mg/m3	10	0.728	0.410	0.666	0.577	0.600	0.666
	SO <sub>2</sub> mg/m3	5	BDL	BDL	BDL	BDL	BDL	BDL
	Zn mg/m3	5	0.134	0.124	0.131	0.125	0.189	0.196
Pyro Sinter Area	SPM mg/m3	10	0.575	0.501	0.600	0.615	0.615	0.662
	SO <sub>2</sub> mg/m3	5	BDL	BDL	BDL	BDL	BDL	BDL
	Zn mg/m3	5	0.123	0.109	0.199	0.163	0.166	0.162
H -1 Purification Section	SPM mg/m3	10	0.625	0.666	0.487	0.443	0.509	0.531
	SO <sub>2</sub> mg/m3	5	BDL	BDL	BDL	BDL	BDL	BDL
	Zn mg/m3	5	0.112	0.117	0.081	0.178	0.087	0.083
H - 1 Cell House	SPM mg/m3	10	0.152	0.176	0.221	0.153	0.136	0.150
	SO <sub>2</sub> mg/m3	5	0.349	0.537	0.354	0.288	0.298	0.266
	Zn mg/m3	5	BDL	BDL	BDL	BDL	BDL	BDL
LRP Casting Area	SPM mg/m3	10	0.602	0.556	0.659	0.552	0.527	0.491
	SO <sub>2</sub> mg/m3	5	BDL	BDL	BDL	BDL	BDL	BDL
	Pb mg/m3	0.15	BDL	BDL	BDL	BDL	BDL	BDL
LRP K-5 Dross Area	SPM mg/m3	10	0.583	0.618	0.549	0.637	0.637	0.615
	SO <sub>2</sub> mg/m3	5	BDL	BDL	BDL	BDL	BDL	BDL
	Pb mg/m3	0.15	BDL	BDL	BDL	BDL	BDL	BDL
H-2 Cell House	SPM mg/m3	10	0.164	0.155	0.120	0.111	0.116	0.110
	SO <sub>2</sub> mg/m3	5	0.452	0.590	0.341	0.232	0.264	0.288
	Zn mg/m3	5	BDL	BDL	BDL	BDL	BDL	BDL
CPP Coal Yard	SPM mg/m3	10	0.444	0.424	0.396	0.466	0.531	0.400
	SO <sub>2</sub> mg/m3	5	BDL	BDL	BDL	BDL	BDL	BDL
	Zn mg/m3	5	BDL	BDL	BDL	BDL	BDL	BDL

  
**Tarun Kumar Meghwal**

Environment Head  
Chanderia Lead Zinc Smelter

**Annexure -**  
**HINDUSTAN ZINC LIMITED**  
**CHANDERIA LEAD ZINC SMELTER**  
**Work Zone (15 – Minute) Environment Monitoring Results**  
**(Apr'20 - Sept'20)**

Month Location	Parameters/Unit	Prescribed Standards*	Apr'20	May'20	Jun'20	Jul'20	Aug'20	Sep'20
<b>Pyro, CPP, H-1 &amp; H-2 Plant</b>								
Pyro RMH	SPM mg/m3	-	3.00	5.33	4.66	6.33	5.00	3.66
	SO <sub>2</sub> mg/m3	10	BDL	BDL	BDL	BDL	BDL	BDL
	Zn mg/m3	10	0.051	0.063	0.07	0.03	0.07	0.05
Pyro Sinter Area	SPM mg/m3	-	4.33	4.66	5.33	4.66	4.00	3.66
	SO <sub>2</sub> mg/m3	10	BDL	BDL	BDL	BDL	BDL	BDL
	Zn mg/m3	10	0.092	0.058	0.08	0.07	0.05	0.04
H -1 Purification Section	SPM mg/m3	-	3.66	2.66	4.00	5.00	2.00	3.00
	SO <sub>2</sub> mg/m3	10	BDL	BDL	BDL	BDL	BDL	BDL
	Zn mg/m3	10	0.05	0.02	0.05	0.05	0.02	0.02
H – 1 Roster Area	SPM mg/m3	-	4.33	3.33	3.66	4.00	3.66	4.66
	SO <sub>2</sub> mg/m3	10	BDL	BDL	BDL	BDL	BDL	BDL
	Zn mg/m3	10	0.03	0.05	0.05	0.05	0.04	0.06
LRP Casting Area	SPM mg/m3	-	4.66	5.00	4.66	3.66	4.00	5.33
	SO <sub>2</sub> mg/m3	10	BDL	BDL	BDL	BDL	BDL	BDL
	Pb mg/m3	-	BDL	BDL	BDL	BDL	BDL	BDL
LRP K-5 Dross Area	SPM mg/m3	-	3.66	3.33	4.33	5.33	3.66	5.00
	SO <sub>2</sub> mg/m3	10	BDL	BDL	BDL	BDL	BDL	BDL
	Pb mg/m3	-	BDL	BDL	BDL	BDL	BDL	BDL
H-2 Roaster Area	SPM mg/m3	-	4.33	3.66	3.00	4.33	3.00	4.66
	SO <sub>2</sub> mg/m3	10	BDL	BDL	BDL	BDL	BDL	BDL
	Zn mg/m3	10	0.16	0.06	0.04	0.06	0.03	0.05
CPP Coal Yard	SPM mg/m3	-	2.66	4.33	3.66	3.33	4.33	4.00
	SO <sub>2</sub> mg/m3	10	BDL	BDL	BDL	BDL	BDL	BDL
	Zn mg/m3	10	BDL	BDL	BDL	BDL	BDL	BDL



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Environment Head

Chandera Lead Zinc Smelter

**Annexure -**  
**HINDUSTAN ZINC LIMITED**  
**Chanderia Lead Zinc Smelter**  
**STACK HEIGHT – PYRO PLANT**

S. No.	Stack Attached to	Height(m)
<b>Ausmelt</b>		
1	Dust extraction system of feed handling	35
2	Hygeine and ventilation system	30
3	Ausmelt furnace	52
4	SO2 absorption tower	55
<b>Hydro 1</b>		
1	Zinc dross milling bag filter	30
2	Zinc atomizing bag filter	30
3	Zinc melting furnace bag filter (1st stack)	30
4	Zinc melting furnace bag filter (2nd stack)	30
5	Acid plant	100
<b>Pyro</b>		
1	Sinter venturi	45
2	Sinter main	75
3	Crusher venturi	75
4	Crusher bag filter	75
5	ISF slagging floor	75
6	ZRP fume extraction	35
7	ZRP ventilation stack	75
8	LRP	75
9	Copper recovery plant	30
10	Copper drossing	34
11	TGT (Acid plant)	75
<b>Hydro 2</b>		
1	Zinc melting furnace bag filter	30
2	Zinc dross milling bag filter	30
3	Zinc atomizing bag filter	30
4	Acid plant	100
<b>CPP</b>		
1	Captive power plant	165
2	Captive power plant-Phase-II	165
3	16 MW DG SET	30

  
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Chanderia Lead Zinc Smelter

**Annexure -**  
**HINDUSTAN ZINC LIMITED**  
**Chandaria Lead Zinc Smelter**  
**Stack Monitoring Results (PM & LEAD)**  
**(APR'20 - SEPT'20)**

Location	Parameters	Limit	Unit	Result Apr-Jun'20	Result Jul-Sept'20
Sinter Main	PM	150	Mg/nm3	15.76	47.58
	Lead	10	Mg/nm3	BLQ(LOQ 0.005)	4.12
Sinter Venturi	PM	150	Mg/nm3	11.40	37.74
	Lead	10	Mg/nm3	BLQ(LOQ 0.005)	3.58
Crusher Main	PM	150	Mg/nm3	28.70	32.48
	Lead	10	Mg/nm3	BLQ(LOQ 0.005)	3.22
Crusher Venturi	PM	150	Mg/nm3	11.16	27.45
	Lead	10	Mg/nm3	BLQ(LOQ 0.005)	2.89
LRP Main	PM	150	Mg/nm3	6.16	15.25
	Lead	10	Mg/nm3	BLQ(LOQ 0.005)	0.80
ZRP Main	PSD				
ZRP Fume	PSD				



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Chandaria Lead Zinc Smelter

**Annexure -**  
**HINDUSTAN ZINC LIMITED**  
**Chanderia Lead Zinc Smelter**  
**Stack Monitoring Results (PM & LEAD)**  
**(APR'20 - SEPT'20)**

Location	Parameters	Limit	Unit	Result Apr-Jun'20	Result Jul-Sept'20
LRP Copper Drossing	PM	150	Mg/nm3	35.0	23.65
	Lead	10	Mg/nm3	BLQ(LOQ 0.005)	2.74
ISF Slagging Floor	PM	150	Mg/nm3	35.57	42.63
	Lead	10	Mg/nm3	BLQ(LOQ 0.005)	3.01
CRP Milling	PM	150	Mg/nm3	26.85	29.95
	Lead	10	Mg/nm3	BLQ(LOQ 0.005)	1.44
Ausmelt RMH	PM	50	Mg/nm3	15.09	35.56
	Lead	10	Mg/nm3	BLQ(LOQ 0.005)	1.01
Ausmelt Hygiene	PM	50	Mg/nm3	11.73	29.65
	Lead	10	Mg/nm3	BLQ(LOQ 0.005)	1.38




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Environment Head

Chanderia Lead Zinc Smelter

**Annexure -**  
**HINDUSTAN ZINC LIMITED**  
**Chandera Lead Zinc Smelter**  
**Stack Monitoring Results (PM)**  
**(APR'20 - SEPT'20)**

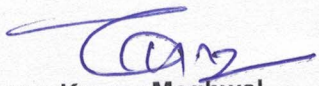
Location	Parameters	Limit	Unit	Result Apr-Jun'20	Result Jul-Sept'20
H-1 ZMC – 1st	PM	50	Mg/nm3	26.80	21.48
H-1 ZMC - 2nd	PM	50	Mg/nm3	13.07	23.69
H-1 Zinc Dust	PM	50	Mg/nm3	14.04	28.85
H-2 ZMC in side	PM	50	Mg/nm3	20.19	22.39
H-2 Zinc Dross	PM	50	Mg/nm3	20.92	37.78
H-2 Zinc Dust	PM	50	Mg/nm3	30.28	31.84
CPP Unit - 1 & 2	PM	50	Mg/nm3	30.75	29.85
CPP Unit - 3	PM	50	Mg/nm3	34.19	42.56

  
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Chandera Lead Zinc Smelter

**Annexure -**  
**HINDUSTAN ZINC LIMITED**  
**Chandera Lead Zinc Smelter**  
**Treated Water Monitoring Results**  
**(Apr'20 - Sept'20)**

**ETP Out Let - (Hydro - 2)**

Parameter	Unit	Limit	Result (Apr-Jun'20)	Result (Jul-Sept'20)
pH	-	5.5 - 9.0	7.21	7.28
Chloride	Mg/l	1000	144	479.85
Oil & Grease	Mg/l	10.0	BDL	3.0
Total Residual Chlorine	Mg/l	1.0	BDL	BDL
Ammonical Nitrogen	Mg/l	50.0	9.09	2.80
Nitrate Nitrogen	Mg/l	10.0	BDL	1.20
BOD	Mg/l	30	5.00	5.2
COD	Mg/l	250	16.1	36
TSS	Mg/l	100	BDL	12
Fluoride	Mg/l	2.0	0.9	0.85


  
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Environment Head  
Chandera Lead Zinc Smelter

**Annexure -**  
**HINDUSTAN ZINC LIMITED**  
**Chandera Lead Zinc Smelter**  
**Treated Water Monitoring Results**  
**(Apr'20-Sept'20)**

**ETP Out Let – (Hydro – 2)**

Parameter	Unit	Limit	Result (Apr-Jun'20)	Result (Jul-Sept'20)
Phosphate	Mg/l	5.0	0.03	BDL
Cyanide	Mg/l	0.2	BDL	BDL
Cadmium	Mg/l	2.0	BDL	BDL
Chromium	Mg/l	2.0	BDL	BDL
Copper	Mg/l	3.0	BDL	BDL
Iron as Fe	Mg/l	Not Specified	0.14	BDL
Lead as Pb	Mg/l	0.1	BDL	0.02
Nickel	Mg/l	3.0	BDL	BDL
Zinc	Mg/l	5.00	BDL	0.37

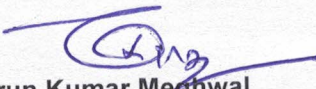
  
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Chandera Lead Zinc Smelter



**Annexure -**  
**HINDUSTAN ZINC LIMITED**  
**Chanderia Lead Zinc Smelter**  
**Treated Water Monitoring Results**  
**(Apr'20-Sept'20)**

**ETP Out Let – (PYRO)**

Parameter	Unit	Limit	Result (Apr-Jun'20)	Result (Jul-Sept'20)
pH	-	5.5 - 9.0	7.26	8.12
Chloride	Mg/l	1000	141.00	541.75
Oil & Grease	Mg/l	10.0	BDL	5
Total Residual Chlorine	Mg/l	1.0	BDL	BDL
Ammonical Nitrogen	Mg/l	50.0	8.81	3.40
Nitrate Nitrogen	Mg/l	10.0	BDL	2.25
BOD	Mg/l	30	7.40	10.7
COD	Mg/l	250	28.20	62.47
TSS	Mg/l	100	BDL	15
Fluoride	Mg/l	2.0	0.9	1.08

  
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 Chanderia Lead Zinc Smelter

**Annexure -**  
**HINDUSTAN ZINC LIMITED**  
**Chandera Lead Zinc Smelter**  
**Treated Water Monitoring Results**  
**(Apr'20-Sept'20)**

**ETP Out Let – (PYRO)**

Parameter	Unit	Limit	Result (Apr-Jun'20)	Result (Jul-Sept'20)
Phosphate	Mg/l	5.0	0.04	0.15
Cyanide	Mg/l	0.2	BDL	BDL
Cadmium	Mg/l	2.0	BDL	BDL
Chromium	Mg/l	2.0	BDL	BDL
Copper	Mg/l	3.0	BDL	BDL
Iron as Fe	Mg/l	Not Specified	0.11	BDL
Lead as Pb	Mg/l	0.1	BDL	0.03
Nickel	Mg/l	3.0	BDL	BDL
Zinc	Mg/l	5.00	BDL	0.35


  
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Chandera Lead Zinc Smelter

Annexure -  
HINDUSTAN ZINC LIMITED  
Chandaria Lead Zinc Smelter  
Water Monitoring Results  
(Apr'20-Sept'20)

Bearach River Up Stream Report


Parameter	Unit	Limit	Result (Apr-Jun'20)	Result (Jul-Sept'20)
pH	-	6.5 – 8.5	8.32	7.66
Zinc	Mg/l	15.0	0.353	1.96
Lead	Mg/l	0.1	BDL	BDL
Cadmium	Mg/l	0.01	0.05	0.038
Copper	Mg/l	1.5	BDL	BDL
Iron	Mg/l	5.0	BDL	BDL
Hardness	Mg/l	600	604	652
Chloride	Mg/l	600	277.95	218.37
Sulphate	Mg/l	1000	102.80	115.23

  
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Environment Head  
Chandaria Lead Zinc Smelter

**Annexure -**  
**HINDUSTAN ZINC LIMITED**  
**Chandera Lead Zinc Smelter**  
**Water Monitoring Results**  
**(Apr'20-Sept'20)**

**Bearach River Down Stream Report**

Parameter	Unit	Limit	Result (Apr-Jun'20)	Result (Jul-Sept'20)
pH	-	6.5 – 8.5	8.37	7.58
Zinc	Mg/l	15.0	0.067	1.58
Lead	Mg/l	0.1	BDL	0.27
Cadmium	Mg/l	0.01	BDL	.073
Copper	Mg/l	1.5	BDL	BDL
Iron	Mg/l	5.0	BDL	BDL
Hardness	Mg/l	600	456	636
Chloride	Mg/l	600	207.02	241.06
Sulphate	Mg/l	1000	106.60	105.32

  
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Environment Head  
Chandera Lead Zinc Smelter

**Annexure -**  
**Hindustan Zinc Limited**  
**Chandera Lead Zinc Smelter Complex**  
**Putholi, Chandera , Dist. Chittorgarh, Rajasthan.**

**ACID PLANT MONITORING**  
**Quarterly Monitoring (Apr'20-Sept'20)**

Month Location	Parameters	Prescribed Limits	Apr-June'20	July-Sept'20
Acid Plant* ( Hydro-1)	SO <sub>2</sub> (2 Kg/T of H <sub>2</sub> SO <sub>4</sub> Production)=224 PPM	224 ppm	106.00 ppm 0.97 kg/T	77.49 ppm 0.97 kg/T
	ACID MIST	50 (mg/nm <sup>3</sup> )	35.80	26.38
Acid Plant* ( Hydro-2)	SO <sub>2</sub> (2 Kg/T of H <sub>2</sub> SO <sub>4</sub> Production)=224 PPM	224 ppm	110.00 ppm 1.10 kg/T	92.35 ppm 1.10 kg/T
	ACID MIST	50 (mg/nm <sup>3</sup> )	23.00	34.28
TGT Stack (Pyro Plant)	SO <sub>2</sub> (2 Kg/T of H <sub>2</sub> SO <sub>4</sub> Production)=224 PPM	224 ppm	86.00 ppm 1.10 kg/T	54.50 ppm 1.10 kg/T
	ACID MIST	50 (mg/nm <sup>3</sup> )	29.10	29.95
Cansolve (Ausmelt Plant)	SO <sub>2</sub> (2 Kg/T of H <sub>2</sub> SO <sub>4</sub> Production)=224 PPM	224 ppm	96.00 ppm 0.99 kg/T	91.05 ppm 0.99 kg/T
	ACID MIST	50 (mg/nm <sup>3</sup> )	33.03	35.52

  
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**Meghwal**

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Chandera Lead Zinc Smelter

Annexure –

**HINDUSTAN ZINC LIMITED**

**Chandera Lead Zinc Smelter**

**Ambient Air Quality Monitoring Results**

**Quarterly Monitoring (Apr-June'20)**

Name of Monitoring Station	Parameters (Values are in $\mu\text{g}/\text{m}^3$ )				
	PM (2.5)	PM (10)	CO	NO <sub>x</sub>	SO <sub>2</sub>
Limit	60 $\mu\text{g}/\text{m}^3$	100 $\mu\text{g}/\text{m}^3$	4000 $\mu\text{g}/\text{m}^3$	80 $\mu\text{g}/\text{m}^3$	80 $\mu\text{g}/\text{m}^3$
Near CISF Colony C1	48.65	88.16	0.50	27.47	7.95
Near LOCO Shed C2	49.21	92.45	0.63	23.92	7.50
Near Slag Gate	47.85	86.58	0.75	30.55	8.30
Near DM Plant	36.52	73.01	0.50	25.32	8.75

**Ambient Air Quality Monitoring Results**

**Quarterly Monitoring (Jul-Sept'20)**

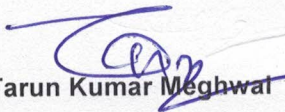
Name of Monitoring Station	Parameters (Values are in $\mu\text{g}/\text{m}^3$ )				
	PM (2.5)	PM (10)	CO	NO <sub>x</sub>	SO <sub>2</sub>
Limit	60 $\mu\text{g}/\text{m}^3$	100 $\mu\text{g}/\text{m}^3$	4000 $\mu\text{g}/\text{m}^3$	80 $\mu\text{g}/\text{m}^3$	80 $\mu\text{g}/\text{m}^3$
Near CISF Colony C1	36.62	65.48	320	27.71	28.87
Near LOCO Shed C2	36.52	70.84	370	32.39	31.26
Near Slag Gate	37.49	71.27	410	33.50	35.14
Near DM Plant	37.74	72.10	380	29.38	33.20

  
**Tarun Kumar Meghwal**


Environment Head  
 Chandera Lead Zinc Smelter

**Annexure**  
**HINDUSTAN ZINC LIMITED**  
**CHANDERIA LEAD ZINC SMELTER**  
**Ambient Air Quality Monitoring Report (Outside Plant)**  
**Quarterly Monitoring (Apr'20 - Sept'20)**

Month	Parameters	Limit	(Apr-Jun'20)	(Jul-Sept'20)
Village		Unit		
Putholi	PM-10	100 µg/m <sup>3</sup>	84.32	69.95
	PM-2.5	60 µg/m <sup>3</sup>	42.13	28.74
	SO <sub>2</sub>	80 µg/m <sup>3</sup>	6.56	15.56
	NO <sub>x</sub>	80 µg/m <sup>3</sup>	31.11	26.35
	Pb	1.0 µg/m <sup>3</sup>	0.01	0.19
Munga ka khera	PM-10	100 µg/m <sup>3</sup>	94.78	64.78
	PM-2.5	60 µg/m <sup>3</sup>	35.25	27.79
	SO <sub>2</sub>	80 µg/m <sup>3</sup>	8.61	22.14
	NO <sub>x</sub>	80 µg/m <sup>3</sup>	36.01	15.54
	Pb	1.0 µg/m <sup>3</sup>	0.01	0.16
Nagari	PM-10	100 µg/m <sup>3</sup>	92.24	66.58
	PM-2.5	60 µg/m <sup>3</sup>	40.70	32.85
	SO <sub>2</sub>	80 µg/m <sup>3</sup>	6.77	14.68
	NO <sub>x</sub>	80 µg/m <sup>3</sup>	26.26	18.57
	Pb	1.0 µg/m <sup>3</sup>	0.002	0.18
Biliya	PM-10	100 µg/m <sup>3</sup>	78.24	62.57
	PM-2.5	60 µg/m <sup>3</sup>	50.12	30.28
	SO <sub>2</sub>	80 µg/m <sup>3</sup>	6.96	24.40
	NO <sub>x</sub>	80 µg/m <sup>3</sup>	29.65	16.89
	Pb	1.0 µg/m <sup>3</sup>	0.002	0.14

  
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 Environment Head  
 Chanderia Lead Zinc Smelter

Ajoliya Ka Khera	PM-10	100 $\mu\text{g}/\text{m}^3$	72.41	63.48
	PM-2.5	60 $\mu\text{g}/\text{m}^3$	37.55	27.74
	SO2	80 $\mu\text{g}/\text{m}^3$	8.61	15.14
	NOx	80 $\mu\text{g}/\text{m}^3$	30.65	16.59
	Pb	1.0 $\mu\text{g}/\text{m}^3$	0.01	0.09
Anwalhera	PM-10	100 $\mu\text{g}/\text{m}^3$	62.78	62.11
	PM-2.5	60 $\mu\text{g}/\text{m}^3$	33.45	28.87
	SO2	80 $\mu\text{g}/\text{m}^3$	7.15	14.58
	NOx	80 $\mu\text{g}/\text{m}^3$	29.91	17.76
	Pb	1.0 $\mu\text{g}/\text{m}^3$	0.005	0.18
Zinc Nagar	PM-10	100 $\mu\text{g}/\text{m}^3$	86.33	58.60
	PM-2.5	60 $\mu\text{g}/\text{m}^3$	39.65	28.57
	SO2	80 $\mu\text{g}/\text{m}^3$	9.43	10.33
	NOx	80 $\mu\text{g}/\text{m}^3$	26.08	14.41
	Pb	1.0 $\mu\text{g}/\text{m}^3$	0.008	0.12

  
**Tarun Kumar Meghwal**  
 Environment Head  
 Chanderia Lead Zinc Smelter




**Annexure -**  
**HINDUSTAN ZINC LIMITED**  
**Chandera Lead Zinc Smelter**  
**Ambient NOISE Monitoring Results**  
**(Apr'20 - Sept'20)**

**April to June - 2020**

S.No.	Testing Protocol	Parameters	Point of Collection	Observed Value	Observed Value
			<b>Noise Standard(dB)</b>	<b>DAY - 75</b>	<b>Night - 70</b>
1	IS 9989	Noise Level (dB)	Near Loco shade C2	53.2	48.9
2	IS 9989	Noise Level (dB)	Near Slag gate	58.2	53.6
3	IS 9989	Noise Level (dB)	Near DM Plant	58.3	53.7
4	IS 9989	Noise Level (dB)	Near CISF Colony C1	52.2	47.6


**July to Sept - 2020**

S.No.	Testing Protocol	Parameters	Point of Collection	Observed Value	Observed Value
			<b>Noise Standard(dB)</b>	<b>DAY - 75</b>	<b>Night - 70</b>
1	IS 9989	Noise Level (dB)	Near Loco shade C2	67.2	57.6
2	IS 9989	Noise Level (dB)	Near Slag gate	64.8	55.0
3	IS 9989	Noise Level (dB)	Near DM Plant	72.4	64.5
4	IS 9989	Noise Level (dB)	Near CISF Colony C1	66.7	56.5

  
**Tarun Kumar Meghwal**  
 Environment Head  
 Chandera Lead Zinc Smelter

**Annexure -**  
**HINDUSTAN ZINC LIMITED**  
**Chandera Lead Zinc Smelter**  
**Ambient Air Quality (CAAQM) Report**

AMBIENT AIR QUALITY STATUS OF CLZS								
Direction	CAAQMS NO.1 Near C1 Office							
West	LOCATION							
	Parameter	Standard of AAQ	APRIL	MAY	JUNE	JULY	AUGUST	SEPT
	PM 10	100	84	87	74	50	34	68
	SOX	80	19.66	21.13	20.09	20.32	22.60	23.90
	NOX	80	16.6	16.8	14.3	12.3	14.5	16.4
Direction	CAAQMS NO.2 DM Plant – CPP							
East	LOCATION							
	Parameter	Standard of AAQ	APRIL	MAY	JUNE	JULY	AUGUST	SEPT
	PM 10	100	76	83	75	45	29	59
	SOX	80	36.3	47.3	41.1	36.5	29.8	27.9
	NOX	80	17.8	25.1	23.8	19.5	15.5	18.5
Direction	CAAQMS NO.3 Chittorgarh Fort							
South	LOCATION							
	Parameter	Standard of AAQ	APRIL	MAY	JUNE	JULY	AUGUST	SEPT
	PM 10	100	66	62	55	48	44	51
	SOX	80	8.3	7.6	10.1	10.6	10.4	10.7
	NOX	80	22.5	17.9	23.8	23.5	21.7	22.4
Direction	CAAQMS NO.4 Pond No 1 (New Station )							
North	LOCATION							
	Parameter	Standard of AAQ	APRIL	MAY	JUNE	JULY	AUGUST	SEPT
	PM 2.5	60	37	27	40	35	24	34
	PM 10	100	77	71	84	80	55	71
	SOX	80	29.5	25.2	22.3	23.4	23.2	22.1
	NOX	80	7.6	7.4	4.4	4.5	4.7	3.7

  
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# ROAD SWEEPING BY VACCUM ROAD SWEEPER

