



The Additional PCCF,
Ministry of Environment, Forests & Climate Change
Regional office (West Central Zone),
Ground Floor, East Wing,
"New Secretary Building"
Civil lines, Nagpur - 440001

26/05/2020

Subject: Compliance Status of Environment Clearance No J-11015/239/2006-IA-II (M) conditions of Durgmanwadi Bauxite Mines (M. L. area 182.23 Ha.)

Dear Sir,

Attached please find the compliance condition of the Environment Clearance granted to Durgmanwadi Bauxite Mines on 5th of February 2007 vide clearance No J-11015/239/2006-IA-II (M) under EIA 2006.

Please be informed that, since 17/03/2018, the mining activities at our Durgmanwadi Bauxite Mines have been stopped as per the directions and show cause notice dated 15th March 2018, bearing reference NO.Z-11013/3/2018-IA-II (M), issued by Ministry of Environment Forest & Climate Change. The same is enclosed for your ready reference as Annexure - 1.

Further, it may be noted that Environmental Clearance granted to **Durgmanwadi Bauxite Mines** is kept in abeyance by Ministry of Environment Forest & Climate Change as per their direction dated: 6th March 2019, bearing reference no. F. No. J-11015/239/2005-IA-II (M). The same is enclosed for your ready reference as Annexure - 2.

We are herewith submitting the compliance against the conditions laid down in the Environment Clearance for the 6 months duration (**October'2019 to March'2020**).

Hope you will please find the above in order.

Thanking you,

Yours very truly,

Uday V. Pawar
Head – West Coast Mines
Hindalco Industries Limited.

Encl. A/a

Copy to:

1. The Member Secretary,
Central Pollution Control Board,
Parivesh Bhavan, East Arjun Nagar,
DELHI - 110032
2. The Regional Officer
Maharashtra Pollution Control Board
Udyog Bhawan, KOLHAPUR.

Hindalco Industries Limited

Durgmanwadi Mines: PO Radhanagari - 416 212, Dist. Kolhapur, Maharashtra, T: +91 02321 202072, 202178, 133,

Kolhapur Office: T:+91 0231 2661458, 2666621, 2021461, 2021462

Registered Office: Ahura Centre, 1st Floor, B-Wing, Mahakali Caves Road, Andheri (East), Mumbai - 400 093, India

T: +91 22 6691 7000 | Fax: +91 22 6691 7001 | E: hindalco@adityabirla.com | W: www.hindalco.com | Corporate ID No.: L27020MH1958PLC011238

**COMPLIANCE STATUS OF
ENVIRONMENTAL CLEARANCE CONDITIONS
Environment Clearance Durgmanwadi Bauxite Mines granted on 5th of
February 2007 vide clearance No J-11015/239/2006-IA-II (M)**

Sr.No.	Conditions	Compliance
Specific Conditions :-		
i)	The mining activity to be restricted to private land only for which the conservation plan has been accepted by the State Government.	Mining activities were restricted to private land only when the mine was operational. Please be informed that, since 17/03/2018, the mining activities at Durgmanwadi Bauxite Mines have stopped as per the MoEF&CC directions and show cause notice dated 15th March 2018.
ii)	Preparation of conservation plan for protection of endangered fauna reported in the study area.	Conservation Plan for protection of endangered species was prepared and submitted to MoEF at the time of grant of Environment clearance.
iii)	Top soil to be stacked properly with proper slope with adequate safeguards & backfilled for reclamation & rehabilitation of mined out area.	The top soil stacked initially in dumps was rehandled and used for mine restoration, when the mine was operational.
iv)	Overburden to be stacked at earmarked dump site(s) only at max height not more than 20 m and slopes not to exceed 28 ⁰ . The OB dumps shall be scientifically vegetated with suitable native species to prevent erosion and surface runoff.	All the overburden dumps were backfilled into the mined out voids, when the mine was operational. The backfilled areas have been scientifically vegetated through afforestation.
v)	External OB dumps and other wastes to be stacked at earmarked sites only.	There are no external dumps for overburden stacking.
vi)	Catch drains and siltation ponds of appropriate size to be constructed to arrest silt and sediment flows.	The run-off mine was channelized towards settling tanks and silt check dams. All the natural storm water streams were passed through silt check dams. The mine is not operational since 17 th March 2018.
vii)	Drilling and blasting should not be involved.	No drilling & blasting was carried out when the mine was operational.
viii)	Plantation to be raised in an area of 121.50 ha. The density of trees should be around 2000 plants per ha.	The plantation has been carried out every year as per plan. Till date 3,38,999 plants have been planted within & outside the lease

		<p>area and at feeder road side. The area covered with plantation within mine lease area is 76.04 Ha. As Mine is not in operation since 17 March 2018, no reclamation activities were being carried out since then.</p> <p>During the year 2019-20, 2000 saplings have been planted to cover about 2 Ha.</p>
ix)	Implement suitable conservation measures to augment ground water resources in the area.	6 No. of water harvesting ponds have been developed in the mined out area when the mine was operational.
x)	Regular monitoring of ground water level and quality shall be carried out by establishing a network of existing wells.	The ground water quality is monitored on quarterly basis through MoEF approved third party.
xi)	Plan rainwater harvesting measures on long-term basis should be planned and implemented.	6 No. of water harvesting ponds have been developed in the mined out area when the mine was operational which is still exist.
xii)	<p>a) Vehicular emissions to be kept under Control.</p> <p>b) The vehicles should be covered with a tarpaulin and shall not be over loaded.</p> <p>c) Regular water sprinkling arrangements shall be made to control the fugitive dust generation from the haul roads.</p>	<p>There was a system to check the PUC certificates of hired trucks, when the mine was operational.</p> <p>Timely maintenance of all heavy equipment was carried out. All transport vehicles were covered with tarpaulin. The vehicles were weighed within the mines and all the vehicles were carrying bauxite as per RLW, when the mine was operational.</p> <p>Mobile water tankers were used to sprinkle water on haul roads, when the mine was operational.</p>
xiii)	Install sewage treatment plant for colony. ETP should be provided for workshop and waste generation from mining operation.	Not Applicable – There is no colony set up at the mines.
xiv)	A final Mine closer plan along with details of Corpus Fund should be submitted to the MoEF 5 years in advance of final mine closer for approval.	<p>Please be informed that, since 17/03/2018, the mining activities in Durgmanwadi Bauxite Mines has been stopped as per the MoEF&CC directions and show cause notice dated 15th March 2018, bearing reference N0.Z-11013/3/2018-IA-II (M), issued by Ministry of Environment Forest & Climate Change.</p> <p>The final closure plan will be submitted as per the directions of competent authorities post resumption of mining operations.</p>

B	General Conditions.	
i)	No change in mining technology and scope of working without prior approval	Noted and agreed.
ii)	No change in calendar plan including excavation, quantum of mineral ore & waste.	Noted and agreed.
iii)	Conservation measures for protection of flora & fauna in the core & buffer zone to be drawn	Mined out area were scientifically afforested. For this we procured soil, manure, vermi compost, bagasse and press-mud to improve the condition of plantation base. We had engaged experts to implement afforestation activity. Care had been taken to plant mostly local flora along with some exotic species. The working hours were restricted only to day light when mine was operational.
iv)	Establish four ambient air quality monitoring stations in the core zone & buffer zone for RPM, SPM, SO ₂ , NO _x . Monitoring.	4 Nos. of Ambient air quality stations have been established in the core and as well as in buffer area.
v)	Regular submission of data on ambient air quality (RPM, SPM, SO ₂ ,NO _x)	The monitoring is carried out as per the schedule and Data is submitted regularly. The post monsoon and winter season reports are attached as annexure 3.
vi)	Regular control of fugitive dust emissions from all the sources	The dust generated during mining operations was suppressed by atomized water sprinklers and during mining and transportation by mobile water tankers when the mine was operational.
vii)	Take measures for control of noise levels below 85 dBA in the work environment	All the noise generating machineries were enclosed to suppress the noise during operation. The noise level in the work environment was below 85dBA and all the workers engaged during operation of HEMM were provided with ear-plugs / muffs, when the mine was operational.
viii)	Proper collection, treatment of industrial waste water to conform the standards prescribed under GSR 422 (E) dt.19 th May, 1993	There was no industrial waste water, as there was no processing was carried out, when the mine was operational.
ix)	Provide adequate training and information on safety & health aspects & provide protective respiratory devices to workers	Regular training to employees on Safety and Health aspects was provided, when mine was in operation. All the employees engaged in operations were provided with dusk masks & ear-plugs / muffs, when the mine was operational.
x)	Undertake periodical Occupational health surveillance program of workers	The health surveillance was done once in a year for all employees and there were no cases of occupational health hazards.

xi)	Set-up separate environmental management cell with suitable qualified personnel.	A qualified person has been employed at the unit level. A full-fledged Environment cell operates at the unit level.																								
xii)	The project authority shall inform to the regional office located at Bhopal regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development.	Please be informed that, since 17/03/2018, the mining activities at our Durgmanwadi Bauxite Mines have been stopped as per the MoEF & CC directions and show cause notice dated 15th March 2018.																								
xiii)	The funds earmarked for environmental protection measures shall be kept in separate account and should be diverted for other purposes.	<p>The separate funds have been allocated for implementation of environmental protection measures along with item-wise breakup such as furnished below (From Apr-2019 to Mar-2020).</p> <table border="1"> <thead> <tr> <th>SO. NO.</th> <th>Shop Order Description</th> <th>Expenditure for the year 2019 -20 (Rs.)</th> </tr> </thead> <tbody> <tr> <td>1610 & 1611</td> <td>Nursery saplings & aftercare</td> <td>94,620.0</td> </tr> <tr> <td>1612</td> <td>Environment Monitoring</td> <td>4,50,000.0</td> </tr> <tr> <td>1613</td> <td>Dust suppression</td> <td>0.0</td> </tr> <tr> <td>1614</td> <td>Statutory Compliance</td> <td>0.0</td> </tr> <tr> <td>1615</td> <td>Environment Others</td> <td>0.0</td> </tr> <tr> <td>3019</td> <td>Mine restoration & rehabilitation</td> <td>24,700.0</td> </tr> <tr> <td colspan="2">TOTAL</td> <td>5,69,320.0</td> </tr> </tbody> </table> <p>The mine is not operational since 17th March 2018.</p>	SO. NO.	Shop Order Description	Expenditure for the year 2019 -20 (Rs.)	1610 & 1611	Nursery saplings & aftercare	94,620.0	1612	Environment Monitoring	4,50,000.0	1613	Dust suppression	0.0	1614	Statutory Compliance	0.0	1615	Environment Others	0.0	3019	Mine restoration & rehabilitation	24,700.0	TOTAL		5,69,320.0
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xv)	The project authorities should extend full cooperation to the officer(s) of the Regional office by furnishing the requisite data/information / monitoring reports.	Agreed and Noted																								
xvi)	A copy of clearance letter will be marked to concern Panchayat.	A copy of clearance letter was marked to concern Panchayat.																								
xvii)	The project authority should advertise at least in two local news papers within 7 days of the issue of the clearance letter.	The advertisement was published in the local daily news papers "Tarun Bharat" & "Pudari" on 08/02/2007.																								

ANNEXURE – 1

Annexure - 1

Speed Post

No. Z-11013/3/2018-IA-II (M)
Government of India
Ministry of Environment, Forest and Climate Change
IA-II (Non Coal Mining)

Vayu Wing, 3rd Floor,
Indira Paryavaran Bhavan, Aliganj,
Jor Bagh Road, New Delhi-110 003

Dated: 15th March, 2018

Sub.: Direction to the Unit under section 5 of the Environment (Protection) Act, 1986 – for keeping in abeyance the Environmental Clearance -regarding

Whereas, Environmental Clearance was granted vide letter No J-11015/239/2006-IA.II(M) dated 5.02.2007 for Durgaamanwadi Bauxite Mines Project of M/s Hindalco Industries Limited at village Durgmanwadi & Padsill, Taluka: Radhanagri in Kolhapur District in Maharashtra.

Whereas, as per direction of Hon'ble Supreme Court a team constituted by the Ministry visited the mining site of M/s Punthembekar Minerals limited during 10-11th October, 2017 and submitted its report to the Ministry. The matter was thereafter examined in the Ministry and it has found that Durgaamanwadi Bauxite Mines Project of M/s Hindalco Industries Limited is located within 1 KM of the Radhanagri Wildlife Sanctuary.


Whereas, the Hon'ble Supreme Court in its order dated 04.08.2006 in IA 1000 W.P. (c) 202 of 1995 (T.N Godavaram vs. Union of India) prohibited the mining activity around protected area as an interim measure and directed that 1 Km safety zone shall be maintained subject to the order that may be made in this I.A. regarding Jamua Ramgarh Sanctuary.

Whereas, as per Ministry O.M. No. J-11013/41/2006-IA (I) dated 02/12/2009, all the development projects/activities for which the environment clearance had been granted prior to 02/12/2009 and were located within 10km radius of National Park/Wildlife Sanctuary were required to obtain wildlife clearance from National Board for Wildlife. In this regard, a public notice was also inserted in newspapers by the Impact Assessment Division of the Ministry in January 2009 asking the Project Proponents to seek wildlife clearance from Standing Committee of National Board for Wildlife by 31st January 2009. But it has been observed that Durgaamanwadi Bauxite Mines Project of M/s Hindalco Industries Limited is operating without obtaining wildlife clearance from the Standing Committee of National Board for Wildlife.

Whereas, in exercise of powers vested under Section 5 of Environment (Protection) Act, 1986 you are directed to immediately stop all the mining activity within 1 KM of Radhanagri Wildlife Sanctuary pursuant to Hon'ble Supreme Court order dated 04.08.2006 in IA 1000 W.P. (c) 202 of 1995 (T.N Godavaram vs. Union of India) and to show cause as to why the Environmental Clearance granted vide letter No J-11015/239/2006-IA.II(M) dated 5.02.2007 for Durgaamanwadi Bauxite Mines Project of M/s Hindalco Industries Limited should not be revoked for carrying out mining activity since 1994 till 05.02.2007 without obtaining EC, within 1KM of Radhanagri Wildlife Sanctuary in contravention to Hon'ble Supreme Court in its order dated 04.08.2006 in IA 1000 W.P. (c) 202 of 1995 (T.N Godavaram vs. Union of India) and beyond 1KM but within 10 KM from Radhanagri Wildlife Sanctuary without obtaining the Wildlife Clearance from Standing Committee of National Board of Wildlife. You are requested to reply within 15 days of receipt of this letter, along with past production details since inception of mines duly authenticated by Department of Mines & Geology, copy of Consent to Establish (CTE) and Consent to Operate (CTO) issued by State Pollution Control Board from time to time, failing which your EC may be considered for revocation.

Lastly, it may be noted that violation of the direction under Section 5 of Environment (Protection) Act, 1986 shall attract penal action under section 15 of the Environment (Protection) Act, 1986.

This issues with the approval of the Competent Authority.


(Surender Kumar)
Scientist - 'G'
Email: s.kumar1958@gov.in
Phone/Fax: 011-24695340

To,
M/s Hindalco Industries Limited
P.O Radhanagri
Kolhapur, Maharashtra-416212

Copy to:

- 1) **The Chief Secretary**, Government of Maharashtra, 6th Floor Main Building, Mantralaya, Dr. Madan Cama Road, Fort, Mumbai-400032
- 2) **The Chairman**, Maharashtra Pollution Control Board, Kalpataru Point, 3rd and 4th floor, Opp. Cine Planet, Sion Circle, Mumbai-400 022.
- 3) **The Controller General**, Indian Bureau of Mines
2nd Floor, Indira Bhawan, Civil Lines, Nagpur- 440 001
Phone : + 91 712 2560041, Fax : + 91 712 2565073
email : cg@ibm.gov.in
- 4) **The Director**, Directorate of Geology & Mining,
Government of Maharashtra, "Khanij Bhawan", Plot No 27, Shivaji Nagar, Cement Road,
Nagpur-440010
- 5) **The District Collector** (Kolhapur),
District Collector Office, Kolhapur
New Shahupuri, Kolhapur, Maharashtra 416003
- 6) **The Additional Principal Chief Conservator of Forests (C)**,
Ministry of Environment, Forest and Climate Change, Regional Office (WCZ), Ground Floor,
East Wing, New Secretariat Building Civil Lines, Nagpur-440001
Tel.No.0712-2531318, Fax: 0712-2531318
Email: apccfcentral-ngp-mef@gov.in
- 7) **Mr. Kumar Mangalam Birla**,
Chairman, Hindalco Industries Limited
Birla Centurion, 7th floor
Pandurang Budhkar Road
Worli, Mumbai 400 030
- 8) MoEFCC Website
- 9) Guard File

ANNEXURE – 2

By Speed Post/Online



F. No. J-11015/239/2005-IA-II (M)
Government of India
Ministry of Environment, Forest and Climate Change
Impact Assessment Division

Indira Paryavaran Bhavan,
Vayu Wing, 3rd Floor, Aliganj,
Jor Bagh Road, New Delhi-110 003

Dated: 6th March, 2019

Sub.: Direction to the Unit under section 5 of the Environment (Protection) Act, 1986- for keeping in abeyance the Environmental Clearance - regarding.

Whereas, Environmental Clearance was granted vide letter No J-11 015/239/2006-1A.II(M) dated 5.02.2007 for Durgaamanwadi Bauxite Mines Project of M/s Hindalco Industries Limited, located at Village Durgmanwadi & Padsill, Taluka: Radhanagri in Kolhapur District in Maharashtra.

Whereas, as per direction of Hon'ble Supreme Court a team constituted by the Ministry visited the mining site of M/s Punthembekar Minerals limited during 10-11th October, 2017 and submitted its report to the Ministry. The matter was thereafter examined in the Ministry and it has found that Durgaamanwadi Bauxite Mines Project of M/s Hindalco Industries Limited is located within 1 KM of the Radhanagri Wildlife Sanctuary.

Whereas, in exercise of powers vested under Section 5 of Environment (Protection) Act, 1986, directions was issued vide LR No Z -11013/3/2018 dated 15.03.2018 wherein it has mentioned that "you are directed to immediately stop all the mining activity within 7 KM of Radhanagri Wildlife Sanctuary pursuant to Hon'ble Supreme Court in its order dated 04.08.2006 in IA 7000 WP. (c) 202 of 7995 (T.N Godavaram vs. Union of India) and to showcause as why Environmental Clearance granted No J-11015/239/2006-IA.II(M) dated 5.02.2007 for Durgaamanwadi Bauxite Mines Project of M/s Hindalco Industries Limited should not be revoked for carrying out mining activity since 1994 till 05.02.2007 without obtaining EC, within 7 KM of Radhanagri Wildlife Sanctuary in contravention to Hon'ble Supreme Court in its order dated 04.08.2006 in IA 1000 W.P. (c) 202 of 1995 (T.N Godavaram vs. Union of India) and for remaining area without obtaining the Wildlife Clearance from Standing Committee of National Board of Wildlife. You are requested to reply within 15 days of receipt of this letter, along with past production details since inspection of mines duly authenticated by Department of Mines & Geology, copy of Consent to Establish (CTE) and Consent to Operate (CTO)

issued state pollution control board from time to time, failing which your EC may be kept in abeyance."

Whereas, the Ministry vide OM No. J-11013/41/2006-IA (I), dated 02/12/2009, all the development projects/activities for which the environment clearance had been granted prior to 02/12/2009 and were located within 10 km radius of National Park/Wildlife Sanctuary were required to obtain wildlife clearance from National Board for Wildlife. In this regard, a public notice was also inserted in newspapers by the Impact Assessment Division of the Ministry in January 2009 asking the Project Proponents to seek wildlife clearance from Standing Committee of National Board for Wildlife by 31st January 2009. The reply submitted by you dated 30.03.2018 & KML file submitted by you on 31.10.2018 was examined in the Ministry and it has found that Durgaamanwadi Bauxite Mines Project of M/s Hindalco Industries Limited is falling within 10 KM of the of Radhanagri Wildlife Sanctuary and operating without obtaining wildlife clearance from the Standing Committee of the National Board for Wildlife.

Whereas, the Hon'ble Supreme Court in its order dated 02.11.2018 in W.P. 202/1995 in the matter of T.N. Goadvarman Thirumulpad vs UoI & Ors. in I.A 3949 inter-alia mentioned that *"The Chief Secretary has assured us that he will look into the matter and see whether any illegal mining has been going on, that is to say, mining without any environmental clearance or without any forest clearance or clearance from the Standing Committee of the National Board for Wildlife. If that is so, necessary steps be taken by the State of Maharashtra to recover the amounts due to illegal mining (if any) under Section 21(5) of the Mines and Minerals (Development and Regulation) Act, 1957."*

Whereas, the Hon'ble NGT in its Judgment dated 25.09.2018 inter-alia mentioned that *"It is clear from above that the order dated 04.08.2006 passed regarding TWPs in Jamuwa Ramgarh Wildlife Sanctuary in Rajasthan was the basis of the case of Goa Foundation (supra) wherein all the mining activities have been prohibited within 1km of the boundaries of National Parks and Sanctuaries. It is therefore amply clear that considering the sensitiveness of the National Parks and Sanctuaries no mining activity can be permitted up to 1 km from the boundaries of the National Parks and Sanctuaries anywhere in the country"*.

Whereas, the reply submitted by M/s Hindalco Industries Limited vide letter dated 30.03.2018, email dated 31.10.2018, 25.11.2018 and 12.12.2018 was examined in the Ministry and it has found the mining lease is falling within 10 KM of the Radhanagri Wildlife Sanctuary and mining has been carried out without obtaining the Clearance from the Standing Committee of the National Board of Wildlife.

Now, therefore, in exercise of powers vested under Section 5 of Environment (Protection) Act, 1986, **the Environmental Clearance granted vide letter No J-11015/239/2006-1A, II(M) dated 5.02.2007 for Durgaamanwadi Bauxite Mines Project of M/s Hindalco Industries Limited, located at Village Durgmanwadi & Padsill, Taluka: Radhanagri in Kolhapur District in**

Maharashtra is kept in abeyance with immediate effect and until further orders.

Lastly, it may be noted that violation of the direction under Section 5 of Environment (Protection) Act, 1986 shall attract penal action under section 15 of the Environment (Protection) Act, 1986.

This issues with the approval of the Competent Authority.

(Dr. R.B. Lal)
Addl. Director

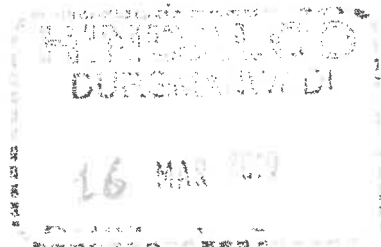
To,

✓
M/s Hindalco Industries Limited
P.o Radhanagri, Kolhapur,
Maharashtra-416212

Copy to:

1. **The Chief Secretary**, Government of Maharashtra, 6th Floor Main Building, Mantralaya, Dr. Madan Cama Road, Fort, Mumbai-400032- for necessary action.
2. **The Chairman**, Maharashtra Pollution Control Board, Kalpataru Point, 3rd and 4th floor, Opp. Cine Planet, Sion Circle, Mumbai-400 022- for necessary action.
3. **The Controller General**, Indian Bureau of Mines 2nd Floor, Indira Bhawan, Civil Lines, Nagpur- 440 001 Phone: + 91 7122560041, Fax: + 91 7122565073 email: cg@ibm.gov.in - for necessary action.
4. **The Director**, Directorate of Geology & Mining, Government of Maharashtra, Khanij Bhawan", Plot No 27, Shivaji Nagar, Cement Road, Nagpur-440010- for necessary action.
5. **The District Collector** (Kolhapur), District Collector Office, Kolhapur New Shahupuri, Kolhapur, Maharashtra 416003- for necessary action.
6. **The Additional Principal Chief Conservator of Forests (C)**, Ministry of Environment, Forest and Climate Change, Regional Office (WCZ), Ground Floor, East Wing, New Secretariat Building Civil Lines, Nagpur-440001 TeI.No.0712-2531318, Fax: 0712-2531318 Email: apccfcentral-ngp-mef@gov.in.
7. **Mr. Kumar Mangalam Birla**, Chairman, Hindalco Industries Limited Birla Centurion, 7th floor Pandurang Budhkar Road Worli, Mumbai 400 030.
8. PARIVESH Portal.
9. Guard File.

(Dr. R.B. Lal)
Addl. Director



ANNEXURE – 3

DURGAMANWADI BAUXITE MINE

**TAHSIL: RADHANAGARI , DISTRICT: KOLHAPUR
STATE: MAHARASHTRA**

OF

M/s HINDALCO INDUSTRIES LTD.

ENVIRONMENTAL QUALITY MONITORING REPORT

**SEASON - POST MONSOON 2019
SEPTEMBER, OCTOBER, NOVEMBER**

PREPARED BY



EQUINOX ENVIRONMENTS (I) PVT. LTD.,

**ENVIRONMENTAL; CIVIL & CHEMICAL ENGINEERS, CONSULTANTS & ANALYSTS,
KOLHAPUR (MS)**

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An ISO 9001:2015 & QCI NABET ACCREDITED ORGANIZATION



2019 - 2020

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PREFACE

M/s. Hindalco Industries Limited entrusted environmental quality monitoring at **Durgmanwadi Bauxite Mine** situated Radhanagari Tahsil, Kolhapur District, Maharashtra to **Equinox Environments (India) Pvt. Ltd.** during post monsoon season of the year 2019.

According to MoU dt. 1st September 2018, **The Equinox Environments (India) Pvt. Ltd.** has availed the various monitoring services by lab viz. **Green Envirosafe Engineers & Consultant Pvt. Ltd.** which is recognized and duly approved by the **Ministry of Environment, Forests & Climate Change (MoEFCC); New Delhi** (through Notification No. S.O. 1174 (E) dated 18.07.2007 as amended vide Notification No. S.O. 388 (E) dated 10.02.2017) and NABL (ISO/IEC 17025:2005 vide certificate number TC-8061 dated 03.11.2018) has also received certifications namely ISO 9001:2015 and OHSAS 18001: 2007 from Crescent Quality Certification Pvt. Ltd.

The environmental monitoring was carried out in core zone and buffer zone during the months of September–October–November 2019. The data obtained was compiled to assess the current environmental status of the mining as well as the surrounding villages in the study area for the following environmental parameters.

- ❖ Micro-meteorology
- ❖ Ambient air quality
- ❖ Ambient noise level quality
- ❖ Water quality
- ❖ Soil Quality
- ❖ DG set Stack monitoring

Equinox Environments (India) Pvt. Ltd. gratefully acknowledges the cooperation extended by management and staff of M/s. Hindalco Industries Limited and village people to the field staff.

EXECUTIVE SUMMARY

Durgamanwadi Bauxite Mine of M/s. Hindalco Industries Limited includes the study of the ambient air quality, noise level quality, water and soil quality in core zone and buffer zone in and around the mine lease area during the post monsoon season of the year 2019.

AMBIENT AIR QUALITY

The scenario of the existing ambient air quality in the study region has been assessed through a network of selected ambient air quality locations. Pre-calibrated respirable dust and fine particulate sampler has been used for AAQ monitoring. Maximum, minimum, average and percentile values have been computed from the data collected at all individual sampling stations to represent the ambient air quality status.

AMBIENT NOISE LEVEL MONITORING

Mining and allied activities usually cause noise pollution. Excessive noise levels cause adverse effects on human beings and associated environment including domestic animals, wild life, natural ecosystem and structures. To know the ambient noise levels in the study area, noise levels were recorded at mining area and nearby villages using noise level meter.

WATER QUALITY MONITORING

Water quality monitoring consists of the study of surface and ground water sources and its quality in the core and buffer zone of the lease area. Assessment of water quality in the study area and in the mine area includes the quality assessment of parameters as per the Indian Standard IS:10500 (Drinking water standard). Water samples were collected from selected locations during study period and analyzed in the laboratory as per the standard IS & APHA Procedures.

SOIL QUALITY MONITORING

The normal mineral composition of plants is affected by alteration in soil conditions. Organic remains accumulate mainly on the surface of the soil. Soils that have low stability of structure disperse and slake when they are wetted by rains or water from irrigation and may develop a hard crust as the soil surface dries. This crust presents a serious barrier for emerging seedlings. With some crops often it is the main cause for poor growth. In the present study, soil samples were collected from the identified locations and analyzed in the laboratory.

MICROMETEOROLOGY

Meteorological scenario helps to understand the trends of the climatic factors. It also helps in the identification of sampling stations in the study area meteorological scenario exerts a critical influence on air quality as the pollution arises from the interaction of atmospheric contaminants with adverse meteorological conditions.

AREA DETAILS

INTRODUCTION

Hindalco Industries is one of the leading producers of aluminum in the country. The company business involves bauxite mining to alumina refining. Alumina to metal conversion, sheet, extrusion, foil manufacturing and is spread all over the country. The company is operating number of bauxite mines in Maharashtra, Orissa, Chhattisgarh and Jharkhand to feed the Alumina plants located in Belgaum, Renukut and Muri.

As per the directions of the Government of Maharashtra the mining plan was prepared for the entire lease area of 141.18 ha and the same was approved by the Indian Bureau of Mines vide letter no. RMP/MECH-02(MAH)/GOA/2017-18 DT.07/06/2019 on submission of approved mining plan Government of Maharashtra has sanctioned mining lease for the production of bauxite for the revenue land, The Environmental Clearance was obtained for the production of 0.864 million TPA of bauxite over the entire area. The mining lease was executed by the collector of Kolhapur over the area on 30/01/2017 and the lease expires on 31/03/2030.

MINE DETAIL

Durgmanwadi bauxite mine is located near Durgmanwadi village of Radhanagari Tahsil of Kolhapur District in Maharashtra state.

GEOGRAPHICAL DETAILS

Latitude: 16.0° 20.0'25.09"
Longitude: 73.0° 55.0'41.45"
MSL: 992 m

DETAILS OF LEASE AREA

The following table gives the details of the area in terms of District, Tahsil, Village, Gat No., etc.

District	Tahsil	Village	Gat No.	Area Granted (ha)
Kolhapur	Radhanagari	Durgamanwadi	120(p)	40.21
			123(p)	0.81
		Padsali	13(p)	9.51
			14	6.76
			15(p)	15.58
			16(p)	3.72
			18(p)	3.04
			38(p)	2.75
			39(p)	5.91
			40	18.66
			41(p)	11.65
			42	17.12
			36(p)	3.54
			43(p)	10.24
			45(p)	4.65
			188(p)	28.08
			Total	182.23

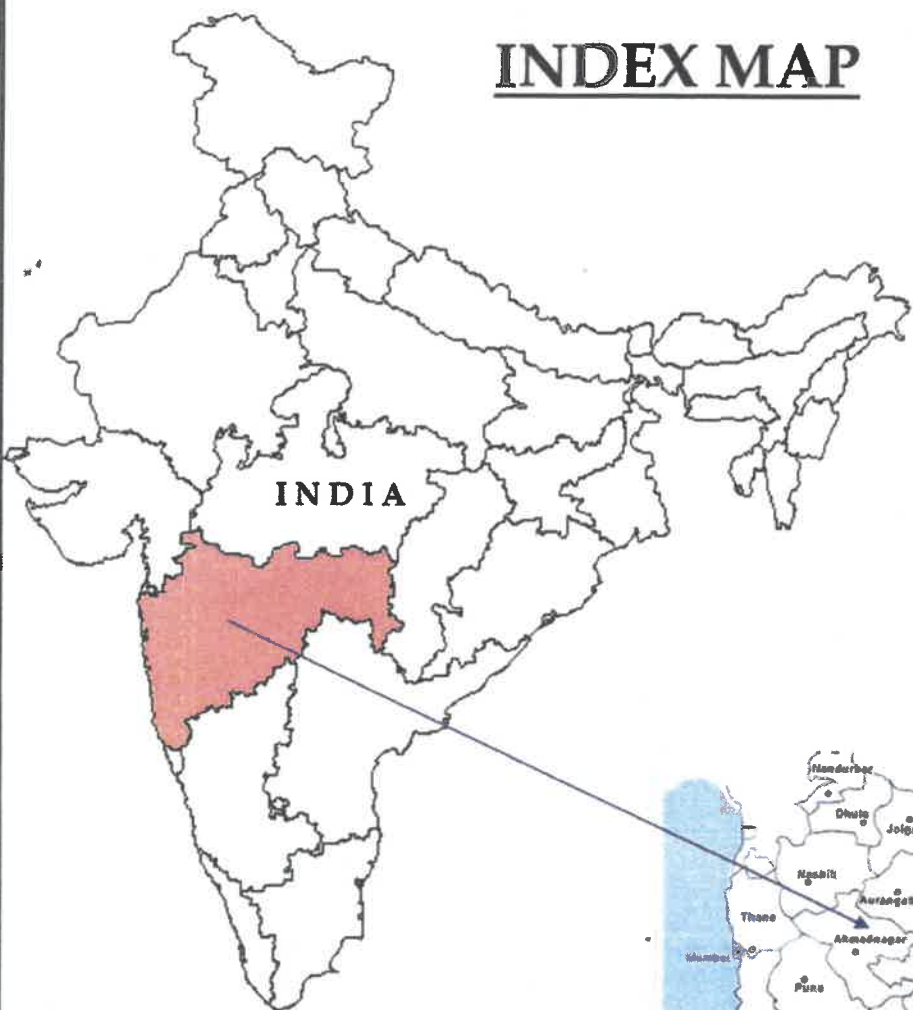
Note:

The mining activities at Durgamanwadi Bauxite Mine have been stopped since 17/03/2018 as per the directions and show cause notice dated 15/03/2018, bearing letter no. Z-11013/3/2018-IA-11(M) issued by Ministry of Environment Forest and Climate Change.

AREA DETAILS

DURGAMANWADI BAUXITE MINE (M/s. Hindalco Industries Limited)	
DETAILS	
State	Maharashtra
District	Kolhapur
Tahsil	Radhanagari
Village	Durgamanwadi
Latitude	16° 20'25.09"
Longitude	73°55'41.45"
Nature of the area	Hilly Area
Toposheet no.	47 H/15
GENERAL CLIMATIC CONDITIONS	
Maximum temperature	40.0°C
Minimum temperature	16.0°C
ACCESSIBILITY	
Road connectivity	Durgamanwadi Bauxite Mine is approachable from Radhanagari by tar road at a distance of 19 km.
Rail connectivity	Kolhapur railway station (55 km)
Airport	Kolhapur (55 km)
Sea port	Ratnagiri (180 km)
Biosphere reserve	Not any
Sanctuary	Extended Radhanagari Wildlife Sanctuary adjacent to lease area.

INDEX MAP








(Mine Lease Area)
DURGMANWADI BAUXITE MINE
M/s Hindalco Industries Limited

NOT TO SCALE



KEY PLAN

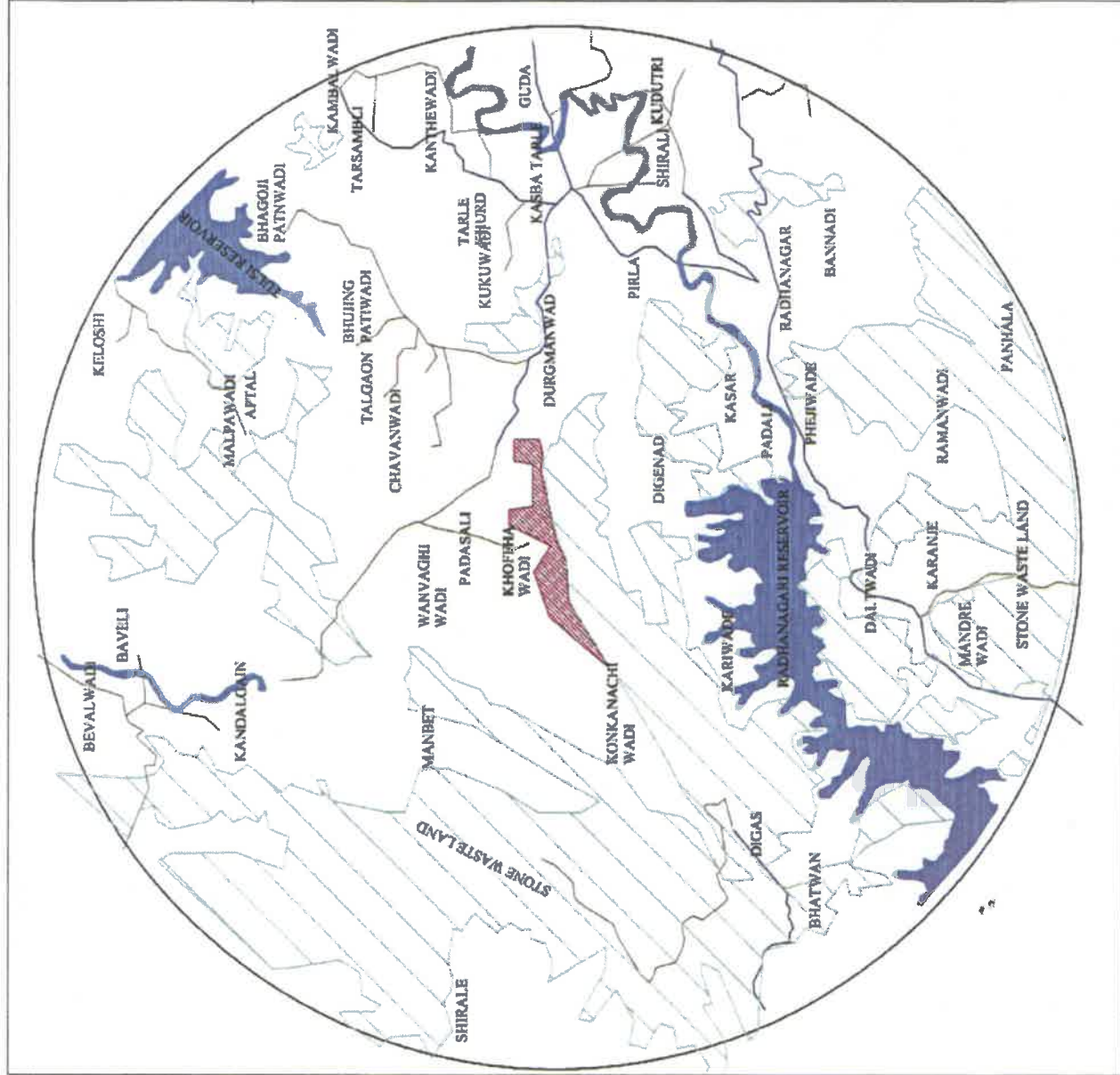
- LEGEND**
-  MINING LEASE
 -  METAL ROAD
 -  UNMETAL ROAD
 -  WATER COURSES
 -  FOREST AREA



**PROJECT : DURGAMANWADI
BAUXITE MINES**

TITLE : KEY PLAN

**PREPARED BY
EQUINOX ENVIRONMENTS INDIA PVT. LTD.
KOLHAPUR**



MICRO-METEOROLOGY

Meteorological data within the project area during the air quality survey period was assessed.

PRIMARY / BASIC METEOROLOGICAL PARAMETERS

- Wind Speed (km/h)
- Wind Direction

Since the dispersion and diffusion of pollutants mainly depend on the above factors these factors are considered as primary meteorological parameters.

SECONDARY METEOROLOGICAL PARAMETERS

- Ambient Temperature
- Humidity

Meteorological Data September - 2019							
Date	Temperature/Humidity			Wind Speed Km/h			Wind Direction
	MIN	MAX	AVERAGE	MIN	MAX	AVERAGE	
02.09.2019	16	29	85	0	7	5.5	West
03.09.2019	17	30	87	0	8	4.5	West
09.09.2019	16	28	89	0	10	4.0	West
10.09.2019	16	29	91	0	9	4.0	West
16.09.2019	15	30	86	0	13	6.0	West
17.09.2019	16	31	85	0	12	5.0	West
23.09.2019	17	32	90	0	11	5.0	West
24.09.2019	18	32	88	0	10	5.0	West

Meteorological Data October - 2019							
Date	Temperature/Humidity			Wind Speed Km/h			Wind Direction
	MIN	MAX	AVERAGE	MIN	MAX	AVERAGE	
07.10.2019	19	32	74	0	8	4.0	West
08.10.2019	18	32	77	0	12	5.5	West
14.10.2019	17	34	80	0	8	3.5	West
15.10.2019	18	35	72	0	6	2.5	West
21.10.2019	18	34	82	0	10	3.0	West
22.10.2019	19	35	81	0	13	6.0	West
28.10.2019	18	34	77	0	9	3.5	West
29.10.2019	18	35	80	0	12	5.5	West

Meteorological Data November - 2019							
Date	Temperature/Humidity			Wind Speed Km/h			Wind Direction
	MIN	MAX	AVERAGE	MIN	MAX	AVERAGE	
04.11.2019	17	33	68	0	7	3.0	East
05.11.2019	16	34	66	0	10	4.5	East
11.11.2019	16	33	70	0	11	5.5	East
12.11.2019	17	33	65	0	10	5.0	East
18.11.2019	16	34	62	0	9	4.0	East
19.11.2019	17	33	61	0	12	5.5	East
25.11.2019	17	35	64	0	8	4.0	East
26.11.2019	16	34	65	0	10	3.5	East

ENVIRONMENTAL QUALITY

Environmental quality monitoring at Durgamanwadi Bauxite Mine of M/s. Hindalco Industries Limited at Durgamanwadi village of Radhanagari Tahsil, Kolhapur district, Maharashtra includes monitoring of various environmental components like air, noise, water and soil quality status within core zone and buffer zone in and around the mine lease area.

AMBIENT AIR QUALITY

The main aim of the ambient air quality monitoring within core zone and buffer zone was to assess the environmental condition and to know the existing levels of the air pollution in the project area. Air pollution forms an important and critical factor to study the environmental issues in the mining areas. Thus, air quality has to be frequently monitored to know the extent of pollution due to mining and allied activities. Ambient air quality monitoring stations were set up at eight selected locations, 4 in core zone and 4 in buffer zone.

SELECTION OF SAMPLING LOCATIONS

The status of the ambient air quality has been assessed through ambient air quality-monitoring network. The design of monitoring network in the air quality surveillance program has been based on the following considerations:

- Meteorological conditions on synoptic scale
- Topography of the study area
- Representatives of regional background air quality for obtaining

Ambient air quality monitoring stations were set up at 8 locations, 3 in core zone and 5 in buffer zone with due considerations to the above mentioned points.

INSTRUMENT USED FOR SAMPLING

Ambient Fine Dust Sampler was used for monitoring particulate matter (PM₁₀), particulate matter (PM_{2.5}) and other gaseous pollutants.

Sr. No.	Instrument Name	Ambient Fine Dust Sampler
1.	Model No.	IPM-FDS-M 2.5 μ /10 μ Fine Dust Sampler
2.	Serial No.	FDSM/2018-19/368-1
3.	Calibration Details	From 02/08/2019 To 02/07/2020
4.	Calibration Certificate No.	IPM-FDS/18-19/368-1

METHOD FOR TESTING PM₁₀/ PM_{2.5}

Sr. No.	Content	Details
1.	Name of Pollutant	PM ₁₀ / PM _{2.5}
2.	Medium	Air
3.	Instrument	Respirable Dust Sampler /Fine Particulate Sampler
4.	Duration	24hourly
5.	Mode	Continuous
6.	Unit	$\mu\text{g}/\text{m}^3$
7.	Method	Gravimetric

METHOD FOR TESTING

Sr. No.	Name of Pollutant	Sulphur Dioxide	Oxides of Nitrogen	Carbon monoxide
1.	Method	Modified West & Geake Method	Modified Jacob & Hochheiser Modified (Na-Arsenite) Method	NDIR Method
2.	Frequency	24 hourly	24 hourly	24 hourly
3.	Mode	Continuous	Continuous	Continuous
4.	Unit	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	mg/m^3
5.	Procedure	AS Per IS 5182 (Part II)	AS Per IS 5182 (Part IV)	NDIR Method

MONITORING LOCATION DETAILS

Respirable dust sampler and Fine particulate sampler were placed at a height of 3m above the ground level in above mentioned monitoring locations. These stations were selected so as to assess present pollution level. The observed levels of PM₁₀, PM_{2.5}, SO₂, NO_x, CO collected during post monsoon season of the year 2019 are presented in annexure and are summarized in the following table.

AMBIENT AIR QUALITY MONITORING STATION

Sr. No.	Station Code	Name of the Sampling Station	Direction w.r.t. Mines Lease Area
1	A-1	Near Weigh Bridge/DG Set	---
2	A-2	Near Mines Office	---
3	A-3	Near Haulage Road	---
4	A-4	Manbet Village	NW
5	A-5	Padsali Village	N
6	A-6	Durgamanwadi Village	E
7	A-7	Kariwade Village	SW
8	A-8	Chavanwadi Village	NE



AMBIENT AIR QUALITY LOCATIONS

LEGEND

- MINING LEASE
- METAL ROAD
- UNMETAL ROAD
- WATER COURSES
- FOREST AREA
- AAQ LOCATIONS

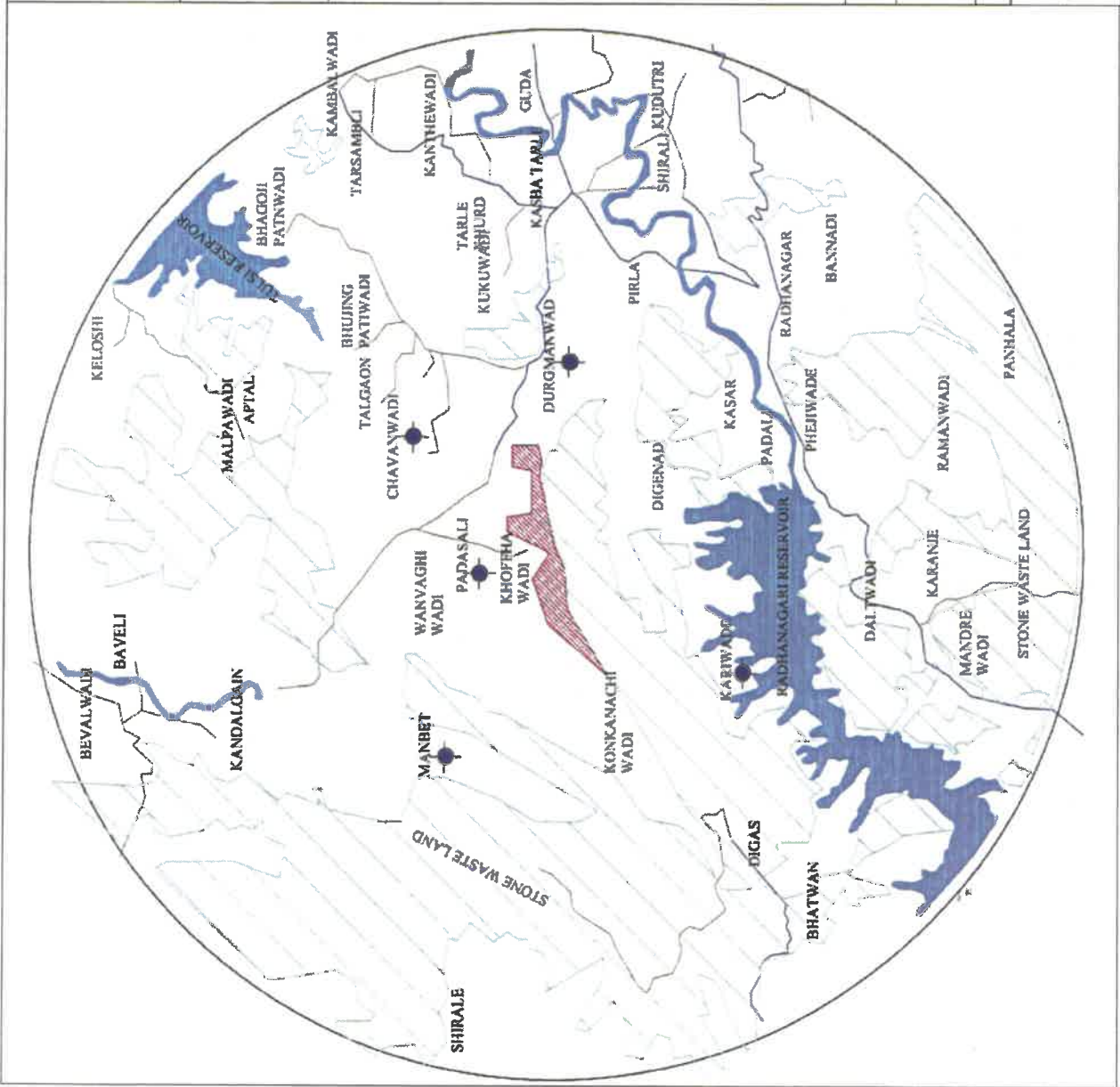


PROJECT : DURGAMANWADI

BAUXITE MINES

TITLE : AAQ LOCATIONS

PREPARED BY
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KOLHAPUR



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Ambient Air Quality Monitoring Report

Report No-	GESEC/PRO/2019-20/12/224-247	Date of Report	13/12/2019
Name of Client	Equinox Environments (I) Pvt- Ltd-, Kolhapur, Maharashtra		
Project Name & Address	M/s. Hindalco Industries Limited (Durgamanwadi Bauxite Mine) A/P. Durgamanwadi, Tahsil. Radhanagari, District. Kolhapur, State. Maharashtra.		
Sample Collected and Analyzed by	Green EnviroSafe Engineers & Consultant Pvt- Ltd, Pune, Maharashtra		
Name Of Instrument & Calibration Details	Make	Date of calibration	Calibration Due Date
Combo Sampler	Instrumex	08/02/2019	07/02/2020
			IPM-FDS/18-19/368-1

NAME OF LOCATION- Station: A1, Near Weigh Bridge/DG Set

Sampling Date	Date of Sample Registration	Parameter	PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO _x µg/m ³	CO mg/m ³
		Limit	100 (µg/m ³)	60 (µg/m ³)	80 (µg/m ³)	80 (µg/m ³)	04 (mg/m ³)
Analysis Method			IS: 5181 (Part-23)	IS: 5181 (Part-23)	Modified West &Gaeke	Jacob & Hocheiser's	NDIR Method

September – 2019

02.09.2019	06.09.2019	Week-1	49.8	16.4	12.5	18.1	0.07
03.09.2019	06.09.2019	Week-1	52.5	18.0	11.8	17.8	0.05
09.09.2019	13.09.2019	Week-2	48.8	15.8	13.4	18.7	0.06
10.09.2019	13.09.2019	Week-2	51.1	16.8	13.2	18.0	0.05
16.09.2019	20.09.2019	Week-3	53.2	17.3	12.4	16.6	0.09
17.09.2019	20.09.2019	Week-3	50.7	15.5	11.3	17.5	0.08
23.09.2019	27.09.2019	Week-4	51.5	16.6	12.6	18.4	0.05
24.09.2019	27.09.2019	Week-4	54.4	17.5	13.5	16.9	0.08

October – 2019

07.10.2019	11.10.2019	Week-2	51.2	16.6	13.4	16.6	0.06
08.10.2019	11.10.2019	Week-2	49.8	18.4	14.3	17.7	0.08
14.10.2019	18.10.2019	Week-3	51.7	15.8	13.3	18.1	0.06
15.10.2019	18.10.2019	Week-3	51.4	16.4	11.5	15.8	0.07
21.10.2019	25.10.2019	Week-4	49.4	18.0	14.7	16.3	0.05
22.10.2019	25.10.2019	Week-4	50.2	15.5	15.0	16.5	0.05
28.10.2019	01.11.2019	Week-5	52.4	17.9	15.4	17.5	0.08
29.10.2019	01.11.2019	Week-5	49.2	18.7	12.5	15.6	0.06

November – 2019

04.11.2019	08.11.2019	Week-1	49.7	18.6	13.6	17.8	0.08
05.11.2019	08.11.2019	Week-1	51.5	15.8	15.3	18.1	0.06
11.11.2019	15.11.2019	Week-2	53.3	18.1	14.5	16.5	0.05
12.11.2019	15.11.2019	Week-2	50.3	16.7	12.5	15.7	0.07
18.11.2019	22.11.2019	Week-3	51.5	17.6	15.1	17.5	0.09
19.11.2019	22.11.2019	Week-3	48.6	18.4	11.4	15.6	0.08
25.11.2019	29.11.2019	Week-4	49.8	16.5	12.6	16.9	0.08
26.11.2019	29.11.2019	Week-4	50.3	15.9	15.3	18.3	0.07



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Ambient Air Quality Monitoring Report

Report No-	GESEC/PRO/2019-20/12/248-271	Date of Report	13/12/2019
Name of Client	Equinox Environments (I) Pvt- Ltd-, Kolhapur, Maharashtra		
Project Name & Address	M/s. Hindalco Industries Limited (Durgamanwadi Bauxite Mine) A/P. Durgamanwadi, Tahsil. Radhanagari, District. Kolhapur, State. Maharashtra.		
Sample Collected and Analyzed by	Green EnviroSAFE Engineers & Consultant Pvt- Ltd, Pune, Maharashtra-		

Name Of Instrument & Calibration Details	Make	Date of calibration	Calibration Due Date	Calibration Certificate No-
Combo Sampler	Instrumex	08/02/2019	07/02/2020	IPM-FDS/18-19/368-2

NAME OF LOCATION- Station: A2, Near Mines Office

Sampling Date	Date of Sample Registration	Parameter	PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO _x µg/m ³	CO mg/m ³
		Limit	100 (µg/m ³)	60 (µg/m ³)	80 (µg/m ³)	80 (µg/m ³)	04 (mg/m ³)
Analysis Method			IS: 5181 (Part-23)	IS: 5181 (Part-23)	Modified West &Gaeke	Jacob & Hocheiser's	NDIR Method

September – 2019

02.09.2019	06.09.2019	Week-1	49.8	15.6	11.5	17.8	0.09
03.09.2019	06.09.2019	Week-1	52.1	16.8	13.2	18.1	0.07
09.09.2019	13.09.2019	Week-2	51.5	15.5	14.5	15.6	0.06
10.09.2019	13.09.2019	Week-2	53.1	18.4	15.1	17.4	0.05
16.09.2019	20.09.2019	Week-3	50.5	17.7	12.4	15.8	0.08
17.09.2019	20.09.2019	Week-3	49.6	16.6	14.1	18.5	0.05
23.09.2019	27.09.2019	Week-4	51.3	17.8	14.4	17.3	0.07
24.09.2019	27.09.2019	Week-4	53.6	18.0	12.6	16.7	0.09

October – 2019

07.10.2019	11.10.2019	Week-2	53.4	18.1	12.3	15.8	0.09
08.10.2019	11.10.2019	Week-2	50.3	15.6	14.2	16.3	0.07
14.10.2019	18.10.2019	Week-3	49.5	16.7	11.4	15.4	0.07
15.10.2019	18.10.2019	Week-3	48.9	16.3	11.9	17.6	0.06
21.10.2019	25.10.2019	Week-4	50.8	17.0	13.4	18.1	0.05
22.10.2019	25.10.2019	Week-4	51.4	15.8	12.2	17.3	0.05
28.10.2019	01.11.2019	Week-5	50.5	16.5	12.3	16.5	0.08
29.10.2019	01.11.2019	Week-5	52.5	17.6	13.6	17.7	0.07

November – 2019

04.11.2019	08.11.2019	Week-1	49.4	15.7	12.0	18.1	0.07
05.11.2019	08.11.2019	Week-1	51.2	16.9	14.2	16.5	0.05
11.11.2019	15.11.2019	Week-2	53.2	17.5	11.4	15.7	0.06
12.11.2019	15.11.2019	Week-2	51.6	15.8	12.0	15.9	0.06
18.11.2019	22.11.2019	Week-3	50.4	17.5	13.2	16.7	0.05
19.11.2019	22.11.2019	Week-3	52.5	16.4	14.4	17.8	0.08
25.11.2019	29.11.2019	Week-4	50.3	17.4	12.8	18.0	0.09
26.11.2019	29.11.2019	Week-4	49.9	18.1	14.5	16.6	0.06

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Ambient Air Quality Monitoring Report

Report No-	GESEC/PRO/2019-20/12/272-295	Date of Report	13/12/2019
Name of Client	Equinox Environments (I) Pvt- Ltd-, Kolhapur, Maharashtra		
Project Name & Address	M/s. Hindalco Industries Limited (Durgamanwadi Bauxite Mine) A/P. Durgamanwadi, Tahsil. Radhanagari, District. Kolhapur, State. Maharashtra.		
Sample Collected and Analyzed by	Green EnviroSafe Engineers & Consultant Pvt- Ltd, Pune, Maharashtra-		

Name Of Instrument& Calibration Details	Make	Date of calibration	Calibration Due Date	Calibration Certificate No-
Combo Sampler	Instrumex	08/02/2019	07/02/2020	IPM-FDS/18-19/367-1

NAME OF LOCATION- Station: A3, Near Haulage Road

Sampling Date	Date of Sample Registration	Parameter	PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO _x µg/m ³	CO mg/m ³
		Limit	100 (µg/m ³)	60 (µg/m ³)	80 (µg/m ³)	80 (µg/m ³)	04 (mg/m ³)
Analysis Method			IS: 5181 (Part-23)	IS: 5181 (Part-23)	Modified West &Gaeke	Jacob & Hocheiser's	NDIR Method

September – 2019

02.09.2019	06.09.2019	Week-1	49.8	16.8	12.4	15.6	0.06
03.09.2019	06.09.2019	Week-1	53.1	15.6	14.1	17.3	0.07
09.09.2019	13.09.2019	Week-2	51.3	17.1	15.3	16.7	0.07
10.09.2019	13.09.2019	Week-2	49.6	18.5	13.5	18.1	0.08
16.09.2019	20.09.2019	Week-3	48.7	16.3	11.8	17.5	0.05
17.09.2019	20.09.2019	Week-3	53.8	15.5	14.0	16.4	0.07
23.09.2019	27.09.2019	Week-4	48.6	17.4	13.1	15.4	0.06
24.09.2019	27.09.2019	Week-4	50.1	18.4	13.5	16.2	0.05

October – 2019

07.10.2019	11.10.2019	Week-2	49.4	16.2	12.4	18.2	0.06
08.10.2019	11.10.2019	Week-2	51.4	15.8	15.2	17.8	0.09
14.10.2019	18.10.2019	Week-3	52.0	18.4	11.5	16.6	0.06
15.10.2019	18.10.2019	Week-3	50.3	15.5	13.3	15.5	0.08
21.10.2019	25.10.2019	Week-4	48.1	16.7	11.8	17.5	0.05
22.10.2019	25.10.2019	Week-4	49.4	17.5	14.2	16.4	0.07
28.10.2019	01.11.2019	Week-5	51.2	16.7	13.1	15.6	0.07
29.10.2019	01.11.2019	Week-5	49.4	15.8	15.3	17.4	0.05

November – 2019

04.11.2019	08.11.2019	Week-1	50.2	18.7	14.3	16.8	0.06
05.11.2019	08.11.2019	Week-1	51.2	19.1	11.6	17.5	0.08
11.11.2019	15.11.2019	Week-2	49.5	16.6	13.2	16.5	0.05
12.11.2019	15.11.2019	Week-2	51.1	15.8	14.4	18.7	0.06
18.11.2019	22.11.2019	Week-3	53.3	17.4	13.3	18.2	0.09
19.11.2019	22.11.2019	Week-3	52.5	17.9	11.4	17.3	0.07
25.11.2019	29.11.2019	Week-4	48.3	18.4	12.2	15.5	0.09
26.11.2019	29.11.2019	Week-4	50.8	16.3	11.7	16.2	0.08

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Ambient Air Quality Monitoring Report

Report No-	GESEC/PRO/2019-20/12/296-319	Date of Report	13/12/2019
Name of Client	Equinox Environments (I) Pvt- Ltd-, Kolhapur, Maharashtra		
Project Name & Address	M/s. Hindalco Industries Limited (Durgamanwadi Bauxite Mine) A/P. Durgamanwadi, Tahsil. Radhanagari, District. Kolhapur, State. Maharashtra.		
Sample Collected and Analyzed by	Green EnviroSAFE Engineers & Consultant Pvt- Ltd, Pune, Maharashtra-		

Name Of Instrument & Calibration Details	Make	Date of calibration	Calibration Due Date	Calibration Certificate No-
Combo Sampler	Instrumex	08/02/2019	07/02/2020	IPM-FDS/18-19/367-2

NAME OF LOCATION- Station: A4, Manbet Village

Sampling Date	Date of Sample Registration	Parameter	PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO _x µg/m ³	CO mg/m ³
		Limit	100 (µg/m ³)	60 (µg/m ³)	80 (µg/m ³)	80 (µg/m ³)	04 (mg/m ³)
Analysis Method			IS: 5181 (Part-23)	IS: 5181 (Part-23)	Modified West &Gaeke	Jacob & Hocheiser's	NDIR Method

September – 2019

04.09.2019	07.09.2019	Week-1	49.7	16.6	11.3	16.5	0.08
05.09.2019	07.09.2019	Week-1	50.2	18.4	11.6	15.7	0.05
11.09.2019	14.09.2019	Week-2	51.3	15.5	13.5	18.4	0.09
12.09.2019	14.09.2019	Week-2	48.8	18.5	14.4	16.8	0.07
18.09.2019	21.09.2019	Week-3	49.5	16.6	15.1	17.4	0.06
19.09.2019	21.09.2019	Week-3	51.1	17.0	12.8	17.0	0.07
25.09.2019	28.09.2019	Week-4	53.1	17.1	11.3	16.3	0.05
26.09.2019	28.09.2019	Week-4	50.5	15.7	12.2	15.6	0.06

October – 2019

09.10.2019	12.10.2019	Week-2	49.4	15.3	13.5	18.3	0.06
10.10.2019	12.10.2019	Week-2	50.3	17.5	15.1	16.6	0.09
16.10.2019	19.10.2019	Week-3	48.1	15.8	12.6	15.8	0.07
17.10.2019	19.10.2019	Week-3	51.4	18.2	12.2	17.4	0.08
23.10.2019	26.10.2019	Week-4	52.5	17.5	11.5	15.5	0.05
24.10.2019	26.10.2019	Week-4	51.5	16.7	14.3	17.4	0.07
30.10.2019	02.11.2019	Week-5	50.6	17.6	11.8	15.8	0.08
31.10.2019	02.11.2019	Week-5	53.4	15.8	11.2	18.1	0.06

November – 2019

06.11.2019	09.11.2019	Week-1	52.1	16.8	13.6	16.5	0.07
07.11.2019	09.11.2019	Week-1	51.3	18.4	13.3	15.5	0.05
13.11.2019	16.11.2019	Week-2	50.5	16.6	10.4	17.6	0.09
14.11.2019	16.11.2019	Week-2	49.1	16.4	14.4	18.5	0.08
20.11.2019	23.11.2019	Week-3	53.3	15.8	12.8	16.7	0.06
21.11.2019	23.11.2019	Week-3	49.5	17.5	13.7	17.4	0.08
27.11.2019	30.11.2019	Week-4	51.2	18.1	11.9	16.9	0.07
28.11.2019	30.11.2019	Week-4	49.4	16.4	12.5	18.0	0.06

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Ambient Air Quality Monitoring Report

Report No-	GESEC/PRO/2019-20/12/320-343	Date of Report	13/12/2019
Name of Client	Equinox Environments (I) Pvt- Ltd-, Kolhapur, Maharashtra		
Project Name & Address	M/s. Hindalco Industries Limited (Durgamanwadi Bauxite Mine) A/P. Durgamanwadi, Tahsil. Radhanagari, District. Kolhapur, State. Maharashtra.		
Sample Collected and Analyzed by	Green Envirosafe Engineers & Consultant Pvt- Ltd, Pune, Maharashtra-		

Name Of Instrument & Calibration Details	Make	Date of calibration	Calibration Due Date	Calibration Certificate No-
Combo Sampler	Instrumex	08/02/2019	07/02/2020	IPM-FDS/18-19/368-1

NAME OF LOCATION- Station: A 5, Padsali Village

Sampling Date	Date of Sample Registration	Parameter	PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO _x µg/m ³	CO mg/m ³
		Limit	100 (µg/m ³)	60 (µg/m ³)	80 (µg/m ³)	80 (µg/m ³)	04 (mg/m ³)
Analysis Method			IS: 5181 (Part-23)	IS: 5181 (Part-23)	Modified West &Gaeke	Jacob & Hocheiser's	NDIR Method

September – 2019

04.09.2019	07.09.2019	Week-1	41.2	11.4	10.3	12.8	0.03
05.09.2019	07.09.2019	Week-1	43.0	13.2	12.1	14.5	0.05
11.09.2019	14.09.2019	Week-2	41.5	11.8	08.7	11.6	0.02
12.09.2019	14.09.2019	Week-2	42.1	12.6	09.9	14.0	0.04
18.09.2019	21.09.2019	Week-3	41.9	10.5	10.5	12.4	0.03
19.09.2019	21.09.2019	Week-3	43.7	11.7	09.9	11.2	0.02
25.09.2019	28.09.2019	Week-4	42.2	12.3	11.2	14.5	0.03
26.09.2019	28.09.2019	Week-4	42.6	13.4	08.7	12.3	0.02

October – 2019

09.10.2019	12.10.2019	Week-2	41.8	11.8	10.2	12.3	0.02
10.10.2019	12.10.2019	Week-2	43.5	13.1	12.8	14.8	0.04
16.10.2019	19.10.2019	Week-3	42.7	10.6	09.7	14.2	0.03
17.10.2019	19.10.2019	Week-3	41.3	12.5	11.4	15.5	0.05
23.10.2019	26.10.2019	Week-4	42.6	14.1	09.4	13.4	0.02
24.10.2019	26.10.2019	Week-4	43.3	13.7	08.9	12.5	0.03
30.10.2019	02.11.2019	Week-5	42.4	11.9	11.2	13.1	0.04
31.10.2019	02.11.2019	Week-5	41.1	11.4	08.7	11.4	0.03

November – 2019

06.11.2019	09.11.2019	Week-1	41.3	10.7	08.6	13.4	0.02
07.11.2019	09.11.2019	Week-1	41.1	11.4	10.3	12.8	0.04
13.11.2019	16.11.2019	Week-2	42.9	13.3	11.5	13.3	0.03
14.11.2019	16.11.2019	Week-2	43.5	11.7	09.7	11.7	0.05
20.11.2019	23.11.2019	Week-3	40.7	10.9	08.4	13.0	0.04
21.11.2019	23.11.2019	Week-3	42.6	12.7	10.6	14.6	0.02
27.11.2019	30.11.2019	Week-4	43.4	11.5	11.0	13.5	0.03
28.11.2019	30.11.2019	Week-4	41.8	13.2	09.6	12.6	0.05

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Ambient Air Quality Monitoring Report

Report No-	GESEC/PRO/2019-20/12/344-367	Date of Report	13/12/2019
Name of Client	Equinox Environments (I) Pvt- Ltd-, Kolhapur, Maharashtra		
Project Name & Address	M/s. Hindalco Industries Limited (Durgamanwadi Bauxite Mine) A/P. Durgamanwadi, Tahsil. Radhanagari, District. Kolhapur, State. Maharashtra.		
Sample Collected and Analyzed by	Green Envirosafe Engineers & Consultant Pvt- Ltd, Pune, Maharashtra-		
Name Of Instrument& Calibration Details	Make	Date of calibration	Calibration Due Date
Combo Sampler	Instrumex	08/02/2019	07/02/2020
			IPM-FDS/18-19/368-2

NAME OF LOCATION- Station: A6, Durgamanwadi Village

Sampling Date	Date of Sample Registration	Parameter	PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO _x µg/m ³	CO mg/m ³
		Limit	100 (µg/m ³) IS: 5181 (Part-23)	60 (µg/m ³) IS: 5181 (Part-23)	80 (µg/m ³) Modified West &Gaeke	80 (µg/m ³) Jacob & Hocheiser's	04 (mg/m ³) NDIR Method
September – 2019							
04.09.2019	07.09.2019	Week-1	41.4	14.0	09.0	11.9	0.03
05.09.2019	07.09.2019	Week-1	41.7	11.5	08.8	11.3	0.02
11.09.2019	14.09.2019	Week-2	42.8	12.7	08.5	12.6	0.02
12.09.2019	14.09.2019	Week-2	43.3	11.9	10.9	11.8	0.04
18.09.2019	21.09.2019	Week-3	41.2	10.8	11.6	13.2	0.03
19.09.2019	21.09.2019	Week-3	40.5	15.1	10.0	12.0	0.03
25.09.2019	28.09.2019	Week-4	41.1	14.5	09.5	12.5	0.04
26.09.2019	28.09.2019	Week-4	42.5	12.8	08.9	11.5	0.05
October – 2019							
09.10.2019	12.10.2019	Week-2	41.7	11.0	08.4	10.5	0.03
10.10.2019	12.10.2019	Week-2	43.1	11.5	09.9	11.8	0.05
16.10.2019	19.10.2019	Week-3	42.3	11.2	11.9	15.0	0.02
17.10.2019	19.10.2019	Week-3	42.8	12.8	10.7	13.4	0.03
23.10.2019	26.10.2019	Week-4	43.5	12.7	08.1	10.7	0.04
24.10.2019	26.10.2019	Week-4	41.8	10.0	10.5	12.6	0.03
30.10.2019	02.11.2019	Week-5	41.3	11.7	09.9	10.4	0.02
31.10.2019	02.11.2019	Week-5	40.8	10.9	10.0	12.4	0.03
November – 2019							
06.11.2019	09.11.2019	Week-1	42.2	10.8	09.2	10.9	0.02
07.11.2019	09.11.2019	Week-1	40.4	12.3	10.5	13.5	0.02
13.11.2019	16.11.2019	Week-2	41.8	13.2	10.0	12.6	0.03
14.11.2019	16.11.2019	Week-2	42.5	11.7	08.7	12.8	0.04
20.11.2019	23.11.2019	Week-3	41.9	10.5	08.1	10.2	0.05
21.11.2019	23.11.2019	Week-3	42.1	11.4	09.5	10.0	0.04
27.11.2019	30.11.2019	Week-4	43.3	13.0	10.6	12.0	0.03
28.11.2019	30.11.2019	Week-4	41.9	12.5	09.0	11.1	0.02

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Ambient Air Quality Monitoring Report

Report No-	GESEC/PRO/2019-20/12/368-391	Date of Report	13/12/2019
Name of Client	Equinox Environments (I) Pvt- Ltd-, Kolhapur, Maharashtra		
Project Name & Address	M/s. Hindalco Industries Limited (Durgamanwadi Bauxite Mine) A/P. Durgamanwadi, Tahsil. Radhanagari, District. Kolhapur, State. Maharashtra.		
Sample Collected and Analyzed by	Green Envirosafe Engineers & Consultant Pvt- Ltd, Pune, Maharashtra-		

Name Of Instrument & Calibration Details	Make	Date of calibration	Calibration Due Date	Calibration Certificate No-
Combo Sampler	Instrumex	08/02/2019	07/02/2020	IPM-FDS/18-19/367-1

NAME OF LOCATION- Station: A7, Kariwade Village

Sampling Date	Date of Sample Registration	Parameter	PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO _x µg/m ³	CO mg/m ³
		Limit	100 (µg/m ³)	60 (µg/m ³)	80 (µg/m ³)	80 (µg/m ³)	04 (mg/m ³)
Analysis Method			IS: 5181 (Part-23)	IS: 5181 (Part-23)	Modified West &Gaeke	Jacob & Hocheiser's	NDIR Method
September – 2019							
06.09.2019	09.09.2019	Week-1	41.1	10.7	09.1	11.2	0.04
07.09.2019	09.09.2019	Week-1	43.5	11.3	10.7	13.5	0.02
13.09.2019	16.09.2019	Week-2	40.7	12.0	08.7	14.4	0.03
14.09.2019	16.09.2019	Week-2	42.8	10.5	10.1	14.3	0.03
20.09.2019	23.09.2019	Week-3	43.3	11.9	09.5	13.7	0.05
21.09.2019	23.09.2019	Week-3	41.9	11.5	10.4	15.4	0.02
27.09.2019	30.09.2019	Week-4	42.6	13.9	11.3	13.3	0.04
28.09.2019	30.09.2019	Week-4	41.7	12.1	08.5	12.2	0.03
October – 2019							
11.10.2019	14.10.2019	Week-2	42.5	10.7	09.8	10.8	0.02
12.10.2019	14.10.2019	Week-2	43.1	11.2	10.4	12.5	0.03
18.10.2019	21.10.2019	Week-3	41.3	12.5	11.3	13.7	0.02
19.10.2019	21.10.2019	Week-3	42.4	12.8	10.5	13.2	0.03
25.10.2019	28.10.2019	Week-4	41.4	11.3	12.5	14.0	0.04
26.10.2019	28.10.2019	Week-4	43.8	11.9	09.0	10.6	0.05
November – 2019							
01.11.2019	05.11.2019	Week-1	41.8	13.3	09.1	12.9	0.03
02.11.2019	05.11.2019	Week-1	44.7	12.1	08.8	10.8	0.04
08.11.2019	12.11.2019	Week-2	42.3	10.0	10.5	12.2	0.02
09.11.2019	12.11.2019	Week-2	43.9	11.7	08.2	11.8	0.02
15.11.2019	19.11.2019	Week-3	41.3	14.1	09.7	12.7	0.03
16.11.2019	19.11.2019	Week-3	42.6	12.4	08.9	11.4	0.04
22.11.2019	26.11.2019	Week-4	42.1	14.4	10.8	11.8	0.05
23.11.2019	26.11.2019	Week-4	41.7	11.5	10.0	14.5	0.03
29.11.2019	03.12.2019	Week-5	42.3	13.7	08.5	13.5	0.02
30.11.2019	03.12.2019	Week-5	43.6	10.5	09.7	14.1	0.03



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Ambient Air Quality Monitoring Report

Report No-	GESEC/PRO/2019-20/12/392-415		Date of Report	13/12/2019
Name of Client	Equinox Environments (I) Pvt- Ltd-, Kolhapur, Maharashtra			
Project Name & Address	M/s. Hindalco Industries Limited (Durgamanwadi Bauxite Mine) A/P. Durgamanwadi, Tahsil. Radhanagari, District. Kolhapur, State. Maharashtra.			
Sample Collected and Analyzed by	Green Envirosafe Engineers & Consultant Pvt- Ltd, Pune, Maharashtra-			
Name Of Instrument & Calibration Details	Make	Date of calibration	Calibration Due Date	Calibration Certificate No-
Combo Sampler	Instrumex	08/02/2019	07/02/2020	IPM-FDS/18-19/367-2

NAME OF LOCATION- Station: A 8, Chavanwadi Village

Sampling Date	Date of Sample Registration	Parameter	PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO _x µg/m ³	CO mg/m ³
		Limit	100 (µg/m ³)	60 (µg/m ³)	80 (µg/m ³)	80 (µg/m ³)	04 (mg/m ³)
Analysis Method			IS: 5181 (Part-23)	IS: 5181 (Part-23)	Modified West &Gaeke	Jacob & Hocheiser's	NDIR Method
September – 2019							
06.09.2019	09.09.2019	Week-1	42.7	10.5	09.1	12.4	0.04
07.09.2019	09.09.2019	Week-1	41.2	12.7	08.8	10.8	0.02
13.09.2019	16.09.2019	Week-2	40.6	11.4	10.5	13.5	0.02
14.09.2019	16.09.2019	Week-2	43.1	13.3	08.2	11.0	0.03
20.09.2019	23.09.2019	Week-3	42.4	12.5	09.7	10.5	0.02
21.09.2019	23.09.2019	Week-3	41.9	14.2	08.9	12.3	0.03
27.09.2019	30.09.2019	Week-4	42.4	11.6	10.8	11.4	0.02
28.09.2019	30.09.2019	Week-4	43.0	10.6	10.0	12.0	0.04
October – 2019							
11.10.2019	14.10.2019	Week-2	42.5	10.8	09.0	11.0	0.04
12.10.2019	14.10.2019	Week-2	41.7	11.6	10.1	11.5	0.05
18.10.2019	21.10.2019	Week-3	43.8	12.1	08.7	12.4	0.03
19.10.2019	21.10.2019	Week-3	41.6	11.8	10.6	14.0	0.03
25.10.2019	28.10.2019	Week-4	42.4	12.2	09.3	11.8	0.02
26.10.2019	28.10.2019	Week-4	42.3	11.5	08.5	12.8	0.02
November – 2019							
01.11.2019	05.11.2019	Week-1	42.5	12.5	09.5	13.2	0.02
02.11.2019	05.11.2019	Week-1	41.6	11.0	08.2	10.3	0.03
08.11.2019	12.11.2019	Week-2	43.8	14.1	10.8	13.4	0.03
09.11.2019	12.11.2019	Week-2	42.2	10.7	08.5	14.2	0.04
15.11.2019	19.11.2019	Week-3	42.2	13.2	09.1	12.5	0.02
16.11.2019	19.11.2019	Week-3	43.7	11.0	10.8	11.7	0.05
22.11.2019	26.11.2019	Week-4	41.4	12.8	08.7	10.5	0.03
23.11.2019	26.11.2019	Week-4	43.2	10.9	10.0	13.6	0.02
29.11.2019	03.12.2019	Week-5	42.2	11.4	08.4	10.8	0.02
30.11.2019	03.12.2019	Week-5	44.1	10.5	09.8	12.3	0.04

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SUMMARY OF AMBIENT AIR QUALITY

Sr. No.	Location		PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)
1	A1 Near Weigh Bridge/DG Set	Min	48.60	15.50	11.30	15.60	0.05
		Max	54.40	18.70	15.40	18.70	0.09
		Mean	50.93	17.03	13.38	17.19	0.07
		10th percentile	49.26	15.80	11.59	15.73	0.05
		30th percentile	49.80	16.40	12.50	16.59	0.06
		50th percentile	50.90	16.75	13.35	17.50	0.07
		95th percentile	53.29	18.57	15.30	18.39	0.09
		98th percentile	53.89	18.65	15.35	18.56	0.09
2	A2 Near Mines Office	Min	48.90	15.50	11.40	15.40	0.05
		Max	53.60	18.40	15.10	18.50	0.09
		Mean	51.14	16.89	13.07	16.97	0.07
		10th percentile	49.53	15.63	11.62	15.73	0.05
		30th percentile	49.52	16.39	12.29	16.48	0.06
		50th percentile	51.00	16.85	13.00	17.00	0.07
		95th percentile	53.37	18.10	14.50	18.10	0.09
		98th percentile	53.51	18.26	14.82	18.32	0.09
3	A3 Near Haulage Road	Min	48.10	15.50	11.40	15.40	0.05
		Max	53.80	19.10	15.30	18.70	0.09
		Mean	50.55	17.02	13.19	16.87	0.07
		10th percentile	48.63	15.66	11.63	15.53	0.05
		30th percentile	49.49	16.29	12.38	16.38	0.06
		50th percentile	50.25	16.75	13.25	16.75	0.07
		95th percentile	53.27	18.67	15.29	18.20	0.09
		98th percentile	53.57	18.92	15.30	18.47	0.09
4	A4 Manbet Village	Min	48.10	15.30	10.40	15.50	0.05
		Max	53.40	18.50	15.10	18.50	0.09
		Mean	50.74	16.91	12.79	16.90	0.07
		10th percentile	49.19	15.73	11.30	15.63	0.05
		30th percentile	49.68	16.40	11.89	16.48	0.06
		50th percentile	50.55	16.75	12.70	16.85	0.07
		95th percentile	53.27	18.40	15.00	18.39	0.09
		98th percentile	53.35	18.45	15.10	18.45	0.09
5	A5 Padsali Village	Min	40.70	10.50	8.40	11.20	0.02
		Max	43.70	14.10	12.80	15.50	0.05
		Mean	42.26	12.14	10.14	13.14	0.03
		10th percentile	41.13	10.76	8.70	11.63	0.02
		30th percentile	41.77	11.49	9.58	12.49	0.03
		50th percentile	42.30	11.85	10.05	13.05	0.03
		95th percentile	43.50	13.66	12.01	14.77	0.05

		98th percentile	43.61	13.92	12.48	15.18	0.05
6	A6 Durgamanwadi Village	Min	40.40	10.00	8.10	10.00	0.02
		Max	43.50	15.10	11.90	15.00	0.05
		Mean	42.00	12.10	9.68	11.95	0.03
		10th percentile	40.89	10.80	8.43	10.43	0.02
		30th percentile	41.67	11.38	8.99	11.28	0.03
		50th percentile	41.90	11.80	9.70	11.95	0.03
		95th percentile	43.30	14.43	11.50	13.49	0.05
		98th percentile	43.41	14.82	11.76	14.31	0.05
7	A7 Kariwade Village	Min	40.70	10.00	8.20	10.60	0.02
		Max	44.70	14.40	12.50	15.40	0.05
		Mean	42.43	12.00	9.83	12.85	0.03
		10th percentile	41.30	10.56	8.56	10.92	0.02
		30th percentile	41.79	11.30	9.09	12.16	0.03
		50th percentile	42.35	11.90	9.75	13.05	0.03
		95th percentile	43.89	14.07	11.30	14.49	0.05
		98th percentile	44.33	14.26	11.95	14.99	0.05
8	A8 Chavanwadi Village	Min	40.60	10.50	8.20	10.30	0.02
		Max	44.10	14.20	10.80	14.20	0.05
		Mean	42.44	11.87	9.42	12.08	0.03
		10th percentile	41.46	10.63	8.43	10.59	0.02
		30th percentile	42.17	11.00	8.79	11.36	0.02
		50th percentile	42.40	11.60	9.20	12.15	0.03
		95th percentile	43.80	13.98	10.80	13.94	0.05
		98th percentile	43.96	14.15	10.80	14.11	0.05

Note:

All the obtained air quality values in core zone and buffer zone as compared with the air quality standards prescribed by Central Pollution Control Board 2009 are found to be within the limit.

Stack Monitoring

As mine is shut down, DG SETs are not in the operating condition.

Revised National Ambient Air Quality Standards

Revised National Ambient Air Quality Standards (MoEF notification G.S.R 826(E), dated 16.11.2009)

Sl. No	Pollutant	Time Weighted Average	New Standards (Schedule VII, Rule 3 (3B) 16 th Nov 2009)		Methods of measurement
			Concentration in ambient air		
			Industrial Area Residential, Rural & other Areas	Ecologically sensitive area (Notified by Central Govt)	
1	Sulphur Dioxide(SO ₂)	Annual Avg*	50.0 µg/m ³	20.0 µg/m ³	-Improved West and Gaeke method -Ultraviolet fluorescence
		24 hours**	80.0 µg/m ³	80.0 µg/m ³	
2	Oxides of Nitrogen as NO ₂	Annual Avg*	40.0 µg/m ³	30.0 µg/m ³	-Modified Jacob and Hochheise (Sodium Arsenite) -Chemiluminescence
		24 hours**	80.0 µg/m ³	80.0 µg/m ³	
3	Particulate matter (size less than 10µm)	Annual Avg*	60.0 µg/m ³	60.0 µg/m ³	-Gravimetric -TOEM -Beta attenuation
		24 hours**	100.0 µg/m ³	100.0 µg/m ³	
4	Particulate matter (size less than 2.5 µm)	Annual Avg*	40.0 µg/m ³	40.0 µg/m ³	-Gravimetric -TOEM -Beta attenuation
		24 hours**	60.0 µg/m ³	60.0 µg/m ³	
5	Lead (Pb)	Annual Avg*	0.50 µg/m ³	0.50 µg/m ³	-AAS/ICP method for sampling on EPM2000 or Equivalent Filter paper -ED-XRF using Teflon filter paper
		24 hours**	1.0 µg/m ³	1.0 µg/m ³	
6	Carbon Monoxide (CO)	8 hours**	2.0 mg/m ³	2.0 mg/m ³	-Non Dispersive Infra Red (NDIR) spectroscopy
7	Ozone	1 hour	4.0 mg/m ³	4.0 mg/m ³	-Photometric -Chemiluminescence -Chemical method
		8 hours**	100.0 µg/m ³	100.0 µg/m ³	
		24 hours**	60.0 µg/m ³	60.0 µg/m ³	
8	Ammonia (NH ₃)	Annual Avg*	100.0 µg/m ³	100.0 µg/m ³	-Chemiluminescence -Indo-Phenol Blue method
		24 hours**	400.0 µg/m ³	400.0 µg/m ³	
9	Benzene	Annual Avg*	5.0 µg/m ³	5.0 µg/m ³	-GC based continuous analyzer -Adsorption/desorption followed by GC analysis
10	Benzo(a) pyrene	Annual Avg*	1.0 ng/m ³	1.0 ng/m ³	-Solvent extraction followed by GC/HPLC extraction
11	Arsenic	Annual Avg*	6.0 ng/m ³	6.0 ng/m ³	AAS/ICP method for sampling on EPM2000 OR Equivalent Filter paper
12	Nickel		20.0 ng/m ³	20.0 ng/m ³	-AAS/ICP method for sampling on EPM2000 OR Equivalent Filter paper

- * Annual Arithmetic mean of minimum 104 measurements in a year taken twice a Week 24 hourly at uniform interval,
- ** 24 hourly / 8 hourly or 1 hourly monitored values as applicable shall be complied with 98 % of the time in a year. However, 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

AMBIENT NOISE LEVEL QUALITY

Noise is nothing but unwanted sound produced due to various activities. As a part of occupational health and safety measures, certain safeguards have been incorporated to mitigate noise pollution in working environment. Noise level surveys were carried out at 8 selected locations in and around the mine lease area. Noise survey has been conducted in the study area for the period of 24 hr at each location.

AMBIENT NOISE LEVEL MONITORING STATIONS:

Sr. No.	Station Code	Name of the Sampling Station	Direction w.r.t. Mines Lease Area
1	A-1	Near Weigh Bridge/DG Set	---
2	A-2	Near Mines Office	---
3	A-3	Near Haulage Road	---
4	A-4	Manbet Village	NW
5	A-5	Padsali Village	N
6	A-6	Durgamanwadi Village	E
7	A-7	Kariwade Village	SW
8	A-8	Chavanwadi Village	NE

NATIONAL AMBIENT NOISE QUALITY STANDARDS:

AREA CODE	CATEGORY of AREA	LIMIT in dB (A) Leq	
		DAY TIME	NIGHT TIME
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40


Note:

- Day time is reckoned in between 6 am and 9 pm.
- Night time is reckoned in between 9 pm and 6 am.
- Silence zone is defined as area up to 100 meters around such premises as hospitals, educational institutions and courts. The silence zones are to be declared by the Competent Authority.
- Mixed categories of areas should be declared as one of the four above mentioned categories by the Competent Authority and the corresponding standards shall apply.



AMBIENT NOISE QUALITY LOCATIONS

LEGEND

-  MINING LEASE
-  METAL ROAD
-  UNMETAL ROAD
-  WATER COURSES
-  FOREST AREA
-  NOISE LOCATIONS

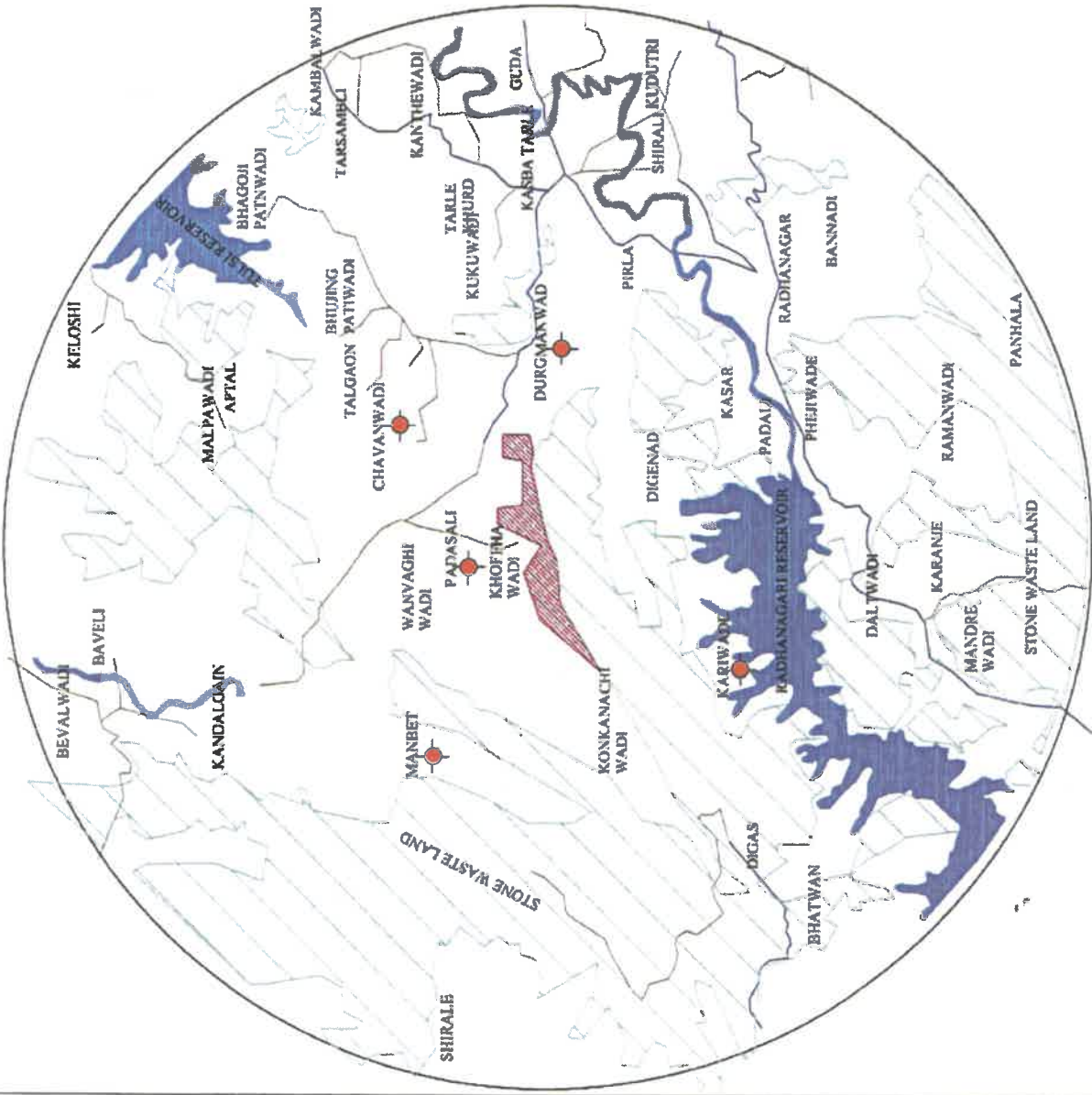


PROJECT : DURGAMANWADI

BAUXITE MINES

TITLE : NOISE LOCATIONS

**PREPARED BY
EQUINOX ENVIRONMENTS INDIA PVT. LTD.
KOLHAPUR**





Recognised by Ministry of Environment, Forest & Climate Change (MoEF) Govt. of India and ISO/IEC 17025:2005 (NABL), ISO 9001:2015 and OHSAS 18001:2007 Certified Company

Ambient Noise Monitoring Report

Report No.	GESEC/PRO/2019-20/12/416-423	Date of Report	13/12/2019
Name of Client	Equinox Environments (I) Pvt. Ltd., Kolhapur, Maharashtra.		
Project Name and Address	M/s. Hindalco Industries Limited (Durgamanwadi Bauxite Mine) A/P. Durgamanwadi, Tahsil. Radhanagari, District. Kolhapur, State. Maharashtra.		
Sample Collected By	Green EnviroSafe Engineers & Consultant Pvt. Ltd, Pune, Maharashtra.		
Date of Sampling	Nov-2019		
Name Of Instrument & Calibration Details	Date of calibration	Calibration Due Date	Calibration Certificate No.
Sound Level meter	01/06/2019	31/05/2020	TECH/CAL/2019/671/16
Analysis Method	S: 4758-1968 Reaff.2002.		

Date	06.09.2019	07.09.2019	13.09.2019	14.09.2019	20.09.2019	21.09.2019	27.09.2019	28.09.2019
Location	Near Weigh Bridge/ DG set	Near mines office	Near Houlage Road	Manbet Village	Padsali village	Durgamanwadi village	Kariwade Village	Chavanwadi village
Time	N1	N2	N3	N4	N5	N6	N7	N8
6.00	41.3	45.7	42.9	43.4	40.5	41.3	41.8	43.2
7.00	48.9	46.7	48.8	48.9	37.3	38.1	38.4	39.6
8.00	50.6	48.8	50.6	51.1	38.3	39.7	40.0	40.9
9.00	53.7	51.2	46.7	46.7	45.1	43.6	44.4	45.3
10.00	55.7	53.1	48.6	48.9	46.1	46.1	47.9	47.8
11.00	62.0	52.4	48.5	48.5	41.4	47.4	48.3	49.7
12.00	63.3	46.5	49.0	50.6	40.9	47.7	49.2	49.4
13.00	61.4	51.9	47.2	48.2	41.2	47.6	49.2	49.2
14.00	61.4	51.5	46.6	47.7	41.7	48.8	49.3	51.4
15.00	59.5	50.2	44.9	45.9	40.8	46.9	47.2	48.9
16.00	57.8	48.7	43.8	44.5	45.5	50.0	50.7	51.9
17.00	56.8	46.8	43.5	43.3	47.5	46.9	50.9	49.2
18.00	55.9	45.8	49.0	48.9	43.1	49.3	50.8	50.7
19.00	55.3	44.6	47.9	48.5	37.6	43.9	45.6	45.8
20.00	50.7	39.8	43.3	43.8	34.6	41.1	41.4	42.4
21.00	46.6	44.3	48.1	48.2	38.7	38.1	38.6	39.6
22.00	40.9	38.7	42.1	41.6	39.2	38.5	38.9	39.7
L10	44.5	42.5	43.1	43.4	37.5	38.3	38.8	39.7
L50	55.7	46.8	47.2	48.2	40.9	46.1	47.2	47.8
L90	61.6	52.1	49.0	49.6	45.7	49.0	50.7	51.0
Lday	60.6	48.3	47.8	48.8	42.0	48.0	49.6	49.9
23.00	39.6	37.2	40.8	40.5	37.0	37.3	38.2	38.5
24.00	39.3	37.6	41.2	40.7	36.7	38.1	38.3	39.5
1.00	39.5	37.6	41.5	41.2	37.3	36.2	37.5	38.7
2.00	40.5	37.8	42.2	41.5	36.6	36.0	36.5	37.4
3.00	40.5	38.6	42.8	41.9	36.5	36.0	37.6	38.4
4.00	36.1	33.9	37.6	37.3	38.1	38.7	39.1	40.8
5.00	35.6	33.3	37.5	37.1	37.2	38.1	38.9	40.3
L10	35.9	33.7	37.6	37.2	36.6	36.0	37.1	38.0
L50	39.5	37.6	41.2	40.7	37.0	37.3	38.2	38.7
L90	40.5	38.1	42.4	41.7	37.6	38.3	39.0	40.5



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Lnight	39.9	37.9	41.6	41.0	37.0	37.4	38.3	38.8
Ldn	58.8	48.2	49.6	49.8	44.6	47.8	49.1	49.5
Avg L10	40.2	38.1	40.4	40.3	37.0	37.2	37.9	38.8
Avg L 50	47.6	42.2	44.2	44.5	39.0	41.7	42.7	43.3
Avg L 90	51.1	45.1	45.7	45.6	41.7	43.7	44.9	45.7

Lab Chemist



Authorized Signatory

AMBIENT NOISE LEVEL MONITORING RESULTS [Leqin dB(A)]

Date	06.09.2019	07.09.2019	13.09.2019	14.09.2019	20.09.2019	21.09.2019	27.09.2019	28.09.2019
Location	Near Weigh Bridge/DG set	Near mines office	Near Houlage Road	Manbet Village	Padsali village	Durgaman wadi village	Kariwade Village	Chavanwa di village
L ₁₀	44.5	42.5	43.1	43.4	37.5	38.3	38.8	39.7
L ₅₀	55.7	46.8	47.2	48.2	40.9	46.1	47.2	47.8
L ₉₀	61.6	52.1	49.0	49.6	45.7	49.0	50.7	51.0
L _{day}	60.6	48.3	47.8	48.8	42.0	48.0	49.6	49.9
L ₁₀	35.9	33.7	37.6	37.2	36.6	36.0	37.1	38.0
L ₅₀	39.5	37.6	41.2	40.7	37.0	37.3	38.2	38.7
L ₉₀	40.5	38.1	42.4	41.7	37.6	38.3	39.0	40.5
L _{night}	39.9	37.9	41.6	41.0	37.0	37.4	38.3	38.8
L _{dn}	58.8	48.2	49.6	49.8	44.6	47.8	49.1	49.5
Avg L ₁₀	40.2	38.1	40.4	40.3	37.0	37.2	37.9	38.8
Avg L ₅₀	47.6	42.2	44.2	44.5	39.0	41.7	42.7	43.3
Avg L ₉₀	51.1	45.1	45.7	45.6	41.7	43.7	44.9	45.7

Remark:

All the obtained noise level quality values in core zone and buffer zone as compared with the noise level standards prescribed by Central Pollution Control Board are found to be within the limit.

WATER QUALITY

Water quality monitoring consists of the study of water sources and its quality in the core and buffer zone of the lease area. Its study consists of following two important systems of water bodies:

- Surface water quality.
- Ground water quality.

A total of 6 locations have selected, out of which 3 are for ground water and 3 are for surface water. Location of water quality monitoring stations is given below.

WATER QUALITY MONITORING LOCATIONS

Code	Name of sampling station	Source of water
W-1	Chavanwadi Village	Ground water
W-2	Durgmanwadi Village	Ground water
W-3	Talegaon Village	Ground water
W-4	Mine accumulated water	Surface water
W-5	Tulsi stream	Surface water
W-6	Padsali Village	Surface water

SAMPLING DETAILS







The water samples were collected from 6 sampling locations out of which one is from core zone and other 5 are from buffer zone. Assessment of water quality in the study area and in the mine area includes the quality assessment of parameters as per the Indian Standard IS 10500 (Drinking water standard). Samples were collected in the post monsoon season of the year 2019 as per the prescribed sample collecting methods and analyzed as per the IS standard procedures.

SURFACE WATER QUALITY

Proper drainage system has prepared to drag the monsoon water into the mine pit area for harvesting rain water and overflow of the same is being channelized through series of check dams and settling tanks so as to reduce the water pollution. Buffer zone has seasonal nallahs which used to recharge the ground water table.



WATER QUALITY LOCATIONS

- LEGEND**
-  MINING LEASE
 -  METAL ROAD
 -  UNMETAL ROAD
 -  WATER COURSES
 -  FOREST AREA
 -  WATER LOCATIONS

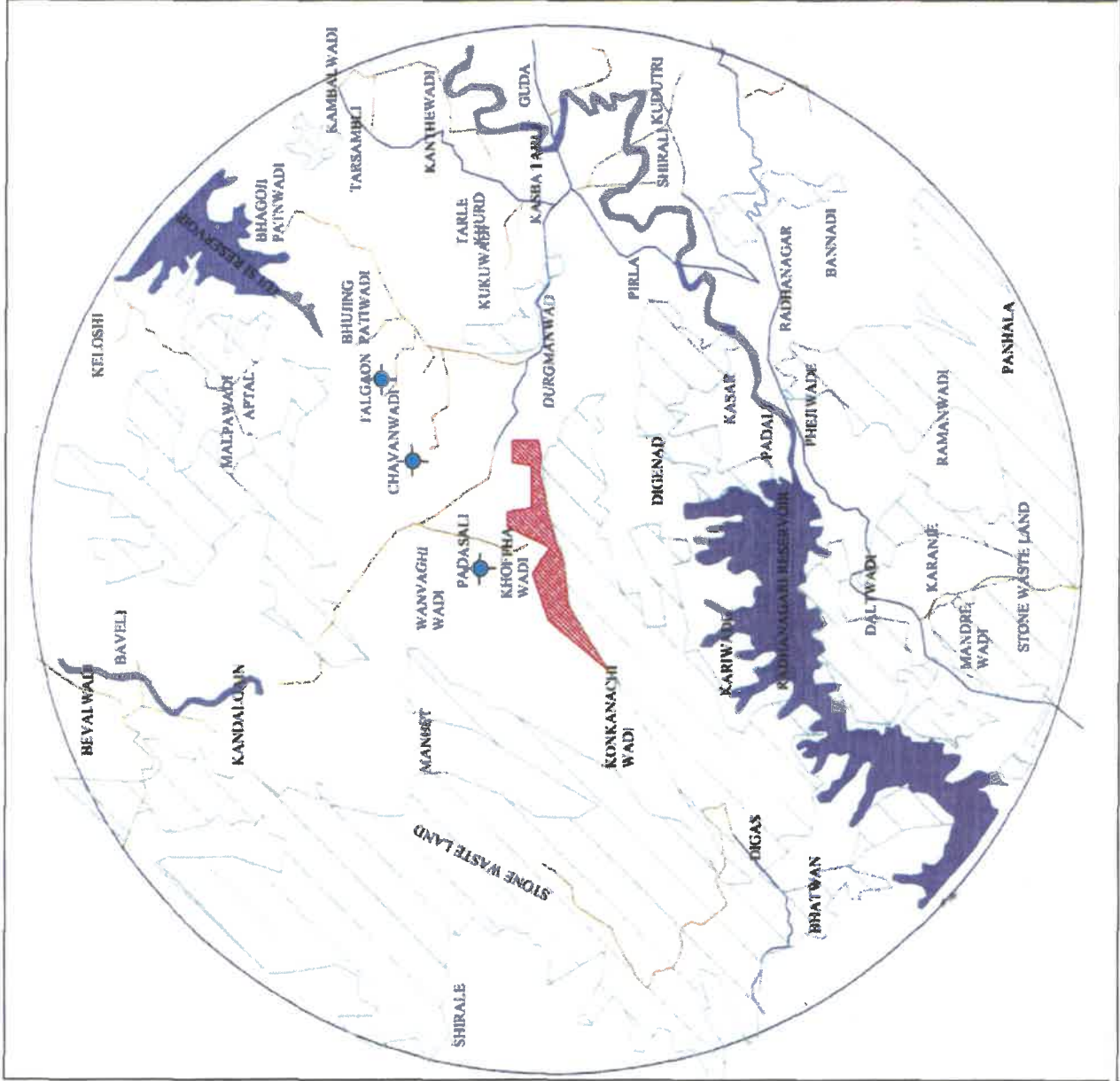


PROJECT : DURGAMANWADI

BAUXITE MINES

TITLE : WATER LOCATIONS

**PREPARED BY
EQUINOX ENVIRONMENTS INDIA PVT. LTD.
KOLHAPUR**





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TEST CERTIFICATE

Client Name:		Equinox Environments (I) Pvt. Ltd., Kolhapur, Maharashtra.		Report Number	GESEC/PRO/2019-20/12/427-429	
Project Name and Address: M/s. Hindalco Industries Limited (Durgamanwadi Bauxite Mine) A/P. Durgamanwadi, Tahsil. Radhanagari, District. Kolhapur, State. Maharashtra.				Date of Report	13/12/2019	
				Sample Details:	Surface Water	
				Date of Sampling:	22/11/2019	
				Date of Sample Received	23/11/2019	
Sample Collected & Analyzed By: Green EnviroSAFE Engineers & Consultant Pvt- Ltd, Pune, Maharashtra				Location		
Sr. No.	Parameter	Unit (s)	Mine accumulated water	Tulsi Stream	Padsali Village	
1.	Odor	--	Un-objectionable	Un-objectionable	Un-objectionable	
2.	Taste	--	Agreeable	Agreeable	Agreeable	
3.	Color	Hazen	<5.00	<5.00	<5.00	
4.	pH	--	8.02	7.52	7.57	
5.	Turbidity	NTU	<5.00	<5.00	<5.00	
6.	DO	mg/lit	1.38	5.23	5.15	
7.	TDS	mg/lit	266.39	112.29	142.17	
8.	TSS	mg/lit	21.58	3.26	5.90	
9.	BOD:3 days at 27°C	mg/lit	10.07	4.01	5.12	
10.	Alkalinity as CaCO ₃	mg/lit	68.76	18.42	25.47	
11.	Total Hardness as CaCO ₃	mg/lit	119.42	52.95	71.04	
12.	Nitrate as NO ₃	mg/lit	25.06	3.78	7.64	
13.	Phosphorous as PO ₄	mg/lit	1.98	0.42	0.53	
14.	Chlorides as Cl ⁻	mg/lit	32.71	13.78	18.82	
15.	Sulphates as SO ₄	mg/lit	14.37	3.04	7.35	
16.	Sodium as Na	mg/lit	11.65	1.42	2.98	
17.	Potassium as K	mg/lit	19.21	2.78	4.44	
18.	Calcium as Ca	mg/lit	32.74	14.62	19.27	
19.	Magnesium as Mg	mg/lit	9.12	3.98	5.55	
20.	Lead as Pb	mg/lit	BDL	BDL	BDL	
21.	Manganese as Mn	mg/lit	BDL	BDL	BDL	
22.	Cadmium as Cd	mg/lit	BDL	BDL	BDL	
23.	Chromium as Cr	mg/lit	BDL	BDL	BDL	
24.	Copper as Cu	mg/lit	BDL	BDL	BDL	
25.	Zinc as Zn	mg/lit	BDL	BDL	BDL	





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26.	Iron as Fe	mg/lit	0.15	0.04	0.09
27.	Fluorides as F ⁻	mg/lit	0.64	0.01	0.03
28.	Mercury as Hg	mg/lit	BDL	BDL	BDL
29.	Selenium as Se	mg/lit	BDL	BDL	BDL
30.	Arsenic as As	mg/lit	BDL	BDL	BDL
31.	Cyanide as CN	mg/lit	BDL	BDL	BDL
32.	Boron as B	mg/lit	BDL	BDL	BDL

ANALYZED BY-



AUTHORIZED SIGNATORY

SURFACE WATER QUALITY

Sr. No.	Parameter	Unit (s)	Mine Accumulated Water	Tulsi Stream	Padsali Village
1.	Odor	--	Un-objectionable	Un-objectionable	Un-objectionable
2.	Taste	--	Agreeable	Agreeable	Agreeable
3.	Color	Hazen	<5.00	<5.00	<5.00
4.	pH	--	8.02	7.52	7.57
5.	Turbidity	NTU	<5.00	<5.00	<5.00
6.	DO	mg/lit	1.38	5.23	5.15
7.	TDS	mg/lit	266.39	112.29	142.17
8.	TSS	mg/lit	21.58	3.26	5.90
9.	BOD:3 days at 27°C	mg/lit	10.07	4.01	5.12
10.	Alkalinity as CaCO ₃	mg/lit	68.76	18.42	25.47
11.	Total Hardness as CaCO ₃	mg/lit	119.42	52.95	71.04
12.	Nitrate as NO ₃	mg/lit	25.06	3.78	7.64
13.	Phosphorous as PO ₄	mg/lit	1.98	0.42	0.53
14.	Chlorides as Cl ⁻	mg/lit	32.71	13.78	18.82
15.	Sulphates as SO ₄	mg/lit	14.37	3.04	7.35
16.	Sodium as Na	mg/lit	11.65	1.42	2.98
17.	Potassium as K	mg/lit	19.21	2.78	4.44
18.	Calcium as Ca	mg/lit	32.74	14.62	19.27
19.	Magnesium as Mg	mg/lit	9.12	3.98	5.55
20.	Lead as Pb	mg/lit	BDL	BDL	BDL
21.	Manganese as Mn	mg/lit	BDL	BDL	BDL
22.	Cadmium as Cd	mg/lit	BDL	BDL	BDL
23.	Chromium as Cr	mg/lit	BDL	BDL	BDL
24.	Copper as Cu	mg/lit	BDL	BDL	BDL
25.	Zinc as Zn	mg/lit	BDL	BDL	BDL
26.	Iron as Fe	mg/lit	0.15	0.04	0.09
27.	Fluorides as F ⁻	mg/lit	0.64	0.01	0.03
28.	Mercury as Hg	mg/lit	BDL	BDL	BDL
29.	Selenium as Se	mg/lit	BDL	BDL	BDL
30.	Arsenic as As	mg/lit	BDL	BDL	BDL
31.	Cyanide as CN	mg/lit	BDL	BDL	BDL
32.	Boron as B	mg/lit	BDL	BDL	BDL

Note:




- mg/l: milligram per liter
- BDL: Below Desirable Limit

Remark:

All the parameters of the surface water samples collected from various sites are well below the desirable limit and maximum permissible limit as per IS: 10500 Standard for Drinking Water.



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TEST CERTIFICATE				
Report Number : GESEC/PRO/2019-20/12/436				
DURGAMANWADI MINES			Date of Sampling	22/11/2019
WELL DEPTHS OF VILLAGES			Date of Analysis	23/11/2019
			Date of Report	13/12/2019
S.NO.	LOCATION	NAME OF THE MINE AREA	TOTAL DEPTH IN MTS	WATER LEVEL FROM SURFACE IN MTS
1	PADSALI VILLAGE	DMW	4.10	0.50
2	CHAVANWADI VILLAGE	DMW	2.80	2.60
ANALYZED BY-		AUTHORIZED SIGNATORY		
		 		

Terms and conditions

1. The report is refer only to the sample tested and not applies to the bulk.
2. The results shown in this test report may differ based on various factors including temperature, humidity, pressure, retention time etc.
3. The test report cannot be reproduced wholly or in part and cannot be used for promotional or publicity purpose without the written consent of laboratory, GESEC.
4. Samples will be retained for a period of seven (7) days after completion of analysis. Longer retention periods can be arranged, on request of the customer.
5. We strictly maintain the confidentiality of all test result of sample(s) collected by us/ supplied by customer and not revel to third party unless required by the statutory or legal requirement.
6. MoEF approved Lab by Govt. of India. From date. 09/02/2017 to 08/02/2022.

GROUND WATER QUALITY

The source of drinking water in the study area is the ground water, which is tapped by a bore well. The buffer zone is good in ground water source. The ground water in the study area gets recharged by rainwater.

Assessment of water quality in the study area and in the mine area includes the quality assessment of parameters as per the Indian Standard IS 10500 (Drinking water standard). Total of 3 locations have selected from buffer zone.

DURGAMANWADI MINES				
WELL DEPTHS OF VILLAGES				
S.NO.	LOCATION	NAME OF THE MINE AREA	TOTAL DEPTH IN MTS	WATER LEVEL FROM SURFACE IN MTS
1	PADSALI VILLAGE	DMW	4.10	0.40
2	CHAVANWADI VILLAGE	DMW	2.80	0.70



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TEST CERTIFICATE

Client Name:	Equinox Environments (I) Pvt. Ltd., Kolhapur, Maharashtra.	Report Number	GESEC/PRO/201920/12/424-426
Project Name and Address:		Date of Report	13/12/2019
M/s. Hindalco Industries Limited (Durgamanwadi Bauxite Mine)		Sample Details	Ground water
A/P. Durgamanwadi, Tahsil. Radhanagari, District. Kolhapur, State. Maharashtra.		Date of Sampling	22/11/2019
		Date of Sample Received	23/11/2019
		Date of Analysis	23/11/2019

Sample Collected & Analyzed By : Green EnviroSafe Engineers & Consultant Pvt- Ltd, Pune, Maharashtra.

SR. NO.	PARAMETER	UNIT(S)	Location		
			CHAVANWADI VILLAGE	DURGAMANWADI VILLAGE	TALEGAON VILLAGE
1.	Odor	--	Un-objectionable	Un-objectionable	Un-objectionable
2.	Taste	--	Agreeable	Agreeable	Agreeable
3.	Color	Hazen	<5.00	<5.00	<5.00
4.	pH	--	7.52	7.61	7.78
5.	Turbidity	NTU	<5.00	<5.00	<5.00
6.	DO	mg/lit	4.72	4.35	4.53
7.	TDS	mg/lit	108.93	131.13	113.72
8.	TSS	mg/lit	3.20	6.25	4.67
9.	BOD:3 days at 27°C	mg/lit	2.05	4.26	3.78
10.	Alkalinity as CaCO ₃	mg/lit	14.93	25.68	21.40
11.	Total Hardness as CaCO ₃	mg/lit	22.31	50.46	38.55
12.	Nitrate as NO ₃	mg/lit	5.61	11.84	8.92
13.	Phosphorous as PO ₄	mg/lit	0.18	0.51	0.35
14.	Chlorides as Cl ⁻	mg/lit	5.82	12.73	10.44
15.	Sulphates as SO ₄	mg/lit	1.02	4.12	3.63
16.	Sodium as Na	mg/lit	0.13	3.06	1.58
17.	Potassium as K	mg/lit	2.57	4.23	2.98
18.	Calcium as Ca	mg/lit	8.25	15.98	12.34
19.	Magnesium as Mg	mg/lit	0.41	2.55	1.87
20.	Lead as Pb	mg/lit	BDL	BDL	BDL
21.	Manganese as Mn	mg/lit	BDL	BDL	BDL
22.	Cadmium as Cd	mg/lit	BDL	BDL	BDL
23.	Chromium as Cr	mg/lit	BDL	BDL	BDL
24.	Copper as Cu	mg/lit	BDL	BDL	BDL
25.	Zinc as Zn	mg/lit	BDL	BDL	BDL
26.	Iron as Fe	mg/lit	0.01	0.35	0.19





27.	Fluorides as F ⁻	mg/lit	BDL	0.08	0.02
28.	Mercury as Hg	mg/lit	BDL	BDL	BDL
29.	Selenium as Se	mg/lit	BDL	BDL	BDL
30.	Arsenic as As	mg/lit	BDL	BDL	BDL
31.	Cyanide as CN	mg/lit	BDL	BDL	BDL
32.	Boron as B	mg/lit	BDL	BDL	BDL

Lab Chemist



Authorized Signatory

GROUND WATER QUALITY

Sr. No.	Parameter	Unit(s)	Chavanwadi Village	Durgamanwadi Village	Talegaon Village
1.	Odor	--	Un-objectionable	Un-objectionable	Un-objectionable
2.	Taste	--	Agreeable	Agreeable	Agreeable
3.	Color	Hazen	<5.00	<5.00	<5.00
4.	pH	--	7.52	7.61	7.78
5.	Turbidity	NTU	<5.00	<5.00	<5.00
6.	DO	mg/lit	4.72	4.35	4.53
7.	TDS	mg/lit	108.93	131.13	113.72
8.	TSS	mg/lit	3.20	6.25	4.67
9.	BOD:3 days at 27°C	mg/lit	2.05	4.26	3.78
10.	Alkalinity as CaCO ₃	mg/lit	14.93	25.68	21.40
11.	Total Hardness as CaCO ₃	mg/lit	22.31	50.46	38.55
12.	Nitrate as NO ₃	mg/lit	5.61	11.84	8.92
13.	Phosphorous as PO ₄	mg/lit	0.18	0.51	0.35
14.	Chlorides as Cl ⁻	mg/lit	5.82	12.73	10.44
15.	Sulphates as SO ₄	mg/lit	1.02	4.12	3.63
16.	Sodium as Na	mg/lit	0.13	3.06	1.58
17.	Potassium as K	mg/lit	2.57	4.23	2.98
18.	Calcium as Ca	mg/lit	8.25	15.98	12.34
19.	Magnesium as Mg	mg/lit	0.41	2.55	1.87
20.	Lead as Pb	mg/lit	BDL	BDL	BDL
21.	Manganese as Mn	mg/lit	BDL	BDL	BDL
22.	Cadmium as Cd	mg/lit	BDL	BDL	BDL
23.	Chromium as Cr	mg/lit	BDL	BDL	BDL
24.	Copper as Cu	mg/lit	BDL	BDL	BDL
25.	Zinc as Zn	mg/lit	BDL	BDL	BDL
26.	Iron as Fe	mg/lit	0.01	0.35	0.19
27.	Fluorides as F ⁻	mg/lit	BDL	0.08	0.02
28.	Mercury as Hg	mg/lit	BDL	BDL	BDL
29.	Selenium as Se	mg/lit	BDL	BDL	BDL
30.	Arsenic as As	mg/lit	BDL	BDL	BDL
31.	Cyanide as CN	mg/lit	BDL	BDL	BDL
32.	Boron as B	mg/lit	BDL	BDL	BDL

Note:

- mg/l: milligram per liter
- BDL: Below Desirable Limit

Remark:

All the parameters of the surface water samples collected from various sites are well below the desirable limit and maximum permissible limit as per IS: 10500 Standard for Drinking Water.

DRINKING WATER STANDERDS AS PER IS:10500

Sr. No.	Parameter	Unit	Desirable Limit	Maximum Permissible Limit
1	Odor		Un-objectionable	
2	Taste		Agreeable	
3	Colour	Hazen unit	5.00	25.00
4	pH		6.5-8.5	
5	Turbidity	NTU	5.00	10.00
6	Dissolved Oxygen	mg/l	---	
7	Total Dissolved Solids	mg/l	500.00	2000.00
8	Total Suspended Solids	mg/l	---	
9	BOD 3 at 27°C	mg/l	---	
10	Alkalinity as CaCO ₃	mg/l	200.00	600.00
11	Total Hardness as CaCO ₃	mg/l	300.00	600.00
12	Nitrates as NO ₃	mg/l	45.00	100.00
13	Phosphorus as PO ₄	mg/l	---	
14	Chlorides as Cl	mg/l	250.00	1000.00
15	Sulphates as SO ₄	mg/l	200.00	400.00
16	Sodium as Na	mg/l	---	
17	Potassium as K	mg/l	---	
18	Calcium as Ca	mg/l	75.00	200.00
19	Magnesium as Mg	mg/l	30.00	100.00
20	Lead (Pb)	mg/l	0.05	0.05
21	Manganese(Mn)	mg/l	0.10	0.30
22	Cadmium (Cd)	mg/l	0.01	0.01
23	Chromium(Cr)	mg/l	0.05	0.05
24	Copper (Cu)	mg/l	0.05	1.50
25	Zinc (Zn)	mg/l	5.00	15.00
26	Iron (Fe)	mg/l	0.30	1.00
27	Fluoride (F)	mg/l	1.00	1.50
28	Mercury (Hg)	mg/l	0.001	0.001
29	Selenium (Se)	mg/l	0.01	0.01
30	Arsenic (As)	mg/l	0.05	0.05
31	Cyanide (Cn)	mg/l	0.05	0.05
32	Boron (B)	mg/l	1.00	5.00

DOMESTIC EFFLUENT ANALYSIS

The only source of waste water on site was canteen effluent. All employees used to have two meals in the canteen according to their shifts. The said canteen has now been stopped since the workmen of the mines have been retrenched with effective from 1st August 2019 consequent to the stoppage of mines as per MoEF directives. Sample was not collected from outlet and analyzed as there is no domestic effluent due to closure of canteen.

SOIL QUALITY

The normal mineral composition of plants is affected by alteration in soil condition. It is essential to determine the potential of soil in the area and identify the impacts of mining activity on soil quality. So soil sample has been collected from different villages around the lease area during study period. In order to study the soil profile of the region, sampling locations were selected to assess the existing soil conditions around the project area representing various land use conditions.

The physico-chemical and heavy metal concentrations were determined. The soil sample was prepared in accordance with IS: 2720 (Part-I)-1983 for various tests. The sampling locations have been identified to determine the baseline soil characteristics of study area.

The present study on soil profile establishes the environmental characteristics and identifies the incremental concentrations if any, due to the mining activities. The sampling locations have been identified with the following objectives:

- To determine the soil characteristics of the study area
- To determine the impact of mining activity on soil characterization and
- To determine the impact on soils more importantly from agricultural productivity point of view.

SAMPLING DETAILS

A total of six locations were selected for analyzing the soil quality status in study area. The soil samples were collected from the selected areas. The samples have been analyzed for physico-chemical parameters and were given in the table.

SOIL QUALITY MONITORING LOCATIONS

Code	Name of Sampling Station
S-1	Restored Area
S-2	Non Mineralized Afforested Area
S-3	Float Area
S-4	Rice Plot Near Durgamanwadi Village
S-5	Jawar Plot Near Padsali Village
S-6	Forest Area Near Chavanwadi



SOIL QUALITY LOCATIONS

LEGEND

-  MINING LEASE
-  METAL ROAD
-  UNMETAL ROAD
-  WATER COURSES
-  FOREST AREA
-  SOIL LOCATIONS

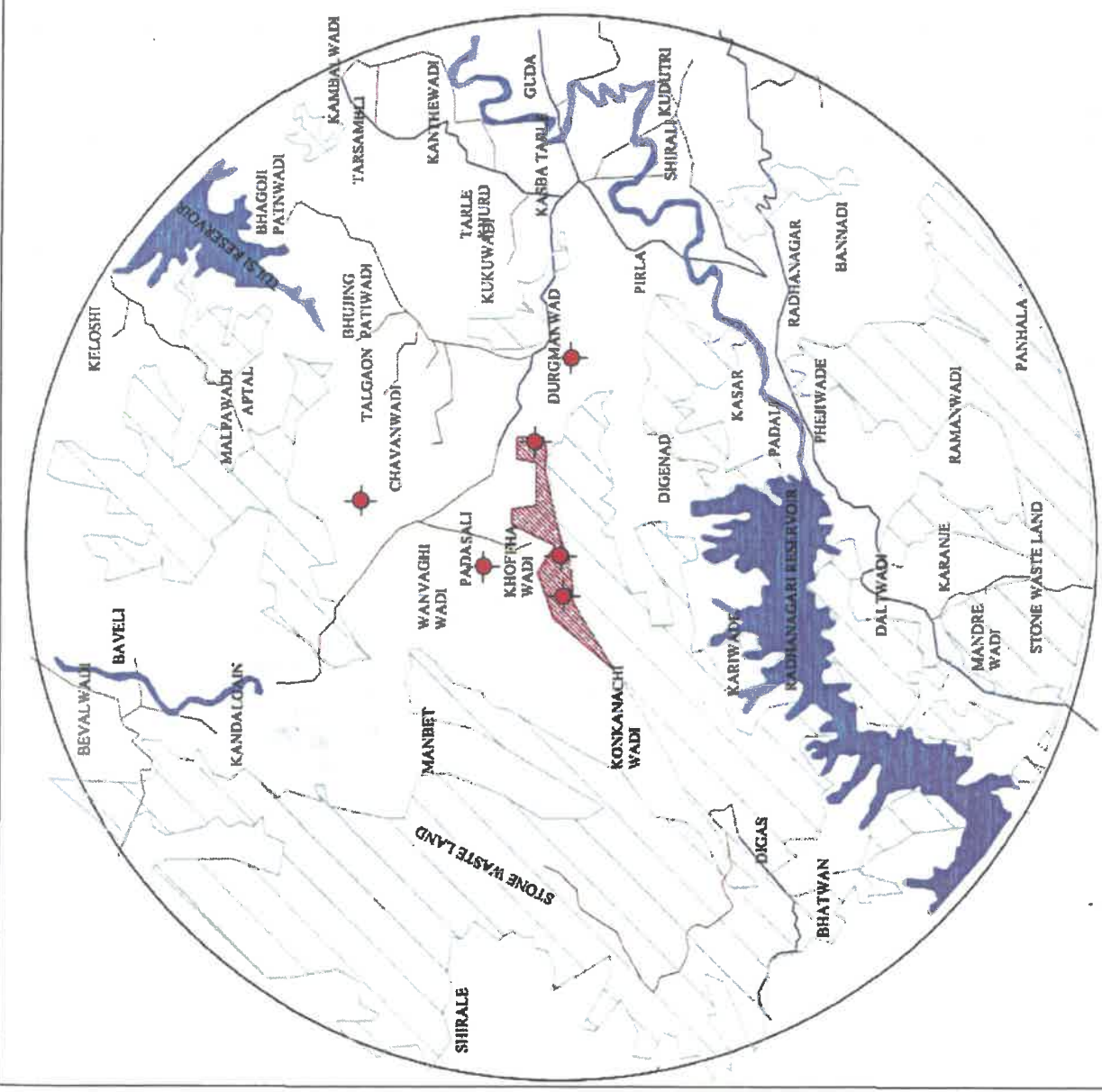


PROJECT : DURGAMANWADI

BAUXITE MINES

TITLE : SOIL LOCATIONS

PREPARED BY
EQUINOX ENVIRONMENTS INDIA PVT. LTD.
KOLHAPUR





Recognised by Ministry of Environment, Forest & Climate Change (MoEF) Govt. of India and ISO/IEC 17025:2005 (NABL), ISO 9001:2015 and OHSAS 18001:2007 Certified Company

TEST CERTIFICATE

Client Name:	Equinox Environments (I) Pvt. Ltd., Kolhapur, Maharashtra.	Report Number	GESEC/PRO/2019-20/12/430-435
Project Name and Address: M/s. Hindalco Industries Limited (Durgamanwadi Bauxite Mine) A/P. Durgamanwadi, Tahsil. Radhanagari, District. Kolhapur, State. Maharashtra.		Date of Report	13/12/2019
		Sample Details	Soil
		Date of Sampling	12/11/2019
		Date of Sample Received	23/12/2019
		Date of Start Analysis	23/12/2019
Sample Collected & Analyzed By :		Green EnviroSAFE Engineers & Consultant Pvt- Ltd, Pune, Maharashtra.	

Sr.No.	Test Parameters	Locations					
		S1- Restored Area	S2- Non mineralized a forestation area	S3- Float area	S4- Rice plot near Durgamanwadi Village	S5- Jawar plot near Padsali village	S6- Forest area near Chavanwadi
1	pH (1:5Aq. Extraction)	7.51	7.58	7.50	7.59	7.69	7.71
2	E.C. (µs)(1:5 Aq. Suspension)	1.35	1.36	1.32	2.88	2.43	1.19
3	Nitrates (mg/kg)	30.7	42.01	47.74	81.41	71.52	21.71
4	Available Phosphorus as P ₂ O ₅ (mg/kg)	4.52	4.52	6.42	45.45	29.55	18.66
5	Potassium as K ₂ O (mg/kg)	19.11	14.69	12.02	59.58	49.48	13.88
6	Available Sodium as Na ₂ O (mg/kg)	1.35	2.54	4.11	32.59	12.81	2.84
7	Ex. Calcium (mg/kg)	373.95	325.30	376.72	769.48	547.72	184.95
8	Ex. Magnesium (mg/kg)	118.05	167.68	104.48	356.97	295.21	222.38
9	Water Soluble Chlorides as Cl (mg/kg)	88.55	88	68.76	318.13	355.02	67.86
10	Organic Carbon (%)	0.41	1.82	0.33	2.02	1.83	1.11
11	Texture	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil
	a) Sand (%)	82.11	72.83	79.32	55.25	59.63	69.37
	b) Silt (%)	2.75	8.72	7.41	12.47	11.47	12.45
	c) Clay (%)	15.14	18.45	13.27	32.28	28.90	18.18
12	Total Soluble Salts (mg/kg)	901.64	911.56	885.58	1930.63	1628.14	798.39

[Signature]

Lab Chemist



[Signature]

Authorized Signatory

SOIL QUALITY

Sr. No.	Test Parameters	Locations					
		S-1 Restored Area	S-2 Non Mineralized Aforestation Area	S-3 Float Area	S-4 Rice Plot Near Durgama nwadi Village	S-5 Jawar Plot Near Padsali Village	S-6 Forest Area Near Chavanwadi
1	pH (1:5Aq. Extraction)	7.51	7.58	7.50	7.59	7.69	7.71
2	E.C. (μ s)(1:5 Aq. Suspension)	1.35	1.36	1.32	2.88	2.43	1.19
3	Nitrates (mg/kg)	30.7	42.01	47.74	81.41	71.52	21.71
4	Available Phosphorus as P_2O_5 (mg/kg)	4.52	4.52	6.42	45.45	29.55	18.66
5	Potassium as K_2O (mg/kg)	19.11	14.69	12.02	59.58	49.48	13.88
6	Available Sodium as Na_2O (mg/kg)	1.35	2.54	4.11	32.59	12.81	2.84
7	Ex. Calcium (mg/kg)	373.95	325.30	376.72	769.48	547.72	184.95
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9	Water Soluble Chlorides as Cl (mg/kg)	88.55	88	68.76	318.13	355.02	67.86
10	Organic Carbon (%)	0.41	1.82	0.33	2.02	1.83	1.11
11	Texture	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil	Sandy Soil
	a) Sand (%)	82.11	72.83	79.32	55.25	59.63	69.37
	b) Silt (%)	2.75	8.72	7.41	12.47	11.47	12.45
	c) Clay (%)	15.14	18.45	13.27	32.28	28.90	18.18
12	Total Soluble Salts (mg/kg)	901.64	911.56	885.58	1930.63	1628.14	798.39

DURGAMANWADI BAUXITE MINE

**TAHSIL: RADHANAGARI , DISTRICT: KOLHAPUR
STATE: MAHARASHTRA**

OF

M/s HINDALCO INDUSTRIES LTD.

ENVIRONMENTAL QUALITY MONITORING REPORT

SEASON - WINTER 2019-20

DECEMBER, JANUARY, FEBRUARY

PREPARED BY



EQUINOX ENVIRONMENTS (I) PVT. LTD.,

**ENVIRONMENTAL; CIVIL & CHEMICAL ENGINEERS, CONSULTANTS & ANALYSTS,
KOLHAPUR (MS)**

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An ISO 9001:2015 & QCI NABET ACCREDITED ORGANIZATION



2019 - 2020

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PREFACE

M/s. Hindalco Industries Limited entrusted environmental quality monitoring at **Durgmanwadi Bauxite Mine** situated Radhanagari Tahsil, Kolhapur District, Maharashtra to **Equinox Environments (India) Pvt. Ltd.** during winter season of the year 2019-20.

According to MoU dt. 1st September 2018, **The Equinox Environments (India) Pvt. Ltd.** has availed the various monitoring services by lab viz. **Green Envirosafe Engineers & Consultant Pvt. Ltd.** which is recognized and duly approved by the **Ministry of Environment, Forests & Climate Change (MoEFCC); New Delhi** (through Notification No. S.O. 1174 (E) dated 18.07.2007 as amended vide Notification No. S.O. 388 (E) dated 10.02.2017) and NABL (ISO/IEC 17025:2005 vide certificate number TC-8061 dated 03.11.2018) has also received certifications namely ISO 9001:2015 and OHSAS 18001: 2007 from Crescent Quality Certification Pvt. Ltd.

The environmental monitoring was carried out in core zone and buffer zone during the months of December–2019, January & February 2020. The data obtained was compiled to assess the current environmental status of the mining as well as the surrounding villages in the study area for the following environmental parameters.

- ❖ Micro-meteorology
- ❖ Ambient air quality
- ❖ Ambient noise level quality
- ❖ Water quality
- ❖ DG set Stack monitoring

Equinox Environments (India) Pvt. Ltd. gratefully acknowledges the cooperation extended by management and staff of **M/s. Hindalco Industries Limited** and village people to the field staff.

EXECUTIVE SUMMARY

Durgamanwadi Bauxite Mine of M/s. Hindalco Industries Limited includes the study of the ambient air quality, noise level quality and water in core zone and buffer zone in and around the mine lease area during the winter season of the year 2019-20.

AMBIENT AIR QUALITY

The scenario of the existing ambient air quality in the study region has been assessed through a network of selected ambient air quality locations. Pre-calibrated respirable dust and fine particulate sampler has been used for AAQ monitoring. Maximum, minimum, average and percentile values have been computed from the data collected at all individual sampling stations to represent the ambient air quality status.

AMBIENT NOISE LEVEL MONITORING

Mining and allied activities usually cause noise pollution. Excessive noise levels cause adverse effects on human beings and associated environment including domestic animals, wild life, natural ecosystem and structures. To know the ambient noise levels in the study area, noise levels were recorded at mining area and nearby villages using noise level meter.

WATER QUALITY MONITORING

Water quality monitoring consists of the study of surface and ground water sources and its quality in the core and buffer zone of the lease area. Assessment of water quality in the study area and in the mine area includes the quality assessment of parameters as per the Indian Standard IS:10500 (Drinking water standard). Water samples were collected from selected locations during study period and analyzed in the laboratory as per the standard IS & APHA Procedures.

MICROMETEOROLOGY

Meteorological scenario helps to understand the trends of the climatic factors. It also helps in the identification of sampling stations in the study area meteorological scenario exerts a critical influence on air quality as the pollution arises from the interaction of atmospheric contaminants with adverse meteorological conditions.

AREA DETAILS

INTRODUCTION

Hindalco Industries is one of the leading producers of aluminum in the country. The company business involves bauxite mining to alumina refining. Alumina to metal conversion, sheet, extrusion, foil manufacturing and is spread all over the country. The company is operating number of bauxite mines in Maharashtra, Orissa, Chhattisgarh and Jharkhand to feed the Alumina plants located in Belgaum, Renukut and Muri.

As per the directions of the Government of Maharashtra the mining plan was prepared for the entire lease area of 141.18 ha and the same was approved by the Indian Bureau of Mines vide letter no. RMP/MECH-02(MAH)/GOA/2017-18 DT.07/06/2019 on submission of approved mining plan Government of Maharashtra has sanctioned mining lease for the production of bauxite for the revenue land, The Environmental Clearance was obtained for the production of 0.864 million TPA of bauxite over the entire area. The mining lease was executed by the collector of Kolhapur over the area on 30/01/2017 and the lease expires on 31/03/2030.

MINE DETAIL

Durgmanwadi bauxite mine is located near Durgmanwadi village of Radhanagari Tahsil of Kolhapur District in Maharashtra state.

GEOGRAPHICAL DETAILS

Latitude: 16.0° 20.0'25.09"
Longitude: 73.0° 55.0'41.45"
MSL: 992 m

DETAILS OF LEASE AREA

The following table gives the details of the area in terms of District, Tahsil, Village, Gat No., etc.

District	Tahsil	Village	Gat No.	Area Granted (ha)
Kolhapur	Radhanagari	Durgamanwadi	120(p)	40.21
			123(p)	0.81
		Padsali	13(p)	9.51
			14	6.76
			15(p)	15.58
			16(p)	3.72
			18(p)	3.04
			38(p)	2.75
			39(p)	5.91
			40	18.66
			41(p)	11.65
			42	17.12
			36(p)	3.54
			43(p)	10.24
			45(p)	4.65
			188(p)	28.08
			Total	182.23

Note:

The mining activities at Durgamanwadi Bauxite Mine have been stopped since 17/03/2018 as per the directions and show cause notice dated 15/03/2018, bearing letter no. Z-11013/3/2018-IA-11(M) issued by Ministry of Environment Forest and Climate Change.

AREA DETAILS

DURGAMANWADI BAUXITE MINE (M/s. Hindalco Industries Limited)	
DETAILS	
State	Maharashtra
District	Kolhapur
Tahsil	Radhanagari
Village	Durgamanwadi
Latitude	16° 20'25.09"
Longitude	73°55'41.45"
Nature of the area	Hilly Area
Toposheet no.	47 H/15
GENERAL CLIMATIC CONDITIONS	
Maximum temperature	40.0°C
Minimum temperature	16.0°C
ACCESSIBILITY	
Road connectivity	Durgamanwadi Bauxite Mine is approachable from Radhanagari by tar road at a distance of 19 km.
Rail connectivity	Kolhapur railway station (55 km)
Airport	Kolhapur (55 km)
Sea port	Ratnagiri (180 km)
Biosphere reserve	Not any
Sanctuary	Extended Radhanagari Wildlife Sanctuary adjacent to lease area.

INDEX MAP

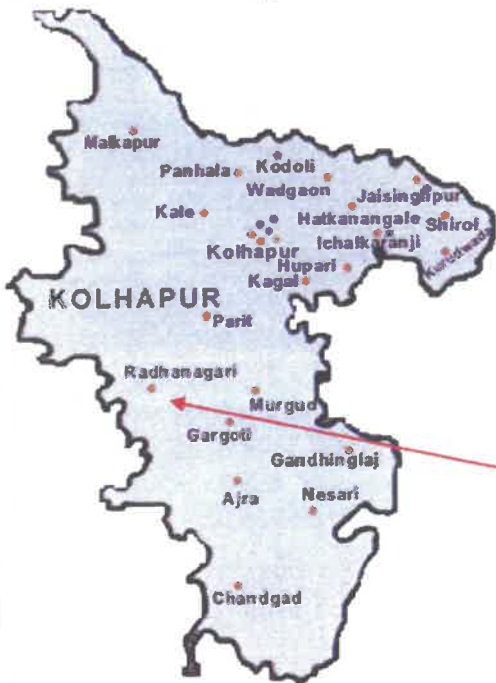


INDIA



MAHARASTRA

ARABIAN SEA



KOLHAPUR



(Mine Lease Area)

DURGMANWADI BAUXITE MINE

M/s Hindalco Industries Limited

NOT TO SCALE



KEY PLAN

LEGEND

- MINING LEASE
- METAL ROAD
- UNMETAL ROAD
- WATER COURSES
- FOREST AREA

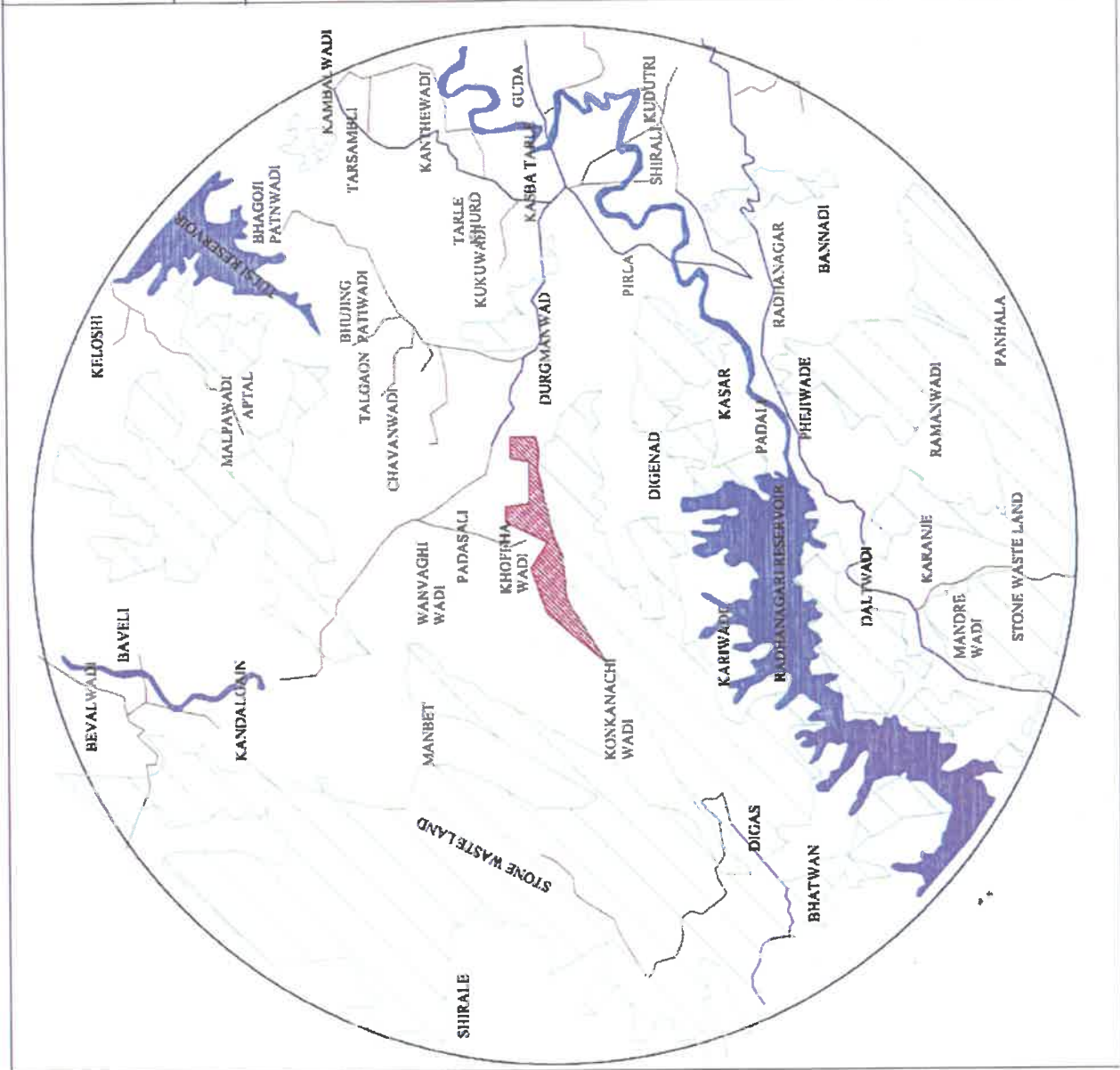


PROJECT : DURGAMANWADI

BAUXITE MINES

TITLE : KEY PLAN

PREPARED BY
EQUINOX ENVIRONMENTS INDIA PVT. LTD.
KOLHAPUR



MICRO-METEOROLOGY

Meteorological data within the project area during the air quality survey period was assessed.

PRIMARY / BASIC METEOROLOGICAL PARAMETERS

- Wind Speed (km/h)
- Wind Direction

Since the dispersion and diffusion of pollutants mainly depend on the above factors these factors are considered as primary meteorological parameters.

SECONDARY METEOROLOGICAL PARAMETERS

- Ambient Temperature
- Humidity

Meteorological Data December - 2019							
Date	Temperature/Humidity			Wind Speed Km/h			Wind Direction
	MIN	MAX	AVERAGE	MIN	MAX	AVERAGE	
02.12.2019	16	32	60	0	9	4.5	E, SE, W
03.12.2019	18	34	58	0	12	6.0	E, SE, W
09.12.2019	17	32	59	0	14	7.0	E, SE, W
10.12.2019	19	32	55	0	13	6.5	E, SE, W
16.12.2019	17	34	54	0	12	6.0	E, SE, W
17.12.2019	18	33	60	0	15	6.5	E, SE, W
23.12.2019	17	31	52	0	12	6.0	E, SE, W
24.12.2019	18	30	61	0	14	7.0	E, SE, W

Meteorological Data January - 2020							
Date	Temperature/Humidity			Wind Speed Km/h			Wind Direction
	MIN	MAX	AVERAGE	MIN	MAX	AVERAGE	
06.01.2020	18	34	58	0	8	4.0	E,W,SE
07.01.2020	17	33	56	0	12	6.0	E,W,SE
13.01.2020	19	32	55	0	8	4.0	E,W,SE
14.01.2020	18	34	59	0	9	4.5	E,W,SE
20.01.2020	19	32	54	0	13	6.5	E,W,SE
21.01.2020	17	34	58	0	15	7.5	E,W,SE
27.01.2020	18	33	60	0	13	6.5	E,W,SE
28.01.2020	18	32	62	0	12	6.0	E,W,SE

Meteorological Data February - 2020							
Date	Temperature/Humidity			Wind Speed Km/h			Wind Direction
	MIN	MAX	AVERAGE	MIN	MAX	AVERAGE	
03.02.2020	17	34	55	0	9	4.5	W,E,NW
04.02.2020	18	32	62	0	12	6.0	W,E,NW
10.02.2020	19	33	57	0	13	6.5	W,E,NW
11.02.2020	17	34	56	0	12	6.0	W,E,NW
17.02.2020	18	32	58	0	10	5.0	W,E,NW
18.02.2020	19	31	55	0	12	6.0	W,E,NW
24.02.2020	17	32	54	0	9	4.5	W,E,NW
25.02.2020	18	33	58	0	13	6.5	W,E,NW

ENVIRONMENTAL QUALITY

Environmental quality monitoring at Durgamanwadi Bauxite Mine of M/s. Hindalco Industries Limited at Durgamanwadi village of Radhanagari Tahsil, Kolhapur district, Maharashtra includes monitoring of various environmental components like air, noise, water and soil quality status within core zone and buffer zone in and around the mine lease area.

AMBIENT AIR QUALITY

The main aim of the ambient air quality monitoring within core zone and buffer zone was to assess the environmental condition and to know the existing levels of the air pollution in the project area. Air pollution forms an important and critical factor to study the environmental issues in the mining areas. Thus, air quality has to be frequently monitored to know the extent of pollution due to mining and allied activities. Ambient air quality monitoring stations were set up at eight selected locations, 4 in core zone and 4 in buffer zone.

SELECTION OF SAMPLING LOCATIONS

The status of the ambient air quality has been assessed through ambient air quality-monitoring network. The design of monitoring network in the air quality surveillance program has been based on the following considerations:

- Meteorological conditions on synoptic scale
- Topography of the study area
- Representatives of regional background air quality for obtaining

Ambient air quality monitoring stations were set up at 8 locations, 3 in core zone and 5 in buffer zone with due considerations to the above mentioned points.

INSTRUMENT USED FOR SAMPLING

Ambient Fine Dust Sampler was used for monitoring particulate matter (PM₁₀), particulate matter (PM_{2.5}) and other gaseous pollutants.

Sr. No.	Instrument Name	Ambient Fine Dust Sampler
1.	Model No.	IPM-FDS-M 2.5 μ /10 μ Fine Dust Sampler
2.	Serial No.	FDSM/2018-19/368-1
3.	Calibration Details	From 02/08/2019 To 02/07/2020
4.	Calibration Certificate No.	IPM-FDS/18-19/368-1

METHOD FOR TESTING PM₁₀/ PM_{2.5}

Sr. No.	Content	Details
1.	Name of Pollutant	PM ₁₀ / PM _{2.5}
2.	Medium	Air
3.	Instrument	Respirable Dust Sampler /Fine Particulate Sampler
4.	Duration	24 hourly
5.	Mode	Continuous
6.	Unit	$\mu\text{g}/\text{m}^3$
7.	Method	Gravimetric

METHOD FOR TESTING

Sr. No.	Name of Pollutant	Sulphur Dioxide	Oxides of Nitrogen	Carbon monoxide
1.	Method	Modified West & Geake Method	Modified Jacob & Hochheiser Modified (Na-Arsenite) Method	NDIR Method
2.	Frequency	24 hourly	24 hourly	24 hourly
3.	Mode	Continuous	Continuous	Continuous
4.	Unit	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	mg/m^3
5.	Procedure	AS Per IS 5182 (Part II)	AS Per IS 5182 (Part IV)	NDIR Method

MONITORING LOCATION DETAILS

Respirable dust sampler and Fine particulate sampler were placed at a height of 3 m above the ground level in above mentioned monitoring locations. These stations were selected so as to assess present pollution level. The observed levels of PM₁₀, PM_{2.5}, SO₂, NO_x, CO collected during winter season of the year 2019-20 are presented in annexure and are summarized in the following table.







AMBIENT AIR QUALITY MONITORING STATION

Sr. No.	Station Code	Name of the Sampling Station	Direction w.r.t. Mines Lease Area
1	A-1	Near Weigh Bridge/DG Set	---
2	A-2	Near Mines Office	---
3	A-3	Near Haulage Road	---
4	A-4	Manbet Village	NW
5	A-5	Padsali Village	N
6	A-6	Durgamanwadi Village	E
7	A-7	Kariwade Village	SW
8	A-8	Chavanwadi Village	NE



AMBIENT AIR QUALITY LOCATIONS

LEGEND

-  MINING LEASE
-  METAL ROAD
-  UNMETAL ROAD
-  WATER COURSES
-  FOREST AREA
-  AAQ LOCATIONS

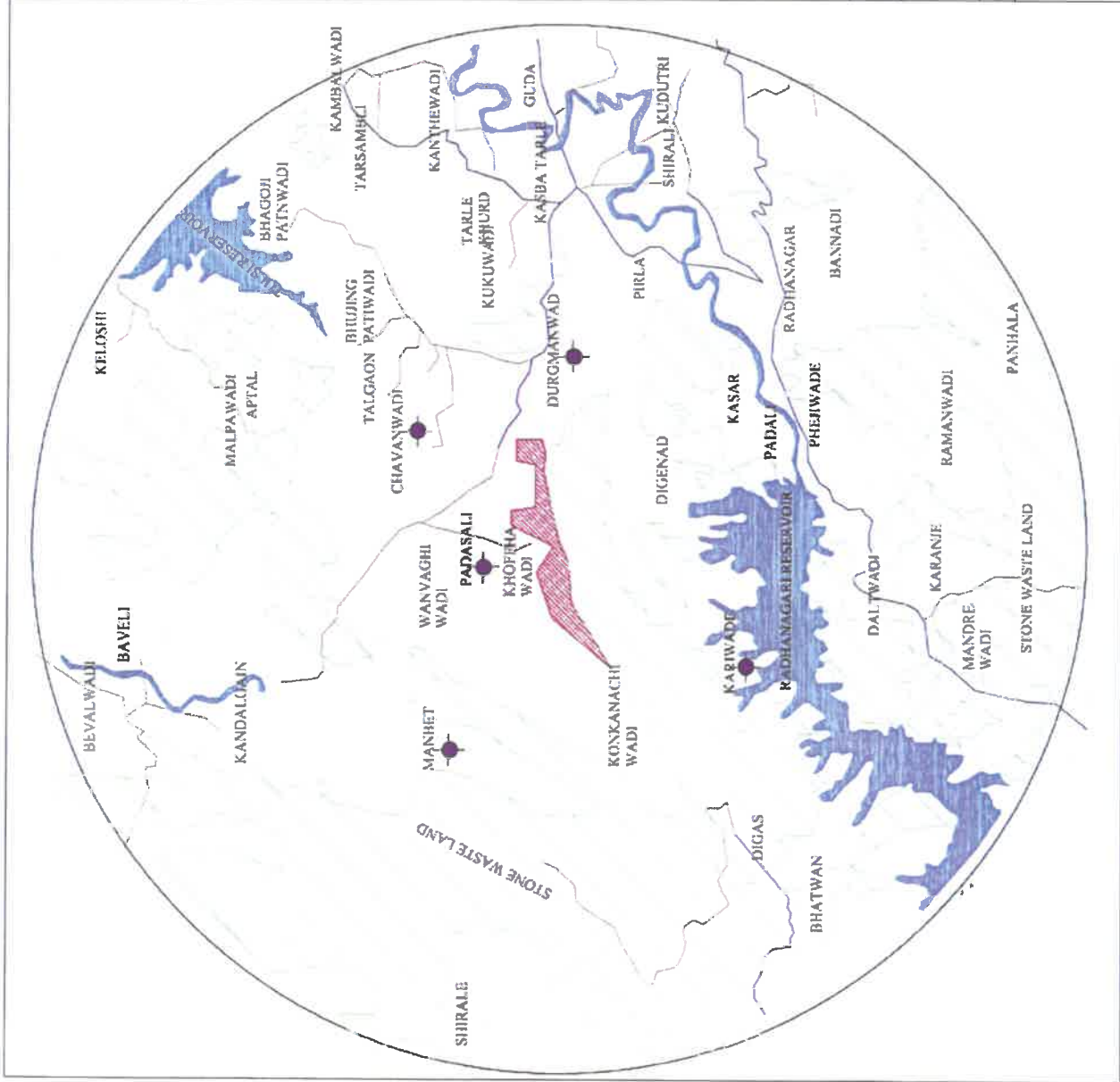


PROJECT : DURGAMANWADI

BAUXITE MINES

TITLE : AAQ LOCATIONS

**PREPARED BY
EQUINOX ENVIRONMENTS INDIA PVT. LTD.
KOLHAPUR**





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Ambient Air Quality Monitoring Report

Report No-	GESEC/PRO/2019-20/03/438-361	Date of Report	13/03/2020
Name of Client	Equinox Environments (I) Pvt- Ltd-, Kolhapur, Maharashtra		
Project Name & Address	M/s. Hindalco Industries Limited (Durgamanwadi Bauxite Mine) A/P. Durgamanwadi, Tahsil. Radhanagari, District. Kolhapur, State. Maharashtra.		
Sample Collected and Analyzed by	Green EnviroSAFE Engineers & Consultant Pvt- Ltd, Pune, Maharashtra		
Name Of Instrument & Calibration Details	Make	Date of calibration	Calibration Due Date
Ambient Fine Dust	Instrumex	13/04/2019	12/04/2020
Calibration Certificate No- TECH/CAL/2019/AP/9			

NAME OF LOCATION- Station: A1, Near Weigh Bridge/DG Set

Sampling Date	Date of Sample Registration	Parameter	PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO _x µg/m ³	CO mg/m ³
		Limit	100 (µg/m ³)	60 (µg/m ³)	80 (µg/m ³)	80 (µg/m ³)	04 (mg/m ³)
Analysis Method			IS: 5181 (Part-23) 2006	IS: 5181 (Part-23) 2006	Modified West & Gaeke Method	Jacob & Hocheiser's Method	NDIR Method

December - 2019

02.12.2019	04.12.2019	Week-1	46.8	15.4	11.5	16.1	0.06
03.12.2019	04.12.2019	Week-1	48.5	16.0	10.8	14.8	0.04
09.12.2019	11.12.2019	Week-2	45.8	14.8	11.4	16.7	0.03
10.12.2019	11.12.2019	Week-2	48.1	14.8	12.2	15.0	0.04
16.12.2019	18.12.2019	Week-3	50.2	16.3	13.4	14.6	0.06
17.12.2019	18.12.2019	Week-3	46.7	13.5	10.3	14.5	0.07
23.12.2019	25.12.2019	Week-4	48.5	14.6	10.6	16.4	0.04
24.12.2019	25.12.2019	Week-4	50.4	15.5	11.5	13.9	0.05

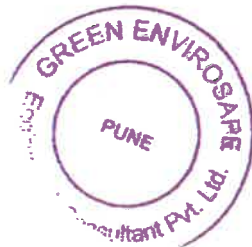
January - 2020

06.01.2020	08.01.2020	Week-2	48.2	15.6	13.4	14.6	0.05
07.01.2020	08.01.2020	Week-2	46.8	16.4	12.3	15.7	0.06
13.01.2020	15.01.2020	Week-3	49.7	14.8	12.3	15.1	0.08
14.01.2020	15.01.2020	Week-3	48.4	14.4	10.5	13.8	0.04
20.01.2020	22.01.2020	Week-4	46.4	16.0	12.7	14.3	0.06
21.01.2020	22.01.2020	Week-4	47.2	13.5	13.0	13.5	0.03
27.01.2020	29.01.2020	Week-5	48.4	15.9	14.4	13.5	0.02
28.01.2020	29.01.2020	Week-5	46.2	16.7	11.5	14.6	0.07

February - 2020

03.02.2020	05.02.2020	Week-1	46.7	16.6	11.6	15.8	0.07
04.02.2020	05.02.2020	Week-1	57.5	14.8	13.3	16.1	0.05
10.02.2020	12.02.2020	Week-2	50.3	16.1	12.5	14.5	0.04
11.02.2020	12.02.2020	Week-2	46.3	15.7	11.5	12.7	0.06
17.02.2020	19.02.2020	Week-3	47.5	16.6	13.1	15.5	0.08
18.02.2020	19.02.2020	Week-3	45.6	17.4	10.4	13.6	0.07
24.02.2020	26.02.2020	Week-4	46.8	14.5	11.6	14.9	0.07
25.02.2020	26.02.2020	Week-4	46.3	15.9	13.3	15.3	0.06

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**GREEN ENVIROSAFE**

Engineers & Consultant Pvt Ltd.

Survey No-1405/06, Mayuri Residency, Shop No-16, 2nd Floor, Sanaswadi, Tal-Shirur, Pune-41220.

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CIN No. : U74900PN2013PTC149666

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Ambient Air Quality Monitoring Report

Report No-	GESEC/PRO/2019-20/03/462-685	Date of Report	13/03/2020
Name of Client	Equinox Environments (I) Pvt- Ltd-, Kolhapur, Maharashtra		
Project Name & Address	M/s. Hindalco Industries Limited (Durgamanwadi Bauxite Mine) A/P. Durgamanwadi, Tahsil. Radhanagari, District. Kolhapur, State. Maharashtra.		
Sample Collected and Analyzed by	Green EnviroSafe Engineers & Consultant Pvt- Ltd, Pune, Maharashtra-		

Name Of Instrument& Calibration Details	Make	Date of calibration	Calibration Due Date	Calibration Certificate No-
Ambient Fine Dust	Instrumex	13/04/2019	12/04/2020	TECH/CAL/2019/AP/9

NAME OF LOCATION- Station: A2, Near Mines Office

Sampling Date	Date of Sample Registration	Parameter	PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO _x µg/m ³	CO mg/m ³
		Limit	100 (µg/m ³)	60 (µg/m ³)	80 (µg/m ³)	80 (µg/m ³)	04 (mg/m ³)
Analysis Method			IS: 5181 (Part-23) 2006	IS: 5181 (Part-23) 2006	Modified West & Gaeke Method	Jacob & Hocheiser's Method	NDIR Method

December - 2019

02.12.2019	04.12.2019	Week-1	46.8	14.6	09.5	15.8	0.08
03.12.2019	04.12.2019	Week-1	48.1	15.8	11.2	16.1	0.06
09.12.2019	11.12.2019	Week-2	47.5	13.5	12.5	14.6	0.05
10.12.2019	11.12.2019	Week-2	50.1	16.4	13.1	14.4	0.04
16.12.2019	18.12.2019	Week-3	46.5	16.7	11.4	13.8	0.06
17.12.2019	18.12.2019	Week-3	46.6	14.6	12.1	16.5	0.04
23.12.2019	25.12.2019	Week-4	47.3	15.8	12.4	14.3	0.08
24.12.2019	25.12.2019	Week-4	50.6	14.0	11.6	13.7	0.07

January - 2020

06.01.2020	08.01.2020	Week-2	50.4	17.1	11.3	13.8	0.08
07.01.2020	08.01.2020	Week-2	47.3	13.6	13.2	13.3	0.06
13.01.2020	15.01.2020	Week-3	46.5	15.7	10.4	12.4	0.05
14.01.2020	15.01.2020	Week-3	45.9	14.3	10.9	16.6	0.04
20.01.2020	22.01.2020	Week-4	46.8	15.0	11.4	15.1	0.03
21.01.2020	22.01.2020	Week-4	48.4	13.8	10.2	14.3	0.06
27.01.2020	29.01.2020	Week-5	46.5	15.5	11.3	14.5	0.07
28.01.2020	29.01.2020	Week-5	48.5	16.6	12.6	15.7	0.05

February - 2020

03.02.2020	05.02.2020	Week-1	45.4	14.7	11.0	15.1	0.08
04.02.2020	05.02.2020	Week-1	48.2	15.9	13.2	14.5	0.06
10.02.2020	12.02.2020	Week-2	50.2	16.5	12.4	12.7	0.07
11.02.2020	12.02.2020	Week-2	47.6	13.8	10.0	13.9	0.06
17.02.2020	19.02.2020	Week-3	46.4	15.5	11.2	13.7	0.06
18.02.2020	19.02.2020	Week-3	48.5	14.4	12.4	15.8	0.09
24.02.2020	26.02.2020	Week-4	47.3	15.4	11.8	16.0	0.06
25.02.2020	26.02.2020	Week-4	46.9	16.1	12.5	13.6	0.05

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Ambient Air Quality Monitoring Report

Report No-	GESEC/PRO/2019-20/03/486-509	Date of Report	13/03/2020
Name of Client	Equinox Environments (I) Pvt- Ltd-, Kolhapur, Maharashtra		
Project Name & Address	M/s. Hindalco Industries Limited (Durgamanwadi Bauxite Mine) A/P. Durgamanwadi, Tahsil. Radhanagari, District. Kolhapur, State. Maharashtra.		
Sample Collected and Analyzed by	Green EnviroSafe Engineers & Consultant Pvt- Ltd, Pune, Maharashtra-		

Name Of Instrument & Calibration Details	Make	Date of calibration	Calibration Due Date	Calibration Certificate No-
Ambient Fine Dust	Instrumex	13/04/2019	12/04/2020	TECH/CAL/2019/AP/9

NAME OF LOCATION- Station: A3, Near Haulage Road

Sampling Date	Date of Sample Registration	Parameter	PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO _x µg/m ³	CO mg/m ³
		Limit	100 (µg/m ³)	60 (µg/m ³)	80 (µg/m ³)	80 (µg/m ³)	04 (mg/m ³)
Analysis Method			IS: 5181 (Part-23) 2006	IS: 5181 (Part-23) 2006	Modified West & Gaeke Method	Jacob & Hocheiser's Method	NDIR Method

December - 2019

02.12.2019	04.12.2019	Week-1	46.8	15.8	12.4	15.6	0.06
03.12.2019	04.12.2019	Week-1	50.1	14.6	14.1	17.3	0.07
09.12.2019	11.12.2019	Week-2	47.3	16.1	15.3	16.7	0.07
10.12.2019	11.12.2019	Week-2	46.6	17.5	13.5	18.1	0.08
16.12.2019	18.12.2019	Week-3	45.7	14.3	11.8	17.5	0.05
17.12.2019	18.12.2019	Week-3	49.8	14.5	14.0	16.4	0.07
23.12.2019	25.12.2019	Week-4	45.6	15.4	13.1	15.4	0.06
24.12.2019	25.12.2019	Week-4	47.1	16.4	13.5	16.2	0.05

January - 2020

06.01.2020	08.01.2020	Week-2	49.4	15.2	11.4	15.2	0.05
07.01.2020	08.01.2020	Week-2	51.4	13.8	14.2	14.8	0.08
13.01.2020	15.01.2020	Week-3	52.0	16.4	10.5	14.6	0.07
14.01.2020	15.01.2020	Week-3	50.3	14.5	11.3	13.5	0.06
20.01.2020	22.01.2020	Week-4	48.1	15.7	10.8	14.5	0.04
21.01.2020	22.01.2020	Week-4	49.4	16.5	12.2	13.4	0.06
27.01.2020	29.01.2020	Week-5	51.2	14.7	11.1	13.6	0.08
28.01.2020	29.01.2020	Week-5	49.4	13.8	13.3	15.4	0.04

February - 2020

03.02.2020	05.02.2020	Week-1	47.2	17.7	13.3	13.8	0.05
04.02.2020	05.02.2020	Week-1	48.2	18.1	10.6	15.5	0.07
10.02.2020	12.02.2020	Week-2	46.5	14.6	11.2	13.5	0.08
11.02.2020	12.02.2020	Week-2	47.1	14.8	12.4	15.7	0.07
17.02.2020	19.02.2020	Week-3	49.3	15.4	11.3	16.2	0.08
18.02.2020	19.02.2020	Week-3	48.5	16.9	10.4	14.3	0.06
24.02.2020	26.02.2020	Week-4	44.3	15.4	11.2	12.5	0.04
25.02.2020	26.02.2020	Week-4	47.8	14.3	10.7	13.2	0.08

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Ambient Air Quality Monitoring Report

Report No-	GESEC/PRO/2019-20/03/510-533	Date of Report	13/03/2020
Name of Client	Equinox Environments (I) Pvt- Ltd-, Kolhapur, Maharashtra		
Project Name & Address	M/s. Hindalco Industries Limited (Durgamanwadi Bauxite Mine) A/P. Durgamanwadi, Tahsil. Radhanagari, District. Kolhapur, State. Maharashtra.		
Sample Collected and Analyzed by	Green EnviroSAFE Engineers & Consultant Pvt- Ltd, Pune, Maharashtra-		
Name Of Instrument & Calibration Details	Make	Date of calibration	Calibration Due Date
Ambient Fine Dust	Instrumex	13/04/2019	12/04/2020
			TECH/CAL/2019/AP/9

NAME OF LOCATION- Station: A4, Manbet Village

Sampling Date	Date of Sample Registration	Parameter	PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO _x µg/m ³	CO mg/m ³
		Limit	100 (µg/m ³)	60 (µg/m ³)	80 (µg/m ³)	80 (µg/m ³)	04 (mg/m ³)
Analysis Method			IS: 5181 (Part-23) 2006	IS: 5181 (Part-23) 2006	Modified West & Gaeke Method	Jacob & Hocheiser's Method	NDIR Method

December - 2019

04.12.2019	06.12.2019	Week-1	46.7	15.6	10.3	13.5	0.07
05.12.2019	06.12.2019	Week-1	47.2	16.4	09.6	14.7	0.06
11.12.2019	13.12.2019	Week-2	48.3	14.5	11.5	15.4	0.08
12.12.2019	13.12.2019	Week-2	44.8	16.5	12.4	13.8	0.06
18.12.2019	20.12.2019	Week-3	45.5	14.6	13.1	15.4	0.05
19.12.2019	20.12.2019	Week-3	48.1	16.0	11.8	14.0	0.08
25.12.2019	27.12.2019	Week-4	50.1	16.1	10.3	13.3	0.03
26.12.2019	27.12.2019	Week-4	47.5	14.7	11.2	12.6	0.04

January - 2020

08.01.2020	10.01.2020	Week-2	46.4	14.3	12.5	15.3	0.07
09.01.2020	10.01.2020	Week-2	46.3	16.5	13.1	14.6	0.08
15.01.2020	17.01.2020	Week-3	44.1	12.8	11.6	13.8	0.06
16.01.2020	17.01.2020	Week-3	48.4	16.2	11.2	14.4	0.05
22.01.2020	24.01.2020	Week-4	49.5	16.5	10.5	13.5	0.06
23.01.2020	24.01.2020	Week-4	47.5	15.7	12.3	14.4	0.08
29.01.2020	31.01.2020	Week-5	46.6	15.6	10.8	13.8	0.09
30.01.2020	31.01.2020	Week-5	50.4	13.8	10.2	15.1	0.04

February - 2020

05.02.2020	07.02.2020	Week-1	48.1	15.8	11.6	13.5	0.06
06.02.2020	07.02.2020	Week-1	47.3	16.4	12.3	12.5	0.04
12.02.2020	14.02.2020	Week-2	46.5	14.6	10.4	14.6	0.06
13.02.2020	14.02.2020	Week-2	45.1	15.4	12.4	15.5	0.07
19.02.2020	21.02.2020	Week-3	50.3	14.8	10.8	13.7	0.08
20.02.2020	21.02.2020	Week-3	46.5	15.5	11.7	14.4	0.06
26.02.2020	28.02.2020	Week-4	47.2	16.1	10.9	13.9	0.05
27.02.2020	28.02.2020	Week-4	46.4	14.4	10.5	15.0	0.04

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Ambient Air Quality Monitoring Report

Report No-	GESEC/PRO/2019-20/03/534-557	Date of Report	13/03/2020
Name of Client	Equinox Environments (I) Pvt- Ltd-, Kolhapur, Maharashtra		
Project Name & Address	M/s. Hindalco Industries Limited (Durgamanwadi Bauxite Mine) A/P. Durgamanwadi, Tahsil. Radhanagari, District. Kolhapur, State. Maharashtra.		
Sample Collected and Analyzed by	Green EnviroSAFE Engineers & Consultant Pvt- Ltd, Pune, Maharashtra-		
Name Of Instrument & Calibration Details	Make	Date of calibration	Calibration Due Date
Ambient Fine Dust	Instrumex	13/04/2019	12/04/2020
Calibration Certificate No- TECH/CAL/2019/AP/9			

NAME OF LOCATION- Station: A 5, Padsali Village

Sampling Date	Date of Sample Registration	Parameter	PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO _x µg/m ³	CO mg/m ³
		Limit	100 (µg/m ³)	60 (µg/m ³)	80 (µg/m ³)	80 (µg/m ³)	04 (mg/m ³)
Analysis Method			IS: 5181 (Part-23) 2006	IS: 5181 (Part-23) 2006	Modified West & Gaeke Method	Jacob & Hocheiser's Method	NDIR Method
December - 2019							
04.12.2019	06.12.2019	Week-1	38.2	10.4	08.3	10.8	0.04
05.12.2019	06.12.2019	Week-1	40.0	12.2	11.1	11.5	0.06
11.12.2019	13.12.2019	Week-2	38.5	10.8	07.7	10.6	0.03
12.12.2019	13.12.2019	Week-2	39.1	11.6	08.9	11.0	0.05
18.12.2019	20.12.2019	Week-3	37.9	09.5	09.5	10.4	0.04
19.12.2019	20.12.2019	Week-3	39.7	10.7	08.9	10.2	0.03
25.12.2019	27.12.2019	Week-4	38.2	11.3	10.2	11.5	0.04
26.12.2019	27.12.2019	Week-4	39.6	12.4	07.7	10.3	0.03
January - 2020							
08.01.2020	10.01.2020	Week-2	38.8	10.8	09.2	10.3	0.03
09.01.2020	10.01.2020	Week-2	40.5	11.1	11.8	11.8	0.05
15.01.2020	17.01.2020	Week-3	39.7	08.6	08.7	11.2	0.04
16.01.2020	17.01.2020	Week-3	38.3	10.5	10.4	12.5	0.06
22.01.2020	24.01.2020	Week-4	39.6	12.1	07.4	11.4	0.02
23.01.2020	24.01.2020	Week-4	40.3	11.7	07.9	10.5	0.07
29.01.2020	31.01.2020	Week-5	39.4	10.9	10.2	10.1	0.02
30.01.2020	31.01.2020	Week-5	38.1	10.4	07.7	10.4	0.03
February - 2020							
05.02.2020	07.02.2020	Week-1	38.3	09.7	07.6	12.4	0.03
06.02.2020	07.02.2020	Week-1	37.1	08.4	09.3	11.8	0.05
12.02.2020	14.02.2020	Week-2	39.9	11.3	10.5	11.3	0.05
13.02.2020	14.02.2020	Week-2	40.5	10.7	08.7	11.7	0.06
19.02.2020	21.02.2020	Week-3	37.7	09.9	07.4	11.0	0.03
20.02.2020	21.02.2020	Week-3	39.6	11.7	09.6	12.6	0.01
26.02.2020	28.02.2020	Week-4	40.4	10.5	10.0	11.5	0.02
27.02.2020	28.02.2020	Week-4	38.8	12.2	08.6	10.6	0.06

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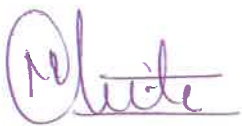
Ambient Air Quality Monitoring Report

Report No-	GESEC/PRO/2019-20/03/558-581	Date of Report	13/03/2020
Name of Client	Equinox Environments (I) Pvt- Ltd-, Kolhapur, Maharashtra		
Project Name & Address	M/s. Hindalco Industries Limited (Durgamanwadi Bauxite Mine) A/P. Durgamanwadi, Tahsil. Radhanagari, District. Kolhapur, State. Maharashtra.		
Sample Collected and Analyzed by	Green Envirosafe Engineers & Consultant Pvt- Ltd, Pune, Maharashtra-		

Name Of Instrument & Calibration Details	Make	Date of calibration	Calibration Due Date	Calibration Certificate No-
Ambient Fine Dust	Instrumex	13/04/2019	12/04/2020	TECH/CAL/2019/AP/9

NAME OF LOCATION- Station: A6, Durgamanwadi Village

Sampling Date	Date of Sample Registration	Parameter	PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO _x µg/m ³	CO mg/m ³
Limit			100 (µg/m ³)	60 (µg/m ³)	80 (µg/m ³)	80 (µg/m ³)	04 (mg/m ³)
Analysis Method			IS: 5181 (Part-23) 2006	IS: 5181 (Part-23) 2006	Modified West & Gaeke Method	Jacob & Hocheiser's Method	NDIR Method
December - 2019							
04.12.2019	06.12.2019	Week-1	39.4	13.0	07.0	10.9	0.04
05.12.2019	06.12.2019	Week-1	38.7	10.5	06.8	11.3	0.03
11.12.2019	13.12.2019	Week-2	28.8	11.7	07.5	10.6	0.05
12.12.2019	13.12.2019	Week-2	40.3	10.9	09.9	11.8	0.06
18.12.2019	20.12.2019	Week-3	37.2	09.8	10.6	10.2	0.04
19.12.2019	20.12.2019	Week-3	36.5	13.1	08.0	10.0	0.03
25.12.2019	27.12.2019	Week-4	37.1	12.5	07.5	10.5	0.04
26.12.2019	27.12.2019	Week-4	39.5	11.8	06.9	10.5	0.06
January - 2020							
08.01.2020	10.01.2020	Week-2	38.7	10.0	06.4	10.5	0.04
09.01.2020	10.01.2020	Week-2	40.1	09.5	07.9	10.8	0.06
15.01.2020	17.01.2020	Week-3	39.3	10.2	10.9	12.0	0.01
16.01.2020	17.01.2020	Week-3	38.8	10.8	08.7	10.4	0.02
22.01.2020	24.01.2020	Week-4	40.5	11.7	07.1	11.7	0.05
23.01.2020	24.01.2020	Week-4	38.8	09.0	09.5	10.6	0.07
29.01.2020	31.01.2020	Week-5	39.3	10.7	08.9	11.4	0.03
30.01.2020	31.01.2020	Week-5	37.8	09.9	09.0	10.4	0.04
February - 2020							
05.02.2020	07.02.2020	Week-1	38.2	08.8	08.2	10.9	0.03
06.02.2020	07.02.2020	Week-1	39.4	10.3	09.5	10.5	0.05
12.02.2020	14.02.2020	Week-2	38.8	11.2	09.0	10.6	0.04
13.02.2020	14.02.2020	Week-2	39.5	10.7	07.7	11.8	0.07
19.02.2020	21.02.2020	Week-3	38.9	09.5	06.1	10.2	0.02
20.02.2020	21.02.2020	Week-3	39.1	10.4	08.5	11.0	0.01
26.02.2020	28.02.2020	Week-4	40.3	11.0	09.6	10.0	0.06
27.02.2020	28.02.2020	Week-4	39.9	10.5	08.0	10.1	0.08



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Ambient Air Quality Monitoring Report

Report No-	GESEC/PRO/2019-20/03/582-605	Date of Report	13/03/2020
Name of Client	Equinox Environments (I) Pvt- Ltd-, Kolhapur, Maharashtra		
Project Name & Address	M/s. Hindalco Industries Limited (Durgamanwadi Bauxite Mine) A/P. Durgamanwadi, Tahsil. Radhanagari, District. Kolhapur, State. Maharashtra.		
Sample Collected and Analyzed by	Green EnviroSAFE Engineers & Consultant Pvt- Ltd, Pune, Maharashtra-		

Name Of Instrument& Calibration Details	Make	Date of calibration	Calibration Due Date	Calibration Certificate No-
Ambient Fine Dust	Instrumex	13/04/2019	12/04/2020	TECH/CAL/2019/AP/9

NAME OF LOCATION- Station: A7, Kariwade Village

Sampling Date	Date of Sample Registration	Parameter	PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO _x µg/m ³	CO mg/m ³
		Limit	100 (µg/m ³)	60 (µg/m ³)	80 (µg/m ³)	80 (µg/m ³)	04 (mg/m ³)
Analysis Method			IS: 5181 (Part-23) 2006	IS: 5181 (Part-23) 2006	Modified West & Gaeke Method	Jacob & Hocheiser's Method	NDIR Method
December - 2019							
06.12.2019	09.12.2019	Week-1	39.1	09.7	08.1	11.2	0.03
07.12.2019	09.12.2019	Week-1	40.5	10.3	09.7	10.5	0.02
13.12.2019	16.12.2019	Week-2	37.7	11.0	07.7	11.4	0.01
14.12.2019	16.12.2019	Week-2	39.8	09.5	09.1	11.3	0.05
20.12.2019	23.12.2019	Week-3	40.3	09.9	08.5	10.7	0.02
21.12.2019	23.12.2019	Week-3	38.9	09.5	08.4	12.4	0.07
27.12.2019	30.12.2019	Week-4	39.6	10.9	09.3	10.3	0.05
28.12.2019	30.12.2019	Week-4	38.7	10.1	07.5	11.5	0.09
January - 2020							
03.01.2020	06.01.2020	Week-1	38.5	10.7	07.8	10.8	0.01
04.01.2020	06.01.2020	Week-1	40.1	09.2	08.4	11.5	0.02
10.01.2020	13.01.2020	Week-2	39.3	11.5	10.3	10.7	0.01
11.01.2020	13.01.2020	Week-2	38.4	11.8	08.5	10.2	0.02
17.01.2020	20.01.2020	Week-3	38.4	10.3	10.5	11.0	0.03
18.01.2020	20.01.2020	Week-3	40.8	10.9	07.0	10.6	0.04
24.01.2020	27.01.2020	Week-4	38.8	12.3	08.1	10.9	0.03
25.01.2020	27.01.2020	Week-4	40.7	11.1	07.8	10.8	0.07
February - 2020							
07.02.2020	10.02.2020	Week-2	38.3	09.0	08.5	11.2	0.02
08.02.2020	17.02.2020	Week-2	40.9	09.7	07.2	10.8	0.04
14.02.2020	17.02.2020	Week-3	37.3	12.1	08.7	11.7	0.03
15.02.2020	17.02.2020	Week-3	38.6	10.4	07.9	10.4	0.04
21.02.2020	24.02.2020	Week-4	38.1	11.4	09.8	10.8	0.04
22.02.2020	24.02.2020	Week-4	37.7	10.5	09.0	11.5	0.03
28.02.2020	02.03.2020	Week-5	38.3	12.7	07.5	10.5	0.01
29.02.2020	02.03.2020	Week-5	40.6	09.5	08.7	11.1	0.03

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Ambient Air Quality Monitoring Report

Report No-	GESECC/PRO/2019-20/03/606-629	Date of Report	13/03/2020
Name of Client	Equinox Environments (I) Pvt- Ltd-, Kolhapur, Maharashtra		
Project Name & Address	M/s. Hindalco Industries Limited (Durgamanwadi Bauxite Mine) A/P. Durgamanwadi, Tahsil. Radhanagari, District. Kolhapur, State. Maharashtra.		
Sample Collected and Analyzed by	Green EnviroSafe Engineers & Consultant Pvt- Ltd, Pune, Maharashtra-		
Name Of Instrument & Calibration Details	Make	Date of calibration	Calibration Due Date
Ambient Fine Dust	Instrumex	13/04/2019	12/04/2020
			TECH/CAL/2019/AP/9

NAME OF LOCATION- Station: A B, Chavanwadi Village

Sampling Date	Date of Sample Registration	Parameter	PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO _x µg/m ³	CO mg/m ³
		Limit	100 (µg/m ³)	60 (µg/m ³)	80 (µg/m ³)	80 (µg/m ³)	04 (mg/m ³)
Analysis Method			IS: 5181 (Part-23) 2006	IS: 5181 (Part-23) 2006	Modified West & Gaeke Method	Jacob & Hocheiser's Method	NDIR Method
December - 2019							
06.12.2019	09.12.2019	Week-1	38.7	09.5	08.1	11.4	0.03
07.12.2019	09.12.2019	Week-1	39.2	11.7	07.8	10.8	0.04
13.12.2019	16.12.2019	Week-2	36.6	10.4	08.5	10.5	0.06
14.12.2019	16.12.2019	Week-2	40.1	12.3	07.2	11.0	0.07
20.12.2019	23.12.2019	Week-3	39.4	11.5	08.7	11.5	0.08
21.12.2019	23.12.2019	Week-3	38.9	12.2	06.9	10.3	0.02
27.12.2019	30.12.2019	Week-4	38.4	09.6	08.8	12.4	0.04
28.12.2019	30.12.2019	Week-4	40.0	09.6	09.0	10.0	0.03
January - 2020							
03.01.2020	06.01.2020	Week-1	38.5	09.8	08.0	10.0	0.03
04.01.2020	06.01.2020	Week-1	39.7	10.6	10.1	11.5	0.06
10.01.2020	13.01.2020	Week-2	40.8	11.1	07.7	12.4	0.02
11.01.2020	13.01.2020	Week-2	37.6	09.8	09.6	12.0	0.03
17.01.2020	20.01.2020	Week-3	38.4	10.2	08.3	11.8	0.01
18.01.2020	20.01.2020	Week-3	39.3	09.5	07.5	12.8	0.02
24.01.2020	27.01.2020	Week-4	38.5	11.5	08.5	12.2	0.05
25.01.2020	27.01.2020	Week-4	39.6	10.0	07.2	10.3	0.04
February - 2020							
07.02.2020	10.02.2020	Week-2	40.8	12.1	09.8	11.4	0.02
08.02.2020	17.02.2020	Week-2	38.2	09.7	07.5	13.2	0.03
14.02.2020	17.02.2020	Week-3	38.2	12.2	08.1	12.5	0.02
15.02.2020	17.02.2020	Week-3	40.7	10.0	10.8	10.7	0.06
21.02.2020	24.02.2020	Week-4	37.4	11.8	08.7	10.5	0.03
22.02.2020	24.02.2020	Week-4	40.2	09.9	09.0	12.6	0.02
28.02.2020	02.03.2020	Week-5	39.2	10.4	08.4	10.8	0.02
29.02.2020	02.03.2020	Week-5	41.1	09.5	09.8	12.3	0.04

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SUMMARY OF AMBIENT AIR QUALITY

Sr. No.	Location		PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (mg/m ³)
1	A1 Near Weigh Bridge/DG Set	Min	45.60	13.50	10.30	12.70	0.02
		Max	57.50	17.40	14.40	16.70	0.08
		Mean	48.05	15.49	12.05	14.81	0.05
		10th percentile	46.23	14.43	10.53	13.53	0.03
		30th percentile	46.70	14.80	11.50	14.48	0.04
		50th percentile	47.35	15.65	11.90	14.70	0.06
		95th percentile	50.39	16.69	13.40	16.36	0.08
		98th percentile	54.23	17.08	13.94	16.56	0.08
2	A2 Near Mines Office	Min	45.40	13.50	9.50	12.40	0.03
		Max	50.60	17.10	13.20	16.60	0.09
		Mean	47.68	15.22	11.65	14.59	0.06
		10th percentile	46.43	13.80	10.26	13.39	0.04
		30th percentile	46.42	14.58	11.20	13.80	0.05
		50th percentile	47.30	15.45	11.50	14.45	0.06
		95th percentile	50.37	16.69	13.19	16.44	0.08
		98th percentile	50.51	16.92	13.20	16.55	0.09
3	A3 Near Haulage Road	Min	44.30	13.80	10.40	12.50	0.04
		Max	52.00	18.10	15.30	18.10	0.08
		Mean	48.30	15.52	12.23	15.12	0.06
		10th percentile	45.94	14.30	10.63	13.43	0.04
		30th percentile	47.10	14.60	11.20	14.25	0.06
		50th percentile	48.15	15.40	12.00	15.30	0.07
		95th percentile	51.37	17.67	14.19	17.47	0.08
		98th percentile	51.72	17.92	14.79	17.82	0.08
4	A4 Manbet Village	Min	44.10	12.80	9.60	12.50	0.03
		Max	50.40	16.50	13.10	15.50	0.09
		Mean	47.28	15.37	11.38	14.20	0.06
		10th percentile	45.22	14.33	10.30	13.36	0.04
		30th percentile	46.49	14.69	10.77	13.79	0.05
		50th percentile	47.20	15.60	11.35	14.20	0.06
		95th percentile	50.27	16.50	13.01	15.40	0.08
		98th percentile	50.35	16.50	13.10	15.45	0.09
5	A5 Padsali Village	Min	37.10	8.40	7.40	10.10	0.01
		Max	40.50	12.40	11.80	12.60	0.07
		Mean	39.09	10.81	9.05	11.14	0.04
		10th percentile	37.96	9.56	7.63	10.30	0.02
		30th percentile	38.30	10.49	8.26	10.59	0.03
		50th percentile	39.25	10.80	8.90	11.10	0.04
		95th percentile	40.49	12.20	11.01	12.49	0.06

		98th percentile	40.50	12.31	11.48	12.55	0.07
6	A6 Durgamanwadi Village	Min	28.80	8.80	6.10	10.00	0.01
		Max	40.50	13.10	10.90	12.00	0.08
		Mean	38.54	10.73	8.30	10.78	0.04
		10th percentile	37.13	9.50	6.83	10.13	0.02
		30th percentile	38.70	10.18	7.50	10.49	0.03
		50th percentile	39.00	10.60	8.10	10.60	0.04
		95th percentile	40.30	12.93	10.50	11.80	0.07
		98th percentile	40.41	13.05	10.76	11.91	0.08
7	A7 Kariwade Village	Min	37.30	9.00	7.00	10.20	0.01
		Max	40.90	12.70	10.50	12.40	0.09
		Mean	39.14	10.58	8.50	10.99	0.03
		10th percentile	37.82	9.50	7.50	10.43	0.01
		30th percentile	38.40	9.88	7.89	10.70	0.02
		50th percentile	38.85	10.45	8.45	10.85	0.03
		95th percentile	40.79	12.27	10.23	11.67	0.07
		98th percentile	40.85	12.52	10.41	12.08	0.08
8	A8 Chavanwadi Village	Min	36.60	9.50	6.90	10.00	0.01
		Max	41.10	12.30	10.80	13.20	0.08
		Mean	39.15	10.62	8.50	11.45	0.04
		10th percentile	37.78	9.53	7.29	10.30	0.02
		30th percentile	38.49	9.80	7.98	10.79	0.02
		50th percentile	39.20	10.30	8.45	11.45	0.03
		95th percentile	40.80	12.20	10.06	12.77	0.07
		98th percentile	40.96	12.25	10.48	13.02	0.08

Note:

All the obtained air quality values in core zone and buffer zone as compared with the air quality standards prescribed by Central Pollution Control Board 2009 are found to be within the limit.

Stack Monitoring

As mine is shut down, DG SETs are not in the operating condition.

AMBIENT NOISE LEVEL QUALITY

Noise is nothing but unwanted sound produced due to various activities. As a part of occupational health and safety measures, certain safeguards have been incorporated to mitigate noise pollution in working environment. Noise level surveys were carried out at 8 selected locations in and around the mine lease area. Noise survey has been conducted in the study area for the period of 24 hr at each location.

AMBIENT NOISE LEVEL MONITORING STATIONS:

Sr. No.	Station Code	Name of the Sampling Station	Direction w.r.t. Mines Lease Area
1	A-1	Near Weigh Bridge/DG Set	---
2	A-2	Near Mines Office	---
3	A-3	Near Haulage Road	---
4	A-4	Manbet Village	NW
5	A-5	Padsali Village	N
6	A-6	Durgamanwadi Village	E
7	A-7	Kariwade Village	SW
8	A-8	Chavanwadi Village	NE

NATIONAL AMBIENT NOISE QUALITY STANDARDS:

AREA CODE	CATEGORY of AREA	LIMIT in dB (A) Leq	
		DAY TIME	NIGHT TIME
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40

Note:

1. Day time is reckoned in between 6 am and 9 pm.
2. Night time is reckoned in between 9 pm and 6 am.
3. Silence zone is defined as area up to 100 meters around such premises as hospitals, educational institutions and courts. The silence zones are to be declared by the Competent Authority.
4. Mixed categories of areas should be declared as one of the four above mentioned categories by the Competent Authority and the corresponding standards shall apply.



AMBIENT NOISE QUALITY LOCATIONS

- LEGEND**
- Mining Lease (Red hatched pattern)
 - Metal Road (Blue hatched pattern)
 - Unmetal Road (Green hatched pattern)
 - Water Courses (Blue lines)
 - Forest Area (Light green pattern)
 - Noise Locations (Red circle with a dot)

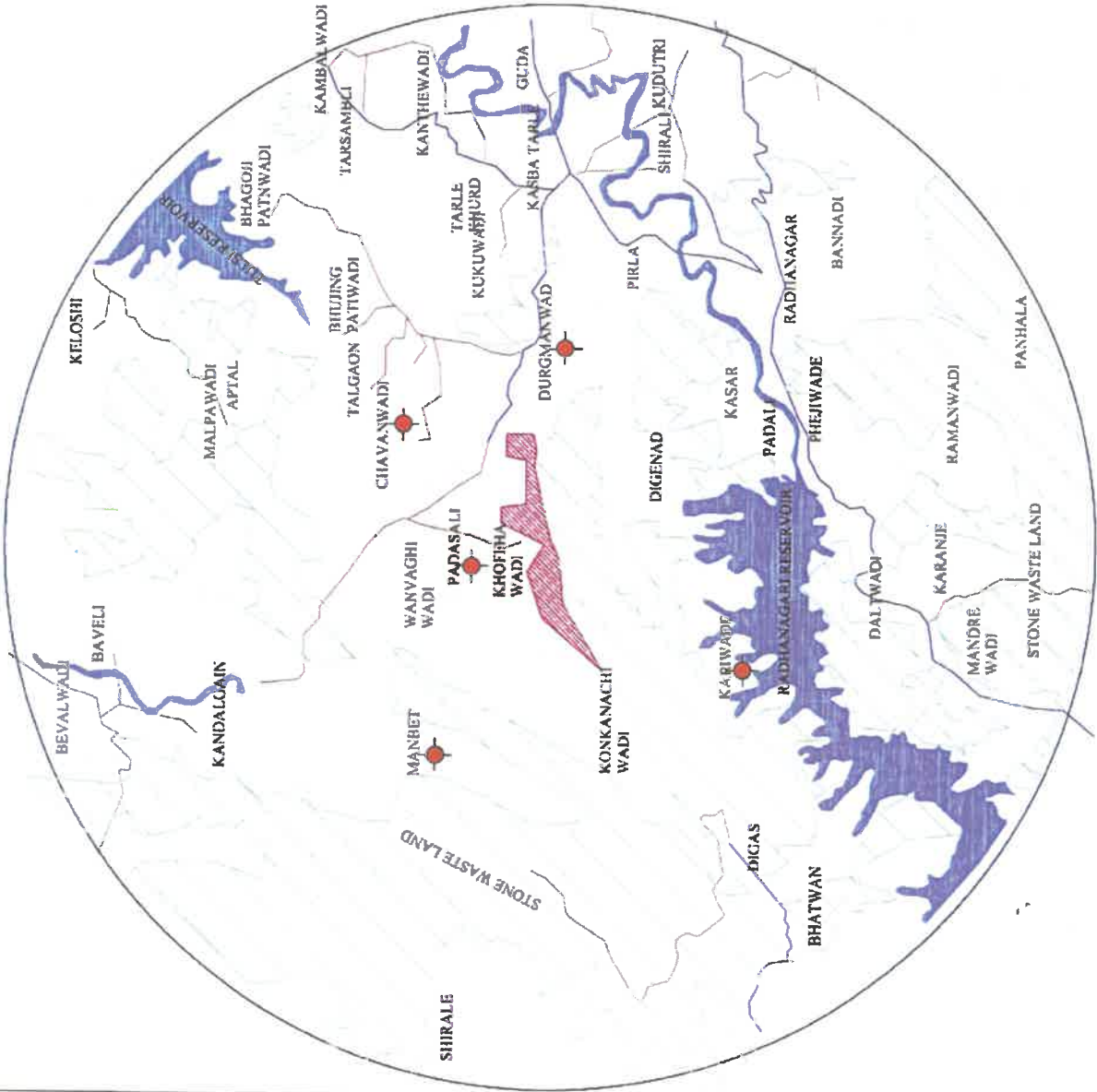


PROJECT : DURGAMANWADI

BAUXITE MINES

TITLE: NOISE LOCATIONS

PREPARED BY
EQUINOX ENVIRONMENTS INDIA PVT. LTD.
KOLHAPUR



Recognised by Ministry of Environment, Forest & Climate Change (MoEF) Govt. of India and ISO/IEC 17025:2005 (NABL), ISO 9001:2015 and OHSAS 18001:2007 Certified Company

Ambient Noise Monitoring Report

Report No.	GESEC/PRO/2019-20/03/630-637	Date of Report	13/03/2020
Name of Client	Equinox Environments (I) Pvt. Ltd., Kolhapur, Maharashtra.		
Project Name and Address	M/s. Hindalco Industries Limited (Durgamanwadi Bauxite Mine) A/P. Durgamanwadi, Tahsil. Radhanagari, District. Kolhapur, State. Maharashtra.		
Sample Collected By	Green Envirosafe Engineers & Consultant Pvt. Ltd, Pune, Maharashtra.		
Date of Sampling	January-2020.		
Name Of Instrument & Calibration Details	Date of calibration	Calibration Due Date	Calibration Certificate No.
Sound Level meter	01/06/2019	31/05/2020	TECH/CAL/2019/671/16
Monitoring Method	IS: 4758-1968 Reaff.2002.		

Date	06.01.2020	08.01.2020	10.01.2020	13.01.2020	15.01.2020	17.01.2020	20.01.2020	22.01.2020
Location	Near Weigh Bridge/ DG set	Near mines office	Near Houlage Road	Manbet Village	Padsali village	Durgamanwadi village	Kariwade Village	Chavanwadi village
Time	N1	N2	N3	N4	N5	N6	N7	N8
6.00	41.0	40.4	41.6	38.1	40.2	41.0	41.5	42.9
7.00	47.6	41.4	43.5	43.6	40.6	41.4	41.7	42.9
8.00	49.3	41.5	43.3	43.8	41.6	43.0	43.3	44.2
9.00	52.4	43.9	42.4	42.4	44.8	43.3	44.1	45.0
10.00	52.4	45.8	41.3	41.6	45.8	45.8	47.6	47.5
11.00	58.7	45.1	41.2	41.2	41.1	47.1	48.0	49.4
12.00	60.0	39.2	41.7	43.3	40.6	47.4	48.9	49.1
13.00	58.1	44.6	45.9	40.9	40.9	47.3	48.9	48.9
14.00	58.1	44.2	45.3	40.4	41.4	48.5	49.0	51.1
15.00	56.2	42.9	43.6	41.6	40.5	46.6	46.9	48.6
16.00	56.5	41.4	42.5	40.2	45.2	49.7	50.4	51.6
17.00	55.5	45.5	42.2	41.0	47.2	46.6	50.6	48.9
18.00	54.6	44.5	41.7	41.6	42.8	49.0	50.5	50.4
19.00	54.0	43.3	46.6	41.2	40.9	46.2	47.9	48.1
20.00	49.4	43.1	42.0	41.5	41.9	43.4	43.7	44.7
21.00	45.3	44.6	40.8	40.9	41.0	40.4	40.9	41.9
22.00	39.6	42.0	40.8	41.3	41.5	40.8	41.2	42.0
L10	43.6	41.0	41.0	40.3	40.6	40.9	41.4	42.5
L50	54.0	43.3	42.2	41.3	41.4	46.2	47.6	48.1
L90	58.3	45.3	45.5	43.4	45.4	48.7	50.4	50.7
Lday	57.6	43.6	42.5	41.5	41.8	47.2	49.0	49.2
23.00	42.9	37.5	41.1	40.8	37.3	37.6	38.5	38.8
24.00	42.6	37.9	41.5	41.0	37.0	38.4	38.6	39.8
1.00	42.8	37.9	41.2	41.5	37.6	36.5	37.8	39.0
2.00	43.8	38.1	41.9	41.8	36.9	37.3	36.8	40.7
3.00	43.8	38.9	42.5	41.6	36.8	37.3	37.9	41.7
4.00	39.4	34.2	37.3	37.0	38.4	40.0	39.4	44.1
5.00	38.9	33.6	37.2	36.8	37.5	39.4	39.2	43.6
L10	39.2	34.0	37.3	36.9	36.9	37.0	37.4	38.9
L50	42.8	37.9	41.2	41.0	37.3	37.6	38.5	40.7
L90	43.8	38.4	42.1	41.7	37.9	39.6	39.3	43.8





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GESLU

Lnight	43.2	38.2	41.6	41.4	37.3	37.7	38.6	41.1
Ldn	56.4	45.9	48.2	47.8	44.7	47.4	48.8	50.0
Avg L10	41.4	37.5	39.2	38.6	38.7	39.0	39.4	40.7
Avg L 50	48.4	40.6	41.7	41.2	39.4	41.9	43.1	44.4
Avg L 90	51.1	41.8	43.8	42.6	41.7	44.2	44.9	47.2

Lab Chemist



Authorized Signatory

AMBIENT NOISE LEVEL MONITORING RESULTS [Leqin dB(A)]

Date	06.01.2020	08.01.2020	10.01.2020	13.01.2020	15.01.2020	17.01.2020	20.01.2020	22.01.2020
Location	Near Weigh Bridge/DG set	Near mines office	Near Houlage Road	Manbet Village	Padsali village	Durgaman wadi village	Kariwade Village	Chavanwa di village
L ₁₀	43.6	41.0	41.0	40.3	40.6	40.9	41.4	42.5
L ₅₀	54.0	43.3	42.2	41.3	41.4	46.2	47.6	48.1
L ₉₀	58.3	45.3	45.5	43.4	45.4	48.7	50.4	50.7
L _{day}	57.6	43.6	42.5	41.5	41.8	47.2	49.0	49.2
L ₁₀	39.2	34.0	37.3	36.9	36.9	37.0	37.4	38.9
L ₅₀	42.8	37.9	41.2	41.0	37.3	37.6	38.5	40.7
L ₉₀	43.8	38.4	42.1	41.7	37.9	39.6	39.3	43.8
L _{night}	43.2	38.2	41.6	41.4	37.3	37.7	38.6	41.1
L _{dn}	56.4	45.9	48.2	47.8	44.7	47.4	48.8	50.0
Avg L ₁₀	41.4	37.5	39.2	38.6	38.7	39.0	39.4	40.7
Avg L ₅₀	48.4	40.6	41.7	41.2	39.4	41.9	43.1	44.4
Avg L ₉₀	51.1	41.8	43.8	42.6	41.7	44.2	44.9	47.2

Remark:

All the obtained noise level quality values in core zone and buffer zone as compared with the noise level standards prescribed by Central Pollution Control Board are found to be within the limit.

WATER QUALITY

Water quality monitoring consists of the study of water sources and its quality in the core and buffer zone of the lease area. Its study consists of following two important systems of water bodies:

- Surface water quality.
- Ground water quality.

A total of 6 locations have selected, out of which 3 are for ground water and 3 are for surface water. Location of water quality monitoring stations is given below.

WATER QUALITY MONITORING LOCATIONS

Code	Name of sampling station	Source of water
W-1	Chavanwadi Village	Ground water
W-2	Durgmanwadi Village	Ground water
W-3	Talegaon Village	Ground water
W-4	Mine accumulated water	Surface water
W-5	Tulsi stream	Surface water
W-6	Padsali Village	Surface water

SAMPLING DETAILS

The water samples were collected from 6 sampling locations out of which one is from core zone and other 5 are from buffer zone. Assessment of water quality in the study area and in the mine area includes the quality assessment of parameters as per the Indian Standard IS 10500 (Drinking water standard). Samples were collected in the winter season of the year 2019-20 as per the prescribed sample collecting methods and analyzed as per the IS standard procedures.

SURFACE WATER QUALITY

Proper drainage system has prepared to drag the monsoon water into the mine pit area for harvesting rain water and overflow of the same is being channelized through series of check dams and settling tanks so as to reduce the water pollution. Buffer zone has seasonal nallahs which used to recharge the ground water table.



WATER QUALITY LOCATIONS

LEGEND

-  MINING LEASE
-  METAL ROAD
-  UNMETAL ROAD
-  WATER COURSES
-  FOREST AREA
-  WATER LOCATIONS

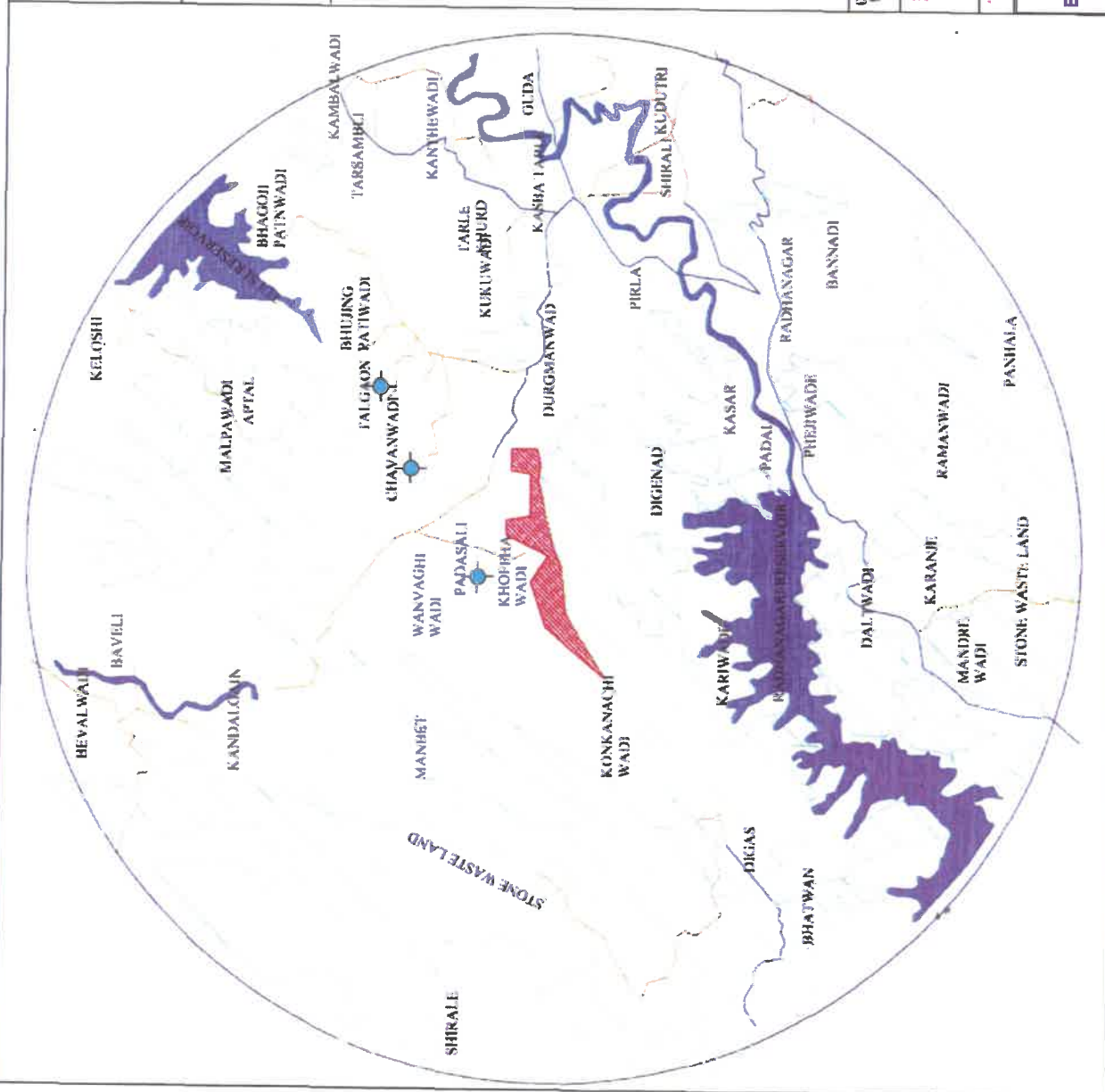


PROJECT : DURGAMANWADI

BAUXITE MINES

TITLE : WATER LOCATIONS

PREPARED BY
EQUINOX ENVIRONMENTS INDIA PVT. LTD.
KOLHAPUR





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Surface Water Analysis Report

Client Name:		Equinox Environments (I) Pvt. Ltd., Kolhapur, Maharashtra.		Report Number		GESEC/PRO/2019- 20/03/641-643	
Project Name and Address: M/s. Hindalco Industries Limited (Durgamanwadi Bauxite Mine) A/P. Durgamanwadi, Tahsil. Radhanagari, District. Kolhapur, State. Maharashtra.				Date of Report		13/03/2020	
				Sample Details:		Surface Water	
				Date of Sampling:		17/12/2019	
				Date of Sample Received		18/12/2019	
Date of Analysis		18/12/2019					
Sample Collected & Analyzed By: Green EnviroSafe Engineers & Consultant Pvt- Ltd, Pune, Maharashtra				Location			
Sr. No.	Parameter	Unit (s)	Mine accumulated water	Tulsi Stream	Padsali Village		
1.	Odor	--	Un-objectionable	Un-objectionable	Un-objectionable		
2.	Taste	--	Agreeable	Agreeable	Agreeable		
3.	Color	Hazen	<5.00	<5.00	<5.00		
4.	pH	--	8.24	7.74	7.59		
5.	Turbidity	NTU	<5.00	<5.00	<5.00		
6.	DO	mg/lit	1.25	4.26	4.10		
7.	TDS	mg/lit	289.54	139.85	153.47		
8.	TSS	mg/lit	26.04	8.20	10.35		
9.	BOD:3 days at 27°C	mg/lit	10.07	3.02	5.69		
10.	Alkalinity as CaCO ₃	mg/lit	72.63	18.11	26.42		
11.	Total Hardness as CaCO ₃	mg/lit	126.20	53.25	61.13		
12.	Nitrate as NO ₃	mg/lit	32.10	6.02	10.51		
13.	Phosphorous as PO ₄	mg/lit	2.30	0.75	1.56		
14.	Chlorides as Cl ⁻	mg/lit	26.45	17.89	22.34		
15.	Sulphates as SO ₄	mg/lit	20.39	5.20	8.92		
16.	Sodium as Na	mg/lit	16.57	2.03	3.87		
17.	Potassium as K	mg/lit	25.68	4.20	7.01		
18.	Calcium as Ca	mg/lit	38.55	16.97	19.35		
19.	Magnesium as Mg	mg/lit	11.93	4.33	5.10		
20.	Lead as Pb	mg/lit	BDL	BDL	BDL		
21.	Manganese as Mn	mg/lit	BDL	BDL	BDL		
22.	Cadmium as Cd	mg/lit	BDL	BDL	BDL		
23.	Chromium as Cr	mg/lit	BDL	BDL	BDL		
24.	Copper as Cu	mg/lit	BDL	BDL	BDL		
25.	Zinc as Zn	mg/lit	BDL	BDL	BDL		
26.	Iron as Fe	mg/lit	0.11	0.01	0.05		
27.	Fluorides as F ⁻	mg/lit	0.03	BDL	BDL		





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28.	Mercury as Hg	mg/lit	BDL	BDL	BDL
29.	Selenium as Se	mg/lit	BDL	BDL	BDL
30.	Arsenic as As	mg/lit	BDL	BDL	BDL
31.	Cyanide as CN	mg/lit	BDL	BDL	BDL
32.	Boron as B	mg/lit	BDL	BDL	BDL

Lab Chemist



Authorized Signatory

SURFACE WATER QUALITY

Sr. No.	Parameter	Unit (s)	Mine Accumulated Water	Tulsi Stream	Padsali Village
1.	Odor	--	Un-objectionable	Un-objectionable	Un-objectionable
2.	Taste	--	Agreeable	Agreeable	Agreeable
3.	Color	Hazen	<5.00	<5.00	<5.00
4.	pH	--	8.24	7.74	7.59
5.	Turbidity	NTU	<5.00	<5.00	<5.00
6.	DO	mg/lit	1.25	4.26	4.10
7.	TDS	mg/lit	289.54	139.85	153.47
8.	TSS	mg/lit	26.04	8.20	10.35
9.	BOD:3 days at 27°C	mg/lit	10.07	3.02	5.69
10.	Alkalinity as CaCO ₃	mg/lit	72.63	18.11	26.42
11.	Total Hardness as CaCO ₃	mg/lit	126.20	53.25	61.13
12.	Nitrate as NO ₃	mg/lit	32.10	6.02	10.51
13.	Phosphorous as PO ₄	mg/lit	2.30	0.75	1.56
14.	Chlorides as Cl ⁻	mg/lit	26.45	17.89	22.34
15.	Sulphates as SO ₄	mg/lit	20.39	5.20	8.92
16.	Sodium as Na	mg/lit	16.57	2.03	3.87
17.	Potassium as K	mg/lit	25.68	4.20	7.01
18.	Calcium as Ca	mg/lit	38.55	16.97	19.35
19.	Magnesium as Mg	mg/lit	11.93	4.33	5.10
20.	Lead as Pb	mg/lit	BDL	BDL	BDL
21.	Manganese as Mn	mg/lit	BDL	BDL	BDL
22.	Cadmium as Cd	mg/lit	BDL	BDL	BDL
23.	Chromium as Cr	mg/lit	BDL	BDL	BDL
24.	Copper as Cu	mg/lit	BDL	BDL	BDL
25.	Zinc as Zn	mg/lit	BDL	BDL	BDL
26.	Iron as Fe	mg/lit	0.11	0.01	0.05
27.	Fluorides as F ⁻	mg/lit	0.03	BDL	BDL
28.	Mercury as Hg	mg/lit	BDL	BDL	BDL
29.	Selenium as Se	mg/lit	BDL	BDL	BDL
30.	Arsenic as As	mg/lit	BDL	BDL	BDL
31.	Cyanide as CN	mg/lit	BDL	BDL	BDL
32.	Boron as B	mg/lit	BDL	BDL	BDL

Note:

- mg/l: milligram per liter
- BDL: Below Desirable Limit

Remark:

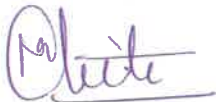

All the parameters of the surface water samples collected from various sites are well below the desirable limit and maximum permissible limit as per IS: 10500 Standard for Drinking Water.

GROUND WATER QUALITY

The source of drinking water in the study area is the ground water, which is tapped by a bore well. The buffer zone is good in ground water source. The ground water in the study area gets recharged by rainwater.

Assessment of water quality in the study area and in the mine area includes the quality assessment of parameters as per the Indian Standard IS 10500 (Drinking water standard). Total of 3 locations have selected from buffer zone.

DURGAMANWADI MINES				
WELL DEPTHS OF VILLAGES				
S.NO.	LOCATION	NAME OF THE MINE AREA	TOTAL DEPTH IN MTS	WATER LEVEL FROM SURFACE IN MTS
1	PADSALI VILLAGE	DMW	4.10	1.34
2	CHAVANWADI VILLAGE	DMW	2.80	1.50

DURGAMANWADI MINES				
WELL DEPTHS OF VILLAGES				
SAMPLING DATE:17/12/2019				
Report No: GESEC/PRO/2019-20/03/644-645				
S.NO.	LOCATION	NAME OF THE MINE AREA	TOTAL DEPTH IN MTS	WATER LEVEL FROM SURFACE IN MTS
1	PADSALI VILLAGE	DMW	4.10	1.34
2	CHAVANWADI VILLAGE	DMW	2.80	1.50
ANALYZED BY-		AUTHORIZED SIGNATORY-		
				



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- Samples will be retained for a period of seven (7) days after completion of analysis. Longer retention periods can be arranged, on request of the customer.
- We strictly maintain the confidentiality of all test result of sample(s) collected by us/ supplied by customer and not revel to third party unless required by the statutory or legal requirement
- MoEF approved Lab by Govt. of India. From date 09/02/2017 to 08/02/2022.



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Ground Water Analysis Report

Client Name:	Equinox Environments (I) Pvt. Ltd., Kolhapur, Maharashtra.		Report Number	GESEC/PRO/2019-20/03/638-640	
Project Name and Address: M/s. Hindalco Industries Limited (Durgamanwadi Bauxite Mine) A/P. Durgamanwadi, Tahsil. Radhanagari, District. Kolhapur, State. Maharashtra.	Date of Report		13/03/2020		
	Sample Details		Ground water		
	Date of Sampling		17/12/2019		
	Date of Sample Received		18/12/2019		
	Date of Analysis		18/12/2019		
Sample Collected & Analyzed By : Green EnviroSafe Engineers & Consultant Pvt- Ltd, Pune, Maharashtra.			Location		
SR. NO.	PARAMETER	UNIT(S)	CHAVANWADI VILLAGE	DURGAMANWADI VILLAGE	TALEGAON VILLAGE
1.	Odor	--	Un-objectionable	Un-objectionable	Un-objectionable
2.	Taste	--	Agreeable	Agreeable	Agreeable
3.	Color	Hazen	<5.00	<5.00	<5.00
4.	pH	--	7.72	7.45	7.59
5.	Turbidity	NTU	<5.00	<5.00	<5.00
6.	DO	mg/lit	4.05	4.21	4.12
7.	TDS	mg/lit	181.15	152.39	168.74
8.	TSS	mg/lit	11.87	7.12	9.03
9.	BOD:3 days at 27°C	mg/lit	4.82	3.98	4.35
10.	Alkalinity as CaCO ₃	mg/lit	12.90	8.47	11.89
11.	Total Hardness as CaCO ₃	mg/lit	80.82	62.60	70.46
12.	Nitrate as NO ₃	mg/lit	20.14	14.75	16.83
13.	Phosphorous as PO ₄	mg/lit	0.98	0.69	0.82
14.	Chlorides as Cl ⁻	mg/lit	22.78	15.06	19.03
15.	Sulphates as SO ₄	mg/lit	5.17	2.51	4.90
16.	Sodium as Na	mg/lit	0.72	0.08	0.25
17.	Potassium as K	mg/lit	3.14	1.90	3.53
18.	Calcium as Ca	mg/lit	22.49	18.25	20.47
19.	Magnesium as Mg	mg/lit	5.97	4.12	4.68
20.	Lead as Pb	mg/lit	BDL	BDL	BDL
21.	Manganese as Mn	mg/lit	BDL	BDL	BDL
22.	Cadmium as Cd	mg/lit	BDL	BDL	BDL
23.	Chromium as Cr	mg/lit	BDL	BDL	BDL
24.	Copper as Cu	mg/lit	BDL	BDL	BDL
25.	Zinc as Zn	mg/lit	BDL	BDL	BDL
26.	Iron as Fe	mg/lit	0.23	0.11	0.15





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27.	Fluorides as F ⁻	mg/lit	BDL	BDL	BDL
28.	Mercury as Hg	mg/lit	BDL	BDL	BDL
29.	Selenium as Se	mg/lit	BDL	BDL	BDL
30.	Arsenic as As	mg/lit	BDL	BDL	BDL
31.	Cyanide as CN	mg/lit	BDL	BDL	BDL
32.	Boron as B	mg/lit	BDL	BDL	BDL

Lab Chemist



Authorized Signatory

GROUND WATER QUALITY

Sr. No.	Parameter	Unit(s)	Chavanwadi Village	Durgamanwadi Village	Talegaon Village
1.	Odor	--	Un-objectionable	Un-objectionable	Un-objectionable
2.	Taste	--	Agreeable	Agreeable	Agreeable
3.	Color	Hazen	<5.00	<5.00	<5.00
4.	pH	--	7.72	7.45	7.59
5.	Turbidity	NTU	<5.00	<5.00	<5.00
6.	DO	mg/lit	4.05	4.21	4.12
7.	TDS	mg/lit	181.15	152.39	168.74
8.	TSS	mg/lit	11.87	7.12	9.03
9.	BOD:3 days at 27°C	mg/lit	4.82	3.98	4.35
10.	Alkalinity as CaCO ₃	mg/lit	12.90	8.47	11.89
11.	Total Hardness as CaCO ₃	mg/lit	80.82	62.60	70.46
12.	Nitrate as NO ₃	mg/lit	20.14	14.75	16.83
13.	Phosphorous as PO ₄	mg/lit	0.98	0.69	0.82
14.	Chlorides as Cl ⁻	mg/lit	22.78	15.06	19.03
15.	Sulphates as SO ₄	mg/lit	5.17	2.51	4.90
16.	Sodium as Na	mg/lit	0.72	0.08	0.25
17.	Potassium as K	mg/lit	3.14	1.90	3.53
18.	Calcium as Ca	mg/lit	22.49	18.25	20.47
19.	Magnesium as Mg	mg/lit	5.97	4.12	4.68
20.	Lead as Pb	mg/lit	BDL	BDL	BDL
21.	Manganese as Mn	mg/lit	BDL	BDL	BDL
22.	Cadmium as Cd	mg/lit	BDL	BDL	BDL
23.	Chromium as Cr	mg/lit	BDL	BDL	BDL
24.	Copper as Cu	mg/lit	BDL	BDL	BDL
25.	Zinc as Zn	mg/lit	BDL	BDL	BDL
26.	Iron as Fe	mg/lit	0.23	0.11	0.15
27.	Fluorides as F ⁻	mg/lit	BDL	BDL	BDL
28.	Mercury as Hg	mg/lit	BDL	BDL	BDL
29.	Selenium as Se	mg/lit	BDL	BDL	BDL
30.	Arsenic as As	mg/lit	BDL	BDL	BDL
31.	Cyanide as CN	mg/lit	BDL	BDL	BDL
32.	Boron as B	mg/lit	BDL	BDL	BDL

Note:

- mg/l: milligram per liter
- BDL: Below Desirable Limit

Remark:

All the parameters of the surface water samples collected from various sites are well below the desirable limit and maximum permissible limit as per IS: 10500 Standard for Drinking Water.

DOMESTIC EFFLUENT ANALYSIS

The only source of waste water on site was canteen effluent. All employees used to have two meals in the canteen according to their shifts. The said canteen has now been stopped since the workmen of the mines have been retrenched with effective from 1st August 2019 consequent to the stoppage of mines as per MoEF directives. Sample was not collected from outlet and analyzed as there is no domestic effluent due to closure of canteen.