



Letter No.: HIL/EC/GP- IV/4/1/2022 -23/ 424

24<sup>th</sup> November, 2022

The Integrated Regional Office,  
Ministry of Environment Forests & Climate Change (MoEF & CC) Aranya Bhawan,  
North Block, Sector – 19, Naya Raipur,  
Atal Nagar, Chhattisgarh, 492002

**Subject: Half Yearly EC Compliance Report for 1 MTPA Gare Palma IV/4 Coal Mines of Hindalco Industries Limited, Village – Banjikhola, Tehsil – Tamnar, District – Raigarh, Chhattisgarh.**

Respected Sir,

This has reference to the Environment Clearance Letter no. – J-11015/183/2010- IA –II. (M) dated 16.04.2015 (Transferred in favour of HIL) & Amendment in EC for production capacity i.e. Opencast: 0.56 MTPA & Under Ground: 0.44 MTPA dated 24.05.2019.

We are submitting herewith the Half Yearly EC Compliance Report along with Environmental Monitoring Report (Hard & Soft) for the period from **April 2022 to September 2022** for your kind perusal please.

The receipt of the report may kindly be acknowledged.

Yours faithfully,  
For Hindalco Industries Limited,

**Govind Kumar**  
**(Mine Agent GP IV/4 CM)**  
Encl.: As Above.

- CC.: 1. Member Secretary, Chhattisgarh Environment Conservation Board, Paryavas Bhawan, Raipur Chhattisgarh.  
2. Regional Officer, Chhattisgarh Environment Conservation Board, TV tower Road, Raigarh (CG).  
3. Member Secretary, CPCB Parivesh Bhawan, East Arjun Nagar Delhi - 110032  
4. The Regional Director, Regional Directorate (Central), Bhopal, Central Pollution Control Board (MoEF & CC, GOI), "Parivesh Bhawan" Paryavaran Parishar, E – 5, Arera Colony, Bhopal (MP), 462016  
5. The Director (Monitoring Cell), Ministry of Environment, Forest & Climate Change, IPB, Aliganj, Jorbagh Road, New Delhi – 110003

**Hindalco Industries Limited**

Gare Palma Mines ( IV/4 & IV/5), Vill & Po: Milupara , Tehsil: Tamnar Dist: Raigarh- 496107 , Chhattisgarh  
T: +91 7762 228212, Website : www.hindalco.com E mail : hindalco@adityabirla.com  
Registered Office : Ahura Centre, 1st Floor, B Wing, Mahakali Caves Road Andheri (East) , Mumbai 400093, India  
T: + 912266917000 | Fax: + 912266917001  
Corporate ID No: L27020MH1958PLC011238

## COMPLIANCE REPORT

**ON STIPULATED CONDITIONS OF ENVIRONMENTAL CLEARANCE (EC) ACCORDED TO GARE PALMA IV/4 COAL MINE VIDE LETTER No.– J-11015/183/2010-IA–II.(M) DATED 16.04.2015 (TRANSFERRED IN FAVOUR OF HIL) & AMENDMENT IN EC FOR PRODUCTION CAPACITY I.E. OPENCAST: 0.56 MTPA & UNDER GROUND: 0.44 MTPA DATED 24.05.2019.**

Sr. No.	Stipulated Conditions	Compliance Statement
1	Any change in scope of work will attract the provisions of Environment Protection Act (EPA), 1986 and Environment Impact Assessment Notification, 2006 in conjunction with the subsequent amendments/circulars.	Noted
2	All conditions stipulated in the EC letter No.J-11015/183/2010-IA.II (M) dated 12 <sup>th</sup> March, 2013 shall remain unchanged.	Noted
3	The successful bidder shall be liable, if any, for any act of violation of the EPA 1986/EIA Notification 2006/subsequent amendments and circulars which it has inherited during the transfer.	Noted
4	Successful bidder shall be liable for compliance of all court directions, if any.	Noted

**ON STIPULATED CONDITIONS OF ENVIRONMENTAL CLEARANCE (EC) ACCORDED TO GARE PALMA IV/4 COAL MINE VIDE LETTER No. – J-11015/183/2010-IA–II.(M) DATED 12.03.2013**

Sr. No.	Stipulated Conditions	Compliance Statement
<b>A. SPECIFIC CONDITIONS</b>		
i	The Maximum production from the mines shall not exceed beyond that for which environmental clearance has been granted for i.e. 0.48 MTPA to 1.0 MTPA of which 0.4 MTPA OC and 0.6 MTPA UG in ML area of 701.512 ha)	<p style="text-align: center;"><b>Being Complied.</b></p> <p>Amendment has been done in this stipulated condition by MoEF &amp; CC dated 24.05.2019 (Letter No. J-11015/183/2010-IA–II.(M) for the production capacity i.e. Open cast - 0.56 MTPA and Under Ground – 0.44 MTPA, Total capacity – 1 MTPA instead of 0.4 MTPA OC and 0.6 MTPA UG.</p> <p>Amendment Copy of EC is attached as <b><u>Annexure - 1</u></b></p> <p>The coal production from the mine from <b>April 2022 to September 2022</b> is within the limit of 1 MTPA as prescribed in the EC.</p>



		<p>Production from (April 2022 to September 2022)</p> <p><b>Open Cast: 0.356 MT (Million Tons)</b>  <b>Under Ground: 0.00 MT (Million Tons)</b></p> <p>Total Coal Production from OC &amp; UG (2022 -2023):  0.356 MT (Million Tons)</p> <p><b>Open Cast: 0.356 MT (Million Tons)</b>  <b>Under Ground: 0.00 MT (Million Tons)</b></p> <p>A copy of Statistical return for the month of September 2022 submitted to The Coal Controller Ministry of Coal, GOI Kolkata dated <b>03/10/2022</b> is attached as <b><u>Annexure - 2</u></b></p>
ii	The calendar plan should be uploaded on MOEF website.	<p>As per Approved mining plan (2018) the coal production from HIL GP IV/4 is 0.56 MTPA from OC &amp; 0.44 MTPA from the UG.</p> <p>The production will be within the limit of above schedule. Proposed calendar year quantities based on the current scenario.</p> <p>Mining calendar plan for FY 22-23:</p> <p><b>Open Cast: 0.56 MT (Million Tons)</b>  <b>Under Ground: No proposal as of now</b></p> <p>In future if there will be any change in calendar plan the same will be intimated to MoEF &amp; CC.</p>
iii	The coal transportation by road is up to 270 km at Raipur by road presently with tarpaulin covered trucks and partially by rail up to Bhupdevpur. After new siding comes up which is approximately 3 km away for changing over to rail transport. The coal transportation by road should be by mechanically covered trucks. The mode of transportation shall be shifted to by rail by 2017.	<p><b>Not Applicable.</b></p> <p>This particular condition is not applicable to us, as per Vesting order issued by Ministry of Coal, GOI, (vide vesting order No. 104/16/2015/NA dated 23rd March 2015) Coal is being used in the captive power plant of HIL located at Hirakud (Distance - 160 km) and Lapanga (Distance - 130 km) District Sambalpur, Odisha and mode of transportation is by road. We are transporting the coal by road through tarpaulin covered trucks.</p> <p>A copy of Vesting order is attached as <b>Annexure - 3</b></p>

iv	Karanj should be deleted from the list of native species for plantation program.	<b>Complied.</b> Karanj will not be planted in mining area.
v	Rs. 5/T of coal/annum till the end of life of project with the escalation factor of coal production.	<b>Being Complied.</b> As per condition Rs. 5 /T of coal /annum is being utilized under CSR activities & Sustainability. Expenditure details from <b>April 2022 to September 2022</b> is enclosed as <b>Annexure – 4</b>
vi	No external OB dump will be left after mine operation and shall be backfilled in the mine void.	<b>Being Complied.</b> The OB dumping is being done as per the approved Mining Plan only.
vii	The proponent shall take necessary action on the issues raised during public hearing.	<b>Being Complied.</b> The PH was held on 02.05.2012. The issues raised during the PH, include, planning for development of road, water facility, electricity in the project area for Project Affected Persons, development for tribes; persons, education, management of air, water and noise pollution, prevention of blast activities etc. The HIL has taken the appropriate action details attached as <b>Annexure – 5</b> and the same has already communicated to IRO – MoEF & CC, Raipur, MS – IA Division (Coal Mining) & The Addl. Director (Monitoring Cell), New Delhi dated 08.08.2022 along with the ATR.
viii	The coal will be used in existing steel plant of proponent.	<b>Not Applicable.</b> This particular condition is not applicable to us, as per Vesting order by Ministry of Coal, GOI, Coal is being used in the captive power plant of HIL located at Hirakud and Lapanga, District Sambalpur, Odisha.
ix	The Mine Planning is done in such manner that underground mining is proposed below forest land and opencast mining under Government waste land /agriculture land. Hence tree cutting from forest land is not proposed during expansion proposal. However if required plantation will be done 10 times of tree felling in the project affected area.	<b>Being Complied.</b> Mining is being done in such manner that underground mining is being done below forest land and opencast mining is being done under Government waste land /agriculture land. Planation in the mine lease area is being carried out @2500 plant/ha. <b>Total 111821 nos.</b> local plants species have been planted till date in mine lease area including OB dump area. Plantation details are enclosed as <b>Annexure- 6</b>

x	Kelo river and Bendra Nallah shall not be disturbed.	<p style="text-align: center;"><b>Being Complied.</b></p> <p>Kelo river and Bendra Nallah shall not be disturbed. This condition is being complied by HIL as no activities is being done nearby to Kelo river &amp; Bendra Nala.</p> <p>Following steps has been taken to prevent the erosion of internal dump to Bendra nala :</p> <ol style="list-style-type: none"> <li>1. Bendra Nala is situated at the distance of 600 mtr. on the southern side of Patch B.</li>   <li>2. Entire OB is being dumped internally in the de- coaled area on the north eastern side of the pit.</li>   <li>3. Garland drains have been provided at the toe of the benches which are regularly cleaned before the onset of monsoon every year.</li>   <li>4. Till September 2022 in Patch B (South pit), HIL has constructed Approx.4116 mtr. of Garland drain &amp; 2288 mtr. of Toe drain &amp; in Patch C (North Pit) Approx.964 mtr. of Garland drain &amp; 1390 mtr. of Toe drain (Photograph attached as <b>Annexure - 7</b>).</li> <li>4. Retaining wall where ever necessary is erected for stability of the dumps and prevent erosion. Till September 2022 In the 1st Phase we have constructed approx. 55 mtr. long gabion/retaining wall at the toe of permanent dump slope near Patch "C" in Banjikhoh, GP IV/4 Coal Mines. The Gabion /retaining walls had been made of GI wire net cages filled with stone boulders and anchored with angle iron as per specification (Photographs attached as <b>Annexure - 8</b>).</li> </ol> <p>We would also like to inform you that we have taken gabion/retaining wall construction activity at the toe of the OB dump as a continuous process &amp; ensure you that it will be carried out as &amp; when required in future also at mine site. And proposal for this year is to construct the gabion wall approx. 50 mtr. in the Patch C.</p> <ol style="list-style-type: none"> <li>a) Constructed Settling pond/sumps of size 30m X 10m X 1.5m (01Nos) at Banjikhoh (Photograph is attached as <b>Annexure – 9</b>).</li> <li>b) Constructed 03 nos of Settling ponds of size 50m X 30m X 3m (each) with chemical dosing arrangement and sump with adequate capacity (for sedimentation) at Banjikhoh for the mine seepage water collection, settling &amp; treatment before discharge for the agriculture purpose (Photograph is attached as <b>Annexure – 9A</b>).</li> </ol>
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		<p>2. Aprox. 50,000 Nos of Vetiver grass plantation has been done in the year 2020 on OB Dump area near Patch “C” to provide the stability and prevent top soil erosion / Reduce the surface Run- off from OB dumps and same has propose to done in OB dump located at Bankheta (Photographs attached as <b>Annexure - 10</b>).</p> <p>3. Till September 2022 approx. 111821 nos of saplings have been planted covering an area of 39.6 hac. which also helps in preventing erosion of internal dumps. (Plantation report &amp; Photograph enclosed above). HIL has submitted the progress report on construction of drains, gabion wall/retaining wall and plantation details to IRO – MoEF &amp; CC, Raipur dated 11/11/2022- attached as <b>Annexure – 11</b>.</p>																		
xi	<p>External OB dump of 0.67 million cubic meters will be created as reported in closure plan of first year. This external dump will be re handled and backfilled in subsequent years. There will be no external dump left after the mine operation.</p>	<p style="text-align: center;"><b>Being Complied.</b></p> <p>The OB dumping is maintained as per the provisions of approved Mining Plan only. Entire OB is being dumped internally in de – coaled area. The dumped quantity of Overburden/OB is as below:</p> <table border="1"> <thead> <tr> <th>Financial Year</th> <th>Dumped quantity of OB in CuM.</th> </tr> </thead> <tbody> <tr> <td>2015-16</td> <td>294327</td> </tr> <tr> <td>2016-17</td> <td>2163077</td> </tr> <tr> <td>2017-18</td> <td>1190380</td> </tr> <tr> <td>2018-19</td> <td>2041702</td> </tr> <tr> <td>2019-20</td> <td>2418897</td> </tr> <tr> <td>2020-21</td> <td>2599915</td> </tr> <tr> <td>2021-22</td> <td>1925276</td> </tr> <tr> <td>2022- 2023 (From April 2022 to September 2022)</td> <td>2093854</td> </tr> </tbody> </table>	Financial Year	Dumped quantity of OB in CuM.	2015-16	294327	2016-17	2163077	2017-18	1190380	2018-19	2041702	2019-20	2418897	2020-21	2599915	2021-22	1925276	2022- 2023 (From April 2022 to September 2022)	2093854
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xii	<p>Biological reclamation of all external dumps will be done progressively after leveling these dumps. This will provide stability and prevent soil erosion from dumps. The total top soil generated (1.14 m.cum B) during the development of mine will be stacked separately in a soil stack pile in between the pit and the surface dump over an area of 7.12 Ha.</p>	<p style="text-align: center;"><b>Being Complied.</b></p> <p>The Top soil conservation and use are successive and periodic activities during mining operation. In the FY 22 – 23 (From April 2022 to September 2022) approx. <b>503308 cubic meter</b> of the top soil has been generated, of which approx. <b>452977</b> cubic meter has been spread/used on OB Dumps (Banjikhhol &amp; Bankheta) for reclamation, slope stabilization, green belt development &amp; <b>approx. 50331</b> cubic meter has been stored for further uses in the mine area.</p>																		

		<p>Planation in the mine area is being carried out @2500 plant/ha. Total 111821 nos. local plants species have been planted up to September 2022 covering an area of 39.6 hac. in the mine area including OB dump species planted includes medicinal, Native &amp; Fruit bearing Plants i.e. Saja,Siris, Shisham, Yellow flametree, Kassod , Satvan, Acacia Mangium, Ganga Emli, Arjuna, Chirol, Gliricidia, Amla, Mango, guava, Kathal, Neem, Pipal, Ficus sp., Peltafarm, Nilgiri, Casia Samia, Gulmohar, Acacia Coliformis, Jamun, Kachnar, Baheda, Kachnar, Mahua &amp; Saal etc. has been already done in the stabilize internal dump at Banjikhola &amp; Bankheta in consultation with DFO.</p> <p>A report on Monitoring &amp; Evaluation of Plantation carried out at Gare Palma IV/4 Coal Mines has been prepared by the NAV AASTHA JAN VIKAS SEVA SAMITI" 8/5, "JASMATI BHAWAN", NEAR OLD KATTHA FACTORY, GODHANPUR, AMBIKAPUR – 497001 (Authorized/Approved Agency by PCCF, CG &amp; CECB, Raipur Approval letter attached as <b>Annexure – 12</b>. and the same report was submitted to IRO – MoEF &amp; CC, Raipur dated 22nd December 2021 (Report attached as <b>Annexure – 12A</b>)</p>
xiii	<p>The report Titled " Flora and Fauna and conservation plan for endangered species of Gare-IV/8 coal block approved by The PCCF (Wildlife) of Chhatisgarh, dated 22.11.2011 states that there is no national park, tiger reserve, eco-sensitive zones within 15 km radius. It was informed that this area is neither affected by elephant corridor exists. However, there are occasional presence of elephants and other wild lives.</p>	<p style="text-align: center;"><b>Complied.</b></p> <p>This particular condition is for Gare Palma IV/8 block which is now allotted to M/s Ambuja Cement Ltd.</p>
xiv	<p>A Wildlife Conservation Plan for the conservation and protection of wildlife in the study area has been approved at a cost of Rs. 1.0 crore and shall be implemented by the proponent in consultation with Department of Forest and Wildlife, Govt. of Chhattisgarh. The WLCP shall be comprise of components</p>	<p style="text-align: center;"><b>Complied.</b></p> <p>Rs. 1.0 crore has been deposited to state forest department by the prior allottee against Wildlife conservation plan. Company will comply with mitigative measure as suggested by competent authority if any in this regard in future also. A copy of WLCP prepared by prior allottee attached as <b>Annexure - 13</b>. Amount Rs 1 Crores towards WLCP submitted by prior allottee to forest Dept.- attached as</p>

	of habitat improvement and conservation of biodiversity, provision of water holes, and augmenting water bodies, nursery and plantation of species of natural food and fodder found in the natural habitat salt licks, measures for the protection against forest fires and poaching, awareness campaign of villagers in the study area and compensation in case of man animal conflicts. The status of implementation of WL Conservation Plan including budgetary provision of various activities and status of expenditure shall be regularly, uploaded on the website of the forest and wildlife Department of Government of Chhattisgarh and of the project proponent and the status shall be regularly reported to this Ministry and the MoEF Regional Office, as part of the compliance report.	<b>Annexure – 13A.</b> (submitted with ATR dated 08.08.2022)
xv	As per the approved plan of the Flora and Fauna and Conservation plan for endangered species of Gare IV/4 coal block” and recommended the PCCF (Wildlife), Rs. One crore be deposited, at one time. With the department of forest and wildlife, Govt. of Chhattisgarh for the implementation of the plan.	Complied. Rs. 1.0 crore has been deposited to state forest department by the prior allottee against Wildlife conservation plan. Company will comply with mitigative measure as suggested by competent authority if any in this regard in future also.
xvi	The project authority shall also participate in a Regional action plan of the State Government for the conservation of flora and fauna found within the study area, in addition to the above funds shall also contribute financially for implementation of RWLCP. Habitat development such as grassland/conservation measures	Complied. HIL is participating in the Regional Action Plan of the State Government for conservation of flora & fauna. Till date Rs. 90 Lakhs has been paid by HIL to the state Government towards this. (Copy Attached <b>Annexure - 14</b> )

	along the migratory route/habitats of elephants found/ visiting the area shall form a part of the regional action plan.	
xvii	It will be used for growing plants along the fringes of the side roads and reclamation of external dump and backfilled area. The topsoil stockpile will be low height not exceeding 6 m and will be made use for concurrent filling without keeping the top soil for a long period.	<b>Being Complied.</b> Topsoil is being used for green belt development along the road and the reclamation of OB Dump area. The topsoil stockpile is low in height not exceeding 6 m and this is being used and will be used for concurrent filling without keeping the top soil for a long period.
xviii	The OB dump for the South Quarry dump will be spread over 13.75 Ha. area on the south and eastern part of south quarry while the mining operation will start from north and advance towards south and west. Part of OB excavated from the mine from 1st year and part of 2nd year (3.91 Mm3) will be accommodation in it including top soil for afforestation. The height of dump achieved during 1st and 2nd year will be 6 m to 20 m respectively.	<b>Being Complied.</b> The over burden is maintained as per approved mining plan.
xix	The O.B. left in external dump will be re handled and backfilled in the void after the extraction of coal is completed, this will make the operation of UG mining safe as no water will be logged in the quarry. The OB will be temporarily stored which primarily consist of sand stone and shale which does not contain any heavy metal. As per the reclamation plan, the entire OB will be re-handled and biologically reclaimed with local grass to minimize fugitive emission as well to control surface runoff.	<b>Being Complied.</b> The over burden management is being done as per approved mining plan. As per the reclamation plan, the dumps will be biologically reclaimed with local species and grass to minimize fugitive emission as well as to control surface runoff. Backfilling has already started. Since the takeover by HIL no external dumping is being done OB generated annually is being backfilled in de-coaled area. Aprox. 50,000 Nos of Vetiver grass plantation has been done in the year 2020 on OB Dump area near Patch "C" to provide the stability and prevent top soil erosion / Reduce the surface Run- off from OB dumps. <b>(Photograph enclosed above).</b>
xx	Topsoil generated in the balance life of mine should be stacked	<b>Being Complied.</b>

	properly with proper slope at earmarked site (s) and should not be kept active and shall be used for reclamation and development of green belt.	Presently topsoil is being stacked properly and topsoil to be generated in the balance life of mine will be stacked properly with proper slope at earmarked site (s) and will not be kept active. The stocked topsoil is being & will be used for reclamation and development of green belt.
xxi	OB generated in the balance life of mine should be stacked at earmarked one external OB dumpsite within ML area. The ultimate slope of dump shall not exceed 28° Monitoring and management of reclaimed dumpsite should continue until the vegetation becomes self-sustaining. Compliance status should be submitted to the Ministry of Environment & Forests and its Regional offices located at Bhubaneswar on yearly basis. The area of OB dump should be reduced. The grass turfing should be done on OB dumps.	<p style="text-align: center;"><b>Being Complied.</b></p> <p>Since the takeover by HIL no external dumping is being done OB generated annually is being backfilled in de-coaled area.</p> <p>Slope stability study has been carried out by CSIR, Central Institute of Mining &amp; Fuel Research Dhanbad on November 2020 – A copy of report is attached as <b>Annexure - 15.</b></p> <p>The ultimate slope of the dump is maintained within 28° and dumps are stabilized. Monitoring and management of reclaimed dump site is continuing and will continue until the vegetation becomes self – sustaining.</p> <p>Now Raipur, Integrated Regional Office is looking after EC monitoring &amp; compliances. Full co – operation has been extended to Regional Officer by furnishing requisite data information / monitoring reports.</p>
xxii	Adequate numbers of sprinklers should be provided on both the side of road to minimize pollution.	<p style="text-align: center;"><b>Being Complied.</b></p> <p>Regular Water sprinkling on haul road is practiced through truck mounted water sprinklers to prevent the fugitive dust emission. Also installed the fixed type of water sprinklers to control the fugitive dust emission in the mine area.</p> <p>Photographs of truck mounted water sprinklers &amp; fixed type of water sprinklers at GP IV/4 Coal Mines attached as <b>Annexure – 16</b></p> <p>The latest fugitive dust emission monitoring report for the month of September 2022 is attached as <b>Annexure – 16A.</b></p>
xxiii	Catch drains and siltation ponds of appropriate size should be constructed to arrest silt and sediment flows from soil, OB and mineral dumps. The water so collected should be utilized for watering the mine area, roads, green belt development etc. The	<p style="text-align: center;"><b>Being Complied.</b></p> <p>Catch drains are constructed to collect and drain water to sumps and ponds. Catch drains are provided with check dams to arrest slit and maintained properly.</p> <p>Compliance same as Specific Condition No. X)</p>



	<p>drains should be regularly desilted and maintained properly. Garland drains (size, gradient, length,) and sump capacity should be designed 50 % safety margin over and above the peak sudden rainfall and maximum discharge in the area adjoining the mine site.</p> <p>Sump capacity should also provide adequate retention period to allow proper settling of silt material.</p>	<p>The store water is used for spraying / sprinkling on haul roads and also for greenbelt development.</p> <p>Garland drains are constructed to arrest discharge and runoff with slit and sedimentation surging into areas adjoining the periphery of OB dump.</p> <p>HIL Constructed/Provided settling ponds:</p> <p>02 nos of additional settling pond of size (50m X 40m X 5.0 m) for proper settling of mine seepage water generated from mining activities from Patch “B” before discharge for the agriculture purpose (Photograph is attached as <b><u>Annexure – 17</u></b>)</p> <p><b>Also installed the Continuous Online Effluent Quality monitoring system at outlet point of the settling pond for real time monitoring of Environmental Quality parameters i.e. pH, TSS, COD, BOD &amp; Temperature (Photograph is attached as <u>Annexure – 17A</u>)</b></p>
xxiv	<p>Dimension of retaining wall at the toe of the dumps and OB benches within the mine to check run –off and siltation should be based on rain fall data.</p>	<p style="text-align: center;"><b>Being Complied.</b></p> <p>In the 1st Phase we have constructed approx. 55 mtr. long gabion/retaining wall at the toe of permanent dump slope near Patch “C” in Banjikhoh, GP IV/4 Coal Mines.</p> <p>The Gabion /retaining walls had been made of GI wire net cages filled with stone boulders and anchored with angle iron as per specification. Gabions provide vertical support to the bottom of the slope and help against sliding. Those also protect the toe of the reshaped OB dump.</p> <p>We would also like to inform you that we have taken gabion/retaining wall construction activity at the toe of the OB dump as a continuous process &amp; ensure you that it will be carried out as &amp; when required in future also at mine site.</p> <p>The progress report in this regard has been submitted to IRO – MoEF &amp; CC Raipur dated 11/11/2022.</p>

xxv	Water sprinkling system (mist spray type) shall be provided to check fugitive emission from conveyor system, haulage roads and transfer points.	<b>Being Complied.</b> Water sprinkling arrangement has been maintained at all haul roads, loading and unloading points to minimize the fugitive dust emission. The latest fugitive dust emission monitoring report for the month of September 2022 is enclosed above.
xxvi	Fixed sprinkler shall be installed at pit top truck loading hoppers in all the three mines, siding for dust control during coal loading. Adequate numbers of sprinklers should be provided on both the sides of road to minimize dust pollution.	<b>Being Complied.</b> As per requirement, fixed type water sprinklers as well as truck mounted water sprinklers has been provided in the mines and other places.
xxvii	Drills should be wet operated only.	<b>Being Complied.</b> In coal mining wet drilling is under practice.
xxviii	An action plan for mine closure with details of area, depth, voids and details of abandoned mine should be submitted to the Ministry.	<b>Complied.</b>
xxix	Controlled blasting should be practiced with use of delay detonators. The mitigative measures for control of ground vibrations and to arrest the fly of rocks and boulders should be implemented.	<b>Being Complied.</b> Controlled blasting is practiced with use of delay detonators. Ground vibration generated due to the blasting is measured by seismographs regularly. The permissible limit for the ground vibration with respect to the structures is strictly followed. Measures are taken to minimized ground vibrations. Blasting is done during day time only.
xxx	Transportation shall be by covered trucks of higher capacity (25 –tons) and loading shall be by siding. Mechanically covered trucks should be provided for transportation of coal.	<b>Being Complied.</b> Gare Palma IV/4 Coal Mine: a) Underground part of the Coal Mine: The production of coal has been suspended from the Underground portion of Gare Palma IV/4 coal mine since June 2019. b) Opencast part of the Coal Mine: Right now coal is being produced only from the Opencast mine and we would like to inform you that since the transport of coal started from the Gare Palma IV/4, HIL has taken effective steps to ensure zero dust emission/spillage by adopting following means: i. Water Sprinkling: To prevent the fugitive dust generation in the coal mine area Regular Water sprinkling

		<p>on haul road is practiced through mobile water sprinklers for the purpose.</p> <p>Fixed type of water sprinklers are also installed in this regard. (Photographs of truck mounted water sprinklers &amp; fixed type of water sprinklers at GP IV/4 Coal Mines attached as enclosed above. ii. Tarpaulin Covering of Trucks: Each and every coal transport trucks is being properly/completely covered by Tarpaulin before dispatch. iii. Sealing / Lock: Each and every coal transport trucks is being properly covered &amp; sealed with the use of plastic / wire seals to avoid uncovering of tarpaulin in the route. (Photographs attached as <b>Annexure - 18</b>) iv. CCTV cameras have been installed in the truck parking yard and the details are being captured and records are being maintained for every previous 30 days. HIL has submitted the reply with respect to this particular condition to the CECB dated 06.01.2022. Attached a submitted copy of letter as <b>Annexure - 19</b></p>
xxxii	<p>Area brought under afforestation from the three mines shall be by planting native species in consultation with local DFO/Agriculture Department. The density of the trees should be around 2500 plants per ha.</p>	<p><b>Being Complied.</b></p> <p>Planation in the mine area is being carried out @2500 plant/ha. <b>Total 111821 nos.</b> local plants species have been planted till date including OB dump area. Plant Species i.e. Saja, Siris, Shisham, Yellow flametree, Kassod, Satvan, Acacia Mangium, Ganga Emli, Arjuna, Chirol, Gliricidia, Amla, Mango, guava, Kathal, Neem, Pipal, Ficus sp., Peltafarm, Nilgiri, Casia Samia, Gulmohar, Acacia Coliformis, Jamun, Kachnar, Baheda, Kachnar, Mahua &amp; Saal etc. in consultation with DFO.</p>
xxxiii	<p>Extensive plantation should be done near agriculture area to avoid coal dust pollution which may affect the productivity of crop.</p>	<p><b>Being Complied.</b></p> <p>Extensive plantation near agriculture land along road side is being done and will be done in future to avoid coal dust pollution which may affect the productivity of crop.</p>
xxxiiii	<p>Mine discharge water shall be treated to meet the prescribed standards before discharge into the natural water course/agriculture. The quality of water discharge shall be monitored at the outer point and proper records maintained thereof and uploaded regularly on the company website.</p>	<p><b>Being Complied.</b></p> <p><b>a) At Banjikhhol Mine (GP IV/4):</b></p> <p>03 nos of Settling ponds with chemical dosing arrangement and sump with adequate capacity (for sedimentation) has been provided for the mine seepage water treatment before discharge for the agriculture purpose. The treated water quality analysis report from <b>April 2022 to September 2022</b> is enclosed as <b><u>Annexure No.- 20.</u></b></p> <p>Photographs of Treatment Facility enclosed above.</p>

		<p>Also HIL constructed an additional settling pond of size 30m X 10m X 1.5m (01Nos) to collect whole mine seepage water generated during the mining activities from Patch “C” specially in the rainy season for proper settling of mine seepage water before discharge <b>(Photograph enclosed above)</b></p> <p><b>At Bankheta Mine (GP IV/4):</b>  At Bankheta, HIL constructed 02 nos of additional settling pond of size (50m X 40m X 5.0 m) for proper settling of mine seepage water generated from mining activities from Batch “B” before discharge for the agriculture purpose <b>(Photograph enclosed above)</b></p> <p>The treated water quality analysis reports are being periodically furnished to CECB &amp; uploaded regularly on the company website.</p> <p>Also installed 01 nos of COEQMS (Continuous Online Effluent Quality Monitoring System) at Bankheta, (At outlet of Siltation Pond No. 2) for real time monitoring of environmental quality parameters i.e. COD, BOD, TSS, PH &amp; Temperature before discharge for the agriculture purpose <b>(Photograph enclosed above).</b></p>
xxxiv	No ground water shall be used for mining activities; additional water required if any shall be met from mine water or by recycling /reuse of water from existing activities and from rainwater harvesting measures. The project authority shall meet water requirement of nearby village (s) in case the village wells go dry to dewatering of mine.	<p style="text-align: center;"><b>Being Complied.</b></p> <p>For the mining activity only mine seepage water is being used after chemical dosing in settling ponds. To meet the water requirement of nearby villages company is providing treated water through pipeline/ drains and other mode for domestic (Non Drinking) and irrigation purpose.</p>
xxxv	Regular monitoring of groundwater level and quality of the study area shall be carried out by establishing a network of existing wells and construction of new peizometers. The monitoring for quality shall be done four times a year in pre-monsoon (May),	<p style="text-align: center;"><b>Being Complied.</b></p> <p>Regular monitoring of groundwater level and quality of the area is being carried out by establishing a network of existing wells/Piezometers. The Ground water level <b>(from April 2022 to September 2022)</b> and quality Monitoring report of <b>Pre - Monsoon (May 2022)</b> and <b>Monsoon (August 2022)</b> is attached as <b><u>Annexure – 21</u></b></p>

	<p>Monsoon (August) Post- monsoon (November), and winter (January) seasons and for quality including Arsenic and Fluoride during the month of May. Data thus collected should be submitted to the Ministry of Environment &amp; Forests and to the Central Pollution Control Board /SPCB quarterly within one month of monitoring. Rain water harvesting shall be undertaken in case monitoring of water table indicates a declining trend.</p>	<p>Non-working mine pit has been developed as rain water harvesting structure in the mines.</p> <p>Quarterly monitoring report of Ground Water Level (from April 2022 to June 2022) and (from July 2022 to September 2022) &amp; GW Quality Monitoring for the month of <b>Pre - Monsoon (May 2022)</b> and <b>Monsoon (August 2022)</b> has been submitted to MoEF &amp; CC, CPCB and CECB on quarterly within one month of monitoring basis. Attached as <b><u>Annexure – 21A.</u></b></p>
xxxvi	<p>Regular monitoring of subsidence movement on the surface over and around the working area and impact on natural pattern, water bodies, vegetation, structure, roads and surroundings should be continued till movement ceases completely. In case of observation of any high rate of subsidence movement, appropriate effective corrective measures should be taken to avoid loss of life and material. Cracks should be effectively plugged with ballast and clayey soil/suitable material.</p>	<p><b>Being Complied.</b></p> <p>In Gare Palma IV/4 coal mine: the method of underground coal mining is Board &amp; Pillar. Regular monitoring of subsidence movement on the surface over and around the working area and impact on natural pattern, water bodies, vegetation, structure, roads and surroundings is being done by internal expert team. During the observation no any subsidence movement has been observed. In future, if any subsidence movement, occurred then appropriate effective corrective measures will be taken to avoid loss of life and material. Cracks will be effectively plugged with ballast and clayey soil/suitable material.</p> <p>The subsidence study was already carried out for working panel by CSIR – Central Institute of Mining &amp; Fuel Research Dhanbad in March 2019 for GP IV/4 Coal mines.(attached a copy as <b>Annexure - 22</b>)</p>
xxxvii	<p>Sufficient coal pillars shall be left un-extracted around the airshaft (within the subsidence influence area) to protect from any damage from subsidence, if any.</p>	<p><b>Being Complied.</b></p> <p>Sufficient coal pillars have been will be left un-extracted around the airshaft (within the subsidence influence area) to protect from any damage from subsidence.</p>
xxxvii i	<p>High root density tree species shall be selected and planted over areas likely to be affected by subsidence.</p>	<p><b>Being Complied.</b></p> <p>High root density tree species will be selected and planted over areas likely to be affected by subsidence as required.</p>
xxxix	<p>Depression due to subsidence resulting in water accumulating</p>	<p><b>Being Complied.</b></p>

	within the low lying areas shall be filled up or drained out by cutting drains.	As of now depression due to subsidence is not observed. In future if such depression gets observed resulting in water accumulating , the same will be filled up or drained out by cutting drains, if any
xi	Solid barriers shall be left below the village, roads falling within the blocks to avoid any damage to the roads.	<b>Being Complied.</b> Solid barriers is left below the village, roads falling within the blocks to avoid any damage to the roads as per statute.
xli	No depillaring operation shall be carried out below the roads and habitation area found within the lease.	<b>Being Complied.</b> No depillaring operation will be carried out below the roads and habitation area found within the lease.
xlii	The proponent shall ensure to undertake and provide the costs incurred for taking up remedial measures in case of soil.	<b>Being Complied.</b> Cost incurred for taking remedial measures in case of soil will be borne by the company.
xliii	Extensive plantation should be done near agriculture area to avoid coal dust pollution which may affect the productivity of crop.	<b>Being Complied.</b> Extensive planation along road side has been done near the agriculture area to avoid coal dust pollution which may affect the productivity of crop.  The same will be continue in other areas also.
xliv	ETP shall be provided for workshop, CHP, if any. Effluent shall be treated to confirm to prescribe standards in case discharge in to any water course outside the lease. The quality of water discharged shall be monitored at the outer point and proper records maintained thereof and uploaded regularly on the company website.	<b>Being Complied.</b> Water treatment facility has been provided in mines for the seepage water treatment. The quality of treated water is being monitored. The water quality analysis report is already enclosed.  Also HIL constructed/provided the Effluent Treatment Plant of capacity 50 m3/Day. at Bankheta GP IV/4 to treat the waste water generated from Dumper/HEMM washing bay and treated water is being reused again in dumper/HEMM washing, Dust suppression & Greenbelt development.  The treated water quality analysis reports are being periodically furnished to CECB & uploaded regularly on the company website.
xlv	A detailed plan for CSR with specific budgetary allocation (capital and revenue) for various skill development and alternate	<b>Being Complied.</b> Rs. 5/- per ton of coal produce is being utilized for CSR activities under the guidance of District

	<p>livelihood programmes and schemes shall be implemented and the impacts activities under CSR monitored based on in a scientific methodology. An amount of Rs. 5 per tonne of coal produced with escalation factor shall be utilized for the CSR activities for the adjoining villages for the balance life of project apart from one time capital expenditure. The details of CSR undertaken along with budgetary provisions for the village wise various activities and expenditure thereon shall be uploaded on the company website every year. CSR Audit should be carried conducted annually.</p>	<p>Collector, Raigarh. CSR Expenditure detail is attached as enclosed above.</p>																																								
xlvi	<p>A special corpus fund either at company level or in CIL/MOC be provided for the reclamation of abandoned and degraded areas.</p>	<p style="text-align: center;"><b>Being Complied.</b></p> <p>Escrow account has been opened for the reclamation of abandoned and degraded areas in the mine lease till date (March 2022) <b>Rs 1044.56</b> lakhs has been deposited.</p> <p>Escrow account has been opened for the reclamation of abandoned and degraded areas in the mine lease till date (March 2022) Rs 1044.56 lakhs has been deposited.</p> <table border="1" data-bbox="743 1192 1416 1852"> <thead> <tr> <th colspan="4" style="text-align: center;"><b>Escrow- GP IV/4</b></th> </tr> <tr> <th style="text-align: center;"><b>Financial Year</b></th> <th style="text-align: center;"><b>Year</b></th> <th style="text-align: center;"><b>Amount (Rs Lakh)</b></th> <th style="text-align: center;"><b>Reamrks</b></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">2015-16</td> <td style="text-align: center;">1</td> <td style="text-align: center;">151.50</td> <td style="text-align: center;">Deposited</td> </tr> <tr> <td style="text-align: center;">2016-17</td> <td style="text-align: center;">2</td> <td style="text-align: center;">159.08</td> <td style="text-align: center;">Deposited</td> </tr> <tr> <td style="text-align: center;">2017-18</td> <td style="text-align: center;">3</td> <td style="text-align: center;">167.05</td> <td style="text-align: center;">Deposited</td> </tr> <tr> <td style="text-align: center;">2018-19</td> <td style="text-align: center;">4</td> <td style="text-align: center;">0</td> <td style="text-align: center;">Deposited</td> </tr> <tr> <td style="text-align: center;">2019-20</td> <td style="text-align: center;">5</td> <td style="text-align: center;">19.19</td> <td style="text-align: center;">Deposited</td> </tr> <tr> <td style="text-align: center;">2020-21</td> <td style="text-align: center;">6</td> <td style="text-align: center;">267.19</td> <td style="text-align: center;">Deposited</td> </tr> <tr> <td style="text-align: center;">2021-22</td> <td style="text-align: center;">7</td> <td style="text-align: center;">280.55</td> <td style="text-align: center;">Deposited</td> </tr> <tr> <td style="text-align: center;"><b>Total</b></td> <td></td> <td style="text-align: center;"><b>1044.56</b></td> <td></td> </tr> </tbody> </table>	<b>Escrow- GP IV/4</b>				<b>Financial Year</b>	<b>Year</b>	<b>Amount (Rs Lakh)</b>	<b>Reamrks</b>	2015-16	1	151.50	Deposited	2016-17	2	159.08	Deposited	2017-18	3	167.05	Deposited	2018-19	4	0	Deposited	2019-20	5	19.19	Deposited	2020-21	6	267.19	Deposited	2021-22	7	280.55	Deposited	<b>Total</b>		<b>1044.56</b>	
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		Attached a deposited copy as <b>Annexure – 23.</b>
xlvi	For monitoring land use pattern and for post mining land use, a time series of land use, maps, based on satellite imagery (on a scale of 1: 5000) of the core zone and buffer zone, from the start of the project until end of mine life shall be prepared once in the three years (for any one particular season which is consistent in the time series). And the report submitted to MOEF and its regional office at Bhopal. The post mining land use shall be that out of the total 701.512 ha area, 57.73 ha area will be under plantation. 319.65 Ha area for public use, 324.132 ha area shall be undisturbed.	<b>Complied.</b> Report on Assessment of Land Use / Land Cover using High Resolution Satellite Imagery for the GP Mine IV/4 Coal Mine was carried out by IndiGEO Consultants, Bangalore in the month of December 2019 and the report was submitted to MoEF & CC Nagpur, Regional office dated 27 May 2020 & IRO – MoEF & CC dated 08/08/2022. The same is attached as <b>Annexure – 24.</b>
xlvi	A Final Mine closure plan along with a plan for habitat restoration and with details of corpus Fund shall be submitted to the Ministry of Environment & forest five years before mine closure for approval. The species selected for habitat restoration for post mining and shall include a specific plan for development of agro forestry using a mix native species found in the study area.	<b>Being Complied.</b> A Final Mine closure plan along with a plan for habitat restoration and with details of corpus Fund will be submitted to the Ministry of Environment & forest five years before mine closure for approval. The mix species will be selected for habitat restoration as per the conditions set out herewith.
xlvii	A special corpus fund either at company level or in CIL/MOC be provided for reclamation of abandoned and degraded area.	<b>Being Complied.</b> Escrow account has been opened for the reclamation of abandoned and degraded areas in the mine lease. Complied as same condition no -xlvii
1.	The possibility of sand stone, wherever is present in the OB as per lithology report, be explored	<b>Being Complied.</b> As per availability the sand stone is being provided to the locals free of cost.



	and be provided to locals free of cost.	
ii	After extraction of coal is completed, the OB left will be completely rehandled and backfilled the voids. This will be achieved by rehandling of OB Dumps in the area. Contamination of ground water and surface water and occupational and other diseases due to the mining operation.	<b>Being Complied.</b> After extraction of coal is completed, the OB dump created by Hindalco if any will be re-handled and backfilled into the voids as per mine closer plan to the extent possible.
lii	Corporate Environment Responsibility: a)The company shall have a well laid down Environment Policy approved by the Board of Directors. b)The Environment Policy shall prescribe for standard operating process/ procedures to bring into focus any infringements/deviation/violation of the environmental of forest norms/conditions. c)The hierarchical system or administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions shall be furnished. To have proper checks and balances, the company shall have a well laid down system of reporting of no-compliances/ violations of environmental norms to the Board of Directors of the company and /or shareholders at large.	<b>Being Complied.</b> The company has an Environmental policy duly signed by the Managing Director on Board. The environmental policy governs the SOPs for compliance of the stipulations within the frame work of regulatory requirements of environment / Forest Norms. There is compliance monitoring system is in place to take care of alert / reporting of compliance / non compliances of the regulatory requirements to the Mines Head & Head office (Compliance Committee). A copy of Environment policy is attached as <b>Annexure – 25</b> (already submitted to IRO – MoEF & CC, Raipur, dated 08/08/2022 )
<b>General Conditions</b>		
i	No change in mining technology and scope of working should be made without prior approval of the ministry of Environment & Forest.	<b>Noted</b>

ii	No change in the calendar plan for quantum of mineral coal and waste should be made.	<b>Noted</b>
iii	Four ambient air quality monitoring stations shall be established in the core zone as well as in the buffer zone for PM10, PM2.5, SO2, and NOx monitoring. Location of the stations shall be decided based on meteorological data topographical features and environmentally and ecologically sensitive targets in consultation with the state pollution Control Board. Monitoring heavy metals such as Hg, As Ni, Cd, Cr, etc. carried out at least once in six months.	<p><b>Being Complied.</b></p> <p>Four ambient air quality monitoring stations (Core Zone) &amp; Four ambient air quality monitoring stations (Buffer Zone) have been established and regular monitoring is being carried out. Reports are being periodically furnished to CECB. Copy of AAQ Monitoring Report from the period April 2022 to September 2022 is enclosed as <b><u>Annexure – 26.</u></b></p> <p>Also installed 01 nos of <b>CAAQMS</b> (Continuous Ambient Air Quality Monitoring System), at Mine lease boundary towards the village for real time monitoring of environmental quality parameters i.e. PM 2.5, PM 10, NO, NO2, NOX, SO2, CO photograph enclosed as <b><u>Annexure – 26A</u></b></p>
iv	Data on Ambient air quality (PM10, PM 2.5, SO2, NOX) monitoring location of the stations shall be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the state Pollution Control Board. Monitoring of heavy metals such as Hg, As, Ni, Cd, Cr etc. carried out at least once in six months.	<p><b>Being Complied.</b></p> <p>All AAQM stations are decided based on the on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the state Pollution Control Board. Monitoring of heavy metals such as Hg, As, Ni, Cd, Cr etc. carried out once in six months.</p> <p>Heavy metals Monitoring report for the month of September 2022 is attached as <b><u>Annexure – 27</u></b></p>
v	Adequate measures shall be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in blasting and drilling operation of HEMM, etc should be provided with ear plugs/muffs.	<p><b>Being Complied.</b></p> <p>Ear muffs/plugs has been provided to the all workers engaged in blasting and drilling operations. The Noise monitoring report period <b>April 2022 to September 2022</b> is enclosed as <b><u>Annexure-28</u></b></p>
vi	Industrial wastewater (workshop and wastewater from the mine) should be properly collected treated so as to conform to the standards under prescribed GSR 422 (E) dated 19 <sup>th</sup> May 1993 and	<p><b>Being Complied.</b></p> <p>HIL constructed/provided the Effluent Treatment Plant of capacity 50 m3/Day at GP IV/4 to treat the waste water generated from Dumper/HEMM washing bay and treated water is being reused again</p>

	31 <sup>st</sup> December 1993 or as amended from time to time before discharge. Oil and grease trap should be installed before discharge of workshop effluents.	<p>in dumper/HEMM washing, Dust suppression &amp; Greenbelt development.</p> <p>Photograph of Effluent Treatment Plat is attached as <b><u>Annexure – 29</u></b></p> <p>The treated water quality analysis reports are being periodically furnished to CECB.</p> <p>Copy of Analysis Report (Inlet &amp; Outlet) for the month of from April 22 to September 2022 is enclosed as <b><u>Annexure – 30</u></b></p>
vii	Vehicular emission should be kept under control and regularly monitored. Vehicles used for transporting the mineral should be covered with tarpaulins and optimally loaded.	<p><b>Being Complied.</b></p> <p>Regular monitoring of vehicular emission is being done and it is under control. The PUC certificate has been ensured for all the vehicles engaged in transportation of minerals. Records are being maintained (Latest PUC Certificates (From April 22 to September 2022) is attached as <b><u>Annexure - 31</u></b>)</p>
viii	Monitoring of Environmental quality parameters shall be carried out through establishment of adequate number and type of pollution monitoring and analysis equipment in consultation with the state pollution control board and data got analyzed through a laboratory recognized under EPA Rules,1986.	<p><b>Being Complied.</b></p> <p>Environmental monitoring is being carried out through CECB &amp; MoEF &amp; CC approved &amp; NABL accredited Laboratory i.e. Ultimate Enviroltycal Solutions Raipur.</p> <p>Approval letter of Monitoring Agency from CECB Raipur, MoEF &amp; CC &amp; NABL accredited Laboratory certificate is attached as <b><u>Annexure – 32</u></b></p>
ix	Personnel working in dusty area shall wear protective respiratory devices and they shall also be provided with adequate training and information on safety and health aspect.	<p><b>Being Complied.</b></p> <p>Personnel working in dusty areas are provided with protective respiratory devices and they have also been provided with adequate training and information on safety and health aspect.</p>
x	Occupational health surveillance programme of the workers shall be undertaken periodically to observe any contractions due to exposure to dust and to take corrective	<p><b>Being Complied.</b></p> <p>Occupational health surveillance is undertaken as per DGMS guidelines.</p> <p>Occupational health surveillance report is attached as <b><u>Annexure – 33.</u></b></p>

	measures, if needed and records maintained thereof.	
xi	A separate environment management cell with suitable qualified personnel shall be set up under the control of a senior Executive, who will report directly to the head of the company.	<b>Being Complied.</b> A separate Environmental Management Department is functioning at Coal Mine under the direct control of a senior executive. EMD organization Chart is attached as <b>Annexure – 34.</b>
xii	The funds earmarked for environmental protection measures shall be kept in separate account and shall not be diverted for other purpose. Year-wise expenditure shall be reported to this ministry and it's Regional Office at Bhubaneswar.	<b>Being Complied.</b> The funds earmarked for environmental protection measures has been budgeted separately and not been diverted for other purposes. Environmental Expenditure details from <b>April 2022 to September 2022</b> is Enclosed as <b>Annexure – 35.</b> Now Raipur Regional Office is looking after EC monitoring & compliances full co – operation has been extended to Regional Officer by furnishing requisite data information / monitoring reports
xiii	The project authority shall advertise at least in two local newspapers widely circulated around the project, one of which shall be in the vernacular language of the locality concerned within seven days of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State pollution control Board and may also be seen at the website of the ministry of environment & forest at <a href="https://envfro.nic.in">https://envfro.nic.in</a> .	<b>Complied.</b>
xiv	A copy of environmental clearance letter shall be marked to concern panchayat / Zila Parishad, Municipal Corporation or Urban local body and local NGO, if any., from whom any suggestion /representation has been received while processing the proposal. A copy of the clearance letter shall	<b>Complied.</b> A copy of environmental clearance letter has been marked to concern panchayat / Zila Parishad, Municipal Corporation or Urban local body and local NGO & The EC documents are uploaded on the company's website. The status of the environmental parameters is displayed at the main gate.

	also be displayed on company's website.	
xv	A copy of environmental clearance letter shall also be displayed on the website of the concerned State Pollution Control Board. The EC letter shall also be displayed at the regional office, District Industry Sector and Collector's office/Tehsildar's office for 30 days.	<b>Complied.</b> <b>A copy of Environmental Clearance has been circulated to Panchayat and SPCB, Regional office, District Industry Office and Collector Office/Tehsildar Office.</b>
xvi	The Clearance letter shall be uploaded on the company's website. The compliance status of the stipulated environmental clearance conditions shall be uploaded by the project authorities on their website and uploaded at least once every six months so as to bring the same in public domain. The monitoring data of environmental quality parameter (Air, Water, noise and soil) and critical pollutant such as PM10, PM2.5, SO2, and NO2 (Ambient) and critical sectoral parameters shall also be displayed at the entrance of the project premises and mine office and in corporate office and on company's website	<b>Complied.</b> Upload the EC Clearance letter & Half yearly compliance report on the company's website i.e. <a href="http://www.hindalco.com/sustainability/regulatory-compliances">http://www.hindalco.com/sustainability/regulatory-compliances</a> and also displayed the monitoring data of environmental quality parameter (Air, Water, noise and soil) and critical pollutant such as PM10, PM2.5, SO2, and NO2 at the entrance of the mine gate.
xvii	The project proponent shall submit six monthly compliance reports on status of compliance of the stipulated environmental clearance conditions (Both in hard copy and in e- mail) to the respective Regional Office of the Ministry, Respective Zonal officer's of CPCB and the SPCB. Compliance of the EC conditions be monitored by the MoEF and other concerned agencies.	<b>Complied.</b> The last Half Yearly Compliance report for the period from <b>October 2021 to March 2022</b> was submitted to IRO - MoEF & CC office, Raipur & Delhi, CECB Raigarh & Raipur, CPCB Bhopal & Delhi dated 20.05.2022.

xviii	The Regional Office of this ministry located at Bhubaneswar shall monitor compliance of the stipulated conditions. The Project authorities shall extend full cooperation to the office (s) of the Regional Office by furnishing the requisite data / information/ monitoring reports.	<b>Complied.</b>  Now Raipur, Integrated Regional Office is looking after EC monitoring & compliances full co – operation has been extended to Regional Officer by furnishing requisite data information / monitoring reports
xix	The Environmental Statement for each financial year ending 31 March in Form –V is mandated to be submitted by the project proponent for the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently shall be uploaded on the company’s web site along with the status of compliance of EC conditions and shall be sent to the respective Regional Officers of the MoEF & CC by E- mail	<b>Complied.</b>  Submitted the Environmental Statement Report (In Form - V) for the FY 2021 -22 to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, dated 03.09.2022 and also uploaded in the company’s website also E-mailed the EC Compliance report to IRO -MoEF & CC Raipur.
5	The Ministry or other competent authority may stipulated any further condition for environmental Protection.	<b>Noted.</b>
6	Failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract the provisions of the Environmental (Protection) Act, 1986	<b>Noted.</b>
7	The above condition will be enforced inter - alia, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, The Air (Prevention & Control of Pollution) Act, 1981, The Environmental Protection Act 1986, and the Public Liability Insurance Act, 1991 along with their amendments and Rules, The	<b>Noted.</b>

	proponent shall insure to undertake and provide for the costs incurred for taking up remedial measures in case of soil contamination, contamination of ground water and surface water, and occupational and other diseases due to the mining operations.	
8	The Environmental Clearance is subjected to the outcome of the case filed by Chhattisgarh Environmental Conservation Board, in the court of Chief Judicial Magistrate, Raigarh, which is pending.	<b>Noted.</b>

# Annexure-1



J-11015/183/2010-IA-II(M)  
Government of India  
Ministry of Environment, Forest and Climate Change  
IA Division

Indira Paryavaran Bhawan,  
Jorbagh Road, N Delhi-3  
Dated: 24<sup>th</sup> May, 2019

To,

The Assistant Vice-President (Corporate-Affairs)  
M/s Hindalco Industries Limited,  
Aditya Birla Centre, 3<sup>rd</sup> Floor,  
B wing, S.K. Ahire Marg, Worli,  
**Mumbai** - 400030 (Maharashtra) E-mail: corporateaffairs@adityabirla.com

**Sub: Gare-Palma IV/4 Coal Block of capacity 1 MTPA of M/s Hindalco Industries Limited located in District Raigarh (Chhattisgarh) - Amendment in Environmental Clearance - reg.**

Sir,

This is with reference to your online proposal No.IA/CG/CMIN/7679/2010 dated 25<sup>th</sup> January, 2019 on the above-mentioned subject.


2. The Ministry of Environment, Forest and Climate Change has granted environmental clearance vide letter dated 12<sup>th</sup> March, 2013 in favour of M/s Jayaswal Neco Industries to Gare-Palma IV/4 Coal Block of production capacity 1 MTPA (0.6 MTPA Underground & 0.4 MTPA Opencast) in mine lease area of 701.512 ha located in District Raigarh (Chhattisgarh).
3. Subsequent to cancellation of coal blocks pursuant to order of Hon'ble Supreme Court in August/September, 2014 and their reallocation to successful bidders, Gare-Palma IV/4 coal block was vested with M/s Hindalco Industries Limited vide Allotment Order No.104/16/2015/NA dated 23<sup>rd</sup> March, 2015 issued by the Nominated Authority in the Ministry of Coal. The said environmental clearance was accordingly transferred to M/s Hindalco Industries Limited vide this Ministry's letter dated 16<sup>th</sup> April, 2015.
4. M/s Hindalco Industries Limited has sought amendment in the said environmental clearance for change in mining operations (Underground from 0.6 to 0.44 MTPA and Opencast from 0.4 to 0.56 MTPA) with the total capacity remains at 1 MTPA in the same mine lease area of 701.512 ha. Revised Mining Plan has the approval of Ministry of Coal vide letter dated 13<sup>th</sup> December, 2018.
5. The EAC, in its meeting held on 21<sup>st</sup> February, 2019, has recommended the proposed amendment for change in mining operations, and thus amendment in the environmental clearance dated 12<sup>th</sup> March, 2013, read with communication dated 16<sup>th</sup> April, 2015, with all other conditions stipulated therein remaining the same. With the proposed restructuring, mining operations would be revised as under:-

Mining method	Proposed Production Capacity
Opencast	0.56 MTPA (Increase by 0.16 MTPA)
Underground	0.44 MTPA (Decrease by 0.16 MTPA)

*SD*

6. Based on recommendations of the EAC, Ministry of Environment, Forest and Climate Change hereby accords approval for amendment in environmental clearance dated 12<sup>th</sup> March, 2013, read with communication dated 16<sup>th</sup> April, 2015, to Gare-Palma IV/4 Coal Block of M/s Hindalco Industries Limited located in District Raigarh (Chhattisgarh), to effect change in mining operations as stated in para 5 above, with the total capacity remains at 1 MTPA in the same mine lease area of 701.512 ha.

7. All other conditions stipulated in environmental clearance granted vide letter dated 12<sup>th</sup> March, 2013, read with communication dated 16<sup>th</sup> April, 2015, shall remain unchanged.

  
24/5/2019  
**(S. K. Srivastava)**  
**Scientist E**

**Copy to:**

1. The Secretary, Ministry of Coal, New Delhi
2. The Secretary, Department of Environment & Forests, Government of Chhattisgarh, Secretariat, Raipur
3. The Chief Conservator of Forests, Regional office (EZ), Ministry of Environment & Forests, E-2/240 Arera Colony, Bhopal - 462016
4. The Member-Secretary, Central Ground Water Authority, Ministry of Water Resources, Curzon Road Barracks, A-2, W-3 Kasturba Gandhi Marg, New Delhi
5. The Member Secretary, Central Pollution Control Board, CBD-cum-Office Complex, East Arjun Nagar, Delhi - 32
6. The Member Secretary, Chhattisgarh State Environment Conservation Board, 1-Tilak Nagar, Shiv Mandir Chowk, Main Road, Avanti Vihar, Raipur- 492001(Chhattisgarh)
7. The District Collector, Raigarh, Government of Chhattisgarh
8. Monitoring File                      9. Guard File                      10. Record File

# Annexure-2



Ref. No. HIL/GP-IV-4/CCO/2022-23/161

Dated: 03.10.2022

To,  
The Coal Controller,  
Office of the Coal Controller,  
Ministry of Coal,  
Government of India,  
1, Council House Street,  
Kolkata-700001.

Sub: Statistical Return for the month of September-2022 of Gare Palma IV/4 Coal Mine.

Sir,

Enclosed please find the Statistical Return for the month of September-2022 of Gare Palma-IV/4 Coal Mine.

This is for your kind information please.

Thanking you,

Yours sincerely,

  
2/10/22

Mine Manager  
Gare Palma-IV/4 Coal Mine  
Banjikhola, Raigarh (CG).



Encl.: as above.

Copy to: OSD, CCO, Bilaspur.

**Hindalco Industries Limited**

Gare Palma Mines ( IV/4 & IV/5), Vill & Po: Milupara, Tehsil: Tamnar Dist: Raigarh- 496107, Chhattisgarh  
T: +91 7762 228212, Website : www.hindalco.com E mail : hindalco@adityabirla.com  
Registered Office : Ahura Centre, 1st Floor, B Wing, Mahakali Caves Road Andheri (East) , Mumbai 400093, India  
T: + 912266917000 | Fax: + 912266917001



**Statistical return for the month of September -2022.**

- 1 Name of the Coal Company :- Gare Palma IV/4 Coal Mine, M/s Hindalco Industries Limited.
- 2 Contact Name with Designation & Telephone No. :- Deepak Prasad Lenka (Mines Manager), Mob.No.9111006023
- 3 Coal Consuming sector :- Captive Power Plant

**Table-1: Production of Raw Coal, Clean Coal and Middling etc.**

Coal Type	Production (In Thousand Tonnes)					
	During Month			Progressive (F.Y. 2022-23)		
	Opencast	Underground	Total	Opencast	Underground	Total
Coking	-	-	-	-	-	-
Non Coking	50.057	0.000	<b>50.057</b>	356.010	0.000	<b>356.010</b>
Total Raw Coal	50.057	0.000	<b>50.057</b>	356.010	0.000	<b>356.010</b>
Clean Coal	-	-	-	-	-	-
Middlings	-	-	-	-	-	-
Rejects	-	-	-	-	-	-

**Table 2 : Despatch of Raw Coal, Clean Coal and Middling etc.**

Coal Type	Despatch (In Thousand Tonnes)		Mode of Despatch (In Thousand Tonnes)			
	During Month	Progressive (F.Y. 2022-23)	Rail	Road	Others	Total
Coking	-	-	-	-	-	-
Non Coking	56.21761	365.29213	0.00000	56.21761	-	56.21761
Total Raw Coal	56.21761	365.29213	0.00000	56.21761	-	56.21761
Clean Coal	-	-	-	-	-	-
Middlings	-	-	-	-	-	-
Rejects	-	-	-	-	-	-

\* Domestic Consumption - Nil

**Table 3 : Pit Head Closing Stock of 30.09.2022**

Coal Type	Pit Head Closing Stock (In Thousand Tonnes)
	During Month
Coking	-
Non Coking	14.969920
Total Raw Coal	<b>14.969920</b>
Clean Coal	-
Middlings	-
Rejects	-

Signature: 

Designation: Owner/Agent/ Manager

Date :- 03.10.2022



# Annexure-3

**Government of India**  
**Ministry of Coal**  
**O/o the Nominated Authority**

World Trade Tower, New Delhi

Office of the nominated authority constituted under section 6 of the Coal Mines (Special Provisions) Second Ordinance, 2014

**Vesting order under clause (b) of sub-rule (2) of rule 7 and sub-rule (1) of rule 13**

**In re:** **Gare Palma-IV/4 Coal Mine** (the "mine") particulars of which is specified in **Annexure 1**

**Order no.:** 104/16/2015/NA

**Date:** March 23, 2015

**In favour of:** **Hindalco Industries Limited** incorporated in India under the Companies Act, 1956 with corporate identity number L27020MH1958PLC011238, whose registered office is at Century Bhavan, 3<sup>rd</sup> Floor, Dr. Annie Besant Road, Worli, Mumbai-400030, India and principal place of business is at Aditya Birla Centre, 3<sup>rd</sup> Floor, B Wing, S.K. Ahire Marg, Worli, Mumbai-400030 (the "successful bidder")

For utilisation in: End Use Plant situated at 1) Lapanga, Dist. Sambalpur, Odisha, India and 2) Hirakud, Dist. Sambalpur, Odisha, India, as more particularly described below (the "End Use Plant"):

S. No	Name of Specified End Use Plant	Address	Configuration	Capacity	Coal Entitlement
1.	Captive Power Plant of Aditya Aluminium Project	Lapanga, Dist. Sambalpur, Odisha	6 X 150 MW	900 MW	171.43 MT
2.	Captive Power Plant of Hirakud Complex	Hirakud, Dist. Sambalpur, Odisha	4 X 100 MW 1x 67.5 MW	467.5 MW	89.81 MT

*MW: Mega Watt; MT: Million Tonne*

WHEREAS, the nominated authority has, in accordance with provisions of the Coal Mines (Special Provisions) Second Ordinance, 2014 (the "Ordinance") and the Coal Mines (Special Provisions) Rules 2014 (the "Rules") conducted the auction of the mine;

AND WHEREAS the successful bidder is eligible to receive this vesting order with respect to the mine including, inter-alia, -







of a deemed consent from the relevant party(ies)), in accordance with the provisions of sub-section (1) of section 11 of the Ordinance in favour of the successful bidder for the residual term or residual performance of such contract;

2. The successful bidder may seek any change in the terms and conditions attached to such licence, permit, permission, approval or consent by making an application in accordance with applicable laws;
3. Hereinafter, the successful bidder shall be entitled to take possession of the mine as specified in **Annexure 1** without let or hindrance;
4. This vesting order is liable to be cancelled in accordance with the provisions of sub-rule (6) of rule 13.

*Vivek Bharadwaj*

(By the nominated authority)



## Annexures

### Annexure 1: Particulars of the mine

#### Part A – Description of the mine

<b>Name of Coal Mine</b>	<b>Gare Palma-IV/4</b>
Coal Field	Mand-Raigarh Coalfield
Latitude	22 <sup>0</sup> 7'40" N & 22 <sup>0</sup> 10'20" N
Longitude	83 <sup>0</sup> 31'16"E & 83 <sup>0</sup> 33'43"E
Villages	Banjikhol, Bankheta, Dongamahua
Tehsil/ Taluka	Gharghora
District	Raigarh
State	Chhattisgarh

#### Part B – Description of Land in relation to the mine

**Type of Land:** Freehold Land for Mining as per Mining Lease

S.No.	Village	Deed Number	Date of Registration	Area (Hectare)
1	Kondkel	854	17-Oct-06	2.9910
2	Kondkel	844	13-Oct-06	2.5620
3	Kondkel	852	17-Oct-06	0.2300
4	Kondkel	853	17-Oct-06	0.8090
5	Kondkel	841	13-Oct-06	1.6880
6	Kondkel	842	13-Oct-06	0.4040
7	Kondkel	885	26-Oct-06	0.1860
8	Kondkel	785	23-Sep-06	0.9100
9	Kondkel	784	23-Sep-06	0.6960
10	Kondkel	783	23-Sep-06	1.4970
11	Kondkel	861	18-Oct-06	0.8410
12	Kondkel	862	18-Oct-06	0.0700
13	Kondkel	858	18-Oct-06	1.1330
14	Kondkel	847	16-Oct-06	1.2630
15	Kondkel	843	13-Oct-06	0.7130
16	Kondkel	851	17-Oct-06	0.4660
17	Kondkel	905	31-Oct-06	0.6110
18	Kondkel	879	26-Oct-06	0.1620
19	Kondkel	878	26-Oct-06	1.4060
20	Kondkel	1254	23-Jan-07	0.3810
21	Kondkel	16	17-Apr-07	2.3400
22	Kondkel	424	27-Jul-07	0.7450
23	Kondkel	423	27-Jul-07	0.5260
24	Kondkel	662	19-Nov-07	1.0110
25	Kondkel	67	17-Apr-08	1.5490



S.No.	Village	Deed Number	Date of Registration	Area (Hectare)
26	Kondkel	82	21-Apr-08	1.0680
27	Kondkel	116	30-Apr-08	0.7370
28	Kondkel	168	07-May-08	1.2140
29	Kondkel	81	21-Apr-08	1.2140
30	Kondkel	243	22-May-08	1.2140
31	Kondkel	595	17-Jul-08	0.2060
32	Kondkel	936	25-Sep-08	1.4160
33	Kondkel	531	02-Jul-08	0.6640
34	Kondkel	850	10-Sep-08	1.2140
35	Kondkel	849	10-Sep-08	1.2140
36	Kondkel	958	30-Sep-08	0.2550
37	Kondkel	962	01-Oct-08	1.2140
38	Kondkel	422	10-Jun-09	0.0810
39	Kondkel	421	10-Jun-09	0.5010
40	Kondkel	423	10-Jun-09	1.0120

**Type of Land: Leasehold Land for Mining as per Mining Lease**

Nature	Area (Hectares)
Government Land	20.21
Private Land	-
Forest Land	-

**Type of Land: Leasehold Land through Surface Right**

Nature	Area (Hectares)
Government Land	48.45
Private Land	146.37

**Part C – Description of Mine Infrastructure in relation to the mine**

**C1- Mine Infrastructure: Immovable Assets**

S. No.	Head of Assets	Description (Nature of Assets)
1	Electrical And Communication Equipments	Transformer,500 Kva
2	Electrical And Communication Equipments	3.3kv VCB Panel Ht Switch Board
3	Electrical And Communication Equipments	Transformer 5mva,3.3&.433 Kv
4	Electrical And Communication Equipments	3c X 50 Sq.Mm Double Armd Copper Cable (Mtrs)
5	Electrical And Communication Equipments	3.3 Kv/550 Volt,315kva Transwitch Unit
6	Electrical And Communication Equipments	500 Kva Step Up Transformer
7	Electrical And Communication Equipments	MCC Panel 2000a,4p,440v



S. No.	Head of Assets	Description (Nature of Assets)
8	Electrical And Communication Equipments	Polycabe Make Pvc Al.Cable (Mtrs)
9	Electrical And Communication Equipments	Step Up Transformer (NFLP) 500 Kva
10	Other Plant & Machinery (Fixed Installation)	Electrical Installation At Mines
11	Other Plant & Machinery (Fixed Installation)	Weigh Bridge Platform
12	Other Plant & Machinery (Fixed Installation)	Weigh Bridge Cap.100 Mt
13	Other Plant & Machinery (Fixed Installation)	Fully Electronic Weigh Bridge
14	Other Plant & Machinery (Fixed Installation)	Conver Belt 1000 Mm
15	Other Plant & Machinery (Fixed Installation)	Main(Direct Haulage) 75hp/Rope Pull
16	Other Plant & Machinery (Fixed Installation)	Head Pulley-Drum Dia Wth Rubber Lagging
17	Other Plant & Machinery (Fixed Installation)	Utd Cylinder
18	Other Plant & Machinery (Fixed Installation)	Conveyor Belt 1000 Mm
19	Other Plant & Machinery (Fixed Installation)	Jaw Crusher Cap.100m-3mm& Pulverize(Disc Mill)
20	Other Plant & Machinery (Fixed Installation)	Coal Handling Plant
21	Civil Work Including Building-Site & Admin Offices	Hostel Building
22	Civil Work Including Building-Site & Admin Offices	Roads
23	Civil Work Including Building-Site & Admin Offices	Administrative Building
24	Civil Work Including Building-Site & Admin Offices	2.2 Kms Tar Road
25	Civil Work Including Building-Site & Admin Offices	Administrative Building
26	Civil Work Including Building-Site & Admin Offices	First Aid Center At Site
27	Civil Work Including Building-Site & Admin Offices	Administration Building
28	Civil Work Including Building-Site & Admin Offices	Sub-Station Building
29	Civil Work Including Building-Site & Admin Offices	Mine Site Office



**C2- Mine Infrastructure: Land for Compensatory Afforestation**

**Type of Land:** Freehold Land for Compensatory Afforestation

Nil

**Type of Land:** Leasehold Land for Compensatory Afforestation

Nature	Area (Hectares)
Government Land	-
Private Land	-
Forest Land	-

**C3- Mine Infrastructure: Resettlement and Rehabilitation Land**

**Type of Land:** Resettlement and Rehabilitation Freehold Land

Nil

**Type of Land:** Resettlement and Rehabilitation Leasehold Land

Nature	Area (Hectares)
Government Land	-
Private Land	-
Forest Land	-

**Annexure 2: Particulars of statutory licences, permits, permissions, approvals or consents issued by the Central Government which are being transferred alongwith this vesting order.**

S. No	Statutory Clearance	Ministry	Letter No.	Date
1.	<b>Approval of Mining Plan and Mine Closure Plan –</b> a) Approval of revised mine plan for 1 MTPA (including Mine Closure Plan)	Ministry of Coal	13016/5/2000-CA/CA-1	27.04.2010
2.	<b>Mining Lease – Administrative Approval of the Central Government under Section 5 (1) and/ or Section 6 (1) of MMDR Act, 1957</b>  Previous approval Under section 5(1) of the MM(D&R) Act 1957	Ministry of Coal	13016/5/2000-CA	02.12.2003





**Annexure 3: Particulars of statutory licences, permits, permissions, approvals or consents issued by the Central Government to be obtained on application by the successful bidder.**

S. No	Statutory Clearance	Ministry/ Agency	Letter No.	Date
1.	<b>Environment Clearance –</b> Gare IV/4 coal mine project (0.48 MTPA to 1 MTPA in ML area 701.512 ha) - Environment clearance	Ministry of Environment and Forests	J 11015/ 183/ 2010- IA II(N)	12.03.2013
2.	<b>Forest Clearance – Stage 1 and Stage 2 –</b> Diversion of 419.887 ha forest land for underground coal mining in Usha Project of M/s JayaswalsNico Ltd. in district Raigarh, Chhattisgarh	Ministry of Environment and Forests	8-112/2002-FC	9.06.2003
3.	<b>Mine opening permission –</b> a) Seam No. II for OC Patch B of Usha Coal Mine	Ministry of Coal – CCO	--	28.02.2008
	b) Seam No. II for OC Patch C of Usha Coal Mine		--	25.01.2011
4.	Opening of Escrow Account	Ministry of Coal – CCO	--	22.10.2013
5.	<b>Permission from DGMS for Mine Opening –</b> Notice of opening of Usha underground coal mines in Raigarh district Chhattisgarh	Ministry of Labour – DGMS	BSP/1653	21.04.2006
6.	Permission of installation/ Trial Operation of Equipment	Ministry of Labour – DGMS		
7.	Ground water clearance	Ministry of Environment and Forests – Central	21-4(125)/ NCCR/CGWA / 2011-1361	05.03.2012



S. No	Statutory Clearance	Ministry/ Agency	Letter No.	Date
		Ground Water Authority/ Ministry of Water Resources		
8.	Railway Siding Approvals	Ministry of Railway		
9.	Explosive Licenses	Ministry of Commerce, DIPP		
10.	Diesel Storage Tank	Ministry of Commerce, DIPP		
11.	<i>(Any Other clearance)</i>			





**Annexure 4: Particulars of statutory licences, permits, permissions, approvals or consents issued by the State Government to be obtained on application by the successful bidder.**

S. No	Statutory Clearance	Ministry/ Agency	Letter No.	Date
1.	Consent to establish – Permission to establish for expansion from 0.48 MTPA to 1.0 MTPA	Chhattisgarh Environment Conservation Board	Not legible	03.10.2013
2.	Project Import Benefit	State Mineral Resource Department		
3.	Grant of Mining Lease	State Government	Not legible	12.05.2002
4.	Land Mutation	State Government		
5.	Power Line from State Electricity Board	State Electricity Board		
6.	Grant of consent under section 21 of the air(prevention & control of pollution) Act 1981	Chhattisgarh Environment Conservation Board	Not legible	28.06.2014
7.	Grant of consent under section 25/26 of the Water(prevention & control of pollution) Act 1974	Chhattisgarh Environment Conservation Board	Not legible	28.06.2014
8.	(Any Other clearance)			



**Annexure 5: Particulars of the contracts adopted by the successful bidder.**

Description of contract	Name and address of the contractor	Type of agreement	Valid from	Valid upto	Value of the contract
Sealing	C.R.J. Contractor At. Kondkel, P.O. - Milupara, Via. Tamnar, Raigarh, Raigarh 8120777614	Contract	1/10/2014	30/09/2015	480,000
L.H.D Operation	Technoblast Mining Cor. Opp. Mesc Road, Moradabad I Road, Karamtoli Ranchi Contact : 9755024800	Contract	1/12/2012	31/03/2018	RATE CONTRAC T
L.H.D Operation	Sing & Sons Singhnagar Dhegaon Chhindwara Road, Dist-Nagpur (M.S.) 9329272495	Contract	1/12/2012	31/03/2018	RATE CONTRAC T
THIS WORK ORDER IS ISSU ED FOR EXCAVATION OF OPEN CAST MINES (PATCH "B" & "C" BANKHETA & BANJIKHOL) DUMP /MATERIAL / SOIL, USING HEMM, LOADING AND TRANSPORTATION OF THE EXCAVATED EARTH, TO THE EARMARKED DUMPING SITES, LEVELING AND DRESSING OF THE DUMP SIT	Gurumehar Gayatri Firm House, Amaghat, Jingol, Raigarh-(C.G.) 8827393900	Contract	14/10/2014	31/10/2016	697,222,210
PVC Conveyor Belt-	M/s Indica	Contract	29/05/2014	Expiry not	



Description of contract	Name and address of the contractor	Type of agreement	Valid from	Valid upto	Value of the contract
1000MM	Conveyors Ltd. Amritsar Contract 09814822999			mentioned	9,256,000



# Annexure-4

**CSR & Sustainability Expenditure Details**  
**From April 2022 to September 2022**  
**Hindalco Industries Ltd. Gare Palma IV/4**

<b>Sr. No.</b>	<b>Focused Area/ Project Activities</b>	<b>Summary Cost (In Lakhs)</b>
1	Education	5.37
2	Health	3.46
3	Sustainable Livelihood under CSR	0.83
4	Infra - Structure	5.15
5	Social	6.29
6	Other ( if any)	0.22
7	Under Sustainable Development	43.15
	<b>Total</b>	<b>64.45</b>

# Annexure-5

**Action Taken details/Expenditure Details for the period from 2015 to 2022**

Particulars	FY 15-16	Details	FY 16-17	Details	FY 17-18	Details	FY 18-19	Details	FY 19-20	Details	FY 20-21	Details	FY 21-22	Details	
Development of Tribes	150000	Tailoring training at community center Banjikhoh	75000	Tailoring training at community center Kondkel	47000	Tailoring training at community center Kondkel			175000	Tailor machine (30 nos) distributed at Kondkel	54000	Tailoring training at community center Banjikhoh	50000	Tailoring training at community center Banjikhoh	
	1600000	School bus facility	2460000	School bus facility	5648000	School bus facility	3311300	School bus facility	285000	School bus facility	0		550000	School bus facility	
	350000	Celebration National day	11000	Study materials			252000	Computer education for computer center	429000	Education support program			110000	Financial half to education support 02 Students Dipti Sidar & Geeta Rathiya	
	250000	School Building renovation & maintenance at Adarsh School Milupara	1000000	Providing Teacher for High School at Lalunga Block & Tamnar Block (35nos)					289000	Infrastructure development of Anganbadi			50000	Cluster school tournament	
			80000	Celebration National day											
			95000	Computer education for computer center											
			280000	School building renovation & maintenance at Kondkel											
			52000	Furniture for middle School Kondkel										2692315	<b>Kosala</b> Mobilisation of master and individual weavers & Providing source of sustainable livelihood to weavers as well as other artisans like warper, dyer, value added artisans etc.
	<b>Sub-Total (Rs.)</b>	<b>2350000</b>		<b>4053000</b>		<b>5947000</b>		<b>4029900</b>		<b>460000</b>		<b>54000</b>		<b>3452315</b>	
	Development of Road	0	0	1533000	Repairing & maintenance of BT Road from Banjari Mandir To Milupara Chowk & Milupara To Dongamahuha	2000000	Construction of CC Road at Milupara,Kondkel,Sidarpara	300000	Construction of WBM/CC Road/Bridge At Banjikhoh	1600000	Construction of CC/BITUMNS Road From Milupara Village to Kondkel Village (Approx 5 Km.)	500000	Construction of CC Road At Kondkel Village 250 Mts. From Main Chowk To	241000	Construction of CC Road At Kondkel Village.
8488000				BT road repairing from Hunkradippa to Milupara Office	3397000	Repairing of B T Road 1) From Bankheta Turning to Kondkel Turning, and 2) From Kondkel Turning to Police Station to Lalpur	832000	Repairing of 6 Nos. BT Road Culvert by RR Stone Masonry from hukradippa to Milupara	500000	Repairing of Village Road at Sakta/Lalpur /Madwadumar/Milupara/Sidarpara/Banjikhoh	300000	Road Repairing At Kondkel & Milupara	439000	Construction of CC Road 220 Metres towards Bendra River at Kondkel Village under CSR Rural Infrastructure Development Program.	
19000				Side Solder work of BT road	2190000	Widening & Construction of New B T Road from Weigh Bridge to E&M Workshop at Kondkel Mine	744000	Extension of existing RCC Box Culvert with existing Hume pipe on BT Road near Budhadev Temple, Banjikhoh for widening of road and safe movement	2847000	Repairing of 2 B.T. road (1) Bendra Nallah to Donghamuha and (2) Khamaria to Milupara.					
504000				Supply And Filling of Stone Dust with Compaction by Road Roller	271000	Repairing of BT Road 1) From Bankheta Turning to Kondkel Turning and 2) From Kondkel Turning to Police Station to Lalpur			241000	Widening Of Pmgisy Road Connecting Village Milupara With Village Kondkel & Banjikhoh Within The Mine Lease Of Coal Block Gare Palma Iv/4 And Iv/5					
23000				Chipping of BT road surface	693000	Repairing / Patch work of main road from Carmel school to Ghari Chawk, Raigarh town under CSR activity			409000	Construction of CC Road and Drain at Lalpur Village under CSR, GP IV/5.					
748000				Construction of retaining wall in different places inside BT road	879000	Repairing of BT Road from Hukradippa to Kelo River									
					510000	Repairing of existing RCC Hume Pipe Culvert on BT Road from Hukradippa to Milupara Village.									
<b>Sub-Total (Rs.)</b>				<b>0</b>	<b>0</b>	<b>11315000</b>	<b>9940000</b>	<b>1876000</b>	<b>5597000</b>	<b>800000</b>	<b>680000</b>				
Water Facility	5000000	621000	419000	R.O. Water supply at Kondkel Village.	700000	Maintenance of R.O. water filter plant at Kondkel village	5700000	Construction of overhead tank (02lacs LTR) at Kondkel village with pipe line connection	3500000	Drinking water through water tanker at Beljore /Kondkel	464000	Drinking water through water tanker at Beljore /Kondkel / Banjikhoh	612000	Drinking water through water tanker at Beljore /Kondkel / Banjikhoh	
			860000	Construction of Overhead water tank & installation of R.O. for drinking water at R&R Banjikhoh	560000	Drinking water through water tanker at Beljore /Kondkel	278000	Repairing of overhead water tank at Milupara	126000	Overhead tanks repair & construction at R&R Banjikhoh.	102000	Work Order for Repair of Road from Kelo Bridge to Lalpur Sadak under "CSR".			
			378000	Drinking water supply throw pipe lane maintenance work Banjikhoh & Kondkel	832000	Repairing of 6 Nos. BT Road Culvert by RR Stone Masonry from hukradippa to Milupara	590000	Drinking water through water tanker at Beljore /Kondkel							
			30000	Repair of over head water tank & Handpump & other drinking water sourcs near by village	743000	Extension of existing RCC Box Culvert with existing Hume pipe on BT Road near Budhadev Temple, Banjikhoh for widening of road and safe movement of men and coal trucks.									
			840000	Maintenance of R.O. Palnt at Kondkel for water supply											
			430000	Drinking water through water tanker at Beljore /Kondkel											
<b>Sub-Total (Rs.)</b>	<b>1121000</b>	<b>2957000</b>	<b>2835000</b>	<b>6568000</b>	<b>476000</b>	<b>566000</b>	<b>612000</b>								
Electricity Facility					1672506.24	Electrification at R&R Colony Solar Light	1893919.73	1. Extension of OHT Line for R&R Colony 2. Electrification of Anganwadi Kendra, R&R Colony 3. Electrification of Primary School R&R Colony	747861.88	Electrification Near Samlai Mandir					
			<b>Sub-Total (Rs.)</b>	<b>0</b>	<b>0</b>	<b>1672506.24</b>	<b>1893919.73</b>	<b>747861.88</b>	<b>0</b>						
<b>Total Rs.</b>	<b>3471000</b>	<b>18325000</b>	<b>20394506.24</b>	<b>14367219.73</b>	<b>7280861.88</b>	<b>1420000</b>	<b>4744315</b>								



# Development of Tribes



Swachhta Aaviyaan



Computer Classes



School Building



Teachers Support to Govt. Schools



School Bus for Rural Students



Various Competitions of High School Students



Career Counselling by Head HR



Promoting Girls Education



Education Tour



# Development of Tribes



Tailoring Classes



Counselling to Rural Youth for VT



Kosa Silk Weaver



Regular Meeting with Villagers for developments



VDC Creation Meeting



SHG Creation



## Development of Road



Construction village of BT road



Construction of Village CC & WBM Roads



# Water Facility



OHT Construction



RO Plant for Drinking Water Supply



Drinking Water supply



# Electricity Facility



Installed Transformer



Installed Solar Street Lights



Electrification of Villages

## **Management of air, water and noise pollution, prevention of blast activities at Gare Palma IV/4 Coal Mines.**

A separate Environmental Management Department is functioning at Coal Mine under the direct control of a senior executive. The funds earmarked for environmental protection measures has been budgeted separately.

### **Mitigation Measures/ Action Taken to prevent the air, Water and noise pollution**

#### **1. Air Pollution Control Measures:**

- Efficient in-built wet drilling system in addition to fugitive dust collector provided with the drills and operated in day hours only;
- Blasting is being done in most scientific manner, use of non-electric ignition system, use of millisecond delay detonators and optimizing the blasting parameters to control & prevent the dust to get air borne and to control the fly rock;
- Operators utilizes closed AC cabin and dust mask also provided to be used when needed;
- Proper maintenance of vehicles is carried out regularly for minimization of generation of gaseous pollutants;
- Haulage road are adequately sprayed with water by Truck mounted water tanker & fixed type of water sprinklers installed at identified locations.
- Planation in the mine area is being carried out @2500 plant/hac. i.e. area around the lease boundary, sides of approach roads and other places to arrest dust.
- Periodic air quality monitoring /Environmental monitoring is being carried out through CECB & MoEF & CC approved & NABL accredited Laboratory i.e.Ultimate Enviroltical Solutions Raipur.

#### **2. Water Pollution Control**

- Garland drains are provided around the pit to prevent the entry of rainwater into the mining pit;
- Septic tanks and soak pits are provided for the disposal of domestic effluent.
- 03 nos of Settling ponds with chemical dosing arrangement and sump with adequate capacity (for sedimentation) has been provided for the mine seepage water treatment before discharge for the agriculture purpose.
- Constructed an additional settling pond of size 30m X 10m X 1.5m (01Nos) to collect whole mine seepage water generated during the mining activities from Patch "C" specially in the rainy season for proper settling of mine seepage water before discharge.
- Constructed 02 nos of additional settling pond of size (50m X 40m X 5.0 m) for proper settling of mine seepage water generated from mining activities from Batch "B" before discharge for the agriculture purpose
- Installed 01 nos of COEQMS (Continuous Online Effluent Quality Monitoring System) at Bankheta, (At outlet of Siltation Pond No. 2) for
- real time monitoring of environmental quality parameters i.e. COD, BOD, TSS, PH & Temperature before discharge for the agriculture purpose.

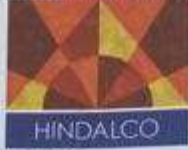
#### **3. Noise Pollution Control and Vibration**

- Sitting arrangements have been done in closed AC cabins, operators have been provided with earplugs/earmuffs;
- Rock breakers are used for avoiding secondary blasting to further reduce noise pollution;
- Proper maintenance, oiling and greasing of machines at regular interval reduces generation of noise;
- Greenbelt/plantation is being done to minimize the propagation of noise; and
- Periodical noise level monitoring is carried out and will be carried out through authorized agency.

**Environmental Expenditure Details for the period from 2015 to 2022**

<b>Sr.No.</b>	<b>Particular</b>	<b>Amount (Lakhs)</b>	<b>Remarks</b>
1	Installation & Commissioning of Continues Ambient Air Quality Monitoring System	65	
2	Installation & Commissioning of Online Effluent Quality Monitoring System	25	
3	Installation & Commissioning of Effluent Treatment Plant of Capacity 50 KLD	47	
4	Construction of Siltation Pond Patch C (01 Nos.)	2	
5	Construction Siltation Pond Patch B (02 Nos)	24	
6	Plantation at OB Dump & mine area	25	
7	Installation & Commissioning of Fixed type of water sprinkler with pumping set and pipe line	30	
8	Truck mounted water tanker	80	
9	Engaged Water tanker for dust suppression nearby villages	50	
10	Vativer grass plantation	1	
11	Gabion wall & Garland drain construction	55	
12	Environmental monitoring	50	
13	Road construction mine premises	30	
14	Various Environmental studies	30	
15	Operation & Maintenance of ETP/Siltation Pond including chemical dosing	10	
16	Installation & Commissioning of digital Water Flow Meter + Telemetry, Piezometers & CCTV Cameras	25	
17	Pumps & pipe lines for water supply in plantation /reclaimed land	50	
18	Top soil preservation, handling & spreading cost for bio- reclamation	200	
19	Man power engaged in Environment/Horticulture Activities	130	
	<b>Total</b>	<b>929</b>	

ADITYA BIRLA



8<sup>th</sup> August, 2022

Letter No.: HIL/EC/GP- IV/4/CCR - II/2022/107-IR

The Integrated Regional Office,  
Ministry of Environment Forests & Climate Change (MoEF & CC) Aranya Bhawan,  
North Block, Sector – 19, Naya Raipur,  
Atal Nagar, Chhattisgarh, 492002

**Subject:** Submission of Action Taken Report for complying the Certified Compliance Report Observations and EC Condition partially complied and not complied of 1 MTPA Gare Palma IV/4 Coal Mines of Hindalco Industries Limited, Village – Banjikhoh, Tehsil – Tamnar, District – Raigarh, Chhattisgarh.

- Ref.:** 1. Certified Compliance Report – Letter No. 3-18/2013 (ENV)/830 dated 21/07/2022 received on dated 25/07/2022.
2. Environment Clearance Letter no.-J-11015/183/2010-IA-II.(M) dated 16.04.2015 (Transferred in favour of HIL) & Amendment in EC for production capacity i.e. Opencast: 0.56 MTPA & Under Ground: 0.44 MTPA dated 24.05.2019.
3. Environment Clearance Letter no.No. J-11015/183/2010-IA.II (M) dated 12.03.2013.

Respected Sir,

Please find enclosed herewith the Action Taken Report for the complying of Certified Compliance Report Observations and EC Condition partially complied and not complied of 1 MTPA Gare Palma IV/4 Coal Mines of Hindalco Industries Limited, Village – Banjikhoh, Tehsil – Tamnar, District – Raigarh, Chhattisgarh. The compliance report was based on the on the Monitoring Report/observations during the mine site visit on 22 June, 2022.

This is for your kind information and record with a request to issue a fresh Certified Compliance/Action Taken Report.

Yours faithfully,  
For Hindalco Industries Limited,

(Govind Kumar – Mine Agent)

Encl.: As Above.

- CC.: 1. The Member Secretary, IA Division (Coal Mining), Ministry of Environment Forest & Climate Change, Indira Paryavaran Bhawan, Aliganj, Jorbagh Road New Delhi - 110003
2. The Addl. Director (Monitoring Cell), Ministry of Environment, Forest & Climate Change, Indira Paryavaran Bhawan, Aliganj, Jorbagh Road New Delhi – 110003 (Email: shruti.rao@nic.in)

Hindalco Industries Limited

Gare Palma Mines (IV/4 & IV/5), Vill & Po: Milupara, Tehsil: Tamnar Dist: Raigarh-496107, Chhattisgarh  
T: +91 7762 228212, Website: www.hindalco.com E mail: hindalco@adityabirla.com  
Registered Office: Ahura Centre, 1st Floor, B Wing, Mahakali Caves Road Andheri (East), Mumbai-400093, India  
T: + 912266917000 | Fax: + 912266917001  
Corporate ID No: L27020MH958PLC01238





**Action Taken Report of Observations made by IRO - MoEF & CC, Raipur (Mine Site Visit dated 22 June, 2022 & Certified copy of compliance status report of EC stipulations – reg. dated 21.07.2022 received on dated 25<sup>th</sup> July 2022).**

Sr. No.	Observations	Compliance Status during the Mine site visit	Compliance Status till date
i	Project authorities are directed to submit comprehensive report on action taken on issues raised during public hearing ( <b>EC Specific Condition No. VII</b> )	<b>Partially Complied.</b>	<p align="center"><b>Complied.</b></p> <p>The PH was held on 02.05.2012. The issues raised during the PH, include, planning for development of road, water facility, electricity in the project area for Project Affected Persons, development for tribes; persons, education, management of air, water and noise pollution, prevention of blast activities etc. The HIL has taken the appropriate action details attached as <b><u>Annexure No. - 1:</u></b></p>
ii	Project authorities are directed to take necessary precautions to prevent the erosion of internal dump to Bendra nala and its compliance is to be submitted on <b><u>quarterly basis</u></b> to this office ( <b>EC Specific Condition No. X</b> )	<b>Partially Complied.</b>	<p align="center"><b>Complied.</b></p> <p>EC Specific Condition No. X refers to Kelo river and Bendra Nallah shall not be disturbed. This condition is being complied by PP as no activities is being done nearby to Kelo river &amp; Bendra Nala.</p> <p><b>Following steps has been taken to prevent the erosion of internal dump to Bendra nala :</b></p> <ol style="list-style-type: none"> <li>1. Bendra Nala is situated at the distance of 600 mtr. on the southern side of Patch B.</li> <li>2. Entire OB is being dumped internally in the de- coaled area on the north eastern side of the pit.</li> <li>3. Garland drains have been provided at the toe of the benches which are regularly cleaned before the onset of monsoon every year.</li> </ol>



		<p>4. Till date in Patch B (South pit), HIL has constructed Approx.4116 mtr. of Garland drain &amp; 2218 mtr. of Toe drain &amp; in Patch C (North Pit) Approx.964 mtr. of Garland drain &amp; 1340 mtr. of Toe drain (Photograph attached as <b><u>Annexure - 2</u></b> ).</p> <p>And proposal for this year is to construct approx. 100 mtr. in the Patch C and 150 mtr in Patch B.</p> <p>4. Retaining wall where ever necessary is erected for stability of the dumps and prevent erosion. Till date In the 1st Phase we have constructed approx. 55 mtr. long gabion/retaining wall at the toe of permanent dump slope near Patch "C" in Banjikhoh, GP IV/4 Coal Mines. The Gabion /retaining walls had been made of GI wire net cages filled with stone boulders and anchored with angle iron as per specification (Photographs attached as <b><u>Annexure - 3</u></b>).</p> <p>We would also like to inform you that we have taken gabion/retaining wall construction activity at the toe of the OB dump as a continuous process &amp; ensure you that it will be carried out as &amp; when required in future also at mine site.</p> <p>And proposal for this year is to construct the gabion wall approx. 50 mtr. in the Patch C.</p> <p>a) Constructed Settling pond/sumps of size 30m X 10m X 1.5m (01Nos) at Banjikhoh (<b>Photograph is attached as <u>Annexure - 4</u></b>).</p> <p>b) Constructed 03 nos of Settling ponds of size 50m X 30m X 3m (each) with chemical dosing arrangement and sump with adequate capacity (for sedimentation) at Banjikhoh for the mine seepage water collection, settling &amp; treatment before discharge for the agriculture purpose (<b>Photograph is attached as <u>Annexure - 5</u></b>).</p>
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			<p>2. Aprox. 50,000 Nos of Vetiver grass plantation has been done in the year 2020 on OB Dump area near Patch “C” to provide the stability and prevent top soil erosion / Reduce the surface Run- off from OB dumps and same has propose to done in OB dump located at Bankheta (Photographs attached as <b><u>Annexure - 6</u></b>).</p> <p>3. Till March 2022 approx. 99821 nos of saplings have been planted covering an area of 35.0 hac. which also helps in preventing erosion of internal dumps. (Plantation report &amp; Photograph is attached as <b><u>Annexure –7</u></b> ).</p> <p>And proposal for this year is to plant approx. 10,000 nos. of saplings over internal dumps. (<b>Photograph is attached as <u>Annexure – 8</u></b>)</p> <p>As directed, we undertake to submit the progress report on construction of drains, gabion wall/retaining wall and plantation details to IRO – MoEF &amp; CC, Raipur office &amp; MoEF &amp; CC New Delhi on quarterly basis.</p>						
iii	Project authorities are directed to submit the details of quantity dumped in OB’s as per stipulated condition to this office ( <b>EC Specific Condition No. XI</b> )	<b>Partially Complied.</b>	<p><b>Complied.</b></p> <p>The OB dumping is maintained as per the provisions of approved Mining Plan only. Entire OB is being dumped internally in de – coaled area.</p> <p>The dumped quantity of Overburden/OB is as below:</p> <table border="1"> <thead> <tr> <th>Financial Year</th> <th>Dumped quantity of OB in CuM.</th> </tr> </thead> <tbody> <tr> <td>2015-16</td> <td>294327</td> </tr> <tr> <td>2016-17</td> <td>2163077</td> </tr> </tbody> </table>	Financial Year	Dumped quantity of OB in CuM.	2015-16	294327	2016-17	2163077
Financial Year	Dumped quantity of OB in CuM.								
2015-16	294327								
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			<table border="1"> <tr> <td>2017-18</td> <td>1190380</td> </tr> <tr> <td>2018-19</td> <td>2041702</td> </tr> <tr> <td>2019-20</td> <td>2418897</td> </tr> <tr> <td>2020-21</td> <td>2599915</td> </tr> <tr> <td>2021-22</td> <td>1925276</td> </tr> <tr> <td><b>Total</b></td> <td><b>12633574</b></td> </tr> </table>	2017-18	1190380	2018-19	2041702	2019-20	2418897	2020-21	2599915	2021-22	1925276	<b>Total</b>	<b>12633574</b>
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2019-20	2418897														
2020-21	2599915														
2021-22	1925276														
<b>Total</b>	<b>12633574</b>														
iv	Biological reclamation was not found satisfactory. Project authorities are directed to undertake the biological reclamation as per stipulated condition and <b>ATR</b> in this regard shall be submitted to this office ( <b>EC Specific Condition No. XII</b> )	<b>Partially Complied.</b>	<p><b>Complied.</b></p> <p>Planation in the mine area is being carried out @2500 plant/ha. Total 99821 nos. local plants species have been planted upto March 2022 approx. <b>99821</b> nos of Extensive plantation has been carried out covering an area of <b>35.0 hac.</b> in the mine area including OB dump species planted includes medicinal, Native &amp; Fruit bearing Plants i.e. Saja,Siris, Shisham, Yellow flametree, Kassod , Satvan, Acacia Mangium, Ganga Emli, Arjuna, Chirol, Gliricidia, Amla,Mango, guava, Kathal,Neem, Pipal, Ficus sp., Peltafarm, Nilgiri, Casia Samia, Gulmohar, Acacia Coliformis, Jamun, Kachnar, Baheda, Kachnar, Mahua &amp; Saal etc. has been already done in the stabilize internal dump at Banjikhhol &amp; Bankheta in consultation with DFO.</p> <p>A report on Monitoring &amp; Evaluation of Plantation carried out at Gare Palma IV/4 Coal Mines has been prepared by the NAV AASTHA JAN VIKAS SEVA SAMITI" 8/5, "JASMATI BHAWAN", NEAR OLD KATTHA FACTORY, GODHANPUR, AMBIKAPUR – 497001 (Authorized/Approved Agency by PCCF, CG &amp; CECB, Raipur Approval letter attached as Annexure - ) and the same report was submitted to IRO – MoEF &amp; CC, Raipur dated 22<sup>nd</sup> December 2021 (<b>Report attached as Annexure –9</b>)</p> <p><b>Action taken Report:</b> In this financial year i.e. 2022 – 2023 HIL has proposed to plant approx. 12,000 Nos. of plants in the vacant area</p>												

			in the stabilized OB dumps (Banjikhola & Bankheta) and we would like to inform you that till July 2022 approx. 5000 nos. of sapling has been done ( <b>Photograph is attached as Annexure -8</b> ) and balance plantation is in progress. The progress report is being submitted on quarterly basis to IRO- MoEF & CC, Raipur.
v	Details pertaining to Flora & fauna and conservation plan for endangered species of Gare IV/8 coal B block has not been provided ( <b>EC Specific Condition No. XIII</b> )	<b>Not Complied.</b>	<b>Complied.</b> This particular condition (EC Specific Condition No. XIII) is for Gare Palma IV/8 block which is now allotted to M/s Ambuja Cement Ltd.
vi	Project authorities are directed to submit physical and financial targets pertaining to wildlife conservation plan to this office as per the stipulated condition ( <b>EC Specific Condition No. XIV &amp; XV</b> )	<b>Partially Complied.</b>	<b>Complied.</b> A copy of WLCP prepared by prior allottee (Attached a <b>Annexure - 10</b> ). Amount Rs 1 Crores towards WLCP submitted by prior allottee to forest Dept. (Attached a copy of letter as <b>Annexure – 10 A</b> )
vii	Details pertaining to participation in the Regional Action Plan of the State Government for conservation of flora & fauna found within the study area have been provided ( <b>EC Specific Condition No. XVI</b> ).	<b>Not Complied.</b>	<b>Complied.</b> HIL is participating in the Regional Action Plan of the State Government for conservation of flora & fauna. Till date Rs. 90 Lakhs has been paid by HIL to the state Government towards this. (Copy Attached <b>Annexure no. - 11</b> )
viii	Project authorities are directed to submit the latest fugitive dust emission monitoring report to this office ( <b>EC Specific Condition No. XXII &amp; XXV</b> ).	<b>Partially Complied.</b>	<b>Complied.</b> The latest fugitive dust emission monitoring report for the month of June 2022 is attached as <b>Annexure - 12</b>
ix	Project authorities are directed to maintain catch drains properly for pre and post monsoon ( <b>EC Specific Condition No. XXIII</b> ).	<b>Partially Complied.</b>	<b>Complied.</b> Same as <b>Point no.(ii)</b> above.
x	Project authorities are directed to construct the retaining wall structures at internal dumps and <b>ATR</b> in this regard shall be submitted to this office ( <b>EC Specific Condition No. XXIV</b> ).	<b>Partially Complied.</b>	<b>Complied.</b> Same as <b>Point no.(ii)</b> above.

**Condition wise compliance Status (Mine Site Visit dated 22 June, 2022 & Certified copy of compliance status report of EC stipulations – reg. dated 21.07.2022 received on dated 25<sup>th</sup> July 2022).**

Sr. No.	Observations	Compliance Status during the Mine site visit	Compliance Status till date
i	Transportation shall be by covered trucks of higher capacity (25 –tons) and loading shall be by siding. Mechanically covered trucks should be provided for transportation of coal. (EC Specific Condition No. XXX).	Partially Complied.	<p align="center"><b>Complied.</b></p> <p><b>Gare Palma IV/4 Coal Mine:</b></p> <p><b>a) Underground part of the Coal Mine:</b> The production of coal has been suspended from the Underground portion of Gare Palma IV/4 coal mine since June 2019.</p> <p><b>b) Opencast part of the Coal Mine:</b> Right now coal is being produced only from the Opencast mine and we would like to inform you that since the transport of coal started from the Gare Palma IV/4, HIL has taken effective steps to ensure zero dust emission/spillage by adopting following means:</p> <p>i. <b>Water Sprinkling:</b> To prevent the fugitive dust generation in the coal mine area Regular Water sprinkling on haul road is practiced through mobile water sprinklers- 4 nos. of truck mounted water sprinklers have been engaged for the purpose. 30 nos. of fixed type of water sprinklers are also installed in this regard. (Photographs of truck mounted water sprinklers &amp; fixed type of water sprinklers at GP IV/4 Coal Mines attached as <b><u>Annexure – 13</u></b>)</p> <p>ii. <b>Tarpaulin Covering of Trucks:</b> Each and every coal transport trucks is being properly/completely covered by Tarpaulin before dispatch.</p> <p>iii. <b>Sealing / Lock:</b> Each and every coal transport trucks is being properly covered &amp; sealed with the use of plastic / wire</p>

			<p>seals to avoid uncovering of tarpaulin in the route. (Photographs attached as <b>Annexure - 14</b>)</p> <p>iv. CCTV cameras have been installed in the truck parking yard and the details are being captured and records are being maintained for every previous 30 days.</p> <p>HIL has submitted the reply with respect to this particular condition to the CECB dated 07.02.2020. Attached a submitted copy of letter as <b>Annexure - 15</b></p> <p>In this regard the CECB, Raipur has issued an order vide letter no. 3600/Mu/Tak/CECB/2021 dated 24/08/2021 for exemption from provision from mechanically covered trucks up to 13/07/2023. <b>Attached a copy as Annexure -16</b></p>																																								
ii	A special corpus fund either at company level or in CIL/MOC be provided for the reclamation of abandoned and degraded areas. (EC Specific Condition No.- xlvi).	<b>Partially Complied.</b>	<p>Escrow account has been opened for the reclamation of abandoned and degraded areas in the mine lease till date (March 2022) <b>Rs 1044.56</b> lakhs has been deposited.</p> <table border="1"> <thead> <tr> <th colspan="4"><b>Escrow- GP IV/4</b></th> </tr> <tr> <th><b>Financial Year</b></th> <th><b>Year</b></th> <th><b>Amount (Rs Lakh)</b></th> <th><b>Reamrks</b></th> </tr> </thead> <tbody> <tr> <td>2015-16</td> <td>1</td> <td>151.50</td> <td>Deposited</td> </tr> <tr> <td>2016-17</td> <td>2</td> <td>159.08</td> <td>Deposited</td> </tr> <tr> <td>2017-18</td> <td>3</td> <td>167.05</td> <td>Deposited</td> </tr> <tr> <td>2018-19</td> <td>4</td> <td>0</td> <td>Deposited</td> </tr> <tr> <td>2019-20</td> <td>5</td> <td>19.19</td> <td>Deposited</td> </tr> <tr> <td>2020-21</td> <td>6</td> <td>267.19</td> <td>Deposited</td> </tr> <tr> <td>2021-22</td> <td>7</td> <td>280.55</td> <td>Deposited</td> </tr> <tr> <td><b>Total</b></td> <td></td> <td><b>1044.56</b></td> <td></td> </tr> </tbody> </table> <p><b>Attached a deposited copy as Annexure -17</b></p>	<b>Escrow- GP IV/4</b>				<b>Financial Year</b>	<b>Year</b>	<b>Amount (Rs Lakh)</b>	<b>Reamrks</b>	2015-16	1	151.50	Deposited	2016-17	2	159.08	Deposited	2017-18	3	167.05	Deposited	2018-19	4	0	Deposited	2019-20	5	19.19	Deposited	2020-21	6	267.19	Deposited	2021-22	7	280.55	Deposited	<b>Total</b>		<b>1044.56</b>	
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<b>Total</b>		<b>1044.56</b>																																									

iii	For monitoring land use pattern and for post mining land use, a time series of land use, maps, based on satellite imagery (on a scale of 1: 5000) of the core zone and buffer zone, from the start of the project until end of mine life shall be prepared once in the three years (for any one particular season which is consistent in the time series). And the report submitted to MOEF and its regional office at Bhopal. The post mining land use shall be that out of the total 701.512 ha area, 57.73 ha area will be under plantation. 319.65 Ha area for public use, 324.132 ha area shall be undisturbed. <b>(EC Specific Condition No.- xlvii).</b>	<b>Partially Complied.</b>	<b>Complied.</b> Report on Assessment of Land Use / Land Cover using High Resolution Satellite Imagery for the GP Mine IV/4 Coal Mine was carried out by IndiGEO Consultants, Bangalore in the month of December 2019 and the report was submitted to MoEF & CC Nagpur, Regional office dated 27 May 2020. The same is attached as <b><u>Annexure - 18</u></b>
iv	A special corpus fund either at company level or in CIL/MOC be provided for reclamation of abandoned and degraded area. <b>(EC Specific Condition No.- xlix).</b>	<b>Partially Complied.</b>	<b>Complied.</b> Escrow account has been opened for the reclamation of abandoned and degraded areas in the mine lease. The same is attached as <b>Annexure above.</b>
v	The possibility of sand stone, wherever is present in the OB as per lithology report, be explored and be provided to locals free of cost. <b>(EC Specific Condition No.- I.).</b>	<b>Partially Complied.</b>	<b>Complied.</b> As per availability the sand stone is being provided to the locals free of cost.
vi	The company shall have a well laid down Environment Policy approved by the Board of Directors. <b>(EC Specific Condition No.- lii).</b>	<b>Partially Complied.</b>	<b>Complied.</b> The company has an Environmental policy duly signed by the Managing Director on Board. A copy of Environment policy is attached as <b>Annexure – 18A</b>
vii	Vehicular emission should be kept under control and regularly monitored. Vehicles used for transporting the mineral should be covered with tarpaulins and optimally loaded. <b>(EC General Condition No.- vii).</b>	<b>Partially Complied.</b>	<b>Complied.</b> Regular monitoring of vehicular emission is being done and it is under control. The PUC certificate has been ensured for all the vehicles engaged in transportation of minerals. Records are being maintained (Latest PUC Certificates (July 2022) is attached as <b>Annexure - 19</b> )

			The vehicle used for transporting the minerals are covered and optimally loaded.
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# Annexure-6

## Plantation Details of Gare Palma IV/4 Coal Mine

(M/s Hindalco Industries Limited)

Year wise plantation detail of Gare Palma IV/4 Coal Mine						
Year	Location	No. of Tree Planted (Approx.)	Survival Rate (%)	Number of Plant Survived	Area Covered in Plantation (hectare)	Sapling Details
Upto 2015	Coal mine lease area/OB Dump.	53000	85	45050	18	Saja,Siris, Shisham, Yellow flametree, Kassod , Satvan, Acacia Mangium, Ganga Emli, Arjuna, Chirol, Gliricidia, Amla,Mango, guava, Kathal,Neem, Pipal, Ficus sp., Peltafarm, Nilgiri, Casia Samia, Gulmohar, Acacia Coliformis,Jamun,Kachnar, Baheda, Kachnar,Mahua & Saal etc.
2016		6500	90	5850	2.3	
2017		10000	87	8700	3.5	
2018		5000	87	4350	1.7	
2019		6600	90	5940	2.4	
2020		10200	94	9570	3.9	
2021		8521	95	8094	3.2	
2022		12000	95	11400	4.6	
<b>Total</b>		<b>111821</b>	<b>88.49</b>	<b>98954</b>	<b>39.6</b>	

*Note : Gap filling of plants is a continuous process*













**Plantation Photographs in OB Dump Area at patch "B" for 2022-23**

















**Plantation Photographs in OB Dump Area at patch "C" for 2022-23**











# Annexure-7



**Photographs of Garland Drain constructed at Patch “B” and Patch “C”  
of Gare Palma IV-4 Coal Mines  
(M/s Hindalco Industries Limited)**













# Annexure-8

**Photographs of Gabion / Retaining Wall constructed at Patch “C”  
of Gare Palma IV-4 Coal Mines  
(M/s Hindalco Industries Limited)**







# Annexure-9

**Settling Pond at Patch C Banjikhoh**



HIL constructed an additional settling pond of size 30m X 10m X 1.5m (01Nos) to collect whole mine seepage water generated during the mining activities from Patch “C” specially in the rainy season for proper settling of mine seepage water before discharge

# Annexure-9A



Constructed 03 Nos of Settling ponds of size 50m X 30m X 3m (each)  
with chemical dosing arrangement



SETTLING POND, NO – 1



SETTLING POND, NO –2



SETTLING POND, NO – 3

# Annexure-10



**2. Vetiver grass plantation at OB dump near Patch "C" at Banjikhoh in GP IV/4 Coal Mine : Aprox. 50,000 Nos of Vetiver grass plantation has been done in OB Dump area near Patch "C" to provide the stability and prevent top soil erosion / Reduce the surface Run- off from OB dumps.**



Before



After

Vetiver is a large tufted bunchgrass and can reach up to 1.5 meter (5 feet) in height. The thin leaves and stems are erect and rigid and the plant bears small brown – purple flowers in long spikes. The fragrant roots grow downward in the soil and can attain depths of more than 3 meters (10 feet)





# Annexure-11



Letter No.: HIL/EC/GP- IV/4 – MoEF&CC - QT/22-/194

11<sup>th</sup> November, 2022

The Integrated Regional Office,  
Ministry of Environment Forests & Climate Change (MoEF & CC) Aranya Bhawan,  
North Block, Sector – 19, Naya Raipur,  
Atal Nagar, Chhattisgarh, 492002

**Subject: Submission of Compliance Report on quarterly basis w.r.t. observation made by the “Scientist – C” during the GP IV/4 coal mine visit dated 22<sup>th</sup> June 2022 i.e. Project authorities are directed to take necessary precautions to prevent the erosion of internal dump to Bendra nala and its compliance is to be submitted on quarterly basis to this office (EC Specific Condition No. X) – reg.**

**Ref.: 1) MoEF & CC – IRO - Letter No.: 3-18/2013 (ENV)/830 dated 21.07.2022 received on dated 25.07.2022.**

**2) HIL – Letter No.: HIL/EC/GP-IV/4/CCR-R/2022/107-IR dared 08.08.2022**

Dear Sir,

With reference to the above subject we are submitting herewith the quarterly progress compliance report (From Aug. 2022 – Oct. 2022) of Gare Palma IV/4 Coal Mine of Hindalco Industries Limited, Village – Bhanjikhoh, Tehsil – Tamnar, District – Raigarh, Chhattisgarh.

The details are as under:

Sr. No.	Observations	Quarterly Progress Compliance (From Aug. 2022 – Oct. 2022)
1	Project authorities are directed to take necessary precautions to prevent the erosion of internal dump to Bendra nala and its compliance is to be submitted on quarterly basis to this office (EC Specific Condition No. X)	<b>1) Plantation/Greenbelt Development:</b> Planation in the mine lease area is being carried out @2500 plant/ha. In this monsoon season approx. 12000 nos. local plants species have been planted in the mine lease area including OB dump area (Patch C & Patch B) which also helps in preventing erosion of internal dumps. (Plantation report & Photograph is attached as <b>Annexure –1</b> ). <b>2) Garland drains:</b> Till Oct. 2022 in Patch B (South pit), HIL has constructed Approx.4116 mtr. of Garland drain & 2288 mtr. of Toe drain & in Patch C (North Pit) Approx.964 mtr. of Garland drain & 1390 mtr. of Toe drain. <b>3) Gabion Wall/Retaining:</b> Construction of gabion wall in Patch C at the toe of the OB dump is under

**Hindalco Industries Limited**

Gare Palma Mines ( IV/4 & IV/5), Vill & Po: Milupara , Tehsil: Tamnar Dist: Raigarh- 496107 , Chhattisgarh  
T: +91 7762 228212, Website : www.hindalco.com E mail : hindalco@adityabirla.com  
Registered Office : Ahura Centre, 1st Floor, B Wing, Mahakali Caves Road Andheri (East) , Mumbai 400093, India  
T: + 912266917000 | Fax: + 912266917001  
Corporate ID No: L27020MH1958PLC011238



		<p>progress till October 2022 we have made approx. Gabion Box (2*1*1): 25 nos. Gabion Box (1.5*1*1): 25 Nos. Gabion Box (1*1*1): 25 Nos. Total Box – 75 Nos. We would also like to inform you that we have taken gabion/retaining wall construction activity at the toe of the OB dump as a continuous process and in this Financial year 22 – 23 will construct the gabion wall approx. 50 mtr.</p>
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Submitted for your kind information & record please.

Yours faithfully,  
For **Hindalco Industries Limited**,



**Govind Kumar**  
(Mine Agent – GP IV/4 Coal Mine)

# Annexure - 1

### Year wise plantation detail of Gare Palma IV/4 Coal Mine

Year	Location	No. of Tree Planted (Approx.)	Survival Rate (%)	Number of Plant Survived	Area Covered in Plantation (hectare)	Sapling Details
Upto 2015	Coal mine lease area/OB Dump.	53000	85	45050	18	Saja,Siris, Shisham, Yellow flametree, Kassod , Satvan, Acacia Mangium, Ganga Emlil, Arjuna, Chirol, Gliricidia, Amla, Mango, guava, Kathal, Neem, Pipal, Ficus sp., Peltafarm, Nilgiri, Casia Samia, Gulmohar, Acacia Coliformis, Jamun, Kachnar, Baheda, Kachnar, Mahua & Saal etc.
2016		6500	90	5850	2.3	
2017		10000	87	8700	3.5	
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2019		6600	90	5940	2.4	
2020		10200	94	9570	3.9	
2021		8521	95	8094	3.2	
2022		12000	95	11400	4.6	
<b>Total</b>		<b>111821</b>	<b>88.49</b>	<b>98954</b>	<b>39.6</b>	

*Note : Gap filling of plants is a continuous process*

**Plantation Photographs in OB Dump Area at patch "C" for 2022-23**













**Plantation Photographs in OB Dump Area at patch "B" for 2022-23**















# Annexure-12



## कार्यालय प्रधान मुख्य वन संरक्षक छत्तीसगढ़, अरण्य भवन, रायपुर

(शाखा-संयुक्त वन-प्रबंधन)

दूरभाष: 0771 - 2552239, फ़ैक्स: 0771 - 2880399,

E-mail: apccf\_jfm@rediffmail.com

क्रमांक/स.व.प्र/एफ.डी.ए./04/871

रायपुर, दिनांक 18/11/2014

प्रति,

समस्त मुख्य वन संरक्षक (क्षेत्रीय)

छत्तीसगढ़

विषय:- वन विकास अभिकरणों का स्वतंत्र एजेन्सियों द्वारा अनुश्रवण एवं मूल्यांकन।

—0—

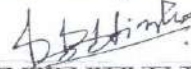
विषयांतर्गत राष्ट्रीय वनीकरण कार्यक्रम के अंतर्गत वन विकास अभिकरणों में कराये गये कार्यों का अनुश्रवण एवं मूल्यांकन स्वतंत्र एजेन्सियों से कराया जाना होता है। राष्ट्रीय वनीकरण कार्यक्रम हेतु भारत सरकार, पर्यावरण एवं वन मंत्रालय के पत्र क्र/35.38.2/2002 दिनांक 05.07.2003 में जारी दिशा निर्देश एवं नवीन पुनरीक्षित गाईड लाईन, 2009 के अनुसार वन विकास अभिकरणों में कराये गये कार्यों का परियोजना अवधि के 24 से 36 माह में प्रथम मूल्यांकन एवं पांचवें वर्ष में द्वितीय मूल्यांकन कराये जाने का प्रावधान है। उक्त के अनुसार छ.ग. राज्य के वन विकास अभिकरणों में वर्ष 2010-11 में कराये गये कार्यों का द्वितीय (अंतिम) मूल्यांकन एवं 2012-13 में कराये गये कार्यों का प्रथम मूल्यांकन कराया जाना है।

उपरोक्त के तारतम्य में वन विकास अभिकरणों में कराये गये कार्यों के अनुश्रवण एवं मूल्यांकन हेतु पैनल का निर्धारण करते हुए वन विकास अभिकरणवार निम्नानुसार विशेषज्ञ/स्वयं सेवी संस्थाओं का निर्धारण किया जाता है:-

क्र.	विशेषज्ञ/ संस्था का नाम	एफ.डी.ए. का नाम जिनमें वर्ष 2010-11 के कार्यों का द्वितीय एवं वर्ष 2012-13 के कार्यों का प्रथम मूल्यांकन किया जाना है
1	डॉ. के.केशव रेड्डी, सेवानिवृत्त प्र.मु.व.सं.,आं.प्र. मकान नं. 4, - 135, शिव नगर, श्री अय्यप्पा स्वामी मंदिर रोड मदनापल्ले (पी.ओ.) 517325, चित्तुर, आन्ध्रप्रदेश	बीजापुर, सुकमा एवं दंतेवाड़ा
2	श्री के. एम. जौहरी, सेवानिवृत्त मु.व.सं., छ.ग. एफ - 7, कम्फर्ट गार्डन, चूना भट्टी, भोपाल	दुर्ग, राजनांदगांव, खैरागढ़ एवं कवर्धा
3	श्री सी.एम. शकील, अध्यक्ष सर्वोत्कर्ष सेवा समिति, सी/76 शैलेन्द्र नगर, रायपुर	बिलासपुर, जांजगीर-चाम्पा, रायगढ़, कटघोरा, कोरबा एवं मरवाही
4	सोसायटी फॉर इनवायरमेन्ट एण्ड इंटीग्रेटेड डेवलपमेन्ट, जे-9 ए, श्रीराम नगर, रायपुर	उत्तर कोण्डागांव, द. कोण्डागांव एवं बस्तर
5	स्वयं सेवी संस्था, सिन्द्रा, 237 पंचवटी नगर, कांपा, रायपुर	कांकेर, नारायणपुर, पू. भानुप्रतापपुर एवं प. भानुप्रतापपुर

6	सोसायटी फॉर पिपुल्स, इनवायरमेंट एण्ड एजुकेशन डेवलपमेंट, पुराना सरकण्डा, बिलासपुर	रायपुर (बलौदाबाजार) एवं धरमजयगढ़
7	नव आस्था जन विकास सेवा समिति, वार्ड नं. 3 पुराना कत्था फैक्ट्री के पास गोवर्धनपुर, अंबिकापुर	उ.सरगुजा (सूरजपुर), कोरिया, मनेन्द्रगढ़ एवं धूमतरी
8	श्री आरिफ अली, सेवानिवृत्त सहायक वन संरक्षक, कं/6, टी.वी. टावर के पिछे, अनुपम नगर, रायपुर	द. सरगुजा (सरगुजा), पू. सरगुजा (बलरामपुर) एवं जशपुर
9	श्री एम.एल. तिवारी, सेवानिवृत्त, स.व.स., 338 सुंदर नगर, (मिलेनियम टावर रोड), रायपुर	महासमुंद, पूर्व रायपुर एवं उदन्ती

वन विकास अभिकरणों के मूल्यांकन हेतु भारत सरकार, पर्यावरण एवं वन मंत्रालय द्वारा निर्धारित प्रपत्र संलग्न है। मूल्यांकन प्रतिवेदन निर्धारित प्रपत्र के अनुसार ही अनिवार्य रूप से तैयार कराया जावे। अन्य किसी प्रपत्र में प्रस्तुत प्रतिवेदन मान्य नहीं किया जावेगा। वर्ष 2010-11 का द्वितीय (अंतिम) मूल्यांकन एवं 2012-13 के प्रथम मूल्यांकन हेतु पृथक-पृथक प्रतिवेदन प्रस्तुत किया जावे। उपरोक्तानुसार विशेषज्ञों/संस्थाओं से अपने अधिनस्थ वन विकास अभिकरणों का अनुश्रवण एवं मूल्यांकन दिनांक 20.12.14 तक पूर्ण कराते हुए मूल्यांकन प्रतिवेदन दिनांक 30.12.14 तक इस कार्यालय को अनिवार्य रूप से प्रेषित करने का कष्ट करें। मूल्यांकनकर्ताओं को आवश्यक अभिलेख एवं सहयोग प्रदान करें, ताकि निर्धारित समयवधि में मूल्यांकन कार्य पूर्ण किया जा सके।

  
अपर प्रधान मुख्य वन संरक्षक

(संयुक्त वन प्रबंधन एवं नीति विश्लेषण)  
छत्तीसगढ़, रायपुर

रायपुर, दिनांक 17/11/2014

पू.क्रमांक/सं.व.प्र/एफ.डी.ए./04/872

प्रतिलिपि:-

- समस्त वनमण्डलाधिकारी एवं मुख्य कार्यपालन अधिकारी, वन विकास अभिकरण, छत्तीसगढ़ को पालनार्थ। कृपया अधिकृत संस्थाओं को वांछित सहयोग प्रदान करते हुए वर्ष अन्तर्गत निर्धारित समितिवार भौतिक एवं आर्थिक लक्ष्य, उपलब्धि तथा आस्थामूलक कार्यों सहित अन्य कराये गये कार्यों की सूची तथा निर्धारित प्रपत्र के आधार पर समितिवार अन्य वांछित जानकारी अनिवार्य रूप से उपलब्ध करावें।

संबंधित विशेषज्ञ/ सेवानिवृत्त अधिकारी/स्वतंत्र एजेन्सी ..... को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित। कृपया संबंधित वनमण्डल से सम्पर्क कर तत्काल मूल्यांकन कार्य प्रारंभ करें तथा निर्धारित तिथि तक कार्य पूर्ण कर, संलग्न प्रपत्र में प्रतिवेदन वनमण्डलाधिकारी को प्रस्तुत करते हुए 1 प्रति इस कार्यालय को भी प्रेषित किया जावे।

  
अपर प्रधान मुख्य वन संरक्षक

(संयुक्त वन प्रबंधन एवं नीति विश्लेषण)  
छत्तीसगढ़, रायपुर

कार्यालय प्रधान मुख्य वन संरक्षक, छत्तीसगढ़, अरण्य भवन, मेडिकल कॉलेज रोड, रायपुर  
(शाखा - संयुक्त वन प्रबंधन एवं नीति विश्लेषण)

फैक्स: 0771 - 2880399

E-mail: apccf\_jfm@rediffmail.com

क्रमांक/सं.व.प्र./एफ.डी.ए./04/ 273

रायपुर, दिनांक 17/04/2014

प्रति,

1. मुख्य वन संरक्षक,  
रायपुर, दुर्ग, बिलासपुर एवं सरगुजा
2. वन संरक्षक,  
(कांकेर एवं जगदलपुर वृत्त)  
छत्तीसगढ़

विषय:- वन विकास अभिकरणों का स्वतंत्र एजेन्सियों द्वारा अनुश्रवण एवं मूल्यांकन।

—0—

विषयांतर्गत राष्ट्रीय वनीकरण कार्यक्रम के अंतर्गत वन विकास अभिकरणों में कराये गये कार्यों का अनुश्रवण एवं मूल्यांकन स्वतंत्र एजेन्सियों से कराया जाना होता है। राष्ट्रीय वनीकरण कार्यक्रम हेतु भारत सरकार, पर्यावरण एवं वन मंत्रालय के पत्र क्र. 35.38.2/2002 दिनांक 05.07.2003 में जारी दिशा निर्देश एवं नवीन पुनरीक्षित गार्ड लाईन, 2009 के अनुसार वन विकास अभिकरणों में कराये गये कार्यों का परियोजना अवधि के 24 से 36 माह में प्रथम मूल्यांकन एवं पांचवे वर्ष में द्वितीय मूल्यांकन कराये जाने का प्रावधान है। उक्त के अनुसार छ.ग. राज्य के वन विकास अभिकरणों में वर्ष 2009-10 में कराये गये कार्यों का द्वितीय मूल्यांकन एवं 2011-12 में कराये गये कार्यों का प्रथम मूल्यांकन कराया जाना है।

उपरोक्त के तारतम्य में वन विकास अभिकरणों में कराये गये कार्यों के अनुश्रवण एवं मूल्यांकन हेतु पैनल का निर्धारण करते हुए वन विकास अभिकरणवार निम्नानुसार विशेषज्ञ/स्वयं सेवी संस्थाओं का निर्धारण किया जाता है:-

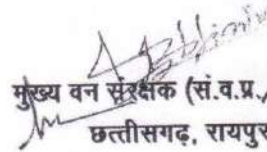
क्र.	विशेषज्ञ/ संस्था का नाम	एफ.डी.ए. का नाम जिनमें वर्ष 2009-10 के कार्यों का द्वितीय एवं वर्ष 2011-12 के कार्यों का प्रथम मूल्यांकन किया जाना है
1	डॉ. के. केशव रेड्डी, सेवानिवृत्त प्र.मु.व.सं.आ.प्र. मकान नं. 4, - 135, शिव नगर, श्री अय्यप्पा स्वामी मंदिर रोड मदनापल्ले (पी.ओ.) 517325, चित्तूर, आन्ध्रप्रदेश	पूर्व भानुप्रतापपुर, प.भानुप्रतापपुर, नारायणपुर एवं कांकेर
2	श्री के. एम. जौहरी, सेवानिवृत्त मु.व.सं., छ.ग. एफ - 7, कम्फर्ट गार्डन, चूना भट्टी, भोपाल	दुर्ग, राजनांदगांव, खैरागढ़ एवं कवर्धा
3	श्री सी.एम. शकील, अध्यक्ष सर्वोत्कर्ष सेवा समिति, सी/76 शैलेन्द्र नगर, रायपुर	जगदलपुर वृत्त के एफडीए, उदती, द.सरगुजा एवं जशपुर



4	सोसायटी फॉर इनवायरमेन्ट एण्ड इटीग्रेटेड डेवलपमेन्ट, जे-9 ए, श्रीराम नगर, रायपुर	महासमुन्द, रायपुर (बलौदा बाजार), एवं पू, रायपुर
5	स्वयं सेवी संस्था, सिन्द्रा, 237 पंचवटी नगर, कांपा, रायपुर	उ. कोण्डगांव, द. कोण्डगांव, धमतरी
6	सोसायटी फॉर पिपुल्स, इनवायरमेन्ट एण्ड एजुकेशन डेवलपमेन्ट, पुराना सरकारण्डा, बिलासपुर	मरवाही, कोरबा एवं धरमजयगढ़
7	नव आस्था जन विकास सेवा समिति, वार्ड नं. 3 पुराना कल्था फैक्ट्री के पास गोवर्धनपुर, अंबिकापुर	उ. सरगुजा, पू. सरगुजा, कोरिया, कटघोरा
8	स्वयं सेवी संस्था, कल्पवृक्ष, सेन्ट्रल स्कूल के पीछे, मनेन्द्रगढ़	मनेन्द्रगढ़, रायगढ़
9	प्रकृति विज्ञान समिति, नया सरकारण्डा, बिलासपुर	बिलासपुर, जांजगीर चांपा

वन विकास अभिकरणों के मूल्यांकन हेतु भारत सरकार, पर्यावरण एवं वन मंत्रालय द्वारा निर्धारित प्रपत्र संलग्न है। मूल्यांकन प्रतिवेदन उक्त संलग्न प्रपत्र के अनुसार ही अनिवार्य रूप से तैयार कराया जावे। अन्य किसी प्रपत्र में प्रस्तुत प्रतिवेदन मान्य नहीं किया जावेगा। वर्ष 2009-10 का द्वितीय मूल्यांकन एवं 2011-12 के प्रथम मूल्यांकन हेतु पृथक-पृथक प्रतिवेदन प्रस्तुत किया जावे। उपरोक्तानुसार विशेषज्ञों/संस्थाओं से अपने अधिनस्थ वन विकास अभिकरणों का अनुश्रवण एवं मूल्यांकन दिनांक 20.05.14 तक पूर्ण कराते हुए मूल्यांकन प्रतिवेदन दिनांक 25.05.14 तक इस कार्यालय को अनिवार्य रूप से प्रेषित करने का कष्ट करें। मूल्यांकनकर्ताओं को आवश्यक अभिलेख एवं सहयोग प्रदान करें, ताकि निर्धारित समयावधि में मूल्यांकन कार्य पूर्ण किया जा सके।

संलग्न:- उपरोक्तानुसार

  
मुख्य वन संरक्षक (सं.व.प्र./नी.वि.)  
छत्तीसगढ़, रायपुर

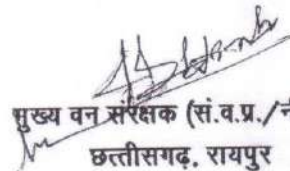
पृ.क्रमांक/सं.व.प्र./एफ.डी.ए./04/274

रायपुर, दिनांक 17/04/2014

प्रतिलिपि:-

1. समस्त वनमण्डलाधिकारी एवं मुख्य कार्यपालन अधिकारी, वन विकास अभिकरण, छत्तीसगढ़ को पालनार्थ।
2. संबंधित विशेषज्ञ/ सेवानिवृत्त अधिकारी/स्वतंत्र एजेन्सी .....को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित। कृपया संबंधित वनमण्डल में सम्पर्क कर तत्काल मूल्यांकन कार्य प्रारंभ करें तथा निर्धारित तिथि तक कार्य पूर्ण कर संलग्न प्रपत्र में प्रतिवेदन वनमण्डलाधिकारी को प्रस्तुत करते हुए 1 प्रति इस कार्यालय को भी प्रेषित किया जावे।

संलग्न:- उपरोक्तानुसार

  
मुख्य वन संरक्षक (सं.व.प्र./नी.वि.)  
छत्तीसगढ़, रायपुर



कार्यालय वनमण्डलाधिकारी, कोरिया वनमण्डल, बैकुण्ठपुर.

Ph. No. (O) 07836-232227 (R) 232230 (F) 233564 E Mail :- dfo.korea\_bkp@yahoo.co.in

क्रमांक/व्यय-2/FDA/2014/1187  
प्रति,

/बैकुण्ठपुर, दिनांक/ 13/05/2014

सचिव,  
नव आस्था जन विकास सेवा समिति,  
अम्बिकापुर (छ0ग0)  
विषय:- वन विकास अभिकरण का स्वतंत्र एजेन्सियों द्वारा अनुश्रवण एवं मूल्यांकन ।  
संदर्भ :- मुख्य वनसंरक्षक (सं.व.प्र./नी.वि.)छ0ग0 रायपुर का पृ.क्र./सं.व.प्र./एफ.डी.ए./04/274  
दिनांक 17.04.2014 एवं आपका पत्र क्र/11/najvss/2014-15 अंबिकापुर, दि. 22.04.2014

-00-

उपरोक्त विषयांकित संदर्भित पत्र के माध्यम से वन विकास अभिकरण वनमण्डल अंतर्गत वर्ष 2009-10 एवं 2011-12 में संपन्न कराये गये कार्यों का अनुश्रवण एवं मूल्यांकन हेतु आपको अधिकृत किया गया है । तदनुसार कराये गये क्षेत्रों का विवरण निम्नानुसार है :-

क्र.	वर्ष	परिक्षेत्र का नाम	कार्य का नाम	वन विकास अभिकरण समिति का नाम	आवृत्त क्षेत्र	
					कक्ष क्रमांक	रकबा
01.	02.	03.	04.	05.	06.	07.
01.	2009-10	सोनहत	प्राकृतिक पुनरुत्पादन (वृक्षारोपण)	01. बेलिया 02. कछाडी 03. भुईहारीपारा 04. मेण्ड्रा 05. गरनई	243 P-217 253 P-248 P-199	50.000 50.000 50.000 50.000 50.000
02.	2009-10	देवगढ़	प्राकृतिक पुनरुत्पादन (वृक्षारोपण)	06. कछार 07. ओदारी 08. पाराडोल 09. विकमपुर 10. घुघरा	394 402 393 P 372. 404 P-415	50.000 50.000 50.000 50.000 50.000
					<b>योग :-</b>	<b>500.000</b>
03.	2009-10	बैकुण्ठपुर	मिश्रित वृक्षारोपण	11. आनंदपुर 12. सलबा 13. सरईगहना 14. हथवर 15. देवखोल	456-P 480, 481 483 446 A, 445 439	25.000 25.000 25.000 25.000 25.000
04.	2009-10	चिरमिरी	मिश्रित वृक्षारोपण	16. मुकभुकी 17. दुग्गी 18. चिरमी 19. छोटे कलुआ 20. मुकुण्ठपुर	548 564 575 579 560	25.000 25.000 25.000 25.000 25.000
					<b>योग :-</b>	<b>250.000</b>
05.	2011-12	कोटाडोल	बांस रोपण	01. रजरावल 02. जमुनिहा	P-9 18	20.00 30.00
06.	2011-12	देवगढ़		11. काचरडांड 12. सोनारी	417 368	25.00 30.00
07.	2011-12	बैकुण्ठपुर		18. टेमरी 01. मदनपुर (मटीआरिफ)	430 516	25.00 30.00
					<b>योग :-</b>	<b>160.00</b>

वनमण्डलाधिकारी,  
कोरिया वनमण्डल, बैकुण्ठपुर

# Annexure-12A



HIL/GP-IV/4/Letter/GB – RO/CECB/450

22 December, 2021

**The Regional Officer,  
Chhattisgarh Environment Conservation Board  
TV Tower road,  
Raigarh (CG)**

**Subject: Submission of Monitoring & Evaluation of Plantation/Greenbelt Report for Gare Palma IV/4 Coal Mine of M/s Hindalco Industries Limited, Village – Banjikhola, Tehsil – Tamnar, Distt. – Raigarh, Chhattisgarh – 496107.**

Dear Sir,

With reference to above subject we are submitting herewith the **Monitoring & Evaluation of Plantation/Greenbelt Report for Gare Palma IV/4 Coal Mine of M/s Hindalco Industries Limited, Village – Banjikhola, Tehsil – Tamnar, Distt. –Raigarh, Chhattisgarh – 496107.**

The Plantation/Greenbelt monitoring & Evaluation report has been prepared by the **NAV AASTHA JAN VIKAS SEVA SAMITI" 8/5, "JASMATI BHAWAN", NEAR OLD KATTHA FACTORY, GODHANPUR, AMBIKAPUR – 497001.**

Receipt of the report may kindly be acknowledged.

Thanking you,

Yours faithfully,

For **Hindalco Industries Limited,**

  
**Govind Kumar  
(Mine Agent)**

- CC: 1. The Integrated Regional Office, Ministry of Environment Forests & Climate Change (MoEF & CC) Aranya Bhawan, North Block, Sector – 19, Naya Raipur, Atal Nagar, Chhattisgarh, 492002**
- 2. The Member Secretary, Chhattisgarh Environment Conservation Board, Paryawas Bhawan, North Block Sector-19, Naya Raipur Chhattisgarh**

**Hindalco Industries Limited**

Gare Palma Mines ( IV/4 & IV/5), Vill & Po: Milupara , Tehsil: Tamnar Dist: Raigarh- 496107 , Chhattisgarh  
T: +91 7762 228212, Website : www.hindalco.com E mail : hindalco@adityabirla.com  
Registered Office : Ahura Centre, 1st Floor, B Wing, Mahakali Caves Road Andheri (East) , Mumbai 400093, India  
T: + 912266917000 | Fax: + 912266917001  
Corporate ID No: L27020MH1958PLC011238

**A REPORT ON**  
**“MONITORING AND EVALUATION OF**  
**PLANTATION” AT**  
**GARE PALMA IV/4 COAL MINES OF M/S**  
**HINDALCO INDUSTRIES LIMITED, VILLAGE-**  
**BANJIKHOL / BANKHETA, TEHSIL – TAMNAR,**  
**DISTRICT – RAIGARH, CHHATTISGARH**

**OCTOBER – 2021**



**“NAV AASTHA JAN VIKAS SEVA SAMITI”**  
**8/5, “JASMATI BHAWAN”, NEAR OLD KATTHA FACTORY,**  
**GODHANPUR, AMBIKAPUR – 497001**  
**CONTACT – #99261-54460 #94255-80401**  
**WEBSITE – [www.navaastha.in](http://www.navaastha.in) Email – [najvss@gmail.com](mailto:najvss@gmail.com)**



## WHO WE ARE?

NAV AASTHA JAN VIKAS SEVA SAMITI is a registered NGO under societies registration act. 1973 of Indian constitution, registered on 07<sup>th</sup> April 2005 at Raipur (C.G.). The working area of the organization is whole Chhattisgarh. Our main focus is towards the youth development as well as women and child empowerment of the state.



We have been working continuously in betterment of the people of Chhattisgarh (*chhattisgarhiya*) in educational, social and many more sectors by the help of schemes of govt. The organization works under many schemes of the respectable govt. like - **Green India Mission (GIM), Bio-diversity Program, Integrated Watershed Management Program (IWMP), SGSY, SHG forming, JFMC** and many more. We are also engaged in **Monitoring and Evaluation** of plantations of government entities as well as private entities. We are also enlisted for the monitoring and evaluation of various entities working in Chhattisgarh by PCCF, Raipur under the ministry of Environment and Forest GoCG.

*“New challenges new innovations.....”*



# CENTRAL POLLUTION CONTROL BOARD

The **Central Pollution Control Board (CPCB)**, statutory organization, was constituted in September, 1974 under the Water (Prevention and Control of Pollution) Act, 1974. Further, CPCB was entrusted with the powers and functions under the Air (Prevention and Control of Pollution) Act, 1981.



It serves as a field formation and also provides technical services to the Ministry of Environment and Forests of the provisions of the Environment (Protection) Act, 1986. Principal **Functions** of the CPCB, as spelt out in the Water (Prevention and Control of Pollution) Act, 1974, and the Air (Prevention and Control of Pollution) Act, 1981, (i) to promote cleanliness of streams and wells in different areas of the States by prevention, control and abatement of water pollution, and (ii) to improve the quality of air and to prevent, control or abate air pollution in the country.

**Air Quality Monitoring** is an important part of the air quality management. The **National Air Monitoring Programme (NAMP)** has been established with objectives to determine the present air quality status and trends and to control and regulate pollution from industries and other source to meet the air quality standards. It also provides background air quality data needed for industrial siting and towns planning.

Besides this, CPCB has an automatic monitoring station at ITO Intersection in New Delhi. At this station Resizable Suspended Particulate Matter (RSPM), Carbon Monoxide (CO), Ozone (O<sub>3</sub>), Sulphur Dioxide (SO<sub>2</sub>), Nitrogen Dioxide (NO<sub>2</sub>) and Suspended Particulate Matter (SPM) are being monitored regularly. This information on Air Quality at ITO is updated every week.

# REPORT

S.N.	Plantation Year	Area/Village Covered	No. of Sapling Planted (Approx.)	No. of Sapling Survived	Survival Rate
1	2018	In and around mines area / OB Dump.	5000	4700	94%
2	2019	In and around mines area / OB Dump.	6600	6072	92%
3	2020	In and around mines area / OB Dump.	10200	9282	91%
4	2021	In and around mines area / OB Dump.	8581	7723	90%
<b>Total</b>			<b>30381</b>	<b>27777</b>	<b>91.75%</b>

\*As per records given by the company for the year 2018 to 2021 (Mines Leased & outside Areas)

Note –

1. Gap filling of plants is a continuous process.

2. Up to 2017 Survival rate of plantation done by company was 94.91% evaluated by Nav Aastha Jan Vikas Seva Samiti, Ambikapur.

## **CONCLUSION**

The Survival percentile of plant in the plantation done by “Coal Mines HINDALCO Industries Limited, Banjikhola / Bankheta, Tamnar, Raigarh, C.G.” is about **91.75%** which is **Outstanding** for the company. All the works of the company were completely satisfactory and this will lead them to a bright future ahead.

The official staff of the company was so co-operative and helpful towards the work.

### **GRADING OF PROJECT ON A SCALE OF 1 TO 10**

Overall Grading of the Project	Outstanding (8-10)	Very Good (5-8)	Good(3-5)	Poor(<3)
	9.1			



## ON SITE PHOTOGRAPHS







# Annexure-13



**कार्यालय प्रधान मुख्य वन संरक्षक (वन्यप्राणी एवं जैव विविधता संरक्षण)**

**सह मुख्य वन्यप्राणी अभिरक्षक, छत्तीसगढ़**

मेडिकल कॉलेज रोड, "अरण्य भवन", रायपुर

फोन नं. 0771-2552228 / फैक्स- 0771-2552227

ई-मेल : pccfwl@sify.com/cwlv-cg@nic.in

क्रमांक/व.प्रा./ प्रबंध -30/11/

रायपुर, दिनांक /11/2011

प्रति,

मुख्य वन संरक्षक

(भू-प्रबंध)

छत्तीसगढ़, रायपुर

**विषय : मेसर्स जैसवाल निको इंडस्ट्रीज लिमिटेड के पक्ष में रायगढ़ वनमंडल के गारे पेलमा ब्लॉक के IV/8 उपखंड में कोयला उत्खनन हेतु 224.220 हेक्टेयर वनभूमि के व्यपवर्तन प्रकरण से संबंधित वन्यप्राणी संरक्षण योजना का अनुमोदन।**

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कृपया मुख्य वन संरक्षक (भू-प्रबंध) के पत्र क्रमांक भू-प्रबंध/खनिज/331-41/1812, दिनांक 29/08/2011 का अवलोकन करना चाहेंगे जिसके द्वारा मेसर्स जैसवाल निको इंडस्ट्रीज लिमिटेड द्वारा रायगढ़ वनमंडल के कोल ब्लॉक गारे पेलमा IV/8 में कोयला उत्खनन हेतु 224.22 हेक्टेयर वनभूमि के व्यपवर्तन के प्रकरण में भारत सरकार, वन एवं पर्यावरण मंत्रालय द्वारा लगाई गई शर्तों के पालन में तैयार की गई वन्यप्राणी संरक्षण योजना को प्रेषित करते हुए उसके अनुमोदन का अनुरोध किया गया है।

2. भारत शासन, वन एवं पर्यावरण मंत्रालय के पत्र क्रमांक 8-75/2007-FC दिनांक 27 फरवरी, 2009 द्वारा 224.220 हेक्टेयर वनभूमि संस्था के पक्ष में कोयला उत्खनन हेतु व्यपवर्तन की प्रथम चरण की अनुमति प्रदान की गई है जिसमें 163.33 हेक्टेयर क्षेत्र में भूमिगत खदान तथा 56.89 हेक्टेयर क्षेत्र में खुली खदान निर्मित की जाएगी। भारत सरकार द्वारा जारी की गई प्रथम चरण की स्वीकृति में लगाई गई शर्तों में शर्त क्रमांक-9 में यह उल्लेख है कि उपयोगकर्ता संस्था मुख्य वन्यप्राणी अभिरक्षक के दिशा निर्देशों के अनुरूप उत्खनन के हानिकारक प्रभावों को कम करने के उद्देश्य से एक वन्यप्राणी संरक्षण योजना तैयार करेगी। इसी शर्त के अधीन उपयोगकर्ता संस्था द्वारा एक वन्यप्राणी संरक्षण योजना मुख्य वन संरक्षक (भू-प्रबंध) के मार्फत प्रस्तुत की गई है।

3. प्रस्तुत की गई वन्यप्राणी संरक्षण योजना उपयोगकर्ता एजेंसी द्वारा इस कार्यालय को प्रस्तुत की गई थी जिसका परीक्षण किये जाने के उपरांत इस कार्यालय के पत्र क्रमांक/व.प्रा./136 रायपुर दिनांक 29.10.2011 से दिये गये निर्देशों के अनुसार संशोधन कर प्रस्तुत करने हेतु लेख किया गया था। जिसके अनुसार संस्था द्वारा पुनः संशोधित योजना दिनांक 13.10.2011 को प्रस्तुत की गयी। वन्य प्राणियों को उपयुक्त प्राकृतवास उपलब्ध कराने के लिये 10 वर्षों की वन्यप्राणी संरक्षण योजना तैयार की गई है। वन्यप्राणी संरक्षण योजना में निम्नानुसार घटकों का प्रावधान किया गया है :-



- (I) सर्वप्रथम कोर जोन में आने वाले वनस्पतियों का सर्वे किया गया है एवं उनके आंकड़े प्रस्तावित योजना की कंडिका-2 (पृष्ठ क्रमांक-2 से 6 तक) में उल्लेखित किये गये हैं। क्षेत्र में पाये जाने वाले वृक्षों की मुख्य प्रजातियों में *Buchanania lanzan*, *Cassia fistula*, *Madhuca longifolia*, *Shorea robusta*, *Soymida febrifuga*, *Terminalia tomentosa* आदि प्रमुख हैं। क्षेत्र में *Fern*, *Satawar*, *Herb*, *Kali-Musli*, *Dang Kanda*, *Hiran Khur* आदि प्रमुख हैं। कोर जोन के पौधों पर चराई और जैविक दबाव अपेक्षाकृत ज्यादा है।
- (II) कोर क्षेत्र में पाये जाने वाले वन्य प्राणियों के सर्वे की जानकारी पैरा-3 (पृष्ठ क्र. 6 से 10 तक) में उल्लेखित है। संबंधित क्षेत्र किसी अभ्यारण्य, राष्ट्रीय उद्यान अथवा जैवविविधता रिजर्व का भाग नहीं है। न ही उक्त क्षेत्र से 15 कि.मी. की परिधि में कोई अभ्यारण्य, राष्ट्रीय उद्यान स्थित है। क्षेत्र में पाये जाने वाले जीवों में *Jackal*, *Sloth bear*, *Five stripped squirrel*, *Field rat*, *Indian fox* आदि, पाये जाने वाली पक्षियों में *Corvus splendens*, *Acridotheris tristis*, *Strurnus pagodrum*, *Streptopelia chinensis*, *Psittacutla krameri*, *Eudynamys scolopoaicea*, *Streptopelia chinensis*, *Coturnix coturnix* आदि प्रमुख हैं। रेंगने वाले जीवों में *Calotes versicolor*, *Bufo mealanostictus*, *Ptyas mucosus*, *Amphiesma stolata*, *Naja naja*, *Bungarus caeruleus* की उपलब्धता पायी गई है।
- (III) बफर क्षेत्र में पाये जाने वाले पौधों का विवरण योजना प्रस्ताव के पृष्ठ क्रमांक 10 से 18 तक में उल्लेखित है। बफर क्षेत्र में सर्वे में यह पाया गया कि उक्त क्षेत्र में ऐसी कोई भी प्रजाति नहीं है जो विलुप्तप्रायः हो ।
- (IV) बफर क्षेत्र में पाये जाने वाले वन्यप्राणियों का विवरण वन्यप्राणी संरक्षण योजना प्रस्ताव के पृष्ठ क्रमांक 18 से 22 तक दिये गये विवरण में उल्लेखित है। बफर क्षेत्र में भारतीय वन्यप्राणी अधिनियम के Schedule-I में पाये जाने वाले वन्यप्राणियों में *Bengal monitor*, *Peafowl*, *Sloth bear* एवं *Elephant* क्षेत्र में पाये जाने की जानकारी प्राप्त हुई है।
- (V) खनन के कार्य से वन्यप्राणियों पर पड़ने वाले प्रभाव को कम करने के लिये प्रस्तावित वन्यप्राणी संरक्षण योजना में रहवास सुधार, अग्नि सुरक्षा, जल स्रोतों का विकास, साल्टलिक का विकास, प्रशिक्षण व जन जागरूकता, वृक्षारोपण, पेट्रोलिंग, वन्यप्राणी- मानव -द्वन्द्व प्रबंधन, जैव-विविधता संरक्षण जैसे कार्य प्रस्तावित किये गये हैं। उपरोक्त कार्यों के लिये 10 वर्षों में राशि रूपये 1.00 करोड़ की राशि प्रस्तावित की गई है। जिनका विवरण निम्नानुसार है :-

Year wise utilization of fund from 1 to 10 years in lakhs of rupees.

Sr. No.	Activity	Years from the beginings of mining										Total
		1	2	3	4	5	6	7	8	9	10	
1	Watch tower	3.50	3.50	1.00	-	-	-	-	-	-	-	8.00
2	Fire Protection Measures	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	12.00
3	Creation of water holes & maintenance	11.00	1.00	0.50	0.50	0.50	0.50	0.50	0.50	0.50	-	15.50
4	Provision of salt lick	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	5.00
5	Planting shade, fodder & fruit trees	0.25	9.45	6.85	1.75	0.75	2.35	1.00	1.00	1.00	1.00	25.40
6	Creation of hide out	0.08	3.84	3.40	0.67	0.23	0.28	0.25	0.25	0.25	0.25	9.50
7	Inventorise, document and conserve Biodiversity by State Biodiversity Board	16.00	-	-	-	-	-	-	-	-	-	16.00
8	Damages for loss to human life and to the crops	5.50	-	-	-	-	-	-	-	-	-	5.50
9	Training & Creation of awareness	1.00	0.60	0.50	0.50	0.50	-	-	-	-	-	3.10
		39.83	20.89	13.75	4.92	3.48	4.63	3.25	3.25	3.25	2.75	100.00

(VI) वन्यप्राणी संरक्षण योजना का सार प्रस्ताव के पृष्ठ क्रमांक 63 से 64 तक उल्लेखित किया गया है।

4. प्रस्तावित क्षेत्र के 15 किलोमीटर की परिधि के बफर क्षेत्र तक में कोई भी टायगर रिजर्व, बायोस्फियर रिजर्व, नेशनल पार्क, अभ्यारण्य क्षेत्र नहीं है परंतु इस क्षेत्र में जंगली हाथियों की उपस्थिति निम्नानुसार रही है -

क्र.	ग्राम का नाम	आवागमन की आवृत्ति				
		वर्ष 2007	वर्ष 2008	वर्ष 2009	वर्ष 2010	वर्ष 2011
1.	सेमीजोर	4 बार	-	-	1 बार	
2.	खर्सा, छिरवानी	-	2 बार	-	-	-

ऊपर दर्शायी गई वस्तुस्थिति से यह स्पष्ट होता है कि परियोजना के बफर क्षेत्र में हाथियों का आवागमन रहता है। प्रस्तावित क्षेत्र एवं बफर क्षेत्र में जैव विविधतायें विद्यमान है। जैव-विविधता सर्वेक्षण, अभिलेखन तथा संरक्षण का कार्य राज्य जैव विविधता बोर्ड के माध्यम से कराए जाने का उल्लेख उपयोगकर्ता संस्था द्वारा वन्यप्राणी संरक्षण योजना में किया गया है। क्षेत्र में पाए जाने वाले वन्यप्राणियों में Bengal monitor, Peafowl, Sloth bear एवं Elephant प्रजाति के वन्यजीव प्रमुख हैं।

5. वन्यप्राणी संरक्षण योजना की लागत रु. 1.00 करोड़ वर्तमान दरों पर है, परियोजना में देरी होने से यह लागत बढ़ेगी जिसमें प्राईस इन्डेक्स के हिसाब से वृद्धि होगी। परियोजना के क्रियान्वयन के समय जो भी लागत आयेगी वह परियोजना प्रस्तावकों को वन विभाग में एकमुश्त जमा करानी होगी। जिससे मूल्य



वृद्धि के प्रभाव को समाप्त किया जा सके। वन विभाग एकमुश्त जमा की गई राशि से वन्यप्राणी संरक्षण योजना क्रियान्वित करेगा।

6. अनुमोदित वन्यप्राणी संरक्षण योजना की एक प्रति संलग्न प्रेषित है। कृपया वन्यप्राणी संरक्षण योजना में प्रावधानित राशि रू. 1.00 करोड़ एकमुश्त जमा कराने हेतु परियोजना प्रस्तावकों को आदेशित करने का कष्ट करें।

(रामप्रकाश)

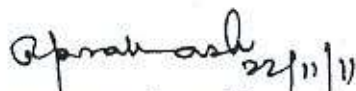
प्रधान मुख्य वन संरक्षक (वन्यप्राणी)  
छत्तीसगढ़, रायपुर

पृ.क्रमांक/व.प्रा./प्रबंध - 30/11/2698  
प्रतिलिपि :-

रायपुर, दिनांक 23/11/2011

1. अपर मुख्य सचिव, छत्तीसगढ़ शासन, वन विभाग, डी0के0एस0 भवन रायपुर की ओर मय योजना की प्रति सहित सूचनार्थ प्रेषित।

✓ 2. श्री डी. एल. चौधरी, अध्यक्ष माईन्स, जैसवाल निको इंडस्ट्रीज लिमिटेड, स्टील प्लांट डिविजन, सिलतरा ग्रोथ सेन्टर, रायपुर - 493221 की ओर मय योजना की प्रति सहित सूचनार्थ प्रेषित।

  
प्रधान मुख्य वन संरक्षक (वन्यप्राणी)  
छत्तीसगढ़, रायपुर

**REPORT ON  
FLORA AND FAUNA AND CONSERVATION PLAN FOR  
ENDANGERED SPECIES OF GARE IV/8 COAL BLOCK**

**FOR  
JAYASWAL NECO INDUSTRIES Ltd.**



**BY  
M. L. NAIK & SANJU SINHA**



## TABLE OF CONTENTS

SN	CHAPTER		PAGE
1.	Introduction		1
2.	Flora in the core zone		2
	2.1.	Trees and shrubs	3
	2.2.	Climbers	3
	2.3.	Herbs, sedges and grasses	4
	2.4.	Ferns	5
	2.5.	Epiphytes	5
	2.6.	Medicinal plants	5
3.	Fauna in the core zone		6
	3.1.	Mammals	7
	3.2.	Birds	8
	3.3.	Amphibians & reptiles	8
	3.4.	Spiders and insects	8
	3.5.	Butterflies	9
4.	Shedule I species in the core zone		9
5.	Endemic species		9
6.	Part of national park		9
7.	Part of any wild life sanctuary		10
8.	Flora of the buffer zone		10
	8.1.	Cultivated plants	10
	8.2.	Natural vegetations	12
	8.2.1.	Trees (t) and small trees (t)	12
	8.2.2.	Shrubs and herbs (sh. & h.)	14
	8.2.3.	Bamboo and grasses	16
	8.2.4	Climbers	16
	8.2.5.	Epiphytes and parasites	17

	8.2.6.	Pteridophytes including ferns	17
	8.2.7.	Aquatic plants	18
	8.3.	Endangered plant species in the buffer zone	18
	8.4.	Endemic plant species	18
9.	Fauna in the buffer zone		18
	9.1.	Mammals	18
	9.2.	Birds	19
	9.3.	Amphibians & reptiles	20
	9.4.	Spiders and insects	20
	9.5.	Moth & Butterflies	21
	9.6.	Domestic animals	21
10.	Shedule I species in buffer zone		21
11.	Endemic species		22
12.	Migratory species		22
13.	Route of migratory species		22
14.	Aquatic fauna (fishes)		22
15.	Conservation plan for medicinal plants		22
16.	Basis of the conservation plan		26
17.	Conservation plan for fauna		27
	17.1.	Habitat improvement	28
	17.2.	Elimination of man-animal conflict	28
	17.3.	Prevention of forest fire	28
	17.4.	Prevention of poaching	29
	17.5.	Reducing stake holder's dependence on forest produce	29
	17.6.	Creating awareness amongst forest stake holders	29
	17.7.	Water availability	30
	17.8.	Restriction of grazing and creation of waterholes	30
	17.9.	Providing salt licks	30
	17.10.	Training and awareness programme	30
	17.11.	Encourage local villagers to grow trees	31

	17.12.	Creation of conservation awareness		31
18.	Conservation plan for wildlife belonging to schedule I			32
	18.1.	Varanus bengalensis		32
	18.2.	Pavo cristatus		33
	18.3.	Melursus ursinus		34
	18.4.	Elephas maximus		40
		18.4.1.	Introduction	40
		18.4.2.	Important points in the conservation of elephants	41
		18.4.3.	Habitat	41
		18.4.4.	Food	42
		18.4.5.	Time-activity budget of elephants	42
		18.4.6	Food plants	42
		18.4.7.	Threats	45
		18.4.8.	Conflicts	46
		18.4.9.	Conservation status	46
		18.4.10.	Conservation of elephants in Gare-Palma IV/8 coal block	46
		18.4.11.	Elephant corridor/reserve	48
		18.4.12.	Suggestions to escape elephant damage Active & passive methods	48
		18.4.13.	Steps taken in Africa, to escape elephant damage	50
19.	Green belt			51
	19.1.	Plantation in the green belt		51
		19.1.1.	Trees	52
		19.1.2.	Shrubs	53
		19.1.3	Climbers and lianas	53
20.	Overburden dump management			54
21.	Backfill dump			54
	21.1.	Top soil dump		55
	21.2.	Bio reclamation of backfilled area		55

	21.3.	Species selection for reclamation of the area	56
	21.4.	The plantation	56
22.		Plantation in the buffer zone	57
23.		Strategy of mitigation of the perceived adverse impact of the project	58
24.		Action plan	59
25.		Action plan monitoring	61
26.		Tentative cost of implementing the scheme	62
27.		Summary and conclusions	63



# **REPORT ON FLORA AND FAUNA AND CONSERVATION PLAN FOR ENDANGERED SPECIES OF GARE IV/8 COAL BLOCK**

## **1. INTRODUCTION**

Conservation of Biodiversity is essential for the survival of the biosphere. Biodiversity consists of two components: richness, or taxonomic diversity, and evenness, or the distribution of individuals among taxa. Anthropogenic factors are eroding both the richness as well as evenness components of the biodiversity, jeopardizing the survival of human race itself. This realization has initiated serious efforts towards conservation of both the components of biodiversity. One of the causes for the erosion of biodiversity has been recognized to be the mining activity. Some of the important minerals of our country are lying below the forests. Opencast mining of such areas are bound to result in the destruction or fragmentation of the habitat. If the area under mining is not having any endemic species then the mining will result only in the reduction in the genepool, i.e. the evenness component of the biodiversity. However, mining an area with endemic species will have more drastic effect on biodiversity. Similarly, if the area falls under crucial migratory route of a species then also the mining may have some impact on such migratory species. Thus, it is required to evaluate the area, going to be mined, for any endemic and endangered species and any direct or indirect impact on biodiversity.

Mining is required for development. Then, is the mining antithesis of development? No, it cannot be, provided sufficient measures are taken to offset the impact on biodiversity. Present account is, thus, an evaluation of the status of the biodiversity of the proposed mining lease area, and proposed offset measures to any negative impact on biodiversity.

## 2. FLORA IN THE CORE ZONE

Core zone of the Gare IV/8 Coal Mining Project is located in an area with small and large plants. An area of 491.0 ha of land has been presently applied for lease for mining. The forest area in the core zone is an unchecked grazing land where almost throughout the day time some or the other type of cattle can be observed, grazing in the area. The core zone, due to heavy grazing, has changed in to a degraded forest and the flora and fauna of the area is typical of overgrazed, degraded forest. Most of the tree species have disappeared from the core zone while the remaining species have been reduced mainly to sapling, pole or small tree stage. Char (*Buchanania lanzan*), Sal (*Shorea robusta*) and Mahua (*Madhuca longifolia* var. *latifolia*) are the only three species surviving in countable numbers. Together with the reduction in variety, density of the trees has also got reduced considerably to about 92/ha. with a basal cover of only 0.04%. Mahua (*Madhuca longifolia*) only has some larger trees while other tree species are generally smaller in girth. Quality of the site is IVB. Phytosociological studies were made, of the core zone, with the help of Point centered quarter method. Results are given in Table 1.

Table 1: Phytosociological characters of the trees in core zone.

S N	Species	Freque ncy	Densit y/ha	Range of Basal area (sq. cm).	% Basal cover
1.	<i>Buchanania lanzan</i>	40.90	53.26	31.82-644.32	0.00901
2.	<i>Cassia fistula</i>	4.54	1.24	91.95	-
3.	<i>Madhuca longifolia</i> var. <i>latifolia</i>	40.90	18.58	49.72-3507.95	0.01691
4.	<i>Shorea robusta</i>	40.90	16.10	31.82-3181.82	0.01425
5.	<i>Soymida febrifuga</i>	4.54	1.24	81.45	-
6.	<i>Terminalia tomentosa</i>	4.54	1.24	733.09	-
	<b>TOTAL</b>		<b>91.66</b>		<b>0.04018</b>

Due to overgrazing large openings have appeared. These openings are covered with typical grazing land, herbaceous, annual species. Shrub layer is

composed mainly of *Wrightia tinctoria*, proliferating through root suckers. These are mixed with coppices of *Lagerstroemia parviflora* and occasional shrubs of *Diospyros melanoxylon*. The forest, demarcated as core zone, has already been reduced to be used as a grazing land and as a minor source of fuel wood, together with the source of mahua flower and fruit and chiroji fruits. Mahua trees (*Madhuca longifolia* var. *latifolia*) are much in abundance in the area, particularly around the village settlements. Thus the Mahua trees of the core zone are of little value as a source of mahua flower or fruit.

Photographs of vegetation, some plants and animals are given in Plates.

### 2.1. Trees and shrubs:

1. Sal	<i>Shorea robusta</i>
2. Char	<i>Buchnanian lanzan</i>
3. Mahua	<i>Madhuca longifolia</i> var. <i>Latifolia</i>
4. Tendu	<i>Diospyros melanoxylon</i>
5. Dhawda	<i>Anogessus latifolia</i>
6. Lendia, Senha	<i>Lagerstroemia parviflora</i>
7. Neem	<i>Azadirachta indica</i>
8. Saja	<i>Terminalia tomentosa</i>
9. Palas	<i>Butea monosperma</i>
10. Dudhi	<i>Wrightia tinctoria</i>
11. Amti	<i>Antidesma gissembilla</i>
12. Amaltas	<i>Cassia fistula</i>
13. Rohina	<i>Soymida febrifuga</i>
14. Mudhi	<i>Mytragyna parviflora</i>
15. Haldu	<i>Adina cordifolia</i>

## 2.2. Climbers:

- |    |                       |                               |
|----|-----------------------|-------------------------------|
| 1. | <b>Dangkanda</b>      | <b>Dioscorea bulbifera</b>    |
| 2. | <b>Bankulthi</b>      | <b>Atylosia scarabaeoides</b> |
| 3. | <b>Jangali Angoor</b> | <b>Cissus vitiginea</b>       |
| 4. | <b>Madhivilata</b>    | <b>Hiptage benghalensis</b>   |
| 5. | <b>Keoti</b>          | <b>Ventilago madaraspata</b>  |
| 6. | <b>Belpalas</b>       | <b>Spatholobus roxburghii</b> |

## 2.3. Herbs, sedges and grasses:

1. **Ageratum conyzoides**
2. **Alysicarpus vaginalis**
3. **Chrysopogon aciculatus**
4. **Aristida adscensionis**
5. **Byttneria herbacea**
6. **Celosia argentea**
7. **Commelina longifolia**
8. **Convolvulus nummularius**
9. **Cyperus pilosus**
10. **Desmodium triflorum**
11. **Digitaria granularis**
12. **Elephantopus scaber**
13. **Eragrostiella bifaria**
14. **Eragrostis nutans**
15. **Eragrostis tenella**
16. **Eragrostis viscosa**
17. **Euphorbia hirta**
18. **Evolvulus alsinoides**
19. **Leucas aspera**
20. **Lindernia ciliata**
21. **Lindernia crustacea**
22. **Melochia corchorifolia**



23. **Merremia emarginata**
24. **Mollugo pentaphylla**
25. **Oplismenus burmannii**
26. **Phyllanthus virgata**
27. **Polygala arvensis**
28. **Polygala elongata**
29. **Sebastiania chamaelea**
30. **Sida cordata**
31. **Sida rhomboidea**
32. **Spermacoce hispida**
33. **Spermacoce pumilla**
34. **Striga angustifolia**
35. **Theriophonum minutum**
36. **Urena lobata ssp. sinuata**
37. **Zornia gibbosa**

#### **2.4. Ferns:**

1. **Adiantum lunulatum**
2. **Cheilanthes tenuifolia**

#### **2.5. Epiphytes:**

1. **Vanda tasellata**

#### **2.6. Medicinal plants**

**It is very difficult to define a medicinal plant. Almost every plant species has got some or the other medicinal value. Recognition of medicinal value of a plant varies also from region to region. The core zone is a heavily degraded, open forest where cattle and man are moving freely. Due to unchecked cutting and removal, plant species, useful to man, have either disappeared or have become exceedingly scarce in**

the area. This is true also for the medicinal plants. Only a few plant species, to be named as medicinal plants, are visible in the area, but with much reduced density. These include the herbaceous species like: *Adiantum lunulatum*, *Asparagus racemosus*, *Byttneria herbacea*, *Curculigo orchioides*, *Dioscorea bulbifera*, *Elephantopus scaber*, *Evolvulus alsinoides*, *Hemidesmus indicus* and *Tephrosia purpurea*, and tree species like: *Azadirachta indica*. The later species is not a natural plant of the core zone but has been introduced in the region through plantation. Absence of *Andrographis paniculata*, from the core zone, which is one of the most common species of the area is indicative of the extent of degradation of the forest of the area

1. Fern	<i>Adiantum lunulatum</i>
2. Satawar	<i>Asparagus racemosus</i>
3. Herb	<i>Byttneria herbacea</i>
4. Kali-Musli	<i>Curculigo orchioides</i>
5. Dang Kanda	<i>Dioscorea bulbifera</i>
6. Hiran Khuri	<i>Elephantopus scaber</i>
7. Sankhpushpi	<i>Evolvulus alsinoides</i>
8. Anantmool	<i>Hemidesmus indicus</i>
9. Sarphunka	<i>Tephrosia purpurea</i>

### 3. FAUNA OF THE CORE ZONE

Vegetation cover, variety and density of the core zone are sparse, as has been described above. The area is silent with respect to the chirping sound of the birds. With the present condition of the core zone, it is unimaginable that the area may be a permanent habitat to any of the terrestrial, mammalian wild life, particularly the larger, wild mammals. Similarly it is unlikely that, during daytime, terrestrial, mammalian wild life would like to move in the area. Some of the persons from adjoining villages informed that they have neither seen nor have heard about coming or any other activity of any tiger or panther in the area. However, moving of some other types of wild mammals, during

the nighttime, have been reported in the area. One example is the sloth bear (*Melursus ursinus*), which generally visit the area during the Mahua (*Madhuca longifolia*) flowering season. Flowering period of this tree is generally the months of March and April and so the frequency of visit of bear is confined mainly to these two months. Some mammals like Jackal (*Canis aureus*) and Fox (*Vulpus benghalensis*) are more common, night visitors of the area. Frugivorous, five striped squirrel (*Funambulus pennanti*) is seen only during the fruiting seasons of the trees, while trees, producing fruits to the liking of frugivorous bats (*Cynopterus sphinx*) are rare, if any, making the area, less probable place for their visit. Among the lizards, Garden Lizard (*Calotes versicolor*), forest calotes (*Calotes rouxi*) are the lizards while Buffstriped keel back or Sita ki Lath (*Amphiesma stolata*), Cobra (*Naja naja*) and Dhaman or Indian rat snake (*Ptyas mucosus*) are some of the common snakes of the core zone. Among the amphibians the common toad (*Bufo melanostictus*) is the only frog detected in the core zone. Some of the birds, visiting the core zone are House crow (*Corvus splendens*), Common myna (*Acridotheris tristis*) Brahminy myna (*Sturnus pagodrum*), Spotted dove (*Streptopelia chinensis*), Parakeet (*Psittacutla krameri*) Koel, Cuckoo (*Eudynamys scolopacea*), Phakhta (*Streptopelia chinensis*), Jangali Kaua (*Corvus macrorhynchos*), Neelkanth (*Coracias benghalensis*), Bater or Grey Quail (*Coturnix coturnix*), Basanti or Indian cuckoo (*Cuculus micropterus*), Kite (*Milvus migrans*), and Cattle egret (*Bubulcus ibis*). Included with these are some other smaller animals belonging to group insecta including the spiders, grasshoppers, insects and butter flies.

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S.N.	Local Name	English Name	Zoological Name	Status WL(Protection act, (1972)	Schedule Part
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### 3.1. Mammals

1.	Siyar	Jackal	<i>Canis aureus</i>	II	II
2.	Bhalu	Sloth bear	<i>Melursus ursinus</i>	I	I
3.	Gilhari	Five striped squirrel	<i>Funambulus pennanti</i>	IV	-
4.	Chooaha	Field rat	<i>Bandicota benghalensis</i>	-	-

5.	Lomadi	Indian fox	<i>Vulpus benghalensis</i>	II	II
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### 3.2. Birds

1.	House crow		<i>Corvus splendens</i>	V	
2.	Common myna		<i>Acridotheris tristis</i>	IV	
3.	Brahminy myna		<i>Sturnus pagodrum</i>	IV	
4.	Spotted dove		<i>Streptopelia chinensis</i>	IV	
5.	Parakeet		<i>Psittacula krameri</i>	IV	
6.	Koel, Cuckoo		<i>Eudynamis scolopacea</i>	IV	
7.	Phakhta		<i>Streptopelia chinensis</i>	IV	
8.	Jangali Kauri		<i>Corvus macrorhynchos</i>	V	
9.	Neelkanth		<i>Coracias benghalensis</i>	IV	
10.	Bater (Grey Quail)		<i>Coturnix coturnix</i>	IV	
11.	Basanti (Indian cuckoo)		<i>Cuculus micropterus</i>	IV	
12.	Kite		<i>Milvus migrans</i>	IV	
13.	Cattle egret		<i>Bubulcus ibis</i>		

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### 3.3. Amphibians & reptiles

1.	Chhipkali	Garden Lizard	<i>Calotes versicolor</i>	IV	
2.	Mendhak	Common toads	<i>Bufo melanostictus</i>	IV	-
3.	Dhaman/Indian Rat snake		<i>Ptyas mucosus</i>	II	II
4.	Sita ki lath		<i>Amphispma stolata</i>	-	-
5.	Nag/Cobra		<i>Naja naja</i>	II	II
6.	Common Krait		<i>Bungarus caeruleus</i>	IV	

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### 3.4. Spiders and insects

1.	Hunting spider		<i>Pisaura mirabilis</i>		
2.	Millipede		<i>Spirobolus</i> sp.		
3.	Hair Dragonfly		<i>Brachytron pratense</i>		



4.	Emperor Dragonfly	<i>Anax imperator</i>
5.	Grasshoppers	
	(i) Common Green	<i>Tettigonia viridissima</i>
	(iii) Common painted	<i>Pecilocerus pictus</i>
6.	Red ant	<i>Oecophylla smaragdina</i>
7.	Scorpion	<i>Palamnaeus sp.</i>
8.	Defoliators	<i>Hepalia mauritia</i>
9.	Swarming caterpillar	<i>Spodoptera mauritia</i>
10.	Aphids	<i>Rhopalosiphum maidis</i>
11.	Scolopender	<i>Scolopendra morsitans</i>
12.	Praying mantid	<i>Sphoromantis lineola</i>
13.	Common stick insect	<i>Carausius morosus</i>
14.	Cockroach	<i>Blatta orientalis</i>

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### 3.5. Butterflies

1.	Fulvous pied flat	<i>Pseudocoladenia dan dan</i>	IV fabrucus
2.	Lemon pansy	<i>Precis lemonias lemonias</i>	IV
3.	Peacock pansy	<i>Precis almana almana</i>	IV
4.	Yellow Pansy	<i>Precis hierta hierta</i>	IV
5.	Blue mormon	<i>Papilio polymnestor</i>	IV
6.	Common mormon	<i>Papilio polytes</i>	IV
7.	Admiral	<i>Limenitis sp.</i>	IV

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#### 4. SCHEDULE I SPECIES IN THE CORE ZONE

Sloth bear

#### 5. ENDEMIC SPECIES - NIL

6. **PART OF NATIONAL PARK:** The area is not a part of any National Park neither any National park is located within 15 km from the applied lease area.
7. **PART OF ANY WILD LIFE SANCTUARY.** The area is not a part of any wildlife sanctuary, neither any sanctuary is located within 15 km from the applied lease area.

The CCF (LM) and Nodal Officer, Chhattisgarh, Raipur, has mentioned in point No. 12 of his report No. 1842, dated 10/07/2007 that the applied land is neither a part of any National Park nor a part of any Wild Life Sanctuary.

## 8. FLORA OF THE BUFFER ZONE

### 8.1. Cultivated plants

#### A. Cereals

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S.No.	Local Name	English Name	Botanical Name
1.	Dhan	Paddy	Oryza sativa
2.	Genhu	Wheat	Triticum aestivum
3.	Makka	Maize	Zea mays

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#### B. Pulses and oil

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1.	Arhar	Pigeon pea	Cajanus cajan
2.	Chana	Bengal gram	Cicer arietinum
3.	Matar	Peas	Pisum sativum
4.	Mung	Green gram	Vigna radiata
5.	Urd	Black gram	Vigna mungo
6.	Til	Sesamum	Sesamum indicum

7.	Mungphali	Ground nut	<i>Arachis hypogea</i>
8.	Sarson	Mustard	<i>Brassica campestris</i> var.

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### C. Fruit Crops

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1.	Kela	Banana	<i>Musa paradisiaca</i>
2.	Aam	Mango	<i>Mangifera indica</i>
3.	Nibbu	Lime	<i>Citrus aurantifolia</i>
4.	Amrud	Guava	<i>Psidium guajava</i>
5.	Papita	Papaya	<i>Carica papaya</i>
6.	Kathal	Jack-fruit	<i>Artocarpus heterophyllus</i>
7.	Seetaphal	Custard-apple	<i>Annona squamosa</i>
8.	Ber	Jujube	<i>Ziziphus mauritiana</i>
9.	Nariyal	Coconut	<i>Cocos nucifera</i>

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### D. Vegetables

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1.	Tamatar	Tomato	<i>Lycopersicum esculantum</i>
2.	Bengan	Brinjal	<i>Solanum melongena</i>
3.	Pattagovi	Cabbage	<i>Brassica oleracea</i>
4.	Phulgovi	Cauliflower	<i>Brassica oleracea</i>
5.	Ganthgovi	Knolksol	<i>Brassica oleracea</i>
5.	Bhindi	Lady's finger	<i>Abelmoschus esculentus</i>
6.	Barbatti	Cowpea	<i>Vignainensis/unguiculatoo</i>
7.	Aloo	Potato	<i>Solanum tuberosum</i>
8.	Muli	Radish	<i>Raphanus sativas,</i>
9.	Karela	Bitter gourd	<i>Momordica charantia</i>
10.	Torai	Ridge gourd	<i>Luffa acutangula</i>
11.	Kaddu	Pumpkin	<i>Cucurbita moschata</i>
12.	Gilki	Sponge gourd	<i>Luffa cylindrica</i>
13.	Palak	Beet	<i>Beta vulgaris</i>
14.	Lalbhaji	Amaranth	<i>Amaranthus</i> spp.

15.	Rakhia Kaddu	Gaurd	Benincasa hispida
16.	Kundru	Kundru	Coccinia grandis
17.	Khira	Cucumber	Cucumis sativus
18.	Lauki	Bottle gourd	Lagenaria siceraria
19.	Chichinda	Snake gourd	Trichosanthes anguina
20.	Ghuiyan	Pichigi	Colocasia esculenta
21.	Lahson	Garlic	Allium sativum
22.	Dhaniya	Coriander	Coriandrum sativum
23.	Kali sarson	Mustard	Brassica campestris
24.	Mirch	Chilli	Capsicum annum
25.	Haldi	Turmeric	Curcuma longa
26.	Piyaz	Onion	Allium cepa

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E. Ornamentals

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1.	Genda	Marigold	Tagetes erecta
2.	Sadabahar	Periwinkle	Catharanthus roseus.
3.	Gudhal	China rose	Hibiscus rosasinensis
4.	Sewanti	Chrysanthemum	Chrysanthemum americanum

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F. Trees

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1.	Babool	Acacia	Acacia nilotica
2.	Karanj	Karanj	Pongamia pinnata
3.	Sarsiwa	Albizzia	Albizzia procera
4.	Subabool	Subabool	Leucaena leucocephala
5.	Munga	Drum stick	Moringa oleifera
6.	Nariyal	Coconut	Cocos nucifera
7.	Vilaiti babool	Australian babool	Acacia auriculiformis
8.	Tad	Palm	Borassus flabellifer

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## 8.2. Natural vegetations



**8.2.1. Trees (T) & small trees (t)**

1.	Imli	T	<i>Tamarindus indica</i>
2.	Palas	t	<i>Butea monosperma</i>
3.	Pipal	T	<i>Ficus religiosa</i>
4.	Bad	T	<i>Ficus religiosa</i>
5.	Mahwa	T	<i>Madhuca latifolia</i>
6.	Jamun	T	<i>Syzygium cumini</i>
7.	Sal	T	<i>Shorea robusta</i>
8.	Tendu	t	<i>Diospyros melanxylon</i>
9.	Haldu	T	<i>Adina cordifolia</i>
10.	Mudhi	T	<i>Mitragyna parviflora</i>
11.	Dhawda	T	<i>Anogeissus latifolia</i>
12.	Saja	T	<i>Terminalia tomentosa</i>
13.	Arjun	T	<i>Terminalia arjuna</i>
14.	Achar/Char	T	<i>Buchanania lanzan</i>
15.	Asta	T	<i>Bauhinia recemosa</i>
16.	Aonla	T	<i>Embllica officinatis</i>
17.	Kasai	T	<i>Bridelia retusa</i>
18.	Bija	T	<i>Pterocarpus marsupium</i>
19.	Kari	T	<i>Miliusa tomentosa</i>
20.	Kumbhi	T	<i>Careya arborea</i>
21.	Kullu	T	<i>Sterculia urens</i>
22.	Kusum	T	<i>Schleichera oleosa</i>
23.	Kedad	T	<i>Garuga pinnata</i>
24.	Khair	T	<i>Acacia catechu</i>
25.	Gular	T	<i>Ficus glomerata</i>
26.	Chichwa	T	<i>Albizzia adoratissima</i>
27.	Chirol	T	<i>Holoptelea integrifolia</i>
28.	Jamrasi	T	<i>Elaeodendron glaucum</i>
29.	Moyan	T	<i>Lannea grandis</i>
30.	Tinsa	T	<i>Ougenia oogeinsis</i>

31.	Tendu	T	<i>Diospyros melanoxylon</i>
32.	Dhobin	T	<i>Dalbergia paniculata</i>
33.	Dhaman	T	<i>Grewia tiliacfolia</i>
34.	Dhaoda	T	<i>Anogeissus latifolia</i>
36.	Pula	T	<i>Kydia calycina</i>
37.	Baheda	T	<i>Terminalia bellerica</i>
38.	Bel	T	<i>Aegle marmelos</i>
39.	Bhira	T	<i>Chhoroxylon swietenia</i>
40.	Bhilwa	T	<i>Semecarpus anacardium</i>
41.	Rohan	T	<i>Soymida febrifuga</i>
42.	Harra	T	<i>Terminalia chebula</i>
43.	Salai	T	<i>Boswellia serrata</i>
44.	Anjan	T	<i>Hardwickia binata</i>
45.	Karra	t	<i>Cleistanthus collinus</i>
46.	Chhind	T	<i>Phoenix sylvestris</i>
47.	Rohina	T	<i>Soymida febrifuga</i>
48.	Maharukk	T	<i>Ailanthus excelsa</i>
49.	Khamar	T	<i>Gmelina arborea</i>
50.	Nilgiri	T	<i>Eucalyptus sp.</i>

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### 8.2.2. Shrubs and herbs (Sh. & H.)

1.	Dudhi	Sh.	<i>Wrightia tinctoria</i>
2.	Gudsakari	H	<i>Grewia hirsuta</i>
4.	Lantana	Sh.	<i>Lantana camara</i>
5.	Flemingia	Sh.	<i>Flemingia strobilifera</i>
6.	Band	H	<i>Evolvulus nummularius</i>
7.	Palas	Sh	<i>Butea monosperma</i>
8.	Chhind	H	<i>Phoenix acaulis</i>
9.	Kakai	Sh.	<i>Flacourtia indica</i>
10.	Karchi	Sh.	<i>Holarrhena antidysenterica</i>

11.	Band	H	<i>Polygala arvensis</i>
12.	Dudhi	Sh.	<i>Wrightia tinctoria</i>
13.	Katma, Amti	Sh.	<i>Antidesma ghaesembilla</i>
14.	Khirni	Sh.	<i>Mimusops hexandra</i>
15.	Gilchi	Sh.	<i>Casearia graveolens</i>
16.	Band	H	<i>Spermacoce stricta</i>
17.	Ghont	Sh.	<i>Zizyphus xylopyra</i>
18.	Churna	Sh.	<i>Zizyphus rugosa</i>
19.	Tondri	Sh.	<i>Casearia graveolens</i>
20.	Papra	Sh.	<i>Gardenia latifolia</i>
21.	Phetoa	Sh.	<i>Gardenia turgida</i>
22.	Marodphal	Sh.	<i>Helicteres isora</i>
24.	Gokhuru (bada)	H	<i>Acanthospermum hirsutum</i>
25.	Bhui Chhind	H	<i>Phoenix acaulis</i>
27.	Dubhi	H	<i>Euphorbia hirta</i>
28.	Dhawai	H	<i>Woodforolia fruticosa</i>
29.	Dikamali	Sh.	<i>Gardenia resinifera</i>
30.	Tikhur	H	<i>Curcuma angustifolia</i>
31.	Apamarang	H	<i>Achyranthes aspera</i>
32.	Karra	Sh	<i>Cleistanthus collinus</i>
33.	Kukurmuta	H	<i>Blumea lacera</i>
34.	Bagh nakha	H	<i>Martynia annua</i>
35.	Ratanjot	Sh.	<i>Jatropha curcas</i>
36.	Sisal	Sh.	<i>Agave americana</i>
37.	Palasbel	Sh.	<i>Spatholobus roxburghii</i>
38.	Dholsamudra	Sh	<i>Leea macrophylla</i>
39.	Ainthe, Marodphalli	Sh	<i>Helicteres isora</i>
40.	Kalabansa	Sh	<i>Colebrookia oppositifolia</i>
41.	Chirayata	H	<i>Andrographis paniculata</i>
42.	Jangali sun	H	<i>Crotalaria montana</i>
43.	Makoy	Sh	<i>Zizyphus oenoplia</i>

44.	Ghas	H	<i>Pygmaeopremna herbacea</i>
45.	Bariari	H	<i>Sida cordifolia</i>
46.	Band	H	<i>Desmodium triflorum</i>
47.	Band	H	<i>Alysicarpus vaginalis</i>
48.	Gokhuru	H	<i>Xanthium indicum</i>
49.	Latkana	H	<i>Triumfetta annua</i>
50.	Keokand	S	<i>Costus speciosus</i>
51.	Theriphorum	S	<i>Theriphorum minutum</i>
52.	Aak	S	<i>Calotropis procera</i>
53.	Jada	S	<i>Jatropha curcas</i>

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### 8.2.3. Bamboo and grasses

1.	Bans	Bamboo	<i>Dendrocalamus strictus</i>
2.	Bhurbhusi	Grass	<i>Eragostis tenella</i>
3.	Ghas	Grass	<i>Eragrostis coarctata</i>
4.	Ghas	Grass	<i>Andropogon aciculatus</i>
5.	Phulbahari	Dag grass	<i>Aristida adscencionis</i>
6.	Sukla	Grass	<i>Heteropogon contortus</i>
7.	Kanta bahari	Dag grass	<i>Aristida setacea</i>
8.	Kanta bahiri	Grass	<i>Aristida adscensionis</i>
9.	Ghas	Grass	<i>Oplismenus burmanii</i>

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### 8.2.4. Climbers

1.	Kewanch	<i>Mucuna pruriens</i>
2.	Kharbel	<i>Ventilago madraspanta</i>
3.	Chameli	<i>Jasminum arborescens</i>
4.	Aparajita	<i>Clitoria ternatea</i>
5.	Amarbel	<i>Cuscuta reflexa</i>
6.	Anantmul	<i>Hemidesmus indicus</i>



7.	Dangkanda	<i>Dioscorea bulbifera</i>
8.	Nagbel	<i>Cryptolepis buchanani</i>
9.	Keoti	<i>Ventilago calyculata</i>
10.	Gunj, Ratti	<i>Abrus precatorius</i>
11.	Dheemer bel	<i>Ichnocarpus frutescens</i>
12.	Palas bel	<i>Butea superba</i>
13.	Bechandi	<i>Dioscorea hispida</i>
14.	Mahul	<i>Bauhinia vahlii</i>
15.	Malkangini, Feng	<i>Celastrus paniculata</i>
16.	Ramdaton	<i>Smilax perfoliata</i>
17.	Morbel	<i>Clematis triloba</i>
18.	Shikakai	<i>Acacia rugata</i>
19.	Satawar	<i>Asparagus racemosus</i>
20.	Panibel	<i>Ampelocissus latifolia</i>
21.	Jangali Angoor	<i>Cayratia auriculata</i>
22.	Dekrabel	<i>Cissus repanda</i>
23.	Raijhai	<i>Ipomoea coccinea</i>
24.	Keoti	<i>Ventilago madaraspatana</i>

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### 8.2.5. Epiphytes and parasites

1.	Bada Bandha	<i>Dendrophthoe falcate</i>
2.	Bandha	<i>Viscum articulatum</i>
3.	Orchid	<i>Vanda tasellata</i>

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### 8.2.6. Pteridophytes including ferns

1.	Selaginella	<i>Selaginella bryopteris</i>
2.	Fern	<i>Cheilanthes farinosa</i>
3.	Fern	<i>Athyrium falcatum</i>
4.	Fern	<i>Lygodium flexuosum</i>
5.	Fern	<i>Adiantum lunulatum</i>

6.	Fern (Vidyapatti)	Cheilanthes farinosa
5.	Sunsunia bhaji	Marsilea minuta
6.	Fern	Cheilanthes tenuifolius

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### 8.2.7. Aquatic plants

1.	Gaj	Najas indica
2.	Gaj	Hydrilla verticillata
3.	Ninda	Cyperus iria
4.	Ghoda ghas	Cyperus articulatus

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### 8.3. Endangered plant species in the buffer zone

There is no known endangered sp. in buffer zone.

### 8.4. Endemic plant species - NIL

## 9. FAUNA IN THE BUFFER ZONE

The terrestrial fauna includes common invertebrates and vertebrates. Wild faunal species like Bear, Hyaena, Fox, Jackal were reported in the buffer zone. Sometimes Bear intrudes in the fields of villages during spring season in search of Mahua flower. Other species reported by villagers were elephant, jackal and mongoose. The major aquatic fauna are fishes, amphibians and water snakes. The list of faunal species is given below:

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S.N.	Local Name	English Name	Zoological Name	Status WL(Protection Act, 1972)	Schedule	Part
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### 9.1. Mammals

1.	Siyar	Jackal	Canis aureus	II		II
2.	Langoor	Common langur	Prebitis antellus	II		I
3.	Neola	Common mongoose	Herpestes edwardsi	IV		
4.	Bhalu	Sloth bear	Melursus ursinus	I		I
5.	Kharaha	Common Indian hare	Lepus ruficaudatus			
6.	Gilhari	Five stripped squirrel	Funambulus pennanti	IV		-
7.	Chamgadad	Short nosed fruit bat	Cynopterus sphinx	V		-
8.	Chooha	Field rat	Bandicota benghalensis	-		-
9.	Jangali suar	Indian wild boar	Sus scrofa	III		-
10.	Lomadi	Indian fox	Vulpus benghalensis	II		II
11.	Hathi	Elephant	Elephas maximus <sup>^^</sup>	I		I
12.	Bandar	Monkey	Macaca mulatta	III		-
13.	Hurra	Hyaena	Hyaena hyaena	III		-
14.	Langoor	Common langur	Semnopithecus entellus	II		I
15.	Chital	Spotted dear	Axis axis	III		-
16.	Jangali billi	Jungle cat	Felis chaus	II		II

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### 9.2. Birds

1.	House crow		Corvus splendens	V		
2.	Comman myna		Acridotheris tristis	IV		
3.	House sparrow		Passer domesticus	IV		
4.	Pied myna		Sturnus contra	IV		
5.	Black drongo		Dicrurus adsimilis	IV		

7.	Spotted dove	<i>Streptopelia chinensis</i>	IV	
8.	Cattle Egret	<i>Bubulcus ibis</i>	IV	
9.	Parakeet	<i>Psittacutla krameri</i>	IV	
10.	Indian Robin	<i>Saxicoloides fulicata</i>	IV	
11.	Little Green Bee-Eater	<i>Merops orientalis</i>	IV	
12.	Pond heron	<i>Ardeola grayii</i>	IV	
13.	Oriental Magpie Robin	<i>Copsychus saularis</i>	IV	
14.	Phakhta	<i>Streptopelia chinensis</i>	IV	
15.	Greater Coucal	<i>Centropus sinensis</i>	IV	
16.	Asian Openbill	<i>Anastomus oscitans</i>	IV	
17.	Tania Tota	<i>Psittacula cyanocephala</i>	IV	
18.	Tota	<i>Psittacula krameri</i>	IV	
19.	Neelkanth	<i>Coracias benghalensis</i>	IV	
20.	Brahminy Myna	<i>Sturnus pagodarum</i>	IV	
21.	Basanti (Indian cuckoo)	<i>Cuculus micropterus</i>	IV	
22.	Kite	<i>Milvus migrans</i>	IV	
23.	Peafowl	<i>Pavo cristatus</i>	I	III
24.	Redwhiskered bulbul	<i>Pycnonotus jocosus</i>	IV	

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### 9.3. Amphibians & reptiles

1.	Girgit	Garden lizard	<i>Calotes versicolor</i>	-	-
2.	Mendhak	Bull frog	<i>Rana tigerina</i>	IV	-
3.	Mendhak	Common toads	<i>Bufo melanostictus</i>	IV	-
4.	Mendhak	Skipper frog	<i>Indirana leithii</i>		IV -
5.	Goh, Gobra	Bengal monitor	<i>Varanus benghalensis</i>	I	II
6.	Dhaman/Indian Rat snake		<i>Ptyas mucosus</i>		II
				II	
7.	Dhondwa		<i>Enhydris enhydris</i>	IV	
8.	Nag/Cobra		<i>Naja naja</i>	II	II
9.	Common Karait		<i>Bungarus caeruleus</i>	IV	



10.	Banded Krait	<i>Bungarus fasciatus</i>	IV	
11.	Russel viper	<i>Vipera ruselli</i>	II	II
12.	Sita ki lath	<i>Amphiesma stolata</i>	IV	
13.	Forest lizard	<i>Sitana ponteceriana</i>	IV	

#### 9.4. Spiders and insects

1.	Hunting spider	<i>Pisarua mirabills</i>		
2.	House spider	<i>Tegenaria domestica</i>		
3.	Hair Dragonfly	<i>Brachytron pratense</i>		
4.	Emperor Dragonfly	<i>Anax imperator</i>		
5.	Grasshoppers			
	(i) Common Green	<i>Tettigonia viridissima</i>		
	(ii) Rice grasshopper	<i>Hieroglyphus. Banian</i>		
	(iii) Painted Grasshopper	<i>Pecilocerus pictus</i>		
6.	Paddy Jassids	<i>Nephotettix apicalis</i>		
7.	Skeletonizers	<i>Hylea pura mechaerales</i>		
8.	Defoliators	<i>Hepalia mauritia</i>		
9.	Chingri	<i>Chela bacaila</i>		
10.	Aphids	<i>Rhopalosiphum maidis</i>		
11.	Scolopender	<i>Scolopendra morsitans</i>		
12.	Praying mantid	<i>Sphoromantis lineola</i>		
13.	Common stick insect	<i>Carausius morosus</i>		
14.	Cockroach	<i>Blatta orientalis</i>		
15.	Red ant	<i>Oecophylla smaragdina</i>		

#### 9.5. Moth & Butterflies

1.	Yellow butterfly	<i>Eurema sari</i>	IV	
2.	Lemon pansy	<i>Precis lemonias lemonias</i>	IV	
3.	Peacock pansy	<i>Precis almana almana</i>	IV	
4.	Yellow Pansy	<i>Precis hierta hierta</i>	IV	
5.	Blue mormon	<i>Papilio polymnestor</i>	IV	

6.	Common mormon	Papilio polytes	IV
7.	Moth	Antheraea hylax	-

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#### 9.6. Domestic animals

1. Cow
2. Goat
3. Cat
4. Dog

#### 10. SHEDULE I SPECIES IN BUFFER ZONE

Bengal monitor, Peafowl, Sloth bear, Elephant.

**11. ENDEMIC SPECIES:** NIL

**12. MIGRATORY SPECIES:** NIL

**13. ROUTE OF MIGRATORY SPECIES:** NIL

#### 14. AQUATIC FAUNA (FISHES)

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S.No.	Local Name	Zoological Name
1.	Rohu	Labeo rohita
2.	Katla	Catla catla
3.	Mirgal	Cirrhinus mrigala
4.	Kotri	Puntius sophoro
5.	Tengna	Mystus Cavasium
6.	Bam	Mastocembelus armatus
7.	Padhan	Wallago attu
8.	Magur	Clarius batrachus
9.	Singi	Heteropneustes fossilis
10.	Keu	Anabas testudinius
11.	Khoksi	Channa punctatus
12.	Bengthuru	Lepidocephalichthys guntea

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## 15. CONSERVATION PLAN FOR MEDICINAL PLANTS

Forest area coming under core zone of the mine will be compensated through aforestatiobn in 113.809ha land area, in Narangi. This land area has been allotted by the Department of Forest, Govt. of Chhattisgarh in the North-East side of the mine lease area. This area, being allotted for aforestation, is more than double the area, leased for opencast mining. Conservation of medicinal plants will be done in this area. The aforestation work will be assigned to the Forest Department of Chhattisgarh Govt., with appropriate finacial support. It will, however, be taken care that the medicinal plants get their due significance in the aforestation programme.

Types and number of plant species, to be named as medicinal plants are rare in the core zone. However, conservation of medicinal plants will be done in the area proposed for aforeststion. Medicinal plants recorded in the core zone, all of them are common plants of the area. Endangered species like *Rauwolfia serpentina* or as common a species of the area as *Andrographis paniculata* have not been recorded from the area. The medicinal plants recorded from the core zone are not difficult to be regenerated, however, they will be regenerated as follows:

1. ***Adiantum lunulatum***: This is a perennial, herbaceous plant surviving during the summer months through the rhizome. The fern grows easily like a weed on the wet walls as well as in shady places. The plant may be propagated through the prothallus, available during the rainy season, but it is much easier to propagate the plant by transferring the rhizome during the early rains.
2. ***Asparagus racemosus***: The plant grows much abundantly in the forests of the area. It is used also as a substitute to Safed Musli (*Chlorophytum* sp.) This is also a perennial plant with a bunch of white, tuberous roots. The aboveground part of the plant dies every year at the end of growing season (March-April), new plant emerges from the underground stem, surviving with the tuberous root. The plant will be propagated through the tuber. Tubers will be collected at the end of

- growing season of the plant in the month on March. Tubers will be stored in some cool place in soil and will be planted in the afforestation area in the first week of June.
3. ***Byttneria herbacea***: This delicate herbaceous plant is used as medicine in some parts of Bastar. The plant has very small seeds, which require to be grown in nursery. Thus the plant will be cultivated in shady places, through transplanting either the nursery raised plants or the plants growing naturally.
  4. ***Curculigo orchioides***: The plant called *Kali Musali* is a much valued medicinal plant, but it grows abundantly in the region. This perennial plant grows naturally with a vertical, very deep rhizome. Aboveground part the plant consists of only one or two leaves which dies away every year, regenerating again from the underground rhizome. Generally it grows gregariously near to the base of a tree trunk. It will be regenerated in the afforestation zone from the rhizome.
  5. ***Dioscorea bulbifera***: This twining plant is also a perennial plant, perennating through the underground rhizome. Like the earlier plant aboveground part of this plant also dies away every year. Regeneration of the plant is either through the underground rhizome or the bulbils which are produced in good numbers on the aboveground parts, in the axils of the leaves. Regeneration of the plant can be made easily by sowing the bulbils in the month of June or July. The bulbils will be placed below the soil, below some tree or shrub.
  6. ***Elephantopus scaber***: The plant grows in shade, below the trees with a perennial rhizome. The plant can be propagated either through the seed or by transplantation.
  7. ***Evolvulus alsinoides***: The plant grows abundantly in the area. The plant grows normally outside the forest area in open places, generally the grasslands. It was



recorded presently in the grazed area of the forest. The plant species will not be included to be grown in the presently proposed aforestatin zone.

8. *Hemidesmus indicus*: This twiner species is a perrenial plant with a very deep root system, signifying the name “*Anantmool*” given to the plant. It is a very common plant of the forests as well as undisturbed, open places. The plant flowers sporadically, hence, could be propagated mainly through tranplantation.
9. *Tephrosia purpurea*: This perennial plant grows almost like a weed on open, wastelands. It is a very hardy species tolerating dryness to a good extent. The plant can be easily propagated through seeds, which are produced abundantly by the plant. It is not a typical forest species, hence, will not be included in the list of plants to be grown in the aforestation zone.
10. *Azadirachta indica*: This is one of the most valuable tree species of our country, but is not a typical forest species. Presently the plant is growing in the core zone through artificial plantation, probably under some aforestation programme in the area. The plant can be propagated, easily, through seed and will be included in the list of medicinal plant to be grown in the compensatory aforestation zone.

**As mentioned earlier the plants listed above are some of the common plants of the area. They grow abundantly in the area. They can be grown easily in the aforestation zone. Together with the above mentioned plant species some other plant species, of more medicinal values, will also be in the list of plants to be grown in the aforestation zone. Some examples of such plants are:**

**Herbaceous species like:**

*Andrographis paniculata* (Kalmegh)

*Chlorophytum tuberosum* (Safed musli)

*Costus speciosus* (Keokand), and

*Rauwolfia serpentina* (Sarpchandha)

*Gloriosa superba* (Kaliyari)

**Twiners like:**

*Tinospora cordifolia* (Giloy)

*Gymnema sylvestre* (Gudmar)

**Trees like:**

*Litsea glutinosa* (Maida) etc.

**These are examples of some of the important medicinal plants of the area which have become rare in the forests, but are always much in demand.**

## **16. BASIS OF THE CONSERVATION PLAN OF FAUNA**

The proposed conservation plan has been prepared on the basis of the following:

- a. Field & Desk Study by M. L. Naik and Sanju Sinha
- b. Inputs from The Mine Plan Gare-Plma IV/8 coal block
- c. Working Plan of Raigarh Forest division
- d. FSI Report, 2009
- e. Some other references:
  1. Tikader, BK. 1983. *Threatened Animals of India*. Zoological Survey of India.
  2. Stracey, PD. 1963. *Wild Life in India, its Conservstion and Control*, Ministry of Food Agriculture, C. D. & CO-OP, Department of Agriculture, Govt. of India, New Delhi.
  3. Nair, SM. 1992. *Endangerd Animals of India and their Conservation*, National Book Trust, India.
  4. Singh, SK. 2009. *Text Book of Wildlife Management*, 2<sup>nd</sup> Ed. International Book Distributing Company, Lucknow.
  5. Berwick, SH. And Sharma, VB. 1995. *The Development of International Principles and Practices of WILDLIFE RESEARCH AND MANAGEMENT, Asian and American Approaches*, Oxford University Press, Delhi.

6. Prater, HS. 1980. *The Book of Indian Animals*, Bombay Natural History Society, Bombay.
7. Memon Vivek. 2009. *Mammals of India, A Field Guide*, Wildlife Trust of India.
8. Tiwari, SK. 1998. *National Parks of Madhya Pradesh*. APH Publishing Corporation, New Delhi.
9. Alfred, JRB.; Ramakrishna and Pradhan, MS. 2006. *Validation of threatened Mammals of India*. Zoological Survey of India, Kolkata.

## **17. CONSERVATION PLAN FOR FAUNA**

**The presently applied Gare-Palma IV/8 coal block is surrounded from all the sides by other operating or sanctioned coal blocks. It is thus not possible to propose a conservation plan for fauna, for IV/8 coal block, in isolation. The presently proposed conservation plan should be looked in combination with other conservation plans for the entire Gare-Palma coal block.**

**Conservation Plan for fauna requires knowledge on:**

- 1. Home range of the animal**
- 2. Territorial requirement of the animal**
- 3. Deciding the number of animals to be conserved and accordingly evaluating the carrying capacity of the habitat**
- 4. Conservation is aimed at single species or multiple species**
- 5. Conservation is proposed in a managed ecosystem or an un-managed, natural ecosystem.**

**However, very little knowledge exists on the above parameters of most of the animals.**

**Several reasons for the decline of wild life and methods for their conservation are proposed. However the best method for the conservation of wild life is related**

directly to the maintenance of ecosystems in their natural condition, allowing their natural development and degree of protection afforded to the wildlife and their habitat. Both these phenomena (ecosystem development and habitat protection) are related to anthropogenic factors. Some of the important anthropogenic factors are listed below:

1. Habitat fragmentation and destruction
2. Man-animal conflict
3. Forest fire
4. Poaching
5. Stake holders dependence on forest resources
6. Creating awareness amongst forest stake holders

To the above mentioned factors may be added a non-anthropogenic but important factor:

7. Water scarcity

The plan for wild life conservation with respect to above situations is detailed as under:

**17.1. Habitat improvement:** Sal (*Shorea robusta*) is the most dominant tree species of the area. This should be one of the important species to be used in gap filling of the adjoining (degraded) forest area. Sal is a semi-evergreen tree species, providing shade to the wild life as well as to the ground flora, particularly during intense radiation and scorching summer months. There had been some debate over the regeneration of sal through natural regeneration as well as *dona* transplantation. However, I had observed successful natural regeneration as well as *dona* transplantation, provided it is done with care. Together with sal other local species, particularly some fruit yielding species should also be planted eg: Mango, Tendu and Gular etc. To this it is important to add the plantation of aonla, which has almost disappeared from the area. The area vegetated with the local species will provide natural environment, food and shelter to the wild life attracting them more



to the area. Some hideouts, suitable to different species, should also be created at suitable places.

**17.2. Elimination of man-Animal conflict:** Man-animal conflict is a difficult problem to be eliminated. The conflict is both deliberate as well as inadvertent. However, conflict can be minimized through employing local persons to form anti-depredation team. The conflict can be minimized also through protecting the area, preventing the entry of human beings or the cattle in the area. First aid facilities should be provided in the villages to meet exigencies in case of any conflict.

**17.3. Prevention of forest fire:** Forest fire is caused both naturally as well as by the human beings. Anthropogenic causes will be minimized through forming a fire line around the forest area. To add to the prevention of fire local persons will be employed as fire guards, during the fire prone season. The team will be instructed to fight the fire as soon as it is detected. Watch towers will also be constructed to detect forest fire. Awareness program against forest fire will also be run in adjoining villages.

**17.4. Prevention of poaching:** Poaching is undoubtedly a serious problem in the conservation of wild life. Several methods are employed by the poachers, to kill or trap the wild life, of which poisoning and traps of different types are more common. A proper vigilance will be maintained to check such menace. Poaching menace will be eliminated seriously neither all the efforts to promote wild life survival in the area will go in to waste. This will be achieved through employing, properly equipped, two ex-army jawans to assist the forest officers.

**17.5. Reducing stake holder's dependence on forest produce:** People from adjoining villages have already exploited the forest to the extent that the forests have become a grazing land or a source of fuel wood. Timber and medicinal species have either disappeared or have become scarce. However, regenerating the forest will again attract the villagers towards the forest. To keep the people away from the

forest their economic condition will be improved. This will be achieved through financial and technical help to develop Dairy, Poultry, Vegetable cultivation, Horticulture and Agro-forestry. Promotion of agro-forestry, in particular, will reduce their dependence on forests for timber as well as for fuel wood.

**17.6. Creating awareness amongst forest stake holders:** Awareness about the environment and wild life will be created amongst the adjoining villages. They will be informed about the importance of a good environment, a healthy ecosystem and more importantly about the wild life. Through slide and film shows they will be convinced about the sustenance of natural ecosystems. They will be convinced that their own survival depends upon the survival of a healthy ecosystem, to which a wide variety of wild life is an essential component. To develop affection of the people towards the wild life some of them will be taken to some zoos and wild life sanctuaries. Awareness programmes will be run with the help of Forest Officers and more importantly some national experts will be invited to deliver talks awareness, related to wildlife conservation.

**17.7. Water availability:** Rainfall in the area is about 1300 mm, sufficiently to be categorized as a wet zone. However, due to lack of proper storage, severe water scarcity develops during the summer months. To make the water available throughout the year it is essential to create water storage facility. Multiple water storage places will be created in the Buffer zone through improving the existing ponds, constructing stop dams in the water channels and through creating water holes. Also, camouflage and hiding places should be created. Some wildlife species fulfill their salt requirement through licking the soil. Salt deposits will be arranged for such species adjacent to the water holes. These water holes will also be helpful in recharging the ground water and thus will be supporting good growth of the vegetation.

**17.8. Restriction of grazing and creation of waterholes:** Waterholes will be constructed outside the plain area for exclusive use of wildlife. This will reduce direct conflict between the wild animals and cattle. Patrolling parties will check and stop the

entry and illegal grazing of cattle in the area. Heavy grazing not only reduces the herbaceous cover but brings about compaction of the soil also. It also favours the growth of non-palatable, unwanted weeds like *Lantana camara*, *Hyptis suaveolens*, *Plectranthus incanus*, *ageratum conyzoides* and so on. Such weeds will be uprooted and eradicated, preferably before their flowering and fruiting, to promote the growth of fodder grasses.

**17.9. Providing salt licks:** Compensation of salt requirement through salt licks is one of the major requirements of the wildlife. Salt licks will be provided to them near the waterholes.

**17.10. Training and awareness programme:** This is the most important aspect of wild life conservation. People will be educated regarding the importance of wild life conservation through mass publicity by installing sign-boards, conducting audio visual classes and distributing literature in respective villages in the buffer zone. Experts in the field of wild life conservation will also be invited to deliver talks through slides.

**17.11. Encourage local villagers to grow trees on their own on field bunds/court yards etc.:** In consultation with Forest Department the company will provide some finance, to grow saplings of tree species, having importance for wood, small timber and fuel wood to distribute to the villagers. Bamboo will be another important species with a lot of environmental and economic value. This will, no doubt, will help reduce dependence of people on RF forest; as a result the ecological condition of the area will improve so the wild life will be attracted to this area.

**17.12. Creation of conservation awareness:** What if a few species of wildlife become endangered or extinct? How are we concerned if the Indian Cheetah has been lost forever or the Asiatic lion is precariously perched on the verge of extinction? Why should we spend crores of rupees to protect the tiger? The answers to these questions of “what”, “how” and “why” should form the basis for creating conservation awareness among the public- an understanding of the importance of biological diversity of inter-relationships in nature, of the sustenance and stability of ecosystems and of man’s impact on the natural world.

Protected areas and threatened species could most effectively be safeguarded if local people considered it in their own interest to do so. Working with rather than against local people has become a major working principle for IUCN.

## **18. CONSERVATION PLAN FOR WILDLIFE BELONGING TO SCHEDULE I**

### **18.1. Conservation Plan for Bengal monitor lizard (*Varanus bengalensis bengalensis*) with Particular reference to Gare-Pelma coal block.**

**Habit:** They are often found in agricultural areas. Bengal monitors shelter in burrows that they dig or crevices in rocks and abandoned termite mounds. It is mostly diurnal in habit.

**Habitat:** It is found in a wide range of habitats, **viz.** forest, river banks, by the side of nullah, and agricultural land. It occupies burrows, dense vegetation, hollows of trees, rock cracks and crevices.

**Behaviour:** Mainly ground dweller, but is a very good climber as well. Bengal Monitors are usually solitary and usually found on the ground although the young are often seen on trees. They shelter and spend nights in burrows or crevices in rocks, make use also of abandoned termite mounds. In the night their body temperature drops below ambient. In the morning they raise their body temperatures by basking before commencing activity and for this reason they are rarely active early in the morning and most active in the afternoons when temperatures are highest.

**Food:** Their normal prey consists of beetles, grubs, orthopterans, scorpions, crabs, snails, ants and other invertebrates. Vertebrate prey is comparatively rare and includes frogs, fish, other lizards, snakes birds and their eggs and rodents. They sometimes capture roosting bats.



**Threat:** Monitor lizards are hunted for skin and their body fat. Its eggs are considered a delicacy and the entire animal is also eaten. Unani, the Greco-Arabian system of medicine, recommends the use of various body parts of monitors to cure numerous ailments. The population of the Common Indian Monitor, *Varanus bengalensis* has alarmingly dwindled throughout the Indian sub-continent mainly due to excessive exploitation of the adults for their commercially valuable skins, as food and in traditional medicines. Habitat loss due to large-scale deforestation, urbanization, dams and hydroelectricity projects and other biotic factors are also responsible for the population decline of the species.

**Conservation Status:** Status: Not Listed (IUCN 2000); Endangered (ESA).

Conservation measures: **There is no scarcity of food or habitat to the animal. Preventing poaching will be the single most important factor in the conservation of the species, for which awareness programmes should be run frequently.**

## **18.2. Conservation Plan for Pavo cristatus (Indian Peafowl) with Particular reference to Gare-Pelma, IV/8 coal block**

The Indian Peafowl (*Pavo cristatus*), is also known as the Common Peafowl or the Blue Peafowl, The peacock is the **national bird** of India.

**Habitat:** It is found in forests, but can live also in cultivated regions and around human habitations and is usually found where water is available.

**Food:** It is an omnivorous bird. It's diet consists of small mammals like: mice, reptiles like lizards and snakes, amphibians, arthropods like: insects, ticks, termites, ants, locusts and scorpions, seeds, fruit, vegetables, flowers, leaves, and minnows in shallow streams and so on. With its strong bill it is able to kill a snake, even a cobra. Around cultivated areas, peafowl feed on a wide range of crops such as groundnut, tomato, paddy, chilly, and even bananas. Around human habitations, they feed on a variety of food scraps and even human excreta.

**Conservation Status:** IUCN Red List, Least Concern species.

**Threat:** Poaching of peacocks for their meat, feathers and accidental poisoning by feeding on pesticide treated seeds are known threats to wild birds. Methods to identify if feathers have been plucked or have been shed naturally have been developed as Indian law allows the collection of feathers that have been shed. However, presently, there is no severe threat to this species, primarily for its status as a National bird and secondarily due to religious belief this species is protected. But its train feathers are in great demand for commercial purposes and are the main threat to its survival. Their loud calls make them easy to detect, and in forest areas, often indicate the presence of a predator such as a tiger.

**Conservation:** They are generally protected by religious sentiment and will forage around villages for scraps. The people living in the surrounding area should be rewarded for timely information about disturbing and/or poaching of the bird. The bird has a wide range of food items, hence, improvement of and protection of the bird in the buffer zone will provide sufficient food to the animal.

### **18.3. Conservation Plan for Sloth Bear (*Melursus ursinus*) with Particular reference to Gare-Pelma IV/8 coal block**

1. Introduction
2. Habitat
3. Home Range
4. Habit
6. Food
7. Threats
8. Conflicts
9. Status
10. Conservation Measures

**Some of the references consulted for the preparation of this report are:**

- Garshelis, D.L., Ratnayake S. & Chauhan, N.P.S. 2008. *Melursus ursinus*. In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.4. <[www.iucnredlist.org](http://www.iucnredlist.org)>. Downloaded on 18 May 2011.
- Bargali, H.S.; Akhtar Naim and N.P.S. Chauhan, N.P.S. 2004. Feeding ecology of sloth bears in a disturbed area in central India *Ursus* 15(2):212-217.
- Gopal, R. 1991. Ethological observations on the sloth bear (*Melursus ursinus*). *Indian Forester* 117:915-920.

**Introduction:** Bear is a nocturnal animal. Generally it remains within the forest area, but rarely intrudes within the village area. This is mainly due to the Mahua flower because Mahua trees are most common around the village areas. Therefore intrusion of the bear near to the village area is more during the months of Mahua flowering, the Months of March and April. Approach of the animal near the village areas in other months is extremely rare. Bears are reported in the buffer zone, but their density is never very high. A good study on bear has been made in the central India by Bargali et al (2004).

**Habitat:** Sloth bears, in the area, occupy a wide range of habitats including forests, scrublands, and grasslands where boulders and scattered shrubs and trees provide shelter. The most common shelter is a den, a cavern like structure generally in rocks.

**Home range:** To date, there is no definitive research detailing the exact nature of the home range of the sloth bear. The size of the home range of an individual sloth bear will vary with the concentration of high energy food sources. Thus, the more concentrated the food sources, the smaller the range necessary to maintain an animal.

**Habit:** The sloth bear is more inclined to attack man unprovoked than almost any other animal. Sloth bears avoid areas where human disturbance is high, however, the bear raid peanut, maize, and fruit crops. Sloth bears like to escape from the heat of the day and

forage for food at night. They will start to become active as the sun starts to set. This is also the time when many insects such as termites are more active.

They are generally nocturnal, occasionally approaching near to the village area even during the day time. Locally they prefer isolated shelters below rocks and caverns to spend their day time hours. Occasionally, near to the village area, after consuming large amount of mahua (*Madhuca latifolia*) flower they remain sleeping below the tree late after sun rise.

**Food:** Sloth bears subsist primarily on termites, ants, and fruits. This is the only species of bear adapted specifically for myrmecophagy (ant and termite-eating; The ratio of insects to fruits in the diet varies seasonally and geographically. Most bears are opportunistic omnivores. As such, their activities are governed by the availability of food items and dietary components within their habitat. When trees are in fruit, usually during the monsoon season, sloth bears dine on mango, fig, ebony, and other fruits, and also on some flowers. However, ground dwelling ants and termites, dug out of their cement-hard nest mounds, are a year-round staple. They have special liking for the honey for which the animal can climb trees and knock down honeycombs, later collecting the sweet bounty on the forest floor. Beetles, grubs, ants, and other insects round out their diet. During food shortages, sloth bears will eat carrion. In March and April, they will eat the fallen petals of mowha trees and are partial to mangoes, sugar cane, the pods of the Amaltas and the fruit of the jack-tree. Sloth bears are extremely fond of honey. Sloth bears will also climb and shake fruit trees to obtain food. They will also eat leafy plants, sugar-rich fruits, nuts, root, tubers, berries, vegetables, honey, eggs and small vertebrates like rodents. Will also eat virtually any carrion which they may discover. Seasonal availability and geographic location are the biggest factors determining the primary food sources of sloth bears.

Food items of bear are documented with the help of scat analysis and direct observation. However, percent occurrence of a particular food in scats may differ from actual consumption. It is possible that most easily digestible food may be observed less in the scat while less digested food may be more.

Some studies have shown that sloth bears are mainly myrmecophagous but in another study of the scat it has been observed that *Ficus* species dominated in all seasons. expressed as percent dry-weight, plant matter dominated in all seasons. Similarly, a study on sloth bears in central India has found that fruits were eaten year round and were the mainstay of the diet from February to June, whereas termites, ants, and honey were the predominant foods in other months.

A study on the scat of bear, in the central of India has revealed following to be present in the scat and hence forming the food item of the bear. Months of their local availability has been added with each of the food item.

1. Black ant and their egg: Available all round the year but more during winter and summer season.
2. Red ant and their eggs: Available all round the year but more during winter and summer season.
3. Termite and their egg: Available all round the year
4. Honey Bees: Available all round the year but more during late winter and summer season
5. *Ficus benghalensis* (Bargad), *Ficus religiosa* (Pipal): Summer season
6. *Ficus virens*: Winter, Summer
7. *Ficus racemosa*: Winter summer
8. *Ficus glomerata* (Gular): Summer
9. *Ziziphus mauritiana* (Ber), *Ziziphus oenoplia* (Makoy) and *Ziziphus nummularia* (Jharberi): Winter
10. *Aegle marmelos* (Bel): summer
11. *Briedelia squamosa* Kasihi): Late winter to early summer
12. *Diospyros melanoxylon* (tendu): Summer
13. *Buchanania lanzan* (Achar): Summer
14. *Schleichera oleosa* (Kusum): Summer
15. *Syzygium cumini* (Jamun): Summer
16. *Cassia fistula*( Amaltas) fruit: Rainy
17. *Madhuca indica* (Mahua) (flower): March-April
18. *Madhuca indica* (fruit): June-July



19. *Arachis hypogea* (Groundnut): Late rainy season
20. *Zea mays* (Corn): rainy
21. Amaroode (*Psidium guajava*): Winter
22. Aam (*Mangifera indica*): Summer
23. Kathal (*Artocarpus heterophyllus*): Summer
24. Bones, hair and animal tissue

Many of the non-timber forest produce, forming the food of the bear are collected like flowers and fruits of mahuwa (*Madhuca indica*) and fruits of bel (*Aegle marmelos*), char (*Buchanania lanzan*), jamun (*Syzygium cumini*), and tendu (*Diospyros melanoxylon*). Such collection may limit their availability for bears. *Ficus* spp. are not used by local people, so are readily available for the bears. Thus *Ficus* spp. play important roles by providing supply of food throughout the year. This is particularly important during summer when there are no crops in fields to raid and fewer fruiting species, and bears find it difficult to dig for termite and ants.

**Threat:** Major threats to this species are habitat loss, poaching and conflict killings. Habitat loss is mainly due to overharvest of forest products, monoculture plantations (e.g., teak, eucalyptus), expansion of agricultural areas, human settlements, and roads. Poaching is mainly for the commercial trade in bear parts. Encounters resulting in conflicts between people and sloth bears occur mainly where the habitat has become severely degraded but still being used by both. The only natural threats to sloth bears are tigers (*Panthera tigris*) and possibly leopards (*P. pardus*). Dhole packs may also attack sloth bears. Asian elephants are reported not to tolerate sloth bears in their vicinity. The reason for this is unknown. Bear parts are valuable commodities in the trade for Asian medicines. Incentives for killing bears are therefore high. Although, bear is protected to varying degrees by national laws, however, they can be killed to protect life or property.

**Conflicts:** The sloth bear is more inclined to attack man unprovoked than almost any other animal. Major man-bear conflicts result during the mawha flowering season. Persons going early to collect the flower encounter the animal, frequently, some times the

bear remain sleeping below the tree after consuming large amount of mahua flower and is one of the major causes of man-bear conflicts. Persons going to the forest for the collection of wood or other forest produce encounter the bear, inadvertently resulting in conflicts.

**Status: CITES APPENDIX: I: Indian Wildlife (Protection) Act (1972) (As amended up to 2002): Scheduled I; Part I; Indian Red Data Book (IUCN 1994): Not Listed; IUCN (1998) (Proposed); Vulnerable (National) and Data Deficient (Global); IUCN (2002) (Proposed): Vulnerable (Global) based on Version 2.3 1994 (IUCN, 2003). According to Alfred *et al.* considering the nature and degree of threats and trends reported, it is strongly recommended to include sloth bear in one of the endangered categories of IUCN. They are particularly vulnerable to loss of habitat because of their reliance on lowland areas, which tend to be the places most readily used by people. Poaching and trade in sloth bears or their parts is also common in many parts of their range.**

### Conservation Measures

1. Education will help to reduce bear-human conflicts and enhance a conservation ethic among locals,
2. Habitat improvements (government or community-based reforestation) would be helpful in alleviating conflicts.
3. Planting of fruit trees more particularly the spp. of *Ficus*, because *Ficus* spp. are not collected by man but form an important diet to the animal.
4. Promoting honey bee in the area will not only serve as food to the bear but will help also in warding off the elephant.
5. Red ant (*Oecophylla smaragdina*) can be promoted easily to form colonies in the trees. This will serve as important source of insect diet and may compensate for the termite.
6. Artificial method to promote termite colonies should be developed.

7. Den like structures should be developed in the area if such structures are lacking or less in number in the area.
8. It is unfortunate that the conservation of Elephant and Bear go contradictory to each other.
9. Villagers should avoid growing crops of liking to bear like ground nut and corn etc. particularly near their den sites.
10. Translocation of bears from isolated habitat patches to more suitable areas should be carried out.

#### **18.4. *Elephas maximus* (Asian elephant) ssp. *Indicus* (Indian elephant)**

1. Introduction
2. Elephant in South Sarguja forest division
3. Important points in the conservation of elephant
4. Habitat
- 5. Food habits**
- 6. Time-activity budget of elephants**
7. Food plants
8. Threats
9. Conflicts
10. Conservation status
11. Elephant corridor
12. Conservation of the elephants in Sondhia Coal Block
13. Some suggestions to escape elephant damage.

The latest and most exhaustive reference on elephants in India is:

Rangarajan, M; Desai, A; Sukumar, R, Easa, PS; Menon, V; Vincent, S; Ganguly, S; Talukdar, BK; Singh, B; Mudappa, D; Chowdhary, Sushant and Prasad, AN. 2010. SECURING THE FUTURE FOR ELEPHANTS IN INDIA, The Report of the Elephant Task Force, Ministry of Environment and Forests, August 31, 2010.

### 18.4.1. Introduction

Wild elephants move from the State of Orissa to Jharkhand State. During this they use the land of Chhattisgarh State as Corridor. The animal left the area of Chhattisgarh somewhere around 1904 and re-entered in 1986, after almost a gap of about 82 years.. This is not peculiar as the animal has re-entered the area of Andhra Pradesh state, after a gap of about 200 years. Districts of Chhattisgarh, through which the elephants move are Raigarh>Korba>Sarguja>Jashpur. Presently applied area for coal mining is in Gare-Pelma, Raigarh District of Chhattisgarh State. However, the presently applied area for coal mining, Gare IV/8 is not an elephant habitat nor is a part of project elephant. The animal visits the buffer zone at irregular intervals, ranging from six months to a year.

### 18.4.2. Important points in the conservation of elphants

Following are some key points in the conservation of elephants:

1. Require 150-250 kg of plant food every day, with preference for grasses..
2. Evolved to a large size, with black colour. The black colour absorbs more heat.
3. Lack sweat gland to dissipate the body heat, hence, require a shade in sunny days, or require frequent cooling through wallowing or spreading water over the body.
4. A good source of water is required also for drinking.
5. Frequent dusting of the body or mud cover over the body is required to protect the body from the biting insects.
6. Change in cropping pattern by introducing crops disliked by elephant or the plants which act as elephant repellent (e.g. *Patchouli*, (Pachouli) *Helianthus annus* (Sunflower) *Capsicum annum* (Chilli) *Sesamum indicum* (Til) and *Citrus* should be promoted.

### **18.4.3. Habitat**

Elephants are generalists, but use mainly scrub forest. They can be found in the jungle, but generally on the edge where open, grassy areas are accessible. They prefer areas that combine grass, low woody plants, and forest. Elephants rarely forage in one area for more than a few days in a row. In general, food, water and shade are the three basic resources that can be expected to influence the movement of the elephant (Sukumar *et al*, 2003). Their Home range ranges from 30-600 km<sup>2</sup>.

### **18.4.4. Food**

Elephants eat a wide variety of species of vegetation. They are herbivore, folivore and lignivore. More than 100-130 different species of plants may be eaten They prefer grasses, but they also consume bark, roots, leaves, wood, stems and leaves of trees, vines, shrubs, tubers, bamboo and barn, An average day's intake is 150-200kg of wet vegetation. The proportions of the different plant types in their diet vary depending upon the habitat and season. Annual diet has been found to be dominated by grass. Maximum straying distance covered by the raiding elephant has been recorded up to 5.5km .

### **18.4.5. Time-activity budget of elephants**

Generally they are active almost throughout the day during rainy and winter months, but during summer months they are active only in the morning and evening hours. They become active well before dawn and start their morning activities in the vicinity of the area where they spent night. Evening hour is the time for drinking and bathing especially during summers. In summer season percentage of movement is more due to lack of fodder species and shrinkage of natural water sources.

### **18.4.6. Food plants**

Following is a list of plants reported as food by different workers. However, only the names of plants, local to the area, have been taken and the local names have been changed. Part of the plant eaten may be different for the different species.



<b>SN</b>	<b>Botanical Name</b>	<b>Local Name</b>
1	<i>Acacia catechu</i>	Khair
2	<i>Acacia nilotica</i>	Babool
3	<i>Aegle marmelos</i>	Bel
4	<i>Albizzia lebbek</i>	Kala siris
5	<i>Bambusa arundinacea</i>	Bans
6	<i>Albizzia procera</i>	Safed siris
7	<i>Bauhinia variegata</i>	Kachnar
8	<i>Bauhinia vahlii</i>	Mahul
9	<i>Bauhinia malabarica</i>	Khatua
10	<i>Bombax ceiba</i>	Semal
11	<i>Brachiaria sp.</i>	Ghas
12	<i>Bridelia retusa</i>	Kasai
13	<i>Careya arborea</i>	Kumhi
14	<i>Cordia myxa</i>	Lassora
15	<i>Cymbopogon flexuosus</i>	Ghas
16	<i>Cynodon dactylon</i>	Doob Grass
17	<i>Dalbergia sissoo</i>	Shisham
18	<i>Dendrocalamus strictus</i>	Bans / Bamboo
19	<i>Desmostachya bipinnata</i>	Urai/Khus
20	<i>Eleusine sp.</i>	Ghas
21	<i>Emblica officinalis</i>	Amla
22	<i>Eucalyptus spp</i>	Nilgiri
23	<i>Eulaliopsis binata</i>	Bagai Ghas
24	<i>Feronia elephantum</i>	Kaith
25	<i>Ficus bengalensis</i>	Bargad/Bar
26	<i>Ficus glomerata</i>	Dumar/Gular
27	<i>Ficus religiosa</i>	Pipal
28	<i>Ficus rumphii</i>	Duranga-hesa
29	<i>Ficus infectoria</i>	Pakar

30	<i>Flacourtia indica</i>	Kandai
31	<i>Garuga pinnata</i>	Kekad
32	<i>Grewia elastica</i>	Dhaman
33	<i>Helicteres isora</i>	Ainhi
34	<i>Holarrhena antidysenterica</i>	Korea
35	<i>Ipomoea</i> spp.	Karmata
36	<i>Imperata arundinacea</i>	Ulu
37	<i>Kydia calycina</i>	Baranga/Pula
38	<i>Lagerstroemia parviflora</i>	Senha/Sidha
39	<i>Limonia acidissima</i>	Kaith
40	<i>Mallotus philippinensis</i>	Sinduri/Rohini
41	<i>Mimosa pudica</i>	Lajwanti
42	<i>Mitragyna parvifolia</i>	Mudhi
43	<i>Musa paradisiaca</i>	Banana
44	<i>Neyraudia arundinacea</i>	Bichhloo
45	<i>Oryza sativa</i>	Dhan
46	<i>Ougeinia oojeinensis</i>	Tinsa
47	<i>Phoenix humilis</i>	Buta Chhind
48	<i>Pithecellobium dulce</i>	Jangal Jalebi
49	<i>Randia dumetorium</i>	Mainphal
50	<i>Saccharum munja</i>	Kandi-khar
51	<i>Saccharum officinarum</i>	Ganna
52	<i>Saccharum spontaneum</i>	Kans
53	<i>Sansevieria</i> sp.	
54	<i>Schleichera oleosa</i>	Kosam/Kusum
55	<i>Shorea robusta</i>	Sarai/Sal
56	<i>Syzygium cumini</i>	Jamun
57	<i>Tamarindus indica</i>	Amli / Imli
58	<i>Terminalia tomentosa</i>	Saja
59	<i>Tectona grandis</i>	Sagaun / Teak

60	<i>Tinospora cordifolia</i>	Giloe / Gurch
61	<i>Thysanolaena agrostis</i>	Hathi ghas / Pirlu
62	<i>Zizyphus mauritiana</i>	Bhander
63	<i>Zizyphus xylopyra</i>	Ghont

*Saccharum spontaneum*, *Thysanolaena maxima* and fruit parts of *Dillenia indica*, are some of the other species recorded to be preferred by elephants. Some other food plants have been reported by the villagers of elephant moving areas of Chhattisgarh state. The list includes

*Musa paradisiaca* (Kela),

*Oryza sativa* (rice) eat very cleverly the fruiting part, only, in the barn yard they dismantle the heap of gathered rice

*Saccharum officinarum* (Ganna) is one of the most preferred food item.

*Dendrocalamus strictus* (Bamboo):

*Ficus benghalensis* (Bargad)

*Ficus religiosa* (peepal)

*Artocarpus heterophyllus* (Kathal)

*Miliusa velutina* (Bhilwa)

*Pterocarpus marsupium* (Bija)

*Zea mays* (Maka)

*Phoenix sylvestris* (Chhind)

*Phoenix acaulis* (Buta chhind)

*Buchanania lanzan* (Char): The saplings are up-rooted, the root is thrashed clean of soil and is then eaten.

*Goruga pinnata* (Kekad)

*Carica papaya* (Papita)

**Some of the elephants develop fascination for country made alcoholic drinks called *Handia*.**

#### **18.4.7. Threats**

The pre-eminent threats to the Asian elephant today are habitat loss, degradation, agriculture and farming, grazing, mining, human interference, trade, pollution, hunting for ivory, insurgency, corridor loss, anthropogenic pressures on the habitat, man-elephant conflict, forest fires, illegal captures of live animals etc. Poisoning and disease are some other threats to the animal.

#### **18.4.8. Conflicts**

Due to frequent visit of the animal, conflicts have also increased between man and elephant in the area. However, never any fierce conflict has been reported. The villagers use fire crackers, drums and even burning tyre and tubes to scare the animal. Help from the forest department reaches quickly, provided the information reaches to them timely.

#### **18.4.9. Conservation status**

*CITES APPENDIX : 1; Indian Wildlife (Protection) Act (1972) (As amended up to 2009); Sheduled-1; Part-1; Indian Red Data Book (IUCN, 1994); Vulnerable; (IUCN 1998) (Proposed); Vulnerable (National) and data deficient (Global); IUCN (2002) (Proposed); Endangered (Global) based on version 2.3 1994 (IUCN, 2003).*

#### **18.4.10. Conservation of the elephants in Gare-Pakma IV/8 coal block, mining lease area**

Habitat destruction by man has threatened the survival of the Asian Elephant. Therefore, maintenance of the habitat is the first requirement in the conservation of the elephants. If proper habitat is absent or is below the desirable standard, then it may be developed. Elephants require, simultaneously, two types of habitats:

- a. Dense forest with tall trees and
- b. Scrub jungle and grasslands

Dense forest is required as refuge and protection from intense sun rays. While scrub and grasslands are required as a better feeding area. Tall trees are not a good source of food because their foliage and tender twigs are beyond the reach of elephant's trunk. It is only the fallen fruit and bark of such trees which can be eaten. It is generally difficult to peel off the bark from trees. In a scrub or a grassland, it is easy to feed. The food item

may be foliage, tender shoot, entire plant or even the root, whichever is within their easy reach.

With respect to the area, there are two options for the conservation of the elephants:

- Restrict the elephants in a defined area
- Develop a corridor for long, may be interstate, migration route.

Best method for the management of elephant in Gare-Palma IV/8 lease area will be a development of a corridor, or a residence area, far beyond the lease area. The corridor, to be developed, must have both the dense forest with tall trees as well as shrubby areas. Now it depends upon the condition of the area to decide that the shrubby areas should be forming outer fringe to the tall tree area or should be in the middle or should be in patches in between the tall trees. The corridor belt should be of sufficient width and should be planned either away from the village settlements or the isolated houses near to their path should be shifted. Elephants require 150-200kg of food per head, per day. Habitat planning should include provisions to yield sufficient food. It is important now to decide about the plant species. The food plants should be of more liking type to the elephants. To keep the food plants within easy reach of the elephants, regular planting of new plants or pruning to stimulate coppicing, should be made. Some of the food plant species suggested to be planted in the area are:

*Dendrocalamus strictus*, (Bans) *D. Rhedii* (Bans), *Bambusa arundinacea* (Bans), *Ficus benghalensis* (Bargad), *Ficus religiosa* (peepal), *Ficus glomerata* (Gular), *Ficus rumphii* (Jangali Bargad), *Ficus infectoria* (Pakar), *Artocarpus heterophyllus* (Kathal), *Miliusa velutina* (Bhilwa), *Pterocarpus marsupium* (Bija), *Phoenix sylvestris* (Chhind), *Phoenix acaulis* (Buta chhind), *Buchanania lanzan* (Char), *Feronia elephantum* (Kaith), *Goruga pinnata* (Kekad), *Thysanolaena agrostis* (Hathi ghas), *Cymbopogon flexuosus* (ghas), *Themeda quadrivalvis* (Ghas), *Iseilema laxum* (Ghas), *Bothriochloa pertusa* (Ghas), *Apluda mutica* (Ghas) etc.

Bamboos (*Dendrocalamus strictus*, *Bambusa arundinacea*) are one group of fast growing plants which can form a good proportion of diet to the elephants. Another bamboo species *Dendrocalamus rhedii* will be an exotic species to the area but is



common in Western Ghats. It has a thin stem. Elephants have special liking for the bamboo plant and it is easy to grow the plant in sufficient quantity in short time. However, it is not a species which can create any problem. The villagers in Sondhiaarea have informed that the elephants have special liking for *Buchanania lanzan*. The saplings of the plant are uprooted and the root thrashed clean and eaten.

With the vegetation it is essential to develop perennial sources of water with some salt ponds, within the conservation area.

With the above following more steps should be taken for the conservation of this flagship species:

- i. Forest officers should be trained in Wildlife management.
- ii. Frequent use of fireworks should be avoided. This may lead to develop immunity in elephants against the fire works.
- iii. Conflict with human is a major conservation problem, hence, should be reduced to the lowest possible level.
  - iv. Anti poaching efforts should be strengthened.
  - v. Awareness programmes should be run frequently.
- vi. Interstate committee of Madhya Pradesh, Chhattisgarh, Jharkhand and Orissa Govts. should be constituted for elephants.

#### **18.4.11. Elephant corridor/reserve**

There are news that Chhattisgarh Govt. is going to establish an elephant reserve, combining the Tamor-Pingla and Semarsoot wildlife sanctuaries in Sarguja district and Badalkhol wildlife sanctuary in Jashpur district. Corridor will be developed to join these three wildlife sanctuaries. The proposed arera is far beyond, from the presently applied lease area. However, still no notification has been issued, so far, to implement the policy. The concept is good but it depends upon the Govt. to make it a reality.

#### **18.4.12. Some suggestions to escape elephant damage**

Methods adapted to escape elephant damage may be categorized as i) Active and ii) passive methods:

**i. Active methods**

- a. Noise-making like shouting, drum beating, bursting fire crackers, firing gun shots into the air (by forest officials only),
- b. Using elephant torch light
- c. Pelting stones and lighted fuel-woods.
- d. Loudspeaker broadcasting of tiger roaring sound

However, the major drawback of using all these methods is that these may provoke the raiding elephants increasing the possibility of more damage to the crops and other properties as well as higher risk to the farmer's life. Further, If the active methods fail to be effective, singly, then combined effort should be made.

**ii. Passive methods**

- a. Change in cropping pattern by introducing some elephant repellent alternative cash crops (e.g. *Patchouli*, *Helianthus annus*, *Capsicum annum* and *Citrus*).
- b. Digging trenches around village area.
- c. Planting sisal (*Agave Americana*) around village boundary.
- d. Solar fencing.
- e. Improvement of water sources.
- f. Raise/improve fodder resources.

Crops of elephant liking should be avoided, as far as possible. Some of the crops, listed above, should be used to replace the more traditional crops like the sugarcane and rice. In Karnataka elephant proof trenches are being dig around the village area, but I have observed in Gare-Pakma IV/8 district in Chhattisgarh state that the elephants can move down and up in trenches of good depth. Sisal has been found to be good to prevent the elephants to cross the sisal planted area. The plant yields a good quality fibre. Electric fencing has also been suggested as one of the methods but in Assam it has been found to be a failure as the elephant have discovered techniques to break such fences, safely. In areas like Kamakshyanagar in Dhenkanal division in Orissa improvement of fodder

resources in the forest has shown promising result of restricting the elephants more in the forest area.

Passive methods are always better to avoid man-elephant conflicts. More important are the selection of plants as alternative crop as well as plants to check the entry of elephants in to the settlement areas.

A good amount of researches and suggestions on the conservation and reducing its conflicts with human being is going on, resulting in suggestions coming frequently on these aspects. Thus the presently prepared report is not the final. With the above, some more, methods are being suggested for Sondhia coal block region:

- **Two doors in a house:** Most of the houses in villages have only one door or exit. In case the elephant enters the house through the door, the occupants can escape through another door.
- **Timely information:** Timely information to the helping person about the approach of elephants can reduce the conflicts as well as loss of human life. For this a network should be formed with the villages and the forest officers.
- **Elephant torch:** The elephant torch should be provided to each of the vulnerable villages. Presently the torch is only with the forest officer, one torch for several villages.

18.4.13. Steps taken in Africa, to escape elephant damage:Elephant area is fenced with ropes. Fencing ropes are smeared with a mixture of chilli + tobacco powder in engine oil. Disagreeable smell of the mixture, helps to some extent, to ward off the elephants

- **Honey bee combs are promoted on the elephant corridor boundary. Honey bees ward off the elephants.**
- **Electronic tracking devices are attached to the elephants to track their movements. This helps in timely information to the villagers.**

## 19. GREEN BELT

Green belts will be developed along the boundary of the open cast mining area. The area for green belt plantation consists of undisturbed soil, hence, plantation could be made like gap filling in a forest area. Green belt is erected not from biodiversity conservation point of view but is basically developed as a screen to check the spread of dust pollution. **An area of 113.809 hectares has been earmarked by forest department Tamnar for afforestation and greenbelt development.**

### **19.1. Plantation in the Green Belt**

2. A green belt, 100m in width will be developed around the open cast mining area.
3. Green belt plantation will be started with the beginning of the mining and will be completed within five years from the beginning.
4. To raise seedlings for plantation in the green belt a nursery will be developed. Seedlings of only local species, suitable for green belt plantation will be raised in this nursery.
5. Green belt plantation will be protected properly. If need arises then the saplings will be protected with tree guards. Together with the trees green belt plantation will include shrubs, climbers and some herbaceous species also. However, only local species will be used in the plantation.
6. Green belt will help in reducing the spread of fugitive dust and noise from the mining area.
7. Selection of plants for green belt plantation will be made on following criteria:
  - Having tolerance to dust pollution.
  - Should maintain leaves for as longer a time as possible.
  - Combination of plants should be such so that almost a screen of plants is formed to check the dust from escaping the area. Thus the green belt plants will consist of mainly the trees and shrubs with some herbs also.
  - The trees should provide shade.
  - Trees less affected due to pruning should be given preference because pruning will yield fuel wood.

- Every plant species to be planted in the green belt should have some basis for its selection to be planted in the green belt.
- Only local species will be taken for plantation.

Green belt will be developed with the aim to form a curtain to check the spread of fugitive dust. Hence, the belt will consist of trees, shrubs and lianas and climbers. With these above considerations following, local plant species will be taken for green belt plantation.

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### 19.1.1. Trees

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1. Imli (*Tamarindus indica* – seed)
2. Mahua (*Madhuca latifolia*– seed)
3. Saja (*Terminalia tomentosa* - seed)
4. Aam (*Mangifera indica* – seed, seedling transplantation)
5. Kumhi (*Careya arborea* – seed)
6. Rohan (*Soymida febrifuga* - seed)
7. Sidha (*Lagerstroemia parviflora* - seed)
8. Bargad (*Ficus benghalensis* - Transplantation)
9. Pipal (*Ficus religiosa* - Transplantation)
10. Umar (*Ficus racemosa* - Transplantation)
11. Pakar (*Ficus infectoria* - Transplantation)
12. Neem (*Azadirachta indica*- seed)
13. Sal (*Shorea robusta*- seed)
14. Karanj (*Pongamia pinnata* - seed)
15. Haldu (*Adina cordifolia* – seed)
16. Bel (*Aegle marmelos* - Seed)
17. Maharukh (*Ailanthus excelsa* - Seed)
18. Kala sisris (*Albizia lebeck* - seed)
19. Chichwa (*Albizia odoratissima* - seed)
20. Asta (*Bauhinia racemosa* – seed)



21. Kasai (*Bridelia retusa* - seed)
  22. Amaltas (*Cassia fistula* - seed)
  23. Mainphal (*Catunaregam spinosa* - seed)
  24. Lasora (*Cordia myxa* - seed)
  25. Jamrashi (*Elaeodendron glaucum* - seed)
  26. Bhonrsal (*Hymenodictyon excelsum* - seed)
  27. Baranga (*Kydia calycina* - seed)
  28. Kari (*Miliusa tomentosa* - seed)
  29. Kusum (*Schleichera oleosa* - seed)
  30. Jamun (*Syzygium cumini* - seed)
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### 19.1.2. Shrubs

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19. Chilhi (*Casearia tomentosa* – seed)
  20. Dikamali (*Gardenia gummifera* – seed)
  21. Adusa (*Adhatoda vasica* – seed)
  22. Akol (*Alangium salvifolium* - seed)
  23. Karonda (*Carissa spinarum* – seed)
  24. Chipti (*Desmodium pulchellum* - seed)
  25. Chapar (*Moghamia chapar* – seed)
  26. Baibirang (*Embelia ribes* – seed)
  27. Marodphali (*Helecteres isora* – seed)
  28. Dudhi (*Holarrhena antidysentirica* – seed, transplantation)
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### 19.1.3. Climbers and Lianas

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19. Satawar (*Asparagus racemosus* – seed, tuber)
20. Mahul (*Bauhinia vahlii* – seed)
21. Palasbel (*Spatholobus roxburghii* – seed)
22. Malkangni (*Celestrus peniculata* - seed)
23. Baichandi (*Dioscorea hispida* – tuber, bulbil)

24. Dangkanda (*Dioscorea bulbifera* – seed, tuber, bulbil)
25. Gudmar (*Gymnema sylvestre* – cutting, seed)
26. Dhimarbel (*Ichnocarpus frutescens* – seed)
27. Ramdaton (*Smilax zeylanica* – seed)
28. Guruch (*Tinospora cordifolia* – cutting, seed)
29. Keoti (*Vallisneria spiralis* – seed)
30. Keoti (*Ventilago calyculata* – seed)

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Green belt development will be started immediately after the sanction of permission for mining.

## **20. OVERBURDEN DUMP MANAGEMENT**

The overburden soil will first be dumped, temporarily and then later on it will be used for filling the void. The overburden consists of two types of soil:

- I). The top soil about 0.5 meter average thickness. It is rich in nutrients and suitable for plant growth, and
- II). The lower soil, which in true sense is not a soil but is earth, because in this soil organic matter is totally absent and is generally poor in nutrients required for plant growth.

These two types of soil will be dumped separately. After dumping the soil for 2-3 years the topsoil, dumped separately, will then be used as the top layer over the lower soil.

## **21. BACKFILL DUMP:**

Backfilling will start from 3<sup>rd</sup> year of the project operation (during 3<sup>rd</sup> year). All the OB generated during 4<sup>th</sup> and 5<sup>th</sup> year will be backfilled. After 5<sup>th</sup> year and upto the conceptual stage OB will be backfilled.

### **21.1. Topsoil dump:**

The total top soil generated during the life of mine will be stacked separately in a soil stack pile. It will be used for growing plants along the fringes of the site roads and reclamation of external dump and back filled area. The top soil stockpile will be of low height not exceeding 6m and will be grassed to retain fertility.

### **21.2. Bio Reclamation of backfilled area**

The soil used for backfilling will be a better soil than the original soil because during dumping some leaf litter will be added to it and some grasses will be promoted to grow on it through seed sowing.

Biological reclamation will be done to transform the degraded land and waste dump into a self - sustaining ecologically stable land. This will prevent soil erosion, dust pollution and will create aesthetic beauty. Re-vegetation of waste dump through systematic means, increases the slope stability, enhances the infiltration of rain water and its availability, increases the soil fertility and promotes natural regeneration of native plant species.

With spreading of top soil layer the surface is ready for bio-reclamation it is recommended to plant saplings of selected species by pit plantation technique. A circular pit of 0.6 m dia and 1m depth will be at spacing of 2m x 2m on both sides. It will be filled with a mixture of top soil and organic fertilizer. Saplings would be planted in the prepared pit. Plantation should be done at the onset of monsoon.

### **21.3. Species Selection for Reclamation of the Area**

Successful bio- reclamation would largely depend on the selection of appropriate species for re- vegetation. While selecting plant species following parameters will be considered.

- Local and native to the soil
- Nitrogen fixing leguminous species will form at least 30% of the total plantation.
- Shrubs, herbs and grasses to check soil erosion and development of fertile soil.

Apart from above top Soil management will be done to ensure the inoculation of Micro-organism, seed, organic matter etc.

### **21.4. The Plantation**

Criteria for the selection of plants:

Plant species selected for plantation in the backfilled, overburden soil should possess any or more of the following properties.

- a. Have soil binding property.
- b. Be a nitrogen fixer.
- c. Be able to tolerate, at least to some extent, the crack formation in the soil.
- d. Have drought tolerance ability.
- e. Be able to grow in a slope.
- f. Be able to grow in nutrient and organic matter poor soil.
- g. Be a local species.

Plantation of the overburden soil will be taken up in two phases.

**Phase: I**

The first phase will be aimed to establish plants, which will make the overburden soil suitable for plantation and/or natural growth of the local species.

**Phase: II**

Second phase will then vegetate the area, introducing as much local biodiversity as possible with the aim to develop a natural ecosystem, prevalent in the area. The first phase of stabilization of the overburden soil is expected to take 3-4 years. After that, in the overburden soil reclamation area, the local tree, shrub, herb, grasses and sedges and climber species, inhabiting the nearby forest area, will be introduced. This will lead, gradually, to the development of a natural forest and thus the natural ecosystem, in the area.

**22. PLANTATION IN THE BUFFER ZONE**

- Trees will be planted in the buffer zone also. This plantation will be done at selected places only and only local species will be used in the plantation. Some of the tree species included will be: Aonla (*Emblica officinalis*), Arjun (*Terminalia arjuna*) Saja (*Terminalia tomentosa*), Baheda (*Terminalia bellerica*) Bija (*Pterocarpus masupium*), Bargad (*Ficus benghalensis*), Peepal (*Ficus religiosa*), Mahua (*Madhuca latifolia*), Sal (*Shorea robusta*), Dhawda (*Anogeissus latifolia*) Tendu (*Diospyros melanoxylon*), Char (*Buchanania lanzan*), Khair (*Acacia catechu*), Lodh (*Symplocos racemosa*) etc.
- Care will be taken to include some fruit bearing trees like Gular (*Ficus glomerata*), Achar (*Buchanania lanzan*), Aonla (*Emblica officinalis*) Am (*Mangifera indica*) and such trees to provide food to the herbivores which in turn will be the food source of the carnivores.
- Water, particularly during drier seasons, becomes the most important factor to all types of wild animals including the mammals, birds and reptiles. If water is



available safely, then all other factors become secondary for the presence and survival of the wild life in any forested area.

- Places suitable for mini watersheds will be identified in the core as well as in the buffer zone to store rainwater. Further, to make water available at all the times, throughout the year, some of these water holes will be recharged through artificial means. Proper slope will be given to approach these water sources so that the wild animals will be able to drink water without any difficulty.
- Proper cover through vegetation or any other type of even artificial cover will be developed near to these water sources so that the prey species will be able to hide themselves from the predators, at the time of approaching the water sources.
- To attract the birds, plants yielding food to the birds will be planted on priority basis. If water and food are available to the birds without any anthropogenic disturbances the area can become an ideal place for bird watching.

Execution of the above works is proposed to be taken up by the forest department of Chhattisgarh financed by the company.

To fulfill the requirements of nursery plants, a nursery will be established at the site. During peak requirements, additional plants will be transported from Govt. / Forest nurseries, located around the area. The common species used for plantation in the region are Sal, Mahua, Gulmohar, Neem, Siris, Acacia, Casuarina, Pongamia, Mango, China-rose, Kaner, etc.

### **23. STRATEGY OF MITIGATION OF THE PERCEIVED ADVERSE IMPACT OF THE PROJECT:**

- (1) As the project area is gradually built up, socio-economic forces are likely to set in a process of gradual destruction of forests. The resident population of the area would be enamoured of the project activities, which confer

immediate economic gain and employment. A climate of general apathy for the forests and wildlife might be created in the surrounding areas. It would therefore be necessary to prevent this decline in people's stake-holding of the forest and wildlife values of the area through massive awareness building exercise, management interventions, and well designed incentive structure.

- (2) A preventive ring of protection of flora and fauna would be built up around the impact area, and capacity would be built up within the Forest Division as well as among the other stakeholders in enforcing the protection measures. The protection measures would be sustained over the years as a long-term intervention.
- (3) Habitat quality would be maintained and wherever degradation and depletion has set in, measures of resurrection would be launched. These could be by way of assisted natural regeneration, plantation of species occurring naturally at the site, soil and water conservation measures and incentives for prevention of fire and grazing.
- (4) Special emphasis would be laid on creation and restoration of water bodies through measures of water harvesting to mitigate water stress to wild animals during the dry months.

#### **24. ACTION PLAN:**

- (1) A comprehensive action plan would be launched immediately to strengthen the administration to combat illicit felling of trees, smuggling of forest produce, protection of wildlife habitat and protection of wild flora and fauna in the area. This will include augmenting the staff strength, motivated local youths and personnel drawn from private security agencies on contractual basis.
- (2) 'Wildlife camps' can be set up at strategic locations with infrastructure such as watch tower, communication equipments, vehicles for mobility to

effectively handle poaching of animals, smuggling of forest produce and also depredation caused by wild animals.

- (3) Mobile units will be constituted for intensive surveillance and enforcement of forest and wildlife protection activities. This will create a deterrent effect on the forces of forest destruction.
- (4) VHF communication network will be strengthened by erection of VHF stations and towers and provision of hand sets to staff manning different posts.
- (5) Habitat conservation and restoration measures will consist of (a) soil and moisture conservation measures on the slopes, (b) water harvesting structures and creation of water bodies, assisted natural regeneration and plantation of species occurring naturally in the area to cover the degraded & barren areas.
- (6) Fire prevention and fire beating operation will be organised both by provision of incentives to villagers actively cooperating in the task and also by engaging labourers to combat forest fire. Systematic monitoring and surveillance of all fire prone areas would be launched through a squad to continuously assess the damage, and the extent and efficacy of counter fire prevention and fire measures.
- (7) Plantation would emphasize on local species for regeneration of degraded areas.
- (8) Cattle immunization will be carried out in all villages within the project impact area and in villages in the vicinity to check the spread of infectious diseases among wild animals. This will be done through health camps to be conducted with the local Veterinary officers.

(9) Imaginative Eco-development activities to provide opportunities for alternate livelihood with reduction of dependence on forest, and Eco-tourism promotions will be carried out.

(10) Monitoring, evaluation and motivation of the surrounding villagers through eco-club activities and through formation of Green Brigades will be carried out.

## **25. ACTION PLAN MONITORING**

- A. Monitoring: By a committee under the chairmanship of D.F.O Sarguja Division with mine representative, V.S.S presidents (2), Labour representative, Range officer, as members. The committee meets twice a year in April and November to sort out bottle necks and recommend future course of action. In addition, committee shall review progress of reclamation and restoration in mined - out area.
- B. Data Inputs: Committee takes input from field formation of F.D., Mine Manager, Van Sahayaks, Fire Watchers, V.S.S members regarding habitat, status of wild animals, movement pattern of the animals, depredation control, progress and survival of plantations, eco-development and their outcome, participation levels of villagers, environmental data and advice desirable action.

## 26. TENTATIVE COST OF IMPLEMENTING THE SCHEME:

Many other coal blocks, adjoining to the presently applied Gare IV/8 coal block are either running or have been cleared for operation. Hence, the presently proposed cost of implementation is a part to be combined with other such costs, for a comprehensive conservation plan for the entire Gare-Palma coal block.

### Year wise utilization of fund from 1 to 10 years, in lakhs of rupees.

S.No	Activity	Years from the beginning of mining										Total	
		1	2	3	4	5	6	7	8	9	10		
1	Watch tower	3.50	3.50	1.00	-	-	-	-	-	-	-	-	8.00
2	Fire Protection Measures	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	12.00
3	Creation of water holes & maintenance	11.00	1.00	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	15.50
4	Provision of salt lick	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	5.00
5	Planting shade, fodder & fruit trees	0.25	9.45	6.85	1.75	0.75	2.35	1.00	1.00	1.00	1.00	1.00	25.40
6	Creation of hide out	0.08	3.84	3.40	0.67	0.23	0.28	0.25	0.25	0.25	0.25	0.25	9.50
7	Inventorise, document and conserve Biodiversity by State Biodiversity Board	16.00	-	-	-	-	-	-	-	-	-	-	16.00
8	Damages for loss to human life and to the crops	5.50	-	-	-	-	-	-	-	-	-	-	5.50
9	Training & Creation of awareness	1.00	0.60	0.50	0.50	0.50	-	-	-	-	-	-	3.10
		39.83	20.89	13.75	4.92	3.48	4.63	3.25	3.25	3.25	2.75		100.00

**Total Rs. 1, 00,000.00 (One crore) only**



## **27. SUMMARY AND CONCLUSIONS**

**The core zone of Gare IV/8 area, applied for mining lease by the Jaysawal Neco, Pvt. Limited is, although, a protected forest but is in much degraded condition. In the core zone only a few species are surviving as trees, all other tree species have mostly disappeared or have been reduced to shrub stage. The lease area is open for cattle grazing. Illegal cutting of trees is also common in the area. Most part of the area has either been converted in to grassy patch or covered with shrubby growth. Wild life in the area is very sparce.**

**The applied lease area is surrounded by other operating or sanctioned coal blocks, which also may be one cause for reduced wildlife variety and density in the area. Tree cover is very less. Human movement with their cattle is frequent in the area. Except for rare visit of fox and jackal, other wild animals, likely to be prey to large cats, are absent from the area. Only Schedule I species, visiting the area, is the sloth bear. The animal prefers to live in rocky, natural caves, which are lacking in the presently applied mining lease area. Hence, the area applied for mining lease is not a habitat of the animal. Its natural hiding places are the rocky, hills, at some distance from the area applied for mining lease. However, the sloth bear is a visitor to the area, during the mahua flowering, spring season (Months of March and April). Mahua trees are much abundant in the entire region, with more abundance around all the village settlements. Tiger and Panther are shy animals. Lack of hiding place, rarity of wild animal prey and extensive human interference, make the area totally an unlikely place for inhabitation of large cats like Tiger and Panther.**

**However, some good forests are there in the buffer zone (10 km radius from the applied lease area), particularly in the Gharghoda forest division. These forests are still supporting some wild species, although, in much reduced density. Shedule I species recorded from the buffer zone include: Sloth bear, Elephant, Peafowl and Bengal monitor. Elephants visit the area mostly during the crop season. They cause**

**mostly the loss of crops and stored grains with house breaking. Human life loss is rare in the area.**

There are news that Chhattisgarh Govt. is going to establish an elephant reserve, combining the Tamor-Pingla and Semarsoot wildlife sanctuaries in Sarguja district and Badalkhol wildlife sanctuary in Jashpur district. Corridor will be developed to join these three wildlife sanctuaries. The proposed area is far beyond, about to more than 100 km from the presently applied lease area. However, still no notification has been issued, so far, to implement the policy. The concept is good but it depends upon the Govt. to make it a reality.

**Elephants move from Orissa elephant reserves to Jharkhand elephant reserves using Raigarh, Korba, Sarguja and Jashpur districts of Chhattisgarh as corridor. Presently applied Gare IV/8 area is surrounded by other areas, leased for mining, where mining operation is going on. Also the presently applied area is neither a part of the elephant corridor nor is included in the plan proposed to develop Elephant Reserves/Corridor, in Chhattisgarh.**

**A green belt will be developed around the mining area, as well as the overburden dump and backfilled areas will also be vegetated, with only the local species as has been mentioned in the list.**

**Medicinal plants of the rare type are totally absent as well as medicinal plants of lesser value are also rare in the area. However, medicinal plants of the core zone will be grown in the 113.809ha land area allotted for afforestation. No additional area will be used for the purpose. Together with the medicinal plants of the core zone, some additional types of medicinal plants will also be grown in the afforestation area.**

**A total of rupees one crore have been proposed to be contributed for the conservation of medicinal plants, Schedule I animals and improvement of the area.**

## SOME VIEWS OF THE BUFFER ZONE



**The hill forming the boudary of Gare-Palma coal block**



**Fallow land**



**Illegal cutting in the forest**



**Bamboo forest**



**Diospyros melanoxylon on waste land**



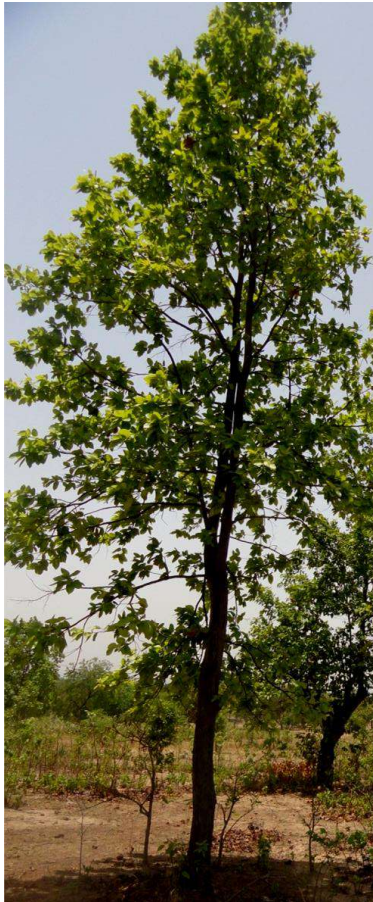
## SOME TREES



**Mahua grove outside village area**



**Ficus benghalensis**



**Shorea robusta**



**Terminalia arjuna**



**Buchanania lanzan**



**PHOTOGRAPHS OF THE CORE ZONE**





**SHRUBS**



**Jatropha curcas**



**Agave americana**



**Butea monosperma**



**Holarrhaena antidynerica**



**Cleistanthus collinos**



**Spatholobus roxburghii**



**Casearia graveolens**



**GRAZING AREAS AND GRASSES IN THE CORE ZONE**



**Aristida  
adscencionis**



**Digitaria granularis**



**Open grassy area**



**Chrysopogon aciculatus**



**Open grassy area**



**Oplismenus burmannii**



**Eragrostis coarctata**



**HERBS**



**Flemingia strobilifera**



**Evolvulus nummularius**



**Spermacoce stricta**



**Therriophorum minutum**



**Buettneria herbacea**



**Desmodium triflorum**



**Polygala arvensis**



**ALGAE, FUNGI, LICHEN, FERN & EPIPHYTE**



**Spirogyra sp.**



**Ganoderma lucidum**



**Rusula sp.**



**Foliose lichen**



**Lygodium flexuosum**



**Adiantum lunulatum**



**Vanda tasellata**



**Cheilanthes  
farinosa**



**Cheilanthes tenuifolia**



## WATER BODIES



**Kelo river**



**Pond with silty yellow water**



**Hydrilla verticillata & Najas indica in Kelo river**



## PREVENTING ELEPHANT CONFLICTS



**Sunflower (*Helianthus annuus*) and Chilli (*Capsicum annum*) crops distracting elephants**



**Sissal (*Agave americana*) to prevent**



**Honeybee to ward off elephants**



ARTHROPODS



Oecophylla smaragdina



Beetle



Honey bee



Scorpion



Spider



Spider



Spider



Neptis hylas



Butterfly



Tanaecia lepidia



Chela bacaila



Ant lion



Borer



Millipede



Crab

**INSECTS AND BUTTERFLIES**



**Antheraea mylitta**



**Oecophylla smaragdina**



**Preying mantid**



**Grass hopper**



**Neptis hylas**



**Dragon fly**



**Eurema sari**



**Butter fly**



**Butter fly**



**Dragon fly**



**Butter fly**



**Butter fly**



**Butter fly**



**MOLLUSCA AND FISHES**



**Snails**



**Puntius sophor & Clarias  
batrachus**



**Labio rohita**



**Lepidocephalichthys**



**Lepidocephalichthys guntea**



**Channa punctatus**



**Mastocembelus armatus**



**Puntius sophoro**



**Anabas  
testudinius**



**Mastocembelus  
armatus**

AMPHIBIA REPTILES AND BIRDS



**Bufo  
melanostictus**



**Indirana leitheii**



**Fejervarya  
subdramatica**



**Fejervarya sp**



**Sitana ponteceria**



**Pseudibis  
apilosa**



**Amphiesma stolata A Snake**



**Anastomus oscitans**



**Bubulcus ibis**



**Psittacula krameri**



**BIRDS**



**Sturnus contra**



**Acridotheres  
tristis**



**Merops  
orientalis**



**Carvus splendens**



**Pycnonotus cafer**



**Streptopelia senegalensis**



**Coracias  
benghalensis**

**BIRDS AND MAMMALS**



**Centropus sinensis**



**Bubulcus ibis  
returning**



**Saxicoloides fulicata**



**Dicurus**



**Passer domesticus**



**Copsychus saulaeris**



**Sturnus  
pagodarum**



**Streptopelia chinensis**



**Macaca mulatta**



**Funambulus pennanti**



**Semnopithecus entellus**

# PROPOSED ELEPHANT RESERVE AND CORRIDOR IN CHHATTISGARH

## National Parks & Sanctuaries of Chhattisgarh



# Annexure-13A



कार्यालय प्रधान मुख्य वन संरक्षक, छत्तीसगढ़, अरण्य भवन, मेडिकल कॉलेज रोड, रायपुर  
(मुख्य वन संरक्षक - भू प्रबंध)

दूरभाष: 0771 - 2552233

ई - मेल: cefm\_cg@yahoo.com

क्र./भू-प्रबंध/खनिज/331-41/2011

रायपुर दिनांक 16/11/2012

प्रति,

वन महानिरीक्षक (एफ.सी)  
भारत सरकार - पर्यावरण एवं वन मंत्रालय  
पर्यावरण भवन, कक्ष क्रमांक - 106  
प्रथम तल, सी.जी.ओ कॉम्प्लेक्स, लोधी रोड  
नई दिल्ली - 110003

विषय- **Diversion of 224.22 hect. of forest land for coal mining in IV/8 sub block of Gare-Palma Block in favour of M/s Jaiswal NECO Limited in Raigarh Forest Division of Raigarh District of Chhattisgarh.**

संदर्भ: पंजीयन कोड क्रमांक BLS/ RGH/ RGH/MJS/ 006/ 050  
भारत सरकार, पर्यावरण एवं वन मंत्रालय, नई दिल्ली का पत्र क्रमांक/ S-75/ 2007-एफ सी दिनांक 16.05.2012

- वन संरक्षक, बिलासपुर वृत्त, बिलासपुर का पत्र क्रमांक / मा. वि/ 2264 दिनांक 23.10.2012

- 0 -

भारत सरकार, पर्यावरण एवं वन मंत्रालय, नई दिल्ली द्वारा संदर्भित पत्र -1 द्वारा 4 बिन्दुओं पर अतिरिक्त जानकारी चाही गई है जो निम्नानुसार है:

क्र.	बिन्दु क्रमांक	पालन प्रतिवेदन
1	The credit of Rs. 8,32,14,733 was recieved in Current account No. 344901010070192 in Union Bank of India, Sunder Nagar, New Delhi 110003 which is in the name of Maharashtra State CAMPA on 1st April, 2010. There is no evidence of credit of the amount of Rs 3,29,58,062 either in the above account or in the account No. 344901010070184 which is in the name of Chhattisgarh State CAMPA.	<p>- जो क रास्था द्वारा विषयांकित प्रकरण हेतु रु. 8,32,14,733 छत्तीसगढ़ राज्य के कैम्पा खाता क्रमांक 3449010070128 यूनिशन बैंक आफ इण्डिया सुंदर नगर : नई दिल्ली में स्टेट बैंक आफ त्रवनकोर, त्रवनकोर, त्रवनकोर के माध्यम से बैंक क्रमांक 053808 दिनांक 20.04.2010 से जमा कराया गया है (प्रदर्श "अ")।</p> <p>- आ. क रास्था द्वारा विषयांकित प्रकरण हेतु रु. 3,29,58,062 प्रजाप नेशनल बैंक नागपुर, महाराष्ट्र के माध्यम से बैंक क्रमांक 761915 दिनांक 22.10.2010 द्वारा वनमंडल कार्यालय में जमा किया गया है।</p> <p>- रा. वनमंडल क पत्र क्रमांक/541 दिनांक 03.02.2011 कापॉरेशन बैंक, नई दिल्ली को बैंक आफ इंडिया बैंक क्रमांक 469131 दिनांक 03.02.2011 द्वारा रु. 12,18,44,699/- रा. वनमंडल कार्यालय में जमा करने हेतु त्रेषित किया गया है।</p> <p>- वनमंडल क पत्र क्रमांक/541 दिनांक 03.02.2011 अनुसार बैंक लेपक वृक्षाणण के अंतर को नई रु. 9,06,599 दिनांक 19.03.2012 को कैम्पा खाता क्रमांक एस.सी.ओ. 1025203 में जमा किया गया है।</p> <p>- वनमंडल क पत्र क्रमांक/541 दिनांक 03.02.2011 अनुसार बैंक लेपक वृक्षाणण के अंतर को राशि रु. 10,16,868 दिनांक 26.06.2012 को कैम्पा खाता क्रमांक एस.सी.ओ. 1025203 में जमा किया गया है।</p>

क्रमशः-2

5.11.2012 612

2.	The user agency, in accordance with the conservation plan as recommended by the Chief Wildlife Warden, Government of Chhattisgarh, may be directed to deposit the cost of implementation of the said plan in Ad-hoc CAMPA.	3.	This Ministry may be apprised about the progress to notify the orange forest land under Section 4 of the Indian Forest Act, 1927.	4.	A report on compliance the FRA, 2006, as per the directions given in the advisory dated 03-08-2009
		प्रधान मुख्य वन्यप्राणी अभिरक्षक, छत्तीसगढ़ वन्यप्राणी योजना की राशि रुपये 1.00 करोड़ के लिए बैंक ऑफ इंडिया, सुन्दर नगर बाजार, नई दिल्ली के ए. ए. क्रमांक 3449020/0105412 में चेक क्रमांक 1303 दिनांक 16.06.2012 के माध्यम से आ.टी.जी.एस द्वारा जमा किया जा चुका है (प्रदर्श-''ब'')।		आवेदन क्षेत्र का अधिसूचना प्रस्ताव कार्यालयीन पत्र क्रमांक / भू-प्रबंध/खनिज/331-41/2024 दिनांक 16.11.2012 द्वारा छत्तीसगढ़ शासन, वन विभाग को अधिसूचना प्रस्ताव अधिसूचित करने हेतु प्रेषित किया गया (प्रदर्श-''स'')।	
		वन अधिकार अधिनियम, 2006 अंतर्गत कलेक्टर, रायपुर का अनापत्ति प्रमाण पत्र का मूल प्रति एवं ग्राम सभा की ठहराव प्रस्ताव की मूल प्रति संलग्न है (प्रदर्श-''द'')।		वन संरक्षक, बिलासपुर वृत्त, बिलासपुर के उपरोक्त प्रतिवेदनो अनुसार प्रकरण में अग्रिम कार्यवाही करने का अनुरोध है।	

वन संरक्षक, बिलासपुर वृत्त, बिलासपुर के उपरोक्त प्रतिवेदनो अनुसार प्रकरण में अग्रिम कार्यवाही करने का अनुरोध है।

संलग्न - उपरोक्तानुसार

३१ दिसंबर २०११  
(मुदित कुमार सिंह)

मुख्य वन संरक्षक (भू-प्रबंध / व.सं.अ)  
छत्तीसगढ़

पृ. क्र./भू-प्रबंध/खनिज/331-41/२६५५

रायपुर, दिनांक 16/11/2012

प्रतिलिपि सूचनार्थ एवं आवश्यक कार्यवाही हेतु:

1. प्रमुख रात्रिव, छत्तीसगढ़ शासन, वन विभाग, मंत्रालय, रायपुर।
2. वन संरक्षक बिलासपुर वृत्त, बिलासपुर, छत्तीसगढ़।
3. वन मंडलाधिकारी, रायगढ़ वन मंडल, रायगढ़, छत्तीसगढ़।
4. अध्यक्ष (खदान), मेसर्स जायसवाल निको लिमिटेड (स्टील फ्लैट डिवीजन), सिलतरा, रायपुर, छ. ग।  
वर्तमान में किसी भी क्षेत्र में कार्य प्रारंभ करने की अनुमति नहीं है।

३१ दिसंबर २०११  
मुख्य वन संरक्षक (भू-प्रबंध / व.सं.अ)  
छत्तीसगढ़

# Annexure-14



# कार्यालय प्रधान मुख्य वन संरक्षक एवं वन बल प्रमुख, छत्तीसगढ़

"अरण्य भवन" सेक्टर.19, नार्थ ब्लॉक, नवा रायपुर, अटल नगर, रायपुर

(अपर प्रधान मुख्य वन संरक्षक – विकास/योजना)

Ph-0771-2512888, 2512819

Email-Id-apccfdevcggf@gmail.com, apccfdevcgg@rediffmail.com,

क्र./वि.यो./बजट/ 1159

नवा रायपुर, अटल नगर, दिनांक 01/07/2021

प्रति,

✓ वरिष्ठ उपाध्यक्ष,  
मेसर्स हिण्डालको इण्डस्ट्रीज लिमिटेड,  
ग्राम-नीलूपारा, तहसील-तमनार,  
जिला-रायगढ़, छत्तीसगढ़

**विषय :-** वित्तीय वर्ष 2016-17, 2017-18 एवं 2018-19 में हरियर छत्तीसगढ़ कोष में जमा राशि का उपयोगिता प्रमाण पत्र।

**संदर्भ:-** कार्यालयीन पत्र क्रमांक/वि.यो./बजट/1799 दिनांक 23.08.2019

▲ ▲ ▲

विषयांतर्गत वित्तीय वर्ष 2016-17, 2017-18 एवं 2018-19 में हरियर छत्तीसगढ़ कोष में औद्योगिक संस्थान हिण्डालको, रायगढ़ द्वारा जमा राशि से रायपुर वृत्त के अंतर्गत आने वाले क्षेत्रों में कराए गए वृक्षारोपण तथा रखरखाव कार्यों में किए गए व्यय राशि की जानकारी माह जून 2021 की स्थिति में निम्नानुसार है :-

(राशि लाख रुपये में)

क्र.	औद्योगिक संस्थान का नाम	जमा राशि	पूर्व में प्रेषित व्यय राशि	वर्तमान में व्यय राशि	कुल व्यय राशि
1	हिण्डालको इण्डस्ट्रीज, रायगढ़	90.00	89.05	0.95	90.00

अ.प्र.मु.व.सं., (वि./यो.) एवं सदस्य सचिव,  
हरियर छत्तीसगढ़ कार्यक्रम, नवा रायपुर  
अटल नगर, रायपुर, छत्तीसगढ़



# Annexure-15



**REPORT**

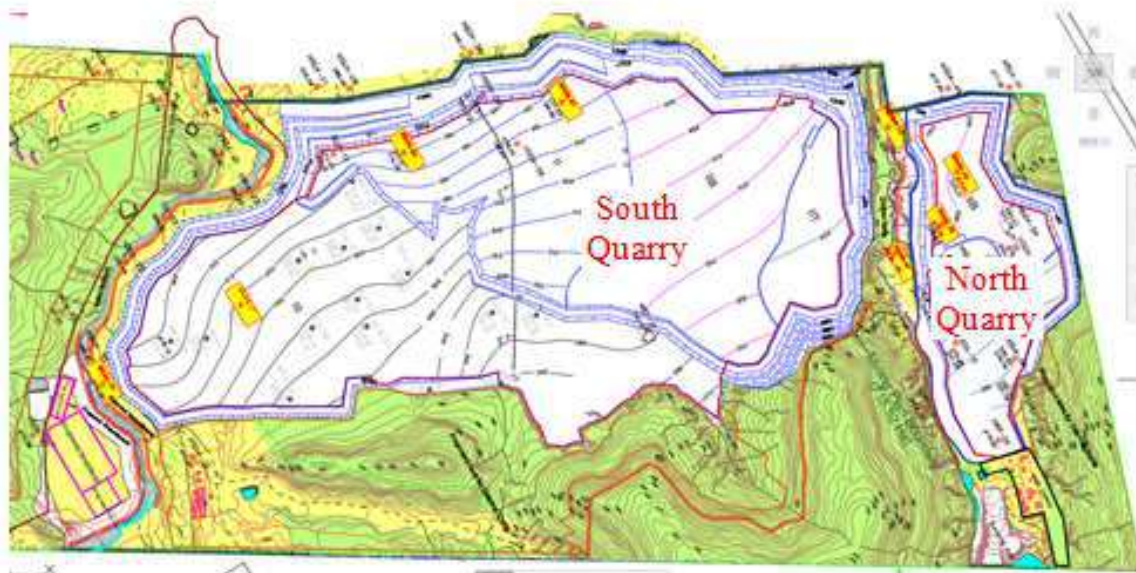
**CONFIDENTIAL**

**CSIR-CENTRAL INSTITUTE OF MINING AND FUEL RESEARCH,  
BARWA ROAD, DHANBAD**  
*(Council of scientific and Industrial Research)*



**PROJECT TITLE:**

**SCIENTIFIC STUDY FOR ULTIMATE PIT SLOPE DESIGN AND  
ADVICE THEREON FOR GARE PALMA IV/4 COAL MINE**



**SPONSORED BY:**

**GARE PALMA IV/4 COAL MINE, HINDALCO INDUSTRIES LTD.**

**NOVEMBER, 2020**

**PROJECT NO. :- CNP/4990/2020-21**



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

*(Council of Scientific and Industrial Research)*

Project Title	:	Scientific study for ultimate pit slope design and advice thereon for <u>Gare Palma IV/4</u> coal mine
<u>CIMFR Project No.</u>	:	CNP/4990/2020-21
Sponsor	:	<u>Gare Palma IV/4 Coal Mine, Hindalco Industries Ltd.</u>
Project Co-ordinator	:	<u>Mr. Jitendra Kumar Singh</u>
Project Leader	:	Dr. Sanjay Kumar Roy
Project Collaborator	:	<u>Mr. Ajit Kumar,</u> <u>Dr. Ritesh Kumar,</u> <u>Mr. Kartik Varwade,</u> <u>Mr. Manish Kumar,</u> <u>Mr. Rakesh Kumar Singh,</u> <u>Mr. Prince Kumar &amp;</u> <u>Mr. Swapan Mahato</u>

**November, 2020**

**Note:**

1. The report is meant only for internal use of the sponsor and it should not be published in full or part by the sponsor or any of its staff members. It should not be communicated or circulated to outside parties except concerned Government department. CIMFR reserves the right to publish the results in a general way for the benefit of the industry without disclosing the name of the sponsor.
2. Recommendations stipulated in the report should be implemented under the supervision of a competent agency and strictly be followed.

**Project Leader**

(S. K. Roy)

Senior Principal Scientist & HOS  
Slope Stabilisation & Landslide Management

**Project Co-ordinator**

(J. K. Singh)

Chief Scientist & HORG  
Slope Stabilisation & Landslide Management

**CSIR-CIMFR Authorised Signatories**

(P. K. Mishra)

Senior Principal Scientist & HOS  
Project Planning and Monitoring

(R. V. K. Singh)

Chief Scientist & Coordinator  
Project Planning & Industry Interface



## SCIENTIFIC STUDY FOR SLOPE STABILITY OF TWO INTERNAL DUMPS OF GARE PALMA IV/4 COAL MINE

### Introduction

Opencast coal mining involves removal of overburden to expose different seams for coal production. Overburden removed from the mine can be disposed at external dumps created at a site away from the coal bearing area or at internal dumps created by in-pit dumping concurrent to the creation of voids by extraction of coal. Advantages of in-pit dumping include less requirement of additional land and low cost of transport and is a preferred choice of the mine management, wherever it is possible.

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

Geotechnical studies of opencast mines are helpful in economically successful completion of mining of coal blocks without creating conditions which may put in danger the entire mining operations. Earlier, slope stability analysis of proposed pits and dumps in the mining plan was not an integral part of the approval of new mines in India. Coal Mines Regulations, 2017 have specified categorically in Regulation 106(2) that before starting a mechanised opencast working, the owner and agent of the mine shall ensure that the mine, including its method of working, ultimate pit slope, dump slope and monitoring of slope stability, has been planned, designed and worked as determined by a scientific study and a copy of the report of such study has been kept available in the office of the mine. Provided that in case of mines where such a study has not been made, it shall be the responsibility of





the owner and agent to get the said study made within one year from the date of coming into force of these regulations. Moreover, DGMS has issued DGMS (Tech.) Circular no. 02 of 2020 dated 09.01.2020 and DGMS (Tech.) Circular no. 03 of 2020 dated 16.01.2020 related to slope stability analysis and monitoring.

M/s Hindalco Industries Limited vide work order no. N/PO/SRV/1920/0109 dated 23.01.2020 and amended work order dated 02.07.2020 entrusted CSIR-CIMFR slope stability study of pits of Patch –B (i.e. South Quarry) & Patch-C (North Quarry) of Gare Palma IV/4 coal mine in light of the recent changes as notified in Regulation 106 of CMR 2017, DGMS (Tech.) Circular no. 02 of 2020 dated 09.01.2020 and DGMS (Tech.) Circular no. 03 of 2020 dated 16.01.2020.

CSIR - Central Institute of Mining and Fuel Research (CIMFR) is one of the pioneer national research laboratories under the aegis of Council of Scientific and Industrial Research (CSIR). The Government of India at Dhanbad established the laboratory on May 10, 1956 to carry out R&D activities in the fields of Rock Mechanics, Mining Methods, Mine Environment and Safety as well as Mine Machinery. It consists of experienced, technically skilled and dedicated experts in these fields.

The slope stability division has been rendering its services for the better and safe mining all over India for last about 30 years. During last ten years CSIR-CIMFR has completed more than 50 projects in coal and non-coal sectors on slope stability. CSIR-CIMFR is well equipped with recent and sophisticated equipment and computer software to study the slope stability problems and slope monitoring. CSIR-CIMFR also has a well-equipped rock mechanics laboratory with latest computerised equipment for determination of all types of engineering properties of rocks and soils.

The stability of the slope primarily depends on the slope geometry and strength properties of the slope materials. The orientation of the discontinuity planes with respect to slope face determines the types of failure possible within that slope. Generally planar, wedge, toppling and buckling types of failure occur in rock slopes, while in soil slopes and weathered / fractured rock slopes circular failure is possible. Ground water and surface water flow conditions also plays a critical role on the stability of dump and pit slopes.



Team of CSIR-CIMFR visited Gare Palma IV/4 coal mine to observe present condition of the pit and collect representative samples of different lithologies for estimation of geo-mechanical properties. CSIR-CIMFR conducted the slope stability study pits of Patch –B (i.e. South Quarry) & Patch-C (North Quarry) of Gare Palma IV/4 coal mine using limit equilibrium method keeping in mind the recent changes as notified in Regulation 106 & 108 of CMR 2017, DGMS (Tech.) Circular no. 02 of 2020 dated 09.01.2020 and DGMS (Tech.) Circular no. 03 of 2020 dated 16.01.2020.

This report deals with the slope stability analysis of pits of Patch –B (i.e. South Quarry) & Patch-C (North Quarry) of Gare Palma IV/4 coal mine and presents the optimum configurations of ultimate pit slope. Moreover, the report presents general measures to be adopted by the mine management to keep the pit slopes in drained condition and methodology for monitoring of dumps for early detection of instability

## Mine Location

Gare Palma IV/4 coal mine was vested in M/S Hindalco Industries Ltd. with effect from 1<sup>st</sup> April 2015 vide vesting order under clause (b) of sub rule 2 of rule 7 and sub-rule 1 of rule 13, Order No. 104/16/2015/NA dated 23rd March 2015. Gare Palma area falls in Mand Raigarh coalfield in Chhattisgarh and contains about 3000 million tonnes of coal as per GSI estimate. This is a large area and has been divided into 4 sectors i.e. I to IV. Sector IV has further been sub-divided into 8 blocks namely IV/1 to IV/8.

Gare Palma-IV/4 Block falls under the administrative control of Tamnar Tehsil, Raigarh district in Chhattisgarh state. This block is located in the south-eastern part of Mand Raigarh Coalfield, close to the Chhattisgarh and Orissa Border. Gare Palma-IV/4 Block is bounded by 22°07'380" N to 22°10'23" N latitudes and 83°31'09" E to 83°33'38" E longitudes and is covered in Survey of India Topo Sheet No. 64N/8 & 12. Gare Palma IV/4 sub-block is located in the northeast of Gare Palma IV/2 and east of Gare Palma IV/5 sub-blocks. It is located about 15 km North east of the Tehsil town of Tamnar and 55 km north-east of the district headquarter, Raigarh.

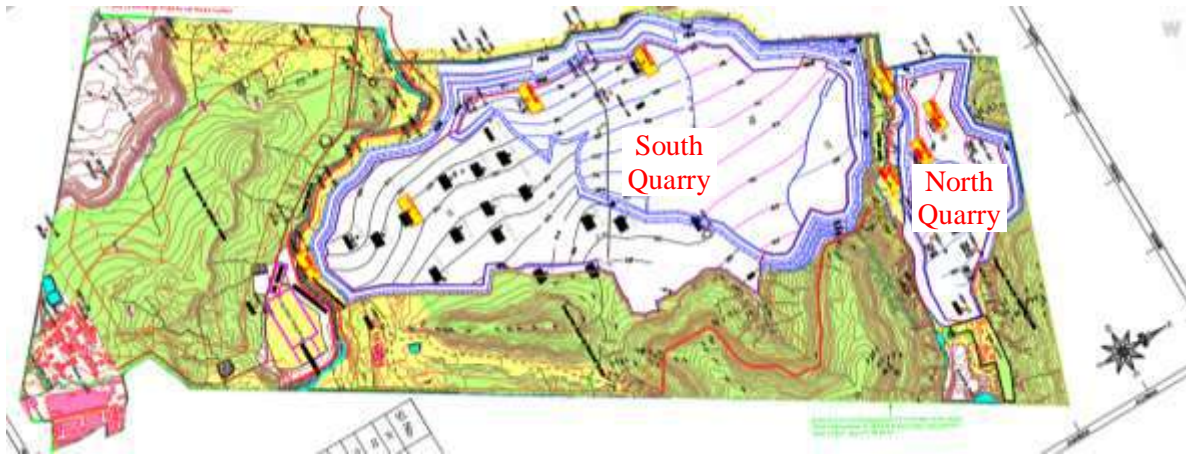
Mand Raigarh Coalfield is well connected by state highways from Bilaspur, Raigarh and Ranchi with Trijunction at Dharamjaygarh located in the northern part of coalfield.

Dharamjaygarh-Raigarh (state highway No.1) and Dharamjaygarh -Kharsia (state highway no. 22) pass through the coalfield and connect with each other by Chhal –Gharghoda Road. Gare Palma IV/4 sub-block is connected by an all weathered road via Tamnar from the district headquarter, Raigarh, located 55 km southwest of the area. The block is also covered by forest and hillocks making the communication difficult. Raigarh is the nearest Railhead on the Howrah –Mumbai line of South East Central Railway. Nearest airport Raipur is 330 km away. Location of Gare Palma IV/4 coal mine has been shown in figure 1.



**Figure 1: Location of Gare Plama IV/4 Coal Mine**

Proposed configurations of pits of Patch –B (i.e. South Quarry) & Patch-C (North Quarry) at ultimate stage as per approved mining plan of Gare Palma IV/4 coal mine have been shown in Figure 2.



*Figure 2: Proposed configuration of ultimate pits of north & south quarry of Gare Palma IV/4*

## **Geology and Geo-hydrology**

Mand – Raigarh Coalfield lies in the drainage basin of Mahanadi. It is a part of Ib-Mand-Korba master basin lying within the Mahanadi Graben. Mand – Raigarh Coalfield is an asymmetrical basin with an approximately NW-SE axis. Gare Palma IV/4 block is located on the south-eastern part of the Mand Raigarh Coalfield. The eastern boundary of the Gare Palma IV/4 block is also the boundary of basin. The structure of the block has been deciphered by surface, sub-surface borehole & underground mine working data. The block is mainly covered by Barakar formation rocks with alluvium/ sandy soil cover. Gare Palma IV/4 block is devoid of any major structural disturbances, excepting one minor fault in the central part of the block. There are reported occurrences of numerous slip planes as evident in the underground workings as sand washed zone in the central part of the block. The area is characterised by the presence of metamorphic high in the south eastern part of the block, restricting the occurrence of Seam I and seam II. The Barakar Formations exhibits broadly N-S strike with swing in NE-SW in eastern part and NW-SE direction in western part of the sub-block respectively. The general dip of the strata is  $5^{\circ}$  to  $8^{\circ}$  in the westerly direction. In all four regional seams (I to IV) and one local seam L1 have been correlated in the block. Due to erratic occurrences and less thickness, seam-V has not been considered.

Physiographically, the sub-block IV/4 can be divided into the hilly terrain covered by forest in the north-central and eastern part and relatively plain country north and south of it. The elevation of the area north of the hilly terrain varies between 268 m and 330 m whereas





the hill rises upto 432 m above mean sea level. Southern part of area is depicted by rolling topography. The area immediate to the south of terrain is more or less plain with gentle slope towards southeast and the elevation ranges between 264m and 290m. The area south of Bendra nallah is represented by a rolling topography with ground elevation ranging between 267m and 301 m and this part is mostly covered by forest. Isolated hillocks of lesser magnitude are also evident in the west central part. The area is traversed by the southeast-northwest trending Dumar nala in the north and Bendra nala in the south. The drainage of the area is controlled by Dumar nala and Bendra nala discharging into the Kelo River in the west, which is a tributary of the Mand River.

The area is characterized by tropical climate with well-defined summer from April to June, monsoon from July to September and winter from November to February. May is the hottest month when the temperature rises to a maximum of 48° C. December is the coldest month with mercury dipping to a low of 7°C. The maximum annual rainfall recorded in the region was 2200.8 mm in 1994, but the average rainfall of last 20 years is 1200 mm. The relative humidity during the monsoon ranges from 75% to 80% and in summer from 18% to 60%.

### ***3.0 Method of working***

Current mining plan (4<sup>th</sup> revision, September 2019) of Gare Palma IV/4 coal mine envisages (i) production of 1.0 MTPA which includes 0.44MTPA from underground mining and 0.56 MTPA from opencast mining upto first three years, (ii) conversion of entire mining operation to opencast mining in third and fourth year, and (iii) increasing the annual production from 1.0MTPA to 1.5 MTPA in the fifth year and then to maintain 1.5MTPA as the target / peak annual production rate. Presently, opencast working is being carried out at two places limited to non-forest land – one at northern side known as North Quarry (Patch-C) and the other one in south-central part known as South Quarry (Patch-B). Mine entry for North Quarry and South Quarry is situated on the eastern side near the in-crop of Seam-II & Seam -III respectively.



Ultimate pit of North Quarry has been delineated as follows:

East : Upto the existing eastern boundary of the north pit

West: Keeping 7.5m from the block boundary

North : Keeping 7.5m from the block boundary, upto a vertical cut-off stripping ratio of 10 and upto seam extent

South : Keeping safe distance of 60m from Domar Nala

Ultimate pit of South Quarry has been delineated as follows:

East : upto a vertical cut-off stripping ratio of 10 and upto seam extent

West: Keeping 7.5m from the block boundary

North : Keeping safe distance of 60m from Domar Nala

South : Keeping safe distance of 60m from Bendra Nala

North Quarry has been planned upto the floor of Seams II Bottom and II Top depending on the workable thickness of the seam. South Quarry has been planned upto the floors of the seam III, II, II Top, II Bottom depending on the areas where these seams are developed and have the workable thickness. The maximum depth of the pit for North & South Quarry will not exceed 47m and 96 m respectively except in some portion where hills will be chopped. The maximum height of individual benches in each quarry will be restricted to 6m.

Opencast mining in both quarries of Gare Palma is being done with shovel dumper combination for both overburden (OB) and coal. Hard OB and coal would be excavated in a series of generally horizontal slices (benches). Considering the targeted production and type of HEMM, bench height has been planned to be kept 6 meters. Proposed and existing HEMM listed in Approved mining plan was reviewed and found to be adequate and sufficient for the planned production and bench configurations.

In the North Quarry split seam II top is the base seam till the workable seam thickness of seam II bottom is obtained as the mine progresses towards the western side. North Quarry will be exhausted till by the end of 4<sup>th</sup> year. In the South Quarry opencast mining operations will be advancing towards both western side as well as southern side towards Bendra Nala in the 4<sup>th</sup> year of the mine life. From 5<sup>th</sup> years onwards the opencast mining operations will be



concentrated in the South Quarry. The mining operation will initially be on the seam III floor as other seams are not developed in this region. The bottom seam II is encountered in the 6<sup>th</sup> year and the mining operations goes down to the floor of Seam II. The mining operations will be advancing to reach the final opencast mine boundary both in the southern side upto the safe distance from Bendra Nala and also to attain the final shape in the western side. After reaching the final shape in the southern boundary and corresponding western boundary the operations will be advancing towards the northern side.

Towards the south and adjacent to Domar nala there is a hilly zone. The hills have two peaks with elevation +425m RL in western side and +435m RL in eastern side. Between the two hills the elevation falls to +370m RL. The drainage pattern of the valley is towards its northern side. In the 9<sup>th</sup> year the chopping of the western peak of hills will be started. In this year the split zone of seam-II top and II bottom is encountered. The mining operations will be on the floor of the seam II and II Bottom. At the end of 10<sup>th</sup> year the working will be reaching the splitted zone of the seam II and seam II bottom is the floor of the pit. Chopping of the western peak of the hill will be almost completed by the end of 15<sup>th</sup> year and eastern peak is also partly chopped. The northern ultimate pit boundary of the south pit reaches upto the safe distance from Domar Nala. The opencast mining operations then advances towards the east side. Major operations are involved in decapping the east peak of the hill. The seam II bottom gets thinner and unworkable in this region. In the 15<sup>th</sup> year the pit bottom is at seam II Top floor. The ultimate pit configuration as shown in figure 2 will be reached at the end of mine life i.e. 17<sup>th</sup> year.

Considering the mild gradient of the floor of the quarry, simultaneous internal dumping has been planned in both the quarries. Slope stability study of the internal dumps of north and south quarry has been conducted and submitted vide CSIR-CIMFR report of project no. CNP/4960/2020-21.

Surface plan of existing North Quarry and South Quarry of Gare Palma IV/4 coal mine have been given in figure 3 & 4. Sections A-A' in North Quarry and sections B-B', C-C' and D-D' in South Quarry of Gare Palma IV/4 have also been shown in figure 3 & 4 respectively along which slope stability analysis of existing pit have been done.



Figure 3: Position of section A-A' in existing pit of north quarry of Gare Palma IV/4

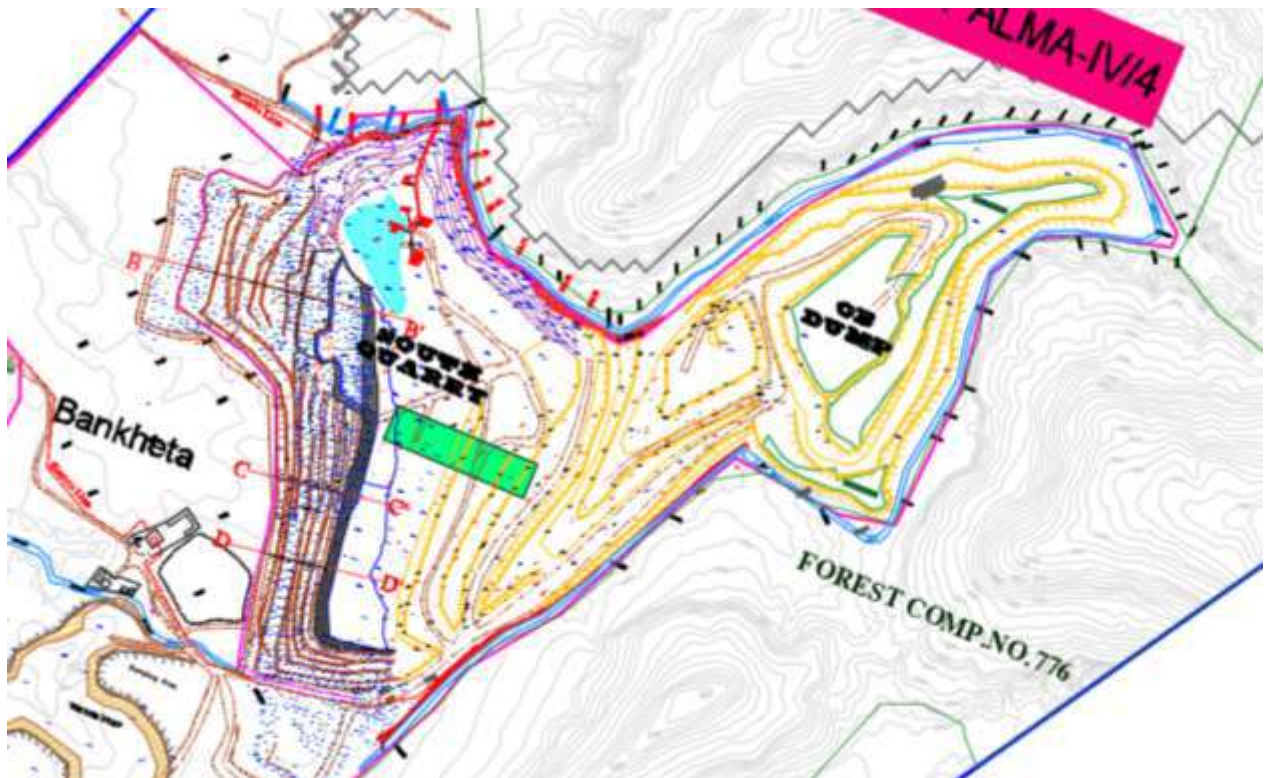


Figure 4: Positions of section B-B', C-C' & D-D' in existing pit of south quarry of Gare Palma IV/4





## Geo-mechanical Properties

It is prudent to know the lithological units in which the slope is to be cut. Engineering properties of these litho units will influence the analysis for slope stability. The samples of rocks and soils of different lithologies were collected from different parts of North Quarry and South Quarry of Gare Palma IV/4. The average relevant strength properties, which were determined at CSIR-CIMFR and subsequently used for slope stability analyses, are summarized in Table 1. The rock mass rating was also used to estimate the strength properties. The values derived from these tests are likely to be valid for the other areas of the mine, as the lithologic sequence is rather homogeneous in the most part of the mine. It is however prudent, from time to time, to re-examine the geotechnical data in different geomining conditions.

Table 1: Geo-mechanical properties

<i>Sr. No.</i>	<i>Lithology</i>	<i>Cohesion (kPa)</i>	<i>Friction angle (degree)</i>	<i>Density (kN/m<sup>3</sup>)</i>
1	Top Soil	44.0	17.0	16.0
2	Weathered rock	105.0	19.0	20.2
3	Sandstone	170.0	22.0	22.1
4	Coal	150.0	20.0	14.4

## Slope Stability Analysis

Slope stability analysis of existing pit slopes of North Quarry and South Quarry of Gare Plama IV/4 coal mine were analysed by limit equilibrium method using GALENA software to assess their factor of safety and to finally decide the optimum ultimate pit slope configurations. In single stability analysis using GALENA software, at least one thousand failure planes are run to determine the most critical failure path with minimum factor of safety.

The limit equilibrium method is widely accepted and commonly used design tool in slope engineering. In this method, it is assumed that sliding occurs when a limit equilibrium condition is reached, i.e. when the resisting forces balance the driving forces. These methods are the most widely accepted and commonly used design methods and they permit a quantification of slope performance with the variations in all the parameters involved in the



slope design. The basic idea behind the limit equilibrium approach is to find a state of stress along the failure surface so that the free body, within the slip surface and the free ground surface, is in static equilibrium. This state of stress is known as the mobilized stress, which may not be necessarily the actual state along this surface. This state of stress is then compared with the available strength, i.e. the stress necessary to cause failure along the slip surface.

Limit equilibrium analysis considers the slope performance only at the equilibrium condition between the resisting and disturbing forces for sliding. To represent the slope performance other than the equilibrium condition, it is necessary to have an index and the widely used index is factor of safety (FOS). Factor of safety is calculated as the ratio of shear strength to the available shear stress required for equilibrium, integrated through the whole slide. It is assumed to be constant throughout the potentially sliding mass. Due to scatter of test results and the uncertainty of these input parameters, earlier a cut-off value of 1.3 safety factor was selected for pit slope stability analysis on the basis of the long term stability (Hoek and Bray, 1981). But, in the light of the DGMS(Tech.) Circular No. 3 of 2020 dated 16.01.2020, minimum factor of safety of 1.50 has been considered for optimum slope design of ultimate pit of North Quarry and South Quarry of Gare Plasma IV/4 coal mine.

Lack of ground water table within the rock mass, development of coal seams in earlier underground coal mines and the implementation of different remedial drainage measures would result in to effectively drained slope mass of pit slope for all practical purposes. The slope stability analyses were conducted on the representative sections provided by the mine management, which takes in account the highest and deepest part of ultimate pits configurations.

The slope stability analyses of existing north quarry of Gare Palma IV/4 coal mine were conducted using Galena software on the representative section A-A' provided by the mine management as shown in Figures 3. Similarly, the slope stability analyses of existing South Quarry of Gare Palma IV/4 coal mine were conducted using Galena software on the representative sections B-B', C-C' & D-D' provided by the mine management as shown in Figures 4.



Results of slope stability analysis of existing pit of North Quarry and South Quarry of Gare Palma IV/4 along the representative sections have been shown in figures 5 to 7 and have been listed in Table 2.

Table 2: Stability analyses of existing pits of Gare Palma IV/4 coal mine

Details of the slope	Factor of safety	Figure no.
Slope stability analysis of existing pit of North Quarry (Patch-C) along section A-A' between 240 mRL to 276 mRL	4.23	Fig. 5
Slope stability analysis of existing pit of North Quarry (Patch-C) along section A-A' between 244 mRL to 273 mRL	3.11	Fig. 6
Slope stability analysis of existing pit of South Quarry (Patch-B) along section B-B' between 225 mRL to 271 mRL	5.82	Fig. 7
Slope stability analysis of existing pit of South Quarry (Patch-B) along section B-B' between 239 mRL to 265 mRL	4.96	Fig. 8
Slope stability analysis of existing pit of South Quarry (Patch-B) along section C-C' between 232 mRL to 276 mRL	3.62	Fig. 9
Slope stability analysis of existing pit of South Quarry (Patch-B) along section C-C' between 246 mRL to 276 mRL	3.43	Fig. 10
Slope stability analysis of existing pit of South Quarry (Patch-B) along section D-D' between 232 mRL to 276 mRL	3.39	Fig. 11

From Table 2 and Figures 5 to 11, it is evident that the FOS along representative sections of existing pit of both South and North Quarries of Gare Palma IV/4 coal mine are higher than minimum requirement of 1.50 as per DGMS(Tech.) Circular No. 3 of 2020 dated 16.01.2020 for long term stability. Thus, existing pit of both South Quarry and North Quarry of Gare Palma IV/4 coal mine may be considered to be safe and stable.

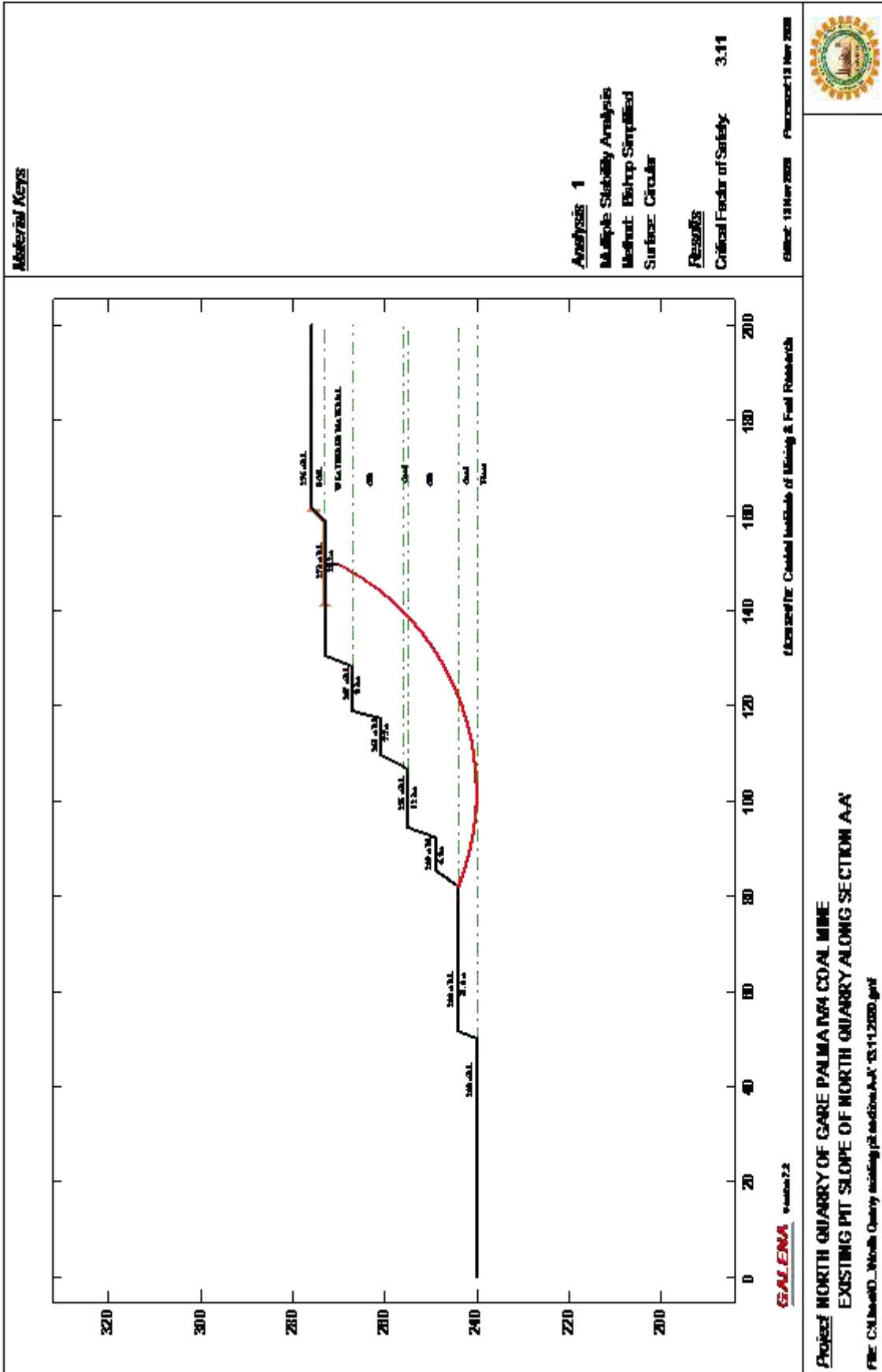


Figure 5 : Slope stability analysis of existing pit of North Quarry (Patch-C) along section A-A' between 240 mRL to 276 mRL







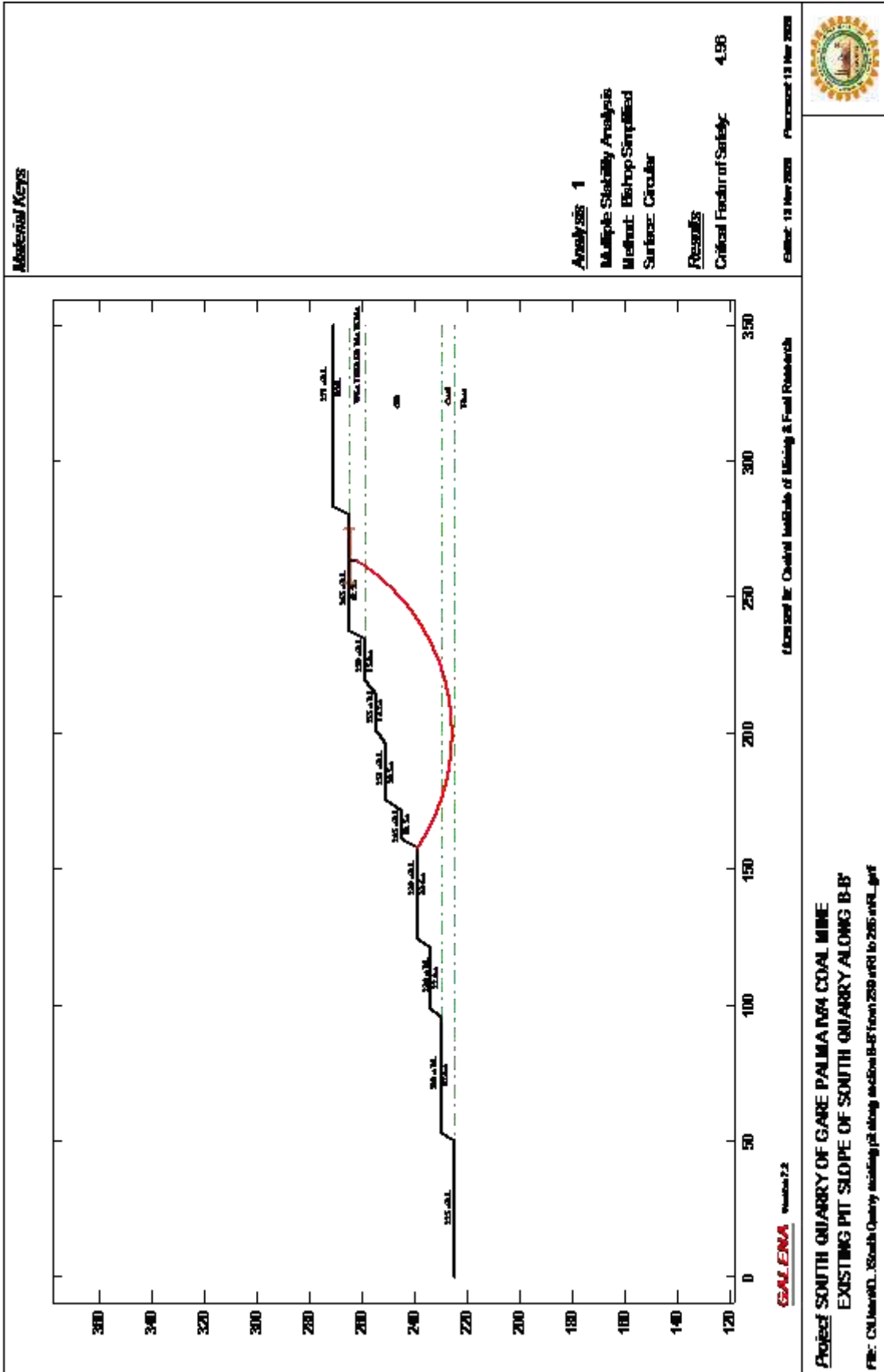


Figure 8 : Slope stability analysis of existing pit of South Quarry (Patch-B) along section B-B' between 239 mRL to 265 mRL

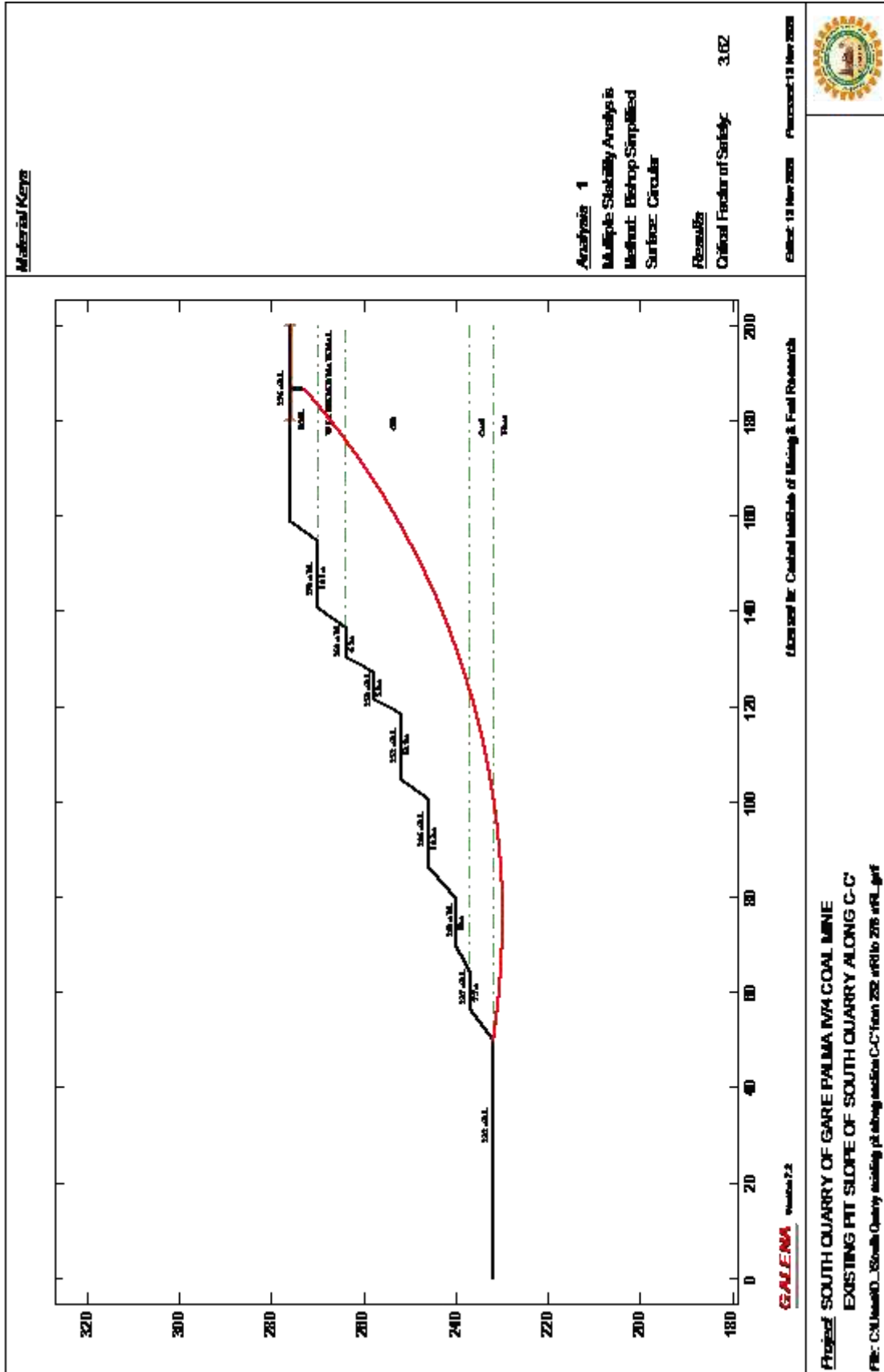


Figure 9 : Slope stability analysis of existing pit of South Quarry (Patch-B) along section C-C' between 232 mRL to 276 mRL

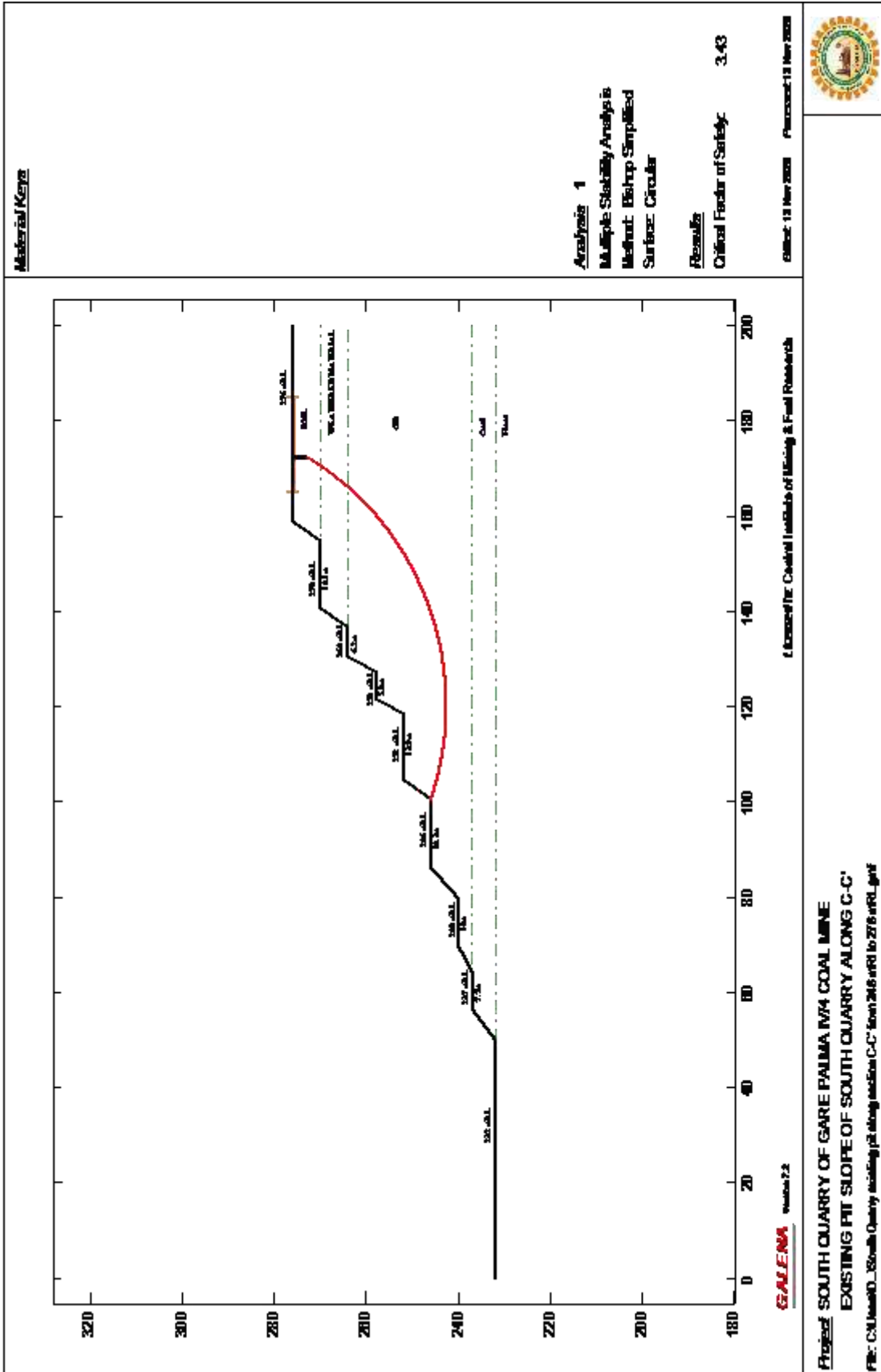


Figure 10 : Slope stability analysis of existing pit of South Quarry (Patch-B) along section C-C' between 232 mRL to 276 mRL



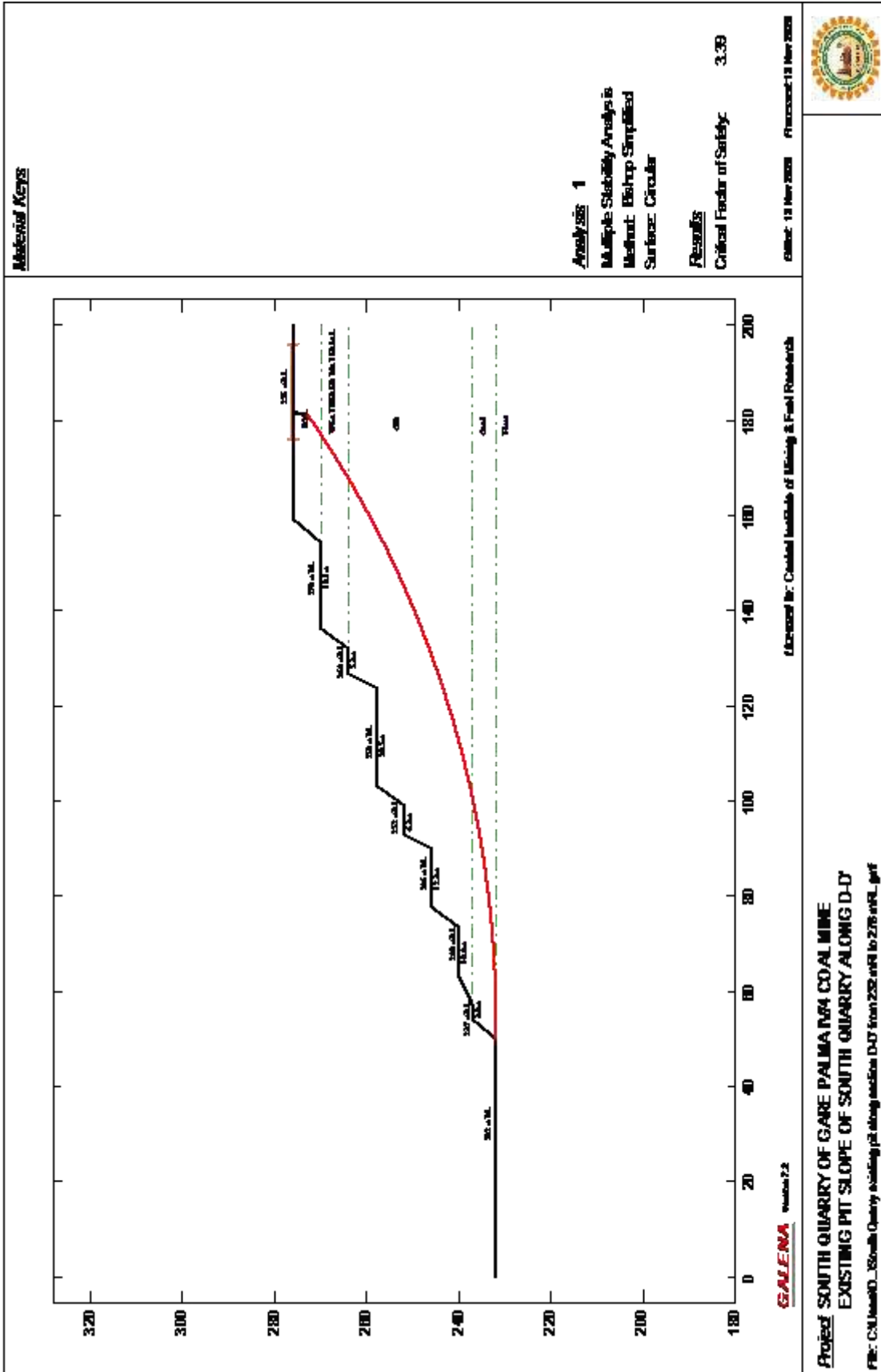


Figure 11 : Slope stability analysis of existing pit of South Quarry (Patch-B) along section C-C' between 232 mRL to 276 mRL



As per the current approved mining plan (4<sup>th</sup> revision), it is evident that the maximum depth of the North Quarry and South Quarry will not exceed 47m and 96m in most part of the mine. Therefore, slope stability analysis of proposed ultimate pit of North Quarry and South Quarry of Gare Palma IV/4 coal mine were done by varying the bench width and thus overall slope angle to determine the optimum configurations to get the desired minimum factor of safety of 1.50. Keeping in mind the proposed equipments, in all the trials, maximum height of each bench in hard strata has been kept at 6m and width of each bench has been varied to get the desired minimum factor of safety of 1.50. As per regulation 106(4) of CMR 2017, bench height and width in soil has been kept constant at 3m and 9m respectively. The optimum bench design of the **ultimate pit slope** of maximum 47m depth in North Quarry and 96m depth in South Quarry of Gare Palma IV/4 coal mine have been presented in Table 3 & 4 respectively.

Table 3: Optimum design of ultimate pit slope of North Quarry of Gare Palma IV/4 coal mine

Geo-mining conditions	Bench Parameters		
	Maximum Bench height (m)	Minimum Exposed bench width (m)	Maximum Angle (deg.)
Top Soil /Sub Soil	3	9	<b>70°</b>
Weathered rock	6	10	<b>70°</b>
Coal seam/parting/overburden	6	6	<b>80°</b>

Table 4: Optimum design of ultimate pit slope of South Quarry of Gare Palma IV/4 coal mine

Geo-mining conditions	Bench Parameters		
	Maximum Bench height (m)	Minimum Exposed bench width (m)	Maximum Angle (deg.)
Top Soil /Sub Soil	3	9	<b>70°</b>
Weathered rock	6	10	<b>70°</b>
Coal seam/parting/overburden	6	8	<b>80°</b>

Results of slope stability analyses using GALENA software for ultimate pit configurations presented in Table 3 & 4 for North Quarry and South Quarry have been shown in figures 12 & 13 respectively. From figures 8 to 9, it is evident that proposed optimum design of ultimate pit slope of North and South Quarry of Gare Palma IV/4 coal mine has factor of safety (FOS) equal to or more than 1.50 and thus can be considered to be safe from long term stability point of view.

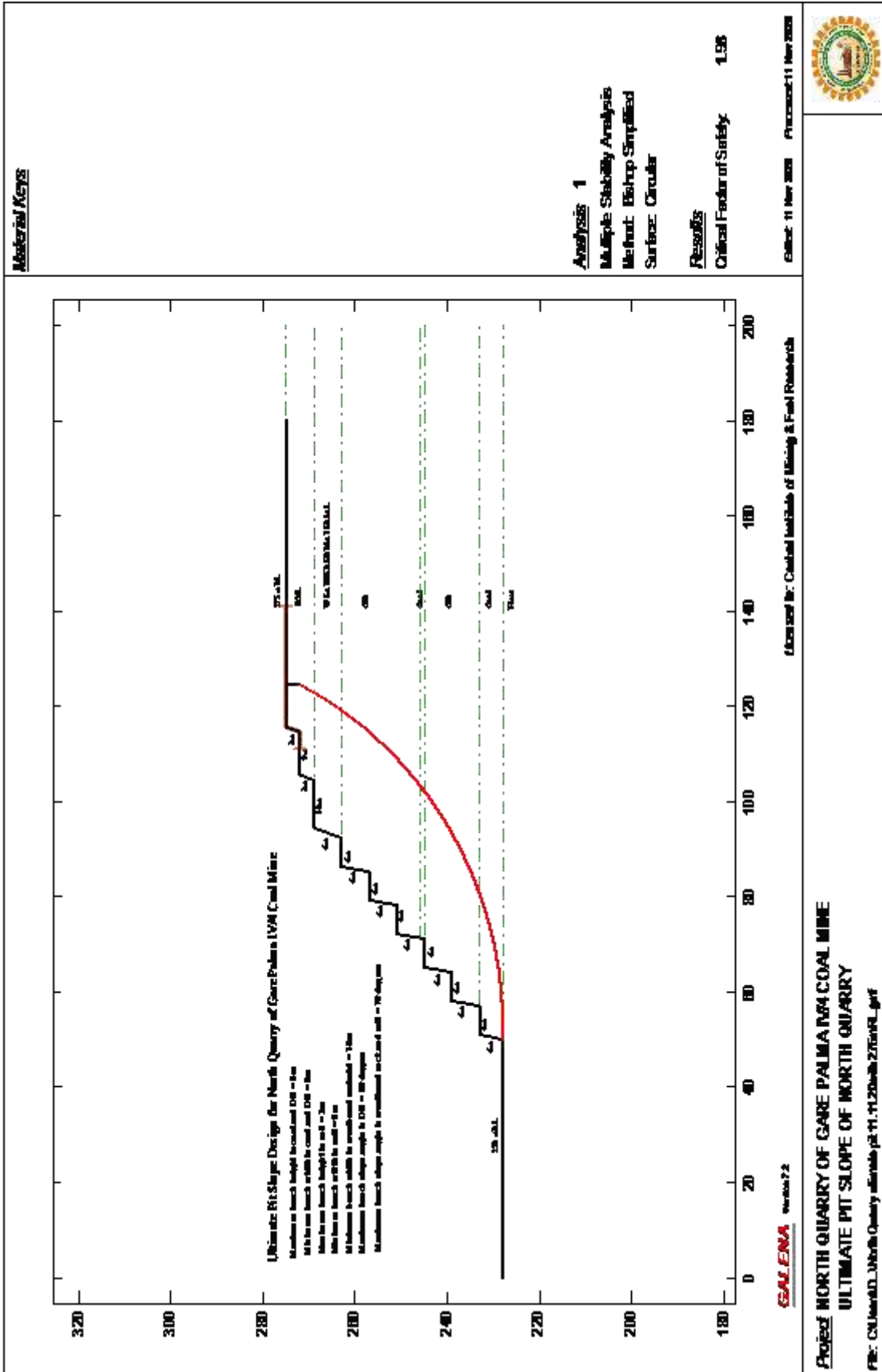


Figure 12 : Slope stability analysis of proposed ultimate pit of North Quarry (Patch-C) of Gare Palma IV/4 coal mine

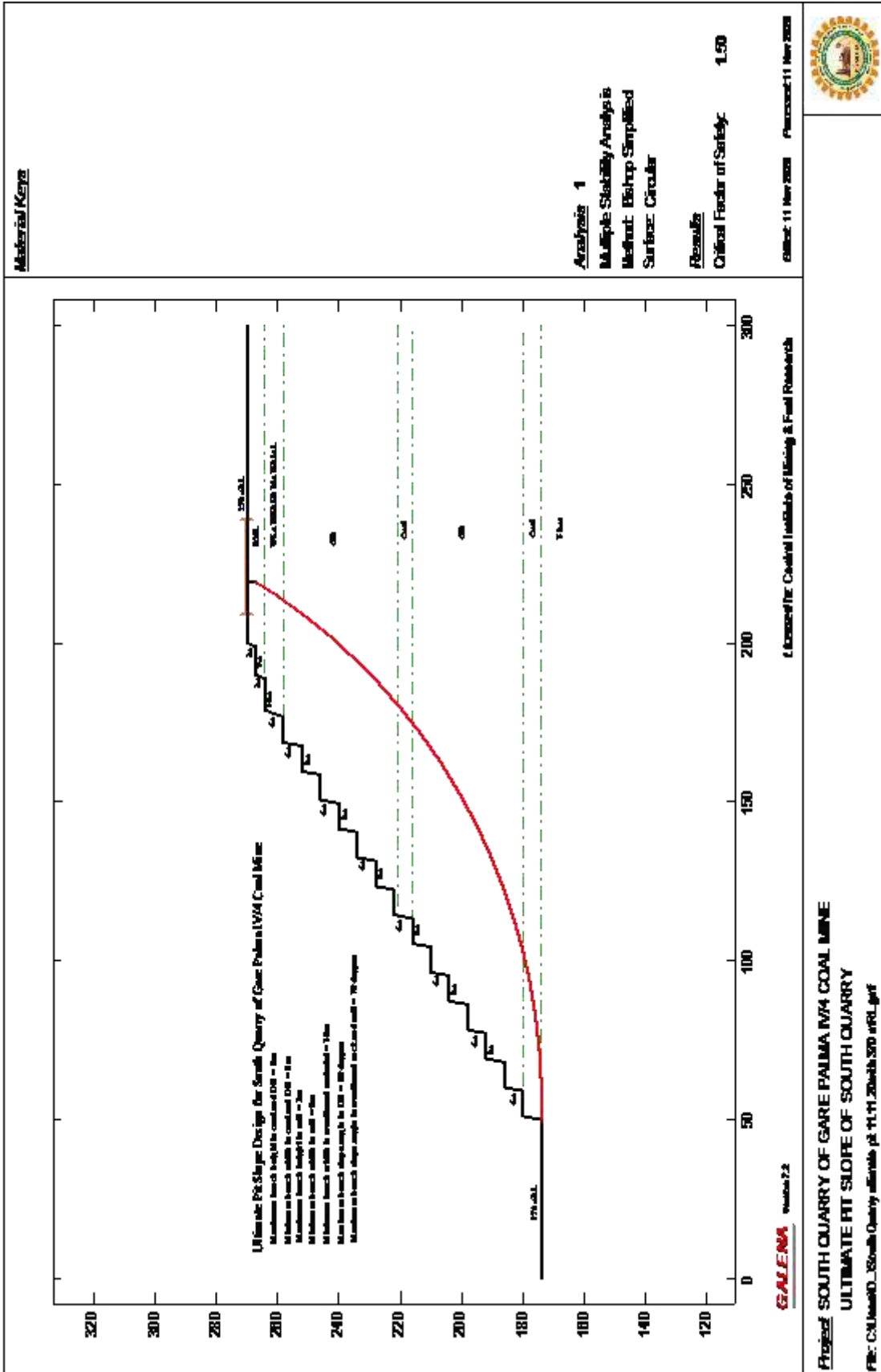


Figure 13 : Slope stability analysis of proposed ultimate pit of South Quarry (Patch-B) of Gare Palma IV/4 coal mine



The analysis shows that the proposed ultimate pit slopes of North Quarry and South Quarry of Gare Palma IV/4 coal mine have factor of safety of 1.50 or higher and thus large-scale failure is unlikely but small-scale failure cannot be completely ruled out. The main philosophy in open pit and dump design is to avoid large-scale failure. Localised bench failure may not cause great concern as it can be arrested on the lower benches, which can be cleaned. So, machinery access on the benches must be maintained. It may be noted that the slope angle needed to avoid all the failure in the mine will be so low that the mining will become uneconomical. Hence, a balance between economy and safety has to be achieved.

The operating bench width of pit should never be less than that specified in Regulation 106(5) of CMR 2017. The unavoidable small-scale bench failures, if any, could be arrested on these wide benches and large-scale slope failure can be avoided. Extra wide working bench will arrest the local bench failures and there would not be any operational problem.

The stability analyses of ultimate pit slopes were done with a consideration of pre-split blasting, drained groundwater condition, proper drainage for rainwater / surface water and slope monitoring. If any observance is made for the occurrence of adverse condition then this slope configurations have to be corrected accordingly. Lack of known phreatic surface within the rock mass, development of coal seam in underground workings and the implementation of different remedial drainage measures would result in to effectively drained slope mass for all practical purposes. It is one of the principles of the open pit design that some localised instability may occur, which will influence a relatively small area especially during monsoon. This is consistent with the mining environment. It should be acknowledged that clean-up will be required within the pit, particularly after the monsoon season. The philosophy adopted in the design of open pit slopes has been to maintain the designed width of the benches for access by equipment.

It may be noted that a few small-scale failures may subsequently cause a big failure. If three or more benches are made steeper at any level in any part of the pit then it may initiate failure. Although the overall slope angle may be quite low but the steeper slope angle of three benches may increase the stress at the toe of relatively steeper part of the slope, which may cause failure. Two or three such small failures may cause a big failure. So, benching should be done properly from top to bottom.





The chances of undercutting / day lighting the weak / discontinuity planes along steep dip of bench slope would be high. The day lighting discontinuities cause slope failures in weak lithology. The chances of structurally controlled instability could be minimised by keeping relatively flat operating bench slope angle with extra wide berm / bench.

Width, gradient and other safety measures like parapet walls, warning notices, signs etc. of all haul roads should meet the criteria specified in CMR 2017 and other guidelines / circulars. Moreover, precautions laid down in DGMS (Tech) Circular Nos. 2/2001, 3/1980, 4/1983, 2/1985 and 2/1990 shall be strictly complied to eliminate the risk of coal dust explosion, blasting in fiery /hot strata, working near dykes etc.

An effective and minimum gap of 100 m between the toe of the lowermost level of internal dump and the toe of active mine slope should be maintained at each stage of operation in the mine. There should be provision of protection bund for the safety against the rolling stones of the dumps down the dump foundation slopes towards the active mine slopes.

## **Working above underground workings**

In Gare Palma IV/4 coal mine, in some areas seams are developed and partially depillared by underground mining methods. Following general guidelines and any other specific directives / guidelines mentioned in DGMS permissions should be followed during working over developed pillars by opencast method using shovel dumper combination:

- Where there exists galleries in coal seams of the below ground workings, no HEMM shall ply on benches over it unless the parting between the floor of the bench and the roof of the gallery is at least 6m.
- Before commencement of excavation over such galleries the voids in coal seams shall be filled by blasting down the strata above the galleries
- The old workings and the goaves of the underground workings already made shall be drained and kept free from water so as not to cause any danger to the persons or machinaries at the mine
- Precautions against danger of coal dust explosion as provided in DGMS circulars shall be strictly complied with.



## Working near in-crop areas and fault planes

Following mentioned points should be kept in mind while working near the in-crop areas and fault planes. Any other safety precautions which are required to be observed to maintain the safe operation considering the prevailing geo-mining conditions should also be followed.

- Benches in soil and subsoil / alluvium shall be kept sufficiently advanced with an aim to reduce the pressure over In-crop or Fault area.
- As far as practicable, slope of the benches shall not be kept along direction of slope of the strata.
- Ratio of height vs. width of working benches shall be not less than 1:2.
- Direction of bench shall be designed, not to be parallel to fault plane.
- Working bench preferably be kept of low height till the area is worked out completely. Excavation may be carried out in several slices as per suitability instead of full height bench.
- Individual bench slope shall be not more than 70°.
- Floor of bench shall be maintained gently dipping away from the high-wall side to eliminate the possibility of water accumulation.
- Any accumulated water shall be promptly drained out.
- Before deploying men or excavating machine at the top of the bench in the fault or in-crop area, the bench face and top shall be properly examined by supervisor for any crack and weak planes. As far as practicable, machine shall be placed away from the bench edge.
- Any undercut should be strictly avoided.
- Persons shall, as far as possible, not be deployed below the high-wall side of benches.
- Special care shall be taken in deployment of drill machine, particularly DTH drills. While drilling, the drill machine should be placed in the direction perpendicular to the bench edge.
- Special care shall be taken in blasting due to possibility of encounter of cracks / fissure / weak planes.
- The cross section of benches shall be drawn at frequent intervals to keep constant watch on the slope of the bench.



## **Drainage and water management**

The rainwater of the adjacent catchments area should not be allowed to enter in to pit in an uncontrolled way. It causes erosion and deep gullies in the weak formations, which in turn may result in to failure in due course of time. So the rainwater of the catchments area should be directed away from the pit. The excavated pit must be provided with an effective garland drain/ bund depending upon the topography to check the entry of rainwater in to the pit during the monsoon. Similarly, all around the periphery of dump, a collector drain/ bund should be formed to divert the rainwater away from the dump. The drainage must always be directed away from the pit. All the drains should be kept clear of soil debris and effective for the free flow of water. The discontinuance of the pre- monsoon preparation at any location will jeopardise the whole effort of maintaining the designed slopes.

The benches should be provided with bench drains to collect the rainwater. The flowing rainwater should not be allowed to flow down to lower benches in an uncontrolled manner. The slope of the upper surface/ benches should be well graded so that the rainwater goes away from the quarry.

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

The advance pit dewatering is suitable when confined aquifer is encountered during later stages of mining. It helps in keeping the working benches dry and adverse effect of the ground water pressure can be minimised. It can be seen from stability analysis that the slopes are most likely stable in the drained geo-mining condition. The slopes may show instability conditions in undrained condition. If presence of water table is established in lower level in future, pit slope configurations may have to be suitably modified.

Horizontal drain holes drilled into the slope face can be very effective in reducing water pressures near the seepage zone. It should be inclined at an angle of five deg. to facili-



tate free flow of water. The holes should be of 10 to 15 m depth at the interval of 5 metres or even closer. A pipe should be inserted into the hole to prevent caving. The pipe should be perforated or slotted to allow water to drain into it. This water will freely flow out of the slope under the gravity. It will improve the stability condition of slopes.

Every attempt should be made to make a proper gradient along the benches, top and floor of the dump. The dump top should be properly levelled with a slope to avoid water retention on dump top/ dump benches and to prevent the rainwater flowing along slope. The upper surface of the mine and dump should be properly graded to divert the run-off of rainwater away from the pit and dump. The proper leveling and grading of benches should be done for quick run-off of rainwater. All benches of external dump should have an effective toe drains. These drains should be interconnected to drain out the rainwater away from the pit.

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

If the old underground working is water logged, dewatering should be done gradually, using borehole from surface connecting developed gallery, to avoid the risk of fire and subsidence of the old workings.

Care should also be taken to prevent inrush of water from nearby worked out quarries and Nala / jore during rainy season. The water level of different underground workings should be closely monitored to avoid accidental in-rush of water in the quarry. No working of opencast mining should be extended within 60m of Dumer Nala and Bendra Nala or any other conditions specified by DGMS should be strictly followed. Because of presence of hillock of more than 100m height, the rush of water in rainy season may be very high from the catchment areas, therefore as precaution against monsoon flooding, HEMM from lower bench should be shifted to higher benches during the monsoon seasons. Planning of the de-



watering of the mine should be done in such a way that as far as possible the working faces remain dry. The layout of the quarry should provided suitable gradient along the quarry floor and benches to facilitate self-drainage of water to the sump at the lowest level of the quarry. Taking into consideration the average and maximum rainfall in the region and the excavation area, backfilled area and catchment area, mine management may keep in ready positions suitable capacity pumps in adequate numbers to deal with pumping of water during the peak rainy season for uninterrupted minining operation. Moreover, adequate numbers of face pumps and slurry pumps should also be kept functioning as and when required to keep the working faces dry.

As per records HFL of Dumer and Bendra Nala has been observed to be 278.80 a on 17.08.2008 and 268.50 on 07.09.2011 respectively. Embankments of proper engineering design should be constructed and maintained on the bank of Dumer Nala and Bendra Nala. The height of the said embankment shall not be less than 3.0m above the H.F.L. of the nala and shall be extended to join to surface contour having R.L. at least 3.0 m above the H.F.L. of nala. The width of the embankment at the top shall not be less than 3.0m having its sides slopes at angle not exceeding 45 degree against nala side and shall be pitched with stone to protect it from erosion. Regular inspection should be carried out to ensure that the embankment remains stable and secure throughout the period in which opencast operated. The frequency of inspection should be increased in the rainy season.

### **Precautions against spontaneous heating / fire**

In order to prevent spontaneous heating / fire in the faces and overburden dumps, mine management should take following precautions:-

- No coal or carbonaceous matter / debris/ overburden (except OB handled by dragline, if employed) shall be stacked within 100m around the active faces and periphery of the opencast workings.
- Blasting operations should be so regulated that broken coal / carbonaceous matter is removed and transported out of the opencast workings / quarry expeditiously.
- No person shall be engaged directly below or within 30m of any active fire area except for the purpose of removing the hot material or quenching it.





- Exposed galleries should be filled up and coal seams should be covered with alluvium soil or incombustible burden immediately on exposure to prevent spontaneous heating. The cover should be removed only at the time of extraction of coal.
- Hot material, coal, shale and other combustible material or overburden containing such materials shall not be deposited anywhere within 100m around the active faces and periphery of the opencast workings. Hot material should be quenched and cooled at the dumpsite.
- An effective fire fighting organization should be maintained at the mine to deal with any fires due to spontaneous heating of the coal and equipment fires.
- Pipe range containing water under pressure with connections at regular intervals should be laid in and around the opencast workings to deal with fire. Adequate length of hoses should be kept stored at suitable places in the quarry. Sufficient numbers of big capacity fire extinguishers shall be made available in the readiness at all time at the mine.
- No persons / machineries should be engaged to load coal and overburden in opencast working without the same being thoroughly treated with water. Pressurized water guns with nozzles should be used for quenching of fire and machineries should be deployed only after cooling down the strata.
- Fire should be dealt by positioning of persons / machineries at a safe distance from the burning coal faces. Fire tenders or water tankers with high capacity pumps to direct jet of water at the fire from distance should be kept available at all time at the mine.
- No person shall be engaged directly below or within a safe distance of any active fire area except for the purpose of removing the hot material or quenching it.
- Blasting operations should be so regulated that broken coal / carbonaceous matter is removed and transported out of the opencast workings / quarry expeditiously and risk of broken coal or carbonaceous matter catching the fire is minimized.
- No diesel operated HEMM should be deployed to remove overlying strata and coal seams in active fire.
- All the workers involved in fire-fighting / quenching should be provided with adequate and suitable personal protective equipment and sufficient specialized training for working in the mine having active fire of the benches.



- All parts of the quarry including work places within the opencast workings shall be inspected by competent persons designed by the Mine manager and not below the rank of Assistant Manager daily for early detection of heating or fire. As soon as heating or a fire is detected, suitable measures to quench it and/or to dig it out shall be adopted. All heated debris / coal shall be removed by the machines and deposited outside the premises of the opencast workings.
- Provision of pumped water supply with permanently laid pipe line shall be ensured in the coal stock year also to meet tackle spontaneous heating and fire, if any.
- Mine management may adopt any other additional site-specific measures or directives issued by the competent authority against spontaneous heating / fire in dumps and pit slope.

Although open fires / spontaneous heating in faces and dumps may make the nearby material weak and may reduce its physico-mechanical properties like density/cohesion / angle of friction controlling the slope stability, there are no reliable literatures which exactly quantify the extent of their reduction. Existing conditions of fire have been taken into consideration while deciding the shear strength properties of the rockmass. It is a known fact that the probable circle or line of failure for large scale instability in pit slope or dump slopes involving large areas are deep seated and hence localized fires at surface or within few meters depth in dump or pit may not cause instability of slope of dumps and pit at large scale. The general measures suggested against above and any other site-specific measures for prevention and control of spontaneous heating / fire in mine if implemented in true spirit by the mine management, large scale instability of slopes of pits and dumps due to fire / spontaneous heating can be eliminated. If mine management observes that there is presence of deep seated fire / spontaneous heating in large of dumps and coal seams, then design suggested in this report has to be reviewed again considering the practical conditions.

## **Stability of Benches by Controlled Blasting**

The damage due to poor blasting has a significant influence upon stability of highwall slopes. Uncontrolled blasting results in rough uneven contours, over breaks, overhangs and extension of tension cracks in the slope. Poor blasting causes opening between various weak planes, which result in loss of resultant cohesion between them. It also results into shattering



of the slope mass well behind the desired location and consequently allowing easier infiltration of surface water, which leads to unfavourable groundwater pressures and related problems.

Thus, ground vibrations from blasting have two fold action of the rock mass. On one hand, they affect the integrity of rocks or their strength parameters while on the other, they can provoke wall or slope collapses when unstabilising actions are introduced (Jimeno et. al. 1996). Therefore, peak particle velocity due to blasting should be controlled by proper selection of explosive types, blast pattern, maximum charge per delay etc. Bauer and Calder (1971) proposed the following generalized criteria, as given in Table 5, for damage level of particle velocity due to blasting on rock mass and slopes.

Table 5: Damage level of rock mass based on ground vibration (after Bauer & Calder, 1971)

Particle velocity (mm/s)	Predictable damages
<250	No danger in sound rock
250-600	Possible sliding due to tensile breakage
600-2500	Strong tensile and some radial cracking
>2500	Complete break-up of rock masses

These detrimental after effects, due to poor blasting, can be checked by controlled blasting. The aim of the controlled blasting is to minimise the damage of the slope mass forming the ultimate pit slope. The final slope face of any open pit quarry has to be maintained in the soundest possible condition. Better ultimate wall stability can be achieved with controlled blasting (Langefors and Kihlstrom, 1963). The uncontrolled blasting can make a slope unstable (Hoek and Londe, 1974).

The controlled blast holes should be closely spaced and lightly charged than the regular blast holes. It should be blasted before the main blast by applying the delay mechanism. It will help in making a crack line along the desired slope. The controlled blasting will not damage the slope mass beyond these lightly charged pre-split holes.

The controlled blasting can be tried, experimented and perfected during regular production blasts. The experience of production blast can be applied to ultimate pit slope blast. Mine management may optimize the pre-splitting technique for the site-specific geo-mining conditions to achieve better pit slope stability. The extra effort of controlled blasting



is well justified because it checks the instability of the pit slopes thus increasing the profitability of the quarry substantially. It is recommended to optimize the pre-splitting technique for the site-specific geo-mining conditions, if required with help of experts, to ensure smooth surface of the highwalls and to minimise formation of loose boulders.

Mine management should follow the precautions laid down in DGMS Circular (Tech) 3 of 1980 and DGMS Circular (Tech) 4 of 1983 against danger of coal dust explosion while extracting pillars by opencast method. Parting from the below ground workings, if any, should be proved at regular intervals and it should not be less than 5m. As and when parting reaches 5m it should be blasted all together. Any other specifications and precautions prescribed in DGMS approval should be strictly followed.

The blasting near the shear/ fault zone must be optimised. Otherwise it would be impossible to maintain proper bench width in the zone where faults are present. Poor blasting may result in to merger of the benches which ultimately may lead to failure. Any heavy blast in the proximity of weak/ weathered lithology or near the day lighting major discontinuity would cause sliding of the overlying slope mass. The heavy production blasting should be avoided/ optimised.

## **Slope Monitoring**

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

The early identification of movement zones allows steps to be taken to minimize the impact of mining on stability by the implementation of corrective measures and at the same time provides for optimum coal extraction. The system contrasts strongly with more common 'passive' systems that frequently only record the occurrence of an event for subsequent post-mortem examination. The active monitoring system permits early and confident decision making by management both for safety purposes and for optimum excavation sequencing.



All geotechnical investigations aimed at collecting input design parameters, however complete, involve an inherent risk of inaccuracy. Hence, any attempt of slope stability analyses and evaluation need to be supported by a sound slope monitoring programme in order to ensure the safe and smooth mining operations.

The continuous mining operation, blasting and changes in groundwater conditions continuously disturb the existing stress condition in the field. The whole system tries to come into equilibrium by stress redistribution and adjustment, which results into movement of the slope. Hence, it is advisable to monitor the trench slopes regularly to detect any movement. DGMS(Tech.) Circular No. 2 of 2020 dated 09.01.2020, mine manager should have a structured team of trained competent persons for slope monitoring headed by a slope monitoring officer with clearly defined duties and responsibilities.

The slope monitoring method allows failures to be predicted for ensuring safe working conditions. Slope monitoring can be used to confirm failure mechanisms. The review of monitoring results, visual inspection and regular briefing of field people help to detect the onset of failure.

The first sign of instability is a tension crack. So, it is important to carry out regular inspection to detect the development of tension cracks on the crest of the slope as well as on benches and to carry out prompt remedial measure. They may develop as a function of high stresses in the slopes. The opening of cracks will tell whether any deep - seated failure can occur or not. Tension cracks should be filled and sealed to prevent the entry of water, which may cause failure.

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

Survey based methods can be used for absolute monitoring, that is determining the movement of a point or points relative to some datum believed to be outside the zone of potential deformation. The latest methods are emerging to monitor pit slopes in open pit mines having their own advantages, applicability and cost implications. These methods are based on various technologies as follows:





Automated total station networks (robotics);  
Non-reflective Lidar scanning;  
Slope Stability Radar (SSR);

Whichever is the technique used for slope monitoring, the objective is to predict future slope instability by appropriate interpretation of Displacement - Time data and analyses of failure mechanism.

The slope monitoring based on standard surveying techniques have found wide acceptance because of the ability to remotely monitor a wall following the establishment of targets. Use of Total Station techniques along with angular measurements have become most popular because of the perceived advantage of low cost and easy availability of trained manpower.

### **Suggested Slope Monitoring System**

Considering the size of the mine, configuration of existing dumps, design of ultimate configurations, past records of failures etc., the suggested slope monitoring scheme for pits and dumps of North and South Quarry of Gare Palma IV/4 coal mine are as follows

Monitoring of pits and dumps is recommended to be done initially with total station by installing monitoring stations on hangwall and footwall side as well as on dumps. The monitoring pillars should be located initially at 30 m to 50m interval. Monitoring pillars should be installed all along the top most bench as well as on intermittent benches after every two to three benches on the hangwall and footwall side. Similarly, monitoring stations should be installed on each bench of the dump. Base station should be located at stable ground in opposite side of the monitoring stations. One or more base stations could be erected to cover all the area. The base station and monitoring stations should be so located that inter-visibility should be there. The gap between the stations can be increased or decreased as per the requirement of the site based on data analysis. It is a general guideline, which may be changed to meet the local requirement. DGMS (Tech.) Circular No. 2 of 2020 dated 09.01.2020 requires mine manager to have a structured team of trained competent persons for slope monitoring headed by a slope monitoring officer with clearly defined duties and responsibilities.



To start with, the monitoring of pits should be done periodically at least once in a month using total station by mine management and the results of monitoring should be recorded in a bound-paged register or in a temper proof electronic form. These data should be regularly analyzed for rate of movement for assessment of instability. Warning level / withdrawal level of slope movement is site-specific and can be decided based on analysis of monitoring data over a long period only. However, if mine management detects an average rate of slope movement of 0.5 mm/day over a period of at least one month for most of the pillars of a zone of mine then the mine management should increase the monitoring frequency to fortnightly. Mine management may also consider deployment of TLS or radars for continuous monitoring of pits and dumps under such conditions. If the movement monitoring data shows average movement rate of more than 1.0 mm/day over a period of at least one month then monitoring system design, frequency, and monitoring technology may have to reviewed by any agency expert in the field of slope design and slope monitoring. Under the condition the working near the affected zone of the mine should also be restricted. The recommendation of such study by expert agency should be implemented by the mine management for the sake of safety of men and machineries.



## Conclusions and Recommendations

- Based on the assessment of the proposed mining plan, mine closure plans and sections, engineering geology, existing geo-mining condition, strength properties and the related geotechnical controls indicated in the report, the following ultimate pit slope design for Gare Palma IV/4 coal mine have been recommended :

Name of Quarry	Geo-mining conditions	Bench Parameters		
		Maximum Bench height (m)	Minimum Exposed bench width (m)	Maximum Angle (deg.)
North Quarry (For maximum ultimate depth of 47m)	Top Soil /Sub Soil	3	9	70°
	Weathered rock	6	10	70°
	Coal seam/parting/overburden	6	6	80°
South Quarry (For maximum ultimate depth of 96m)	Top Soil /Sub Soil	3	9	70°
	Weathered rock	6	10	70°
	Coal seam/parting/overburden	6	6	80°

Above mentioned optimum pit slope design are valid with well-developed drainage system in and around the mine to maintain the pit slope in drained condition as well as with controlled blasting for ultimate pit slopes. The operating bench width of pit should never be less than that specified in Regulation 106(5) of CMR 2017 or as specified above, whichever is higher.

- In no case, extra high benches and/ or reduced bench width should be formed in any part/ any depth of the pit. It may can causes failure. Even in the peak demand period, the recommended benching parameters must be followed in the slopes from top to bottom. It is necessary for better economics and safety in long run.
- If about three benches are made steeper at any level in any part/ depth of the pit then it may initiate failure. Although the overall slope angle may be quite low but the steeper slope angle of three benches may increase the stress at the toe of relatively steeper part of the slope, which may cause failure. Two or three such small failures may cause a big failure. So, benching should be done properly from top to bottom.



- No fresh dump should be developed close to the crest of the mine slope. An effective and minimum gap of 100 m between the toe of the lowermost level of internal dump and toe of active highwall slope of mine should be maintained at each stage of operation in the mine. Similarly, an effective and minimum gap of minimum 100 m between the toe of the lowermost level of external dump and crest of active / final highwall slope of mine should be maintained at each stage of operation in the mine.
- Cutting of toe of benches of pit and OB dumps should be strictly avoided. Such action reduces the safety factor of the slope.
- The mapping of weak zones, faults and bedding planes in the pit should be a regular process by the departmental geologist. It will help to detect any unfavorable conditions at different stages of mining at the earliest possible which may be utilized in future for re-analysing pit slope stability, or for taking remedial measures.
- Width, gradient and other safety measures like parapet walls, warning notices, signs etc. of all haul roads should meet the criteria specified in CMR 2017 and other guidelines / circulars.
- Precautions laid down in DGMS (Tech) Circular Nos. 2/2001, 3/1980, 4/1983, 2/1985 and 2/1990 and any other related circular or site specific directives advised by statutory authorities should be strictly complied to eliminate the risk of coal dust explosion, blasting in fiery /hot strata, working near dykes etc.
- General guidelines mentioned in the report and any other specific directives / guidelines mentioned in DGMS permissions should be strictly followed during working over developed pillars by opencast method using shovel dumper combinations
- It is certainly to be expected that variations in different geotechnical parameters will occur as the pit is opened and progressively deepens and that confirmation of the input parameters must be continued during different stages of mining. It is recommended that a fresh geotechnical study should be conducted within five years or whenever there is change in mining plan, whichever is earlier. It would help in optimization / slope



steepening of the pit slope design with latest available geotechnical data/ information. This fresh geotechnical study may lead to achieve the better financial goals without sacrificing the safety.

- In order to avoid sudden inrush of water from nearby worked out quarries and Nala / jore during rainy season, working of opencast mining should not be extended within 60m of such source of water. Moreover, embankments of proper engineering design should be constructed and maintained on the bank of Dumer Nala and Bendra Nala. The height of the said embankment shall not be less than 3.0m above the H.F.L. of the nala and shall be extended to join to surface contour having R.L. at least 3.0 m above the H.F.L. of nala. The width of the embankment at the top shall not be less than 3.0m having its sides slopes at angle not exceeding 45 degree against nala side and shall be pitched with stone to protect it from erosion. Regular inspection should be carried out to ensure that the embankment remains stable and secure throughout the period in which opencast operated. The frequency of inspection should be increased in the rainy season.
- The mine should have an effective garland drain/ bund, all around, to collect/ divert rain water of the catchment area before it reaches the mine slopes. It is essential that these drains should be kept clear of silt and debris. Horizontal drains should be installed for de-pressurisation of adverse groundwater pressure, especially where seepage is observed.
- Every attempt should be made to make a proper gradient of the dump surface so as to allow rain water to drain out quickly. The drains should be effectively maintained to divert the drained water away from the dump. During the rainy season, effectiveness of drains in and around the pit and dump should be checked frequently. If this drainage system is not effectively achieved then the dumps may fail due to increase in saturation at the bottom of the dumps.
- Because of presence of hillock of more than 100m height, the rush of water in rainy season may be very high from the catchment areas, therefore as precaution against monsoon flooding, HEMM from lower bench should be shifted to higher benches during the monsoon seasons. Planning of the de-watering of the mine should be done in such a way that as far as possible the working faces remain dry. The layout of the quarry should





provide suitable gradient along the quarry floor and benches to facilitate self-drainage of water to the sump at the lowest level of the quarry.

- Mine management should make a structured team of trained competent persons for slope monitoring headed by a slope monitoring officer with clearly defined duties and responsibilities as per DGMS(Tech.) Circular No. 2 of 2020 dated 09.01.2020. The monitoring should be done periodically at least once in a month using total station or any other method and the results of monitoring should be recorded in a bound-paged register or in a temper proof electronic form. These monitoring data should be regularly analyzed for rate of movement of monitoring pillars. Slope monitoring should, in general, be done by the mine survey/geotechnical team. In case any adverse situation from stability viewpoint is detected, advice may be sought from expert agencies in the field of slope stability and slope monitoring for monitoring system design, or data analysis & interpretation to assess slope condition.



## Acknowledgements

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

## Bibliography

- Bandis, S.C., 1990. Mechanical properties of rock joints, Proc. Int. Symp. Rock Joints, Norway, eds. N. Barton and Ove Stephansson, A.A. Balkema, Rotterdam, 125- 140.
- Barton, N., 1973. Review of a new shear strength criteria for rock joints, Eng. Geol., Vol. 7, pp. 287-330.
- Barton, N. and Choubey, V., 1977. The shear strength of rock joints in theory and practice, Rock Mech., Vol. 10, pp. 1-54.
- Bieniawski, Z.T., 1989. Engineering rock mass classification, John Wiley and Sons.
- DGMS, 2017, Coal Mines Regulation- 2017.
- DGMS(Tech.) Circular No. 2 of 2020 dated 09.01.2020
- DGMS(Tech.) Circular No. 3 of 2020 dated 16.01.2020
- Hoek, E. and Bray, J.W., 1981. Rock Slope Engineering, 3rd ed., Inst. Min. Met., London.
- Hoek, E. and Brown, E.T., 1998. Practical estimates of rock mass strength, Intl. J. Rock Mech. Min. Sci., Vol. 34, No. 8, pp. 1165-1186.
- Hoek, E. and Londe, P., 1974. The design of rock slopes and foundations. General report 3<sup>rd</sup> Cong. ISRM, Denver, pp. 1-40.
- ISRM, 1978. Suggested methods for the quantitative description of discontinuities in rock masses. Commission on the standardization of laboratory and field tests in rock mech.
- Langefors, U. and Kihlstrom, B. (1963) The modern technique of rock blasting, John Wiley & Sons Inc., New York.
- Mining plan (including mine closure plan) – 4<sup>th</sup> revision of Gare Palma IV/4 coal mine, 2019
- Pit Slope Manual, CANMET, Ottawa, Canada, (Chapter- Monitoring), 1977.
- Singh, V.K., Influence of the geotechnical parameters on slope stability, Ph.D. thesis, 1992.



# Annexure-16

**Photographs of Truck mounted water sprinklers & Fixed type of water sprinklers at GP IV/4 Coal Mines**

**Fixed type of water sprinklers**







**Truck mounted water sprinkler**





# Annexure-16A



<i>Name &amp; Address Of The Customer</i>		REPORT NO.	UES/TR/22-23/03291	
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA,</b> <b>POST -MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO.	UES/22-23/FE/08530-08539	
		DATE OF SAMPLING	27/09/2022	
		DATE OF RECEIPT	28/09/2022	
		DATE OF REPORT	03/10/2022	
		DATE OF ANALYSIS	START:29/09/2022	END:03/10/2022
<b>SAMPLE DETAILS</b>				
MONITORING FOR	FUGITIVE EMISSION			
SAMPLING LOCATION	Gare Palma-IV/4 COAL MINE			
DURATION OF SAMPLING	8 HOURS			
SAMPLE COLLECTED BY	LABORATORY CHEMIST			
SAMPLING PROCEDURE	AS PER METHOD REFERENCE			
SAMPLE QUANTITY/PACKING	GMF FILTER PAPER (8 X 10 INCH) : 1X10 NO.			

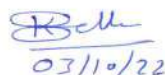

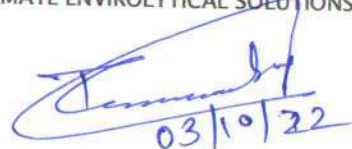
### TEST REPORT

Locations	Unit	Suspended Particulate Matter SPM	Moef& CC Notification (350-1)	Method Reference
Haul Road - Bankheta	µg/m <sup>3</sup>	258	500	EPA Method IO-2.1
Haul Road - Banjhikhol	µg/m <sup>3</sup>	320	500	
Coal Stoke Yard - Bankheta	µg/m <sup>3</sup>	234	500	
Coal Stoke Yard - Banjhikhol	µg/m <sup>3</sup>	322	500	
Near OB Dump- Bankheta	µg/m <sup>3</sup>	242	500	
Near OB Dump- Banjhikhol	µg/m <sup>3</sup>	296	500	
Truck Parking- Bankheta	µg/m <sup>3</sup>	328	500	
Truck Parking- Banjhikhol	µg/m <sup>3</sup>	240	500	
Weight Bridge- Bankheta	µg/m <sup>3</sup>	268	500	
Weight Bridge- Banjhikhol	µg/m <sup>3</sup>	242	500	

**REMARKS:**

*Terms & conditions*

- The report for publication, arbitration or as legal dispute is forbidden.
- Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.
- This is for information as the party has asked for above test(s) only.

 03/10/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  03/10/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----

# Annexure-17



## Settling Pond at Patch B Bankheta



HIL constructed 02 nos of additional settling pond of size (50m X 40m X 5.0 m) for proper settling of mine seepage water generated from mining activities from Batch “B” before discharge for the agriculture purpose

# Annexure-17A

**CONTINUOUS ONLINE EFFLUENT QUALITY MONITORING SYSTEM (COEQMS - 01 Nos.) AT GARE PALMA IV/4 COAL MINE, BANKHETA, RAIGARH**



# Annexure-18



Tarpaulin covered truck coal transportation



Proper sealing arrangement for coal truck





# Annexure-19

ADITYA BIRLA



HIL/GP-IV/4/Letter/NGT – RO/CECB- CCTV -1 2022/488

06 January, 2022

The Regional Officer,  
Chhattisgarh Environment Conservation Board  
TV Tower road,  
Raigarh (CG)

**Subject: Submission of CCTV camera recording footage for the period form 21.11.2021 to 24.12.2021.**

**Ref.: NGT team visit - GP IV/4 coal mine dated 24.11.2021.**

Dear Sir,

With reference aforesaid subject we are submitting the CCTV camera recording footage (in DVD – 03 Nos.) for the period form **21.11.2021 to 24.12.2021** installed at suitable locations to monitor round the clock movement of loaded trucks at the premises of Gare Palma IV/4 Coal Mines of M/s Hindalco Industries Limited, Village – Banjikhoh, Tehsil – Tamnar, District – Raigarh, Chhattisgarh.

Submitted for your kind information and record please.

Yours faithfully,

For Hindalco Industries Limited,

Govind Kumar  
(Mine Agent)



**Hindalco Industries Limited**

Gare Palma Mines ( IV/4 & IV/5), Vill & Po: Milupara , Tehsil: Tamnar Dist: Raigarh- 496107 , Chhattisgarh

T: +91 7762 228212, Website : www.hindalco.com E mail : hindalco@adityabirla.com

Registered Office : Ahura Centre, 1st Floor, B Wing, Mahakali Caves Road Andheri (East) , Mumbai 400093, India

T: + 912266917000 | Fax: + 912266917001

Corporate ID No: L27020MH1958PLC011238

# Annexure-20



HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

Recognized by Ministry of Environment Forest and Climate Change under EP act 1986

Name & Address Of The Customer		REPORT NO	UES/TR/22-23/0355	
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA, POST MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/W/0425	
		DATE OF SAMPLING	25/04/2022	
		DATE OF RECEIPT	26/04/2022	
		DATE OF REPORT	02/05/2022	
		DATE OF ANALYSIS	START:26/04/2022	END:02/05/2022
<b>SAMPLE DETAILS</b>				
SAMPLE TYPE	WASTE WATER	ORDER /REFERENCE:	M/PO/SKY/2122/0043, DTD.	
CUSTOMER SAMPLE ID	REV MILKY WATERINGOL	SAMPLE CONDITION AT RECEIPT	OR	
PACKING OF SAMPLE	3 X 1 NO. PVC CAR 1 X 1 NO. PVC CAR 1 X 1 NO. GLASS BOTTLE	SEALING	SAMPLE COLLECTED BY	LABORATORY CHEMIST
SAMPLING PROCEDURE	IS:3025(PART 1):1993 RA 2003; APHA 22ND Ed. 2012, 1040-B, 1-39	QUANTITY RECEIVED	5 LTR	

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-V] PART-A INLAND SURFACE WATER	RESULT
1	Colour	Hazen	APHA 22 <sup>nd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	<1
2	Odour	-	APHA 22 <sup>nd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	Agreeable
3	Temperature	°C	APHA 22 <sup>nd</sup> Ed. 2012, 2130-B, 2-13	Shall not exceed 5°C above the receiving water temperature	28.4
4	pH	-	APHA 22 <sup>nd</sup> Ed. 2012, 4500-B, 4-92	5.5 to 9.0	7.32
5	Total Residual Chlorine	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 4500-C1-G, 4-69	1.0	N.D.
6	Total Suspended Solids	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 2540-D, 2-66	100	86.0
7	Dissolved Phosphate (as P)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 4500-P-C, 4-153	5.0	N.D.
8	Fluoride (as F)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 4500-F-B&D, 4-84 & 97	2.0	0.10
9	Lead (as Pb)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18	0.1	N.D.
10	Zinc (as Zn)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18	5.0	0.06
11	Copper (as Cu)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18	3.0	N.D.
12	Cadmium (as Cd)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3500-Cd, 3-105	2.0	N.D.
13	Mercury (as Hg)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3112-B, 3-23	0.01	N.D.
14	Arsenic (as As)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3114-C, 3-38	0.2	N.D.
15	Selenium (as Se)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3114-C, 3-38	0.05	N.D.
16	Total Chromium (as Cr)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3500-Cr-B, 3-69	2.0	N.D.
17	Chemical Oxygen Demand (COD)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 5520-B, 5-17	250	148.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS 3025 (Part 44):1993, RA 2003	30	12.6
19	Oil & Grease	mg/L	IS 3025 (Part 39):1991, RA 2003	10.0	N.D.
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	IS 3025 (Part 43):1992, RA 2003	1.0	N.D.

REMARKS: mg/L: milligram per liter, N.D.: Not Detected.

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 02/05/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  02/05/22 <b>AUTHORIZED SIGNATORY</b>
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.....End of the test report.....



HDD-272, Phase III - Near JP Chowk  
 Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
 Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

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Name & Address Of The Customer		REPORT NO	UES/TR/22-23/0990	
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA, POST MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/W/01744	
		DATE OF SAMPLING	20/05/2022	
		DATE OF RECEIPT	21/05/2022	
		DATE OF REPORT	01/06/2022	
		DATE OF ANALYSIS	START: 22/05/2022	END: 27/05/2022
<b>SAMPLE DETAILS</b>				
SAMPLE TYPE	WASTE WATER	ORDER /REFERENCE:	M/PO/SRV/2122/0045. DTD.	
CUSTOMER SAMPLE ID	STP WASTE BANKHETA	SAMPLE CONDITION AT RECEIPT	OK	
PACKING OF SAMPLE	3 L X 1 NO. PVC CAN 1 L X 1 NO. PVC CAN 1 L X 1 NO. GLASS BOTTLE	SEALED	SAMPLE COLLECTED BY	LABORATORY CHEMIST
SAMPLING PROCEDURE	IS:3025(PART 1):1997 RA 2003; APHA 2200 ED. 2012, 1060-B, 1-29	QUANTITY RECEIVED	5 LTR	

**TEST REPORT**

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-VI] PART-A INLAND SURFACE WATER	RESULT
1	Colour	Hazen	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	<1
2	Odour	-	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	Agreeable
3	Temperature	°C	APHA 23 <sup>rd</sup> Ed. 2012, 2130-B, 2-13	Shall not exceed 5°C above the receiving water temperature	25.8
4	pH	-	APHA 23 <sup>rd</sup> Ed. 2012, 4500-H <sup>+</sup> -B, 4-92	5.5 to 9.0	7.48
5	Total Residual Chlorine	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-Cl-G, 4-6	1.0	N.D.
6	Total Suspended Solids	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 2540-D, 2-66	100	96.0
7	Dissolved Phosphate (as P)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-P-C, 4-153	5.0	N.D.
8	Fluoride (as F)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-F-B&D, 4-84 & B	2.0	0.18
9	Lead (as Pb)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	0.1	N.D.
10	Zinc (as Zn)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	5.0	0.08
11	Copper (as Cu)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	3.0	N.D.
12	Cadmium (as Cd)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cd, 3-105	2.0	N.D.
13	Mercury (as Hg)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3112-B, 3-23	0.01	N.D.
14	Arsenic (as As)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.2	N.D.
15	Selenium (as Se)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.05	N.D.
16	Total Chromium (as Cr)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cr-B, 3-69	2.0	N.D.
17	Chemical Oxygen Demand (COD)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 5520-B, 5-17	250	192.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS 3025(Part 44):1993, RA 2003	30	24.6
19	Oil & Grease	mg/L	IS 3025(Part 39):1991, RA 2003,	10.0	N.D.
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	IS 3025(Part 43):1992, RA 2003	1.0	N.D.

REMARKS: mg/lit. = milligram per liter, N.D.: Not Detected.

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 REVIEWED BY		For ULTIMATE ENVIROLYTICAL SOLUTIONS  AUTHORIZED SIGNATORY
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.....End of the test report.....





HDD-272, Phase III - Near JP Chowk  
 Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
 Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

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<b>Name &amp; Address Of The Customer</b> <b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA, POST MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		<b>REPORT NO</b> UES/TA/22-23/01970
		<b>LAB REF NO</b> UES/22-23/W/02355
		<b>DATE OF SAMPLING</b> 22/06/2022
		<b>DATE OF RECEIPT</b> 23/06/2022
		<b>DATE OF REPORT</b> 01/07/2022
		<b>DATE OF ANALYSIS</b> START: 23/06/2022      END: 30/06/2022
SAMPLE DETAILS		
<b>SAMPLE TYPE</b>	WASTE WATER	<b>ORDER /REFERENCE</b> R/TC/SRV/2122/0045
<b>CUSTOMER SAMPLE ID</b>	BY INLET MONITORING	<b>ISS. DATE</b> 24-JULY-2021
<b>PACKING OF SAMPLE</b>	3 L X 3 NO. PVC CAR 1 L X 3 NO. PVC CAR 1 L X 3 NO. GLASS BOTTLE	<b>SAMPLE CONDITION AT RECEIPT</b> OK
<b>SAMPLING PROCEDURE</b>	IS 3025(PART 1):1997 RA 2003; APHA 2290 Ed. 2012, 1990-2, 1-19	<b>SAMPLE COLLECTED BY</b> LABORATORY CHEMIST
	<b>SEALED</b>	<b>QUANTITY RECEIVED</b> 5 LTR

TEST REPORT					
SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-V] PART-A INLAND SURFACE WATER	RESULT
1	Colour	Hard	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-1	<1
2	Odour	-	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 4 of Annexure-1	Agreeable
3	Temperature	°C	APHA 23 <sup>rd</sup> Ed. 2012, 2130-B, 2-13	Shall not exceed 5°C above the receiving water temperature	25.2
4	pH	-	APHA 23 <sup>rd</sup> Ed. 2012, 4500-H-8, 4-92	5.5 to 9.0	7.36
5	Total Residual Chlorine	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-Cl-G, 4-6	1.0	N.D.
6	Total Suspended Solids	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 2540-D, 2-66	100	92.0
7	Dissolved Phosphate (as P)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-F-C, 4-153	5.0	N.D.
8	Fluoride (as F)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-F-B40, 4-84 & 8	2.0	0.14
9	Lead (as Pb)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	0.1	N.D.
10	Zinc (as Zn)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	5.0	0.06
11	Copper (as Cu)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	3.0	N.D.
12	Cadmium (as Cd)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cd, 3-105	2.0	N.D.
13	Mercury (as Hg)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3112-B, 3-23	0.03	N.D.
14	Arsenic (as As)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.2	N.D.
15	Selenium (as Se)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.05	N.D.
16	Total Chromium (as Cr)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cr-B, 3-69	2.0	N.D.
17	Chemical Oxygen Demand (COD)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 5520-B, 5-17	250	164.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS 3025 (Part 4):1993, RA 2003	30	22.2
19	Oil & Grease	mg/L	IS 3025 (Part 38):1991, RA 2003,	10.0	N.D.
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	IS 3025 (Part 43):1992, RA 2003	1.0	N.D.

REMARKS: mg/l; mg/lppm; Ital. N.D.: Not Detected

**Terms & conditions**

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- This is for information as the party has asked for above tests.

 REVIEWED BY		For ULTIMATE ENVIROLYTICAL SOLUTIONS  AUTHORIZED SIGNATORY
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.....End of the test report.....



HDD-272, Phase III - Near JP Chowk  
 Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
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<b>Name &amp; Address Of The Customer</b> <b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA, POST MILUPARA,</b> <b>DIST. - RAIGARH (C.G.), 496107</b>		<b>REPORT NO</b> UES/TR/22-23/01805 <b>LAB REF NO</b> UES/22-23/W/03641 <b>DATE OF SAMPLING</b> 25/07/2022 <b>DATE OF RECEIPT</b> 26/07/2022 <b>DATE OF REPORT</b> 01/08/2022 <b>DATE OF ANALYSIS</b> START:26/07/2022    END:01/08/2022	
SAMPLE DETAILS			
<b>SAMPLE TYPE</b>	<b>WASTE WATER</b>	<b>INSD REFERENCE</b>	<b>R/PO/SIV/2122/0045, IND. 24-2017-2021</b>
<b>CUSTOMER SAMPLE ID</b>	<b>EFF WASTY BAK/IRHUL</b>	<b>SAMPLE CONDITION AT RECEIPT</b>	<b>08</b>
<b>PACKING OF SAMPLE</b>	2 L X 1 NO. PVC CAN 1 L X 1 NO. PVC CAN 1 L X 1 NO. GLASS BOTTLE	<b>SEALED</b>	<b>SAMPLE COLLECTED BY</b> LABORATORY CHEMIST
<b>SAMPLING PROCEDURE</b>	<b>IS 3025(PART 3):1997 RA 2003; APHA 22ND ED. 2012, 1040-B, 1-38</b>	<b>QUANTITY RECEIVED</b>	<b>5 LTR</b>

TEST REPORT					
SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 (SCHEDULE-VI) PART-A INLAND SURFACE WATER	RESULT
1	Colour	Hazen	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-1	<1
2	Odour	-	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 4 of Annexure-1	Agreeable
3	Temperature	°C	APHA 23 <sup>rd</sup> Ed. 2012, 2130-B, 2-13	Shall not exceed 5°C above the receiving water temperature	24.6
4	pH	-	APHA 23 <sup>rd</sup> Ed. 2012, 4500-H-1-B, 4-92	5.5 to 9.0	7.34
5	Total Residual Chlorine	mg/l	APHA 23 <sup>rd</sup> Ed. 2012, 4500-Cl-G, 4-5	1.0	N.D.
6	Total Suspended Solids	mg/l	APHA 23 <sup>rd</sup> Ed. 2012, 2540-D, 2-66	100	84.0
7	Dissolved Phosphate (as P)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-F-C, 4-153	5.0	N.D.
8	Fluoride (as F)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-F-B4D, 4-84 & 8	2.0	0.11
9	Lead (as Pb)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	0.1	N.D.
10	Zinc (as Zn)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	5.0	0.08
11	Copper (as Cu)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	3.0	N.D.
12	Cadmium (as Cd)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cd, 3-105	2.0	N.D.
13	Mercury (as Hg)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3112-B, 3-23	0.01	N.D.
14	Arsenic (as As)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.2	N.D.
15	Selenium (as Se)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.05	N.D.
16	Total Chromium (as Cr)	mg/l	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cr-B, 3-69	2.0	N.D.
17	Chemical Oxygen Demand (COD)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 5520-B, 5-17	250	184.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS 3025 (Part 4):1993, RA 2003	30	20.6
19	Oil & Grease	mg/L	IS 3025 (Part 39):1991, RA 2003,	10.0	N.D.
20	Phenolic Compounde (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	IS 3025 (Part 43):1992, RA 2003	1.0	N.D.

REMARKS: mg/L: nil/gram per liter, N.D.: Not Detected.

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 01/08/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/08/22 <b>AUTHORIZED SIGNATORY</b>
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.....End of the test report.....



HDD-272, Phase III - Near JP Chowk  
 Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
 Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

Name & Address Of The Customer		REPORT NO	URS/TR/22-23/02820
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA, POST MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	URS/22-23/W/07876
		DATE OF SAMPLING	24/08/2022
		DATE OF RECEIPT	25/08/2022
		DATE OF REPORT	01/09/2022
		DATE OF ANALYSIS	START:26/08/2022    END:01/09/2022
<b>SAMPLE DETAILS</b>			
SAMPLE TYPE	WASTE WATER	ORDER /REFERENCE:	VERBAL COMMUNICATION.
ORDERED SAMPLE ID	EFF INLET BAR/DWCC	SAMPLE CONDITION AT RECEIPT	OR
PACKING OF SAMPLE	3 L X 1 NO. PVC CAN	SEALED	LABORATORY CHEMIST
	1 L X 1 NO. PVC CAN		
	1 L X 1 NO. GLASS BOTTLE	SAMPLE COLLECTED BY	
SAMPLING PROCEDURE	IS:3025(PART 2):1997 RA 2003: APHA 23RD ED. 2012, 1963-B, 1-24	QUANTITY RECEIVED	5 LTR

<b>TEST REPORT</b>					
SRL NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 (SCHEDULE V) PART-A INLAND SURFACE WATER	RESULT
1	Colour	Razen	APHA 23 <sup>RD</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	<1
2	Odour	-	APHA 23 <sup>RD</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	Agreeable
3	Temperature	°C	APHA 23 <sup>RD</sup> Ed. 2012, 2130-B, 2-13	Shall not exceed 5°C above the receiving water temperature	26.4
4	pH	-	APHA 23 <sup>RD</sup> Ed. 2012, 4500-H <sup>-</sup> -B, 4-92	5.5 to 9.0	7.16
5	Total Residual Chlorine	mg/L	APHA 23 <sup>RD</sup> Ed. 2012, 4500-Cl-G, 4-6	1.0	N.D.
6	Total Suspended Solids	mg/L	APHA 23 <sup>RD</sup> Ed. 2012, 2540- D, 2-66	100	84.0
7	Dissolved Phosphate (as P)	mg/L	APHA 23 <sup>RD</sup> Ed. 2012, 4500-P-C, 4-133	5.0	N.D.
8	Fluoride (as F)	mg/L	APHA 23 <sup>RD</sup> Ed. 2012, 4500-F-B&D, 4-84 & B	2.0	0.14
9	Lead (as Pb)	mg/L	APHA 23 <sup>RD</sup> Ed. 2012, 3111-B, 3-18	0.1	N.D.
10	Zinc (as Zn)	mg/L	APHA 23 <sup>RD</sup> Ed. 2012, 3111-B, 3-18	5.0	0.12
11	Copper (as Cu)	mg/L	APHA 23 <sup>RD</sup> Ed. 2012, 3111-B, 3-18	3.0	N.D.
12	Cadmium (as Cd)	mg/L	APHA 23 <sup>RD</sup> Ed. 2012, 3500-Cd, 3-105	2.0	N.D.
13	Mercury (as Hg)	mg/L	APHA 23 <sup>RD</sup> Ed. 2012, 3112-B, 3-23	0.01	N.D.
14	Arsenic (as As)	mg/L	APHA 23 <sup>RD</sup> Ed. 2012, 3114-C, 3-38	0.2	N.D.
15	Selenium (as Se)	mg/L	APHA 23 <sup>RD</sup> Ed. 2012, 3114-C, 3-38	0.05	N.D.
16	Total Chromium (as Cr)	mg/L	APHA 23 <sup>RD</sup> Ed. 2012, 3000-Cr-B, 3-69	2.0	N.D.
17	Chemical Oxygen Demand (COD)	mg/L	APHA 23 <sup>RD</sup> Ed. 2012, 5520-B, 5-17	250	184.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS 3025 (Part 44):1993, RA 2003	30	26.2
19	Oil & Grease	mg/L	IS 3025 (Part 39):1991, RA 2003	10.0	N.D.
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	IS 3025 (Part 43):1992, RA 2003	1.0	N.D.

REMARKS: mg/lb - milligram per liter, N.D. - Not Detected

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- This is for information as the party has asked for above test(s) only.

 01/09/22 <b>REVIEWED BY</b>		 01/09/22 <b>AUTHORIZED SIGNATORY</b>
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.....End of the test report.....





HDD-272, Phase III - Near JP Chowk  
 Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
 Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA, POST MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>	REPORT NO	UES/TR/22-23/03280
	LAB REF NO	UES/22-23/W/08500
	DATE OF SAMPLING	27/09/2022
	DATE OF RECEIPT	28/09/2022
	DATE OF REPORT	03/10/2022
	DATE OF ANALYSIS	START:29/09/2022    END:03/10/2022

SAMPLE DETAILS			
SAMPLE TYPE	WASTE WATER	ORDER /REFERENCE	F.O.13552310211, DATED:07.09.2022
CUSTOMER SAMPLE ID	EVV INLET BANKHETA	SAMPLE CONDITION AT RECEIPT	OK
PACKING OF SAMPLE	3 X 2 X 2 NO. PVC CAR 1 X 2 X 2 NO. PVC CAR 1 X 1 X 1 NO. GLASS BOTTLE	SAMPLE COLLECTED BY	LABORATORY CHEMIST
SAMPLING PROCEDURE	IS:3025(PART 1):1997 RA 2003/ APHA 22ND Ed. 2012, 1060-H, 1-23	QUANTITY RECEIVED	5 LTR

TEST REPORT					
SRL NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 (SCHEDULE-VI) PART-A INLAND SURFACE WATER	RESULT
1	Colour	Razen	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-1	<1
2	Odour	-	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-1	Agreeable
3	Temperature	°C	APHA 23 <sup>rd</sup> Ed. 2012, 2130-B, 2-13	Shall not exceed 5°C above the receiving water temperature	24.2
4	pH	-	APHA 23 <sup>rd</sup> Ed. 2012, 4500-H <sup>-</sup> -B, 4-92	5.5 to 9.0	6.96
5	Total Residual Chlorine	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-Cl-G, 4-6	1.0	N.D.
6	Total Suspended Solids	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 2540- D, 7-66	100	64.0
7	Dissolved Phosphate (as P)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-P-C, 4-153	5.0	N.D.
8	Fluoride (as F)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-F-H40, 4-84 & 8	2.0	0.16
9	Lead (as Pb)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	0.1	N.D.
10	Zinc (as Zn)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	3.0	0.18
11	Copper (as Cu)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	3.0	N.D.
12	Cadmium (as Cd)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cd, 3-105	2.0	N.D.
13	Mercury (as Hg)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3112-B, 3-23	0.01	N.D.
14	Arsenic (as As)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-39	0.2	N.D.
15	Selenium (as Se)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-39	0.05	N.D.
16	Total Chromium (as Cr)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cr-B, 3-69	2.0	N.D.
17	Chemical Oxygen Demand (COD)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 5520-B, 5-17	250	124.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS 3025 (Part 44):1993, RA 2003	30	22.8
19	Oil & Grease	mg/L	IS 3025 (Part 39):1991, RA 2003	10.0	N.D.
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	IS 3025 (Part 43):1992, RA 2003	1.0	N.D.

REMARKS: mg/L: milligram per liter, N.D.: Not Detected.

*Terms & conditions*  
 \* The request for publication, arbitration or as legal dispute is forbidden  
 \* Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer  
 \* This is for information as the party has asked for above (as per IS:3025)

 03/10/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  03/10/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----



HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

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Name & Address Of The Customer		REPORT NO	UES/TR/22-23/0356	
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA,</b> <b>POST -MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/W/0426	
		DATE OF SAMPLING	25/04/2022	
		DATE OF RECEIPT	26/04/2022	
		DATE OF REPORT	02/05/2022	
		DATE OF ANALYSIS	START:26/04/2022	END: 02/05/2022
<b>SAMPLE DETAILS</b>				
SAMPLE TYPE	WASTE WATER	ORDER /REFERENCE:	K/PO/SW/2122/0049, Dtd. 24-JULY-2021	
CUSTOMER SAMPLE ID	STP OUTLET BANJERHOL	SAMPLE CONDITION AT RECEIPT	OK	
PACKING OF SAMPLE	3 L X I NO. PVC CAN 1 L X I NO. PVC CAN 1 L X I NO. GLASS BOTTLE	SEALED	SAMPLE COLLECTED BY	CHEMIST
SAMPLING PROCEDURE	IS:3025(PART 1):1987 RA 2003; APHA 22ND Ed. 2012, 1060-B, 1-39	QUANTITY RECEIVED	5 LTR	

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-VI] PART-A INLAND SURFACE WATER	RESULT
1	Colour	Hzed	APHA 22 <sup>nd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	<1
2	Odour	-	APHA 22 <sup>nd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	Agreeable
3	Temperature	°C	APHA 22 <sup>nd</sup> Ed. 2012, 2130-B, 2-13	Shall not exceed 5°C above the receiving water temperature	26.8
4	pH	-	APHA 22 <sup>nd</sup> Ed. 2012, 4500-H-B, 4-92	5.5 to 9.0	7.46
5	Total Residual Chlorine	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 4500-Cl-G, 4-69	1.0	N.D.
6	Total Suspended Solids	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 2540-D, 2-66	100	18.0
7	Dissolved Phosphate (as P)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 4500-P-C, 4-153	5.0	N.D.
8	Fluoride (as F)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 4500-F-B 4D, 4-84 & 87	2.0	N.D.
9	Lead (as Pb)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18	0.1	N.D.
10	Zinc (as Zn)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18	5.0	N.D.
11	Copper (as Cu)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18	3.0	N.D.
12	Cadmium (as Cd)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3500-Cd, 3-105	2.0	N.D.
13	Mercury (as Hg)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3112-B, 3-23	0.01	N.D.
14	Arsenic (as As)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3114-C, 3-38	0.2	N.D.
15	Selenium (as Se)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3114-C, 3-38	0.05	N.D.
16	Total Chromium (as Cr)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3500-Cr-B, 3-69	2.0	N.D.
17	Chemical Oxygen Demand (COD)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 5520-B, 5-17	250	30.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS 3025 (Part 44):1993, RA 2003	30	8.4
19	Oil & Grease	mg/L	IS 3025 (Part 39):1991, RA 2003	10.0	N.D.
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	IS 3025 (Part 43):1992, RA 2003	1.0	N.D.

REMARKS: mg/L: milligram per liter, N.D.: Not Detected.

#### Terms & conditions

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- > This is for information as the party has asked for above test only.

 02/05/22 REVIEWED BY		For ULTIMATE ENVIROLYTICAL SOLUTIONS  02/05/22 AUTHORIZED SIGNATORY
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-----End of the test report-----

AN ISO : 9001:2015 / ISO: 14001:2015 / ISO 45001:2018 CERTIFIED LABORATORY





HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

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Name & Address Of The Customer		REPORT NO	UES/TR/22-23/0991	
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA,</b> <b>POST -MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/W/01745	
		DATE OF SAMPLING	20/05/2022	
		DATE OF RECEIPT	21/05/2022	
		DATE OF REPORT	01/06/2022	
		DATE OF ANALYSIS	START:22/05/2022	END:27/05/2022
<b>SAMPLE DETAILS</b>				
SAMPLE TYPE	WASTE WATER	ORDER /REFERENCE:	S/PO/SRV/2122/0045, EDD. 24-JULY-2021	
CUSTOMER SAMPLE ID	ETP OUTLET BANJIKHOL	SAMPLE CONDITION AT RECEIPT	OK	
PACKING OF SAMPLE	3 L X 1 NO. PVC CAN 1 L X 1 NO. PVC CAN 1 L X 1 NO. GLASS BOTTLE	SEALED	SAMPLE COLLECTED BY	CHHIST
SAMPLING PROCEDURE	IS:3025(PART 1):1987 RA 2003; APHA 22ND ED. 2012, 1060-B, 1-39	QUANTITY RECEIVED	5 LTR	

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-VI] PART-A INLAND SURFACE WATER	RESULT
1	Colour	Hazen	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	<1
2	Odour	-	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	Agreeable
3	Temperature	°C	APHA 23 <sup>rd</sup> Ed. 2012, 2130-B, 2-13	Shall not exceed 5°C above the receiving water temperature	24.8
4	pH	-	APHA 23 <sup>rd</sup> Ed. 2012, 4500-H-B, 4-92	5.5 to 9.0	7.28
5	Total Residual Chlorine	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-Cl-G, 4-6	1.0	N.D.
6	Total Suspended Solids	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 2540-D, 2-66	100	18.0
7	Dissolved Phosphate (as P)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-P-C, 4-153	5.0	N.D.
8	Fluoride (as F)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-F-B&D, 4-84 & 8	2.0	N.D.
9	Lead (as Pb)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	0.1	N.D.
10	Zinc (as Zn)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	5.0	N.D.
11	Copper (as Cu)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	3.0	N.D.
12	Cadmium (as Cd)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cd, 3-185	2.0	N.D.
13	Mercury (as Hg)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3112-B, 3-23	0.01	N.D.
14	Arsenic (as As)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.2	N.D.
15	Selenium (as Se)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.05	N.D.
16	Total Chromium (as Cr)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cr-B, 3-69	2.0	N.D.
17	Chemical Oxygen Demand (COD)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 5520-B, 5-17	250	24.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS 3025(Part 44):1993, RA 2003	30	6.8
19	Oil & Grease	mg/L	IS 3025(Part 38):1991, RA 2003,	10.0	N.D.
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	IS 3025(Part 43):1992, RA 2003	1.0	N.D.

REMARKS: mg/lit.: milligram per liter, N.D.-Not Detected.

**Terms & conditions**

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- > This is for information as the party has asked for above listing only.

 REVIEWED BY		For ULTIMATE ENVIROLYTICAL SOLUTIONS  AUTHORIZED SIGNATORY
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-----End of the test report-----

AN ISO : 9001:2015 / ISO: 14001:2015 / ISO 45001:2018 CERTIFIED LABORATORY



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 Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
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Name & Address Of The Customer		REPORT NO	UES/TR/22-23/01971
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA,</b> <b>POST -MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/W/02356
		DATE OF SAMPLING	22/06/2022
		DATE OF RECEIPT	23/06/2022
		DATE OF REPORT	01/07/2022
		DATE OF ANALYSIS	START:23/06/2022      END:30/06/2022
SAMPLE DETAILS			
SAMPLE TYPE	WASTY WATER	ORDER /REFERENCE:	R/PO/ENV/2122/0243 REV. 24-JUL-2021
CUSTOMER SAMPLE ID	KTP OUTLET BANJHETA	SAMPLE CONDITION AT RECEIPT	OK
PACKING OF SAMPLE	3 L X 1 NO. PVC CAN 1 L X 1 NO. PVC CAN 1 L X 1 NO. GLASS BOTTLE	SEALED	SAMPLE COLLECTED BY CHEMIST
SAMPLING PROCEDURE	IS:3025 (PART 1):1997 RA 2003; APWA 22ND ED. 2012, 1060-B, 1-39	QUANTITY RECEIVED	5 LTR

TEST REPORT					
SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-VI] PART-A INLAND SURFACE WATER	RESULT
1	Colour	Hazen	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	<1
2	Odour	-	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	Agreeable
3	Temperature	°C	APHA 23 <sup>rd</sup> Ed. 2012, 2130-B, 2-15	Shall not exceed 5°C above the receiving water temperature	25.6
4	pH	-	APHA 23 <sup>rd</sup> Ed. 2012, 4500-H-B, 4-92	5.5 to 9.0	7.24
5	Total Residual Chlorine	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-Cl-G, 4-6	1.0	N.D.
6	Total Suspended Solids	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 2540-D, 2-66	100	22.0
7	Dissolved Phosphate (as P)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-P-C, 4-153	5.0	N.D.
8	Fluoride (as F)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-F-B4D, 4-84 & 8	2.0	N.D.
9	Lead (as Pb)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	0.1	N.D.
10	Zinc (as Zn)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	5.0	N.D.
11	Copper (as Cu)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	3.0	N.D.
12	Cadmium (as Cd)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cd, 3-105	2.0	N.D.
13	Mercury (as Hg)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-23	0.01	N.D.
14	Arsenic (as As)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.2	N.D.
15	Selenium (as Se)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.05	N.D.
16	Total Chromium (as Cr)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cr-B, 3-69	2.0	N.D.
17	Chemical Oxygen Demand (COD)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 5520-B, 5-17	250	32.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS 3025 (Part 44):1993, RA 2003	30	7.6
19	Oil & Grease	mg/L	IS 3025 (Part 39):1991, RA 2003,	10.0	N.D.
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	IS 3025 (Part 43):1992, RA 2003	1.0	N.D.

REMARKS: mg/lit. milligram per liter, N.D. Not Detected.

**Terms & conditions**

- > The report for publication, distribution or as legal dispute is forbidden.
- > Test sample will be returned for 15 days after issue of test report unless agreed with customer.
- > This is for information as the party has asked for above.

 REVIEWED BY	 For ULTIMATE ENVIROLYTICAL SOLUTIONS	 AUTHORIZED SIGNATORY
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-----End of the test report-----





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 Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
 Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

Format No. : UES/FORM/09

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<b>Name &amp; Address Of The Customer</b>		<b>REPORT NO</b>	UES/YR/22-23/01806
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/4, COAL MINE, VILLAGE - BANKHETA, POST -MILUPARA, DISTT. - RAIGARH (C.G.) 496107</b>		<b>LAB REF NO</b>	UES/22-23/W/03642
		<b>DATE OF SAMPLING</b>	25/07/2022
		<b>DATE OF RECEIPT</b>	26/07/2022
		<b>DATE OF REPORT</b>	01/08/2022
		<b>DATE OF ANALYSIS</b>	START:26/07/2022      END:01/08/2022
<b>SAMPLE DETAILS</b>			
<b>SAMPLE TYPE</b>	WASTE WATER	<b>ORDER /REFERENCE:</b>	R/NO/ENV/3122/0045, PTR. 24-JULY-2021
<b>CUSTOMER SAMPLE ID</b>	KTP OUTLET BANKHETA	<b>SAMPLE CONDITION AT RECEIPT</b>	OK
<b>PACKING OF SAMPLE</b>	3 L X 1 NO. PVC CAR 1 L X 1 NO. PVC CAR 1 L X 1 NO. GLASS BOTTLE	<b>SAMPLE COLLECTED BY</b>	CHHIST
<b>SAMPLING PROCEDURE</b>	IS 3025 (PART 1):1987 RA 2003; APHA 22ND ED. 2012, 1060-B, 1-39	<b>QUANTITY RECEIVED</b>	5 LTR

<b>TEST REPORT</b>					
Sr. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-VI] PART-A INLAND SURFACE WATER	RESULT
1	Colour	Hazen	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-1	CL
2	Odour	-	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 8 of Annexure-1	Agreeable
3	Temperature	°C	APHA 23 <sup>rd</sup> Ed. 2012, 2130-B, 2-13	Shall not exceed 5°C above the receiving water temperature	24.8
4	pH	-	APHA 23 <sup>rd</sup> Ed. 2012, 4500-H-B, 4-92	5.5 to 9.0	7.48
5	Total Residual Chlorine	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-Cl-G, 4-6	1.0	N.D.
6	Total Suspended Solids	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 2540- G, 2-66	100	20.0
7	Dissolved Phosphate (as P)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-P-C, 4-153	5.0	N.D.
8	Fluoride (as F)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-F-BaD, 4-84 & 8	2.0	N.D.
9	Lead (as Pb)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	0.1	N.D.
10	zinc (as Zn)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	5.0	N.D.
11	Copper (as Cu)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	3.0	N.D.
12	Cadmium (as Cd)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cd, 3-105	2.0	N.D.
13	Mercury (as Hg)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3112-B, 3-23	0.01	N.D.
14	Arsenic (as As)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.2	N.D.
15	Selenium (as Se)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.05	N.D.
16	Total Chromium (as Cr)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cr-B, 3-59	2.0	N.D.
17	Chemical Oxygen Demand (COD)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 5520-B, 5-17	250	44.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS 3025 (Part 4):1993, RA 2003	30	6.2
19	Oil & Grease	mg/L	IS 3025 (Part 39):1991, RA 2003,	10.0	N.D.
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	IS 3025 (Part 43):1992, RA 2003	1.0	N.D.

REMARKS: mg/L: milligram per liter, N.D.: Not Detected.

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- This is for information as the party has asked for above price.

 01/08/22 <b>REVIEWED BY</b>	 <b>For ULTIMATE ENVIROLYTICAL SOLUTIONS</b>	 01/08/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----

AN ISO : 9001:2015 / ISO: 14001:2015 / ISO 45001:2018 CERTIFIED LABORATORY



HDD-272, Phase III - Near JP Chowk  
 Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
 Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

Name & Address Of The Customer:		REPORT NO	UES/TR/22-23/02821	
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA,</b> <b>POST -MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/W/07877	
		DATE OF SAMPLING	24/08/2022	
		DATE OF RECEIPT	25/08/2022	
		DATE OF REPORT	01/09/2022	
		DATE OF ANALYSIS	START:26/08/2022	END:01/09/2022
<b>SAMPLE DETAILS</b>				
SAMPLE TYPE	WASTE WATER	ORDER /REFERENCE:	VERBAL COMMUNICATION.	
CUSTOMER SAMPLE ID	EIP OUTLET BANJIRKOL	SAMPLE CONDITION AT RECEIPT	OK	
PACKING OF SAMPLE	3 X 1 NO. PVC CAN	SEALED	SAMPLE COLLECTED BY	CHEMIST
	2 X 1 NO. PVC CAN			
	1 X 1 NO. GLASS BOTTLE			
SAMPLING PROCEDURE	IS 3025 (PART 1):1987, RA 2003/ APHA 22ND ED. 2012, 1060-B, 1-79	QUANTITY RECEIVED	5 LTR	

<b>TEST REPORT</b>					
SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-VI] PART-A INLAND SURFACE WATER	RESULT
1	COLOUR	Nezen	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	<1
2	Odour	-	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	Agreeable
3	Temperature	'C	APHA 23 <sup>rd</sup> Ed. 2012, 2130-B, 2-13	Shall not exceed 5°C above the receiving water temperature	25.6
4	pH	-	APHA 23 <sup>rd</sup> Ed. 2012, 4500-H-8, 4-92	5.5 to 9.0	7.24
5	Total Residual Chlorine	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-Cl-0, 4-6	1.0	N.D.
6	Total Suspended Solids	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 2540- B, 2-66	100	20.0
7	Dissolved Phosphate (as P)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-P-C, 4-153	5.0	N.D.
8	Fluoride (as F)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-F-B60, 4-94 & 8	2.0	N.D.
9	Lead (as Pb)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	0.1	N.D.
10	Zinc (as Zn)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	5.0	N.D.
11	Copper (as Cu)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	3.0	N.D.
12	Cadmium (as Cd)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cd, 3-105	2.0	N.D.
13	Mercury (as Hg)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3112-B, 3-23	0.01	N.D.
14	Arsenic (as As)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.2	N.D.
15	Selenium (as Se)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.05	N.D.
16	Total Chromium (as Cr)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cr-B, 3-69	2.0	N.D.
17	Chemical Oxygen Demand (COD)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 5520-B, 5-17	250	34.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS 3025 (Part 44):1993, RA 2003	30	8.6
19	Oil & Grease	mg/L	IS 3025 (Part 39):1991, RA 2003,	10.0	N.D.
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	IS 3025 (Part 43):1992, RA 2003	1.0	N.D.

REMARKS: mg/ltr.: milligram per liter, N.D.-Not Detected.

**Terms & conditions**

- > The report for publication, arbitration or as legal dispute is Not valid.
- > Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.
- > This is for information as the party has asked for above test(s) only.

 01/09/22 <b>REVIEWED BY</b>	 <b>For ULTIMATE ENVIROLYTICAL SOLUTIONS</b>	 01/09/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----



HDD-272, Phase III - Near JP Chowk,  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA,</b> <b>POST -MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>	REPORT NO	UES/TR/22-23/03281
	LAB REF NO	UES/22-23/W/08501
	DATE OF SAMPLING	27/09/2022
	DATE OF RECEIPT	28/09/2022
	DATE OF REPORT	03/10/2022
	DATE OF ANALYSIS	START:29/09/2022      END:03/10/2022

**SAMPLE DETAILS**

SAMPLE TYPE	WASTE WATER	ORDER /REFERENCE:	P. O. 13552310211, DATED: 07.09.2022
CUSTOMER SAMPLE ID	STP OUTLET BANJIKHOL	SAMPLE CONDITION AT RECEIPT	OK
PACKING OF SAMPLE	3 L X 1 NO. PVC CAN 1 L X 1 NO. PVC CAN 1 L X 1 NO. GLASS BOTTLE	SEALED	SAMPLE COLLECTED BY CHEMIST
SAMPLING PROCEDURE	IS:3025(PART 1):1987 RA 2003; APHA 22ND ED. 2012, 1060-B, 1-39	QUANTITY RECEIVED	5 LTR

**TEST REPORT**

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-VI] PART-A INLAND SURFACE WATER	RESULT
1	Colour	Baren	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	<1
2	Odour	-	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	Agreeable
3	Temperature	°C	APHA 23 <sup>rd</sup> Ed. 2012, 2130-B, 2-13	Shall not exceed 5°C above the receiving water temperature	24.2
4	pH	-	APHA 23 <sup>rd</sup> Ed. 2012, 4500-H <sup>-</sup> -B, 4-92	5.5 to 9.0	7.16
5	Total Residual Chlorine	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-Cl <sup>+</sup> -G, 4-6	1.0	N.D.
6	Total Suspended Solids	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 2540-D, 2-86	100	22.0
7	Dissolved Phosphate (as P)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-P-C, 4-153	5.0	N.D.
8	Fluoride (as F)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-F-H40, 4-84 & 8	2.0	N.D.
9	Lead (as Pb)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	0.1	N.D.
10	Zinc (as Zn)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	5.0	N.D.
11	Copper (as Cu)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	3.0	N.D.
12	Cadmium (as Cd)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cd, 3-105	2.0	N.D.
13	Mercury (as Hg)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3112-B, 3-23	0.01	N.D.
14	Arsenic (as As)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.2	N.D.
15	Selenium (as Se)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.05	N.D.
16	Total Chromium (as Cr)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cr-B, 3-69	2.0	N.D.
17	Chemical Oxygen Demand (COD)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 5520-B, 5-17	250	42.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS 3025 (Part 4):1993, RA 2003	30	16.2
19	Oil & Grease	mg/L	IS 3025 (Part 39):1991, RA 2003,	10.0	N.D.
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	IS 3025 (Part 43):1992, RA 2003	1.0	N.D.

REMARKS: mg/lit.: milligram per liter, N.D.-Not Detected.

**Terms & conditions**

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- Test samples will be retained for 15 days after issue of test report unless otherwise agreed with customer.
- This is for information as the party has asked for above particulars.

 03/10/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  03/10/22 <b>AUTHORIZED SIGNATORY</b>
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End of the test report





HDD-272, Phase III - Near JP Chowk  
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Name & Address Of The Customer		REPORT NO	UES/TR/22-23/0359		
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA, POST MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/W/0429		
		DATE OF SAMPLING	25/04/2022		
		DATE OF RECEIPT	26/04/2022		
		DATE OF REPORT	02/05/2022		
		DATE OF ANALYSIS	START: 26/04/2022	END: 02/05/2022	
		<b>SAMPLE DETAILS</b>			
SAMPLE TYPE	WASTE WATER	ORDER /REFERENCE :	R/PO/ENV/2122/0045,	REQ. 24-	
CUSTOMER SAMPLE ID	ETP INLET & OUTLET, BANKHETA	SAMPLE CONDITION AT RECEIPT	JULY-2022		
PACKING OF SAMPLE	3 L X 1 NO. PVC CAN 1 L X 1 NO. PVC CAN 1 L X 1 NO. GLASS BOTTLE	SEALED		CHEMIST	
SAMPLING PROCEDURE	IS:3025(PART 1):1987 PA 2003; APHA 22ND ED. 2012, 1060-B, 1-39	QUANTITY RECEIVED	5 LTR		

Report No. 0359

<b>TEST REPORT</b>						
SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-V] PART-A INLAND SURFACE WATER	BHANKETA ETP INLET	BANKHETA ETP OUTLET
1	Colour	Hazen	APHA 22 <sup>nd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	5.5	<1.0
2	Odour	-	APHA 22 <sup>nd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	Agreeable	Agreeable
3	Temperature	°C	APHA 22 <sup>nd</sup> Ed. 2012, 2130-B, 2-13	Shall not exceed 5°C above the receiving water temperature	26.2	25.4
4	pH	-	APHA 22 <sup>nd</sup> Ed. 2012, 4500-H <sup>+</sup> -B, 4-92	5.5 to 9.0	7.84	7.26
5	Total Residual Chlorine	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 4500-C1-G, 4-69	1.0	N.D.	N.D.
6	Total Suspended Solids	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 2540-D, 2-66	100	164.0	20.0
7	Dissolved Phosphate (as P)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 4500-P-C, 4-153	5.0	0.68	0.26
8	Fluoride (as F)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 4500-F-B 6D, 4-84 & 87	2.0	0.26	0.12
9	Lead (as Pb)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18	0.1	N.D.	N.D.
10	Zinc (as Zn)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18	5.0	0.34	0.06
11	Copper (as Cu)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18	3.0	N.D.	N.D.
12	Cadmium (as Cd)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3500-Cd, 3-105	2.0	N.D.	N.D.
13	Mercury (as Hg)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3112-B, 3-23	0.01	N.D.	N.D.
14	Arsenic (as As)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3114-C, 3-38	0.2	N.D.	N.D.
15	Selenium (as Se)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3114-C, 3-38	0.05	N.D.	N.D.
16	Total Chromium (as Cr)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3500-Cr-B, 3-69	2.0	N.D.	N.D.

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Report No. 0359

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-VII] PART-A INLAND SURFACE WATER	BHANKETA ETP INLET	BANKHETA ETP OUTLET
17	Chemical Oxygen Demand (COD)	mg/L	APHA 22 <sup>nd</sup> Ed.2012, 5520-B, 5-17	250	104.0	34.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS 3025 (Part 44):1993, RA 2003	30	14.6	6.4
19	Oil & Grease	mg/L	IS 3025 (Part 39):1991, RA 2003	10	N.D.	N.D.
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	IS 3025 (Part 43):1992, RA 2003	1.0	N.D.	N.D.

REMARKS: mg/lit. milligram per liter, N.D.-Not Detected.

**Terms & conditions**

- > The report for publication, abbreviation or in legal dispute is forbidden.
- > Test sample will be retained for 15days after issue of test report unless otherwise agreed with customer.
- > This is for information as the party has asked for above tests only.

 02/05/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  02/05/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----



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Name & Address Of The Customer		REPORT NO	UES/TR/22-23/0994	
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/4, COAL MINE, VILLAGE - BANKHETA, POST MILUPARA, DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/W/01748	
		DATE OF SAMPLING	20/05/2022	
		DATE OF RECEIPT	21/05/2022	
		DATE OF REPORT	01/06/2022	
		DATE OF ANALYSIS	START:22/05/2022	END:27/05/2022
<b>SAMPLE DETAILS</b>				
SAMPLE TYPE	WASTE WATER	ORDER /REFERENCE:	H/PO/SRV/2122/0045, DD. 24-JULY-2021	
CUSTOMER SAMPLE ID	ETP INLET & OUTLET, BANKHETA	SAMPLE CONDITION AT RECEIPT	OK	
PACKING OF SAMPLE	3 L X I NO. PVC CAN 1 L X I NO. PVC CAN 1 L X I NO. GLASS BOTTLE	SEALED	SAMPLE COLLECTED BY	CHEMIST
SAMPLING PROCEDURE	IS: 9025 (PART 1):1987 RA 2003; APHA 22ND ED. 2012, 1060-B, 1-39	QUANTITY RECEIVED	5 LTR	

Report No. 0994

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-VI] PART-A INLAND SURFACE WATER	BHANKETA ETP INLET	BANKHETA ETP OUTLET
1	Colour	Hazen	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	5.5	<1.0
2	Odour	-	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	Agreeable	Agreeable
3	Temperature	°C	APHA 23 <sup>rd</sup> Ed. 2012, 2130-B, 2-13	Shall not exceed 5°C above the receiving water temperature	25.4	24.6
4	pH	-	APHA 23 <sup>rd</sup> Ed. 2012, 4500-H <sup>-</sup> -B, 4-92	5.5 to 9.0	7.46	7.28
5	Total Residual Chlorine	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-Cl-G, 4-6	1.0	N.D.	N.D.
6	Total Suspended Solids	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 2540-D, 2-66	100	184.0	26.0
7	Dissolved Phosphate (as P)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-P-C, 4-153	5.0	0.68	0.18
8	Fluoride (as F)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-F-B&D, 4-84 & B	2.0	0.5	0.2
9	Lead (as Pb)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	0.1	N.D.	N.D.
10	Zinc (as Zn)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	5.0	0.36	0.15
11	Copper (as Cu)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	3.0	N.D.	N.D.
12	Cadmium (as Cd)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cd, 3-105	2.0	N.D.	N.D.
13	Mercury (as Hg)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3112-B, 3-23	0.01	N.D.	N.D.
14	Arsenic (as As)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.2	N.D.	N.D.
15	Selenium (as Se)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.05	N.D.	N.D.
16	Total Chromium (as Cr)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cr-B, 3-69	2.0	N.D.	N.D.

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Report No. 0994

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 (SCHEDULE-VI) PART-A INLAND SURFACE WATER	BHANKETA ETP INLET	BANKHETA ETP OUTLET
17	Chemical Oxygen Demand (COD)	mg/L	APHA 23 <sup>rd</sup> Ed.2012, 5520-B,5-17	250	68.0	32.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS: 3025(Part 44):1993,RA 2003	30	16.4	4.8
19	Oil & Grease	mg/L	IS 3025(Part 39):1991,RA 2003,	10	N.D.	N.D.
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	IS 3025(Part 43):1992,RA 2003	1.0	N.D.	N.D.

REMARKS: mg/lit.: milligram per liter, N.D.-Not Detected.

**Terms & conditions**

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 01/06/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/06/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----



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<i>Name &amp; Address Of The Customer</i>		REPORT NO	UES/TK/22-23/01974	
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/4, COAL MINE, VILLAGE - BANKHETA, POST MILUPARA, DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/W/02359	
		DATE OF SAMPLING	22/06/2022	
		DATE OF RECEIPT	23/06/2022	
		DATE OF REPORT	01/07/2022	
		DATE OF ANALYSIS	START: 23/06/2022	END: 30/06/2022
<b>SAMPLE DETAILS</b>				
SAMPLE TYPE	WASTE WATER	ORDER /REFERENCE:	M/PO/ENV/2112/0045, STD. 24- JULY-2021	
CONTAINER SAMPLE ID	ETP INLET & OUTLET, BANKHETA	SAMPLE CONDITION AT RECEIPT	CR	
PACKING OF SAMPLE	3 L X 1 NO. PVC CAN 1 L X 1 NO. PVC CAN 1 L X 1 NO. GLASS BOTTLE	SEALED	SAMPLE COLLECTED BY	CHEMIST
SAMPLING PROCEDURE	IS: 2025 (PART 1) / 1987 RA 2003/ APHA 22ND ED. 2012, 1060-B, 1-32	QUANTITY RECEIVED	5 LTR	

Report No. 01974

<b>TEST REPORT</b>						
S.R. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE VI] PART-A INLAND SURFACE WATER	BHANKETA ETP INLET	BANKHETA ETP OUTLET
1	Colour	Hazen	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-1	10.5	<1.0
2	Odour	-	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-1	Agreeable	Agreeable
3	Temperature	°C	APHA 23 <sup>rd</sup> Ed. 2012, 2130-B, 2-13	Shell not exceed 5°C above the receiving water temperature	25.6	25.2
4	pH	-	APHA 23 <sup>rd</sup> Ed. 2012, 4500-H- B, 4-92	5.5 to 9.0	7.52	7.31
5	Total Residual Chlorine	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-C1-G, 8-6	1.0	N.D.	N.D.
6	Total Suspended Solids	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 2540- D, 2-66	100	162.0	28.0
7	Dissolved Phosphate (as P)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-F-C, 4-153	5.0	0.54	0.16
8	Fluoride (as F)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-F- B&D, 4-84 & 8	2.0	0.4	0.2
9	Lead (as Pb)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-19	0.1	N.D.	N.D.
10	Zinc (as Zn)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-19	5.0	0.46	0.13
11	Copper (as Cu)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-19	3.0	N.D.	N.D.
12	Cadmium (as Cd)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cd, 3-105	2.0	N.D.	N.D.
13	Mercury (as Hg)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3112-B, 3-23	0.01	N.D.	N.D.
14	Arsenic (as As)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.2	N.D.	N.D.
15	Selenium (as Se)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.05	N.D.	N.D.
16	Total Chromium (as Cr)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cr- B, 3-69	2.0	N.D.	N.D.

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Report No. 02974

TEST REPORT						
SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-V] PART-A INLAND SURFACE WATER	BHANKETA ETP INLET	BANKHETA ETP OUTLET
17	Chemical Oxygen Demand (COD)	mg/L	APHA, 23 <sup>rd</sup> Ed. 2012, 5520-B, 5-17	250	64.0	42.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS 3025 (Part 44):1993, RA 2003	30	18.6	6.8
19	Oil & Grease	mg/L	IS 3025 (Part 39):1991, RA 2003,	10	N.D.	N.D.
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	IS 3025 (Part 43):1992, RA 2003	1.0	N.D.	N.D.

REMARKS: mg/lit. - milligram per liter, N.D. - Not Detected.

Terms & conditions

- \* The report for publication, citation or as legal dispute is forbidden.
- \* Test sample will be retained for 15days after issue of test report unless otherwise agreed with customer.
- \* This is for information as the party has asked for above instance.

 01/07/22 REVIEWED BY		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/07/22 AUTHORIZED SIGNATORY
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-----End of the test report-----



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<b>Name &amp; Address Of The Customer</b>		<b>REPORT NO</b>	UES/TA/22-23/01809
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA, POST MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		<b>LAB REF NO</b>	UES/22-23/W/03645-03646
		<b>DATE OF SAMPLING</b>	25/07/2022
		<b>DATE OF RECEIPT</b>	26/07/2022
		<b>DATE OF REPORT</b>	01/08/2022
		<b>DATE OF ANALYSIS</b>	START: 26/07/2022    END: 01/08/2022
SAMPLE DETAILS			
<b>SAMPLE TYPE</b>	WASTE WATER	<b>ORDER /REFERENCE:</b>	R/20/2017/2122/0048, DTG. 24-2117-2021
<b>CUSTOMER SAMPLE ID</b>	ETP INLET & OUTLET, BANKHETA	<b>SAMPLE CONDITION AT RECEIPT</b>	OK
<b>PACKING OF SAMPLE</b>	3 L X 1 NO. PVC CAN 1 L X 1 NO. PVC CAN    SEALED 1 L X 1 NO. GLASS BOTTLE	<b>SAMPLE COLLECTED BY</b>	CHEMIST
<b>SAMPLING PROCEDURE</b>	IS-3025 (PART 2): 1987 RA 2003; APHA 22ND ED. 2012, 1060-B, 1-38	<b>QUANTITY RECEIVED</b>	5 LTR

Report No.01809

TEST REPORT						
SRL NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-VI] PART-A INLAND SURFACE WATER	BHANKHETA ETP INLET	BANKHETA ETP OUTLET
1	Colour	Hazen	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	15.5	<1.0
2	Odour	-	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	Agreeable	Agreeable
3	Temperature	°C	APHA 23 <sup>rd</sup> Ed. 2012, 2130-B, 2-13	Shall not exceed 5°C above the receiving water temperature	25.4	24.8
4	pH	-	APHA 23 <sup>rd</sup> Ed. 2012, 4500-H <sup>+</sup> -B, 4-92	5.5 to 9.0	7.86	7.46
5	Total Residual Chlorine	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-Cl <sup>-</sup> -G, 4-6	1.0	N.D.	N.D.
6	Total Suspended Solids	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 2540-D, 2-66	100	146.0	24.0
7	Dissolved Phosphate (as P)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-P-C, 4-153	5.0	0.34	0.11
8	Fluoride (as F)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-F-B&D, 4-84 & 8	2.0	0.36	0.21
9	Lead (as Pb)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	0.1	N.D.	N.D.
10	Zinc (as Zn)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	5.0	0.31	0.14
11	Copper (as Cu)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	1.0	N.D.	N.D.
12	Cadmium (as Cd)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cd, 3-105	2.0	N.D.	N.D.
13	Mercury (as Hg)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3112-B, 3-23	0.01	N.D.	N.D.
14	Arsenic (as As)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.2	N.D.	N.D.
15	Selenium (as Se)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.05	N.D.	N.D.
16	Total Chromium (as Cr)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cr-B, 3-69	2.0	N.D.	N.D.

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Report No. 01809

TEST REPORT						
SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 (SCHEDULE-VI) PART-A INLAND SURFACE WATER	BHANKETA ETP INLET	BANKHETA ETP OUTLET
17	Chemical Oxygen Demand (COD)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 5520-B, 5-17	250	34.0	34.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS-3025 (Part 44):1993, RA 2003	30	14.6	8.4
19	Oil & Grease	mg/L	IS-3025 (Part 39):1991, RA 2003	10	N.D.	N.D.
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	IS-3025 (Part 43):1992, RA 2003	1.0	N.D.	N.D.

REMARKS: mg/lit. : milligram per liter, N.D.-Not Detected.

*Terms & conditions*

- > The report for publication, submission or as legal dispute is forbidden.
- > Test sample will be retained for 15days after issue of test report unless otherwise agreed with customer.
- > This is for information as the party has asked for above test(s).

 01/08/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/08/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----



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Name & Address Of The Customer		REPORT NO	UES/TR/22-23/02824
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA, POST MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UE6/22-23/W/07880
		DATE OF SAMPLING	24/08/2022
		DATE OF RECEIPT	25/08/2022
		DATE OF REPORT	01/09/2022
		DATE OF ANALYSIS	START:26/08/2022    END:01/09/2022
<b>SAMPLE DETAILS</b>			
SAMPLE TYPE	WASTE WATER	ORDER /REFERENCE	VERBAL COMMUNICATION
CUSTOMER SAMPLE ID	ESP INLET & OUTLET, BANKHETA	SAMPLE CONDITION AT RECEIPT	OK
PACKING OF SAMPLE	3 L X 3 NO. PVC CAN 1 L X 1 NO. PVC CAN 1 L X 1 NO. GLASS BOTTLE	SEALING	SEALED
SAMPLING PROCEDURE	IS.3025(PART 1):1987 RA 2003; APHA 22ND ED. 2012, 1060-B, 1-39	SAMPLE COLLECTED BY	CHHIST
		QUANTITY RECEIVED	5 LTR

Report No. 02824

**TEST REPORT**

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-VI] PART-A INLAND SURFACE WATER	BHANKETA ETP INLET	BANKHETA ETP OUTLET
1.	Colour	Hazen	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	5.0	<1.0
2.	Odour	-	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	Agreeable	Agreeable
3.	Temperature	°C	APHA 23 <sup>rd</sup> Ed. 2012, 2130-B, 2-13	Shall not exceed 5°C above the receiving water temperature	25.2	24.8
4.	pH	-	APHA 23 <sup>rd</sup> Ed. 2012, 4500-H <sup>+</sup> -B, 4-92	5.5 to 9.0	7.62	7.34
5.	Total Residual Chlorine	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-Cl <sup>-</sup> -G, 4-8	1.0	N.D.	N.D.
6.	Total Suspended Solids	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 2540- D, 2-66	100	192.0	22.0
7.	Dissolved Phosphate (as P)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-P-C, 4-153	5.0	0.54	0.16
8.	Fluoride (as F)	mg/L	AESA 23 <sup>rd</sup> Ed. 2012, 4500-F-BAJ, 4-84 & 8	2.0	0.3	0.1
9.	Lead (as Pb)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	0.1	N.D.	N.D.
10.	Zinc (as Zn)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	5.0	0.23	0.18
11.	Copper (as Cu)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	3.0	N.D.	N.D.
12.	Cadmium (as Cd)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cd, 3-105	2.0	N.D.	N.D.
13.	Mercury (as Hg)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3112-B, 3-23	0.01	N.D.	N.D.
14.	Arsenic (as As)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.2	N.D.	N.D.
15.	Selenium (as Se)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.05	N.D.	N.D.
16.	Total Chromium (as Cr)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cr-B, 3-69	2.0	N.D.	N.D.





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Report No. 02824

TEST REPORT						
SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 (SCHEDULE-VI) PART-A INLAND SURFACE WATER	BHANKETA ETP INLET	BANKHETA ETP OUTLET
17	Chemical Oxygen Demand (COD)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 5520-B, 5-17	250	72.0	34.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS 3025 (Part 4):1993, RA 0003	30	18.6	6.8
19	Oil & Grease	mg/L	IS 3025 (Part 38):1991, RA 2003,	10	N.D.	N.D.
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	IS 3025 (Part 43):1992, RA 2003	1.0	N.D.	N.D.

REMARKS: mg/lit. milligram per liter, N.D.-Not Detected.

Terms & conditions

- > This report for publication, activities or as legal dispute is forbidden.
- > Test sample will be retained for 30 days after issue of test report unless otherwise agreed with customer.
- > This is for information as the party has asked for above test(s) only.

 01/09/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/09/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----





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<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA, POST MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		REPORT NO	URS/TW/22-23/03284
		LAB REF NO	URS/22-23/W/08504
		DATE OF SAMPLING	27/09/2022
		DATE OF RECEIPT	29/09/2022
		DATE OF REPORT	03/10/2022
		DATE OF ANALYSIS	START:29/09/2022    END:03/10/2022
<b>SAMPLE DETAILS</b>			
SAMPLE TYPE	WASTE WATER	ORDER /REFERENCE:	P.O. 13552310211, DATED: 07.09.2022
CUSTOMER SAMPLE ID	ETP INLET & OUTLET, BANKHETA	SAMPLE CONDITION AT RECEIPT	OK
PACKING OF SAMPLE	3 L X 3 NO. PVC CAN 1 L X 3 NO. PVC CAN 1 L X 3 NO. GLASS BOTTLE	SEALED	SAMPLE COLLECTED BY CHEMIST
SAMPLING PROCEDURE	IS: 3025 (PART 2): 1987 RA 2003; APRA 22ND ED. 2012, 1060-B, 1-39	QUANTITY RECEIVED	3 LTR

Report No. 03284

<b>TEST REPORT</b>						
SRL NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 (SCHEDULE-VI) PART-A INLAND SURFACE WATER	BANKHETA ETP INLET	BANKHETA ETP OUTLET
1	Colour	Hazen	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 4 of Annexure-I	10.5	<1.0
2	Odour	-	APHA 23 <sup>rd</sup> Ed. 2012, 2100-B, 2-6	See 4 of Annexure-I	Agreeable	Agreeable
3	Temperature	°C	APHA 23 <sup>rd</sup> Ed. 2012, 2130-B, 2-13	Shall not exceed 5°C above the prevailing water temperature	25.4	24.6
4	pH	-	APHA 23 <sup>rd</sup> Ed. 2012, 4500-H- B, 4-92	5.5 to 9.0	7.42	7.11
5	Total Residual Chlorine	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-Cl-G, 4 --6	1.0	N.D.	N.D.
6	Total Suspended Solids	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 2540- D, 2-66	100	164.0	24.0
7	Dissolved Phosphate (as P)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 6500-P-C, 4-153	5.0	0.68	0.11
8	Fluoride (as F)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-F- BAD, 4-84 & 9	2.0	0.22	0.16
9	Lead (as Pb)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	0.1	N.D.	N.D.
10	Zinc (as Zn)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-19	5.0	0.32	0.19
11	Copper (as Cu)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	1.0	N.D.	N.D.
12	Cadmium (as Cd)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cd, 3-105	2.0	N.D.	N.D.
13	Mercury (as Hg)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3112-B, 3-23	0.01	N.D.	N.D.
14	Arsenic (as As)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.2	N.D.	N.D.
15	Selenium (as Se)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.05	N.D.	N.D.
16	Total Chromium (as Cr)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cr- B, 3-69	2.0	N.D.	N.D.



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Report No. 03284

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 (SCHEDULE-VI) PART-A INLAND SURFACE WATER	BHANKETA ETP INLET	BANKHETA ETP OUTLET
17	Chemical Oxygen Demand (COD)	mg/L	APHA 23 <sup>rd</sup> Ed.2012, 5510-B.5-17	250	84.0	42.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS 3025(Part 44):1993,RA 2003	30	22.8	12.8
19	Oil & Grease	mg/L	IS 3025(Part 39):1991,RA 2003,	10	N.D.	N.D.
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	IS 3025(Part 43):1992,RA 2003	1.0	N.D.	N.D.

REMARKS: mg/lit.: milligram per liter, N.D.-Not Detected.

*Terms & conditions*

- The report for publication, circulation or as legal dispute is forbidden.
- Test sample will be retained for 7 days after issue of test report unless otherwise agreed with customer.
- This is for information as the party has asked for above stated lab.

 03/10/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  03/10/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----



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<i>Name &amp; Address Of The Customer</i>		REPORT NO	UES/TR/22-23/0357	
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/4, COAL MINE, VILLAGE - BANKHETA, POST MILUPARA, DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/W/0427	
		DATE OF SAMPLING	25/04/2022	
		DATE OF RECEIPT	26/04/2022	
		DATE OF REPORT	02/05/2022	
		DATE OF ANALYSIS	START:26/04/2022	END:02/05/2022
<b>SAMPLE DETAILS</b>				
SAMPLE TYPE	EFFLUENT WATER	ORDER /REFERENCE:	N/PO/ENV/2122/0048, DTD. 24-JULY-2021	
CUSTOMER SAMPLE ID	GUPP WATER PATCH "B"	SAMPLE CONDITION AT RECEIPT	OK	
PACKING OF SAMPLE	3 L X 1 NO. PVC CAN 1 L X 1 NO. PVC CAN 1 L X 1 NO. GLASS BOTTLE	SEALED	SAMPLE COLLECTED BY	CHDGGT
SAMPLING PROCEDURE	IS:3025 (PART 1):1997 RA 2003; APHA 22ND ED. 2012, 1940-B, 1-59	QUANTITY RECEIVED	3 LTR	

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-VI] PART-A INLAND SURFACE WATER	RESULT
1	Colour	Hazen	APHA 22 <sup>nd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	<1
2	Odour	-	APHA 22 <sup>nd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	Agreeable
3	Temperature	°C	APHA 22 <sup>nd</sup> Ed. 2012, 2130-B, 2-13	Shall not exceed 5°C above the receiving water temperature	25.8
4	pH	-	APHA 22 <sup>nd</sup> Ed. 2012, 4500-H <sup>-</sup> -B, 4-92	5.5 to 9.0	7.56
5	Total Residual Chlorine	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 4500-Cl-G, 4-69	1.0	N.D.
6	Total Suspended Solids	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 2540-D, 2-66	100	52.0
7	Dissolved Phosphate (as P)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 4500-F-C, 4-153	5.0	N.D.
8	Fluoride (as F)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 4500-F-B 4D, 4-84 & 87	2.0	N.D.
9	Lead (as Pb)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18	0.1	N.D.
10	Zinc (as Zn)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18	5.0	N.D.
11	Copper (as Cu)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18	3.0	N.D.
12	Cadmium (as Cd)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3500-Cd, 3-105	2.0	N.D.
13	Mercury (as Hg)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3112-B, 3-23	0.01	N.D.
14	Arsenic (as As)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3114-C, 3-38	0.2	N.D.
15	Selenium (as Se)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3114-C, 3-38	0.05	N.D.
16	Total Chromium (as Cr)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3500-Cr-B, 3-69	2.0	N.D.
17	Chemical Oxygen Demand (COD)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 5520-B, 5-17	250	52.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS 3025 (Part 44):1993, RA 2003	30	10.6
19	Oil & Grease	mg/L	IS 3025 (Part 39):1991, RA 2003,	10.0	N.D.
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	IS 3025 (Part 43):1992, RA 2003	1.0	N.D.

REMARKS: mg/L: milligram per liter, N.D.-Not Detected.

**Terms & conditions**

- ▶ This report for publication, arbitration or as legal dispute is forbidden.
- ▶ Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.
- ▶ This is for information as the party has asked for above test(s) only.

 02/05/22 REVIEWED BY		For ULTIMATE ENVIROLYTICAL-SOLUTIONS  02/05/22 AUTHORIZED SIGNATORY
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-----End of the test report-----

AN ISO : 9001:2015 / ISO: 14001:2015 / ISO 45001:2018 CERTIFIED LABORATORY





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Name & Address Of The Customer		REPORT NO	UES/TR/22-23/0992	
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA,</b> <b>POST MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/W/01746	
		DATE OF SAMPLING	20/05/2022	
		DATE OF RECEIPT	21/05/2022	
		DATE OF REPORT	01/06/2022	
		DATE OF ANALYSIS	START:22/05/2022	END:27/05/2022
<b>SAMPLE DETAILS</b>				
SAMPLE TYPE	EFFLUENT WATER	ORDER /REFERENCE:	N/PO/ENV/S12/0045, DTD. 24-JULY-2021	
CUSTOMER SAMPLE ID	SURF WATER PATCH "B"	SAMPLE CONDITION AT RECEIPT	OK	
PACKING OF SAMPLE	3 L X 1 NO. PVC CAN 1 L X 1 NO. PVC CAN 1 L X 1 NO. GLASS BOTTLE	SEALED	SAMPLE COLLECTED BY	CHINMAY
SAMPLING PROCEDURE	IS:3025(PART 1):1997 RA 2003; APHA 23RD ED. 2012, 1060-B, 1-33	QUANTITY RECEIVED	3 LTR	

<b>TEST REPORT</b>					
SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-VI] PART-A INLAND SURFACE WATER	RESULT
1	Colour	Hazen	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	2.5
2	Odour	-	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	Agreeable
3	Temperature	'C	APHA 23 <sup>rd</sup> Ed. 2012, 2130-B, 2-13	Shall not exceed 5'C above the receiving water temperature	24.6
4	pH	-	APHA 23 <sup>rd</sup> Ed. 2012, 4500-H'-B, 4-92	5.5 to 9.0	7.18
5	Total Residual Chlorine	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-Cl-G, 4-6	1.0	N.D.
6	Total Suspended Solids	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 2540-D, 2-66	100	52.0
7	Dissolved Phosphate (as P)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-P-C, 4-153	5.0	N.D.
8	Fluoride (as F)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-F-B&D, 4-84 & 8	2.0	N.D.
9	Lead (as Pb)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	0.1	N.D.
10	Zinc (as Zn)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	5.0	N.D.
11	Copper (as Cu)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	3.0	N.D.
12	Cadmium (as Cd)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cd, 3-105	2.0	N.D.
13	Mercury (as Hg)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3112-B, 3-23	0.01	N.D.
14	Arsenic (as As)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.2	N.D.
15	Selenium (as Se)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.05	N.D.
16	Total Chromium (as Cr)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cr-B, 3-69	2.0	N.D.
17	Chemical Oxygen Demand (COD)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 5520-B, 5-17	250	64.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS 3025 (Part 44):1993, RA 2003	30	10.2
19	Oil & Grease	mg/L	IS 3025 (Part 39):1991, RA 2003,	10.0	N.D.
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	IS 3025 (Part 43):1992, RA 2003	1.0	N.D.

REMARKS: mg/lit. milligram per liter, N.D.-Not Detected.

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 01/06/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/06/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----



HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

Recognized by Ministry of Environment Forest and Climate Change under EP act 1986

Name & Address Of The Customer		REPORT NO	UKS/TR/22-23/01972
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA,</b> <b>POST MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	URS/22-23/W/02357
		DATE OF SAMPLING	22/06/2022
		DATE OF RECEIPT	23/06/2022
		DATE OF REPORT	01/07/2022
		DATE OF ANALYSIS	START:23/06/2022    END:30/06/2022
<b>SAMPLE DETAILS</b>			
SAMPLE TYPE	EFFLUENT WATER	ORDER /REFERENCE	R/TO/SPV/2122/0045, STD. 24-JULY-2021
CUSTOMER SAMPLE ID	SIND WATER PARCH 'B'	SAMPLE CONDITION AT RECEIPT	OK
PACKING OF SAMPLE	1 X 1 NO. PVC CAN 1 X 1 NO. PVC CAN 1 X 1 NO. GLASS BOTTLE	SEALED	SAMPLE COLLECTED BY CHUDHRY
SAMPLING PROCEDURE	IS: 3025 (PART 1): 1987 RA 2003; APHA 2300 ED 2012, 1060-B, 1-39	QUANTITY RECEIVED	1 LTR

<b>TEST REPORT</b>					
S.R. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-VI] PART-A INLAND SURFACE WATER	RESULT
1	Colour	Hazen	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	2.0
2	Odour	-	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	Agreeable
3	Temperature	°C	APHA 23 <sup>rd</sup> Ed. 2012, 2130-B, 2-13	Shall not exceed 5°C above the receiving water temperature	24.8
4	pH	-	APHA 23 <sup>rd</sup> Ed. 2012, 4500-H-8, 4-92	5.5 to 9.0	7.33
5	Total Residual Chlorine	mg/l	APHA 23 <sup>rd</sup> Ed. 2012, 4500-Cl-G, 4-6	1.0	N.D.
6	Total Suspended Solids	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 2540-D, 2-66	100	58.0
7	Dissolved Phosphate (as P)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-F-C, 4-153	5.0	N.D.
8	Fluoride (as F)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-F-B&D, 4-14 & B	2.0	N.D.
9	Lead (as Pb)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	0.1	N.D.
10	Zinc (as Zn)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	5.0	N.D.
11	Copper (as Cu)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	3.0	N.D.
12	Cadmium (as Cd)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cd, 3-105	2.0	N.D.
13	Mercury (as Hg)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3112-B, 3-23	0.01	N.D.
14	Arsenic (as As)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.2	N.D.
15	Selenium (as Se)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.05	N.D.
16	Total Chromium (as Cr)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cr-R, 3-69	2.0	N.D.
17	Chemical Oxygen Demand (COD)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 5520-B, 5-17	250	76.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS: 3025 (Part 44): 1993, RA 2003	30	12.6
19	Oil & Grease	mg/L	IS: 3025 (Part 39): 1991, RA 2003,	10.0	N.D.
20	Phenolic Compounds (as C, H, O)	mg/L	IS: 3025 (Part 43): 1992, RA 2003	1.0	N.D.

REMARKS: mg/ltr. milligram per liter, N.D.-Not Detected.

**Terms & conditions**

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- > Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.
- > This is for information as the party has asked for about the test.

 <b>REVIEWED BY</b>	 <b>For ULTIMATE ENVIROLYTICAL SOLUTIONS</b>	 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----





HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

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Name & Address Of The Customer		REPORT NO	UES/TR/22-23/01807	
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA,</b> <b>POST MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/W/03643	
		DATE OF SAMPLING	25/07/2022	
		DATE OF RECEIPT	26/07/2022	
		DATE OF REPORT	01/08/2022	
		DATE OF ANALYSIS	START:26/07/2022	END:01/08/2022
<b>SAMPLE DETAILS</b>				
SAMPLE TYPE	EFFLUENT WATER		ORDER /REFERENCE	W/TO/097/2322/0049, DOL: 24-JULY-2021
CUSTOMER SAMPLE ID	GUND WATER BATCH "B"		SAMPLE CONDITION AT RECEIPT	OK
PACKING OF SAMPLE	3 L X 1 NO. PVC CAR 1 L X 1 NO. PVC CAR 1 L X 1 NO. GLASS BOTTLE	SEALED	SAMPLE COLLECTED BY	ENERGIST
SAMPLING PROCEDURE	IS:3025(PART II):1997 RA 2003; APHA 2000 ED. 2012, 1060-B, 1-39		QUANTITY RECEIVED	3 LTR

<b>TEST REPORT</b>					
Sr. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-VI] PART-A INLAND SURFACE WATER	RESULT
1	Colour	Napen	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-1	2.5
2	Odour	-	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-1	Agreeable
3	Temperature	°C	APHA 23 <sup>rd</sup> Ed. 2012, 2130-B, 2-13	Shall not exceed 5°C above the receiving water temperature	25.4
4	pH	-	APHA 23 <sup>rd</sup> Ed. 2012, 4500-H <sup>+</sup> -B, 4-92	5.5 to 9.0	7.40
5	Total Residual Chlorine	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-CL-G, 4-6	1.0	N.D.
6	Total Suspended Solids	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 2540-D, 2-66	100	64.0
7	Dissolved Phosphate (as P)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-P-C, 4-153	5.0	N.D.
8	Fluoride (as F)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-F-B4D, 4-B4 & B	2.0	N.D.
9	Lead (as Pb)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	0.1	N.D.
10	Zinc (as Zn)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	5.0	N.D.
11	Copper (as Cu)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	3.0	N.D.
12	Cadmium (as Cd)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3560-Cd, 3-105	2.0	N.D.
13	Mercury (as Hg)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3112-B, 3-23	0.01	N.D.
14	Arsenic (as As)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.2	N.D.
15	Selenium (as Se)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.05	N.D.
16	Total Chromium (as Cr)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cr-B, 3-69	2.0	N.D.
17	Chemical Oxygen Demand (COD)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 5520-B, 5-17	250	94.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS 3025 (Part 4):1993, RA 2003	30	16.8
19	Oil & Grease	mg/L	IS 3025 (Part 39):1991, RA 2003,	10.0	N.D.
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	IS 3025 (Part 43):1992, RA 2003	1.0	N.D.

REMARKS: mg/lit.: milligram per liter, N.D.-Not Detected.

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 01/08/22 <b>REVIEWED BY</b>	 <b>For ULTIMATE ENVIROLYTICAL SOLUTIONS</b>  01/08/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----



HDD-272, Phase III - Near JP Chowk  
 Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
 Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

Name & Address of The Customer		REPORT NO	UES/TR/22-23/02822	
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA,</b> <b>POST MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/M/07878	
		DATE OF SAMPLING	24/08/2022	
		DATE OF RECEIPT	25/08/2022	
		DATE OF REPORT	01/09/2022	
		DATE OF ANALYSIS	START:26/08/2022	END:01/09/2022
<b>SAMPLE DETAILS</b>				
SAMPLE TITLE	AFFLUENT WATER	ORDER /REFERENCE	VERBAL COMMUNICATION	
CUSTOMER SAMPLE ID	SEW WATER PLANT "B"	SAMPLE CONDITION AT RECEIPT	OK	
PACKING OF SAMPLE	3 L X 3 NO. PVC CAN 3 L X 3 NO. PVC CAN 3 L X 3 NO. GLASS BOTTLE	SEALING	SAMPLE COLLECTED BY	CLIENT
SAMPLING PROCEDURE	IS:3025(PART 4):1993, RA:2003, APHA 23RD Ed. 2012, 1993-B, 3-19	QUANTITY RECEIVED	3 LTR	

<b>TEST REPORT</b>					
SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-VI] PART-A INLAND SURFACE WATER	RESULT
1	Colour	Hazen	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	4.5
2	Odour	-	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	Agreeable
3	Temperature	°C	APHA 23 <sup>rd</sup> Ed. 2012, 2130-B, 2-13	Shall not exceed 5°C above the receiving water temperature	24.8
4	pH	-	APHA 23 <sup>rd</sup> Ed. 2012, 4500-H-B, 4-92	5.5 to 9.0	7.22
5	Total Residual Chlorine	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-Cl-G, 4-6	1.0	N.D.
6	Total Suspended Solids	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 2540-D, 2-66	100	42.0
7	Dissolved Phosphate (as P)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-P-C, 4-153	5.0	N.D.
8	Fluoride (as F)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-F-B4D, 4-84 & B	2.0	N.D.
9	Lead (as Pb)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	0.1	N.D.
10	Zinc (as Zn)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	5.0	N.D.
11	Copper (as Cu)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	3.0	N.D.
12	Cadmium (as Cd)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cd, 3-105	2.0	N.D.
13	Mercury (as Hg)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3112-B, 3-23	0.01	N.D.
14	Arsenic (as As)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.2	N.D.
15	Selenium (as Se)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.05	N.D.
16	Total Chromium (as Cr)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cr-B, 3-69	2.0	N.D.
17	Chemical Oxygen Demand (COD)	mg/l.	APHA 23 <sup>rd</sup> Ed. 2012, 5520-B, 5-17	250	78.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS:3025(Part 4):1993, RA:2003	30	14.8
19	Oil & Grease	mg/l.	IS:3025(Part 39):1993, RA:2003,	10.0	N.D.
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	IS:3025(Part 43):1992, RA:2003	1.0	N.D.

REMARKS: mg/lit. milligram per liter, N.D.-Not Detected.

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 01/09/22 <b>REVIEWED BY</b>	 <b>For ULTIMATE ENVIROLYTICAL SOLUTIONS</b>  01/09/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----

AN ISO 9001:2015 ISO 14001:2015 ISO 45001:2018 CERTIFIED COMPANY



HDD-272, Phase III - Near JP Chowk  
 Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
 Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA,</b> <b>POST MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>	REPORT NO	URS/TR/22-23/03282
	LAB REF NO	URS/22-23/W/08502
	DATE OF SAMPLING	27/09/2022
	DATE OF RECEIPT	28/09/2022
	DATE OF REPORT	03/10/2022
	DATE OF ANALYSIS	START:29/09/2022      END:03/10/2022

SAMPLE DETAILS			
SAMPLE TYPE	SETTLING WATER	ORDER /REFERENCE	P. O. 13552310211, DATED:07.09.2022
ORDERED SAMPLE ID	SEWAGE WATER BATCH "B"	SAMPLE CONDITION AT RECEIPT	OK
PACKING OF SAMPLE	3 x 2 x 1 lit. PVC CAN 1 x 1 x 1 lit. PVC CAN 1 x 1 x 1 lit. GLASS BOTTLE	SEALED	SAMPLE COLLECTED BY
SAMPLING PROCEDURE	IS 3025 (PART 1):1987 RA 2003; APHA 22ND ED. 2012, 1990-E, 1-39	QUANTITY ANALYZED	OWNERS
			5 LITR

TEST REPORT					
SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 (SCHEDULE-VI) PART-A INLAND SURFACE WATER	RESULT
1	Colour	Hazen	APHA 23 <sup>rd</sup> Ed. 2012, 2130-B, 2-6	See 6 of Annexure-1	10.5
2	Odour	-	APHA 23 <sup>rd</sup> Ed. 2012, 2130-B, 2-6	See 6 of Annexure-1	Agreeable
3	Temperature	°C	APHA 23 <sup>rd</sup> Ed. 2012, 2130-B, 2-13	Shall not exceed 5°C above the receiving water temperature	25.4
4	pH	-	APHA 23 <sup>rd</sup> Ed. 2012, 4500-H-H, 4-32	5.5 to 9.0	7.16
5	Total Residual Chlorine	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-Cl-G, 4-6	1.0	N.D.
6	Total Suspended Solids	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 2540-D, 2-66	100	40.8
7	Dissolved Phosphate (as P)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-P-G, 4-353	5.0	N.D.
8	Fluoride (as F)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-F-BAD, 4-84 & 8	2.0	N.D.
9	Lead (as Pb)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	0.1	N.D.
10	Zinc (as Zn)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	5.0	N.D.
11	Copper (as Cu)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	3.0	N.D.
12	Cadmium (as Cd)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	2.0	N.D.
13	Mercury (as Hg)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3112-B, 3-23	0.01	N.D.
14	Arsenic (as As)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.2	N.D.
15	Selenium (as Se)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.05	N.D.
16	Total Chromium (as Cr)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cr-B, 3-69	2.0	N.D.
17	Chemical Oxygen Demand (COD)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 5520-B, 5-17	250	62.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS 3025 (Part 44):1993, RA 2003	30	12.2
19	Oil & Grease	mg/L	IS 3025 (Part 39):1981, RA 2003,	10.0	N.D.
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	IS 3025 (Part 43):1992, RA 2003	1.0	N.D.

REMARKS: mg/lit. milligram per liter, N.D.-Not Detected.

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 \* This is for information as the party has asked for above mentioned.

 03/10/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  03/10/22 <b>AUTHORIZED SIGNATORY</b>
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End of the test report





HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

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Name & Address Of The Customer		REPORT NO	UES/TR/22-23/0358	
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/4, COAL MINE, VILLAGE - BANKHETA, POST MILUPARA, DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/W/0428	
		DATE OF SAMPLING	25/04/2022	
		DATE OF RECEIPT	26/04/2022	
		DATE OF REPORT	02/05/2022	
		DATE OF ANALYSIS	START: 26/04/2022	END: 02/05/2022
<b>SAMPLE DETAILS</b>				
SAMPLE TYPE	EFFLUENT WATER	ORDER / REFERENCE:	M/PO/RAV/2122/0045, JULY-2021	DTD. 24-
CUSTOMER SAMPLE ID	SUMP WATER PITCH "C"	SAMPLE CONDITION AT RECEIPT	OK	
PACKING OF SAMPLE	3 L X 1 NO. PPC CAN 1 L X 1 NO. PPC CAN 1 L X 1 NO. GLASS BOTTLE	SEALED	SAMPLE COLLECTED BY	CHHIBUD
SAMPLING PROCEDURE	IS:3025(PART 1):1987 RA 2003; APHA 22ND ED. 2012, 1000-B, 1-39	QUANTITY RECEIVED	5 LTR	

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-VI] PART-A INLAND SURFACE WATER	RESULT
1	Colour	Hazen	APHA 22 <sup>nd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	<1
2	Odour	-	APHA 22 <sup>nd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	Agreeable
3	Temperature	°C	APHA 22 <sup>nd</sup> Ed. 2012, 2130-B, 2-13	Shall not exceed 5°C above the receiving water temperature	26.4
4	pH	-	APHA 22 <sup>nd</sup> Ed. 2012, 4500-H-B, 4-92	5.5 to 9.0	7.36
5	Total Residual Chlorine	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 4500-CL-G, 4-69	1.0	N.D.
6	Total Suspended Solids	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 2540-D, 2-66	100	42.0
7	Dissolved Phosphate (as P)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 4500-P-C, 4-153	5.0	N.D.
8	Fluoride (as F)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 4500-F-B & D, 4-84 & 87	2.0	N.D.
9	Lead (as Pb)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18	0.1	N.D.
10	Zinc (as Zn)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18	5.0	N.D.
11	Copper (as Cu)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3111-B, 3-18	3.0	N.D.
12	Cadmium (as Cd)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3500-Cd, 3-105	2.0	N.D.
13	Mercury (as Hg)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3112-B, 3-23	0.01	N.D.
14	Arsenic (as As)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3114-C, 3-38	0.2	N.D.
15	Selenium (as Se)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3114-C, 3-38	0.05	N.D.
16	Total Chromium (as Cr)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 3500-Cr-B, 3-69	2.0	N.D.
17	Chemical Oxygen Demand (COD)	mg/L	APHA 22 <sup>nd</sup> Ed. 2012, 5520-B, 5-17	250	70.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS 3025 (Part 44):1993, RA 2003	30	9.4
19	Oil & Grease	mg/L	IS 3025 (Part 39):1991, RA 2003,	10.0	N.D.
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	IS 3025 (Part 43):1992, RA 2003	1.0	N.D.

REMARKS: mg/ltr.: milligram per liter, N.D.-Not Detected.

#### Terms & conditions

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- > This is for information as the party has asked for above test only.

 02/05/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  02/05/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----

AN ISO : 9001:2015 / ISO: 14001:2015 / ISO 45001:2018 CERTIFIED LABORATORY



HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

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<b>Home &amp; Address Of The Customer</b>		<b>REPORT NO</b>	UES/TR/22-23/0993	
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/4, COAL MINE, VILLAGE - BANKHETA, POST MILUPARA, DISTT. - RAIGARH (C.G.) 496107</b>		<b>LAB REF NO</b>	UES/22-23/W/01747	
		<b>DATE OF SAMPLING</b>	20/05/2022	
		<b>DATE OF RECEIPT</b>	21/05/2022	
		<b>DATE OF REPORT</b>	01/06/2022	
		<b>DATE OF ANALYSIS</b>	START:22/05/2022	END:27/05/2022
<b>SAMPLE DETAILS</b>				
<b>SAMPLE TYPE</b>	<b>EFFLUENT WATER</b>	<b>CHUNK /REFERENCE:</b>	<b>S/PO/SRV/1122/0045, JULY-2021</b>	<b>STD. 24-</b>
<b>CUSTOMER SAMPLE ID</b>	<b>RIMP WATER PATCH "C"</b>	<b>SAMPLE CONDITION AT RECEIPT</b>	OK	
<b>PACKING OF SAMPLE</b>	3 L X 1 NO. PVC CAN 1 L X 1 NO. PVC CAN 1 L X 1 NO. GLASS BOTTLE	<b>SEALED</b>	<b>SAMPLE COLLECTED BY</b>	<b>CHEMIST</b>
<b>SAMPLING PROCEDURE</b>	IS:3025 (PART 1):1997 RA 2003; APHA 22ND ED. 2012, 1060-B, 1-39	<b>QUANTITY RECEIVED</b>	± 10%	

<b>TEST REPORT</b>					
SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-VI] PART-A INLAND SURFACE WATER	RESULT
1	Colour	Hazen	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-1	3.5
2	Odour	-	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	Agreeable
3	Temperature	°C	APHA 23 <sup>rd</sup> Ed. 2012, 2130-B, 2-13	Shall not exceed 5°C above the receiving water temperature	25.2
4	pH	-	APHA 23 <sup>rd</sup> Ed. 2012, 4500-H <sup>-</sup> -B, 4-92	5.5 to 9.0	7.46
5	Total Residual Chlorine	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-Cl-G, 4-6	1.0	N.D.
6	Total Suspended Solids	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 2540-D, 2-66	100	38.0
7	Dissolved Phosphate (as P)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-P-C, 4-153	5.0	N.D.
8	Fluoride (as F)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-F-B&D, 4-84 & 8	2.0	N.D.
9	Lead (as Pb)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	0.1	N.D.
10	Zinc (as Zn)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	5.0	N.D.
11	Copper (as Cu)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	3.0	N.D.
12	Cadmium (as Cd)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cd, 3-105	2.0	N.D.
13	Mercury (as Hg)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3112-B, 3-23	0.01	N.D.
14	Arsenic (as As)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.2	N.D.
15	Selenium (as Se)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.05	N.D.
16	Total Chromium (as Cr)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cr-B, 3-69	2.0	N.D.
17	Chemical Oxygen Demand (COD)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 5520-B, 5-17	250	48.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS 3025 (Part 44):1993, RA 2003	30	3.8
19	Oil & Grease	mg/L	IS 3025 (Part 39):1991, RA 2003	10.0	N.D.
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	IS 3025 (Part 43):1992, RA 2003	1.0	N.D.

REMARKS: mg/lit. = milligram per liter, N.D.-Not Detected.

**Terms & conditions**

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- This is for information as the party has asked for above test only.

 <b>REVIEWED BY</b>		<b>For ULTIMATE ENVIROLYTICAL SOLUTIONS</b>  <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----

AN ISO : 9001:2015 / ISO: 14001:2015 / ISO 45001:2018 CERTIFIED LABORATORY





HDD-272, Phase III - Near JP Chowk  
 Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
 Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

Recognized by Ministry of Environment Forest and Climate Change under EP act 1986

<b>Name &amp; Address Of The Customer</b> <b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA,</b> <b>POST MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>	<b>REPORT NO</b>	UES/TR/22-23/01973	
	<b>LAB REF NO</b>	UES/22-23/W/02350	
	<b>DATE OF SAMPLING</b>	22/06/2022	
	<b>DATE OF RECEIPT</b>	23/06/2022	
	<b>DATE OF REPORT</b>	01/07/2022	
	<b>DATE OF ANALYSIS</b>	<b>START:</b> 23/06/2022	<b>END:</b> 30/06/2022
<b>SAMPLE DETAILS</b>			
<b>SAMPLE TYPE</b>	<b>EFFLUENT WATER</b>	<b>ORDER /REFERENCE:</b>	S/PO/20V/2122/0045, 070. 24. JULY-2021
<b>CUSTOMER SAMPLE ID</b>	ISEE WATER SATCM "C"	<b>SAMPLE CONDITION AT RECEIPT</b>	OK
<b>PACKING OF SAMPLE</b>	3 L X 3 NO. PVC CAN 1 L X 3 NO. PVC CAN 1 L X 1 NO. GLASS BOTTLE	<b>SELLER</b>	<b>SAMPLE COLLECTED BY</b>
<b>SAMPLING PROCEDURE</b>	IS: 3025 (PART 1): 1993, RA 2003; APHA 2290 ED. 2012, 1960-B, 1-29	<b>QUANTITY RECEIVED:</b>	0 LTR

<b>TEST REPORT</b>					
<b>SR. NO.</b>	<b>PARAMETER</b>	<b>UNIT</b>	<b>METHOD OF TEST</b>	<b>THE ENVIRONMENT (PROTECTION) RULES, 1986 (SCHEDULE-VI) PART-A INLAND SURFACE WATER</b>	<b>RESULT</b>
1	Colour	Hazen	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	4.5
2	Odour	-	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	Agreeable
3	Temperature	°C	APHA 23 <sup>rd</sup> Ed. 2012, 2130-B, 2-13	Shall not exceed 5°C above the receiving water temperature	25.6
4	pH	-	APHA 23 <sup>rd</sup> Ed. 2012, 4500-H <sup>+</sup> -B, 4-92	5.5 to 9.0	7.55
5	Total Residual Chlorine	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-Cl-G, 4-6	1.0	N.D.
6	Total Suspended Solids	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 2540-D, 2-66	100	32.0
7	Dissolved Phosphate (as P)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-P-C, 4-153	5.0	N.D.
8	Fluoride (as F)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-F-B45, 4-64 & 8	2.0	N.D.
9	Lead (as Pb)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	0.1	N.D.
10	Zinc (as Zn)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	5.0	N.D.
11	Copper (as Cu)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	3.0	N.D.
12	Cadmium (as Cd)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cd, 3-105	2.0	N.D.
13	Mercury (as Hg)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3112-B, 3-23	0.01	N.D.
14	Arsenic (as As)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.2	N.D.
15	Selenium (as Se)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.05	N.D.
16	Total Chromium (as Cr)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cr-B, 3-69	2.0	N.D.
17	Chemical Oxygen Demand (COD)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 5520-B, 5-17	250	96.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS 3025 (Part 4): 1993, RA 2003	30	3.4
19	Oil & Grease	mg/L	IS 3025 (Part 39): 1991, RA 2003,	10.0	N.D.
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	IS 3025 (Part 43): 1992, RA 2003	1.0	N.D.

REMARKS: mg/l. - milligram per liter, N.D.-Not Detected.

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- Test sample will be retained for 15 days after issue of test report. Retention period may be extended as per agreement with customer.
- This is for information as the party has asked for above.

 01/07/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS.  01/07/22 <b>AUTHORIZED SIGNATORY</b>
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End of the test report



HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

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Name & Address Of The Customer		REPORT NO	UES/TR/22-23/01808	
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA,</b> <b>POST MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/W/03644	
		DATE OF SAMPLING	25/07/2022	
		DATE OF RECEIPT	26/07/2022	
		DATE OF REPORT	01/08/2022	
		DATE OF ANALYSIS	START : 26/07/2022	END : 01/08/2022
<b>SAMPLE DETAILS</b>				
SAMPLE TYPE	EFFLUENT WATER	ORDER /REFERENCE	M/PO/SRV/EI/22/1043, 272-24- JULY-2021	
CUSTOMER SAMPLE ID	SEMP-WATER-PATCH "C"	SAMPLE CONDITION AT RECEIPT	OK	
PACKING OF SAMPLE	3 L X 1 NO. PVC CAN 1 L X 3 NO. PVC CAN 1 L X 1 NO. GLASS BOTTLE	SEALED	SAMPLE COLLECTED BY	CHUGGT
SAMPLING PROCEDURE	IS: 3025 (PART 1):1987 RA 2003, APHA 23RD ED.	QUANTITY RECEIVED	3 LTR	
	2012, 1040-B, 1-38			

<b>TEST REPORT</b>					
SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 (SCHEDULE-VI) PART-A INLAND SURFACE WATER	RESULT
1	Colour	Razen	APHA 23 <sup>RD</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	4.0
2	Odour	-	APHA 23 <sup>RD</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	Agreeable
3	Temperature	°C	APHA 23 <sup>RD</sup> Ed. 2012, 2120-B, 2-13	Shall not exceed 5°C above the receiving water temperature	25.2
4	pH	-	APHA 23 <sup>RD</sup> Ed. 2012, 4500-H <sup>-</sup> -B, 4-92	5.5 to 9.0	7.41
5	Total Residual Chlorine	mg/L	APHA 23 <sup>RD</sup> Ed. 2012, 4500-Cl-G, 4-6	1.0	N.D.
6	Total Suspended Solids	mg/L	APHA 23 <sup>RD</sup> Ed. 2012, 2540-D, 2-66	100	36.0
7	Dissolved Phosphate (as P)	mg/L	APHA 23 <sup>RD</sup> Ed. 2012, 4500-P-C, 4-153	5.0	N.D.
8	Fluoride (as F)	mg/L	APHA 23 <sup>RD</sup> Ed. 2012, 4500-F-B4D, 4-84 & B	2.0	N.D.
9	Lead (as Pb)	mg/L	APHA 23 <sup>RD</sup> Ed. 2012, 3111-B, 3-18	0.1	N.D.
10	Zinc (as Zn)	mg/L	APHA 23 <sup>RD</sup> Ed. 2012, 3111-B, 3-18	5.0	N.D.
11	Copper (as Cu)	mg/L	APHA 23 <sup>RD</sup> Ed. 2012, 3111-B, 3-18	3.0	N.D.
12	Cadmium (as Cd)	mg/L	APHA 23 <sup>RD</sup> Ed. 2012, 3500-Cd, 3-105	2.0	N.D.
13	Mercury (as Hg)	mg/L	APHA 23 <sup>RD</sup> Ed. 2012, 3112-B, 3-23	0.01	N.D.
14	Arsenic (as As)	mg/L	APHA 23 <sup>RD</sup> Ed. 2012, 3114-C, 3-38	0.2	N.D.
15	Selenium (as Se)	mg/L	APHA 23 <sup>RD</sup> Ed. 2012, 3114-C, 3-38	0.05	N.D.
16	Total Chromium (as Cr)	mg/L	APHA 23 <sup>RD</sup> Ed. 2012, 3500-Cr-B, 3-69	2.0	N.D.
17	Chemical Oxygen Demand (COD)	mg/L	APHA 23 <sup>RD</sup> Ed. 2012, 5520-B, 5-17	250	44.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS: 3025 (Part 44):1993, RA 2003	30	4.8
19	Oil & Grease	mg/L	IS: 3025 (Part 39):1991, RA 2003,	10.0	N.D.
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	IS: 3025 (Part 43):1992, RA 2003,	1.0	N.D.

REMARKS: mg/lit.: milligram per liter, N.D.-Not Detected.

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- > This is for information as the party has asked for above tests only.

 01/08/22 <b>REVIEWED BY</b>	 <b>For ULTIMATE ENVIROLYTICAL SOLUTIONS</b>  01/08/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----



HDD-272, Phase III - Near JP Chowk  
 Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
 Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

Name & Address Of The Customer		REPORT NO	UES/TR/22-23/02823	
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA,</b> <b>POST MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/W/07879	
		DATE OF SAMPLING	24/08/2022	
		DATE OF RECEIPT	25/08/2022	
		DATE OF REPORT	01/09/2022	
		DATE OF ANALYSIS	START:26/08/2022	END:01/09/2022
<b>SAMPLE DETAILS</b>				
SAMPLE TYPE	EFFLUENT WATER	ORDER /REFERENCE-	VERBAL COMMUNICATION.	
CUSTOMER SAMPLE ID	SUMP WATER FAYCU 'C'	SAMPLE CONDITION AT RECEIPT	OK	
PACKING OF SAMPLE	2 L X 2 NO. PVC CAN 1 L X 1 NO. PVC CAN 1 L X 1 NO. GLASS BOTTLE	ANALYS	SAMPLE COLLECTED BY	CLIENT
SAMPLING PROCEDURE	IS:3025 (PART II):1987 RA 2003; APHA 23RD ED. 2012, 1040-B, 1-18	QUANTITY RECEIVED	1.0L	

<b>TEST REPORT</b>					
SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-VI] PART-A INLAND SURFACE WATER	RESULT
1	Colour	Hazen	APHA 23 <sup>rd</sup> Ed. 2012, 213D-B, 2-6	See 6 of Annexure-1	3.0
2	Odour	-	APHA 23 <sup>rd</sup> Ed. 2012, 212D-B, 2-6	See 6 of Annexure-1	Agresable
3	Temperature	°C	APHA 23 <sup>rd</sup> Ed. 2012, 2130-B, 2-13	Shall not exceed 5°C above the receiving water temperature	24.6
4	pH	-	APHA 23 <sup>rd</sup> Ed. 2012, 4500-H <sup>-</sup> -B, 6-92	5.5 to 9.0	7.53
5	Total Residual Chlorine	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-Cl-G, 4-6	1.0	N.D.
6	Total Suspended Solids	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 2540-B, 2-66	100	32.0
7	Dissolved Phosphate (as P)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-P-C, 4-153	5.0	N.D.
8	Fluoride (as F)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-F-B4D, 4-84 & 8	2.0	N.D.
9	Lead (as Pb)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	0.1	N.D.
10	Zinc (as Zn)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	5.0	N.D.
11	Copper (as Cu)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	3.0	N.D.
12	Cadmium (as Cd)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cd, 3-105	2.0	N.D.
13	Mercury (as Hg)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3113-B, 3-23	0.01	N.D.
14	Arsenic (as As)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.2	N.D.
15	Selenium (as Se)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.05	N.D.
16	Total Chromium (as Cr)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cr-B, 3-69	2.0	N.D.
17	Chemical Oxygen Demand (COD)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 5520-B, 5-17	250	34.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS:3025 (Part 44):1993, RA 2003	30	4.8
19	Oil & Grease	mg/L	IS:3025 (Part 39):1991, RA 2003,	10.0	N.D.
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	IS:3025 (Part 43):1992, RA 2003	1.0	N.D.

REMARKS: mg/lit., milligram per liter. N.D.-Not Detected.

**Terms & conditions**

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- > Test sample will be retained for 10-days after issue of test report unless otherwise agreed with customer.
- > This is for information as the party has asked for above test only.

 01/09/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/09/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----





HDD-272, Phase III - Near JP Chowk  
 Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
 Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

FORM NO. : UES/PHM/09

<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA,</b> <b>POST MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		<b>REPORT NO</b> UES/TR/22-23/03283
		<b>LAB REF NO</b> UES/22-23/W/08503
		<b>DATE OF SAMPLING</b> 27/09/2022
		<b>DATE OF RECEIPT</b> 28/09/2022
		<b>DATE OF REPORT</b> 03/10/2022
		<b>DATE OF ANALYSIS</b> START:29/09/2022      END:03/10/2022
SAMPLE DETAILS		
<b>SAMPLE TYPE</b>	<b>EFFLUENT NAME</b>	<b>ORDER REFERENCE</b>
<b>CUSTOMER SAMPLE ID</b> HUMP KEEPER BATCH "C"		F.O.13552310211, DATED: 07.09.2022
<b>PACKING OF SAMPLE</b>	3 L X 1 NO. PVC CAN 1 L X 1 NO. PVC CAN 2 L X 1 NO. GLASS BOTTLE	<b>SAMPLE CONDITION AT RECEIPT</b> OK
<b>SAMPLING SPECIATION</b>	IS/2025(PART 1)/ENVY RA 2003, APHA 2300 ED. 2012, ISO-9001, 2-39	<b>SAMPLE COLLECTED BY</b> CHENGEZ
		<b>QUANTITY RECEIVED</b> 3 LTR

TEST REPORT					
SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-VI] PART-A INLAND SURFACE WATER	RESULT
1	Colour	Hazen	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	5.5
2	Odour	-	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	Agreeable
3	Temperature	°C	APHA 23 <sup>rd</sup> Ed. 2012, 2130-B, 2-13	shall not exceed 5°C above the receiving water temperature	29.6
4	pH	-	APHA 23 <sup>rd</sup> Ed. 2012, 4500-H-8, 4-92	5.5 to 9.0	7.22
5	Total Residual Chlorine	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-Cl-G, 4-5	1.0	N.D.
6	Total Suspended Solids	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 2540-D, 2-66	100	42.0
7	Dissolved Phosphate (as P)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-P-C, 4-153	5.0	N.D.
8	Fluoride (as F)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-F-BAD, 4-84 & 8	2.0	N.D.
9	Lead (as Pb)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	0.1	N.D.
10	Zinc (as Zn)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	5.0	N.D.
11	Copper (as Cu)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	3.0	N.D.
12	Cadmium (as Cd)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3112-B, 3-23	2.0	N.D.
13	Mercury (as Hg)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.01	N.D.
14	Arsenic (as As)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.2	N.D.
15	Selenium (as Se)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.05	N.D.
16	Total Chromium (as Cr)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cr-B, 3-69	2.0	N.D.
17	Chemical Oxygen Demand (COD)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 5520-B, 5-17	250	24.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS 3025 (Part 4):1993, PA 2003	30	6.2
19	Oil & Grease	mg/L	IS 3025 (Part 39):1991, PA 2003,	10.0	N.D.
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	IS 3025 (Part 43):1992, PA 2003	1.0	N.D.

REMARKS: mg/lit. - milligram per liter, N.D. - Not Detected.

**Terms & conditions**

- The report for publication, arbitration or as legal evidence is forbidden.
- Test sample will be returned for 15 days after issue of test report unless otherwise agreed with customer.
- This is for information as the party has asked for about health/safety.

 03/10/22 <b>REVIEWED BY</b>	 <b>For ULTIMATE ENVIROLYTICAL SOLUTIONS</b>	 03/10/22 <b>AUTHORIZED SIGNATORY</b>
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End of the test report



# Annexure-21

**Ground Water Level Monitoring Report in and around the Coal Mine Area  
(From Apr 2022 to Jun 2022)**

Sr. No.	Location	Types of Structure	In Meters		
			Ground Water level (BGL) Apr 2022	Ground Water level (BGL) May 2022	Ground Water level (BGL) Jun 2022
1	Bankheta (Near HIL Office)	Borewell/ AWLR	12.64	12.99	13.33
2	Banjikhoh (Near Office)	Borewell/ AWLR	25.17	25.30	25.36
3	Milupara (Near Office)	Borewell/ AWLR	12.81	13.28	13.63
4	HIL Staff Quarter	Borewell/ AWLR	8.26	8.80	9.04
5	Milupara Village (PHC-HIL)	Dugwell	7.26	6.14	6.00
6	Sakta Village (Near Primary School)	Dugwell	5.28	3.59	3.50
7	Sidarpara Village (Near Primary School)	Dugwell	12.80	9.58	9.37
8	Bejor Village	Dugwell	8.76	7.18	7.34

**Ground Water Level Monitoring Report in and around the Coal Mine Area  
(From Jul 2022 to Sep 2022)**

Sr. No.	Location	Types of Structure	In Meters		
			Ground Water level (BGL) Jul 2022	Ground Water level (BGL) Aug 2022	Ground Water level (BGL) Sep 2022
1	Bankheta (Near HIL Office)	Borewell/ AWLR	11.51	7.11	6.62
2	Banjikhoh (Near Office)	Borewell/ AWLR	25.55	25.55	25.59
3	Milupara (Near Office)	Borewell/ AWLR	11.55	9.05	8.34
4	HIL Staff Quarter	Borewell/ AWLR	7.45	4.67	4.18
5	Milupara Village (PHC-HIL)	Dugwell	3.31	1.32	0.27
6	Sakta Village (Near Primary School)	Dugwell	4.44	1.43	1.40
7	Sidarpara Village (Near Primary School)	Dugwell	5.44	3.62	3.28
8	Beljor Village	Dugwell	6.30	3.17	3.06



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<b>Name &amp; Address Of The Customer</b> <b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA,</b> <b>POST -MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107.</b>	<b>REPORT NO</b>	UES/TR/22-23/01006	
	<b>LAB REF NO</b>	UES/22-23/W/01769	
	<b>DATE OF SAMPLING</b>	20/05/2022	
	<b>DATE OF RECEIPT</b>	21/05/2022	
	<b>DATE OF REPORT</b>	01/06/2022	
	<b>DATE OF ANALYSIS</b>	START: 22/05/2022	END: 31/05/2022
<b>SAMPLE DETAILS</b>			
<b>SAMPLE TYPE</b>	GROUND WATER	<b>ORDER /REFERENCE:</b>	N/PO/SKV/2122/0045, DTD. 24-JULY-2021
<b>CUSTOMER SAMPLE ID</b>	BANKHETA MINE (PIEZOMETER) AWLR	<b>SAMPLE CONDITION AT RECEIPT</b>	OK
<b>PACKING OF SAMPLE</b>	3 X 1 NO. PVC CAN 1 X 1 NO. PVC CAN 1 X 1 NO. GLASS BOTTLE	<b>SAMPLE COLLECTED BY</b>	CHEMIST
<b>SAMPLING PROCEDURE</b>	IS: 3025 (PART I): 1987 RA 2003; APHA 22ND ED. 2012, 1060-B, 1-39	<b>QUANTITY RECEIVED</b>	5 LTR

Report No. 01006

<b>TEST REPORT</b>						
SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible Limit	
1	Colour	Hazen	IS:3025:(Part-4)	5	15	<1
2	Odour	-	IS 3025(part-5)	Agreeable	Agreeable	Agreeable
3	Taste	-	IS 3025(part-8)	Agreeable	Agreeable	Agreeable
4	pH	-	APHA 23 <sup>rd</sup> Ed.2012,4500-H <sup>+</sup> -B, 4-92	6.5-8.5	NoRelaxation	7.59
5	Turbidity	NTU	APHA 23 <sup>rd</sup> Ed.2012,2130-B,2-13	1	5	1.68
6	Electrical Conductivity	µS/cm	IS 3025(part-14):1984, RA 2013	-	-	162.0
7	Residual Chlorine	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-Cl-G, 4-69	0.2	1	N.D.
8	Total Solid	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,2540- B, 2-64	-	-	102.9
9	Total Dissolved Solids	mg/Lit	IS 3025(part-16):1984, RA 2006	500	2000	98.1
10	Total Suspended Solids	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,2540- D, 2-66	-	-	4.8
11	Alkalinity Total (as CaCO <sub>3</sub> )	mg/Lit	IS 3025(part-23):1986, RA 2003	200	600	44.0
12	Total Hardness ( as CaCO <sub>3</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,2340-C, 2-44,45	200	600	52.0
13	Calcium Hardness (as CaCO <sub>3</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Ca-B, 3-67	-	-	38.0
14	Magnesium Hardness (as CaCO <sub>3</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Mg-B, 3-84	-	-	14.0
15	Calcium (as Ca)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Ca-B, 3-67	75	200	15.2
16	Magnesium (as Mg)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Mg-B, 3-84	30	100	3.4
17	Chloride (as Cl)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-Cl-B, 4-72	250	1000	16.9
18	Sulphate (as SO <sub>4</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-SO <sub>4</sub> -E, 4-190	200	400	18.4
19	Nitrate (as NO <sub>3</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-NO <sub>3</sub> -B, 4-122	45	NoRelaxation	0.48
20	Phosphate (as P)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-P-C, 4-153	-	-	N.D.
21	Sodium (as Na)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Na-B, 3-97	-	-	19.4
22	Potassium (as K)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-K-B, 3-	-	-	1.52





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Report No.01006

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	
			87			
23	Boron (as B)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-B-B, 4-25	0.5	1.0	N.D.
24	Iron (as Fe)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3111-B,3-18	0.3	NoRelaxation	N.D.
25	Fluoride (as F)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-F-B & D, 4-84 & 87	1	1.5	0.16
26	Manganese (as Mn)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	0.1	0.3	N.D.
27	Lead (as Pb)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	0.01	NoRelaxation	N.D.
28	Nickel (as Ni)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Ni, 3-108	0.02	No Relaxation	N.D.
29	Zinc (as Zn)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	5	15	N.D.
30	Copper (as Cu)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	0.05	1.5	N.D.
31	Cadmium (as Cd)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Cd, 3-105	0.003	NoRelaxation	N.D.
32	Mercury (as Hg)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3112-B, 3-23	0.001	NoRelaxation	N.D.
33	Arsenic (as As)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3114-C, 3-38	0.01	0.05	N.D.
34	Selenium (as Se)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3114-C, 3-38	0.01	NoRelaxation	N.D.
35	Chromium (as Cr)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Cr-B, 3-69	0.05	NoRelaxation	N.D.
36	Anionic Detergent (as MBAS)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,5540-C, 5-53	0.2	1.0	N.D.
37	Phenolic Compound (as C <sub>6</sub> H <sub>5</sub> OH)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,5540-B & C, 5-47	0.001	0.002	N.D.
38	Poly-nuclear Aromatic Hydrocarbon (PAH)	µg/Lit	APHA 23 <sup>rd</sup> Ed.2012,6440-6-93	0.0001	NoRelaxation	N.D.
39	Mineral Oil	mg/Lit	IS 3025 (part-39) : 1991, RA 2003	0.5	No Relaxation	N.D.
40	Oil & Grease	mg/Lit	IS 3025 (Part 39):1991, RA 2003	-	-	N.D.
<b>Microbiological Analysis</b>						
1	Total Coliforms	MPN/100 ML	IS:1622:1981: RA:2019	Shall not be detectable in any 100 ml sample		Absent
2	Faecal Coliform	MPN/100ml	IS:1622:1981: RA:2019	Shall not be detectable in any 100 ml sample		Absent
3	E. Coll	MPN/100ml	IS:1622:1981:RA:2019	Shall not be detectable in any 100ml sample		Absent
<b>Pesticides</b>						
1	p,p DDT	µg/L	US EPA 508-1995	1		N.D.
2	o,p DDT	µg/L	US EPA 508-1995	1		N.D.
3	p,pDDE	µg/L	US EPA 508-1995	1		N.D.
4	p,p DDD	µg/L	US EPA 508-1995	1		N.D.
5	O,p DDD	µg/L	US EPA 508-1995	1		N.D.
6	Gamma-HCH (Lindane)	µg/L	US EPA 508-1995	2		N.D.
7	Alpha-HCH	µg/L	US EPA 508-1995	0.01		N.D.
8	Beta-HCH	µg/L	US EPA 508-1995	0.04		N.D.



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Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

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Report No. 01006

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible Limit	
9	Delta HCH	µg/L	US EPA 508-1995	0.04		N.D.
10	Alpha-Endosulfan	µg/L	US EPA 508-1995	0.4		N.D.
11	Beta-Endosulfan	µg/L	US EPA 508-1995	0.4		N.D.
12	Endosulfansulphate	µg/L	US EPA 508-1995	0.4		N.D.
13	Monocrotophos	µg/L	US EPA 8141A-1994	1		N.D.
14	Ethion	µg/L	US EPA 8141A-1994	3		N.D.
15	Chloropyrifos	µg/L	US EPA 8141A-1994	30		N.D.
16	Phorate	µg/L	US EPA 8141A-1994	2		N.D.
17	Phoratesulphoxide	µg/L	US EPA 8141A-1994	-		N.D.
18	Phoratesulphone	µg/L	US EPA 8141A-1994	-		N.D.
19	2,4-D	µg/L	US EPA 515.1-1995	30		N.D.
20	Alachlor	µg/L	US EPA 508-1995	20		N.D.
21	Atrazine	µg/L	US EPA 532-2000	2		N.D.
22	Methyl parathion	µg/L	US EPA 8141A-1994	0.3		N.D.
23	Methyl paraxone	µg/L	US EPA 8141A-1994	-		N.D.
24	Malathion	µg/L	US EPA 8141A-1994	190		N.D.
25	Malaoxon	µg/L	US EPA 8141A-1994	-		N.D.
26	Aldrin	µg/L	US EPA 508-1995	0.03		N.D.
27	Dieldrin	µg/L	US EPA 508-1995	0.03		N.D.

Note: mg/Lt: milligram per liter, N.D.: Not Detected.

#### REMARKS: RESULTS ARE AS ABOVE

#### Terms & conditions

- > The report for publication, arbitration or as legal dispute is forbidden.
- > Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.
- > This is for information as the party has asked for above test(s) only.

 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----



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Name & Address Of The Customer		REPORT NO	UES/TR/22-23/01007	
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA,</b> <b>POST -MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107.</b>		LAB REF NO	UES/22-23/W/01770	
		DATE OF SAMPLING	20/05/2022	
		DATE OF RECEIPT	21/05/2022	
		DATE OF REPORT	01/06/2022	
		DATE OF ANALYSIS	START:22/05/2022	END:31/05/2022
<b>SAMPLE DETAILS</b>				
SAMPLE TYPE	GROUND WATER		ORDER /REFERENCE:	N/PO/SRV/2122/0045, DTD. 24-JULY-2021
CUSTOMER SAMPLE ID	BANKHOLA MINE (PIEZOMETER) AWLR		SAMPLE CONDITION AT RECEIPT	OK
PACKING OF SAMPLE	3 L X 1 NO. PVC CAN 1 L X 1 NO. PVC CAN 1 L X 1 NO. GLASS BOTTLE	SEALED	SAMPLE COLLECTED BY	CHEMIST
SAMPLING PROCEDURE	IS:3025 (PART I):1987 RA 2003; APHA 22ND ED. 2012, 1060-B,1-39		QUANTITY RECEIVED	5 LTR

Report No.01007

<b>TEST REPORT</b>						
SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	
1	Colour	Hazen	IS:3025:(Part-4)	5	15	<1
2	Odour	-	IS 3025(part-5)	Agreeable	Agreeable	Agreeable
3	Taste	-	IS 3025(part-8)	Agreeable	Agreeable	Agreeable
4	pH	-	APHA 23 <sup>rd</sup> Ed.2012,4500-H <sup>+</sup> -B, 4-92	6.5-8.5	NoRelaxation	6.94
5	Turbidity	NTU	APHA 23 <sup>rd</sup> Ed.2012,2130-B,2-13	1	5	2.0
6	Electrical Conductivity	µS/cm	IS 3025(part-14):1984, RA 2013	-	-	186.4
7	Residual Chlorine	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-Cl-G, 4-69	0.2	1	N.D.
8	Total Solid	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,2540- B, 2-64	-	-	116.7
9	Total Dissolved Solids	mg/Lit	IS 3025(part-16):1984, RA 2006	500	2000	112.9
10	Total Suspended Solids	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,2540- D, 2-66	-	-	3.8
11	Alkalinity Total (as CaCO <sub>3</sub> )	mg/Lit	IS 3025(part-23):1986, RA 2003	200	600	56.0
12	Total Hardness ( as CaCO <sub>3</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,2340-C, 2-44,45	200	600	88.0
13	Calcium Hardness (as CaCO <sub>3</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Ca-B, 3-67	-	-	44.0
14	Magnesium Hardness (as CaCO <sub>3</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Mg-B, 3-84	-	-	44.0
15	Calcium (as Ca)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Ca-B, 3-67	75	200	17.6
16	Magnesium (as Mg)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Mg-B, 3-84	30	100	10.6
17	Chloride (as Cl)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-Cl-B, 4-72	250	1000	29.9
18	Sulphate (as SO <sub>4</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-SO <sub>4</sub> -E, 4-190	200	400	34.8
19	Nitrate (as NO <sub>3</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-NO <sub>3</sub> -B, 4-122	45	NoRelaxation	2.6
20	Phosphate (as P)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-P-C, 4-153	-	-	N.D.



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Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

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Report No.01807

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	
21	Sodium (as Na)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Na-B, 3-97	-	-	8.8
22	Potassium (as K)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-K-B, 3-87	-	-	0.26
23	Boron (as B)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-B-B, 4-25	0.5	1.0	N.D.
24	Iron (as Fe)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3111-B,3-18	0.3	NoRelaxation	N.D.
25	Fluoride (as F)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-F-B &D, 4-84 & 87	1	1.5	N.D.
26	Manganese (as Mn)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	0.1	0.3	N.D.
27	Lead (as Pb)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	0.01	NoRelaxation	N.D.
28	Nickel (as Ni)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Ni, 3-108	0.02	No Relaxation	N.D.
29	Zinc (as Zn)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	5	15	N.D.
30	Copper (as Cu)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	0.05	1.5	N.D.
31	Cadmium (as Cd)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Cd, 3-105	0.003	NoRelaxation	N.D.
32	Mercury (as Hg)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3112-B, 3-23	0.001	NoRelaxation	N.D.
33	Arsenic (as As)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3114-C, 3-38	0.01	0.05	N.D.
34	Selenium (as Se)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3114-C, 3-38	0.01	NoRelaxation	N.D.
35	Chromium (as Cr)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Cr-B, 3-69	0.05	NoRelaxation	N.D.
36	Anionic Detergent (as MBAS)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,5540-C, 5-53	0.2	1.0	N.D.
37	Phenolic Compound (as C <sub>6</sub> H <sub>5</sub> OH)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,5540-B & C, 5-47	0.001	0.002	N.D.
38	Poly-nuclear Aromatic Hydrocarbon (PAH)	µg/Lit	APHA 23 <sup>rd</sup> Ed.2012,6440-6-93	0.0001	NoRelaxation	N.D.
39	Mineral Oil	mg/Lit	IS 3025 (part-39) : 1991, RA 2003	0.5	No Relaxation	N.D.
40	Oil & Grease	mg/Lit	IS 3025 (Part 39):1991, RA 2003	-	-	N.D.
<b>Microbiological Analysis</b>						
1	Total Coliforms	MPN/100 ML	IS:1622:1981: RA:2019	Shall not be detectable in any 100 ml sample		Absent
2	Faecal Coliform	MPN/100ml	IS:1622:1981: RA:2019	Shall not be detectable in any 100 ml sample		Absent
3	E. Coli	MPN/100ml	IS:1622:1981:RA:2019	Shall not be detectable in any 100ml sample		Absent
<b>Pesticides</b>						
1	p,p DDT	µg/L	US EPA 508-1995	1		N.D.
2	o,p DDT	µg/L	US EPA 508-1995	1		N.D.
3	p,pDDE	µg/L	US EPA 508-1995	1		N.D.
4	p,p DDD	µg/L	US EPA 508-1995	1		N.D.
5	O,p DDD	µg/L	US EPA 508-1995	1		N.D.
6	Gamma-HCH (Lindane)	µg/L	US EPA 508-1995	2		N.D.
7	Alpha-HCH	µg/L	US EPA 508-1995	0.01		N.D.





**Ultimate**  
ENVIROLYTICAL SOLUTIONS

HDD-272, Phase III - Near JP Chowk  
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Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

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Report No. 01007

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	
8	Beta-HCH	µg/L	US EPA 508-1995	0.04		N.D.
9	Delta HCH	µg/L	US EPA 508-1995	0.04		N.D.
10	Alpha-Endosulfan	µg/L	US EPA 508-1995	0.4		N.D.
11	Beta-Endosulfan	µg/L	US EPA 508-1995	0.4		N.D.
12	Endosulfansulphate	µg/L	US EPA 508-1995	0.4		N.D.
13	Monocrotophos	µg/L	US EPA 8141A-1994	1		N.D.
14	Ethion	µg/L	US EPA 8141A-1994	3		N.D.
15	Chloropyrifos	µg/L	US EPA 8141A-1994	30		N.D.
16	Phorate	µg/L	US EPA 8141A-1994	2		N.D.
17	Phoratesulphoxide	µg/L	US EPA 8141A-1994	-		N.D.
18	Phoratesulphone	µg/L	US EPA 8141A-1994	-		N.D.
19	2,4-D	µg/L	US EPA 515.1-1995	30		N.D.
20	Alachlor	µg/L	US EPA 508-1995	20		N.D.
21	Atrazine	µg/L	US EPA 532-2000	2		N.D.
22	Methyl parathion	µg/L	US EPA 8141A-1994	0.3		N.D.
23	Methyl paraxone	µg/L	US EPA 8141A-1994	-		N.D.
24	Malathion	µg/L	US EPA 8141A-1994	190		N.D.
25	Malaoxon	µg/L	US EPA 8141A-1994	-		N.D.
26	Aldrin	µg/L	US EPA 508-1995	0.03		N.D.
27	Dieldrin	µg/L	US EPA 508-1995	0.03		N.D.

Note: mg/lit.: milligram per liter, N.D.- Not Detected.

**REMARKS: RESULTS ARE AS ABOVE**

#### Terms & conditions

- > The report for publication, arbitration or as legal dispute is forbidden.
- > Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.
- > This is for information as the party has asked for above test(s) only.

 01/06/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/06/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----



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Name & Address Of The Customer		REPORT NO	UES/TR/22-23/01130	
TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/5, MILUPARA U/G COAL NINE, VILLAGE - MILUPARA, BLOCK-TANNAR, DISTT. - RAIGARH (C.G.) 498107		LAB REF NO	UES/22-23/W/01144	
		DATE OF SAMPLING	22/05/2022	
		DATE OF RECEIPT	23/05/2022	
		DATE OF REPORT	01/06/2022	
		DATE OF ANALYSIS	START: 23/05/2022	END: 31/05/2022
<b>SAMPLE DETAILS</b>				
SAMPLE TYPE	GROUND WATER		ORDER /REFERENCE:	M/PO/SRV/2122/0049, DTD. 24-JULY-2021
CUSTOMER SAMPLE ID	NEAR MILUPARA MINES OFFICE PIEZOMETER -AWLR		SAMPLE CONDITION AT RECEIPT	OK
PACKING OF SAMPLE	3 L X 1 NO. PVC CAN 1 L X 1 NO. PVC CAN 1 L X 1 NO. GLASS BOTTLE	SEALED	SAMPLE COLLECTED BY	CHEMIST
SAMPLING PROCEDURE	IS:3025(PART 1):1987 RA 2003; APHA 22ND ED. 2012, 1060-B, 1-39		QUANTITY RECEIVED	5 LTR

REPORT NO. 01130

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	
1	Colour	Hazen	IS:3025:(Part-4)	5	15	<1
2	Odour	-	IS 3025(part-5)	Agreeable	Agreeable	Agreeable
3	Taste	-	IS 3025(part-8)	Agreeable	Agreeable	Agreeable
4	pH	-	APHA 22 <sup>nd</sup> Ed.2012,4500-H <sup>+</sup> -B, 4-92	6.5-8.5	No Relaxation	6.75
5	Turbidity	NTU	APHA 22 <sup>nd</sup> Ed.2012,2130-B,2-13	1	5	2.3
6	Electrical Conductivity	µS/cm	IS 3025(part-14):1984, RA 2013	-	-	186.0
7	Residual Chlorine	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-Cl-G,4 - 69	0.2	1	N.D.
8	Total Solid	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,2540- B, 2- 64	-	-	125.1
9	Total Dissolved Solids	mg/Lit	IS 3025(part-16):1984, RA 2006	500	2000	122.2
10	Total Suspended Solids	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,2540- D, 2- 66	-	-	8.2
11	Alkalinity Total (as CaCO <sub>3</sub> )	mg/Lit	IS 3025(part-23):1986, RA 2003	200	600	31.0
12	Total Hardness (as CaCO <sub>3</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,2340-C, 2- 44,45	200	600	66.0
13	Calcium Hardness (as CaCO <sub>3</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Ca-B, 3-67	-	-	35.0
14	Magnesium Hardness (as CaCO <sub>3</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Mg-B, 3-84	-	-	29.0
15	Calcium (as Ca)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Ca-B, 3-67	75	200	14.1
16	Magnesium (as Mg)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Mg-B, 3-84	30	100	6.9
17	Chloride (as Cl)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-Cl-B, 4-72	250	1000	12.6
18	Sulphate (as SO <sub>4</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-SO <sub>4</sub> - E,4-190	200	400	13.1
19	Nitrate (as NO <sub>3</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-NO <sub>3</sub> -B, 4-122	45	No Relaxation	2.6

AN ISO : 9001:2015 / ISO: 14001:2015 / ISO 45001:2018 CERTIFIED LABORATORY



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Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

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REPORT NO. 01130

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	
20	Phosphate (as P)	mg/Lit	APHA 22nd Ed.2012,4500-P-C, 4-153	-	-	N.D.
20	Sodium (as Na)	mg/Lit	APHA 22ndEd.2012,3500-Na-B, 3-97	-	-	7.8
21	Potassium (as K)	mg/Lit	APHA 22nd Ed.2012,3500-K-B, 3-87	-	-	0.29
22	Boron (as B)	mg/Lit	APHA 22nd Ed.2012,4500-B-B, 4-25	0.5	1.0	N.D.
23	Iron (as Fe)	mg/Lit	APHA 22nd Ed.2012,3111-B,3-18	0.3	No Relaxation	N.D.
24	Fluoride (as F)	mg/Lit	APHA 22nd Ed.2012,4500-F-B &D, 4-84 & 87	1	1.5	0.07
25	Manganese (as Mn)	mg/Lit	APHA 22nd Ed.2012,3111-B, 3-18	0.1	0.3	N.D.
26	Lead (as Pb)	mg/Lit	APHA 22nd Ed.2012,3111-B, 3-18	0.01	No Relaxation	N.D.
27	Nickel (as Ni)	mg/Lit	APHA 22nd Ed.2012,3500-NI, 3-108	0.02	No Relaxation	N.D.
28	Zinc (as Zn)	mg/Lit	APHA 22nd Ed.2012,3111-B, 3-18	5	15	N.D.
29	Copper (as Cu)	mg/Lit	APHA 22nd Ed.2012,3111-B, 3-18	0.05	1.5	N.D.
30	Cadmium (as Cd)	mg/Lit	APHA 22nd Ed.2012,3500-Cd,3-105	0.003	No Relaxation	N.D.
31	Mercury (as Hg)	mg/Lit	APHA 22nd Ed.2012,3112-B, 3-23	0.001	No Relaxation	N.D.
32	Arsenic (as As)	mg/Lit	APHA 22nd Ed.2012,3114-C, 3-38	0.01	0.05	N.D.
33	Selenium (as Se)	mg/Lit	APHA 22nd Ed.2012,3114-C, 3-38	0.01	No Relaxation	N.D.
34	Chromium (as Cr)	mg/Lit	APHA 22nd Ed.2012,3500-Cr-B, 3-69	0.05	No Relaxation	N.D.
35	Anionic Detergent (as MBAS)	mg/Lit	APHA 22nd Ed.2012,5540-C, 5-53	0.2	1.0	N.D.
36	Phenolic Compound (as C <sub>6</sub> H <sub>5</sub> OH)	mg/Lit	APHA 22nd Ed.2012,5540-B & C, 5-47	0.001	0.002	N.D.
37	Poly-nuclear Aromatic Hydrocarbon (PAH)	µg/Lit	APHA 22nd Ed.2012,6440-6-93	0.0001	No Relaxation	N.D.
38	Mineral Oil	mg/Lit	IS 3025 (part-39) : 1991, RA 2003	0.5	No Relaxation	N.D.
39	Oil & Grease	mg/Lit	IS 3025 (Part 39):1991, RA 2003	-	-	N.D.
<b>Microbiological Analysis</b>						
1	Total Coliforms	MPN/100 ML	IS:1622:1981: RA:2019	Shall not be detectable in any 100 ml sample		Absent
2	Faecal coliform	MPN/100ml	IS:1622:1981: RA:2019	Shall not be detectable in any 100 ml sample		Absent
3	E. Coll	MPN/100ml	IS:1622:1981:RA:2019	Shall not be detectable in any 100ml sample		Absent
<b>Pesticides</b>						
1	p,p DDT	µg/L	US EPA 508-1995	1		N.D.
2	o,p DDT	µg/L	US EPA 508-1995	1		N.D.
3	p,pDDE	µg/L	US EPA 508-1995	1		N.D.



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Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

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REPORT NO. 01130

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	
4	p,p DDD	µg/L	US EPA 508-1995		1	N.D.
5	O,p DDD	µg/L	US EPA 508-1995		1	N.D.
6	Gamma-HCH (Lindane)	µg/L	US EPA 508-1995		2	N.D.
7	Alpha-HCH	µg/L	US EPA 508-1995		0.01	N.D.
8	Beta-HCH	µg/L	US EPA 508-1995		0.04	N.D.
9	Delta HCH	µg/L	US EPA 508-1995		0.04	N.D.
10	Alpha-Endosulfan	µg/L	US EPA 508-1995		0.4	N.D.
11	Beta-Endosulfan	µg/L	US EPA 508-1995		0.4	N.D.
12	Endosulfansulphate	µg/L	US EPA 508-1995		0.4	N.D.
13	Monocrotophos	µg/L	US EPA 8141A-1994		1	N.D.
14	Ethion	µg/L	US EPA 8141A-1994		3	N.D.
15	Chloropyrifos	µg/L	US EPA 8141A-1994		30	N.D.
16	Phorate	µg/L	US EPA 8141A-1994		2	N.D.
17	Phoratesulphoxide	µg/L	US EPA 8141A-1994		-	N.D.
18	Phoratesulphone	µg/L	US EPA 8141A-1994		-	N.D.
19	2,4-D	µg/L	US EPA 515.1-1995		30	N.D.
20	Alachlor	µg/L	US EPA 508-1995		20	N.D.
21	Atrazine	µg/L	US EPA 532-2000		2	N.D.
22	Methyl parathion	µg/L	US EPA 8141A-1994		0.3	N.D.
23	Methyl paraxone	µg/L	US EPA 8141A-1994		-	N.D.
24	Malathion	µg/L	US EPA 8141A-1994		190	N.D.
25	Malaoxon	µg/L	US EPA 8141A-1994		-	N.D.
26	Aldrin	µg/L	US EPA 508-1995		0.03	N.D.
27	Dieldrin	µg/L	US EPA 508-1995		0.03	N.D.

Note: µg/Lit.: milligram per liter, N.D. - Not Detected

#### REMARKS: RESULTS ARE AS ABOVE

##### Terms & conditions

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- This is for information as the party has asked for above test(s) only

 01/06/22		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/06/22
<b>REVIEWED BY</b>		<b>AUTHORIZED SIGNATORY</b>

-----End of the test report-----





HDD-272, Phase III - Near JP Chowk  
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Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

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<b>Name &amp; Address Of The Customer</b> <b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/5, MILUPARA</b> <b>U/G COAL MINE,VILLAGE - MILUPARA,</b> <b>BLOCK-TAMNAR,</b> <b>DISTT. - RAIGARH (C.G.) 498107</b>		<b>REPORT NO</b>	UES/TR/22-23/01129	
		<b>LAB REF NO</b>	UES/22-23/W/01143	
		<b>DATE OF SAMPLING</b>	22/05/2022	
		<b>DATE OF RECEIPT</b>	23/05/2022	
		<b>DATE OF REPORT</b>	01/06/2022	
		<b>DATE OF ANALYSIS</b>	<b>START: 23/05/2022</b>	<b>END: 31/05/2022</b>
<b>SAMPLE DETAILS</b>				
<b>SAMPLE TYPE</b>	GROUND WATER		<b>ORDER /REFERENCE:</b>	M/PO/SRV/2122/0049, ETD. 24-JULY-2021
<b>CUSTOMER SAMPLE ID</b>	STAFF QUARTER-RANJIKHOL PIEZOMETER (ANLR)		<b>SAMPLE CONDITION AT RECEIPT</b>	OK
<b>PACKING OF SAMPLE</b>	3 L X 1 NO. PVC CAN 1 L X 1 NO. PVC CAN 1 L X 1 NO. GLASS BOTTLE	SEALED	<b>SAMPLE COLLECTED BY</b>	CHEMIST
<b>SAMPLING PROCEDURE</b>	IS:3025 (PART I):1987 RA 2003; APHA 22ND ED. 2012, 1060-B, 1-39		<b>QUANTITY RECEIVED</b>	5 LTR

REPORT NO. 01129

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	ACCEPTABLE LIMIT FOR DRINKING WATER (IS 10500:2012)		RESULT
				Acceptable Limit	Permissible limit	
1	Colour	Hazen	IS:3025:(Part-4)	5	15	<1
2	Odour	-	IS 3025:(part-5)	Agreeable	Agreeable	Agreeable
3	Taste	-	IS 3025:(part-8)	Agreeable	Agreeable	Agreeable
4	pH	-	APHA 22 <sup>nd</sup> Ed.2012,4500-H <sup>+</sup> -B, 4-92	6.5-8.5	No Relaxation	6.65
5	Turbidity	NTU	APHA 22 <sup>nd</sup> Ed.2012,2130-B,2-13	1	5	0.95
6	Electrical Conductivity	µS/cm	IS 3025(part-14):1984, RA 2013	-	-	230.5
7	Residual Chlorine	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-Cl-G, 4-69	0.2	1	N.D.
8	Total Solid	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,2540- B, 2-64	-	-	132.0
9	Total Dissolved Solids	mg/Lit	IS 3025(part-16):1984, RA 2006	500	2000	155.9
10	Total Suspended Solids	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,2540- D, 2-66	-	-	13.1
11	Alkalinity Total (as CaCO <sub>3</sub> )	mg/Lit	IS 3025(part-23):1986, RA 2003	200	600	40.2
12	Total Hardness ( as CaCO <sub>3</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,2340-C, 2-44,45	200	600	85.0
13	Calcium Hardness (as CaCO <sub>3</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Ca-B, 3-67	-	-	55.0
14	Magnesium Hardness (as CaCO <sub>3</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Mg-B, 3-84	-	-	34.0
15	Calcium (as Ca)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Ca-B, 3-67	75	200	23.0
16	Magnesium (as Mg)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Mg-B, 3-84	30	100	9.68
17	Chloride (as Cl)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-Cl-B, 4-72	250	1000	32.4
18	Sulphate (as SO <sub>4</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-SO <sub>4</sub> -E,4-190	200	400	23.4
19	Nitrate (as NO <sub>3</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-NO <sub>3</sub> -B,4-122	45	No Relaxation	0.66
20	Phosphate (as P)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-P-C, 4-153	-	-	N.D.



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REPORT NO. 01129

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	ACCEPTABLE LIMIT FOR DRINKING WATER (IS 10500:2012)		RESULT
				Acceptable Limit	Permissible limit	
21	Sodium (as Na)	mg/Lit	APHA 22nd Ed.2012,3500-Na-B, 3-97	-	-	5.1
22	Potassium (as K)	mg/Lit	APHA 22nd Ed.2012,3500-K-B, 3-87	-	-	2.2
23	Boron (as B)	mg/Lit	APHA 22nd Ed.2012,4500-B-B, 4-25	0.5	1.0	N.D.
24	Iron (as Fe)	mg/Lit	APHA 22nd Ed.2012,3111-B,3-18	0.3	No Relaxation	N.D.
25	Fluoride (as F)	mg/Lit	APHA 22nd Ed.2012,4500-F-B & D, 4-84 & 87	1	1.5	0.11
26	Manganese (as Mn)	mg/Lit	APHA 22nd Ed.2012,3111-B, 3-18	0.1	0.3	N.D.
27	Lead (as Pb)	mg/Lit	APHA 22nd Ed.2012,3111-B, 3-18	0.01	No Relaxation	N.D.
28	Nickel (as Ni)	mg/Lit	APHA 22nd Ed.2012,3500-Ni, 3-108	0.02	No Relaxation	N.D.
29	Zinc (as Zn)	mg/Lit	APHA 22nd Ed.2012,3111-B, 3-18	5	15	N.D.
30	Copper (as Cu)	mg/Lit	APHA 22nd Ed.2012,3111-B, 3-18	0.05	1.5	N.D.
31	Cadmium (as Cd)	mg/Lit	APHA 22nd Ed.2012,3500-Cd, 3-105	0.003	No Relaxation	N.D.
32	Mercury (as Hg)	mg/Lit	APHA 22nd Ed.2012,3112-B, 3-23	0.001	No Relaxation	N.D.
33	Arsenic (as As)	mg/Lit	APHA 22nd Ed.2012,3114-C, 3-38	0.01	0.05	N.D.
34	Selenium (as Se)	mg/Lit	APHA 22nd Ed.2012,3114-C, 3-38	0.01	No Relaxation	N.D.
35	Chromium (as Cr)	mg/Lit	APHA 22nd Ed.2012,3500-Cr-B, 3-69	0.05	No Relaxation	N.D.
36	Anionic Detergent (as MBAS)	mg/Lit	APHA 22nd Ed.2012,5540-C, 5-53	0.2	1.0	N.D.
37	Phenolic Compound (as C <sub>6</sub> H <sub>5</sub> OH)	mg/Lit	APHA 22nd Ed.2012,5540-B & C, 5-47	0.001	0.002	N.D.
38	Poly-nuclear Aromatic Hydrocarbon (PAH)	µg/Lit	APHA 22nd Ed.2012,6440-6-93	0.0001	No Relaxation	N.D.
39	Mineral Oil	mg/Lit	IS 3025 (part-39) : 1991, RA 2003	0.5	No Relaxation	N.D.
40	Oil & Grease	mg/Lit	IS 3025 (Part 39):1991, RA 2003	-	-	N.D.
<b>Microbiological Analysis</b>						
1	Total Coliforms	MPN/100 ML	IS:1622:1981: RA:2019	Shall not be detectable in any 100 ml sample		Absent
2	Faecal coliform	MPN/100ml	IS:1622:1981: RA:2019	Shall not be detectable in any 100 ml sample		Absent
3	E. Coll	MPN/100ml	IS:1622:1981:RA:2019	Shall not be detectable in any 100ml sample		Absent
<b>Pesticides</b>						
1	p,p DDT	µg/L	US EPA 508-1995	1		N.D.
2	o,p DDT	µg/L	US EPA 508-1995	1		N.D.
3	p,pDDE	µg/L	US EPA 508-1995	1		N.D.
4	p,p DDD	µg/L	US EPA 508-1995	1		N.D.
5	O,p DDD	µg/L	US EPA 508-1995	1		N.D.
6	Gamma-HCH (Lindane)	µg/L	US EPA 508-1995	2		N.D.
7	Alpha-HCH	µg/L	US EPA 508-1995	0.01		N.D.



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REPORT NO. 01129

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	ACCEPTABLE LIMIT FOR DRINKING WATER (IS 10500:2012)		RESULT
				Acceptable Limit	Permissible limit	
8	Beta-HCH	µg/L	US EPA 508-1995	0.04		N.D.
9	Delta HCH	µg/L	US EPA 508-1995	0.04		N.D.
10	Alpha-Endosulfan	µg/L	US EPA 508-1995	0.4		N.D.
11	Beta-Endosulfan	µg/L	US EPA 508-1995	0.4		N.D.
12	Endosulfansulphate	µg/L	US EPA 508-1995	0.4		N.D.
13	Monocrotophos	µg/L	US EPA 8141A-1994	1		N.D.
14	Ethion	µg/L	US EPA 8141A-1994	3		N.D.
15	Chloropyrifos	µg/L	US EPA 8141A-1994	30		N.D.
16	Phorate	µg/L	US EPA 8141A-1994	2		N.D.
17	Phoratesulphoxide	µg/L	US EPA 8141A-1994	-		N.D.
18	Phoratesulphone	µg/L	US EPA 8141A-1994	-		N.D.
19	2,4-D	µg/L	US EPA 515.1-1995	30		N.D.
20	Alachlor	µg/L	US EPA 508-1995	20		N.D.
21	Atrazine	µg/L	US EPA 532-2000	2		N.D.
22	Methyl parathion	µg/L	US EPA 8141A-1994	0.3		N.D.
23	Methyl paraxone	µg/L	US EPA 8141A-1994	-		N.D.
24	Malathion	µg/L	US EPA 8141A-1994	190		N.D.
25	Malaoxon	µg/L	US EPA 8141A-1994	-		N.D.
26	Aldrin	µg/L	US EPA 508-1995	0.03		N.D.
27	Dieldrin	µg/L	US EPA 508-1995	0.03		N.D.

Note: mg/lit.: milligram per liter, N.D. - Not Detected.

#### REMARKS: RESULTS ARE AS ABOVE

#### Terms & conditions

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- > Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.
- > This is for information as the party has asked for above test(s) only.

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-----End of the test report-----



HDD-272, Phase III - Near JP Chowk  
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<b>Name &amp; Address Of The Customer</b>		<b>REPORT NO</b>	UES/TR/22-23/01131	
<b>TO,</b>		<b>LAB REF NO</b>	UES/22-23/W/01145	
<b>HINDALCO INDUSTRIES LIMITED,</b>		<b>DATE OF SAMPLING</b>	22/05/2022	
<b>GARE PALMA - IV/5, MILUPARA</b>		<b>DATE OF RECEIPT</b>	23/05/2022	
<b>U/G COAL MINE,VILLAGE - MILUPARA,</b>		<b>DATE OF REPORT</b>	01/06/2022	
<b>BLOCK-TANNAR,</b>		<b>DATE OF ANALYSIS</b>	START: 23/05/2022	END: 31/05/2022
<b>DISTT. - RAIGARH (C.G.) 496107</b>				
<b>SAMPLE DETAILS</b>				
<b>SAMPLE TYPE</b>	<b>GROUND WATER</b>		<b>ORDER /REFERENCE:</b>	<b>VI/PO/SRV/2122/0049,</b> <b>DTD. 24-JULY-2021</b>
<b>CUSTOMER SAMPLE ID</b>	<b>MILUPARA VILLAGE NEAR PHC- HIL (DUGWELL)</b>		<b>SAMPLE CONDITION AT RECEIPT</b>	<b>OK</b>
<b>PACKING OF SAMPLE</b>	<b>3 L X 1 NO. PVC CAN</b> <b>1 L X 1 NO. PVC CAN</b> <b>1 L X 1 NO. GLASS BOTTLE</b>	<b>SEALED</b>	<b>SAMPLE COLLECTED BY</b>	<b>CHEMIST</b>
<b>SAMPLING PROCEDURE</b>	<b>IS: 3025 (PART I): 1987 RA 2003;</b> <b>APHA 22ND ED. 2012, 1060-B, 1-39</b>		<b>QUANTITY RECEIVED</b>	<b>5 LTR</b>

REPORT NO. 01131

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	
1	Colour	Hazen	IS:3025:(Part-4)	5	15	<1
2	Odour	-	IS 3025(part-5)	Agreeable	Agreeable	Agreeable
3	Taste	-	IS 3025(part-8)	Agreeable	Agreeable	Agreeable
4	pH	-	APHA 22 <sup>nd</sup> Ed.2012,4500-H <sup>+</sup> -B, 4-92	6.5-8.5	No Relaxation	6.74
5	Turbidity	NTU	APHA 22 <sup>nd</sup> Ed.2012,2130-B,2-13	1	5	1.26
6	Electrical Conductivity	µS/cm	IS 3025(part-14):1984, RA 2013	-	-	272.4
7	Residual Chlorine	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-Cl-G, 4 - 69	0.2	1	N.D.
8	Total Solid	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,2540- B, 2-64	-	-	187.0
9	Total Dissolved Solids	mg/Lit	IS 3025(part-16):1984, RA 2006	500	2000	174.6
10	Total Suspended Solids	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,2540- D, 2-66	-	-	12.4
11	Alkalinity Total (as CaCO <sub>3</sub> )	mg/Lit	IS 3025(part-23):1986, RA 2003	200	600	44.0
12	Total Hardness ( as CaCO <sub>3</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,2340-C, 2-44,45	200	600	102.0
13	Calcium Hardness (as CaCO <sub>3</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Ca-B,3-67	-	-	50.0
14	Magnesium Hardness (as CaCO <sub>3</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Mg-B,3-84	-	-	52.0
15	Calcium (as Ca)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Ca-B,3-67	75	200	20.0
16	Magnesium (as Mg)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Mg-B, 3-84	30	100	12.6
17	Chloride (as Cl)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-Cl-B, 4-72	250	1000	23.9
18	Sulphate (as SO <sub>4</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-SO <sub>4</sub> -E, 4-190	200	400	20.7
19	Nitrate (as NO <sub>3</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-NO <sub>3</sub> -B, 4-122	45	No Relaxation	2.6
20	Phosphate (as P)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-P-C, 4-153	-	-	N.D.





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REPORT NO. 01131

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible Limit	
21	Sodium (as Na)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Na-B, 3-97	-	-	5.2
22	Potassium (as K)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-K-B, 3-87	-	-	1.13
23	Boron (as B)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-B-B, 4-25	0.5	1.0	N.D.
24	Iron (as Fe)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3111-B,3-18	0.3	No Relaxation	N.D.
25	Fluoride (as F)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-F-B & D, 4-84 & 87	1	1.5	0.06
26	Manganese (as Mn)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3111-B, 3-18	0.1	0.3	0.14
27	Lead (as Pb)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3111-B, 3-18	0.01	No Relaxation	N.D.
28	Nickel (as Ni)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Ni, 3-108	0.02	No Relaxation	N.D.
29	Zinc (as Zn)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3111-B, 3-18	5	15	N.D.
30	Copper (as Cu)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3111-B, 3-18	0.05	1.5	N.D.
31	Cadmium (as Cd)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Cd, 3-105	0.003	No Relaxation	N.D.
32	Mercury (as Hg)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3112-B, 3-23	0.001	No Relaxation	N.D.
33	Arsenic (as As)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3114-C, 3-38	0.01	0.05	N.D.
34	Selenium (as Se)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3114-C, 3-38	0.01	No Relaxation	N.D.
35	Chromium (as Cr)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Cr-B, 3-69	0.05	No Relaxation	N.D.
36	Anionic Detergent (as MBAS)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,5540-C, 5-53	0.2	1.0	N.D.
37	Phenolic Compound (as C <sub>6</sub> H <sub>5</sub> OH)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,5540-B & C, 5-47	0.001	0.002	N.D.
38	Poly-nuclear Aromatic Hydrocarbon (PAH)	µg/Lit	APHA 22 <sup>nd</sup> Ed.2012,6440-6-93	0.0001	No Relaxation	N.D.
39	Mineral Oil	mg/Lit	IS 3025 (part-39) : 1991, RA 2003	0.5	No Relaxation	N.D.
40	Oil & Grease	mg/Lit	IS 3025 (Part 39):1991, RA 2003	-	-	N.D.

#### Microbiological Analysis

1	Total Coliforms	MPN/100 ML	IS:1622:1981: RA:2019	Shall not be detectable in any 100 ml sample	Absent
2	Faecal coliform	MPN/100ml	IS:1622:1981: RA:2019	Shall not be detectable in any 100 ml sample	Absent
3	E. Coli	MPN/100ml	IS:1622:1981:RA:2019	Shall not be detectable in any 100ml sample	Absent

#### Pesticides

1	p,p DDT	µg/L	US EPA 508-1995	1	N.D.
2	o,p DDT	µg/L	US EPA 508-1995	1	N.D.
3	p,pDDE	µg/L	US EPA 508-1995	1	N.D.
4	p,p DDD	µg/L	US EPA 508-1995	1	N.D.



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REPORT NO. 01131

## TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	
5	O,p DDD	µg/L	US EPA 508-1995	1		N.D.
6	Gamma-HCH (Lindane)	µg/L	US EPA 508-1995	2		N.D.
7	Alpha-HCH	µg/L	US EPA 508-1995	0.01		N.D.
8	Beta-HCH	µg/L	US EPA 508-1995	0.04		N.D.
9	Delta HCH	µg/L	US EPA 508-1995	0.04		N.D.
10	Alpha-Endosulfan	µg/L	US EPA 508-1995	0.4		N.D.
11	Beta-Endosulfan	µg/L	US EPA 508-1995	0.4		N.D.
12	Endosulfansulphate	µg/L	US EPA 508-1995	0.4		N.D.
13	Monocrotophos	µg/L	US EPA 8141A-1994	1		N.D.
14	Ethion	µg/L	US EPA 8141A-1994	3		N.D.
15	Chloropyrifos	µg/L	US EPA 8141A-1994	30		N.D.
16	Phorate	µg/L	US EPA 8141A-1994	2		N.D.
17	Phoratesulphoxide	µg/L	US EPA 8141A-1994	-		N.D.
18	Phoratesulphone	µg/L	US EPA 8141A-1994	-		N.D.
19	2,4-D	µg/L	US EPA 515.1-1995	30		N.D.
20	Alachlor	µg/L	US EPA 508- 1995	20		N.D.
21	Atrazine	µg/L	US EPA 532-2000	2		N.D.
22	Methyl parathion	µg/L	US EPA 8141A-1994	0.3		N.D.
23	Methyl paraxone	µg/L	US EPA 8141A-1994	-		N.D.
24	Malathion	µg/L	US EPA 8141A-1994	190		N.D.
25	Malaoxon	µg/L	US EPA 8141A-1994	-		N.D.
26	Aldrin	µg/L	US EPA 508- 1995	0.03		N.D.
27	Dieldrin	µg/L	US EPA 508-1995	0.03		N.D.

Note: mg/lit.: milligram per liter, N.D. - Not Detected.

**REMARKS: RESULTS ARE AS ABOVE**

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 01/06/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/06/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----



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<b>Name &amp; Address Of The Customer</b>		<b>REPORT NO</b>	UES/TR/22-23/01008	
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/4, COAL MINE,VILLAGE - BANKHETA, POST -MILUPARA, DISTT. - RAIGARH (C.G.) 496107.</b>		<b>LAB REF NO</b>	UES/22-23/W/01771	
		<b>DATE OF SAMPLING</b>	20/05/2022	
		<b>DATE OF RECEIPT</b>	21/05/2022	
		<b>DATE OF REPORT</b>	01/06/2022	
		<b>DATE OF ANALYSIS</b>	START:22/05/2022	END:30/05/2022
<b>SAMPLE DETAILS</b>				
<b>SAMPLE TYPE</b>	GROUND WATER	<b>ORDER /REFERENCE:</b>	N/PO/SRV/2122/0045, DTD. 24-JULY-2021	
<b>CUSTOMER SAMPLE ID</b>	SAKTA VILLAGE, (DUGWELL)	<b>SAMPLE CONDITION AT RECEIPT</b>	OK	
<b>PACKING OF SAMPLE</b>	3 L X 1 NO. PVC CAN 1 L X 1 NO. PVC CAN 1 L X 1 NO. GLASS BOTTLE	<b>SAMPLE COLLECTED BY</b>	CHEMIST	
<b>SAMPLING PROCEDURE</b>	IS:3025(PART I):1987 RA 2003; APHA 22ND ED. 2012, 1060-B, 1-39	<b>QUANTITY RECEIVED</b>	5 LTR	

Report No. 01008

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	
1	Colour	Hazen	IS:3025:(Part-4)	5	15	3.8
2	Odour	-	IS 3025(part-5)	Agreeable	Agreeable	Agreeable
3	Taste	-	IS 3025(part-8)	Agreeable	Agreeable	Agreeable
4	pH	-	APHA 23 <sup>rd</sup> Ed.2012,4500-H <sup>+</sup> -B, 4-92	6.5-8.5	No Relaxation	7.33
5	Turbidity	NTU	APHA 23 <sup>rd</sup> Ed.2012,2130-B,2-13	1	5	2.8
6	Electrical Conductivity	µS/cm	IS 3025(part-14):1984, RA 2013	-	-	284.6
7	Residual Chlorine	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-Cl-G, 4-69	0.2	1	N.D.
8	Total Solid	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,2540- B, 2-64	-	-	179.0
9	Total Dissolved Solids	mg/Lit	IS 3025(part-16):1984, RA 2006	500	2000	172.4
10	Total Suspended Solids	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,2540- D, 2-66	-	-	6.6
11	Alkalinity Total (as CaCO <sub>3</sub> )	mg/Lit	IS 3025(part-23):1986, RA 2003	200	600	92.0
12	Total Hardness ( as CaCO <sub>3</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,2340-C, 2-44,45	200	600	118
13	Calcium Hardness (as CaCO <sub>3</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Ca-B, 3-67	-	-	72.0
14	Magnesium Hardness (as CaCO <sub>3</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Mg-B, 3-84	-	-	46.0
15	Calcium (as Ca)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Ca-B, 3-67	75	200	28.8
16	Magnesium (as Mg)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Mg-B, 3-84	30	100	11.1
17	Chloride (as Cl)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-Cl-B, 4-72	250	1000	32.9
18	Sulphate (as SO <sub>4</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-SO <sub>4</sub> -E, 4-190	200	400	28.4
19	Nitrate (as NO <sub>3</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-NO <sub>3</sub> -B, 4-122	45	No Relaxation	0.42
20	Phosphate (as P)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-P-C, 4-153	-	-	N.D.
21	Sodium (as Na)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Na-B, 3-97	-	-	20.2



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Report No. 01008

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	
7	Alpha-HCH	µg/L	US EPA 508-1995		0.01	N.D.
8	Beta-HCH	µg/L	US EPA 508-1995		0.04	N.D.
9	Delta HCH	µg/L	US EPA 508-1995		0.04	N.D.
10	Alpha-Endosulfan	µg/L	US EPA 508-1995		0.4	N.D.
11	Beta-Endosulfan	µg/L	US EPA 508-1995		0.4	N.D.
12	Endosulfansulphate	µg/L	US EPA 508-1995		0.4	N.D.
13	Monocrotophos	µg/L	US EPA 8141A-1994		1	N.D.
14	Ethion	µg/L	US EPA 8141A-1994		3	N.D.
15	Chloropyrifos	µg/L	US EPA 8141A-1994		30	N.D.
16	Phorate	µg/L	US EPA 8141A-1994		2	N.D.
17	Phoratesulphoxide	µg/L	US EPA 8141A-1994		-	N.D.
18	Phoratesulphone	µg/L	US EPA 8141A-1994		-	N.D.
19	2,4-D	µg/L	US EPA 515.1-1995		30	N.D.
20	Alachlor	µg/L	US EPA 508-1995		20	N.D.
21	Atrazine	µg/L	US EPA 532-2000		2	N.D.
22	Methyl parathion	µg/L	US EPA 8141A-1994		0.3	N.D.
23	Methyl paraxone	µg/L	US EPA 8141A-1994		-	N.D.
24	Malathion	µg/L	US EPA 8141A-1994		190	N.D.
25	Malaaxon	µg/L	US EPA 8141A-1994		-	N.D.
26	Aldrin	µg/L	US EPA 508-1995		0.03	N.D.
27	Dieldrin	µg/L	US EPA 508-1995		0.03	N.D.

Note: mg/lit.: milligram per liter, N.D.- Not Detected.

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-----End of the test report-----





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Report No. 01008

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	
22	Potassium (as K)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-K-B, 3-87	-	-	0.56
23	Boron (as B)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-B-B, 4-25	0.5	1.0	N.D.
24	Iron (as Fe)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3111-B,3-18	0.3	NoRelaxation	N.D.
25	Fluoride (as F)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-F-B & D, 4-B4 & 87	1	1.5	0.18
26	Manganese (as Mn)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	0.1	0.3	0.08
27	Lead (as Pb)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	0.01	NoRelaxation	N.D.
28	Nickel (as Ni)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-NI, 3-108	0.02	No Relaxation	N.D.
29	Zinc (as Zn)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	5	15	N.D.
30	Copper (as Cu)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	0.05	1.5	N.D.
31	Cadmium (as Cd)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Cd, 3-105	0.003	NoRelaxation	N.D.
32	Mercury (as Hg)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3112-B, 3-23	0.001	NoRelaxation	N.D.
33	Arsenic (as As)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3114-C, 3-38	0.01	0.05	N.D.
34	Selenium (as Se)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3114-C, 3-38	0.01	NoRelaxation	N.D.
35	Chromium (as Cr)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Cr-B, 3-69	0.05	NoRelaxation	N.D.
36	Anionic Detergent (as MBAS)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,5540-C, 5-53	0.2	1.0	N.D.
37	Phenolic Compound (as C <sub>6</sub> H <sub>5</sub> OH)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,5540-B & C, 5-47	0.001	0.002	N.D.
38	Poly-nuclear Aromatic Hydrocarbon (PAH)	µg/Lit	APHA 23 <sup>rd</sup> Ed.2012,6440-6-93	0.0001	NoRelaxation	N.D.
39	Mineral Oil	mg/Lit	IS 3025 (part-39) : 1991, RA 2003	0.5	No Relaxation	N.D.
40	Oil & Grease	mg/Lit	IS 3025 (Part 39):1991, RA 2003	-	-	N.D.

#### Microbiological Analysis

1	Total Coliforms	MPN/100 ML	IS:1622:1981: RA:2019	Shall not be detectable in any 100 ml sample	Absent
2	Faecal coliform	MPN/100ml	IS:1622:1981: RA:2019	Shall not be detectable in any 100 ml sample	Absent
3	E. Coli	MPN/100ml	IS:1622:1981:RA:2019	Shall not be detectable in any 100ml sample	Absent

#### Pesticides

1	p,p DDT	µg/L	US EPA 508-1995	1	N.D.
2	o,p DDT	µg/L	US EPA 508-1995	1	N.D.
3	p,pDDE	µg/L	US EPA 508-1995	1	N.D.
4	p,p DDD	µg/L	US EPA 508-1995	1	N.D.
5	O,p DDD	µg/L	US EPA 508-1995	1	N.D.
6	Gamma-HCH (Lindane)	µg/L	US EPA 508-1995	2	N.D.



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<b>Name &amp; Address Of The Customer</b> <b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/5, MILUPARA</b> <b>U/G COAL MINE,VILLAGE - MILUPARA,</b> <b>BLOCK-TAMNAR,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>	<b>REPORT NO</b>	UES/TR/22-23/01132	
	<b>LAB REF NO</b>	UES/22-23/W/01146	
	<b>DATE OF SAMPLING</b>	22/05/2022	
	<b>DATE OF RECEIPT</b>	23/05/2022	
	<b>DATE OF REPORT</b>	01/06/2022	
	<b>DATE OF ANALYSIS</b>	<b>START: 23/05/2022</b>	<b>END: 31/05/2022</b>
<b>SAMPLE DETAILS</b>			
<b>SAMPLE TYPE</b>	GROUND WATER	<b>ORDER /REFERENCE:</b>	M/PO/SRV/2122/0049, D/D. 24-JULY-2021
<b>CUSTOMER SAMPLE ID</b>	SIDARPARA VILLAGE (DUGWELL)	<b>SAMPLE CONDITION AT RECEIPT</b>	OK
<b>PACKING OF SAMPLE</b>	3 L X 1 NO. PVC CAN 1 L X 1 NO. PVC CAN 1 L X 1 NO. GLASS BOTTLE	SEALED	<b>SAMPLE COLLECTED BY</b> CHEMIST
<b>SAMPLING PROCEDURE</b>	IS: 3025 (PART I): 1987 RA 2003; APHA 22ND ED. 2012, 1060-B, 1-39	<b>QUANTITY RECEIVED</b>	5 LTR

REPORT NO. 01132

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	
1	Colour	Hazen	IS:3025:(Part-4)	5	15	<1
2	Odour	-	IS 3025(part-5)	Agreeable	Agreeable	Agreeable
3	Taste	-	IS 3025(part-8)	Agreeable	Agreeable	Agreeable
4	pH	-	APHA 22 <sup>nd</sup> Ed.2012,4500-H <sup>+</sup> -B, 4-92	6.5-8.5	NoRelaxation	7.35
5	Turbidity	NTU	APHA 22 <sup>nd</sup> Ed.2012,2130-B,2-13	1	5	0.45
6	Electrical Conductivity	µS/cm	IS 3025(part-14):1984, RA 2013	-	-	332.0
7	Residual Chlorine	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-Cl-G, 4-69	0.2	1	N.D.
8	Total Solid	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,2540- B, 2-64	-	-	227.0
9	Total Dissolved Solids	mg/Lit	IS 3025(part-16):1984, RA 2006	500	2000	219.4
10	Total Suspended Solids	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,2540- D, 2-66	-	-	3.7
11	Alkalinity Total (as CaCO <sub>3</sub> )	mg/Lit	IS 3025(part-23):1986, RA 2003	200	600	60.0
12	Total Hardness ( as CaCO <sub>3</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,2340-C, 2-44,45	200	600	94.0
13	Calcium Hardness (as CaCO <sub>3</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Ca-B,3-67	-	-	58.0
14	Magnesium Hardness (as CaCO <sub>3</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Mg-B,3-84	-	-	38.0
15	Calcium (as Ca)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Ca-B,3-67	75	200	25.0
16	Magnesium (as Mg)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Mg-B,3-84	30	100	11.3
17	Chloride (as Cl)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-Cl-B, 4-72	250	1000	22.5
18	Sulphate (as SO <sub>4</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-SO <sub>4</sub> -E, 4-190	200	400	11.3
19	Nitrate (as NO <sub>3</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-NO <sub>3</sub> -B,4-122	45	NoRelaxation	3.6
20	Phosphate (as P)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-P-C, 4-153	-	-	N.D.



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Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
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REPORT NO. 01132

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	
21	Sodium (as Na)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Na-B, 3-97	-	-	11.3
22	Potassium (as K)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-K-B, 3-87	-	-	0.7
23	Boron (as B)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-B-B, 4-25	0.5	1.0	N.D.
24	Iron (as Fe)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3111-B,3-18	0.3	NoRelaxati on	N.D.
25	Fluoride (as F)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-F-B &D, 4-84 & 87	1	1.5	0.13
26	Manganese (as Mn)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3111-B, 3-18	0.1	0.3	0.08
27	Lead (as Pb)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3111-B, 3-18	0.01	NoRelaxati on	N.D.
28	Nickel (as Ni)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Ni, 3-108	0.02	No Relaxation	N.D.
29	Zinc (as Zn)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3111-B, 3-18	5	15	N.D.
30	Copper (as Cu)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3111-B, 3-18	0.05	1.5	N.D.
31	Cadmium (as Cd)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Cd, 3-105	0.003	NoRelaxati on	N.D.
32	Mercury (as Hg)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3112-B, 3-23	0.001	NoRelaxati on	N.D.
33	Arsenic (as As)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3114-C, 3-38	0.01	0.05	N.D.
34	Selenium (as Se)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3114-C, 3-38	0.01	NoRelaxati on	N.D.
35	Chromium (as Cr)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Cr-B, 3-69	0.05	NoRelaxati on	N.D.
36	Anionic Detergent (as MBAS)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,5540-C, 5-53	0.2	1.0	N.D.
37	Phenolic Compound (as C <sub>6</sub> H <sub>5</sub> OH)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,5540-B & C, 5-47	0.001	0.002	N.D.
38	Poly-nuclear Aromatic Hydrocarbon (PAH)	µg/Lit	APHA 22 <sup>nd</sup> Ed.2012,6440-6-93	0.0001	NoRelaxati on	N.D.
39	Mineral Oil	mg/Lit	IS 3025 (part-39) : 1991, RA 2003	0.5	No Relaxation	N.D.
40	Oil & Grease	mg/Lit	IS 3025 (Part 39):1991, RA 2003	-	-	N.D.

#### Microbiological Analysis

1	Total Coliforms	MPN/ 100 ML	IS:1622:1981: RA:2019	Shall not be detectable in any 100 ml sample	Absent
2	Faecal coliform	MPN/ 100ml	IS:1622:1981: RA:2019	Shall not be detectable in any 100 ml sample	Absent
3	E. Coli	MPN/ 100ml	IS:1622:1981:RA:2019	Shall not be detectable in any 100ml sample	Absent

#### Pesticides

1	p,p DDT	µg/L	US EPA 508-1995	1	N.D.
2	o,p DDT	µg/L	US EPA 508-1995	1	N.D.
3	p,pDDE	µg/L	US EPA 508-1995	1	N.D.
4	p,p DDD	µg/L	US EPA 508-1995	1	N.D.
5	O,p DDD	µg/L	US EPA 508-1995	1	N.D.
6	Gamma-HCH (Lindane)	µg/L	US EPA 508-1995	2	N.D.



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 Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
 Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

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REPORT NO. 01132

**TEST REPORT**

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	
7	Alpha-HCH	µg/L	US EPA 508-1995	0.01		N.D.
8	Beta-HCH	µg/L	US EPA 508-1995	0.04		N.D.
9	Delta HCH	µg/L	US EPA 508-1995	0.04		N.D.
10	Alpha-Endosulfan	µg/L	US EPA 508-1995	0.4		N.D.
11	Beta-Endosulfan	µg/L	US EPA 508-1995	0.4		N.D.
12	Endosulfansulphate	µg/L	US EPA 508-1995	0.4		N.D.
13	Monocrotophos	µg/L	US EPA 8141A-1994	1		N.D.
14	Ethion	µg/L	US EPA 8141A-1994	3		N.D.
15	Chloropyrifos	µg/L	US EPA 8141A-1994	30		N.D.
16	Phorate	µg/L	US EPA 8141A-1994	2		N.D.
17	Phoratesulphoxide	µg/L	US EPA 8141A-1994	-		N.D.
18	Phoratesulphone	µg/L	US EPA 8141A-1994	-		N.D.
19	2,4-D	µg/L	US EPA 515.1-1995	30		N.D.
20	Alachlor	µg/L	US EPA 508- 1995	20		N.D.
21	Atrazine	µg/L	US EPA 532-2000	2		N.D.
22	Methyl parathion	µg/L	US EPA 8141A-1994	0.3		N.D.
23	Methyl paraxone	µg/L	US EPA 8141A-1994	-		N.D.
24	Malathion	µg/L	US EPA 8141A-1994	190		N.D.
25	Malaoxon	µg/L	US EPA 8141A-1994	-		N.D.
26	Aldrin	µg/L	US EPA 508- 1995	0.03		N.D.
27	Dieldrin	µg/L	US EPA 508-1995	0.03		N.D.

Note: mg/lit.: milligram per liter, N.D. - Not Detected.

**REMARKS: RESULTS ARE AS ABOVE**

**Terms & conditions**

- > The report for publication, arbitration or as legal dispute is forbidden.
- > Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.
- > This is for information as the party has asked for above test(s) only.

 01/06/22 <b>REVIEWED BY</b>		For <b>ULTIMATE ENVIROLYTICAL SOLUTIONS</b>  01/06/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----





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<b>Name &amp; Address Of The Customer</b> <b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,VILLAGE -</b> <b>BANKHETA, POST -MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107.</b>	<b>REPORT NO</b>	UES/TR/22-23/01009	
	<b>LAB REF NO</b>	UES/22-23/W/01772	
	<b>DATE OF SAMPLING</b>	20/05/2022	
	<b>DATE OF RECEIPT</b>	21/05/2022	
	<b>DATE OF REPORT</b>	01/06/2022	
	<b>DATE OF ANALYSIS</b>	<b>START: 22/05/2022</b>	<b>END: 30/05/2022</b>
<b>SAMPLE DETAILS</b>			
<b>SAMPLE TYPE</b>	GROUND WATER	<b>ORDER /REFERENCE:</b>	N/PO/SRV/2122/0045, DTD. 24-JULY-2021
<b>CUSTOMER SAMPLE ID</b>	BEIJOR VILLAGE (DUGWELL)	<b>SAMPLE CONDITION AT RECEIPT</b>	OK
<b>PACKING OF SAMPLE</b>	3 L X 1 NO. PVC CAN 1 L X 1 NO. PVC CAN 1 L X 1 NO. GLASS BOTTLE	<b>SAMPLE COLLECTED BY</b>	CHEMIST
<b>SAMPLING PROCEDURE</b>	IS:3025(PART 1):1987 RA 2003; APHA 22ND ED. 2012, 1060-B, 1-39	<b>QUANTITY RECEIVED</b>	5 LTR

Report No. 01009

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible Limit	
1	Colour	Hazen	IS:3025:(Part-4)	5	15	<1
2	Odour	-	IS 3025(part-5)	Agreeable	Agreeable	Agreeable
3	Taste	-	IS 3025(part-8)	Agreeable	Agreeable	Agreeable
4	pH	-	APHA 23 <sup>rd</sup> Ed.2012,4500-H <sup>+</sup> -B, 4-92	6.5-8.5	No Relaxation	7.48
5	Turbidity	NTU	APHA 23 <sup>rd</sup> Ed.2012,2130-B,2-13	1	5	0.76
6	Electrical Conductivity	µS/cm	IS 3025(part-14):1984, RA 2013	-	-	582.6
7	Residual Chlorine	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-Cl-G, 4-69	0.2	1	N.D.
8	Total Solid	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,2540- B, 2-64	-	-	365.0
9	Total Dissolved Solids	mg/Lit	IS 3025(part-16):1984, RA 2006	500	2000	359.4
10	Total Suspended Solids	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,2540- D, 2-66	-	-	5.6
11	Alkalinity Total (as CaCO <sub>3</sub> )	mg/Lit	IS 3025(part-23):1986, RA 2003	200	600	178.0
12	Total Hardness ( as CaCO <sub>3</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,2340-C, 2-44,45	200	600	198.0
13	Calcium Hardness (as CaCO <sub>3</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Ca-B, 3-67	-	-	116.0
14	Magnesium Hardness (as CaCO <sub>3</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Mg-B, 3-84	-	-	82.0
15	Calcium (as Ca)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Ca-B, 3-67	75	200	46.4
16	Magnesium (as Mg)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Mg-B, 3-84	30	100	19.9
17	Chloride (as Cl)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-Cl-B, 4-72	250	1000	36.9
18	Sulphate (as SO <sub>4</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-SO <sub>4</sub> -E, 4-190	200	400	24.8
19	Nitrate (as NO <sub>3</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-NO <sub>3</sub> -B, 4-122	45	No Relaxation	1.46
20	Phosphate (as P)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-P-C, 4-153	-	-	N.D.



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Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

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Report No.01009

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	
21	Sodium (as Na)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Na-B, 3-97	-	-	6.2
22	Potassium (as K)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-K-B, 3-87	-	-	1.56
23	Boron (as B)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-B-B, 4-25	0.5	1.0	N.D.
24	Iron (as Fe)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3111-B,3-18	0.3	No Relaxation	N.D.
25	Fluoride (as F)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-F-B & D, 4-84 & 87	1	1.5	0.14
26	Manganese (as Mn)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	0.1	0.3	0.08
27	Lead (as Pb)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	0.01	No Relaxation	N.D.
28	Nickel (as Ni)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Ni, 3-108	0.02	No Relaxation	N.D.
29	Zinc (as Zn)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	5	15	N.D.
30	Copper (as Cu)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	0.05	1.5	N.D.
31	Cadmium (as Cd)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Cd, 3-105	0.003	No Relaxation	N.D.
32	Mercury (as Hg)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3112-B, 3-23	0.001	No Relaxation	N.D.
33	Arsenic (as As)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3114-C, 3-38	0.01	0.05	N.D.
34	Selenium (as Se)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3114-C, 3-38	0.01	No Relaxation	N.D.
35	Chromium (as Cr)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Cr-B, 3-69	0.05	No Relaxation	N.D.
36	Anionic Detergent (as MBAS)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,5540-C, 5-53	0.2	1.0	N.D.
37	Phenolic Compound (as C <sub>6</sub> H <sub>5</sub> OH)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,5540-B & C, 5-47	0.001	0.002	N.D.
38	Poly-nuclear Aromatic Hydrocarbon (PAH)	µg/Lit	APHA 23 <sup>rd</sup> Ed.2012,6440-6-93	0.0001	No Relaxation	N.D.
39	Mineral Oil	mg/Lit	IS 3025 (part-39) : 1991, RA 2003	0.5	No Relaxation	N.D.
40	Oil & Grease	mg/Lit	IS 3025 (Part 39):1991, RA 2003	-	-	N.D.
<b>Microbiological Analysis</b>						
1	Total Coliforms	MPN/100 ML	IS:1622:1981: RA:2019	Shall not be detectable in any 100 ml sample		Absent
2	Faecal Coliform	MPN/100ml	IS:1622:1981: RA:2019	Shall not be detectable in any 100 ml sample		Absent
3	E. Coli	MPN/100ml	IS:1622:1981:RA:2019	Shall not be detectable in any 100 ml sample		Absent
<b>Pesticides</b>						
1	p,p DDT	µg/L	US EPA 508-1995	1		N.D.
2	o,p DDT	µg/L	US EPA 508-1995	1		N.D.
3	p,pDDE	µg/L	US EPA 508-1995	1		N.D.
4	p,p DDD	µg/L	US EPA 508-1995	1		N.D.
5	O,p DDD	µg/L	US EPA 508-1995	1		N.D.



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Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

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Report No.01009

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	
6	Gamma-HCH (Lindane)	µg/L	US EPA 508-1995	2		N.D.
7	Alpha-HCH	µg/L	US EPA 508-1995	0.01		N.D.
8	Beta-HCH	µg/L	US EPA 508-1995	0.04		N.D.
9	Delta HCH	µg/L	US EPA 508-1995	0.04		N.D.
10	Alpha-Endosulfan	µg/L	US EPA 508-1995	0.4		N.D.
11	Beta-Endosulfan	µg/L	US EPA 508-1995	0.4		N.D.
12	Endosulfansulphate	µg/L	US EPA 508-1995	0.4		N.D.
13	Monocrotophos	µg/L	US EPA 8141A-1994	1		N.D.
14	Ethion	µg/L	US EPA 8141A-1994	3		N.D.
15	Chloropyrifos	µg/L	US EPA 8141A-1994	30		N.D.
16	Phorate	µg/L	US EPA 8141A-1994	2		N.D.
17	Phoratesulphoxide	µg/L	US EPA 8141A-1994	-		N.D.
18	Phoratesulphone	µg/L	US EPA 8141A-1994	-		N.D.
19	2,4-D	µg/L	US EPA 515.1-1995	30		N.D.
20	Alachlor	µg/L	US EPA 508-1995	20		N.D.
21	Atrazine	µg/L	US EPA 532-2000	2		N.D.
22	Methyl parathion	µg/L	US EPA 8141A-1994	0.3		N.D.
23	Methyl paraxone	µg/L	US EPA 8141A-1994	-		N.D.
24	Malathion	µg/L	US EPA 8141A-1994	190		N.D.
25	Malaoxon	µg/L	US EPA 8141A-1994	-		N.D.
26	Aldrin	µg/L	US EPA 508-1995	0.03		N.D.
27	Dieldrin	µg/L	US EPA 508-1995	0.03		N.D.

Note: µg/lit.: milligram per liter, N.D.- Not Detected.

REMARKS: RESULTS ARE AS ABOVE

#### Terms & conditions

- > The report for publication, arbitration or as legal dispute is forbidden.
- > Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.
- > This is for information as the party has asked for above test(s) only.

 01/06/22 REVIEWED BY		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/06/22 AUTHORIZED SIGNATORY
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-----End of the test report-----



**Ultimate**  
ENVIRONMENTAL SOLUTIONS

HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviron@gmail.com

<b>Name &amp; Address Of The Customer</b> <b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA,</b> <b>POST -MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107.</b>	<b>REPORT NO</b>	UES/TR/22-23/02837	
	<b>LAB REF NO</b>	UES/22-23/W/07911	
	<b>DATE OF SAMPLING</b>	24/08/2022	
	<b>DATE OF RECEIPT</b>	25/08/2022	
	<b>DATE OF REPORT</b>	01/09/2022	
	<b>DATE OF ANALYSIS</b>	<b>START: 26/08/2022</b>	<b>END: 01/09/2022</b>
<b>SAMPLE DETAILS</b>			
<b>SAMPLE TYPE</b>	<b>GROUND WATER</b>	<b>ORDER /REFERENCE:</b>	<b>VERBAL COMMUNICATION.</b>
<b>CUSTOMER SAMPLE ID</b>	<b>BANKHETA</b> <b>MINE (PIEZOMETER) AWLR</b>	<b>SAMPLE CONDITION AT RECEIPT</b>	<b>OK</b>
<b>PACKING OF SAMPLE</b>	3 L X 1 NO. PVC CAN 1 L X 1 NO. PVC CAN 1 L X 1 NO. GLASS BOTTLE	<b>SAMPLE COLLECTED BY</b>	<b>CHEMIST</b>
<b>SAMPLING PROCEDURE</b>	<b>IS: 3025(PART I): 1987 RA</b> <b>2003; APHA 23RD ED. 2012,</b> <b>1060-B, 1-39</b>	<b>QUANTITY RECEIVED</b>	<b>5 LTR</b>

Report No. 02837

<b>TEST REPORT</b>						
SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible Limit	
1	Colour	Hazen	IS:3025:(Part-4)	5	15	<1
2	Odour	-	IS 3025(part-5)	Agreeable	Agreeable	Agreeable
3	Taste	-	IS 3025(part-8)	Agreeable	Agreeable	Agreeable
4	pH	-	APHA 23 <sup>rd</sup> Ed.2012,4500-H <sup>+</sup> -B, 4-92	6.5-8.5	No Relaxation	6.98
5	Turbidity	NTU	APHA 23 <sup>rd</sup> Ed.2012,2130-B,2-13	1	5	1.26
6	Electrical Conductivity	µS/cm	IS 3025(part-14):1984, RA 2013	-	-	142.0
7	Residual Chlorine	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-Cl-G, 4-69	0.2	1	N.D.
8	Total Solid	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,2540- B, 2-64	-	-	102.9
9	Total Dissolved Solids	mg/Lit	IS 3025(part-16):1984, RA 2006	500	2000	86.6
10	Total Suspended Solids	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,2540- D, 2-66	-	-	2.2
11	Alkalinity Total (as CaCO <sub>3</sub> )	mg/Lit	IS 3025(part-23):1986, RA 2003	200	600	40.0
12	Total Hardness ( as CaCO <sub>3</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,2340-C, 2-44,45	200	600	56.0
13	Calcium Hardness (as CaCO <sub>3</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Ca-B, 3-67	-	-	36.0
14	Magnesium Hardness (as CaCO <sub>3</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Mg-B, 3-84	-	-	20.0
15	Calcium (as Ca)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Ca-B, 3-67	75	200	14.4
16	Magnesium (as Mg)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Mg-B, 3-84	30	100	4.86
17	Chloride (as Cl)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-Cl-B, 4-72	250	1000	11.9
18	Sulphate (as SO <sub>4</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-SO <sub>4</sub> -E, 4-190	200	400	16.4
19	Nitrate (as NO <sub>3</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-NO <sub>3</sub> -B, 4-122	45	No Relaxation	0.34
20	Phosphate (as P)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-P-C, 4-153	-	-	N.D.
21	Sodium (as Na)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Na-B, 3-97	-	-	8.4
22	Potassium (as K)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-K-B, 3-	-	-	0.43



Report No. 02837

TEST REPORT						
SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible Limit	
			87			
23	Boron (as B)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-B-B, 4-25	0.5	1.0	N.D.
24	Iron (as Fe)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3111-B,3-18	0.3	NoRelaxation	N.D.
25	Fluoride (as F)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-F-B &D, 4-84 & 87	1	1.5	0.11
26	Manganese (as Mn)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	0.1	0.3	N.D.
27	Lead (as Pb)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	0.01	NoRelaxation	N.D.
28	Nickel (as Ni)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Ni, 3-108	0.02	No Relaxation	N.D.
29	Zinc (as Zn)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	5	15	N.D.
30	Copper (as Cu)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	0.05	1.5	N.D.
31	Cadmium (as Cd)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Cd, 3-105	0.003	NoRelaxation	N.D.
32	Mercury (as Hg)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3112-B, 3-23	0.001	NoRelaxation	N.D.
33	Arsenic (as As)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3114-C, 3-38	0.01	0.05	N.D.
34	Selenium (as Se)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3114-C, 3-38	0.01	NoRelaxation	N.D.
35	Chromium (as Cr)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Cr-B, 3-69	0.05	NoRelaxation	N.D.
36	Anionic Detergent (as MBAS)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,5540-C, 5-53	0.2	1.0	N.D.
37	Phenolic Compound (as C <sub>6</sub> H <sub>5</sub> OH)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,5540-B & C, 5-47	0.001	0.002	N.D.
38	Poly-nuclear Aromatic Hydrocarbon (PAH)	µg/Lit	APHA 23 <sup>rd</sup> Ed.2012,6440-6-93	0.0001	NoRelaxation	N.D.
39	Mineral Oil	mg/Lit	IS 3025 (part-39) : 1991, RA 2003	0.5	No Relaxation	N.D.
40	Oil & Grease	mg/Lit	IS 3025 (Part 39):1991, RA 2003	-	-	N.D.
<b>Microbiological Analysis</b>						
1	Total Coliforms	MPN/100 ML	IS:1622:1981: RA:2019	Shall not be detectable in any 100 ml sample		Absent
2	Faecal Coliform	MPN/100ml	IS:1622:1981: RA:2019	Shall not be detectable in any 100 ml sample		Absent
3	E. Coli	MPN/100ml	IS:1622:1981:RA:2019	Shall not be detectable in any 100ml sample		Absent
<b>Pesticides</b>						
1	p,p DDT	µg/L	US EPA 508-1995		1	N.D.
2	o,p DDT	µg/L	US EPA 508-1995		1	N.D.
3	p,pDDE	µg/L	US EPA 508-1995		1	N.D.
4	p,p DDD	µg/L	US EPA 508-1995		1	N.D.
5	O,p DDD	µg/L	US EPA 508-1995		1	N.D.
6	Gamma-HCH (Lindane)	µg/L	US EPA 508-1995		2	N.D.
7	Alpha-HCH	µg/L	US EPA 508-1995		0.01	N.D.
8	Beta-HCH	µg/L	US EPA 508-1995		0.04	N.D.

Report No. 02637

TEST REPORT						
SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	
9	Delta HCH	µg/L	US EPA 508-1995		0.04	N.D.
10	Alpha-Endosulfan	µg/L	US EPA 508-1995		0.4	N.D.
11	Beta-Endosulfan	µg/L	US EPA 508-1995		0.4	N.D.
12	Endosulfansulphate	µg/L	US EPA 508-1995		0.4	N.D.
13	Monocrotophos	µg/L	US EPA 8141A-1994		1	N.D.
14	Ethion	µg/L	US EPA 8141A-1994		3	N.D.
15	Chloropyrifos	µg/L	US EPA 8141A-1994		30	N.D.
16	Phorate	µg/L	US EPA 8141A-1994		2	N.D.
17	Phoratesulphoxide	µg/L	US EPA 8141A-1994		-	N.D.
18	Phoratesulphone	µg/L	US EPA 8141A-1994		-	N.D.
19	2,4-D	µg/L	US EPA 515.1-1995		30	N.D.
20	Alachlor	µg/L	US EPA 508-1995		20	N.D.
21	Atrazine	µg/L	US EPA 532-2000		2	N.D.
22	Methyl parathion	µg/L	US EPA 8141A-1994		0.3	N.D.
23	Methyl paraxone	µg/L	US EPA 8141A-1994		-	N.D.
24	Malathion	µg/L	US EPA 8141A-1994		190	N.D.
25	Malaaxon	µg/L	US EPA 8141A-1994		-	N.D.
26	Aldrin	µg/L	US EPA 508-1995		0.03	N.D.
27	Dieldrin	µg/L	US EPA 508-1995		0.03	N.D.

Note: mg/lit.: milligram per liter, N.D.: Not Detected.

REMARKS: RESULTS ARE AS ABOVE

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 01/09/22  <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/09/22  <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----



**Ultimate**  
ENVIROLYTICAL SOLUTIONS

HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

<b>Name &amp; Address Of The Customer</b>		<b>REPORT NO</b>	UES/TR/22-23/02838	
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/4, COAL MINE, VILLAGE - BANKHETA, POST -MILUPARA, DISTT. - RAIGARH (C.G.) 496107.</b>		<b>LAB REF NO</b>	UES/22-23/W/07912	
		<b>DATE OF SAMPLING</b>	24/08/2022	
		<b>DATE OF RECEIPT</b>	25/08/2022	
		<b>DATE OF REPORT</b>	01/09/2022	
		<b>DATE OF ANALYSIS</b>	START: 26/08/2022	END: 01/09/2022
<b>SAMPLE DETAILS</b>				
<b>SAMPLE TYPE</b>	<b>GROUND WATER</b>		<b>ORDER /REFERENCE:</b>	<b>VERBAL COMMUNICATION.</b>
<b>CUSTOMER SAMPLE ID</b>	BANJIKHOL MINE (PIEZOMETER) AWLR		<b>SAMPLE CONDITION AT RECEIPT</b>	OK
<b>PACKING OF SAMPLE</b>	3 L X I NO. PVC CAN 1 L X I NO. PVC CAN 1 L X I NO. GLASS BOTTLE	SEALED	<b>SAMPLE COLLECTED BY</b>	CHEMIST
<b>SAMPLING PROCEDURE</b>	IS: 3025 (PART I): 1987 RA 2003; APHA 22ND ED. 2012, 1060-B, 1-39		<b>QUANTITY RECEIVED</b>	5 LTR

Report No. 02838

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable limit	Permissible limit.	
1	Colour	Hazen	IS:3025:(Part-4)	5	15	<1
2	Odour	-	IS 3025(part-5)	Agreeable	Agreeable	Agreeable
3	Taste	-	IS 3025(part-8)	Agreeable	Agreeable	Agreeable
4	pH	-	APHA 23 <sup>rd</sup> Ed.2012,4500-H <sup>+</sup> -B, 4-92	6.5-8.5	No Relaxation	7.16
5	Turbidity	NTU	APHA 23 <sup>rd</sup> Ed.2012,2130-B,2-13	1	5	1.4
6	Electrical Conductivity	µS/cm	IS 3025(part-14):1984, RA 2013	-	-	168.8
7	Residual Chlorine	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-Cl-G, 4-69	0.2	1	N.D.
8	Total Solid	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,2540- B, 2-64	-	-	104.5
9	Total Dissolved Solids	mg/Lit	IS 3025(part-16):1984, RA 2006	500	2000	102.3
10	Total Suspended Solids	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,2540- D, 2-66	-	-	2.2
11	Alkalinity Total (as CaCO <sub>3</sub> )	mg/Lit	IS 3025(part-23):1986, RA 2003	200	600	48.0
12	Total Hardness ( as CaCO <sub>3</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,2340-C, 2-44,45	200	600	72.0
13	Calcium Hardness (as CaCO <sub>3</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Ca-B, 3-67	-	-	40.0
14	Magnesium Hardness (as CaCO <sub>3</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Mg-B, 3-84	-	-	32.0
15	Calcium (as Ca)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Ca-B, 3-67	75	200	16.0
16	Magnesium (as Mg)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Mg-B, 3-84	30	100	7.77
17	Chloride (as Cl)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-Cl-B, 4-72	250	1000	18.9
18	Sulphate (as SO <sub>4</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-SO <sub>4</sub> -E, 4-190	200	400	26.4
19	Nitrate (as NO <sub>3</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-NO <sub>3</sub> -B, 4-122	45	NoRelaxation	2.2
20	Phosphate (as P)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-P-C, 4-153	-	-	N.D.





**Ultimate**  
ENVIROLYTICAL SOLUTIONS

HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

Report No.02838

**TEST REPORT**

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	
8	Beta-HCH	µg/L	US EPA 508-1995	0.04		N.D.
9	Delta HCH	µg/L	US EPA 508-1995	0.04		N.D.
10	Alpha-Endosulfan	µg/L	US EPA 508-1995	0.4		N.D.
11	Beta-Endosulfan	µg/L	US EPA 508-1995	0.4		N.D.
12	Endosulfansulphate	µg/L	US EPA 508-1995	0.4		N.D.
13	Monocrotophos	µg/L	US EPA 8141A-1994	1		N.D.
14	Ethion	µg/L	US EPA 8141A-1994	3		N.D.
15	Chloropyrifos	µg/L	US EPA 8141A-1994	30		N.D.
16	Phorate	µg/L	US EPA 8141A-1994	2		N.D.
17	Phoratesulphoxide	µg/L	US EPA 8141A-1994	-		N.D.
18	Phoratesulphone	µg/L	US EPA 8141A-1994	-		N.D.
19	2,4-D	µg/L	US EPA 515.1-1995	30		N.D.
20	Alachlor	µg/L	US EPA 508- 1995	20		N.D.
21	Atrazine	µg/L	US EPA 532-2000	2		N.D.
22	Methyl parathion	µg/L	US EPA 8141A-1994	0.3		N.D.
23	Methyl paraxone	µg/L	US EPA 8141A-1994	-		N.D.
24	Malathion	µg/L	US EPA 8141A-1994	190		N.D.
25	Malaoxon	µg/L	US EPA 8141A-1994	-		N.D.
26	Aldrin	µg/L	US EPA 508- 1995	0.03		N.D.
27	Dieldrin	µg/L	US EPA 508-1995	0.03		N.D.

Note: mg/lit.: milligram per liter, N.D.- Not Detected.

REMARKS: RESULTS ARE AS ABOVE

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- > Test sample will be retained for 15days after issue of test report unless otherwise agreed with customer.
- > This is for information as the party has asked for above test(s) only.

 01/09/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/09/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----



<b>Name &amp; Address Of The Customer</b>		<b>REPORT NO</b>	UES/TR/22-23/02875
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/5, MILUPARA U/G COAL MINE, VILLAGE - MILUPARA, BLOCK-TAMNAR, DISTT. - RAIGARH (C.G.) 496107</b>		<b>LAB REF NO</b>	UES/22-23/W/07995
		<b>DATE OF SAMPLING</b>	25/08/2022
		<b>DATE OF RECEIPT</b>	26/08/2022
		<b>DATE OF REPORT</b>	02/09/2022
		<b>DATE OF ANALYSIS</b>	START:26/05/2022    END:01/09/2022
<b>SAMPLE DETAILS</b>			
<b>SAMPLE TYPE</b>	GROUND WATER	<b>ORDER /REFERENCE:</b>	VERBAL COMMUNICATION.
<b>CUSTOMER SAMPLE ID</b>	NEAR MILUPARA MINES OFFICE PIEZOMETER -ANLR	<b>SAMPLE CONDITION AT RECEIPT</b>	OK
<b>PACKING OF SAMPLE</b>	3 L X I NO. PVC CAN 1 L X I NO. PVC CAN 1 L X I NO. GLASS BOTTLE SEALD	<b>SAMPLE COLLECTED BY</b>	CHEMIST
<b>SAMPLING PROCEDURE</b>	IS:3025 (PART 1):1987 RA 2003; APHA 22ND ED. 2012, 1060-B, 1-39	<b>QUANTITY RECEIVED</b>	5 LTR

REPORT NO.02875

**TEST REPORT**

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	
1	Colour	Hazen	IS:3025:(Part-4)	5	15	<1
2	Odour	-	IS 3025(part-5)	Agreeable	Agreeable	Agreeable
3	Taste	-	IS 3025(part-8)	Agreeable	Agreeable	Agreeable
4	pH	-	APHA 22 <sup>nd</sup> Ed.2012,4500-H'-B, 4-92	6.5-8.5	No Relaxation	7.26
5	Turbidity	NTU	APHA 22 <sup>nd</sup> Ed.2012,2130-B,2-13	1	5	2.8
6	Electrical Conductivity	µS/cm	IS 3025(part-14):1984, RA 2013	-	-	262.4
7	Residual Chlorine	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-CI-G,4-69	0.2	1	N.D.
8	Total Solid	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,2540- B, 2-64	-	-	165.8
9	Total Dissolved Solids	mg/Lit	IS 3025(part-16):1984, RA 2006	500	2000	159.0
10	Total Suspended Solids	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,2540- D, 2-66	-	-	6.8
11	Alkalinity Total (as CaCO <sub>3</sub> )	mg/Lit	IS 3025(part-23):1986, RA 2003	200	600	36.0
12	Total Hardness (as CaCO <sub>3</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,2340-C, 2-44,45	200	600	60.0
13	Calcium Hardness (as CaCO <sub>3</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Ca-B, 3-67	-	-	32.0
14	Magnesium Hardness (as CaCO <sub>3</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Mg-B, 3-84	-	-	28.0
15	Calcium (as Ca)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Ca-B, 3-67	75	200	12.8
16	Magnesium (as Mg)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Mg-B, 3-84	30	100	6.8
17	Chloride (as Cl)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-CI-B, 4-72	250	1000	16.9
18	Sulphate (as SO <sub>4</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-SO <sub>4</sub> -E,4-190	200	400	14.8
19	Nitrate (as NO <sub>3</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-NO <sub>3</sub> -B, 4-122	45	No Relaxation	2.8

REPORT NO. 02875

**TEST REPORT**

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Lmt	Permissible limit	
20	Phosphate (as P)	mg/Lit	APHA 22nd Ed.2012,4500-P-C, 4-153	-	-	N.D.
20	Sodium (as Na)	mg/Lit	APHA 22nd Ed.2012,3500-Na-B, 3-97	-	-	7.6
21	Potassium (as K)	mg/Lit	APHA 22nd Ed.2012,3500-K-B, 3-87	-	-	0.22
22	Boron (as B)	mg/Lit	APHA 22nd Ed.2012,4500-B-B, 4-25	0.5	1.0	N.D.
23	Iron (as Fe)	mg/Lit	APHA 22nd Ed.2012,3111-B,3-18	0.3	No Relaxation	N.D.
24	Fluoride (as F)	mg/Lit	APHA 22nd Ed.2012,4500-F-B & D, 4-84 & 87	1	1.5	0.18
25	Manganese (as Mn)	mg/Lit	APHA 22nd Ed.2012,3111-B, 3-18	0.1	0.3	N.D.
26	Lead (as Pb)	mg/Lit	APHA 22nd Ed.2012,3111-B, 3-18	0.01	No Relaxation	N.D.
27	Nickel (as Ni)	mg/Lit	APHA 22nd Ed.2012,3500-Ni, 3-108	0.02	No Relaxation	N.D.
28	Zinc (as Zn)	mg/Lit	APHA 22nd Ed.2012,3111-B, 3-18	5	15	N.D.
29	Copper (as Cu)	mg/Lit	APHA 22nd Ed.2012,3111-B, 3-18	0.05	1.5	N.D.
30	Cadmium (as Cd)	mg/Lit	APHA 22nd Ed.2012,3500-Cd,3-105	0.003	No Relaxation	N.D.
31	Mercury (as Hg)	mg/Lit	APHA 22nd Ed.2012,3112-B, 3-23	0.001	No Relaxation	N.D.
32	Arsenic (as As)	mg/Lit	APHA 22nd Ed.2012,3114-C, 3-38	0.01	0.05	N.D.
33	Selenium (as Se)	mg/Lit	APHA 22nd Ed.2012,3114-C, 3-38	0.01	No Relaxation	N.D.
34	Chromium (as Cr)	mg/Lit	APHA 22nd Ed.2012,3500-Cr-B, 3-69	0.05	No Relaxation	N.D.
35	Anionic Detergent (as MBAS)	mg/Lit	APHA 22nd Ed.2012,5540-C, 5-53	0.2	1.0	N.D.
36	Phenolic Compound (as C <sub>6</sub> H <sub>5</sub> OH)	mg/Lit	APHA 22nd Ed.2012,5540-B & C, 5-47	0.001	0.002	N.D.
37	Poly-nuclear Aromatic Hydrocarbon (PAH)	µg/Lit	APHA 22nd Ed.2012,6440-6-93	0.0001	No Relaxation	N.D.
38	Mineral Oil	mg/Lit	IS 3025 (part-39) : 1991, RA 2003	0.5	No Relaxation	N.D.
39	Oil & Grease	mg/Lit	IS 3025 (Part 39):1991, RA 2003	-	-	N.D.
<b>Microbiological Analysis</b>						
1	Total Coliforms	MPN/100 ML	IS:1622:1981: RA:2019	Shall not be detectable in any 100 ml sample		Absent
2	Faecal coliform	MPN/100ml	IS:1622:1981: RA:2019	Shall not be detectable in any 100 ml sample		Absent
3	E. Coll	MPN/100ml	IS:1622:1981:RA:2019	Shall not be detectable in any 100ml sample		Absent
<b>Pesticides</b>						
1	p,p DDT	µg/L	US EPA 508-1995	1		N.D.
2	o,p DDT	µg/L	US EPA 508-1995	1		N.D.
3	p,pDDE	µg/L	US EPA 508-1995	1		N.D.



HDD-272, Phase III - Near JP Chowk  
 Ring Road No -2, Kabir Nagar, Raipur (C.G.) - 492099  
 Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

REPORT NO. 02875

**TEST REPORT**

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	
4	p,p DDD	µg/L	US EPA 508-1995		1	N.D.
5	O,p DDD	µg/L	US EPA 508-1995		1	N.D.
6	Gamma-HCH (Lindane)	µg/L	US EPA 508-1995		2	N.D.
7	Alpha-HCH	µg/L	US EPA 508-1995		0.01	N.D.
8	Beta-HCH	µg/L	US EPA 508-1995		0.04	N.D.
9	Delta HCH	µg/L	US EPA 508-1995		0.04	N.D.
10	Alpha-Endosulfan	µg/L	US EPA 508-1995		0.4	N.D.
11	Beta-Endosulfan	µg/L	US EPA 508-1995		0.4	N.D.
12	Endosulfansulphate	µg/L	US EPA 508-1995		0.4	N.D.
13	Monocrotophos	µg/L	US EPA 8141A-1994		1	N.D.
14	Ethion	µg/L	US EPA 8141A-1994		3	N.D.
15	Chloropyrifos	µg/L	US EPA 8141A-1994		30	N.D.
16	Phorate	µg/L	US EPA 8141A-1994		2	N.D.
17	Phoratesulphoxide	µg/L	US EPA 8141A-1994		-	N.D.
18	Phoratesulphone	µg/L	US EPA 8141A-1994		-	N.D.
19	2,4-D	µg/L	US EPA 515.1-1995		30	N.D.
20	Alachlor	µg/L	US EPA 508-1995		20	N.D.
21	Atrazine	µg/L	US EPA 532-2000		2	N.D.
22	Methyl parathion	µg/L	US EPA 8141A-1994		0.3	N.D.
23	Methyl paraxone	µg/L	US EPA 8141A-1994		-	N.D.
24	Malathion	µg/L	US EPA 8141A-1994		190	N.D.
25	Malaoxon	µg/L	US EPA 8141A-1994		-	N.D.
26	Aldrin	µg/L	US EPA 508-1995		0.03	N.D.
27	Dieldrin	µg/L	US EPA 508-1995		0.03	N.D.

Note: mg/lit.: milligram per liter, N.D. - Not Detected

**REMARKS: RESULTS ARE AS ABOVE**

**Terms & conditions**

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- > Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.
- > This is for information as the party has asked for above test(s) only

 02/05/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  02/05/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----

<b>Name &amp; Address Of The Customer</b>		<b>REPORT NO</b>	UES/TR/22-23/02874
<b>TO,</b>		<b>LAB REF NO</b>	UES/22-23/W/07994
<b>HINDALCO INDUSTRIES LIMITED,</b>		<b>DATE OF SAMPLING</b>	25/08/2022
<b>GARE PALMA - IV/S, MILUPARA</b>		<b>DATE OF RECEIPT</b>	26/08/2022
<b>U/G COAL MINE, VILLAGE - MILUPARA,</b>		<b>DATE OF REPORT</b>	02/09/2022
<b>BLOCK-TAMNAR,</b>		<b>DATE OF ANALYSIS</b>	START:26/05/2022    END:01/09/2022
<b>DIST. - RAIGARH (C.G.) 496107</b>			
SAMPLE DETAILS			
<b>SAMPLE TYPE</b>	GROUND WATER	<b>ORDER /REFERENCE:</b>	VERBAL COMMUNICATION.
<b>CUSTOMER SAMPLE ID</b>	STAFF QUARTER-BANJIKHOL PIEZOMETER (AWLR)	<b>SAMPLE CONDITION AT RECEIPT</b>	OK
<b>PACKING OF SAMPLE</b>	3 L X 1 NO. PVC CAN 1 L X 1 NO. PVC CAN 1 L X 1 NO. GLASS BOTTLE	<b>SEALED</b> <b>SAMPLE COLLECTED BY</b>	<b>CHEMIST</b>
<b>SAMPLING PROCEDURE</b>	IS:3025 (PART 1):1987 RA 2003; APHA 22ND ED. 2012, 1060-B, 1-39	<b>QUANTITY RECEIVED</b>	5 LTR

REPORT NO.02874

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	ACCEPTABLE LIMIT FOR DRINKING WATER (IS-10500:2012)		RESULT
				Acceptable Limit	Permissible Limit	
1	Colour	Hazen	IS:3025:(Part-4)	5	15	<1
2	Odour	-	IS 3025:(part-5)	Agreeable	Agreeable	Agreeable
3	Taste	-	IS 3025:(part-8)	Agreeable	Agreeable	Agreeable
4	pH	-	APHA 22 <sup>nd</sup> Ed.2012,4500-H <sup>-</sup> -B, 4-92	6.5-8.5	No Relaxation	6.94
5	Turbidity	NTU	APHA 22 <sup>nd</sup> Ed.2012,2130-B,2-13	1	5	0.82
6	Electrical Conductivity	µS/cm	IS 3025(part-14):1984, RA 2013	-	-	210.6
7	Residual Chlorine	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-Cl-G, 4-69	0.2	1	N.D.
8	Total Solid	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,2540- B, 2-64	-	-	136.0
9	Total Dissolved Solids	mg/Lit	IS 3025(part-16):1984, RA 2006	500	2000	127.6
10	Total Suspended Solids	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,2540- D, 2-66	-	-	8.4
11	Alkalinity Total (as CaCO <sub>3</sub> )	mg/Lit	IS 3025(part-23):1986, RA 2003	200	600	34.0
12	Total Hardness ( as CaCO <sub>3</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,2340-C, 2-44,45	200	600	78.0
13	Calcium Hardness (as CaCO <sub>3</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Ca-B, 3-67	-	-	52.0
14	Magnesium Hardness (as CaCO <sub>3</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Mg-B, 3-84	-	-	26.0
15	Calcium (as Ca)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Ca-B, 3-67	75	200	20.8
16	Magnesium (as Mg)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Mg-B, 3-84	30	100	6.31
17	Chloride (as Cl)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-Cl-B, 4-72	250	1000	22.9
18	Sulphate (as SO <sub>4</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-SO <sub>4</sub> -E,4-190	200	400	28.4
19	Nitrate (as NO <sub>3</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-NO <sub>3</sub> -B,4-122	45	No Relaxation	0.64
20	Phosphate (as P)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-P-C, 4-153	-	-	N.D.

REPORT NO. 02874

**TEST REPORT**

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	ACCEPTABLE LIMIT FOR DRINKING WATER (IS 10500:2012)		RESULT
				Acceptable Limit	Permissible limit	
21	Sodium (as Na)	mg/Lit	APHA 22nd Ed.2012,3500-Na-B, 3-97	-	-	5.2
22	Potassium (as K)	mg/Lit	APHA 22nd Ed.2012,3500-K-B, 3-87	-	-	2.8
23	Boron (as B)	mg/Lit	APHA 22nd Ed.2012,4500-B-B, 4-25	0.5	1.0	N.D.
24	Iron (as Fe)	mg/Lit	APHA 22nd Ed.2012,3111-B,3-18	0.3	No Relaxation	N.D.
25	Fluoride (as F)	mg/Lit	APHA 22nd Ed.2012,4500-F-B & D, 4-84 & 87	1	1.5	0.16
26	Manganese (as Mn)	mg/Lit	APHA 22nd Ed.2012,3111-B, 3-18	0.1	0.3	N.D.
27	Lead (as Pb)	mg/Lit	APHA 22nd Ed.2012,3111-B, 3-18	0.01	No Relaxation	N.D.
28	Nickel (as Ni)	mg/Lit	APHA 22nd Ed.2012,3500-NI, 3-108	0.02	No Relaxation	N.D.
29	Zinc (as Zn)	mg/Lit	APHA 22nd Ed.2012,3111-B, 3-18	5	15	N.D.
30	Copper (as Cu)	mg/Lit	APHA 22nd Ed.2012,3111-B, 3-18	0.05	1.5	N.D.
31	Cadmium (as Cd)	mg/Lit	APHA 22nd Ed.2012,3500-Cd, 3-105	0.003	No Relaxation	N.D.
32	Mercury (as Hg)	mg/Lit	APHA 22nd Ed.2012,3112-B, 3-23	0.001	No Relaxation	N.D.
33	Arsenic (as As)	mg/Lit	APHA 22nd Ed.2012,3114-C, 3-38	0.01	0.05	N.D.
34	Selenium (as Se)	mg/Lit	APHA 22nd Ed.2012,3114-C, 3-38	0.01	No Relaxation	N.D.
35	Chromium (as Cr)	mg/Lit	APHA 22nd Ed.2012,3500-Cr-B, 3-69	0.05	No Relaxation	N.D.
36	Anionic Detergent (as MBAS)	mg/Lit	APHA 22nd Ed.2012,5540-C, 5-53	0.2	1.0	N.D.
37	Phenolic Compound (as C <sub>6</sub> H <sub>5</sub> OH)	mg/Lit	APHA 22nd Ed.2012,5540-B & C, 5-47	0.001	0.002	N.D.
38	Poly-nuclear Aromatic Hydrocarbon (PAH)	µg/Lit	APHA 22nd Ed.2012,6440-6-93	0.0001	No Relaxation	N.D.
39	Mineral Oil	mg/Lit	IS 3025 (part-39) : 1991, RA 2003	0.5	No Relaxation	N.D.
40	Oil & Grease	mg/Lit	IS 3025 (Part 39):1991, RA 2003	-	-	N.D.
<b>Microbiological Analysis</b>						
1	Total Coliforms	MPN/100 ML	IS:1622:1981: RA:2019	Shall not be detectable in any 100 ml sample		Absent
2	Faecal coliform	MPN/100ml	IS:1622:1981: RA:2019	Shall not be detectable in any 100 ml sample		Absent
3	E. Coll	MPN/100ml	IS:1622:1981:RA:2019	Shall not be detectable in any 100ml sample		Absent
<b>Pesticides</b>						
1	p,p DDT	µg/L	US EPA 508-1995	1		N.D.
2	o,p DDT	µg/L	US EPA 508-1995	1		N.D.
3	p,pDDE	µg/L	US EPA 508-1995	1		N.D.
4	p,p DDD	µg/L	US EPA 508-1995	1		N.D.
5	O,p DDD	µg/L	US EPA 508-1995	1		N.D.
6	Gamma-HCH (Lindane)	µg/L	US EPA 508-1995	2		N.D.
7	Alpha-HCH	µg/L	US EPA 508-1995	0.01		N.D.





**Ultimate**  
ENVIRONMENTAL SOLUTIONS

HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

REPORT NO. 02874

**TEST REPORT**

SRL NO.	PARAMETER	UNIT	METHOD OF TEST	ACCEPTABLE LIMIT FOR DRINKING WATER (IS 10500:2012)		RESULT
				Acceptable Limit	Permissible limit	
8	Beta-HCH	µg/L	US EPA 508-1995	0.04		N.D.
9	Delta HCH	µg/L	US EPA 508-1995	0.04		N.D.
10	Alpha-Endosulfan	µg/L	US EPA 508-1995	0.4		N.D.
11	Beta-Endosulfan	µg/L	US EPA 508-1995	0.4		N.D.
12	Endosulfansulphate	µg/L	US EPA 508-1995	0.4		N.D.
13	Monocrotophos	µg/L	US EPA 8141A-1994	1		N.D.
14	Ethion	µg/L	US EPA 8141A-1994	3		N.D.
15	Chloropyrifos	µg/L	US EPA 8141A-1994	30		N.D.
16	Phorate	µg/L	US EPA 8141A-1994	2		N.D.
17	Phoratesulphoxide	µg/L	US EPA 8141A-1994	-		N.D.
18	Phoratesulphone	µg/L	US EPA 8141A-1994	-		N.D.
19	2,4-D	µg/L	US EPA 515.1-1995	30		N.D.
20	Alachlor	µg/L	US EPA 508- 1995	20		N.D.
21	Atrazine	µg/L	US EPA 532-2000	2		N.D.
22	Methyl parathion	µg/L	US EPA 8141A-1994	0.3		N.D.
23	Methyl paraxone	µg/L	US EPA 8141A-1994	-		N.D.
24	Malathion	µg/L	US EPA 8141A-1994	190		N.D.
25	Malaoxon	µg/L	US EPA 8141A-1994	-		N.D.
26	Aldrin	µg/L	US EPA 508- 1995	0.03		N.D.
27	Dieldrin	µg/L	US EPA 508-1995	0.03		N.D.

Note: mg/lit.: milligram per liter, N.D. - Not Detected.

**REMARKS: RESULTS ARE AS ABOVE**

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- > This is for information as the party has asked for above test(s) only.

 02/03/22 <b>REVIEWED BY</b>	 	For ULTIMATE ENVIRONMENTAL SOLUTIONS  02/03/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----



**Ultimate**  
ENVIRONMENTAL SOLUTIONS

HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviron@gmail.com

<b>Name &amp; Address Of The Customer</b> <b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/5, MILUPARA</b> <b>UG COAL MINE, VILLAGE - MILUPARA,</b> <b>BLOCK-TAMNAR,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>	<b>REPORT NO</b>	UES/TR/22-23/02876	
	<b>LAB REF NO</b>	UES/22-23/W/07996	
	<b>DATE OF SAMPLING</b>	25/08/2022	
	<b>DATE OF RECEIPT</b>	26/08/2022	
	<b>DATE OF REPORT</b>	02/09/2022	
	<b>DATE OF ANALYSIS</b>	START:26/05/2022	END:01/09/2022
<b>SAMPLE DETAILS</b>			
<b>SAMPLE TYPE</b>	GROUND WATER	<b>ORDER /REFERENCE:</b>	VERBAL COMMUNICATION.
<b>CUSTOMER SAMPLE ID</b>	MILUPARA VILLAGE NEAR PHC-HIL (DUGWELL)	<b>SAMPLE CONDITION AT RECEIPT</b>	OK
<b>PACKING OF SAMPLE</b>	3 L X 1 NO. PVC CAN 1 L X 1 NO. PVC CAN 1 L X 1 NO. GLASS BOTTLE	SEALED	<b>SAMPLE COLLECTED BY</b> CHEMIST
<b>SAMPLING PROCEDURE</b>	IS:3025 (PART I):1987 RA 2003; APHA 22ND ED. 2012,1060-B,1-39	<b>QUANTITY RECEIVED</b>	5 LTR

REPORT NO.02876

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	
1	Colour	Hazen	IS:3025:(Part-4)	5	15	<1
2	Odour	-	IS 3025(part-5)	Agreeable	Agreeable	Agreeable
3	Taste	-	IS 3025(part-8)	Agreeable	Agreeable	Agreeable
4	pH	-	APHA 22 <sup>nd</sup> Ed.2012,4500-H <sup>+</sup> -B, 4-92	6.5-8.5	No Relaxation	7.42
5	Turbidity	NTU	APHA 22 <sup>nd</sup> Ed.2012,2130-B,2-13	1	5	1.82
6	Electrical Conductivity	µS/cm	IS 3025(part-14):1984, RA 2013	-	-	226.4
7	Residual Chlorine	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-Cl-G, 4-69	0.2	1	N.D.
8	Total Solid	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,2540- B, 2-64	-	-	145.6
9	Total Dissolved Solids	mg/Lit	IS 3025(part-16):1984, RA 2006	500	2000	137.2
10	Total Suspended Solids	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,2540- D, 2-66	-	-	8.4
11	Alkalinity Total (as CaCO <sub>3</sub> )	mg/Lit	IS 3025(part-23):1986, RA 2003	200	600	40.0
12	Total Hardness ( as CaCO <sub>3</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,2340-C, 2-44,45	200	600	96.0
13	Calcium Hardness (as CaCO <sub>3</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Ca-B,3-67	-	-	44.0
14	Magnesium Hardness (as CaCO <sub>3</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Mg-B,3-84	-	-	52.0
15	Calcium (as Ca)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Ca-B,3-67	75	200	17.6
16	Magnesium (as Mg)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Mg-B, 3-84	30	100	12.6
17	Chloride (as Cl)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-Cl-B, 4-72	250	1000	36.9
18	Sulphate (as SO <sub>4</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-SO <sub>4</sub> -E, 4-190	200	400	22.4
19	Nitrate (as NO <sub>3</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-NO <sub>3</sub> -B,4-122	45	No Relaxation	2.2
20	Phosphate (as P)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-P-C, 4-153	-	-	N.D.
21	Sodium (as Na)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Na-	-	-	5.6

REPORT NO. 02976

**TEST REPORT**

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible Limit	
			B, 3-97			
22	Potassium (as K)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-K-B, 3-87	-	-	1.22
23	Boron (as B)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-B-B, 4-25	0.5	1.0	N.D.
24	Iron (as Fe)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3111-B,3-18	0.3	No Relaxation	N.D.
25	Fluoride (as F)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-F-B 8D, 4-84 & 87	1	1.5	0.11
26	Manganese (as Mn)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3111-B, 3-18	0.1	0.3	0.18
27	Lead (as Pb)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3111-B, 3-18	0.01	No Relaxation	N.D.
28	Nickel (as Ni)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Ni, 3-108	0.02	No Relaxation	N.D.
29	Zinc (as Zn)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3111-B, 3-18	5	15	N.D.
30	Copper (as Cu)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3111-B, 3-18	0.05	1.5	N.D.
31	Cadmium (as Cd)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Cd, 3-105	0.003	No Relaxation	N.D.
32	Mercury (as Hg)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3112-B, 3-23	0.001	No Relaxation	N.D.
33	Arsenic (as As)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3114-C, 3-38	0.01	0.05	N.D.
34	Selenium (as Se)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3114-C, 3-38	0.01	No Relaxation	N.D.
35	Chromium (as Cr)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Cr-B, 3-69	0.05	No Relaxation	N.D.
36	Anionic Detergent (as MBAS)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,5540-C, 5-53	0.2	1.0	N.D.
37	Phenolic Compound (as C <sub>6</sub> H <sub>5</sub> OH)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,5540-B & C, 5-47	0.001	0.002	N.D.
38	Poly-nuclear Aromatic Hydrocarbon (PAH)	µg/Lit	APHA 22 <sup>nd</sup> Ed.2012,6440-6-93	0.0001	No Relaxation	N.D.
39	Mineral Oil	mg/Lit	IS 3025 (part-39) : 1991, RA 2003	0.5	No Relaxation	N.D.
40	Oil & Grease	mg/Lit	IS 3025 (Part 39):1991, RA 2003	-	-	N.D.
<b>Microbiological Analysis</b>						
1	Total Coliforms	MPN/100 ML	IS:1622:1981: RA:2019	Shall not be detectable in any 100 ml sample		Absent
2	Faecal coliform	MPN/100ml	IS:1622:1981: RA:2019	Shall not be detectable in any 100 ml sample		Absent
3	E. Coli	MPN/100ml	IS:1622:1981:RA:2019	Shall not be detectable in any 100ml sample		Absent
<b>Pesticides</b>						
1	p,p DDT	µg/L	US EPA 508-1995	1		N.D.
2	o,p DDT	µg/L	US EPA 508-1995	1		N.D.
3	p,pDDE	µg/L	US EPA 508-1995	1		N.D.
4	p,p DDD	µg/L	US EPA 508-1995	1		N.D.
5	O,p DDD	µg/L	US EPA 508-1995	1		N.D.



**Ultimate**  
ENVIROLYTICAL SOLUTIONS

HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

REPORT NO. 02876

**TEST REPORT**

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	
6	Gamma-HCH (Lindane)	µg/L	US EPA 508-1995		2	N.D.
7	Alpha-HCH	µg/L	US EPA 508-1995		0.01	N.D.
8	Beta-HCH	µg/L	US EPA 508-1995		0.04	N.D.
9	Delta HCH	µg/L	US EPA 508-1995		0.04	N.D.
10	Alpha-Endosulfan	µg/L	US EPA 508-1995		0.4	N.D.
11	Beta-Endosulfan	µg/L	US EPA 508-1995		0.4	N.D.
12	Endosulfansulphate	µg/L	US EPA 508-1995		0.4	N.D.
13	Monocrotophos	µg/L	US EPA 8141A-1994		1	N.D.
14	Ethion	µg/L	US EPA 8141A-1994		3	N.D.
15	Chloropyrifos	µg/L	US EPA 8141A-1994		30	N.D.
16	Phorate	µg/L	US EPA 8141A-1994		2	N.D.
17	Phoratesulphoxide	µg/L	US EPA 8141A-1994		-	N.D.
18	Phoratesulphone	µg/L	US EPA 8141A-1994		-	N.D.
19	2,4-D	µg/L	US EPA 515.1-1995		30	N.D.
20	Alachlor	µg/L	US EPA 508- 1995		20	N.D.
21	Atrazine	µg/L	US EPA 532-2000		2	N.D.
22	Methyl parathion	µg/L	US EPA 8141A-1994		0.3	N.D.
23	Methyl paraxone	µg/L	US EPA 8141A-1994		-	N.D.
24	Malathion	µg/L	US EPA 8141A-1994		190	N.D.
25	Malaoxon	µg/L	US EPA 8141A-1994		-	N.D.
26	Aldrin	µg/L	US EPA 508- 1995		0.03	N.D.
27	Dieldrin	µg/L	US EPA 508-1995		0.03	N.D.

Note: mg/lit.: milligram per liter, N.D. - Not Detected.

**REMARKS: RESULTS ARE AS ABOVE**

**Terms & conditions**

- > The report for publication, arbitration or as legal dispute is forbidden.
- > Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.
- > This is for information as the party has asked for above test(s) only.

 02/03/22 <b>REVIEWED BY</b>	 02/09/22 <b>AUTHORIZED SIGNATORY</b>	For <b>ULTIMATE ENVIROLYTICAL SOLUTIONS</b>
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-----End of the test report-----



**Ultimate**  
ENVIROLYTICAL SOLUTIONS

HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

<b>Name &amp; Address Of The Customer</b> <b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,VILLAGE -</b> <b>BANKHETA, POST -MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107.</b>	<b>REPORT NO</b>	UES/TR/22-23/02839
	<b>LAB REF NO</b>	UES/22-23/W/07913
	<b>DATE OF SAMPLING</b>	24/08/2022
	<b>DATE OF RECEIPT</b>	25/08/2022
	<b>DATE OF REPORT</b>	01/09/2022
	<b>DATE OF ANALYSIS</b>	START:26/08/2022   END:01/09/2022

**SAMPLE DETAILS**

<b>SAMPLE TYPE</b>	GROUND WATER	<b>ORDER /REFERENCE:</b>	VERBAL COMMUNICATION.
<b>CUSTOMER SAMPLE ID</b>	SAKTA VILLAGE, (DUGWELL)	<b>SAMPLE CONDITION AT RECEIPT</b>	OK
<b>PACKING OF SAMPLE</b>	3 L X 1 NO. PVC CAN 1 L X 2 NO. PVC CAN 1 L X 1 NO. GLASS BOTTLE SEALD	<b>SAMPLE COLLECTED BY</b>	CHEMIST
<b>SAMPLING PROCEDURE</b>	IS:3025(PART I):1987 RA 2003: APHA 23RD ED. 2012, 1060-B, 1-39	<b>QUANTITY RECEIVED</b>	5 LTR

Report No.02839

**TEST REPORT**

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	
1	Colour	Hazen	IS:3025:(Part-4)	5	15	5.8
2	Odour	-	IS 3025(part-5)	Agreeable	Agreeable	Agreeable
3	Taste	-	IS 3025(part-8)	Agreeable	Agreeable	Agreeable
4	pH	-	APHA 23 <sup>rd</sup> Ed.2012,4500-H <sup>+</sup> -B, 4-92	6.5-8.5	No Relaxation	7.64
5	Turbidity	NTU	APHA 23 <sup>rd</sup> Ed.2012,2130-B,2-13	1	5	4.2
6	Electrical Conductivity	µS/cm	IS 3025(part-14):1984, RA 2013	-	-	242.2
7	Residual Chlorine	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-Cl-G, 4-69	0.2	1	N.D.
8	Total Solid	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,2540- B, 2-64	-	-	157.5
9	Total Dissolved Solids	mg/Lit	IS 3025(part-16):1984, RA 2006	500	2000	146.7
10	Total Suspended Solids	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,2540- D, 2-66	-	-	10.8
11	Alkalinity Total (as CaCO <sub>3</sub> )	mg/Lit	IS 3025(part-23):1986, RA 2003	200	600	84.0
12	Total Hardness ( as CaCO <sub>3</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,2340-C, 2-44,45	200	600	124.0
13	Calcium Hardness (as CaCO <sub>3</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Ca-B, 3-67	-	-	86.0
14	Magnesium Hardness (as CaCO <sub>3</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Mg-B, 3-84	-	-	38.0
15	Calcium (as Ca)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Ca-B, 3-67	75	200	34.4
16	Magnesium (as Mg)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Mg-B, 3-84	30	100	9.23
17	Chloride (as Cl)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-Cl-B, 4-72	250	1000	24.9
18	Sulphate (as SO <sub>4</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-SO <sub>4</sub> -E, 4-190	200	400	21.2
19	Nitrate (as NO <sub>3</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-NO <sub>3</sub> -B, 4-122	45	No Relaxation	0.64
20	Phosphate (as P)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-P-C, 4-153	-	-	N.D.
21	Sodium (as Na)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Na-B, 3-97	-	-	14.6





**Ultimate**  
ENVIROLYTICAL SOLUTIONS

HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

Report No. 02839

**TEST REPORT**

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS-10500:2012		RESULT
				Acceptable Limit	Permissible limit	
22	Potassium (as K)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-K-B, 3-87	-	-	0.64
23	Boron (as B)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-B-B, 4-25	0.5	1.0	N.D.
24	Iron (as Fe)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3111-B,3-18	0.3	NoRelaxation	N.D.
25	Fluoride (as F)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-F-B & D, 4-84 & 87	1	1.5	0.12
26	Manganese (as Mn)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	0.1	0.3	0.09
27	Lead (as Pb)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	0.01	NoRelaxation	N.D.
28	Nickel (as Ni)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Ni, 3-108	0.02	No Relaxation	N.D.
29	Zinc (as Zn)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	5	15	N.D.
30	Copper (as Cu)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	0.05	1.5	N.D.
31	Cadmium (as Cd)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Cd, 3-105	0.003	NoRelaxation	N.D.
32	Mercury (as Hg)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3112-B, 3-23	0.001	NoRelaxation	N.D.
33	Arsenic (as As)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3114-C, 3-38	0.01	0.05	N.D.
34	Selenium (as Se)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3114-C, 3-38	0.01	NoRelaxation	N.D.
35	Chromium (as Cr)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Cr-B, 3-69	0.05	NoRelaxation	N.D.
36	Anionic Detergent (as MBAS)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,5540-C, 5-53	0.2	1.0	N.D.
37	Phenolic Compound (as C <sub>6</sub> H <sub>5</sub> OH)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,5540-B & C, 5-47	0.001	0.002	N.D.
38	Poly-nuclear Aromatic Hydrocarbon (PAH)	µg/Lit	APHA 23 <sup>rd</sup> Ed.2012,6440-6-93	0.0001	NoRelaxation	N.D.
39	Mineral Oil	mg/Lit	IS 3025 (part-39) : 1991, RA 2003	0.5	No Relaxation	N.D.
40	Oil & Grease	mg/Lit	IS 3025 (Part 39):1991, RA 2003	-	-	N.D.
<b>Microbiological Analysis</b>						
1	Total Coliforms	MPN/100 ML	IS:1622:1981: RA:2019	Shall not be detectable in any 100 ml sample		Absent
2	Faecal coliform	MPN/100ml	IS:1622:1981: RA:2019	Shall not be detectable in any 100 ml sample		Absent
3	E. Coli	MPN/100ml	IS:1622:1981:RA:2019	Shall not be detectable in any 100ml sample		Absent
<b>Pesticides</b>						
1	p,p DDT	µg/L	US EPA 508-1995	1		N.D.
2	o,p DDT	µg/L	US EPA 508-1995	1		N.D.
3	p,pDDE	µg/L	US EPA 508-1995	1		N.D.
4	p,p DDD	µg/L	US EPA 508-1995	1		N.D.
5	O,p DDD	µg/L	US EPA 508-1995	1		N.D.
6	Gamma-HCH (Lindane)	µg/L	US EPA 508-1995	2		N.D.



**Ultimate**  
ENVIROLYTICAL SOLUTIONS

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Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

Report No. 02839

**TEST REPORT**

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	
7	Alpha-HCH	µg/L	US EPA 508-1995		0.01	N.D.
8	Beta-HCH	µg/L	US EPA 508-1995		0.04	N.D.
9	Delta HCH	µg/L	US EPA 508-1995		0.04	N.D.
10	Alpha-Endosulfan	µg/L	US EPA 508-1995		0.4	N.D.
11	Beta-Endosulfan	µg/L	US EPA 508-1995		0.4	N.D.
12	Endosulfansulphate	µg/L	US EPA 508-1995		0.4	N.D.
13	Monocrotophos	µg/L	US EPA 8141A-1994		1	N.D.
14	Ethion	µg/L	US EPA 8141A-1994		3	N.D.
15	Chloropyrifos	µg/L	US EPA 8141A-1994		30	N.D.
16	Phorate	µg/L	US EPA 8141A-1994		2	N.D.
17	Phoratesulphoxide	µg/L	US EPA 8141A-1994		-	N.D.
18	Phoratesulphone	µg/L	US EPA 8141A-1994		-	N.D.
19	2,4-D	µg/L	US EPA 515.1-1995		30	N.D.
20	Alachlor	µg/L	US EPA 508-1995		20	N.D.
21	Atrazine	µg/L	US EPA 532-2000		2	N.D.
22	Methyl parathion	µg/L	US EPA 8141A-1994		0.3	N.D.
23	Methyl paraxone	µg/L	US EPA 8141A-1994		-	N.D.
24	Malathion	µg/L	US EPA 8141A-1994		190	N.D.
25	Malaoxon	µg/L	US EPA 8141A-1994		-	N.D.
26	Aldrin	µg/L	US EPA 508-1995		0.03	N.D.
27	Dieldrin	µg/L	US EPA 508-1995		0.03	N.D.

Note: mg/lit.: milligram per liter, N.D.- Not Detected.

**REMARKS: RESULTS ARE AS ABOVE**

**Terms & conditions**

- > The report for publication, arbitration or as legal dispute is forbidden.
- > Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.
- > This is for information as the party has asked for above test(s) only.

 01/09/22  <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/09/22  <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----

<b>Name &amp; Address Of The Customer</b> <b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/5, MILUPARA</b> <b>U/G COAL MINE, VILLAGE - MILUPARA,</b> <b>BLOCK-TAMNAR,</b> <b>DISTT. - RAIGARN (C.G.) 496107</b>		<b>REPORT NO</b>	UES/TR/22-23/02877	
		<b>LAB REF NO</b>	UES/22-23/W/07997	
		<b>DATE OF SAMPLING</b>	25/08/2022	
		<b>DATE OF RECEIPT</b>	26/08/2022	
		<b>DATE OF REPORT</b>	02/09/2022	
		<b>DATE OF ANALYSIS</b>	<b>START: 26/05/2022</b>	<b>END: 01/09/2022</b>
<b>SAMPLE DETAILS</b>				
<b>SAMPLE TYPE</b>	<b>GROUND WATER</b>		<b>ORDER /REFERENCE:</b>	<b>VERBAL COMMUNICATION.</b>
<b>CUSTOMER SAMPLE ID</b>	<b>SIDARPARA VILLAGE (DUGWELL)</b>		<b>SAMPLE CONDITION AT RECEIPT</b>	<b>OK</b>
<b>PACKING OF SAMPLE</b>	3 L X 1 NO. PVC CAN 1 L X 1 NO. PVC CAN 1 L X 1 NO. GLASS BOTTLE	<b>SEALED</b>	<b>SAMPLE COLLECTED BY</b>	<b>CHEMIST</b>
<b>SAMPLING PROCEDURE</b>	<b>IS:3025 (PART I):1987 RA 2003;</b> <b>APHA 22ND ED. 2012,1060-B,1-39</b>		<b>QUANTITY RECEIVED</b>	<b>5 LTR</b>

REPORT NO. 02877

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	
1	Colour	Hazen	IS:3025:(Part-4)	5	15	<1
2	Odour	-	IS 3025(part-5)	Agreeable	Agreeable	Agreeable
3	Taste	-	IS 3025(part-8)	Agreeable	Agreeable	Agreeable
4	pH	-	APHA 22 <sup>nd</sup> Ed.2012,4500-H <sup>+</sup> -B, 4-92	6.5-8.5	No Relaxation	7.48
5	Turbidity	NTU	APHA 22 <sup>nd</sup> Ed.2012,2130-B,2-13	1	5	1.26
6	Electrical Conductivity	µS/cm	IS 3025(part-14):1984, RA 2013	-	-	298.0
7	Residual Chlorine	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-Cl-G, 4-69	0.2	1	N.D.
8	Total Solid	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,2540- B, 2-64	-	-	185.4
9	Total Dissolved Solids	mg/Lit	IS 3025(part-16):1984, RA 2006	500	2000	180.6
10	Total Suspended Solids	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,2540- D, 2-66	-	-	4.8
11	Alkalinity Total (as CaCO <sub>3</sub> )	mg/Lit	IS 3025(part-23):1986, RA 2003	200	600	54.0
12	Total Hardness ( as CaCO <sub>3</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,2340-C, 2-44,45	200	600	86.0
13	Calcium Hardness (as CaCO <sub>3</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Ca-B,3-67	-	-	52.0
14	Magnesium Hardness (as CaCO <sub>3</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Mg-B,3-84	-	-	32.0
15	Calcium (as Ca)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Ca-B,3-67	75	200	20.8
16	Magnesium (as Mg)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Mg-B,3-84	30	100	7.76
17	Chloride (as Cl)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-Cl-B, 4-72	250	1000	18.9
18	Sulphate (as SO <sub>4</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-SO <sub>4</sub> -E, 4-190	200	400	26.8
19	Nitrate (as NO <sub>3</sub> )	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-NO <sub>3</sub> -B,4-122	45	No Relaxation	3.8
20	Phosphate (as P)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-P-C, 4-153	-	-	N.D.

REPORT NO. 02877

**TEST REPORT**

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible Limit	
21	Sodium (as Na)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Na-B, 3-97	-	-	18.4
22	Potassium (as K)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-K-B, 3-87	-	-	1.26
23	Boron (as B)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-B-B, 4-25	0.5	1.0	N.D.
24	Iron (as Fe)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3111-B,3-18	0.3	NoRelaxation	N.D.
25	Fluoride (as F)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,4500-F-B &D, 4-84 & 87	1	1.5	0.14
26	Manganese (as Mn)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3111-B, 3-18	0.1	0.3	0.08
27	Lead (as Pb)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3111-B, 3-18	0.01	NoRelaxation	N.D.
28	Nickel (as Ni)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-NI, 3-108	0.02	No Relaxation	N.D.
29	Zinc (as Zn)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3111-B, 3-18	5	15	N.D.
30	Copper (as Cu)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3111-B, 3-18	0.05	1.5	N.D.
31	Cadmium (as Cd)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Cd, 3-105	0.003	NoRelaxation	N.D.
32	Mercury (as Hg)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3112-B, 3-23	0.001	NoRelaxation	N.D.
33	Arsenic (as As)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3114-C, 3-38	0.01	0.05	N.D.
34	Selenium (as Se)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3114-C, 3-38	0.01	NoRelaxation	N.D.
35	Chromium (as Cr)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,3500-Cr-B, 3-69	0.05	NoRelaxation	N.D.
36	Anionic Detergent (as MBAS)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,5540-C, 5-53	0.2	1.0	N.D.
37	Phenolic Compound (as C <sub>6</sub> H <sub>5</sub> OH)	mg/Lit	APHA 22 <sup>nd</sup> Ed.2012,5540-B & C, 5-47	0.001	0.002	N.D.
38	Poly-nuclear Aromatic Hydrocarbon (PAH)	µg/Lit	APHA 22 <sup>nd</sup> Ed.2012,6440-6-93	0.0001	NoRelaxation	N.D.
39	Mineral Oil	mg/Lit	IS 3025 (part-39) : 1991, RA 2003	0.5	No Relaxation	N.D.
40	Oil & Grease	mg/Lit	IS 3025 (Part 39):1991, RA 2003	-	-	N.D.
<b>Microbiological Analysis</b>						
1	Total Coliforms	MPN/100 ML	IS:1622:1981: RA:2019	Shall not be detectable in any 100 ml sample		Absent
2	Faecal coliform	MPN/100ml	IS:1622:1981: RA:2019	Shall not be detectable in any 100 ml sample		Absent
3	E. Coli	MPN/100ml	IS:1622:1981:RA:2019	Shall not be detectable in any 100ml sample		Absent
<b>Pesticides</b>						
1	p,p DDT	µg/L	US EPA 508-1995	1		N.D.
2	o,p DDT	µg/L	US EPA 508-1995	1		N.D.
3	p,pDDE	µg/L	US EPA 508-1995	1		N.D.
4	p,p DDD	µg/L	US EPA 508-1995	1		N.D.
5	O,p DDD	µg/L	US EPA 508-1995	1		N.D.
6	Gamma-HCH (Lindane)	µg/L	US EPA 508-1995	2		N.D.

REPORT NO. 02877

**TEST REPORT**

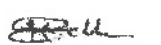

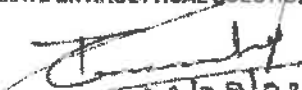
SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10800:2012		RESULT
				Acceptable Limit	Permissible Limit	
7	Alpha-HCH	µg/L	US EPA 508-1995		0.01	N.D.
8	Beta-HCH	µg/L	US EPA 508-1995		0.04	N.D.
9	Delta HCH	µg/L	US EPA 508-1995		0.04	N.D.
10	Alpha-Endosulfan	µg/L	US EPA 508-1995		0.4	N.D.
11	Beta-Endosulfan	µg/L	US EPA 508-1995		0.4	N.D.
12	Endosulfansulphate	µg/L	US EPA 508-1995		0.4	N.D.
13	Monocrotophos	µg/L	US EPA 8141A-1994		1	N.D.
14	Ethion	µg/L	US EPA 8141A-1994		3	N.D.
15	Chloropyrifos	µg/L	US EPA 8141A-1994		30	N.D.
16	Phorate	µg/L	US EPA 8141A-1994		2	N.D.
17	Phoratesulphoxide	µg/L	US EPA 8141A-1994		-	N.D.
18	Phoratesulphone	µg/L	US EPA 8141A-1994		-	N.D.
19	2,4-D	µg/L	US EPA 515.1-1995		30	N.D.
20	Alachlor	µg/L	US EPA 508-1995		20	N.D.
21	Atrazine	µg/L	US EPA 532-2000		2	N.D.
22	Methyl parathion	µg/L	US EPA 8141A-1994		0.3	N.D.
23	Methyl paraxone	µg/L	US EPA 8141A-1994		-	N.D.
24	Malathion	µg/L	US EPA 8141A-1994		190	N.D.
25	Malaoxon	µg/L	US EPA 8141A-1994		-	N.D.
26	Aldrin	µg/L	US EPA 508-1995		0.03	N.D.
27	Dieldrin	µg/L	US EPA 508-1995		0.03	N.D.

Note: mg/Lt.: milligram per liter, N.D. - Not Detected.

**REMARKS: RESULTS ARE AS ABOVE**

**Terms & conditions**

- > The report for publication, arbitration or as legal dispute is forbidden.
- > Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.
- > This is for information as the party has asked for above test(s) only.

 02/09/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  02/09/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----





**Ultimate**  
ENVIRONMENTAL SOLUTIONS

HDD-272, Phase III - Near JP Chowk  
Ring Road No -2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

<b>Name &amp; Address Of The Customer</b> <b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,VILLAGE -</b> <b>BANKHETA, POST -MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107.</b>	<b>REPORT NO</b>	UES/TR/22-23/02840
	<b>LAB REF NO</b>	UES/22-23/W/07914
	<b>DATE OF SAMPLING</b>	24/08/2022
	<b>DATE OF RECEIPT</b>	25/08/2022
	<b>DATE OF REPORT</b>	01/09/2022
	<b>DATE OF ANALYSIS</b>	START:26/08/2022   END:01/09/2022

**SAMPLE DETAILS**

<b>SAMPLE TYPE</b>	GROUND WATER	<b>ORDER /REFERENCE:</b>	VERBAL COMMUNICATION.
<b>CUSTOMER SAMPLE ID</b>	BELJOR VILLAGE (DUGWELL)	<b>SAMPLE CONDITION AT RECEIPT</b>	OK
<b>PACKING OF SAMPLE</b>	3 L X 1 NO. PVC CAN 1 L X 1 NO. PVC CAN 1 L X 1 NO. GLASS BOTTLE SEALD	<b>SAMPLE COLLECTED BY</b>	CHEMIST
<b>SAMPLING PROCEDURE</b>	IS:3025(PART I):1987 RA 2003; APHA 22ND ED. 2012, 1060-B, 1-39	<b>QUANTITY RECEIVED</b>	5 LTR

Report No. 02840

**TEST REPORT**

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	
1	Colour	Hazen	IS:3025:(Part-4)	5	15	<1
2	Odour	-	IS 3025(part-5)	Agreeable	Agreeable	Agreeable
3	Taste	-	IS 3025(part-8)	Agreeable	Agreeable	Agreeable
4	pH	-	APHA 23 <sup>rd</sup> Ed.2012,4500-H <sup>+</sup> -B, 4-92	6.5-8.5	No Relaxation	7.28
5	Turbidity	NTU	APHA 23 <sup>rd</sup> Ed.2012,2130-B,2-13	1	5	0.68
6	Electrical Conductivity	µS/cm	IS 3025(part-14):1984, RA 2013	-	-	468.8
7	Residual Chlorine	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-Cl-G, 4-69	0.2	1	N.D.
8	Total Solid	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,2540- B, 2-64	-	-	288.3
9	Total Dissolved Solids	mg/Lit	IS 3025(part-16):1984, RA 2006	500	2000	284.1
10	Total Suspended Solids	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,2540- D, 2-66	-	-	4.2
11	Alkalinity Total (as CaCO <sub>3</sub> )	mg/Lit	IS 3025(part-23):1986, RA 2003	200	600	160.0
12	Total Hardness ( as CaCO <sub>3</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,2340-C, 2-44,45	200	600	186.0
13	Calcium Hardness (as CaCO <sub>3</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Ca-B, 3-67	-	-	120.0
14	Magnesium Hardness (as CaCO <sub>3</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Mg-B, 3-84	-	-	66.0
15	Calcium (as Ca)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Ca-B, 3-67	75	200	48.0
16	Magnesium (as Mg)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Mg-B, 3-84	30	100	16.0
17	Chloride (as Cl)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-Cl-B, 4-72	250	1000	29.9
18	Sulphate (as SO <sub>4</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-SO <sub>4</sub> -E, 4-190	200	400	22.4
19	Nitrate (as NO <sub>3</sub> )	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-NO <sub>3</sub> -B, 4-122	45	No Relaxation	1.18
20	Phosphate (as P)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-P-C, 4-153	-	-	N.D.



**Ultimate**  
ENVIROLYTICAL SOLUTIONS

HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviron@gmail.com

Report No. 02840

**TEST REPORT**

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	
21	Sodium (as Na)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Na-B, 3-97	-	-	6.8
22	Potassium (as K)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-K-B, 3-87	-	-	1.64
23	Boron (as B)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-B-B, 4-25	0.5	1.0	N.D.
24	Iron (as Fe)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3111-B,3-18	0.3	No Relaxation	N.D.
25	Fluoride (as F)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,4500-F-B & D, 4-84 & 87	1	1.5	0.16
26	Manganese (as Mn)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	0.1	0.3	0.04
27	Lead (as Pb)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	0.01	No Relaxation	N.D.
28	Nickel (as Ni)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Ni, 3-108	0.02	No Relaxation	N.D.
29	Zinc (as Zn)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	5	15	N.D.
30	Copper (as Cu)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	0.05	1.5	N.D.
31	Cadmium (as Cd)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Cd, 3-105	0.003	No Relaxation	N.D.
32	Mercury (as Hg)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3112-B, 3-23	0.001	No Relaxation	N.D.
33	Arsenic (as As)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3114-C, 3-38	0.01	0.05	N.D.
34	Selenium (as Se)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3114-C, 3-38	0.01	No Relaxation	N.D.
35	Chromium (as Cr)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,3500-Cr-B, 3-69	0.05	No Relaxation	N.D.
36	Anionic Detergent (as MBAS)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,5540-C, 5-53	0.2	1.0	N.D.
37	Phenolic Compound (as C <sub>6</sub> H <sub>5</sub> OH)	mg/Lit	APHA 23 <sup>rd</sup> Ed.2012,5540-B & C, 5-47	0.001	0.002	N.D.
38	Poly-nuclear Aromatic Hydrocarbon (PAH)	µg/Lit	APHA 23 <sup>rd</sup> Ed.2012,6440-6-93	0.0001	No Relaxation	N.D.
39	Mineral Oil	mg/Lit	IS 3025 (part-39) : 1991, RA 2003	0.5	No Relaxation	N.D.
40	Oil & Grease	mg/Lit	IS 3025 (Part 39):1991, RA 2003	-	-	N.D.

**Microbiological Analysis**

1	Total Coliforms	MPN/100 ML	IS:1622:1981: RA:2019	Shall not be detectable in any 100 ml sample	Absent
2	Faecal Coliform	MPN/100ml	IS:1622:1981: RA:2019	Shall not be detectable in any 100 ml sample	Absent
3	E. Coll	MPN/100ml	IS:1622:1981:RA:2019	Shall not be detectable in any 100 ml sample	Absent

**Pesticides**

1	p,p DDT	µg/L	US EPA 508-1995	1	N.D.
2	o,p DDT	µg/L	US EPA 508-1995	1	N.D.
3	p,pDDE	µg/L	US EPA 508-1995	1	N.D.
4	p,p DDD	µg/L	US EPA 508-1995	1	N.D.
5	O,p DDD	µg/L	US EPA 508-1995	1	N.D.



**Ultimate**  
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Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

Report No. 02840

**TEST REPORT**

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	AS PER IS 10500:2012		RESULT
				Acceptable Limit	Permissible limit	
6	Gamma-HCH (Lindane)	µg/L	US EPA 508-1995	2		N.D.
7	Alpha-HCH	µg/L	US EPA 508-1995	0.01		N.D.
8	Beta-HCH	µg/L	US EPA 508-1995	0.04		N.D.
9	Delta HCH	µg/L	US EPA 508-1995	0.04		N.D.
10	Alpha-Endosulfan	µg/L	US EPA 508-1995	0.4		N.D.
11	Beta-Endosulfan	µg/L	US EPA 508-1995	0.4		N.D.
12	Endosulfansulphate	µg/L	US EPA 508-1995	0.4		N.D.
13	Monocrotophos	µg/L	US EPA 8141A-1994	1		N.D.
14	Ethion	µg/L	US EPA 8141A-1994	3		N.D.
15	Chloropyrifos	µg/L	US EPA 8141A-1994	30		N.D.
16	Phorate	µg/L	US EPA 8141A-1994	2		N.D.
17	Phoratesulphoxide	µg/L	US EPA 8141A-1994	-		N.D.
18	Phoratesulphone	µg/L	US EPA 8141A-1994	-		N.D.
19	2,4-D	µg/L	US EPA 515.1-1995	30		N.D.
20	Atachlor	µg/L	US EPA 508-1995	20		N.D.
21	Atrazine	µg/L	US EPA 532-2000	2		N.D.
22	Methyl parathion	µg/L	US EPA 8141A-1994	0.3		N.D.
23	Methyl paraxone	µg/L	US EPA 8141A-1994	-		N.D.
24	Malathion	µg/L	US EPA 8141A-1994	190		N.D.
25	Malaoxon	µg/L	US EPA 8141A-1994	-		N.D.
26	Aldrin	µg/L	US EPA 508-1995	0.03		N.D.
27	Dieldrin	µg/L	US EPA 508-1995	0.03		N.D.

Note: mg/lit.: milligram per liter, N.D.- Not Detected.

REMARKS: RESULTS ARE AS ABOVE

**Terms & conditions**

- > The report for publication, arbitration or as legal dispute is forbidden.
- > Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.
- > This is for information as the party has asked for above test(s) only.

 01/05/22  REVIEWED BY		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/05/22 AUTHORIZED SIGNATORY
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-----End of the test report-----

# Annexure-21A



Letter No. : HIL/EC/GP-IV/4 –Q1/2022-23/210

04<sup>TH</sup> July, 2022

The Integrated Regional Office,  
Ministry of Environment Forests & Climate Change (MoEF & CC) Aranya Bhawan,  
North Block, Sector – 19, Naya Raipur,  
Atal Nagar, Chhattisgarh, 492002

**Sub.:** Compliance of condition no. xxxv of Environment Clearance Letter no. – No. J-11015/183/2010-IA.II (M) dated 12 March, 2013.

**Ref.:** Environment Clearance Letter no. – No. J-11015/183/2010-IA.II (M) dated 12 March, 2013.

Dear Sir,

With reference to above subject, we are submitting herewith the quarterly monitoring report of Ground Water Level (from Apr'2022 to Jun'2022) & GW Quality for the month of May 2022 – Pre-Monsoon Season of Gare Palma IV/4 Coal Mine, M/s Hindalco Industries Limited, Village – Bhanjikhola, Tehsil – Tamnar, District – Raigarh, Chhattisgarh.

Thanking you,

Yours faithfully,

  
Govind Kumar  
(Mine Agent – Gare Palma Mines)  
Hindalco Industries Limited



Encl: As above

- CC: 1) Member Secretary, Chhattisgarh Environment Conservation Board, Paryavas, Bhawan, Raipur, Chhattisgarh.
- 2) Regional Officer, Chhattisgarh Environment Conservation Board, TV tower Road, Raigarh (CG).
- 3) The Regional Director, Regional Directorate (Central), Bhopal Central Pollution Control Board (MoEF & CC, GOI), "Parivesh Bhawan" Paryavaran Parishar, E – 5, Arera Colony, Bhopal (MP), 462016
- 4) The Regional Director, Central Ground Water Board, North Central Chhattisgarh Region, 2nd Floor, LK Corporate and Logistic Park, Dumartarai, Raipur-492015
- 5) Member Secretary, Central Ground Water Authority, 18/11, Jamnagar House, Mansingh Road, New Delhi – 110011

Hindalco Industries Limited

Gare Palma Mines ( IV/4 & IV/5), VIII & Po: Milupara , Tehsil: Tamnar Dist: Raigarh- 496107 , Chhattisgarh  
T: +91 7762 228212, Website : www.hindalco.com E mail : hindalco@adityabirla.com  
Registered Office : Ahura Centre, 1st Floor, B Wing, Mahakali Caves Road Andheri (East) , Mumbai 400093, India  
T: + 912266917000 | Fax: + 912266917001  
Corporate ID No: L27020MH1958PLC011238



**Ground Water Level Monitoring Report in and around the Coal Mine Area  
(From Apr 2022 to Jun 2022)**

Sr. No.	Location	Types of Structure	In Meters		
			Ground Water level (BGL) Apr 2022	Ground Water level (BGL) May 2022	Ground Water level (BGL) Jun 2022
1	Bankheta (Near HIL Office)	Borewell/ AWLR	12.64	12.99	13.33
2	Banjikhoh (Near Office)	Borewell/ AWLR	25.17	25.30	25.36
3	Milupara (Near Office)	Borewell/ AWLR	12.81	13.28	13.63
4	HIL Staff Quarter	Borewell/ AWLR	8.26	8.80	9.04
5	Milupara Village (PHC-HIL)	Dugwell	7.26	6.14	6.00
6	Sakta Village (Near Primary School)	Dugwell	5.28	3.59	3.50
7	Sidarpara Village (Near Primary School)	Dugwell	12.80	9.58	9.37
8	Bejor Village	Dugwell	8.76	7.18	7.34



Letter No. : HIL/EC/GP-IV/4 –Q2/2022-23/ 378

05<sup>TH</sup> October, 2022

The Integrated Regional Office,  
Ministry of Environment Forests & Climate Change (MoEF & CC) Aranya Bhawan,  
North Block, Sector – 19, Naya Raipur,  
Atal Nagar, Chhattisgarh, 492002

**Sub.: Compliance of condition no. xxxv of Environment Clearance Letter no. – No. J-11015/183/2010-IA.II (M) dated 12 March, 2013.**

**Ref.: Environment Clearance Letter no. – No. J-11015/183/2010-IA.II (M) dated 12 March, 2013.**

Dear Sir,

With reference to above subject, we are submitting herewith the quarterly monitoring report of Ground Water Level (from Jul'2022 to Sep'2022) & GW Quality for the month of August 2022 – Monsoon Season of Gare Palma IV/4 Coal Mine, M/s Hindalco Industries Limited, Village – Bhanjikhola, Tehsil – Tamnar, District – Raigarh, Chhattisgarh.

Thanking you,

Yours faithfully,

06/10/22

Govind Kumar  
(Mine Agent – Gare Palma Mines)  
Hindalco Industries Limited



Encl: As above

- CC: 1) Member Secretary, Chhattisgarh Environment Conservation Board, Paryavas, Bhawan, Raipur, Chhattisgarh.
- 2) Regional Officer, Chhattisgarh Environment Conservation Board, TV tower Road, Raigarh (CG).
- 3) The Regional Director, Regional Directorate (Central), Bhopal Central Pollution Control Board (MoEF & CC, GOI), "Parivesh Bhawan" Paryavaran Parishar, E – 5, Arera Colony, Bhopal (MP), 462016
- 4) The Regional Director, Central Ground Water Board, North Central Chhattisgarh Region, 2nd Floor, LK Corporate and Logistic Park, Dumartarai, Raipur-492015
- 5) Member Secretary, Central Ground Water Authority, 18/11, Jamnagar House, Mansingh Road, New Delhi – 110011

**Hindalco Industries Limited**

Gare Palma Mines ( IV/4 & IV/5), Vill & Po: Milupara , Tehsil: Tamnar Dist: Raigarh- 496107 , Chhattisgarh  
T: +91 7762 228212, Website : www.hindalco.com E mail : hindalco@adityabirla.com  
Registered Office : Ahura Centre, 1st Floor, B Wing, Mahakali Caves Road Andheri (East) , Mumbai 400093, India  
T: + 912266917000 | Fax: + 912266917001  
Corporate ID No: L27020MH1958PLC011238

**Ground Water Level Monitoring Report in and around the Coal Mine Area  
(From Jul 2022 to Sep 2022)**

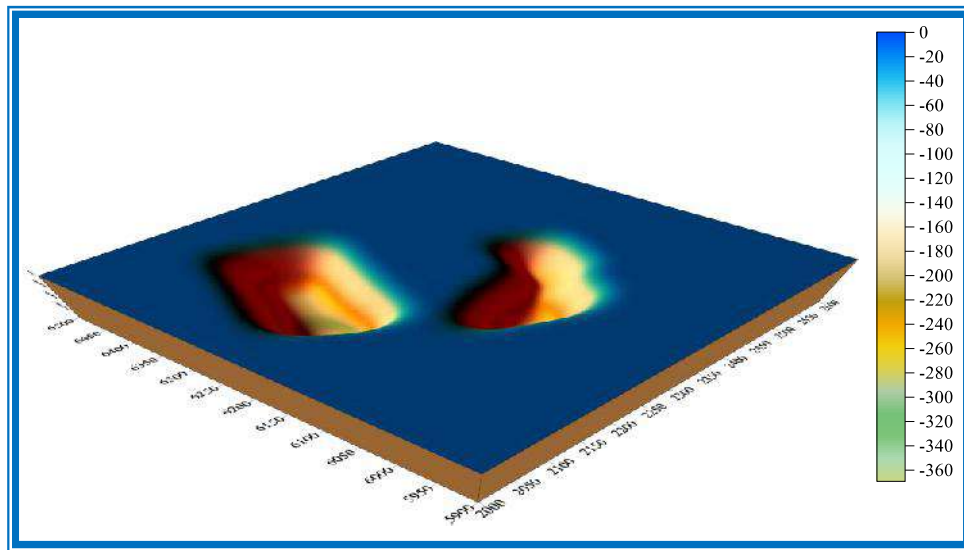
Sr. No.	Location	Types of Structure	In Meters		
			Ground Water level (BGL) Jul 2022	Ground Water level (BGL) Aug 2022	Ground Water level (BGL) Sep 2022
1	Bankheta (Near HIL Office)	Borewell/ AWLR	11.51	7.11	6.62
2	Banjikhoh (Near Office)	Borewell/ AWLR	25.55	25.55	25.59
3	Milupara (Near Office)	Borewell/ AWLR	11.55	9.05	8.34
4	HIL Staff Quarter	Borewell/ AWLR	7.45	4.67	4.18
5	Milupara Village (PHC-HIL)	Dugwell	3.31	1.32	0.27
6	Sakta Village (Near Primary School)	Dugwell	4.44	1.43	1.40
7	Sidarpara Village (Near Primary School)	Dugwell	5.44	3.62	3.28
8	Beljor Village	Dugwell	6.30	3.17	3.06

# Annexure-22

# REPORT

on

## ADVICE FOR COAL EXTRACTION OF PANEL-13 AND PANEL-15 OF SEAM II WITH STOWIG BY CRUSHED OVERBURDEN FOR SAFETY OF SURFACE STRUCTURES AT GARE PALMA IV/4 OF HINDALCO INDUSTRIES LIMITED



**March, 2019**

**MINE SUBSIDENCE AND SURVEYING**  
**CSIR-CENTRAL INSTITUTE OF MINING & FUEL RESEARCH**  
*(Council of Scientific & Industrial Research)*  
**Barwa Road, Dhanbad – 826 015, Jharkhand**



## REPORT

on

### ADVICE FOR COAL EXTRACTION OF PANEL-13 AND PANEL-15 OF SEAM II WITH STOWING BY CRUSHED OVERBURDEN FOR SAFETY OF SURFACE STRUCTURES AT GARE PALMA IV/4 OF HINDALCO INDUSTRIES LIMITED

Project No. CNP/4696/2018-19

#### PROJECT PERSONNEL

Dr. A. Prakash, Pr. Scientist  
Mr. A. Kumar, Pr. TO  
Mr. A. Verma, Scientist  
Mr. M. K. Singh, Sr. Tech (1)  
Dr. K. K. K. Singh, Chief Scientist  
Mr. T. K. Mandal, Pr. TO

This report is meant for internal use of your organization only and it should not be published in full or part by your organization or staff. It should not be communicated/circulated to outside parties except the concerned departments. Central Institute of Mining & Fuel Research, Dhanbad reserves the right to publish the results of this report for the benefit of the industry.

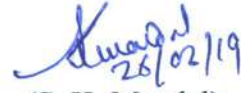
#### Signature of the Project Proponents



(Ajay Kumar)  
Pr. TO  
Project Leader  
CSIR-CIMFR, Dhanbad

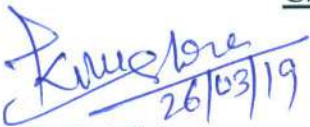


(Amar Prakash)  
Pr. Scientist  
Head of Section  
CSIR-CIMFR, Dhanbad

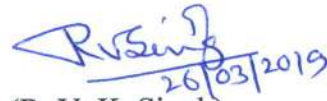


(S. K. Mandal)  
Chief Scientist  
HORG  
CSIR-CIMFR, Dhanbad

#### CSIR-CIMFR Authorised Signatories



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



(R. V. K. Singh)  
Chief Scientist & HORG,  
Business Development & Industrial Liaison

# CONTENTS

	page no.
EXECUTIVE SUMMARY	iv
1.0 INTRODUCTION	1
2.0 GEO-MINING DETAILS	1
3.0 SUBSIDENCE PREDICTION	2
4.0 METHODOLOGY	5
5.0 ASSUMPTIONS	6
6.0 RESULTS	7
6.1 Maximum Subsidence, Slope and Strains	7
6.2 Subsidence Contour	10
6.3 Strain Contour	10
6.4 Surface Profile	11
6.5 Condition for strain restriction within safe limit at the floor of Seam III	12
7.0 CONCLUSION AND RECOMMENDATION	14
8.0 REFERENCES	15
Annexure-I	16
Annexure-II	18

## EXECUTIVE SUMMARY

The Gare Pamla IV/4 coal mine of M/s Hindalco Industries Limited is located in the south-eastern part of the Mand-Raigarh coalfield in the state of Chhattisgarh. The mine management proposed to extract Panel-13 and Panel-15 of seam II with stowing by crushed overburden. It is located outside the forest boundary close to foot of the hill. The panels having a dip of 1 in 33.4 are proposed to extract by bord and pillar method of mining up to a height of 4 m with 70 percent of extraction. The important surface features and structures over and around the proposed panel are paddy land, forest, Jalipatra village, drain, pond, canal, road connecting to Kondkal and electric line. There is an opencast mine at the south-east of the proposed panel. The proposed panels are overlain by developed seam III, having a parting of 44.11 m from seam II. The overlying strata are 20 m thick alluvial soil followed by fine and coarse grained sandstone. The subsidence prediction is done by modified influence function method on the surface as well as on the floor of seam III due to the extraction of proposed Panel-13 and Panel-15 of seam II.

The subsidence prediction done using modified influence function method due to working in Panel-13 and Panel-15 in seam II with stowing by crushed overburden on surface as well as on the floor seam III led to the following conclusion and recommendation:

1. The maximum subsidence, slope, compressive and tensile strain at the surface due to 4.0 m height of extraction of Panel-13 with 20 cm stowing gap are 354 mm, 6.09 mm/m, 3.68 mm/m and 1.96 mm/m respectively. The corresponding values for Panel-15 are 369 mm, 6.60 mm/m, 1.70 mm/m and 1.62 mm/m. The strain value exceeds the safe limit of 3 mm/m under this mining condition for Panel-13 whereas it is within safe limit for Panel-15.
2. The maximum subsidence, slope, compressive and tensile strain at the surface due to 3.0 m height of extraction for modified dimension of Panel-13 (Fig. 7) with 20 cm stowing gap are 278 mm, 6.95 mm/m, 2.18 mm/m and 1.66 mm/m respectively.

3. With modified dimension of the Panel-13 (Fig. 7), the anticipated maximum subsidence, slope, compressive and tensile strain on the floor of seam III due to 3.0 m height of extraction with 20 cm stowing gap are 306 mm, 10.92 mm/m, 2.72 mm/m and 2.48 mm/m respectively. Thus, the strain values on the floor of seam III are within safe limit ( $< 3\text{mm/m}$ ). These anticipated subsidence values are not likely to cause any damage to the floor of seam III. Therefore, it is recommended to extract 3.0 m height coal for modified dimension of Panel-13 with 70 percent of extraction in conjunction with stowing by crushed overburden.
4. The maximum subsidence, slope, compressive and tensile strain on the floor of seam III due to 3.5 m height of extraction of Panel-15 with 20 cm stowing gap are 342 mm, 10.17 mm/m, 2.86 mm/m and 2.24 mm/m respectively. It is safe to mine 3 m height but should not exceed 3.5 m. Therefore, it is recommended to extract 3.0 m height coal of Panel-15 with 70 percent of extraction in conjunction with stowing by crushed overburden.
5. Mine management can take a call on depillaring of seam III (upper seam) above these two panels at any later date subsequently.
6. It is recommended to maintain stowing gap less than 20 cm for safety viewpoint.
7. It is recommended to monitor subsidence movements during depillaring of panels to know the actual ground movement and to validate the subsidence prediction model as well. This will also support in evaluating the safety of surface structures during mining operation.
8. It is also recommended to monitor stowing gap during depillaring operation. During the course of depillaring operation, the stowing gap can be measured by intrinsically safe and flameproof 3D Laser Scanner. The other means of measuring stowing gap is by borehole camera. Resistivity imaging system can also be experimented, especially for shallow depth, for assessment of stowing gap.

## **1.0 INTRODUCTION**

Gare Palma IV/4 coal mine of M/s Hindalco Industries Limited, the eastern most sub-block in Gare Palma, is located in the south-eastern part of the Mand-Raigarh coalfield in the state of Chhattisgarh. The mine lies between  $22^{\circ} 7' 38.719''$  to  $22^{\circ} 10' 23.695''$  North and  $83^{\circ} 32' 0.089''$  to  $83^{\circ} 33' 37.747''$  East at about 27 km east of the Tehsil town of Gharghoda and 55 km north-east of the district headquarter, Raigarh. The mine management proposed to extract Panel-13 and Panel-15 of seam II with stowing by crushed overburden lying below surface structures. Therefore, the mine management requested CSIR-Central Institute of Mining and Fuel Research (CIMFR), Dhanbad to predict subsidence, slope, compressive and tensile strains on the surface due to extraction of Panel-13 and Panel-15 of seam II. The panels having a dip of 1 in 33.4 are proposed to extract by bord and pillar method of mining up to a height of 4 m with 70 percent of extraction. The depth of the proposed panels varies between 70 and 90 m. Panels are located outside the forest boundary close to foot of the hill. The subsidence prediction is done by modified influence function method. The subsidence, slope, compressive and tensile strains prediction due to extraction of Panel-13 and Panel-15 of seam II over surface as well as on the floor of the seam III are done.

## **2.0 GEO-MINING DETAILS**

The Barakar formation exhibits broadly N-S strike with swing in NE-SW in eastern part and NW-SE direction in western part of the sub block. The general dip of strata is  $5^{\circ}$  to  $8^{\circ}$  in westerly direction. The sub-block is free from fault. Four regional seams (IV, III, II & I) and one local seam (L1) are in the block. The sequence of seam with parting and depth range is given in Table 1. Sub-block IV/4 is represented by mostly paddy fields in the southwest and hillock covered by forest in the north-central and east. The area is traversed by the southeast-northwest trending Dumer nala in the north and Bendra nala in the south and is free from any industrial activity.

It is proposed to extract Panel-13 and Panel-15 of seam II with stowing by crushed overburden. The topography above the proposed panel is nearly flat. The top most seam III in this region is developed. The section of borehole (No. NCM006) in the vicinity of the Panel-13 shows the position of seams with lithology (Fig. 1). The thickness of the alluvial soil is on an average of 20 m followed by fine and coarse grained sandstone of less strength i.e. the strata overlying the



proposed panel is weak in nature. The important surface features and structures over and around the proposed panel are paddy land, forest, Jalipatra village, drain, pond, canal, road connecting to Kondkal and electric line. There is an opencast mine at the south-east of the proposed panel. The area of the Jalipatra village is 3015.8 m<sup>2</sup>.

Table 1: Sequence of seam with parting range in the Gare Palma IV/4 sub-block

Coal seam / Parting	Thickness range (m)		Depth range (m)
	From	To	
Seam IV	0.23	2.66	26.13 -79.91
Parting of IV&III	46.69	73.53	
Seam III	0.15	10.23	19.00-149.35
Parting of III & L1	13.98	32.73	
Seam L1	0.43	3.43	
Parting of L1 & II	9.00	18.40	
Parting of III & II	34.04	39.27	
Seam II	0.36	8.25	6.79 -192.40
Parting of II & I	10.14	48.40	
Seam I	0.22	1.56	36.46-127.80

The proposed panels of seam II with overlying surface structures and features is shown in Fig. 2. The proposed height of extraction is 4.0 m by conventional bord and pillar method of mining with 70 percent extraction. The variation in depth of Panel-13 is from 70 m to 75 m whereas it is between 77 and 90 m for Panel-15. The parting between seam II and overlying seam III is 44.11 m. The geo-mining details of extraction of Panel-13 and Panel-15 is briefed in Table 2.

### 3.0 SUBSIDENCE PREDICTION

In the current scientific study, the main objective is to predict the subsidence movements caused due to extraction of proposed panels and its impact on overlying surface structures as well as on the floor of III seam.

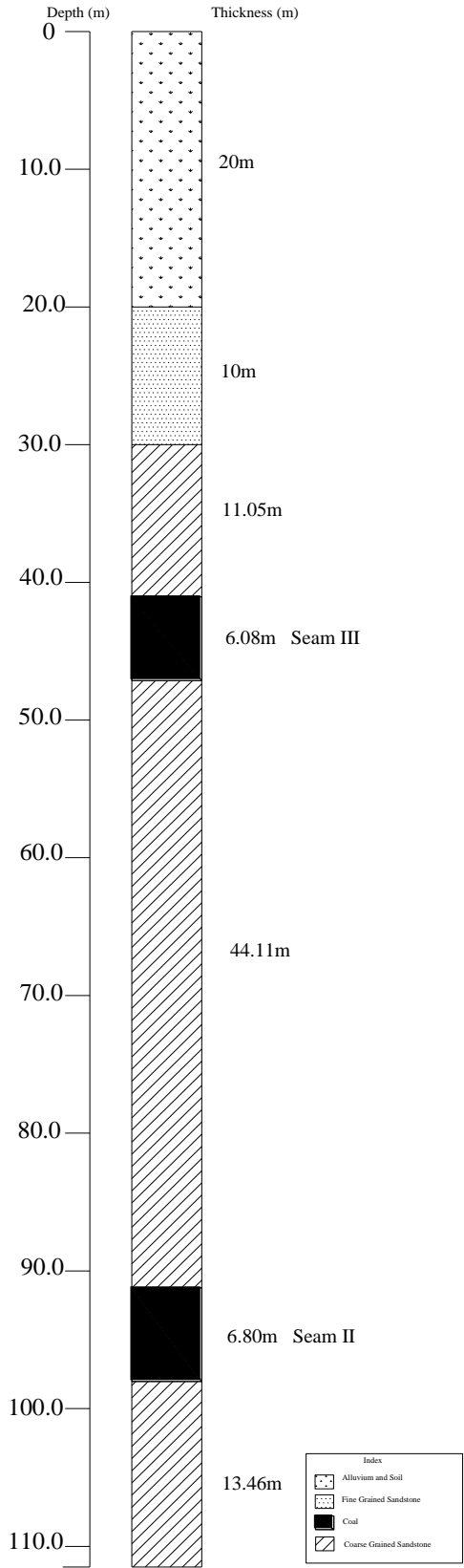


Fig.1: Lithological section of borehole no. NCM-6

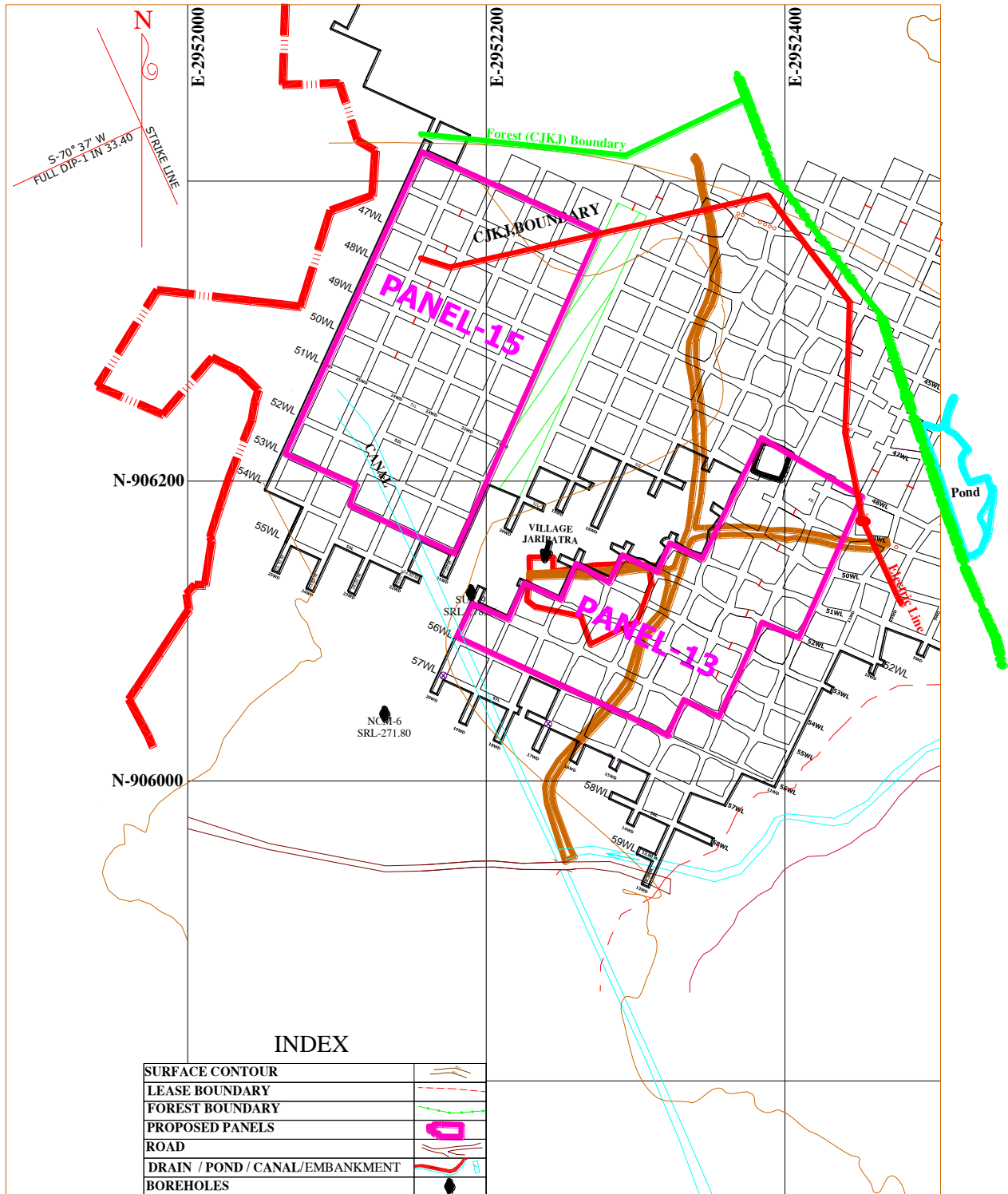


Fig. 2: Proposed Panel-13 and Panel-15 with overlying surface features

Table 2: Geo-mining details of proposed panels

Sl. No.	Parameters	Panel-13	Panel-15
1	Seam	II	II
2	Seam thickness-m	6.80	6.80
3	Extraction thickness-m	4.0 (proposed)	4.0 (proposed)
4	Mining method	Bord and pillar	Bord and pillar
5	Percentage of extraction	70	70
6	Seam inclination	1 in 33.4	1 in 33.4
7	Depth-m		
	7.1 Minimum	70.0	77.0
	7.2 Maximum	75.0	90.0
	7.3 Average	72.5	83.5
8	Seam parting-m		
	8.1 Between II and III	44.11	44.11
9	Status of working in overlying seam	developed	developed
10	Surface features	Jalipatra village, canal, pond, drain, paddy field, forest land, road, electric line	Canal, paddy field, electric line
11	Goaf treatment	Stowing by crushed overburden	Stowing by crushed overburden

Subsidence prediction is done with the help of three-dimensional subsidence prediction model using influence function method. This model can predict the three-dimensional subsidence trough with slopes and strains at any point on the trough quite accurately (Anon., 1999). In this study, three-dimensional subsidence prediction program has been used, which employs influence function method. This method has also been validated from subsidence observations from various Indian coalfields (Anon., 1999 and Sheorey et al., 2000). Calculation approach is outlined in Annexure I.

#### 4.0 METHODOLOGY

The methodology adopted for the subsidence prediction with the principles of influence function method is explained in the above references. Subsidence movements due to the extraction of proposed panels on the surface as well as on the floor of seam III with stowing by crushed overburden have been modelled. The values of subsidence, compressive and tensile strains and

slope have been obtained at each grid point on the surface and floor of seam III due to extraction of the proposed Panel-13 and Panel-15 in seam II.

## 5.0 ASSUMPTIONS

1. Subsidence investigations have already been conducted with crushed overburden stowing in different Indian coalfields. The subsidence factor of 0.10 has been taken in the prediction model against maximum possible subsidence at Gare Palma IV/4 mine.
2. The overlying strata being weak in nature, a Non-Effective Width (NEW) of 0.30 times the depth of extraction has been taken in the model for working in both panels for calculation of subsidence at the surface and floor of seam III as well. It is a single seam mining condition.
3. The angle of draw is taken as  $25^{\circ}$  on positive side in modelling for Panel-13 and Panel-15 by taking single seam mining condition into consideration.
4. A void of maximum up to 50 cm in stowing by crushed overburden has been assumed for modelling as the seam gradient is 1 in 33.4.
5. A grid of 10 m spacing in X and Y directions is employed for subsidence prediction.
6. All the input parameters considered for the current study are applicable to this particular problem alone and, therefore, should not be generalized for other mine in the same area.

The detailed input parameters of Panel-13 and Panel-15 are given in Annexure II.

### **Justification for considering 10% subsidence factor for crushed overburden**

A study was conducted in 2018 by CIMFR at Gare Palma-IV/5 underground mine of M/s Hindalco Industries Limited (*Scientific study on suitability of crushed overburden as a stowing material for underground mines, May-2018*) which is adjacent to Gare Palma-IV/4 mine belonging to the same owner. The recommendations were given in the report based on the detailed study conducted by CIMFR which are reproduced below:

- a) The specific gravity of crushed overburden was found to be 2.69 which is more when compared to bottom ash 2.04. The percentage void of crushed OB and bottom ash was found to be 47 % and 54.9% respectively. This indicates that the compressibility of crushed OB will be on the lower side than the bottom ash.
- b) Grain Size distribution of crushed overburden indicates that its (D50) average size is 800 microns m. and sample is uniformly graded with a narrow range of size distribution. Only



2.75 % particles are below 100 microns m. Hence it can be said that crushed overburden is suitable as stowing material considering the fineness of the material.

- c) Crushed overburden has a high water percolation rate of 45.53 cm/hr and is well above the minimum required percolation rate. Therefore, it qualifies as a good stowing material.
- d) 100 % particles of crushed overburden settles within 15 minutes and the rate of settlement was found to be rapid in the first 10 min then it gradually flattens out. Crushed overburden exhibits a good settlement rate well above the desired level and is found to be suitable for stowing.
- e) Auto – oxidation characteristics of crushed overburden indicates that it is not susceptible to spontaneous heating and can be easily used as a stowing material for underground mines.
- f) Compressibility characteristics indicate that the crushed overburden has compressibility of 11.63 % which slightly lower than that of bottom ash which is 13.35% at a pressure of 90 Kg/cm<sup>2</sup> which is equivalent to a depth of about 380 m. When crushed OB is mixed with bottom ash at a ratio of 1:1, the compressibility of the mix becomes 12.65%, at this depth river sand have a compressibility of about 8-9%. However, the depth of working at Gare Palma IV/5 is less, hence the compressibility of the proposed stowing material at shallow depth of 90 – 100m is comparable with sand, which is considered to be a suitable stowing material.
- g) From the above findings it can be concluded that the crushed overburden from 2<sup>nd</sup> and 3<sup>rd</sup> overburden benches of Gare Palma – IV/4 opencast mines could be used as a stowing material for underground mines either alone or in admixture with bottom ash.

From the above recommendations given in the earlier report it is clear that crushed OB can be used as an effective stowing material in Gare Palma-IV/4 mine as well as the depth of the proposed depillaring panels is also less than 100 m in this mine. Thus, an assumption of 10% subsidence factor can take care of compressibility of crushed overburden.

## **6.0 RESULTS**

### **6.1 Maximum Subsidence, Slope and Strains**

The values of maximum subsidence, maximum slope, maximum compressive strain and maximum tensile strain were predicted due to extraction of proposed Panel-13 and Panel-15 of

seam II with stowing by crushed overburden at each grid point with the help of three dimensional subsidence predictions modelling using modified influence function method. The magnitude of anticipated maximum subsidence, strains and slope at the floor level of seam III and at the surface with an assumption of 100% crushed overburden stowing due to extraction of 4.0 m height of proposed panels is given in Table 3. Modelling has also been done for a cavity of 20 cm, 30 cm, 40 cm and 50 cm in crushed overburden stowing due to low gradient of the seam (1 in 33.4) for surface and floor of seam III as given in Table 4.

Table 3: Subsidence, slope and strains due to extraction of 4 m height with full stowing

Seam	Panel	Location	Subsidence (mm)	Slope (mm/m)	Compressive strain (mm/m)	Tensile strain (mm/m)
II	13	Surface	263	4.53	2.74	1.46
II	13	Floor of seam III	280	7.16	3.48	1.98
II	15	Surface	274	4.91	1.26	1.20
II	15	Floor of seam III	280	8.34	2.34	1.84

Table 4: Anticipated subsidence, slope and strains due to gap in stowing

Panel	Stowing gap (cm)	Location	Subsidence (mm)	Slope (mm/m)	Compressive strain (mm/m)	Tensile strain (mm/m)
13	20	Surface	354	6.09	3.68	1.96
		Floor of seam III	376	9.63	4.68	2.66
	30	Surface	400	6.87	4.16	2.22
		Floor of seam III	425	10.86	5.28	3.00
	40	Surface	445	7.65	4.62	2.46
		Floor of seam III	473	12.10	5.88	3.36
	50	Surface	491	8.43	5.10	2.72
		Floor of seam III	521	13.33	6.48	3.70
15	20	Surface	<b>369</b>	<b>6.60</b>	<b>1.70</b>	<b>1.62</b>
		Floor of seam III	377	9.83	3.14	2.48
	30	Surface	416	7.45	1.90	1.82
		Floor of seam III	425	10.54	3.56	2.80
	40	Surface	463	8.29	2.12	2.02
		Floor of seam III	473	11.26	3.96	3.10
	50	Surface	510	9.14	2.34	2.24
		Floor of seam III	521	11.98	4.36	3.42

The feasibility of stowing up to the roof for a gradient of 1 in 33.4 is practically difficult. The strain value exceeded a safe limit of 3 mm/m at the surface for proposed 4.0 m height of extraction with a stowing gap of 20 cm for Panel-13. Hence, modelling was done to predict subsidence by varying the height of extraction to 3.5 m and 3.0 m as given in Table 5 and Table 6 respectively to assess the safe limit of extraction. The strain values were within safe limit for Panel-15 with 4.0 m height of extraction considering 20 cm gap in stowing (Table 4).

Table 5: Anticipated subsidence, slope and strains for 3.5 m extraction height

Panel	Stowing gap (cm)	Location	Subsidence (mm)	Slope (mm/m)	Compressive strain (mm/m)	Tensile strain (mm/m)
13	20	Surface	321	5.52	3.34	1.78
		Floor of seam III	341	8.73	4.24	2.42
	30	Surface	367	6.30	3.82	2.04
		Floor of seam III	390	9.96	4.84	2.76
	40	Surface	412	7.08	4.28	2.28
		Floor of seam III	438	11.2	5.44	3.12
	50	Surface	458	7.86	4.76	2.54
		Floor of seam III	486	12.43	6.04	3.04

Table 6: Anticipated subsidence, slope and strains for 3.0 m extraction height

Panel	Stowing gap (cm)	Location	Subsidence (mm)	Slope (mm/m)	Compressive strain (mm/m)	Tensile strain (mm/m)
13	20	Surface	<b>288</b>	<b>4.96</b>	<b>2.98</b>	<b>1.60</b>
		Floor of seam III	306	7.84	3.80	2.18
	30	Surface	334	5.74	3.46	1.86
		Floor of seam III	355	9.07	4.40	2.52
	40	Surface	379	6.52	3.92	2.10
		Floor of seam III	403	10.31	5.00	2.88
	50	Surface	425	7.30	4.40	2.36
		Floor of seam III	451	11.54	5.60	3.22

The height of extraction by 3.0 m with a maximum of 20 cm void in stowing was found to be the apt mining condition for extraction of Panel-13 in respect to the safety of surface structures although the strain value will exceed 3 mm/m at the floor of the seam III.

## 6.2 Subsidence Contour

Result of three dimensional subsidence prediction modelling by using modified influence function method are depicted in the form of subsidence contour. The anticipated surface contour on surface after 3.0 m height of extraction of Panel-13 and 4.0 m height of extraction of Panel-15 by taking 20 cm stowing gap into consideration is shown in Fig. 3. The subsidence contour is due to extraction of both panels in conjunction with crushed overburden stowing and 70 percent of extraction. Forest cover and pond are outside the influence of subsidence zone.

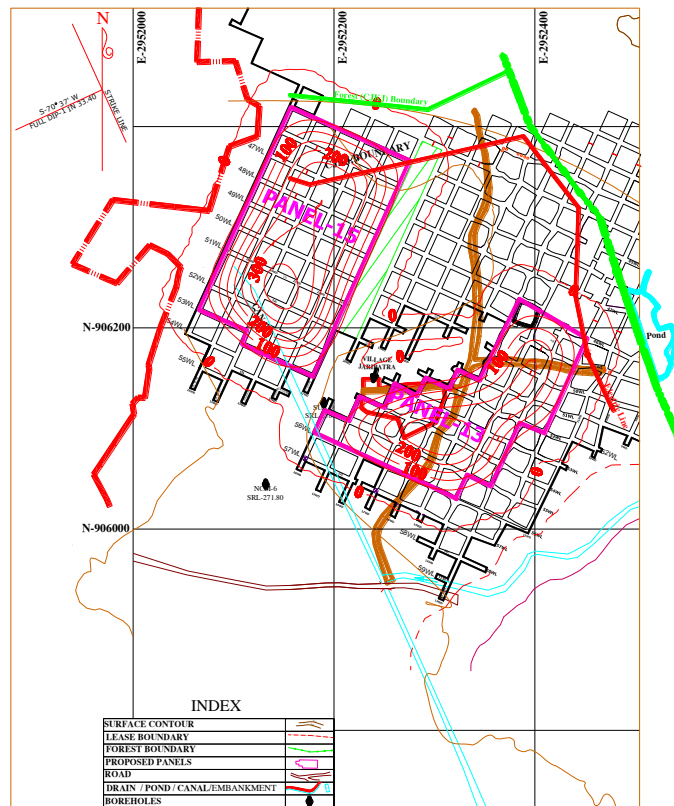


Fig. 3: Anticipated subsidence contour on surface due to extraction of both panels

## 6.3 Strain Contour

The development of anticipated strain contour at the surface due to extraction of both panels with 20 cm stowing gap is shown in Fig. 4.

## 6.4 Surface Profile

The three dimensional view of surface profile due to depillaring of proposed panels considering 20 cm stowing gap with crushed overburden stowing at Gare Palma IV/4 mine is shown in Fig. 5. There is minor depression in the central part of trough over both the proposed panels.

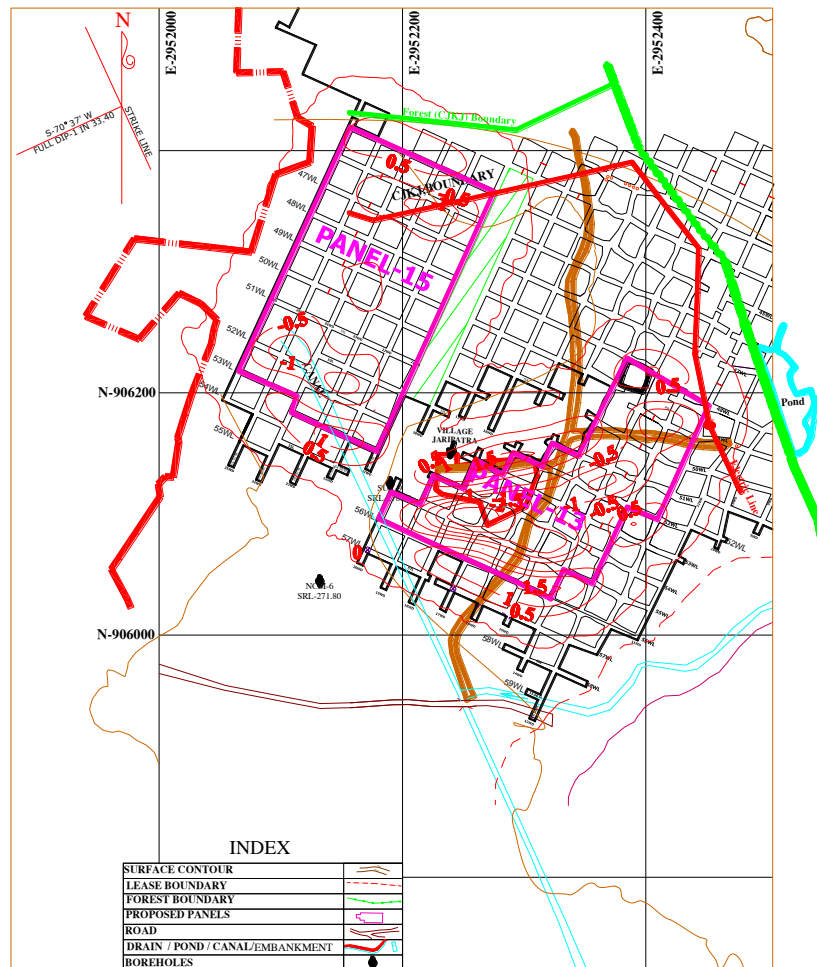


Fig. 4: Anticipated strain contour on surface due to extraction of both panels



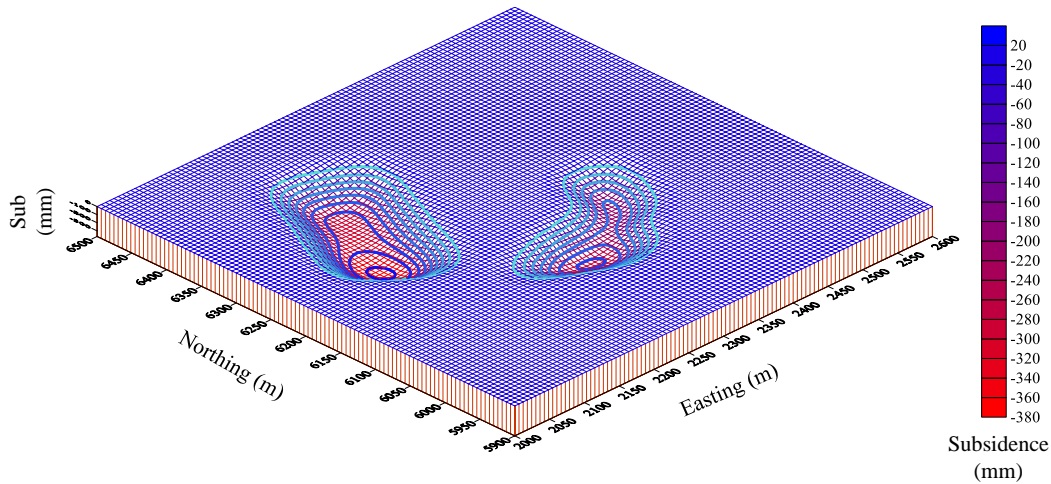


Fig. 5: Three dimensional view of surface due to extraction of Panel-13 and Panel-15

### 6.5 Condition for strain restriction within safe limit at the floor of Seam III

Strain values were calculated for both the panels with height of extraction up to 4 m in which the compressive strain at the floor of seam III was exceeding the permissible values but the values were found to be within permissible limit on surface with a stowing gap of 20 cm. Hence modelling was done again for both the panels with limiting height of extraction up to 3.5 and 3 m. The subsidence modelling was conducted by tuning the geometry of the Panel-13 considering 3m height of extraction with 20cm stowing gap. The modified geometry of the panel is shown in Fig. 1A. This was done to ensure that the floor of seam III is subjected to strain values less than the permissible limit ( $<3\text{mm/m}$ ) due to extraction of proposed Panel-13 and Panel-15 of seam II.

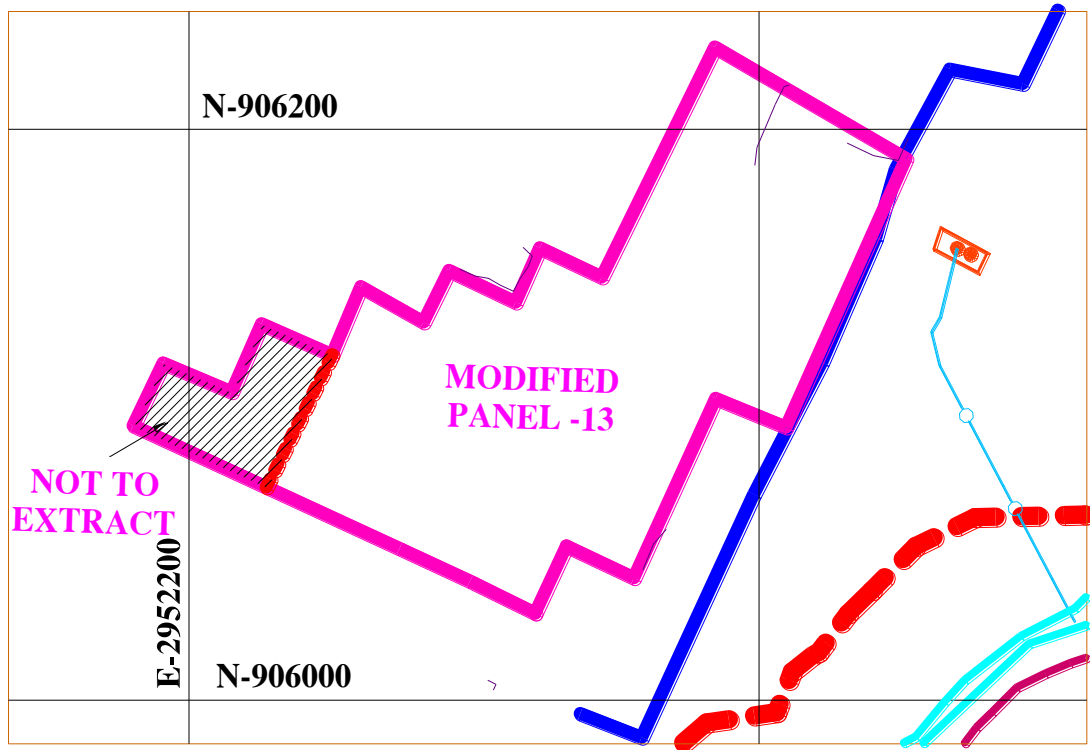


Fig. 6: Modified geometry of Panel-13

Thus, strain values can be controlled within safe limit by restricting the extraction of three pillars (hatched pillars- not to be extracted) shown in the Fig. 6 in Panel-13.

In case of Panel-15, strain values can be restricted within safe limit by reducing the height of extraction. It is safe to mine 3m height but should not exceed 3.5m. The anticipated outcomes of subsidence due to extraction of Panel-13 and Panel-15 of seam II is given in Table 7.

Table 7: Anticipated subsidence under modified conditions

Seam	Location	Height of extraction (m)	Sub (mm)	Slope (mm/m)	Comp. strain (mm/m)	Tensile strain (mm/m)
13	Surface	3	278	6.95	2.18	1.66
	Floor of seam III	3	306	10.92	2.72	2.48
15	Surface	3.5 (max.)	334	5.98	1.54	1.48
	Floor of seam III	3.5 (max.)	342	10.17	2.86	2.24

Hence, both the panels can be extracted safely without causing damage to the floor of Seam III by maintaining the stowing gap less than 20 cm and without any time lag in stowing. Jaripatra village, electric line, road and small part of canal are not likely to be affected due to extraction of Panel-13 and Panel-15 under these mining conditions. However, subsidence monitoring on the floor of Seam III and at surface must be carried out during the course of depillaring.

The mine management has proposed to extract coal initially from seam II (bottom seam) with stowing. Since there will be no disturbance on the floor of seam-III by the above recommended method, decision of depillaring seam III above can be taken by HIL management at any later date.

## **7.0 CONCLUSION AND RECOMMENDATION**

The subsidence prediction done using modified influence function method due to working in Panel-13 and Panel-15 in seam II with crushed overburden stowing on surface as well as on the floor seam III led to the following conclusion and recommendation:

1. The maximum subsidence, slope, compressive and tensile strain at the surface due to 4.0 m height of extraction of Panel-13 with 20 cm stowing gap are 354 mm, 6.09 mm/m, 3.68 mm/m and 1.96 mm/m respectively. The corresponding values for Panel-15 are 369 mm, 6.60 mm/m, 1.70 mm/m and 1.62 mm/m. The strain value exceeds the safe limit of 3 mm/m under this mining condition for Panel-13 whereas it is within safe limit for Panel-15.
2. The maximum subsidence, slope, compressive and tensile strain at the surface due to 3.0 m height of extraction for modified dimension of Panel-13 (Fig. 7) with 20 cm stowing gap are 278 mm, 6.95 mm/m, 2.18 mm/m and 1.66 mm/m respectively.
3. With modified dimension of the Panel-13 (Fig. 7), the anticipated maximum subsidence, slope, compressive and tensile strain on the floor of seam III due to 3.0 m height of extraction with 20 cm stowing gap are 306 mm, 10.92 mm/m, 2.72 mm/m and 2.48 mm/m respectively. Thus, the strain values on the floor of seam III are within safe limit (< 3mm/m). These anticipated subsidence values are not likely to cause any damage to the floor of seam III. Therefore, it is recommended to extract 3.0 m height coal for

modified dimension of Panel-13 with 70 percent of extraction in conjunction with stowing by crushed overburden.

4. The maximum subsidence, slope, compressive and tensile strain on the floor of seam III due to 3.5 m height of extraction of Panel-15 with 20 cm stowing gap are 342 mm, 10.17 mm/m, 2.86 mm/m and 2.24 mm/m respectively. It is safe to mine 3 m height but should not exceed 3.5 m. Therefore, it is recommended to extract 3.0 m height coal of Panel-15 with 70 percent of extraction in conjunction with stowing by crushed overburden.
5. Mine management can take a call on depillaring of seam III (upper seam) above these two panels at any later date subsequently.
6. It is recommended to maintain stowing gap less than 20 cm for safety viewpoint.
7. It is recommended to monitor subsidence movements during depillaring of panels to know the actual ground movement and to validate the subsidence prediction model as well. This will also support in evaluating the safety of surface structures during mining operation.
8. It is also recommended to monitor stowing gap during depillaring operation. During the course of depillaring operation, the stowing gap can be measured by intrinsically safe and flameproof 3D Laser Scanner. The other means of measuring stowing gap is by borehole camera. Resistivity imaging system can also be experimented, especially for shallow depth, for assessment of stowing gap.

## **8.0 REFERENCES**

- Anon. (1999). Subsidence studies for development of models with special reference to multi-seam mining in India. **Coal S & T Project Report**, Central Mining Research Institute, 126 p.
- Sheorey, P. R., John Loui P., Singh K.B. and Singh S.K. (2000). Ground subsidence observations and a modified influence function method for complete subsidence prediction. **International Journal of Rock Mechanics & Mining Sciences**, 37, pp 801-818.

### Calculation by Influence Function method

Since the workings in seams as per production program were found to be situated irregularly in three-dimensions, not always vertically superimposed, the influence function method is of great use in finding out subsidence parameters (Anon., 1999). This method is suitable for all types of depillaring workings, irrespective of shape, size or different rates of retreat of extraction in successive seams. Each infinitesimal (small) sector 'dA' is regarded as an extraction element and has its own weighting factor according to its placement in the influence circle. An influence circle has radius  $H \tan \theta$  where  $H$  is depth of working and  $\theta$  is angle of draw (Fig. A1). The following is the modified influence function used in CIMFR – subsidence software.

$$K_z = \frac{0.532}{R^2} \left( 1 + \cos \frac{\pi r}{R} \right) \quad \text{--- 1}$$

Where,

$K_z$  = influence function for subsidence,

$R$  = radius of influence circle and

$r$  = radial distance of sector centroid from centre of influence circle

$$\iint_{A_0} K_z dA = 1 \quad \text{--- 2}$$

Where,  $A_0$  is the area of influence circle.

The subsidence at point P on the surface or a chosen plane of reference is simply the sum of multiplications of weighting factors and maximum possible subsidence ( $S_{\max}$ ), considered all the extraction elements of the proposed extraction panel.  $S_{\max}$  is given as follows:

$$S_{\max} = a.m.e \quad \text{--- 3}$$

Where,

$a$  = subsidence factor

$m$  = height of extraction and

$e$  = percentage of extraction expressed in ratio



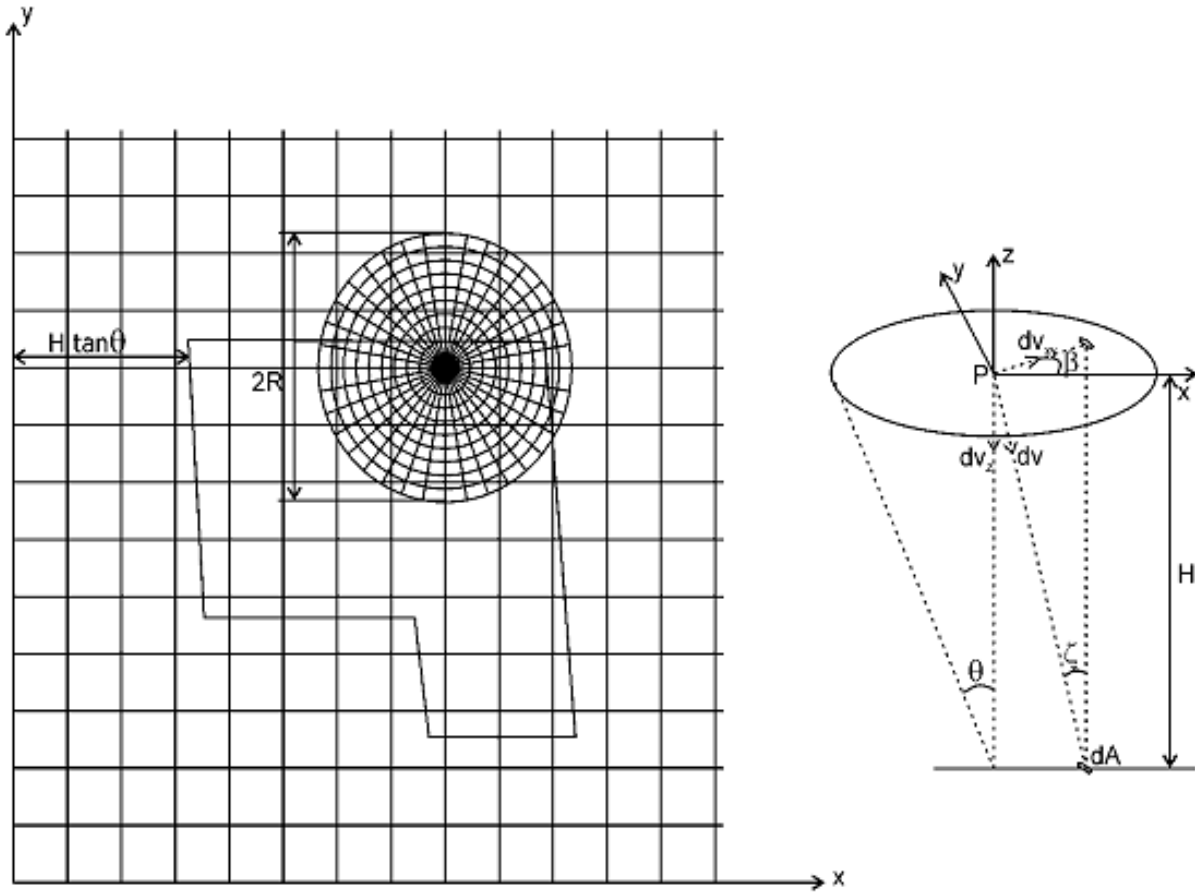


Fig. A1: Illustration of influence function method

**Input parameters of Panel-13 for subsidence prediction on surface**

Depth of working = 70 m

Angle of draw = 25°

NEW = 0.30

Subsidence factor = 0.10

Height of extraction = 4.00 m (proposed)

Total percentage of extraction = 70%

Grid pattern: dx 10 dy 10

Faceline start 2180.8 6095.7 end 2452.0 6189.2 angle 135

1	2180.8	6095.7
2	2191.3	6117.7
3	2215.3	6107.5
4	2225.8	6131.4
5	2250.6	6120.5
6	2260.6	6144.4
7	2282.7	6132.0
8	2291.6	6150.1
9	2315.0	6138.9
10	2323.5	6158.0
11	2345.2	6147.7
12	2384.9	6228.3
13	2452.0	6189.2
14	2409.9	6095.2
15	2385.2	6105.2
16	2356.5	6042.4
17	2332.8	6053.5
18	2321.9	6030.0

**Input parameters of Panel-15 for subsidence prediction on surface**

Depth of working = 77 m

Angle of draw = 25°

NEW = 0.30

Subsidence factor = 0.10

Height of extraction = 4.00 m (proposed)

Total percentage of extraction = 70%

Grid pattern: dx 10    dy 10

Faceline start 2065.8 6217.6 end 2275.8    6365.7 angle 135

1	2065.8	6217.6
2	2157.5	6418.9
3	2275.8	6365.7
4	2179.2	6151.4
5	2109.0	6183.5
6	2113.3	6197.2

# Annexure-23

## Transactions Inquiry



A/c. No	<b>0429102000003186</b>	CCY / SOL ID	<b>INR / 429</b>
Names	<b>MINE CLOSURE ESCROW ACCOUNT GARE PALMA IV/4 COAL MINE</b>		
GL Sub Head	<b>10200</b>	Balance	<b>430.00 Dr</b>
Opening Bal.	<b>0.00 Cr</b>	Closing Bal.	<b>430.00 Dr</b>
Float Balance	<b>0.00 Cr</b>	Funds In Clearing	<b>0.00</b>
Available Amt.	<b>0.00 Cr</b>	Eff. Available Amt	<b>0.00 Cr</b>
Cust. Status	<b>GEN GENERAL</b>	A/c. Open Date	<b>04-02-2016</b>
A/c. Status	<b>A Active</b>	A/c. Status Date	<b>04-02-2016</b>
Last Purge Date	<b>03-02-2016</b>		

**Address** **HINDALCO INDUSTREIS LTD AHURA CENTRE 1ST FLR  
B WING 82 MAHAKALI CAVES ROAD ANDHERI E**

City	<b>MUM MUMBAI</b>	State	<b>MH MAHARASHTRA</b>
Country	<b>IN INDIA</b>	Postal Code	<b>400093</b>
Phone No.	<b>919088033444 / 919702203609</b>	Telex No.	
Email ID			

Tran. Date	Value Date	Chq . No.	Withdrawl	Deposit	Balance	Narration
<a href="#"><u>21-04-2016</u></a>	21-04-2016		430.00 Dr		430.00 Dr	MAB_CHARGE_MAR-2016
<a href="#"><u>28-03-2016</u></a>	28-03-2016		1,51,50,000.00 Dr		0.00 Cr	TRANSFER FOR FD BOOKING
<a href="#"><u>28-03-2016</u></a>	28-03-2016			1,51,50,000.00 Cr	1,51,50,000.00 Cr	RTGS/SBINR52016032827746743/HINDALCO INDUSTRIES L



## Transactions Inquiry



A/c. No	<b>0429106000022154</b>	CCY / SOL ID	<b>INR / 429</b>
Names	<b>MINE CLOSURE ESCROW ACCOUNT GARE PALMA IV/4 COAL MINE</b>		
GL Sub Head	<b>10600</b>	Balance	<b>1,51,58,796.00 Cr</b>
Opening Bal.	<b>0.00 Cr</b>	Closing Bal.	<b>1,51,58,796.00 Cr</b>
Float Balance	<b>0.00 Cr</b>	Funds In Clearing	<b>0.00</b>
Available Amt.	<b>1,51,58,796.00 Cr</b>	Eff. Available Amt	<b>1,51,58,796.00 Cr</b>
Cust. Status	<b>GEN GENERAL</b>	A/c. Open Date	<b>31-03-2016</b>
A/c. Status		A/c. Status Date	
Last Purge Date	<b>30-03-2016</b>		

**Address** **HINDALCO INDUSTREIS LTD AHURA CENTRE 1ST FLR  
B WING 82 MAHAKALI CAVES ROAD ANDHERI E**

City	<b>MUM MUMBAI</b>	State	<b>MH MAHARASHTRA</b>
Country	<b>IN INDIA</b>	Postal Code	<b>400093</b>
Phone No.	<b>919088033444 / 919702203609</b>	Telex No.	
Email ID			

Tran. Date	Value Date	Chq. No.	Withdrawl	Deposit	Balance	Narration
<a href="#">01-04-2016</a>	01-04-2016			8,796.00 Cr	1,51,58,796.00 Cr	Int: 9774.00 Tds: 978.00 []
<a href="#">31-03-2016</a>	28-03-2016			1,51,50,000.00 Cr	1,51,50,000.00 Cr	FD BKD

ADITYA BIRLA



To,

Date: 29<sup>th</sup> March'2017

The Branch Manager  
IDBI Bank, Raigarh Branch.  
Raigarh. C.G.

Sub: Deposit of Rs 1,59,08,000/- in our Escrow Account.

Dear Sir,

We have made RTGS for Rs 1,59,08,000/- Rupees One core Fifty nine Lacs Eight Thousand only to Escrow Account No **0429102000003186** towards deposit of Escrow Amount for the financial year 2016-17.

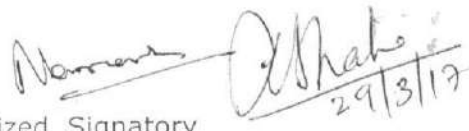
Also request you to please renew for one year of our FD no 0429106000022154 for Rs 1,62,70,587/- .

Kindly do the needful at an early date and confirm us by return mail.

Regards

For  
**Hindalco Industries Limited**

Authorized Signatory

  
29/3/17



Hindalco Industries Limited

o/c



To,  
 Manager of IDBI  
 Raigarh Branch

Date : 27<sup>th</sup> March 2018

Sub: Escrow Account Deposit for the financial year 2018

In reference to:

1. Official letter issued by CCO, Kolkata vide letter no CC/MCPS/Notice/2013-14/330/24 dated 02<sup>nd</sup> Jan'18 & CC/MCPS/Notice/2013-14/330/01 dated 02<sup>nd</sup> Jan'18 of IV / 4 & 5 respectively for deposition of Yearly Mine closure cost FY 2017-18,
2. Revised Mining Plan & Mining Closure Plan of Gare Palma IV / 4 & 5 Coal Mine dated 16<sup>th</sup> December 2015, and
3. The Tripartite agreement among Hindalco Industries Ltd, IDBI Bank & CCO dated 5<sup>th</sup> February 2016

We are required to deposit an amount of Rs. 2,06,02,000/- with your Bank as annual closure cost for the FY 2017-18 to Escrow Account which has been opened on 3<sup>rd</sup> February 2016 in IDBI Bank with CCO as the beneficiary positively with in 31.03.2018 as per below mentioned details:

Gare Palma Mines	GP – IV/4	GP – IV/5
Escrow Deposit Amount	Rs.1,67,04,000/-	Rs.38,98,000/-
Name of Bank	IDBI, Raigarh	IDBI,Raigarh
Escrow Account No	0429102000003186	0429102000003179
IFSC Code	IBKL0000429	IBKL0000429
Branch Code	000429	000429
MICR Code	496259001	496259001

You are requested to deposit the said Escrow Account as per above details by 27/03/18.

Regards,

Narendra Kumar Sahu  
 Head Finance & Accounts  
 Gare Palma Mines, Raigarh  
 Hindalco Industries Ltd,





Ref. No. HIL/GP-IV4/CCO/2020/21

Date: 8<sup>th</sup> May 2020

To  
The Officer on Special duty(MC&P)  
Office of The Coal Controller  
Ministry of Coal, Govt of India  
1, Council House street  
Kolkatta-700001

Sub: - Payment of Escrow account for the FY 2019-20, Gare Palma IV/4 Coal Mine of Hindalco Industries Limited

Ref:- Escrow Account statement as on 31st March 2020.

Dear Sir,

With reference to the Tripartite Agreement among Hindalco Industries Limited, IDBI Bank & CCO dated 27<sup>th</sup> March 2019 an amount of 19.19 lakh rupees has been deposited on 31<sup>st</sup> March 2020 at IDBI Bank as annual Mine Closure Cost for the FY 2019-20 to Escrow Account. The detail of the payment is enclosed herewith.

Account #: 0429102000003186  
Name: MINE CLOSURE ESCROW ACCOUNT GARE PALMA IV/4 COAL MINE  
Rs 19,19,000/-

Thanking You,  
Yours sincerely

For Hindalco Industries Limited,

(Dipesh Bhatia)  
Agent, GP IV/5 Coal Mine  
Head, Chhattisgarh Coal Mines

Enclosures: As above  
Copy to- General Manager, OSD, CCO, Bilaspur

**Hindalco Industries Limited**

Gare Palma Mines ( IV/4 & IV/5), Vill & Po: Milupara , Tehsil: Tamnar Dist: Raigarh- 496107 , Chhattisgarh  
T: +91 7762 228212, Website : www.hindalco.com E mail : hindalco@adityabirla.com  
Registered Office : Ahura Centre, 1st Floor, B Wing, Mahakali Caves Road Andheri (East) , Mumbai 400093, India  
T: + 912266917000 | Fax: + 912266917001  
Corporate ID No: L27020MH1958PLC011238





To,  
The Manager IDBI Bank  
Raigarh Branch

Date: 30<sup>th</sup> March'2021

Sub: Escrow Account Deposit for the financial year 2020-21


Ref: Tripartite Agreement executed among Hindalco Industries Ltd, IDBI Bank & CCO dated 27<sup>th</sup> March'2019.

Please find the below remittance details for an amount of Rs. 2,67,19,000/- with your Bank towards annual closure cost for the FY 2020-21 as per payment schedule of the Tripartite Agreement. We request you to deposit the said amount and confirm us along with Statement of Account by 30<sup>th</sup> March 2021.

Gare Palma Mines	GP - IV/4
Escrow Deposit Amount	Rs. 2,67,19,000/-
Name of Bank	IDBI, Raigarh
Escrow Account No	0429102000003186
IFSC Code	IBKL0000429
Branch Code	000429
MICR Code	496259001
RTGS UTR NO:	SBINR52021033018460870

Kindly acknowledge the receipt of the same.

Regards,

  
Mohamad Ghaji  
Head Finance & Accounts  
Gare Palma Mines, Raigarh  
Hindalco Industries Ltd,



30-3-21  
received.



ADITYA BIRLA



To,

Date 31<sup>st</sup> March'2022

The Branch Manager  
IDBI Bank  
Raigarh Branch.

Sub: - Escrow Account Deposit for the Financial Year 2021-22

Ref: Tripartite Agreement executed among Hindalco Industries Ltd. And IDBI Bank & CCO dated 27<sup>th</sup> March'2019.

Please find the below remittance details for an amount of Rs. 2,80,55,000/- with your Bank towards annual closure cost for the F.Y. 2021-22 as per the payment schedule of the Tripartite Agreement. We request you to deposit the said amount and confirm us along with statement of Account by 31<sup>st</sup> March 2022

<b>Gare Palma Mines</b>	<b>GP-IV/4</b>
Escrow Deposit Amount	Rs. 2,80,55,000/-
Name of Bank	IDBI, Raigarh
Escrow Account No	0429102000003186
IFSC Code	IBKL0000429
Branch Code	000429
MICR Code	496259001
<b>RTGS UTR NO:</b>	<b>SBINR52022033175690923</b>

Kindly acknowledge the receipt of the same.

Regards,

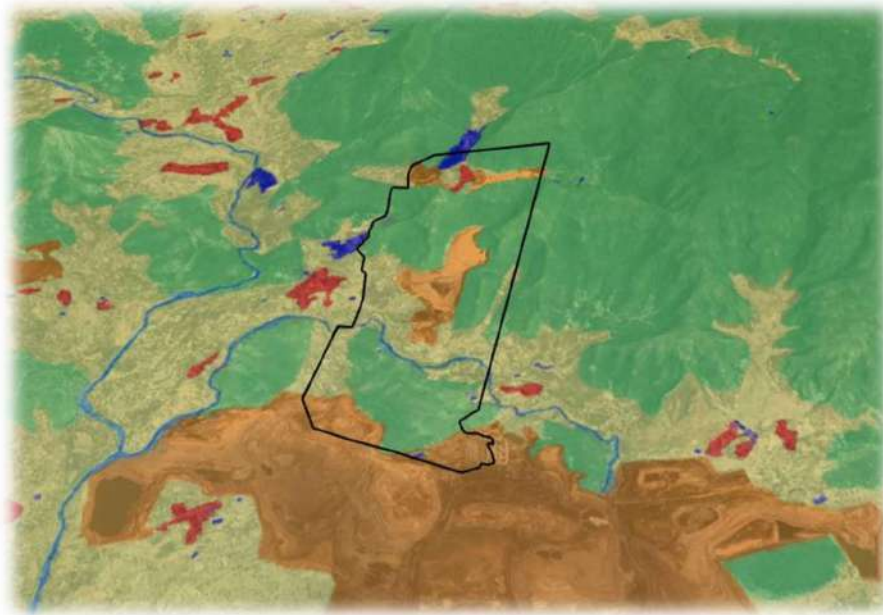
**Vidyadhar Patel**  
Head Finance & Accounts  
Gare Palma Mines, Raigarh  
Hindalco Industries Ltd.



# Annexure-24

**Report on  
Assessment of Land Use / Land Cover  
using High Resolution Satellite Imagery**

**For  
GARE PALMA IV/4 COAL MINE**  
Tehsil – Tamnar, District, Raigarh, Chhattisgarh



**Project Proponent: HINDALCO INDUSTRIES LIMITED, Raipur**



Report Generated By: IndiGEO Consultants, Bangalore

**IndiGEO**

**December 2019**

Report Ref No: 1911029\_GP\_IV/4

## Contents

Executive Summary .....	3
Introduction .....	4
Project Location Map .....	5
Data Used for this Study .....	6
Area of Coal Mine:.....	6
Hindalco Supplied Data: .....	6
Other Reference Data:.....	6
Remote Sensing Data Analysis.....	7
Agriculture:.....	7
Built-up: .....	7
Forest: .....	8
Industry: .....	8
Mining:.....	9
Residential Colony:.....	9
River: .....	10
Settlement Ash Pond:.....	10
Wasteland / Scrubland: .....	11
Waterbody:.....	11
Thematic Map – Land Use / Land Cover Generation Process.....	12
Pre-Processing .....	13
Layer Stack.....	13
Projection Settings .....	14
Digitization .....	14
Thematic Mapping: .....	14
Quality Control:.....	15
Area Calculation: .....	15
Statistical Reports: .....	15
Satellite Imagery Map of Buffer Zone.....	16
Land Use / Land Cover Map of Buffer Zone .....	17
Land Use / Land Cover Statistics of Buffer Zone .....	18
Satellite Imagery Map of Core Zone.....	19
Land Use / Land Cover Map of Core Zone .....	20
Land Use / Land Cover Statistics of the Core Zone.....	21
Comparison of Land Use / Land Cover of Buffer Zone of Lease.....	21
Conclusion .....	24

## Executive Summary

Hindalco Industries Limited has assigned project of assessing Land Use / Land Cover for Gare Palma Block IV/4 for the year 2019 as per the specific condition XLVII of EC granted to prior allottee and transfer to HINDALCO "for monitoring land use pattern and for post mining land use, a time series of land use maps, based on satellite imagery (on a scale of 1:5000) of the core zone and buffer zone, from the start of the project until end of the mine life shall be prepared once in three year". The last report was generated in the year 2016.

For 2019 assessment, high resolution satellite imagery was used, Hindalco team had procured NRSA – IRS Resource Sat 2 imagery with image resolution of 5.8 meters, which was used for this assessment.

After post processing IRS imagery, land use / land cover was classified as per land use / land cover standard, visual interpretation classification method was utilized for this project area.

Once the land use / land cover classification was finalized, statistic was derived for an area of 10km buffer zone around the coal block and the core zone area.

Below is the summary of the study area (buffered zone) for an area 457.743 km<sup>2</sup>

Classes	% of total Area
Agriculture	47.78%
Built up	2.12%
Forest	43.29%
Industry	0.90%
Mining	3.99%
Residential Colony	0.13%
River	0.67%
Settlement Pond	0.48%
Wasteland	0.20%
Waterbodies	0.44%



## Introduction

Gare Palma IV/4 block located in Tamnar tehsil, Raigarh district in Chhattisgarh state, this report consists of study area of 10KM buffer from the outer boundary of the coal block.

There were 11 types of land use / land cover classification identified within this study area based on data already available (2016 report, Bhuvan LULC data) these are the classification Agriculture, Built-up, Forest, Industry, Mining, Residential Colony, River, Settlement Pond, Waste Land, Waterbody.

Remote sensing and GIS are an important tool to develop and understand LULC pattern, recent development in the use of satellite data and GIS technology and data, assist us in producing an accurate representation of ground situations. These outputs will help Hindalco team to understand the changing dynamics around the project area and take appropriate decision.

Hindalco had already procured high resolutions (5.8m resolution) from NRSA, imagery was from IRS – Resource Sat 2, sub scene D, bands 2,3 & 4.

Hindalco team also provided DGPS survey coal block boundary as GIS file as revised vide F.No. 104/28/2015/NA dated 13th October 2015 of Nominated Authority, Ministry of Coal, Government of India ,and certified by CMPDI for an area of 885.525 Ha, which was used as core zone and an area of 10 km radius around it as buffer zone.

Objective of the study was to capture land use / land cover within Core Zone and Buffer Zone “for monitoring land use pattern and for post mining land use ,a time series of land use maps, based on satellite imagery(on a scale of 1:5000)of the core zone and buffer zone, from the start of the project until end of the mine life shall be prepared once in three year” as per the EC condition.

This report consists of detail description of the process / method used for accessing, project map, tables and chart providing detail analysis, which identifies percentage of all type of land use land cover classifications, which enables us to calculate change percentage in two-year period.

80°0'                      81°0'                      82°0'                      83°0'                      84°0'

+ 24°0'

+ 23°0'

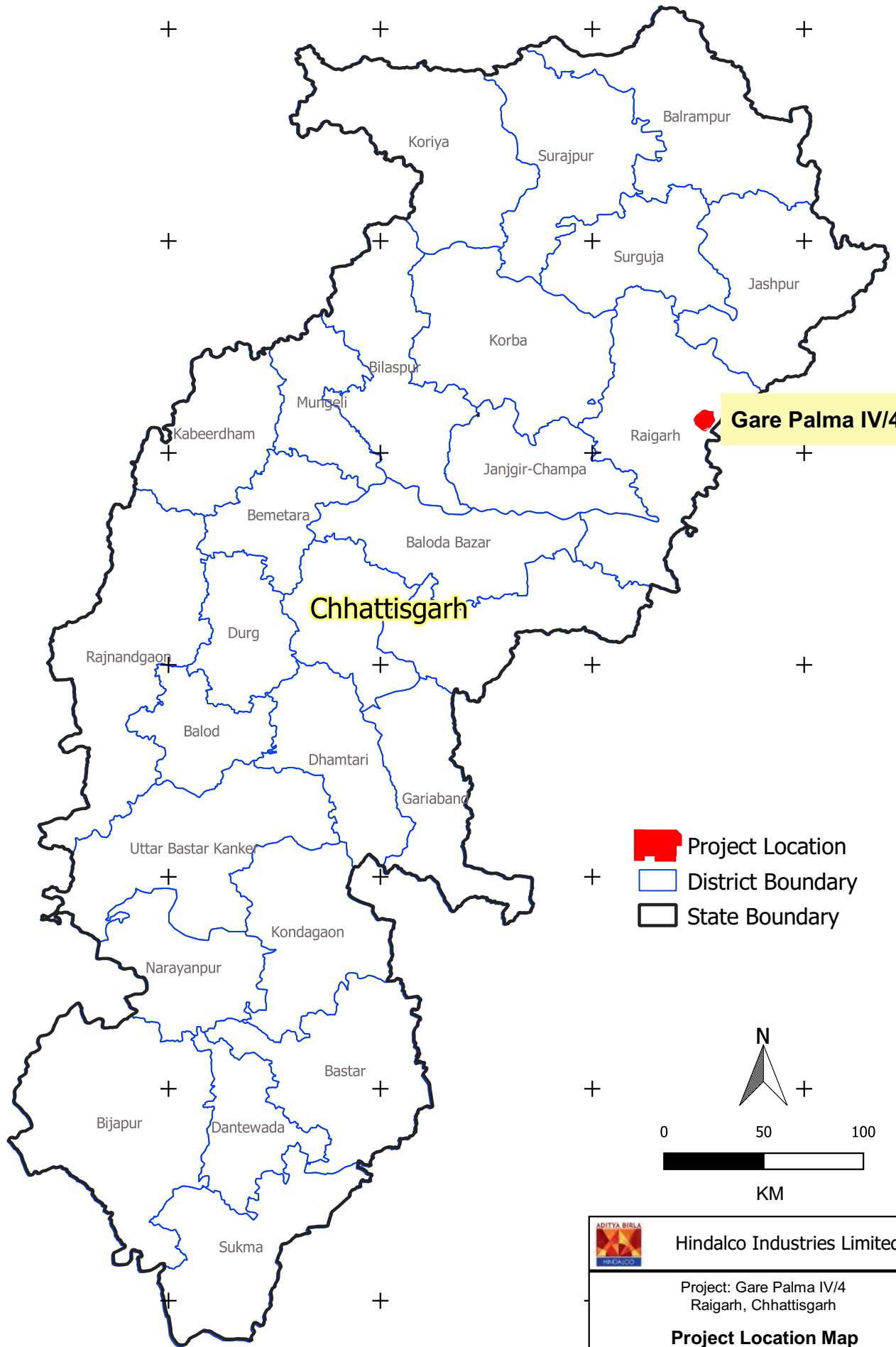
+ 22°0'




+ 21°0'

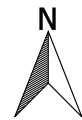
+ 20°0'

+ 19°0'

+ 18°0'



-  Project Location
-  District Boundary
-  State Boundary



0                      50                      100



KM



Hindalco Industries Limited

Project: Gare Palma IV/4  
Raigarh, Chhattisgarh

**Project Location Map**

Author : Suresh C Pal                      Topo Ref: 64N/12

Drawn : IndiGEO                      Date : Dec 2019

Page Size: A4                      Map No: 1

## Data Used for this Study

### ***Area of Coal Mine:***

As per the Block boundary certification done by CMPDI the revised block area and lease area of Gare Palma IV/4 Opencast Coal mine is **885.525 Ha**.

### ***Hindalco Supplied Data:***

- High Resolution Satellite Imagery – IRS – Resourcesat 2: Image resolution of 5.8m was procured for this study, from the Spectral bands 2, 3 & 4 - Natural Colour Composite and False Colour Composite image was processed, which assisted in this classification.
- IRS – Resourcesat 2 Data Specification:

Data				Resolution		
Platform	Sensor	Provider	Spectral Bands	Spatial	Radiometric	Temporal
IRS - Resourcesat 2	L4FX	NRSC - India	B2 - 0.52-0.59 - Green	5.8 m	10 bits	5 Days
			B3 - 0.62-0.68 - Red			
			B4 - 0.77-0.86 - NIR			

- IRS – Resourcesat 2 capture date: 18<sup>th</sup> October 2018
- Coal Block Boundary derived from DGPS survey in GIS format, Block boundary which was generated for earlier report using DGPS survey was made available for this study.

### ***Other Reference Data:***

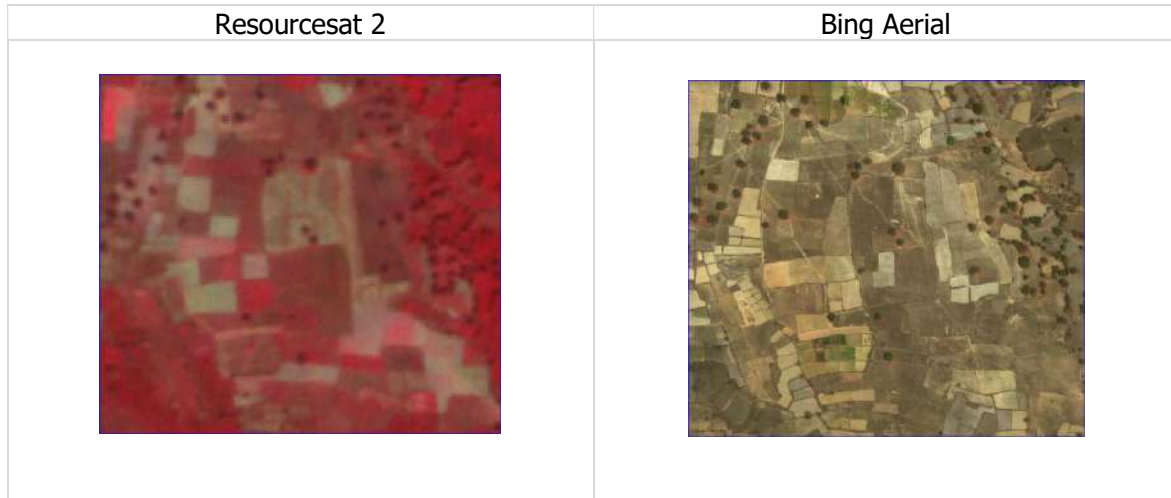
- NRSA – Bhuvan – 2015-2016 Land Use / Land Cover data. There is a portal managed by NRSA named “Bhuvan” where in entire India LULC classification maps are available, however they are dated 2015-2016, which are digitised at 1:50,000 scale, so this data was used as reference only.
- Bing Imagery - High Resolutions satellite imagery supplied by Microsoft, even though this is very high resolution of 50cm, but the imagery dated is of 2017, so this was used as reference only for Quality control purpose.
- Google Imagery – High Resolution satellite imagery supplied by Google, similar lines as Bing Imagery, this imagery dated was also of year 2017, so this was used for reference only for Quality control purpose.

## Remote Sensing Data Analysis

GIS analyst interprets the remote sensing data using the following criteria

### ***Agriculture:***

Identified by light red color, texture will be medium smooth with regular patchwork agricultural pattern surrounded by small to medium size settlements



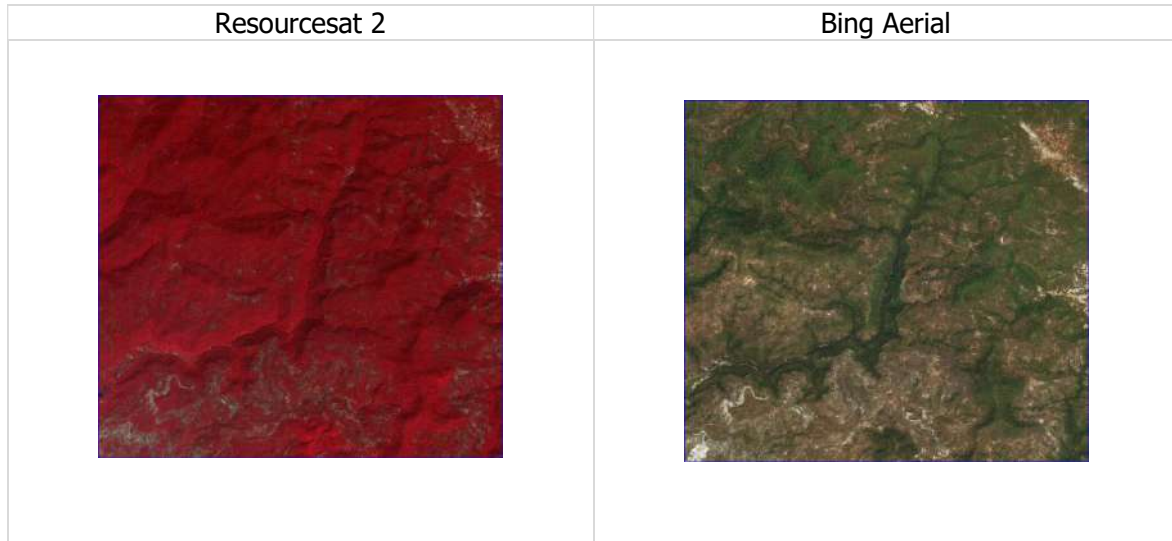
### ***Built-up:***

Identified by with combination of black and brown color, texture will be rough and no regular shapes or pattern.

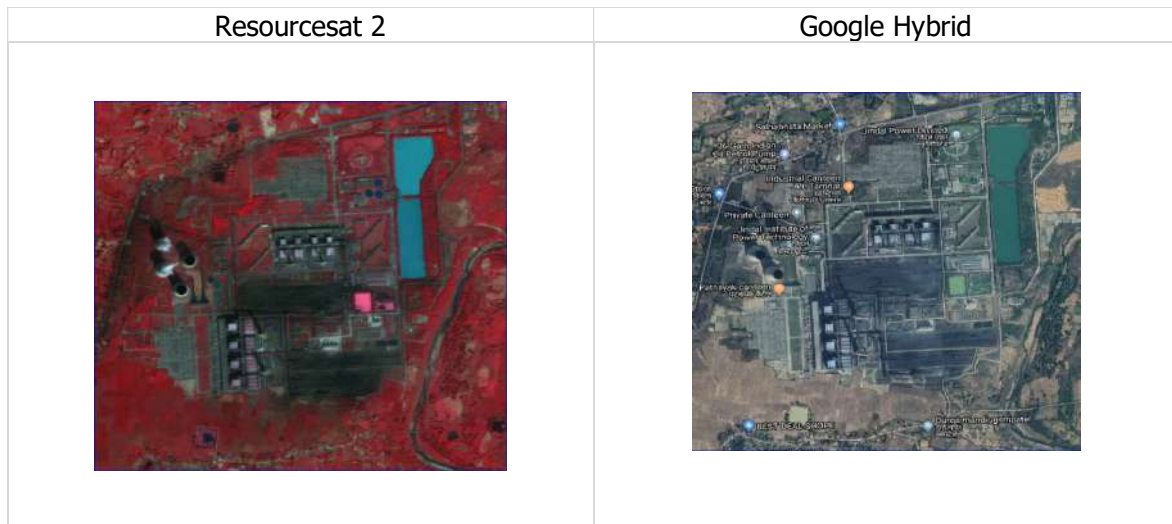


**Forest:**

Identified by Dark red color, texture will vary according to density of forest, dense forest will be rough, open forest will be smooth texture according to the land type, and there is no regular pattern, forest type can be classified by density.

**Industry:**

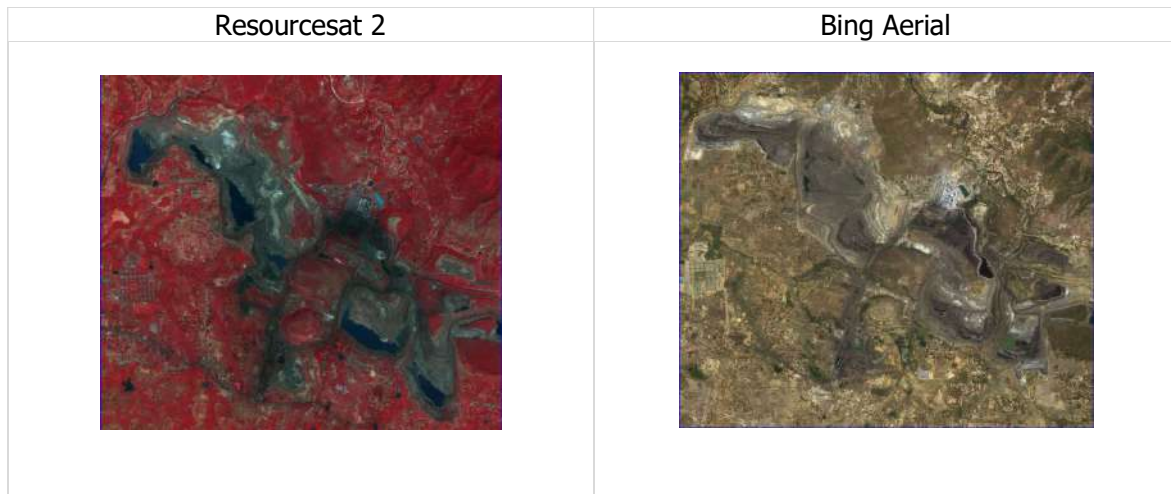
Identification based on the shapes with different colors, need to be validated with Google hybrid and Bhuvan layers, pattern will be rectangular and sometimes irregular.



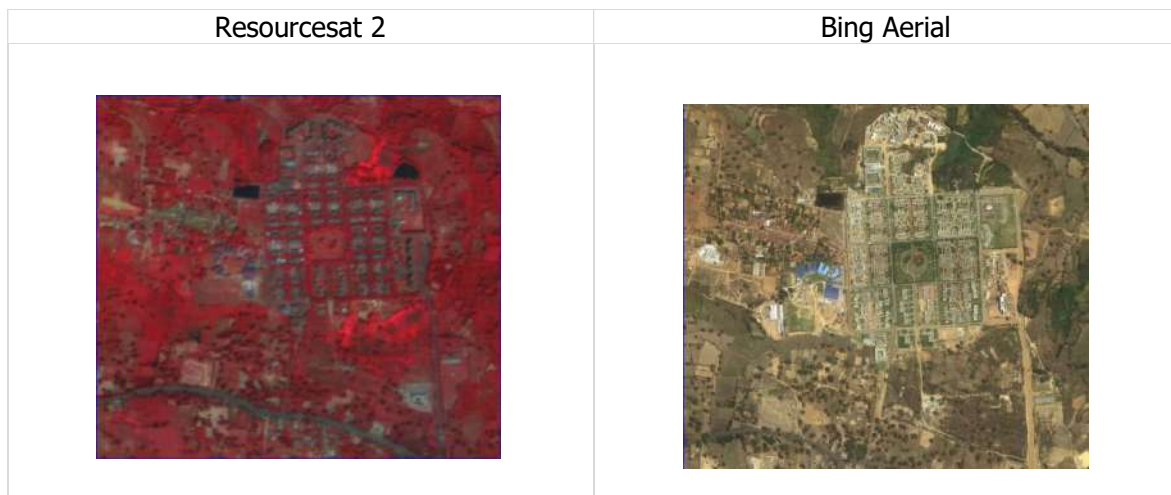


**Mining:**

Identified as irregular pattern, without vegetation and combination of Industry and Soil with water will be there. Mixed of blue, brown, white and black colors. Generally, shows an abrupt change in colour and texture, relative to the surrounding areas.

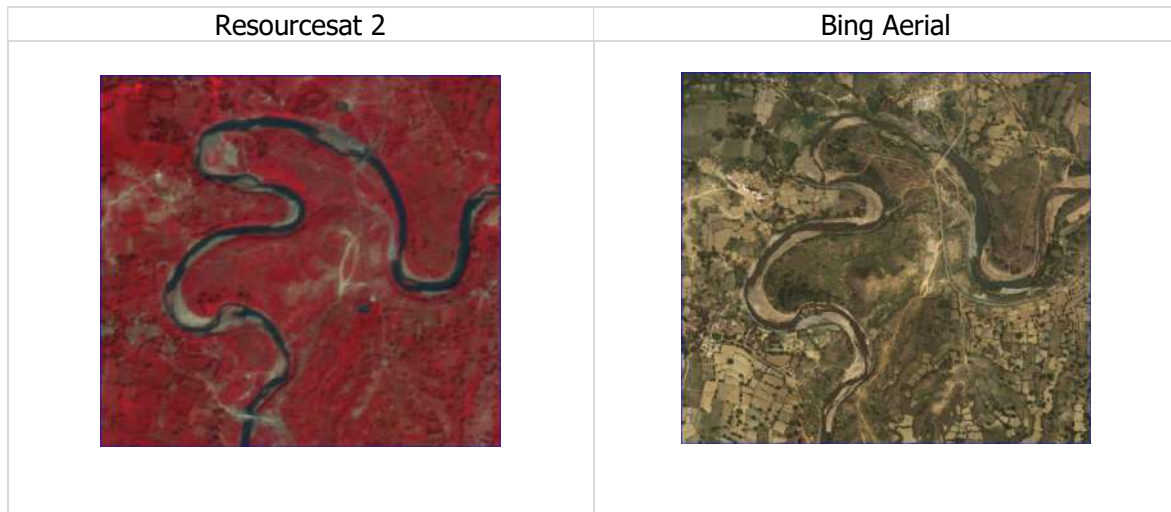
**Residential Colony:**

Identified as a regular pattern as settlements, every house will be the same color and size, usually in false color composition as like built-up it will be brown and black pixels.

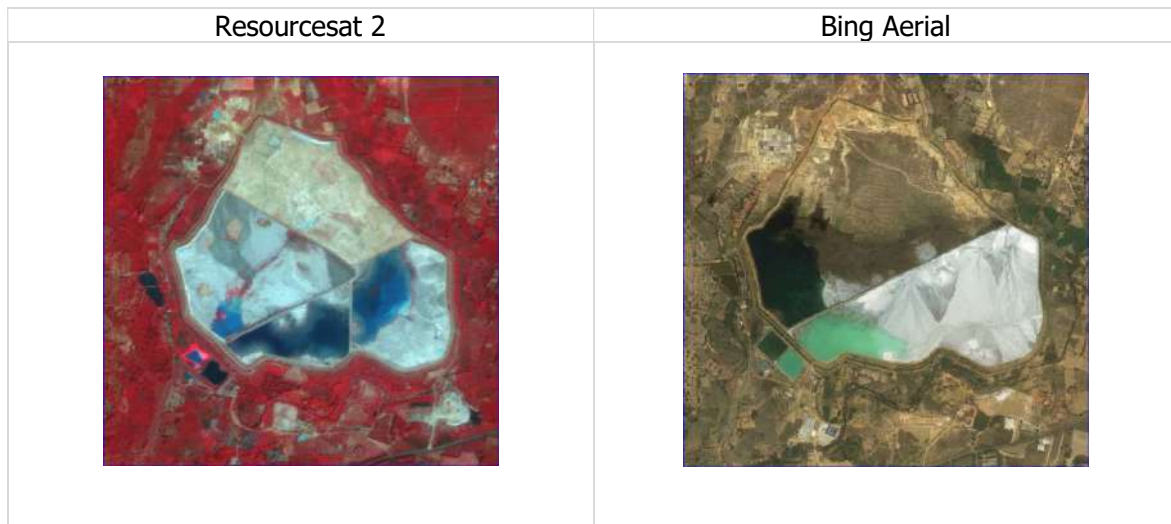


**River:**

Identified as dark blue and black pixels and pattern will be as irregular and linear and tone will be smooth. Recognition of the various drainage patterns assists in the interpretation.

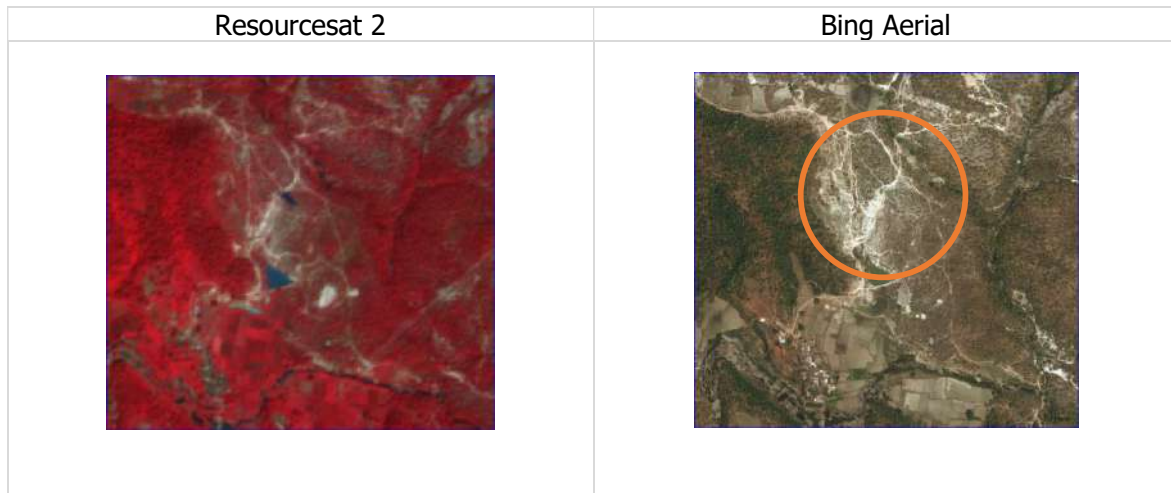
**Settlement Ash Pond:**

Identified as white patches since made up of concrete structures and water pixels is included, pattern is like man made irregular structure. Generally, shows an abrupt change in colour and texture, relative to the surrounding areas.

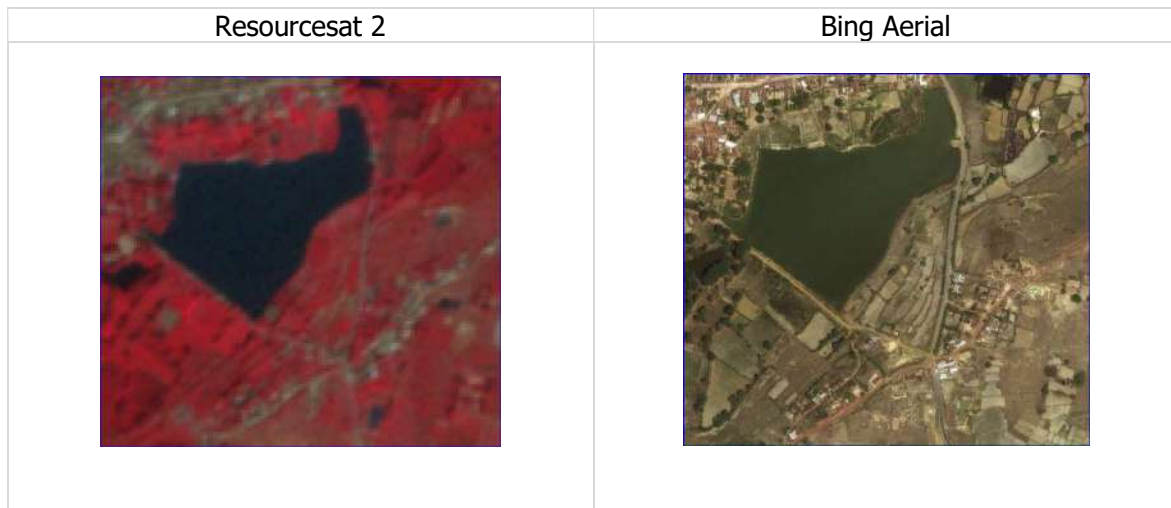


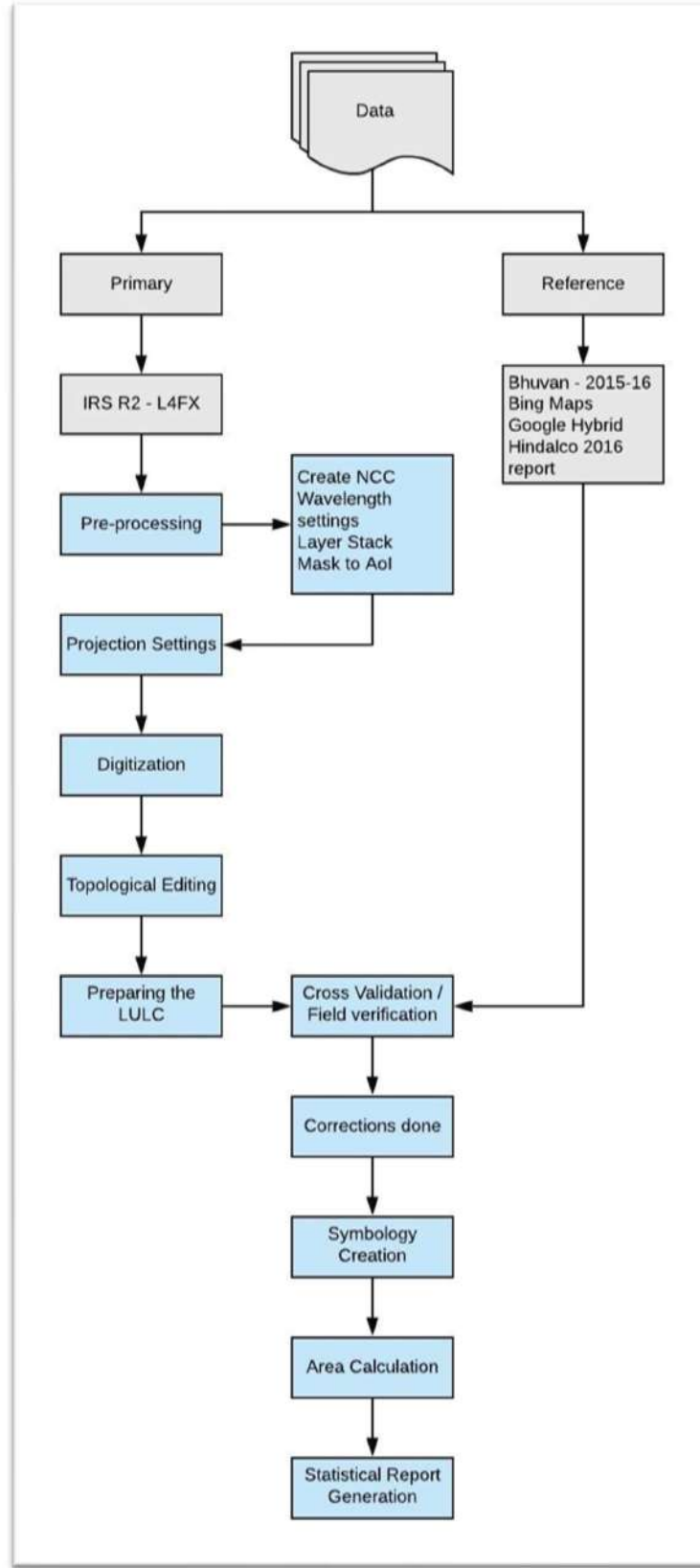
***Wasteland / Scrubland:***

Identified as non - agricultural (exposed soil), and no pattern, can see whitish patch and brown patches, classified based on old reports, Bhuvan datasets.

***Waterbody:***

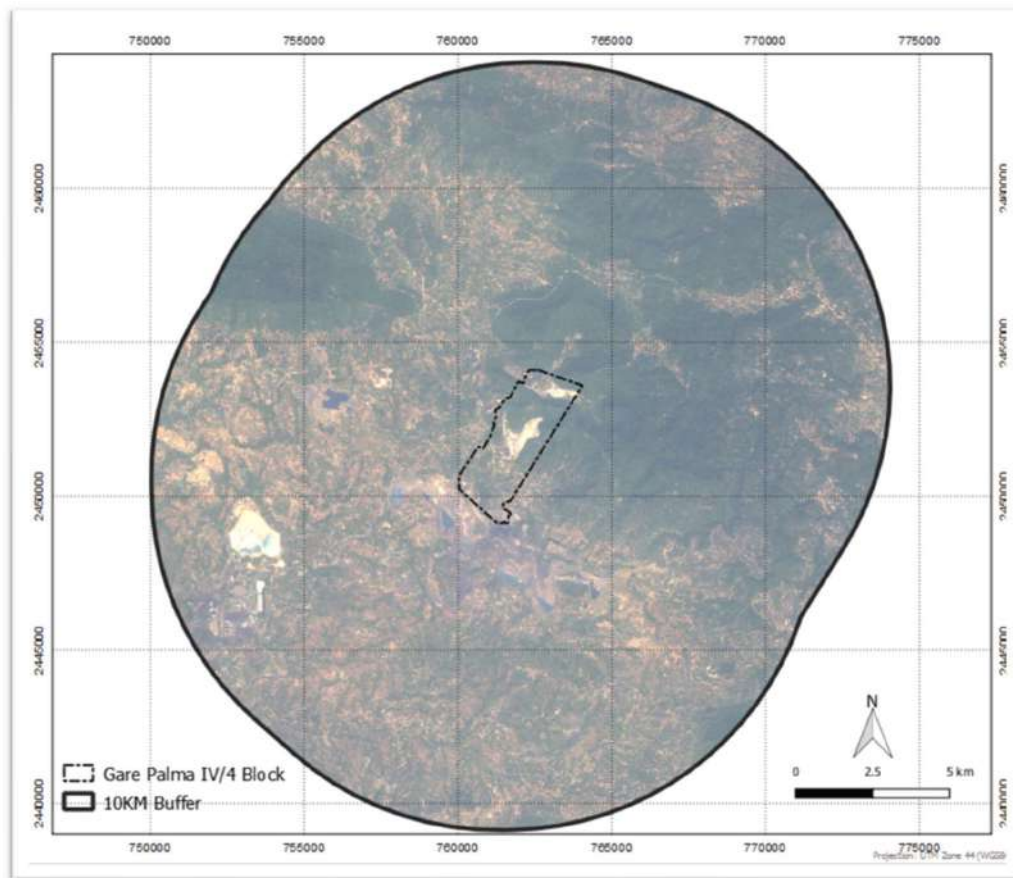
Identified as black pixels (zero values – since no reflectance), no exact pattern – mostly oval and round shapes, if man made structure ponds will be square and rectangular.



**Thematic Map – Land Use / Land Cover Generation Process**

## ***Pre-Processing***

Multispectral images can be displayed as one band or combination of three bands at a time as a colour composite image. Colour composites changeable according to the study and analyst needs. Natural colour composite displays a combination of visible red, green, and blue corresponding RGB channels on the computer display, which resembles natural observation of the human eye. False-colour composites allow us to visualize the wavelengths that the human eye can't see. It created by using near infrared to highlight the spectral differences and highlight the different features.



Resourcesat 2 – Natural Colour Composite of Study Area

## ***Layer Stack***

The imagery which is used for spectral indices must include definitions of, the centre wavelength for each band. Layer stack is process of combining different bands into a single image to compute the spectral indices. Layer stack done, visual settings RGB as 3-2-1 with settings of standard deviation  $\pm 2$  in contrast enhancement.



### ***Projection Settings***

Primary Dataset - The Co-ordinate Reference System is used from the Resourcesat 2 Imagery – EPSG: 32644 – WGS 81 / UTM Zone 44 – Projected and Units in Meters. The generated shapefiles also following the same projection settings as EPSG: 32644.

Reference Dataset – Bing Aerial and Google Hybrid maps followed the EPSG:3857 – WGS 84 / Pseudo Mercator. Bhuvan uses EPSG: 4326 – WGS 84 – Geographic and on-the-fly projection option is enabled for the easy navigation and smooth environment.

### ***Digitization***

On screen visual interpretation technique was followed, polygons were generated for every distinct classes and assigned respective attributes. Secondary datasets used for the cross-validation purposes only and increase the accuracy of area statistics. On screen digitization process shows the best results while comparing to the automatic classification using algorithms and tools, as the study area was limited to 10km buffer area, this enable us to go for visual interpretation by changing band combination to enhance visual representation of a feature and capture them, capturing was performed at a scale of 1:5000.

In order to provide a quality product, topology check was performed to clean up the digitized output, following topology checks were performed on the digitised layer.

- Cleaning the large network datasets
- Identifying overshoot and undershoots and rectifying.
- Snapping error

### ***Thematic Mapping:***

Thematic map was generated using the NRSA Bhuvan classifications as a reference, each polygon digitized has been attributed to a land use type. Thematic map is the final output of the entire process performed on the satellite imagery and digitization process, this provides an exact picture of the land use / land cover pattern as on October 2018 of the study area, in order to maintain consistency, same symbology has been applied which was used in Year 2016 report.



### ***Quality Control:***

Quality control is part of the production process before data delivery, which ensures the integrity of the product / data.

1. Positional accuracy & Classes verification
2. Requirements & Completeness
3. Projection & Coordinate system verification
4. Thematic accuracy
5. Usability

A step of ground verification is also involved to cross verify what has been captured from satellite imagery is on the ground, post ground verification, correction is done on the data and area calculation & report are regenerated.



### ***Area Calculation:***

For area calculation of each land use / land cover, polygons digitized in GIS environment, area are calculated and updated as an attribute in the GIS layer in unit hectares, which is exported for data analyses.

### ***Statistical Reports:***

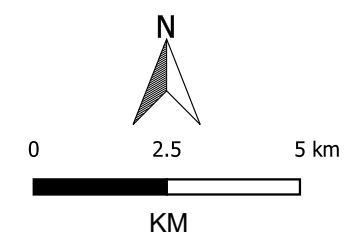
Statistical analysis helps to extract additional information from the data, which cannot be looked in map, like the distribution of values and it helps to find out the spatial trends and spatial patterns. Spatial statistics summarize the attribute values by categories or classes of the polygon dataset.


**Map No: 2**  
**Gare Palma IV/4**  
**Satellite Imagery**  
**Buffer Zone**

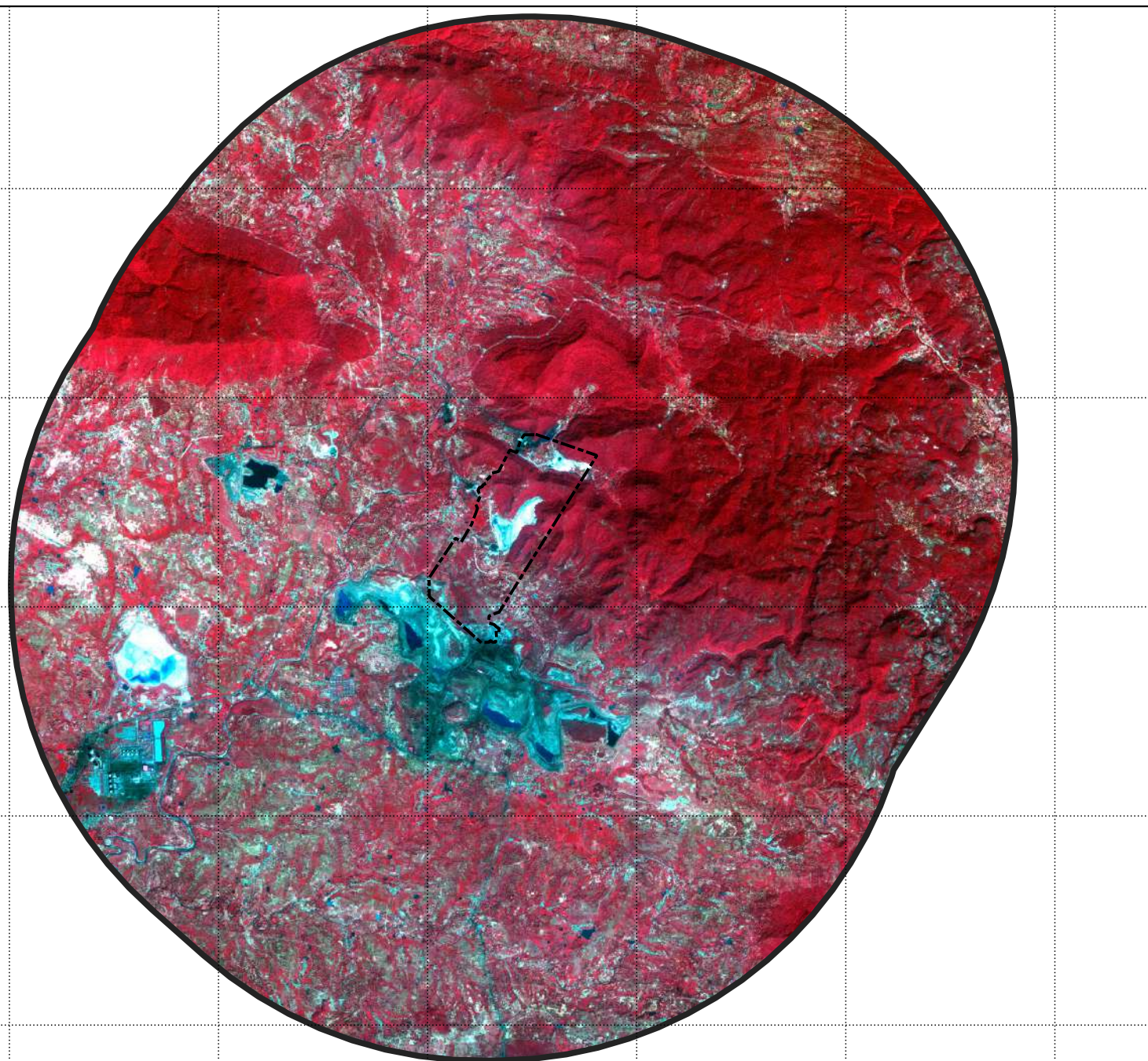
-  Gare Palma IV/4 Block
-  10KM Buffer

Satellite: IRS - ResourceSat 2  
 Sensor - L4 FX

Date of Pass: 18th October 2018  
 Path: 103, Row: 056



		<b>Hindalco Industries Limited</b>	
Project: Gare Palma IV/4, Raigarh, Chhattisgarh			
<b>Satellite Imagery</b> <b>Buffer Zone</b>			
Author : Suresh C Pal		Topo Ref: 64N/12	
Drawn : IndiGEO		Date : Dec 2019	
Page Size: A4		Map No: 2	



750000      755000      760000      765000      770000      775000

2460000  
2455000  
2450000  
2445000  
2440000

2460000  
2455000  
2450000  
2445000  
2440000

750000      755000      760000      765000      770000      775000

Projection: UTM Zone 44 (WGS84)

750000

755000

760000

765000

770000

775000

2465000

2460000

2455000

2450000

2445000

2440000

2465000

2460000

2455000

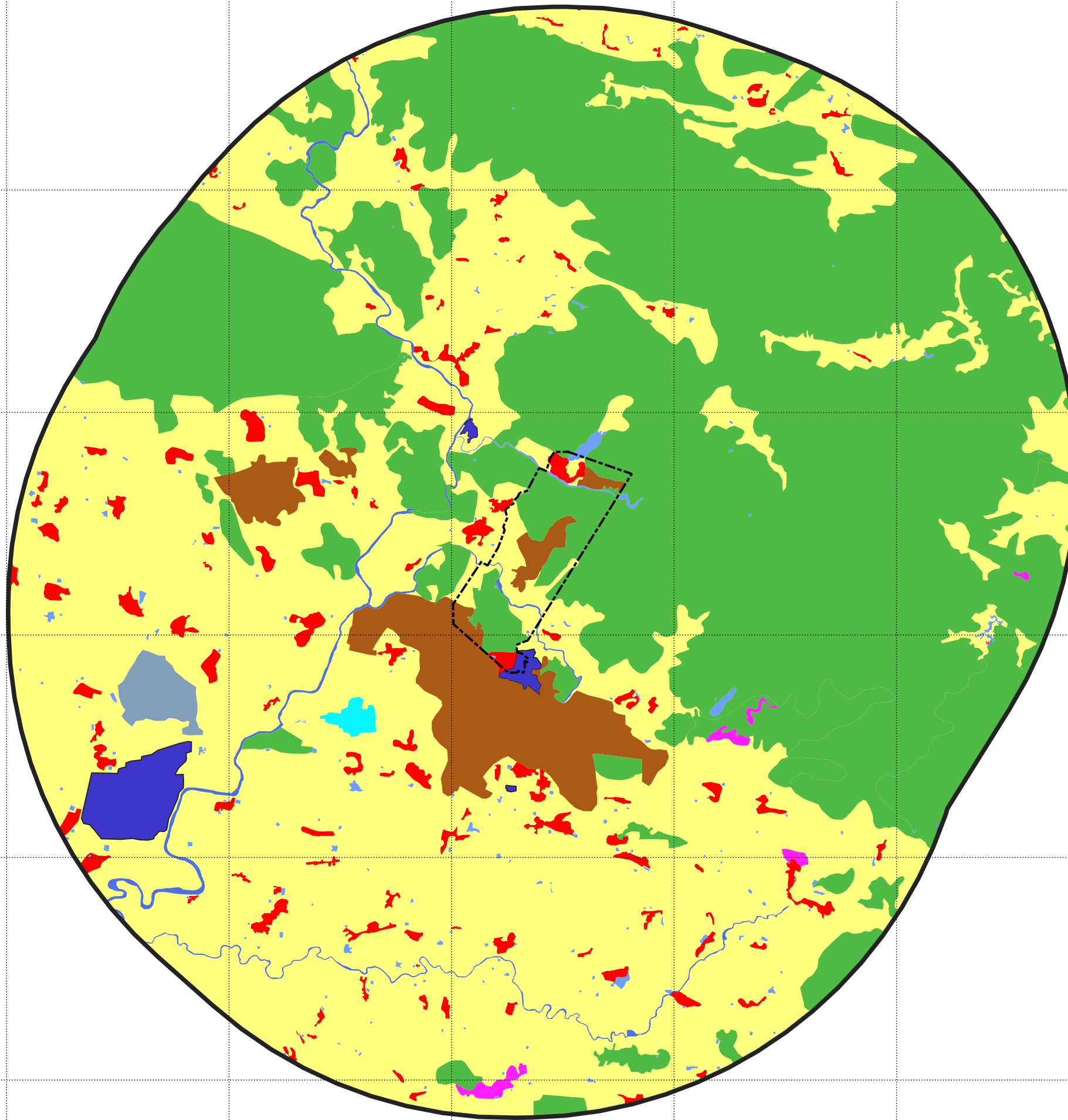
2450000

2445000

2440000

# Map No: 3 Gare Palma IV/4

## Land Use Land Cover Map



Gare Palma IV4 Block

Buffer Area (10KM)

### Land Use Classification

Agricultural

Builtup

Forest

Industry

Mining

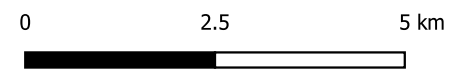
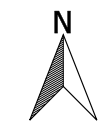
Residential Colony

River

Settlement Pond

Waste Land

Waterbody



KM



Hindalco Industries Limited

Project: Gare Palma IV/4, Raigarh, Chhattisgarh

### Land Use Land Cover Map Buffer Zone

Author : Suresh C Pal      Topo Ref: 64N/12

Drawn : IndiGEO              Date : Dec 2019

Page Size: A3                  Map No: 3

Projection: UTM Zone 44 (WGS84)



**Land Use / Land Cover Statistics of Buffer Zone**

Land Use / Land Cover	Area (Ha)	% of Total
Agricultural	21870.4	47.78%
Builtup	970.567	2.12%
Forest	19815.6	43.29%
Industry	411.749	0.90%
Mining	1828.63	3.99%
Residential Colony	61.649	0.13%
River	305.115	0.67%
Settlement Pond	219.293	0.48%
Waste Land	90.553	0.20%
Waterbody	200.878	0.44%
<b>Total Area</b>	<b>45774.434</b>	<b>100.00%</b>



759000 760000 761000 762000 763000 764000 765000

2454000

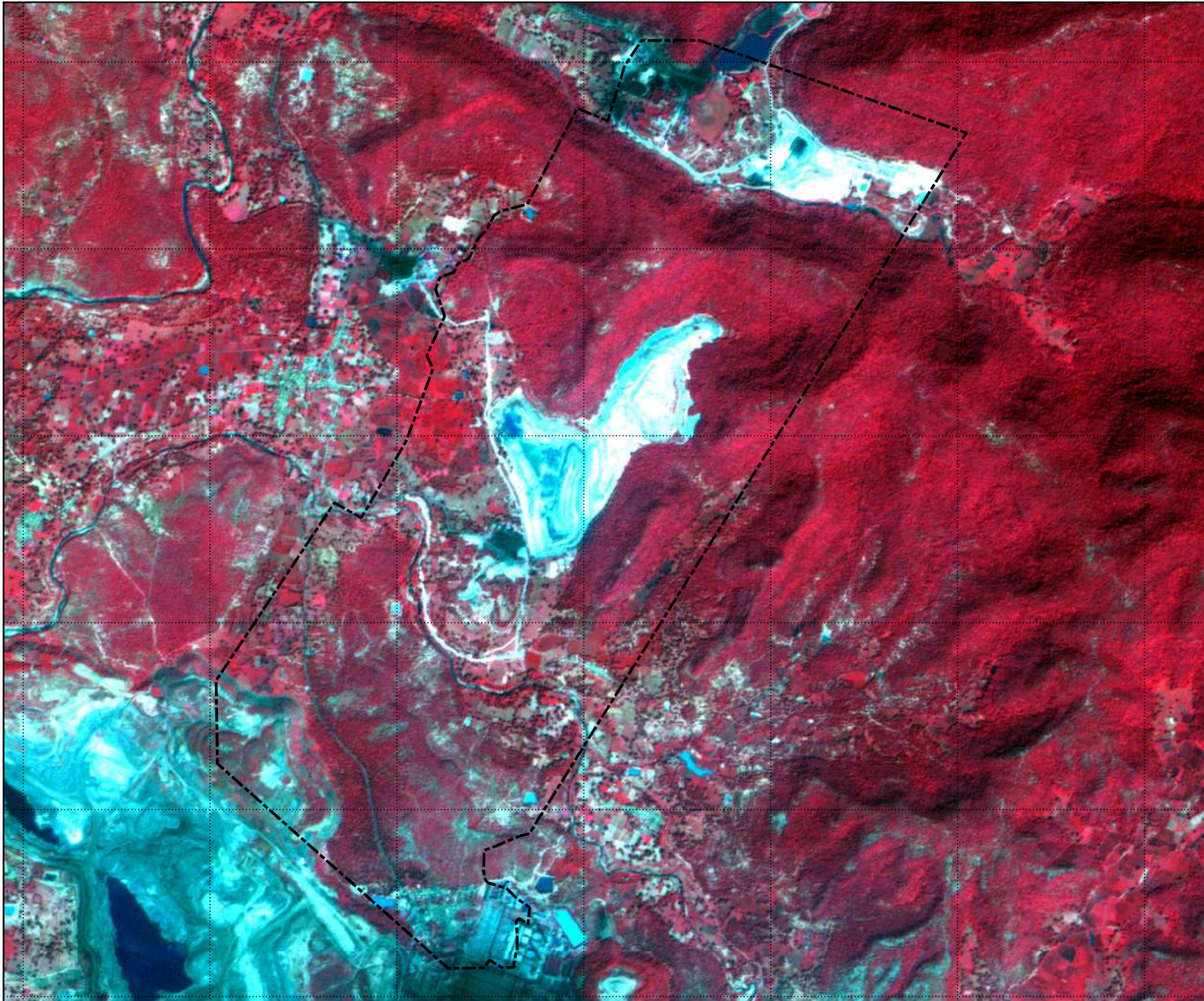
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2452000

2451000

2450000

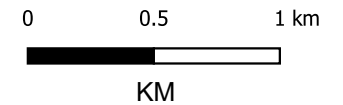
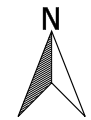
2449000



**Map No: 4**  
**Gare Palma IV/4**  
**Satellite Imagery**  
**Core Zone**

 Gare Palma IV/4 Block


Satellite: IRS - ResourceSat 2  
 Sensor - L4 FX  
 Date of Pass: 18th October 2018  
 Path: 103, Row: 056



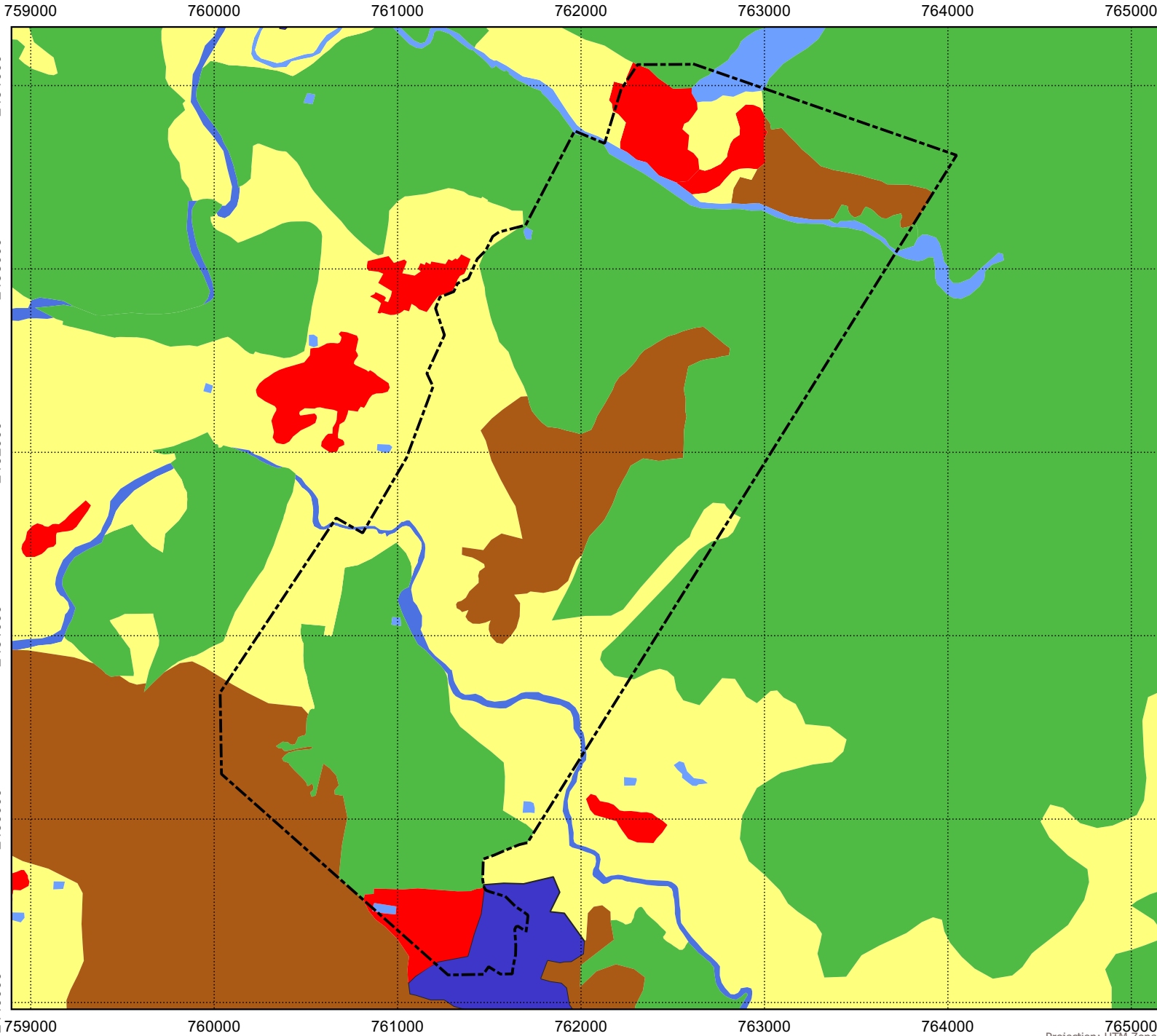
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2453000  
2452000  
2451000  
2450000  
2449000

759000 760000 761000 762000 763000 764000 765000

Projection: UTM Zone 44 (WGS84)

 <b>Hindalco Industries Limited</b>	
Project: Gare Palma IV/4, Raigarh, Chhattisgarh	
<b>Satellite Imagery</b> <b>Core Zone</b>	
Author : Suresh C Pal	Topo Ref: 64N/12
Drawn : IndiGEO	Date : Dec 2019
Page Size: A4	Map No: 4

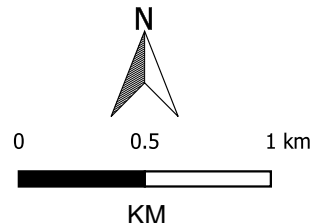





**Map No: 5  
Gare Palma IV/4**

**Land Use Land Cover Map  
Core Zone**

-  Gare Palma IV/4 Block
-  Agricultural
-  Builtup
-  Forest
-  Industry
-  Mining
-  Residential Colony
-  River
-  Settlement Pond
-  Waste Land
-  Waterbody



 <b>Hindalco Industries Limited</b>	
Project: Gare Palma IV/4, Raigarh, Chhattisgarh <b>Land Use Land Cover Map Core Zone</b>	
Author : Suresh C Pal	Topo Ref: 64N/12
Drawn : IndiGEO	Date : Dec 2019
Page Size: A4	Map No: 5

### Land Use / Land Cover Statistics of the Core Zone

Land Use / Land Cover	Area (Ha)	% of Total
Agricultural	207.703	23.46%
Builtup	44.512	5.03%
Forest	450.908	50.92%
Industry	11.209	1.27%
Mining	151.735	17.14%
River	7.969	0.90%
Waterbody	11.489	1.30%
<b>Total Area</b>	<b>885.525</b>	<b>100.00%</b>

### Comparison of Land Use / Land Cover of Buffer Zone of Lease

Below provided comparison table is of these two table

Table 1: April 2016 imagery interpretation information from report provided by Hindalco

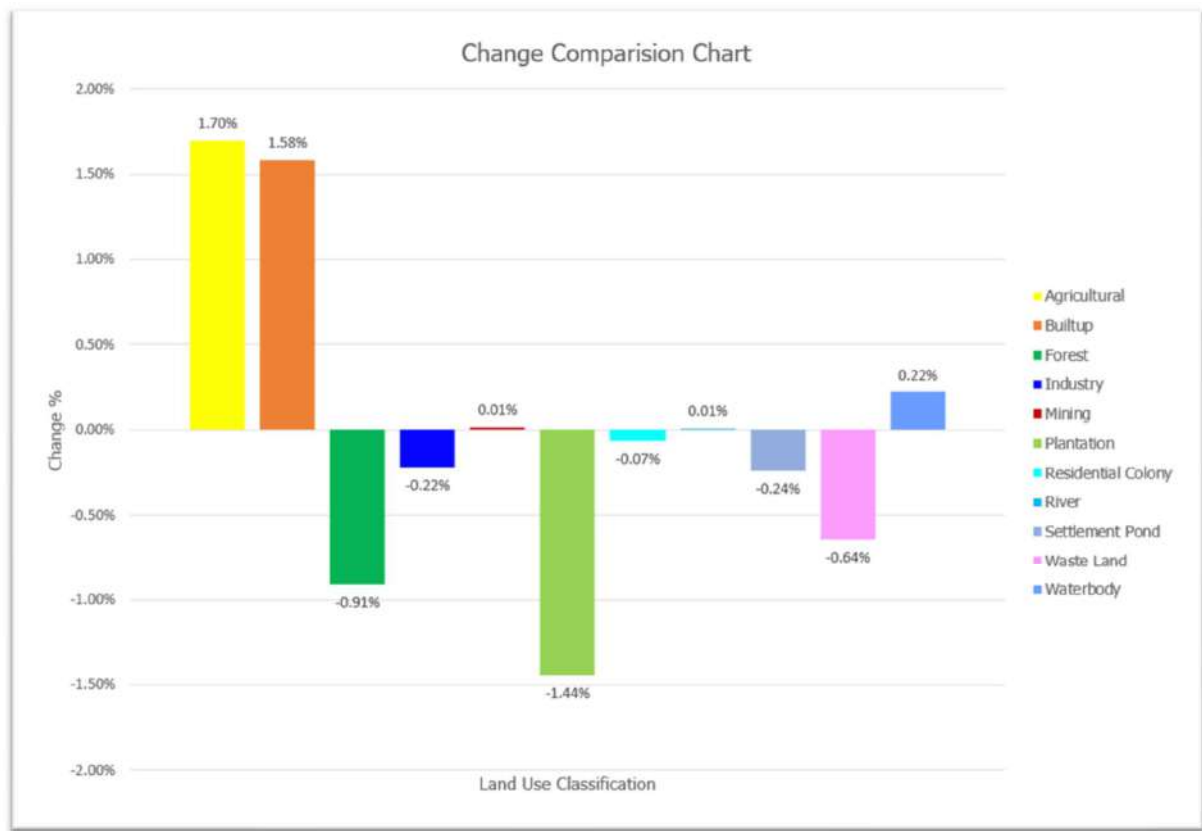
Table 2: Data interpreted using October 2018 satellite imagery.

It should be noted that, these two datasets data interpretation would vary in terms of detail information captured, in current interpretation every village and water feature within the study was captured at very detail scale of 1: 5000, thus increasing percentage change of Built-up and Water body features.

The core area for the report is changed as per the block boundary fixed by MOC and certified by CMPDI which also results in change in area of the buffer zone, resulting slight change in the land use pattern as compared to last report.

Comparison Table of Land Use / Land Cover for Buffer Zone of Lease:

Land Use / Land Cover	% of Land Use in 2016	% of Land Use in 2018	% of Change in Land Use
Agricultural	46.08%	47.78%	<b>1.70%</b>
Builtup	0.54%	2.12%	<b>1.58%</b>
Forest	44.20%	43.29%	-0.91%
Industry	1.12%	0.90%	-0.22%
Mining	3.98%	3.99%	<b>0.01%</b>
Plantation	1.44%	0.00%	-1.44%
Residential Colony	0.20%	0.13%	-0.07%
River	0.66%	0.67%	<b>0.01%</b>
Settlement Pond	0.72%	0.48%	-0.24%
Waste Land	0.84%	0.20%	-0.64%
Waterbody	0.22%	0.44%	<b>0.22%</b>



Classification	Reason of Change
<b>Agricultural</b>	There is increase of 1.70% in agricultural, this is due to multiple factors, reclassifying mix use land, where crop cultivation is visible and improved digitising accuracy.
<b>Builtup</b>	All village features have been accurately captured this year as builtup, thus increasing it by 1.58%
<b>Forest</b>	There is reduction in forest cover of 0.91%, this is due to multiple factor, reclassifying mixed use land as agriculture and digitizing accuracy.
<b>Industry</b>	0.22% reduction is noticed in this category, due to improved accuracy of digitisation
<b>Mining</b>	There is marginal increase of mining, due to improved accuracy of digitisation and addition in mining area in this time period.
<b>Plantation</b>	As the density of trees has increased, this has been reclassified as Forest.
<b>Residential Colony</b>	There is marginal reduction of 0.07%, due to improved accuracy of digitisation
<b>River</b>	There is marginal increase of 0.01% due to improved accuracy of digitisation
<b>Settlement Pond</b>	There is reduction of 0.24%, this is due to improved accuracy of digitisation
<b>Waste Land</b>	0.64% reduction in waste land, vegetation was noticed over this area, which was previously defined waste land, hence it has been reclassified.
<b>Waterbody</b>	0.22% increase in this feature as, all water bodies within buffer zone have been captured.



## **Conclusion**

There have been minor changes in the various Land use Land cover classifications. The primary reason for this change, is due to improvement in classification process and increase in mine area.

Built-up and Water bodies have been captured in detail using IRS imagery and verify with Bing Imagery, Google Imagery, these two imageries are of very high resolution, so better accuracy has been achieved.

Agriculture activity have been identified hence there is increase in agriculture area and reduction in forest area & waste land area, several mix used parcels have been classified as agriculture due to more visibility of crop cultivation in these parcels.

# Annexure-25



## ENVIRONMENT POLICY

We, at Hindalco Industries Limited, operating across the process chain from mining to semi-fabricated products in non-ferrous metals, will strive to continually improve our environmental performance for sustainable operations and responsible growth globally, by integrating sound environmental systems and practices.

To achieve this, we shall :

- Continue to comply with all applicable legal requirements on environment.
- Continually improve environmental performance by strengthening the Environmental Management System conforming to national/international standards, including setting up and reviewing targets and measuring, monitoring and reporting their progress.
- Allocate sufficient resources such as organisational structure, technology and funds for implementation of the policy and for regular monitoring of performance.
- Adopt pollution prevention approach for all our processes; enhance material efficiency and achieve high productivity.
- Conserve key resources like electricity, coal, water, oil, and raw materials, by promoting efficient technologies and manufacturing process improvements, water conservation programmes, and efficient use of raw materials.
- Adopt energy efficient and cleaner technologies based on techno-economic viability, appropriate to the region in which we operate, and in line with our growth and diversification plans.
- Promote the principles of waste prevention, reduction, reuse, recycling and recovery to minimise waste generation and strengthen the practices for management of wastes.
- Work in partnership with regulatory authorities, relevant suppliers, contractors and all stakeholders, as applicable, to understand and initiate improvement actions.
- Adapt environmental performance over life cycle as an important input to the decision-making processes in the organisation.
- Raise environmental awareness at all levels of our operations, through training and effective communication, participation and consultation.
- Develop and follow appropriate communication system to inform the stakeholders, as applicable, about our environmental commitment and performance.

This policy shall be made available to all employees, suppliers, customers, community and other stakeholders, as appropriate.

**Satish Pai**  
Managing Director

19<sup>th</sup> November 2016

# Annexure-26



HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph - 0771 - 4027777 | Email : ultimatenviro@gmail.com

Recognized by Ministry of Environment Forest and Climate Change under EP act 1986

<i>Name &amp; Address Of The Customer</i>		REPORT NO	UES/TR/22-23/0351	
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/4, COAL MINE, VILLAGE - BANKHETA, POST -MILUPARA, DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/AAQM/0393-400	
		DATE OF SAMPLING	04/04/2022 to 29/04/2022	
		DATE OF RECEIPT	05/04/2022 to 30/04/2022	
		DATE OF REPORT	02/05/2022	
		DATE OF ANALYSIS	START: 05/04/2022	END: 02/05/2022
<b>SAMPLE DETAILS</b>				
MONITORING FOR	AMBIENT AIR QUALITY MONITORING	CUSTOMER REF. NO. & DATE	N/PO/SRV/2122/0045, DTD. 24-JULY-2021	
SAMPLING LOCATION	OFFICE AREA, BANJIKHOL			
DURATION OF SAMPLING	24 HOURS	SAMPLE COLLECTED BY	LABORATORY CHEMIST	
SAMPLING PROCEDURE	AS PER METHOD REFERENCE			
SAMPLE QUANTITY/PACKING	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.			

### Test Method and NAAQM Standard for Ambient Air Quality Monitoring

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019, CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182 (Part 10): 1999, RA 2003	4.0
Mercury (Hg)	EPA Method IO-5	--

### TEST REPORT

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
04.04.2022	86	24	14	38	0.9	N.D.
08.04.2022	62	28	12	26	0.8	N.D.
11.04.2022	74	24	16	22	0.6	N.D.
15.04.2022	82	36	10	28	0.4	N.D.
18.04.2022	74	32	12	22	0.8	N.D.
22.04.2022	68	38	18	26	0.4	N.D.
25.04.2022	60	34	12	24	0.6	N.D.
29.04.2022	60	28	14	28	0.4	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

#### Terms & conditions

- The report for publication, circulation or as legal dispute is forbidden.
- Test samples will be retained for 15 days after issue of test report unless otherwise agreed with customer.
- This is the address on the party how and for whom test(s) only.

 02/05/22 REVIEWED BY		For ULTIMATE ENVIROLYTICAL SOLUTIONS  02/05/22 AUTHORIZED SIGNATORY
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-----End of the test report-----

AN ISO : 9001:2015 / ISO: 14001:2015 / ISO 45001:2018 CERTIFIED LABORATORY





HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

Recognized by Ministry of Environment Forest and Climate Change under EP act 1986

<i>Name &amp; Address Of The Customer</i>		REPORT NO	UES/TR/22-23/0986	
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA,</b> <b>POST -MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/AAQM/01712-01719	
		DATE OF SAMPLING	02/05/2022 to 27/05/2022	
		DATE OF RECEIPT	03/05/2022 to 28/05/2022	
		DATE OF REPORT	01/06/2022	
		DATE OF ANALYSIS	START: 04/05/2022	END: 31/05/2022
<b>SAMPLE DETAILS</b>				
MONITORING FOR	AMBIENT AIR QUALITY MONITORING	CUSTOMER REF. NO. & DATE	N/PO/SRV/2122/0045, D/D. 24-JULY-2021	
SAMPLING LOCATION	OFFICE AREA, BANJIKHOL			
DURATION OF SAMPLING	24 HOURS	SAMPLE COLLECTED BY	LABORATORY CHEMIST	
SAMPLING PROCEDURE	AS PER METHOD REFERENCE			
SAMPLE QUANTITY/PACKING	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.			

### Test Method and NAAQM Standard for Ambient Air Quality Monitoring

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182 (Part 10): 1999, RA 2003	4.0
Mercury (Hg)	EPA Method IO-5	--

### TEST REPORT

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
02.05.2022	78	22	12	28	0.7	N.D.
06.05.2022	88	26	10	26	0.5	N.D.
09.05.2022	82	28	18	22	0.9	N.D.
13.05.2022	86	30	12	20	0.6	N.D.
16.05.2022	72	38	10	24	0.2	N.D.
20.05.2022	76	32	08	28	0.8	N.D.
23.05.2022	86	38	16	22	0.5	N.D.
27.05.2022	82	34	12	26	0.6	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

#### Terms & conditions

- > The report for publication, admission or as legal evidence is forbidden.
- > Test sample will be returned for 10 days after issue of test report unless otherwise agreed with customer.
- > This is for information as the party has asked for above testing only.

 01/06/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/06/22 <b>AUTHORIZED SIGNATORY</b>
---	---	--

-----End of the test report-----

AN ISO : 9001:2015 / ISO : 14001:2015 / ISO 45001:2018 CERTIFIED LABORATORY



HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

Recognized by Ministry of Environment Forest and Climate Change under EP act 1986

Name & Address Of The Customer		REPORT NO	UES/TR/22-23/01966	
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA,</b> <b>POST -MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO:	UES/22-23/AAQM/02323-02330	
		DATE OF SAMPLING	03/06/2022 to 27/06/2022	
		DATE OF RECEIPT	04/06/2022 to 28/06/2022	
		DATE OF REPORT	01/07/2022	
		DATE OF ANALYSIS	START: 05/06/2022	END: 30/06/2022
<b>SAMPLE DETAILS</b>				
MONITORING FOR	AMBIENT AIR QUALITY MONITORING	CUSTOMER REF. NO. & DATE	N/PO/SRV/2122/0045, DTD. 24-JULY-2021	
SAMPLING LOCATION	OFFICE AREA, BANJIKHOL			
DURATION OF SAMPLING	24 HOURS	SAMPLE COLLECTED BY	LABORATORY CHEMIST	
SAMPLING PROCEDURE	AS PER METHOD REFERENCE			
SAMPLE QUANTITY/PACKING	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE. RUBBER BLADEMR: 1X1 NO.			

#### Test Method and NAAQM Standard for Ambient Air Quality Monitoring

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 21): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182 (Part 10): 1999, RA 2003	4.0
Mercury (Hg)	EPA Method 10-5	--

#### TEST REPORT

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
03.06.2022	68	28	10	24	0.5	N.D.
06.06.2022	70	36	16	28	0.2	N.D.
10.06.2022	78	22	12	22	0.6	N.D.
13.06.2022	72	30	10	28	0.4	N.D.
17.06.2022	66	32	14	20	0.8	N.D.
22.06.2022	68	28	18	26	0.2	N.D.
24.06.2022	72	34	12	24	0.8	N.D.
27.06.2022	78	38	14	28	0.4	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

#### Terms & conditions

- The report for publication, arbitration or as legal dispute is forbidden.
- Your sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.
- This is for information as the party has asked for above results only.

 01/07/22 <b>REVIEWED BY</b>	 For ULTIMATE ENVIROLYTICAL SOLUTIONS	 01/07/22 <b>AUTHORIZED SIGNATORY</b>
------------------------------------	--	---

AN ISO : 9001:2015 / ISO : 14001:2015 / ISO 45001:2018 CERTIFIED LABORATORY





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Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

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<b>Name &amp; Address Of The Customer</b>		<b>REPORT NO</b>	UES/TR/22-23/01801
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/4, COAL MINE, VILLAGE - BANKHETA, POST -MILUPARA, DISTT. - RAIGARH (C.G.) 496107</b>		<b>LAB REF NO</b>	UES/22-23/AAQM/03609-03616
		<b>DATE OF SAMPLING</b>	04/07/2022 to 28/07/2022
		<b>DATE OF RECEIPT</b>	05/07/2022 to 29/07/2022
		<b>DATE OF REPORT</b>	01/08/2022
		<b>DATE OF ANALYSIS</b>	START: 06/07/2022      END: 01/08/2022
		<b>SAMPLE DETAILS</b>	
<b>MONITORING FOR</b>	AMBIENT AIR QUALITY MONITORING	<b>CUSTOMER REF. NO. &amp; DATE</b>	N/PO/SRV/2122/0045, DTD. 24-JULY-2021
<b>SAMPLING LOCATION</b>	OFFICE AREA, BANKHETA		
<b>DURATION OF SAMPLING</b>	24 HOURS	<b>SAMPLE COLLECTED BY</b>	LABORATORY CHEMIST
<b>SAMPLING PROCEDURE</b>	AS PER METHOD REFERENCE		
<b>SAMPLE QUANTITY/PACKING</b>	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.		

#### Test Method and NAAQM Standard for Ambient Air Quality Monitoring

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182(Part 10):1999, RA 2003	4.0
Mercury (Hg)	EPA Method 10-5	--

#### TEST REPORT

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
04.07.2022	64	24	12	22	0.7	N.D.
07.07.2022	68	32	14	24	0.5	N.D.
11.07.2022	72	26	10	22	0.2	N.D.
15.07.2022	70	38	15	26	0.4	N.D.
19.07.2022	64	30	12	22	0.5	N.D.
21.07.2022	62	26	18	28	0.2	N.D.
25.07.2022	78	30	14	22	0.4	N.D.
28.07.2022	72	32	12	26	0.9	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

#### Terms & conditions

- The report for publication, circulation or as legal document is prohibited.
- Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.
- This is the information on the sample has asked for above test(s) only.

 01/08/22 <b>REVIEWED BY</b>	 <b>For ULTIMATE ENVIROLYTICAL SOLUTIONS</b>	 01/08/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----

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HDD-272, Phase III - Near JP Chowk  
 Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
 Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

<b>Name &amp; Address Of The Customer</b> <b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA,</b> <b>POST -MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>	REPORT NO	UES/TR/22-23/02816
	LAB REF NO	UES/22-23/AAQM/07844-07851
	DATE OF SAMPLING	01/08/2022 to 29/08/2022
	DATE OF RECEIPT	02/08/2022 to 30/08/2022
	DATE OF REPORT	02/09/2022
	DATE OF ANALYSIS	START: 03/08/2022      END: 02/09/2022

SAMPLE DETAILS			
MONITORING PM	AMBIENT AIR QUALITY MONITORING	CUSTOMER REF. NO. & DATE	VERBAL COMMUNICATION.
SAMPLING LOCATION	OFFICE AREA, BANJINGROL		
DURATION OF SAMPLING	24 HOURS	SAMPLE COLLECTED BY	LABORATORY CHEMIST
SAMPLING PROCEDURE	AS PER METHOD REFERENCE		
SAMPLE QUANTITY/PACKING	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.		

Test Method and NAAQM Standard for Ambient Air Quality Monitoring		
Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-1	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS-5182 (Part 24): 2019 CPCB Guidelines Vol.-1	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-1	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-1	80
Carbon Monoxide (CO)*	IS 5182(Part 10):1999, RA 2003	4.0
Mercury (Hg)	EPA Method 10-5	--

TEST REPORT						
Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
01.08.2022	58	28	10	22	0.5	N.D.
04.08.2022	68	20	14	28	0.8	N.D.
08.08.2022	52	26	12	24	0.2	N.D.
16.08.2022	56	20	18	20	0.9	N.D.
18.08.2022	62	22	14	26	0.2	N.D.
22.08.2022	56	22	08	22	0.5	N.D.
25.08.2022	56	26	16	28	0.2	N.D.
29.08.2022	62	24	10	24	0.6	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

**Terms & conditions**

- The report for publication, exhibition or in legal dispute is free.
- Test sample will be retained for 15 days after issue of test report unless otherwise agreed upon.
- This is for information as the party has asked for above test only.

 02/09/22 <b>REVIEWED BY</b>	 <b>For-ULTIMATE ENVIROLYTICAL SOLUTIONS</b>	 02/09/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----



HDD-272, Phase III - Near JP Chowk  
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<i>Name &amp; Address Of The Customer</i>		REPORT NO	UES/TR/22-23/03276
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA,</b> <b>POST -MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/AAQM/08468-08475
		DATE OF SAMPLING	02/09/2022 to 26/09/2022
		DATE OF RECEIPT	03/09/2022 to 27/09/2022
		DATE OF REPORT	01/10/2022
		DATE OF ANALYSIS	START:04/09/2022      END:01/10/2022
		<b>SAMPLE DETAILS</b>	
MONITORING FOR	AMBIENT AIR QUALITY MONITORING	CUSTOMER REF. NO. & DATE	F.O.13552310211, DATED:07.09.2022
SAMPLING LOCATION	OFFICE AREA, BANJIRHOL		
DURATION OF SAMPLING	24 HOURS	SAMPLE COLLECTED BY	LABORATORY CHEMIST
SAMPLING PROCEDURE	AS PER METHOD REFERENCE		
SAMPLE QUANTITY/PACKING	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.		

Test Method and NAAQM Standard for Ambient Air Quality Monitoring		
Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-1	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182(Part 10):1999, RA 2003	4.0
Mercury (Hg)	EPA Method 10-5	---

TEST REPORT						
Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
02.09.2022	50	22	14	26	0.9	N.D.
05.09.2022	60	24	10	24	0.5	N.D.
09.09.2022	56	28	18	28	0.7	N.D.
12.09.2022	52	22	12	20	0.2	N.D.
16.09.2022	60	26	16	24	0.9	N.D.
19.09.2022	54	20	09	28	0.5	N.D.
23.09.2022	50	28	12	22	0.2	N.D.
26.09.2022	62	22	14	28	0.8	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

**Terms & conditions**

- The report for analysis is valid only if the report is received within 15 days after date of test report unless otherwise agreed with customer.
- This is for information as the same has asked for above analysis.

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End of the test report





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<i>Name &amp; Address Of The Customer</i>		REPORT NO	UES/TR/22-23/0352	
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/4, COAL MINE, VILLAGE - BANKHETA, POST -MILUPARA, DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/AAQM/0401-408	
		DATE OF SAMPLING	04/04/2022 to 29/04/2022	
		DATE OF RECEIPT	05/04/2022 to 30/04/2022	
		DATE OF REPORT	02/05/2022	
		DATE OF ANALYSIS	START:05/04/2022	END:02/05/2022
<b>SAMPLE DETAILS</b>				
MONITORING FOR	AMBIENT AIR QUALITY MONITORING	CUSTOMER REF. NO. & DATE	N/PO/SRV/2122/0045, DTD. 24-JULY-2021	
SAMPLING LOCATION	ETP AREA, BANJIKHOL			
DURATION OF SAMPLING	24 HOURS	SAMPLE COLLECTED BY	LABORATORY CHEMIST	
SAMPLING PROCEDURE	AS PER METHOD REFERENCE			
SAMPLE QUANTITY/PACKING	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.			

### Test Method and NAAQM Standard for Ambient Air Quality Monitoring

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182(Part 10):1999, RA 2003	4.0
Mercury (Hg)	EPA Method IO-5	--

### TEST REPORT

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
04.04.2022	72	38	12	20	0.4	N.D.
08.04.2022	68	30	10	24	0.2	N.D.
11.04.2022	76	34	16	22	0.8	N.D.
15.04.2022	68	38	12	25	0.6	N.D.
18.04.2022	80	28	18	20	0.2	N.D.
22.04.2022	76	44	12	28	0.7	N.D.
25.04.2022	68	36	10	22	0.5	N.D.
29.04.2022	82	42	14	26	0.2	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

#### Terms & conditions

- The report for publication, arbitration or as legal evidence is forbidden.
- Test samples will be returned for 15 days after issue of test report unless otherwise agreed with customer.
- This is for information as the party has asked for above testing only.

 02/05/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  02/05/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----



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<b>Name &amp; Address Of The Customer</b>		<b>REPORT NO</b>	UES/TR/22-23/0987	
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/4, COAL MINE, VILLAGE - BANKHETA, POST -MILUPARA, DISTT. - RAIGARH (C.G.) 496107</b>		<b>LAB REF NO</b>	UES/22-23/AAQM/01720-01727	
		<b>DATE OF SAMPLING</b>	02/05/2022 to 27/05/2022	
		<b>DATE OF RECEIPT</b>	03/05/2022 to 28/05/2022	
		<b>DATE OF REPORT</b>	01/06/2022	
		<b>DATE OF ANALYSIS</b>	START:04/05/2022	END:31/05/2022
<b>SAMPLE DETAILS</b>				
<b>MONITORING FOR</b>	AMBIENT AIR QUALITY MONITORING	<b>CUSTOMER REF. NO. &amp; DATE</b>	N/PO/SRV/2122/0045, DTD. 24-JULY-2021	
<b>SAMPLING LOCATION</b>	ETP AREA, BANJIKROL			
<b>DURATION OF SAMPLING</b>	24 HOURS	<b>SAMPLE COLLECTED BY</b>	LABORATORY CHEMIST	
<b>SAMPLING PROCEDURE</b>	AS PER METHOD REFERENCE			
<b>SAMPLE QUANTITY/PACKING</b>	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.			

### Test Method and NAAQM Standard for Ambient Air Quality Monitoring

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182 (Part 10):1999, RA 2003	4.0
Mercury (Hg)	EPA Method IO-5	--

### TEST REPORT

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
02.05.2022	86	30	10	28	0.9	N.D.
06.05.2022	76	36	14	26	0.8	N.D.
09.05.2022	72	28	18	20	0.2	N.D.
13.05.2022	78	34	10	28	0.6	N.D.
16.05.2022	82	38	16	26	0.8	N.D.
20.05.2022	78	42	10	20	0.2	N.D.
23.05.2022	76	30	08	24	0.5	N.D.
27.05.2022	80	48	12	28	0.8	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

#### Terms & conditions

- The report for publication, circulation or as legal document is forbidden.
- Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.
- This is for information as the party has asked for above tested only.

 01/06/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/06/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----

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<b>Name &amp; Address Of The Customer</b>		<b>REPORT NO</b>	UES/TR/22-23/01967	
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/4, COAL MINE, VILLAGE - BANKHETA, POST -MILUPARA, DISTT. - RAIGARH (C.G.) 496107</b>		<b>LAB REF NO</b>	UES/22-23/AAQM/02331-02338	
		<b>DATE OF SAMPLING</b>	03/06/2022 to 27/06/2022	
		<b>DATE OF RECEIPT</b>	04/06/2022 to 28/06/2022	
		<b>DATE OF REPORT</b>	01/07/2022	
		<b>DATE OF ANALYSIS</b>	START: 05/06/2022	END: 30/06/2022
<b>SAMPLE DETAILS</b>				
<b>MONITORING FOR</b>	AMBIENT AIR QUALITY MONITORING	<b>CUSTOMER REF. NO. &amp; DATE</b>	N/PO/SRV/2122/0045, DTD. 24-JULY-2021	
<b>SAMPLING LOCATION</b>	ETP AREA, BANJIKHOL			
<b>DURATION OF SAMPLING</b>	24 HOURS	<b>SAMPLE COLLECTED BY</b>	LABORATORY CHEMIST	
<b>SAMPLING PROCEDURE</b>	AS PER METHOD REFERENCE			
<b>SAMPLE QUANTITY/PACKING</b>	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.			

#### Test Method and NAAQM Standard for Ambient Air Quality Monitoring

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182 (Part 10): 1999, RA 2003	4.0
Mercury (Hg)	EPA Method 10-5	--

#### TEST REPORT

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
03.06.2022	76	24	16	28	0.4	N.D.
06.06.2022	70	32	10	22	0.2	N.D.
10.06.2022	68	28	14	28	0.8	N.D.
13.06.2022	74	32	18	20	0.2	N.D.
17.06.2022	80	34	12	26	0.6	N.D.
22.06.2022	76	40	14	22	0.7	N.D.
24.06.2022	72	36	08	28	0.4	N.D.
27.06.2022	88	44	10	24	0.8	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

#### Terms & conditions

- The report for publication, advertisement or as legal document is forbidden.
- Test sample will be returned for 15 days after issue of test report unless otherwise agreed with customer.
- This is for information of the party not asked for above test only.

 <b>REVIEWED BY</b>	 <b>For ULTIMATE ENVIROLYTICAL SOLUTIONS</b>	 <b>AUTHORIZED SIGNATORY</b>
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<b>Name &amp; Address Of The Customer</b>		<b>REPORT NO</b>	UES/TR/22-23/01802
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/4, COAL MINE, VILLAGE - BANKHETA, POST -MILUPARA, DISTT. - RAIGARH (C.G.) 496107</b>		<b>LAB REF NO</b>	UES/22-23/AAQM/03617-03624
		<b>DATE OF SAMPLING</b>	04/07/2022 to 28/07/2022
		<b>DATE OF RECEIPT</b>	05/07/2022 to 29/07/2022
		<b>DATE OF REPORT</b>	01/08/2022
		<b>DATE OF ANALYSIS</b>	START:06/07/2022 END:01/08/2022
<b>SAMPLE DETAILS</b>			
<b>MONITORING FOR</b>	AMBIENT AIR QUALITY MONITORING	<b>CUSTOMER REF. NO. &amp; DATE</b>	N/PO/SRV/2122/0045, DTD. 24-JULY-2021
<b>SAMPLING LOCATION</b>	ETP AREA, BANJIKHOL		
<b>DURATION OF SAMPLING</b>	24 HOURS	<b>SAMPLE COLLECTED BY</b>	LABORATORY CHEMIST
<b>SAMPLING PROCEDURE</b>	AS PER METHOD REFERENCE		
<b>SAMPLE QUANTITY/PACKING</b>	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.		

#### Test Method and NAAQM Standard for Ambient Air Quality Monitoring

Parameter	Method Reference	NAAQM Standard
Particulate Matter-size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter-size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182(Part 10):1999, RA 2003	4.0
Mercury (Hg)	EPA Method 10-S	--

#### TEST REPORT

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
04.07.2022	70	28	11	26	0.6	N.D.
07.07.2022	68	30	16	22	0.5	N.D.
11.07.2022	62	24	12	24	0.9	N.D.
15.07.2022	64	30	16	26	0.2	N.D.
19.07.2022	76	30	10	20	0.7	N.D.
21.07.2022	72	32	14	28	0.2	N.D.
25.07.2022	70	38	08	24	0.8	N.D.
28.07.2022	66	40	16	22	0.6	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

#### Terms & conditions

- The report for publication, activation or as legal document is for client's use.
- Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.
- There is no information in the parts test asked for above test/analysis.

 01/08/22 <b>REVIEWED BY</b>	 <b>For ULTIMATE ENVIROLYTICAL SOLUTIONS</b>	 01/08/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----

AN ISO : 9001:2015 / ISO: 14001:2015 / ISO 45001:2018 CERTIFIED LABORATORY





HDD-272, Phase III - Near JP Chowk  
 Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
 Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

<b>Name &amp; Address Of The Customer</b>		<b>REPORT NO</b>	UES/TR/22-23/02617
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/4, COAL MINE, VILLAGE - BANKHETA, POST -MILUPARA, DISTT. - RAIGARH (C.G.) 496107</b>		<b>LAB REF NO</b>	UES/22-23/AAQM/07852-07859
		<b>DATE OF SAMPLING</b>	01/08/2022 to 29/08/2022
		<b>DATE OF RECEIPT</b>	02/08/2022 to 30/08/2022
		<b>DATE OF REPORT</b>	02/09/2022
		<b>DATE OF ANALYSIS</b>	START: 03/08/2022      END: 02/09/2022
<b>SAMPLE DETAILS</b>			
<b>MONITORING FOR</b>	AMBIENT AIR QUALITY MONITORING	<b>CUSTOMER REF. NO. &amp; DATE</b>	VERBAL COMMUNICATION.
<b>SAMPLING LOCATION</b>	ETP AREA, BANJIKHOL		
<b>DURATION OF SAMPLING</b>	24 HOURS	<b>SAMPLE COLLECTED BY</b>	LABORATORY CHEMIST
<b>SAMPLING PROCEDURE</b>	AS PER METHOD REFERENCE		
<b>SAMPLE QUANTITY/PACKING</b>	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.		

Test Method and NAAQM Standard for Ambient Air Quality Monitoring		
Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182 (Part 10): 1999, RA 2003	4.0
Mercury (Hg)	EPA Method IO-5	—

TEST REPORT						
Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
01.08.2022	56	24	12	26	0.5	N.D.
04.08.2022	56	26	10	22	0.6	N.D.
08.08.2022	52	22	14	24	0.4	N.D.
16.08.2022	58	28	12	28	0.8	N.D.
18.08.2022	62	30	18	22	0.2	N.D.
22.08.2022	68	22	12	24	0.5	N.D.
25.08.2022	56	20	06	28	0.6	N.D.
29.08.2022	60	28	14	22	0.2	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

**Terms & conditions**

- The report for publication, circulation or as legal document is forbidden.
- This sample will be retained for 10 days after issue of test report unless otherwise agreed with customer.
- This is for information as the party has asked for above test(s) only.

 02/09/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  02/09/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----





HDD-272, Phase III - Near JP Chowk  
 Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
 Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

<b>Name &amp; Address Of The Customer</b>		<b>REPORT NO</b>	UES/TR/22-23/03277
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA,</b> <b>POST -MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		<b>LAB REF NO</b>	UES/22-23/AAQM/08476-08483
		<b>DATE OF SAMPLING</b>	02/09/2022 to 26/09/2022
		<b>DATE OF RECEIPT</b>	03/09/2022 to 27/09/2022
		<b>DATE OF REPORT</b>	01/10/2022
		<b>DATE OF ANALYSIS</b>	START:04/09/2022    END:01/10/2022
		<b>SAMPLE DETAILS</b>	
<b>MONITORING FOR</b>	AMBIENT AIR QUALITY MONITORING	<b>CUSTOMER REF. NO. &amp; DATE</b>	P.O.13552310211, DATED: 07.09.2022
<b>SAMPLING LOCATION</b>	ETP AREA, SANJINGROL		
<b>DURATION OF SAMPLING</b>	24 HOURS	<b>SAMPLE COLLECTED BY</b>	LABORATORY CHEMIST
<b>SAMPLING PROCEDURE</b>	AS PER METHOD REFERENCE		
<b>SAMPLE QUANTITY/PACKING</b>	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO.: 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.		

<b>Test Method and NAAQM Standard for Ambient Air Quality Monitoring</b>		
Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182 (Part 10): 1999, RA 2003	4.0
Mercury (Hg)	EPA Method 10-5	--

<b>TEST REPORT</b>						
Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
02.09.2022	52	22	14	24	0.5	N.D.
05.09.2022	50	24	12	20	0.2	N.D.
09.09.2022	48	28	18	22	0.8	N.D.
12.09.2022	56	22	16	26	0.4	N.D.
16.09.2022	60	26	10	28	0.6	N.D.
19.09.2022	64	28	14	22	0.8	N.D.
23.09.2022	56	24	08	24	0.5	N.D.
26.09.2022	62	22	12	28	0.2	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

**Terms & conditions**

- The report for publication, circulation or as legal document is disallowed.
- Get sample will be returned for 15 days after issue of test report unless otherwise agreed with customer.
- This is for information of the party has asked for above points only.

 01/10/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/10/22 <b>AUTHORIZED SIGNATORY</b>
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HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

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<b>Name &amp; Address Of The Customer</b>		<b>REPORT NO</b>	UES/TR/22-23/0353	
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/4, COAL MINE, VILLAGE - BANKHETA, POST -MILUPARA, DISTT. - RAIGARH (C.G.) 496107</b>		<b>LAB REF NO</b>	UES/22-23/AAQM/0409-416	
		<b>DATE OF SAMPLING</b>	04/04/2022 to 29/04/2022	
		<b>DATE OF RECEIPT</b>	05/04/2022 to 30/04/2022	
		<b>DATE OF REPORT</b>	02/05/2022	
		<b>DATE OF ANALYSIS</b>	<b>START: 05/04/2022</b>	<b>END: 02/05/2022</b>
<b>SAMPLE DETAILS</b>				
<b>MONITORING FOR</b>	AMBIENT AIR QUALITY MONITORING	<b>CUSTOMER REF. NO. &amp; DATE</b>	N/PO/SRV/2122/0045, DTD. 24-JULY-2021	
<b>SAMPLING LOCATION</b>	OFFICE AREA, BANKHETA			
<b>DURATION OF SAMPLING</b>	24 HOURS	<b>SAMPLE COLLECTED BY</b>	LABORATORY CHEMIST	
<b>SAMPLING PROCEDURE</b>	AS PER METHOD REFERENCE			
<b>SAMPLE QUANTITY/PACKING</b>	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.			

### Test Method and NAAQM Standard for Ambient Air Quality Monitoring

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182 (Part 10): 1999, RA 2003	4.0
Mercury (Hg)	EPA Method IO-5	--

### TEST REPORT

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
04.04.2022	78	38	10	26	0.7	N.D.
08.04.2022	64	40	08	20	0.2	N.D.
11.04.2022	70	30	18	28	0.6	N.D.
15.04.2022	62	28	06	22	0.8	N.D.
18.04.2022	84	33	14	28	0.4	N.D.
22.04.2022	76	35	06	22	0.6	N.D.
25.04.2022	67	30	10	34	0.9	N.D.
29.04.2022	86	46	14	28	0.4	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

#### Terms & conditions

- The report for publication, advertisement or any legal dispute is forbidden.
- The sample will be returned for 15 days after issue of test report unless otherwise agreed with customer.
- This is for information as the party has asked for above test only.

 02/05/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  02/05/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----





HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

Recognized by Ministry of Environment Forest and Climate Change under EP act 1986

<b>Name &amp; Address Of The Customer</b> <b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA,</b> <b>POST -MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>	REPORT NO	UES/TR/22-23/0988	
	LAB REF NO	UES/22-23/AAQM/01728-01735	
	DATE OF SAMPLING	02/05/2022 to 27/05/2022	
	DATE OF RECEIPT	03/05/2022 to 28/05/2022	
	DATE OF REPORT	01/06/2022	
	DATE OF ANALYSIS	START: 04/05/2022	END: 31/05/2022
<b>SAMPLE DETAILS</b>			
MONITORING FOR	AMBIENT AIR QUALITY MONITORING	CUSTOMER REF. NO. & DATE	N/PO/SRV/2122/0045, DTD. 24-JULY-2021
SAMPLING LOCATION	OFFICE AREA, BANKHETA		
DURATION OF SAMPLING	24 HOURS	SAMPLE COLLECTED BY	LABORATORY CHEMIST
SAMPLING PROCEDURE	AS PER METHOD REFERENCE		
SAMPLE QUANTITY/PACKING	FILTER PAPER (PM <sub>10</sub> ): 1XI NO., FILTER PAPER (PM <sub>2.5</sub> ): 1XI NO. SO <sub>2</sub> : 30MLXI NO. PVC BOTTLE, NO <sub>2</sub> : 30MLXI NO. PVC BOTTLE RUBBER BLADDER: 1XI NO.		

#### Test Method and NAAQM Standard for Ambient Air Quality Monitoring

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182 (Part 10): 1999, RA 2003	4.0
Mercury (Hg)	EPA Method IO-5	--

#### TEST REPORT

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
02.05.2022	70	36	12	24	0.9	N.D.
06.05.2022	68	44	16	28	0.6	N.D.
09.05.2022	76	32	12	22	0.2	N.D.
13.05.2022	67	26	08	26	0.8	N.D.
16.05.2022	82	38	10	28	0.7	N.D.
20.05.2022	78	32	08	22	0.5	N.D.
23.05.2022	66	36	16	38	0.8	N.D.
27.05.2022	82	40	18	26	0.6	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

#### Terms & conditions

- The report for publication, circulation or as legal document is forbidden.
- Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.
- This is for information as the party has asked for above test(s) only.

 01/06/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/06/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----



HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

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<b>Name &amp; Address Of The Customer</b>		<b>REPORT NO</b>	UES/TR/22-23/01968
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/4, COAL MINE, VILLAGE - BANKHETA, POST -MILUPARA, DISTT. - RAIGARH (C.G.) 496107</b>		<b>LAB REF NO</b>	UES/22-23/AAQM/02339-02346
		<b>DATE OF SAMPLING</b>	03/06/2022 to 27/06/2022
		<b>DATE OF RECEIPT</b>	04/06/2022 to 28/06/2022
		<b>DATE OF REPORT</b>	01/07/2022
		<b>DATE OF ANALYSIS</b>	START: 05/06/2022      END: 30/06/2022
<b>SAMPLE DETAILS</b>			
<b>MONITORING FOR</b>	AMBIENT AIR QUALITY MONITORING	<b>CUSTOMER REF. NO. &amp; DATE</b>	N/PO/SRV/2122/0045, DTD. 24-JULY-2021
<b>SAMPLING LOCATION</b>	OFFICE AREA, BANKHETA		
<b>DURATION OF SAMPLING</b>	24 HOURS	<b>SAMPLE COLLECTED BY</b>	LABORATORY CHEMIST
<b>SAMPLING PROCEDURE</b>	AS PER METHOD REFERENCE		
<b>SAMPLE QUANTITY/PACKING</b>	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.		

### Test Method and NAAQM Standard for Ambient Air Quality Monitoring

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182 (Part 10): 1999, RA 2003	4.0
Mercury (Hg)	EPA Method 10-5	--

### TEST REPORT

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
03.06.2022	74	38	16	28	0.6	N.D.
06.06.2022	62	42	12	26	0.2	N.D.
10.06.2022	70	34	18	20	0.4	N.D.
13.06.2022	60	28	10	24	0.9	N.D.
17.06.2022	76	34	16	26	0.6	N.D.
22.06.2022	72	30	08	28	0.2	N.D.
24.06.2022	68	36	14	32	0.4	N.D.
27.06.2022	74	42	12	24	0.7	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

#### Terms & conditions

- The report for publication, circulation or at legal dispute is exclusive.
- Test samples will be returned for 15 days after issue of report unless otherwise mentioned.
- This is for information as the party has asked for these results only.

 <b>REVIEWED BY</b>	 <b>For ULTIMATE ENVIROLYTICAL SOLUTIONS</b>	 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----

AN ISO : 9001:2015 / ISO: 14001:2015 / ISO 45001:2018 CERTIFIED LABORATORY





HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

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Name & Address Of The Customer		REPORT NO	UES/TR/22-23/01803
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA,</b> <b>POST -MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/AAQM/03625-03632
		DATE OF SAMPLING	04/07/2022 to 28/07/2022
		DATE OF RECEIPT	05/07/2022 to 29/07/2022
		DATE OF REPORT	01/08/2022
		DATE OF ANALYSIS	START:06/07/2022      END:01/08/2022
<b>SAMPLE DETAILS</b>			
MONITORING FOR	AMBIENT AIR QUALITY MONITORING	CUSTOMER REF. NO. & DATE	N/PO/BRV/2122/0045, DTD. 24-JULY-2021
SAMPLING LOCATION	OFFICE AREA, BANKHETA		
DURATION OF SAMPLING	24 HOURS	SAMPLE COLLECTED BY	LABORATORY CHEMIST
SAMPLING PROCEDURE	AS PER METHOD REFERENCE		
SAMPLE QUANTITY/PACKING	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.		

#### Test Method and NAAQM Standard for Ambient Air Quality Monitoring

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-1	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-1	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-1	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-1	80
Carbon Monoxide (CO)*	IS 5182(Part 10):1999, RA 2003	4.0
Mercury (Hg)	EPA Method IO-5	--

#### TEST REPORT

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
04.07.2022	60	32	14	22	0.5	N.D.
07.07.2022	68	44	10	24	0.9	N.D.
11.07.2022	62	38	16	26	0.2	N.D.
15.07.2022	69	22	14	28	0.8	N.D.
19.07.2022	72	36	12	22	0.6	N.D.
21.07.2022	70	32	09	26	0.4	N.D.
25.07.2022	66	38	16	30	0.8	N.D.
28.07.2022	72	40	14	28	0.6	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

#### Terms & conditions

- The report for publication, advertisement or as legal figure is not valid.
- Test samples will be retained for 11 days after issue of test report unless otherwise agreed with customer.
- This is for information as the party has asked for above result only.

 01/08/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/08/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----





HDD-272, Phase III - Near JP Chowk  
 Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
 Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

<b>Name &amp; Address Of The Customer</b>		<b>REPORT NO</b>	UES/TR/22-23/02818	
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/4, COAL MINE, VILLAGE - BANKHETA, POST -MILUPARA, DISTT. - RAIGARH (C.G.) 496107</b>		<b>LAB REF. NO</b>	UES/22-23/AAQM/07860-07867	
		<b>DATE OF SAMPLING</b>	01/08/2022 to 29/08/2022	
		<b>DATE OF RECEIPT</b>	02/08/2022 to 30/08/2022	
		<b>DATE OF REPORT</b>	02/09/2022	
		<b>DATE OF ANALYSIS</b>	START: 03/08/2022	END: 02/09/2022
<b>SAMPLE DETAILS</b>				
<b>MONITORING FOR</b>	AMBIENT AIR QUALITY MONITORING	<b>CUSTOMER REF. NO. &amp; DATE</b>	VERBAL COMMUNICATION.	
<b>SAMPLING LOCATION</b>	OFFICE AREA, BANKHETA			
<b>DURATION OF SAMPLING</b>	24 HOURS	<b>SAMPLE COLLECTED BY</b>	LABORATORY CHEMIST	
<b>SAMPLING PROCEDURE</b>	AS PER METHOD REFERENCE			
<b>SAMPLE QUANTITY/PACKING</b>	FILTER PAPER (PM <sub>10</sub> ): IXI NO., FILTER PAPER (PM <sub>2.5</sub> ): IXI NO. SO <sub>2</sub> : 30MLXI NO. PVC BOTTLE, NO <sub>2</sub> : 30MLXI NO. PVC BOTTLE RUBBER BLADDER: IXI NO.			

**Test Method and NAAQM Standard for Ambient Air Quality Monitoring**

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182 (Part 10):1999, RA 2003	4.0
Mercury (Hg)	EPA Method 10-5	--

**TEST REPORT**

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO+ mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
01.08.2022	50	32	14	22	0.2	N.D.
04.08.2022	68	24	10	26	0.5	N.D.
08.08.2022	56	32	12	20	0.9	N.D.
16.08.2022	57	26	08	28	0.2	N.D.
18.08.2022	62	20	12	24	0.4	N.D.
22.08.2022	58	22	06	20	0.8	N.D.
25.08.2022	66	26	14	28	0.2	N.D.
29.08.2022	52	22	12	24	0.5	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

**Terms & conditions**

- The report for publication, advertisement or as legal document is forbidden.
- Test samples will be retained for 15 days after issue of test report unless otherwise specified by customer.
- Refer to the information on the enquiry form asked for above test(s) only.

 02/09/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  02/09/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----



HDD-272, Phase III - Near JP Chowk  
 Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
 Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

<b>Name &amp; Address Of The Customer</b>		<b>REPORT NO</b>	UES/TR/22-23/03278	
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA,</b> <b>POST -MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		<b>LAB REF NO</b>	UES/22-23/AAQM/08484-08491	
		<b>DATE OF SAMPLING</b>	02/09/2022 to 26/09/2022	
		<b>DATE OF RECEIPT</b>	03/09/2022 to 27/09/2022	
		<b>DATE OF REPORT</b>	01/10/2022	
		<b>DATE OF ANALYSIS</b>	START:04/09/2022	END:01/10/2022
		<b>SAMPLE DETAILS</b>		
<b>MONITORING FOR</b>	AMBIENT AIR QUALITY MONITORING	<b>CUSTOMER REF. NO. &amp; DATE</b>	P.O.13552310211,DATE:07.09.2022	
<b>SAMPLING LOCATION</b>	OFFICE AREA, BANKHETA			
<b>DURATION OF SAMPLING</b>	24 HOURS	<b>SAMPLE COLLECTED BY</b>	LABORATORY CHEMIST	
<b>SAMPLING PROCEDURE</b>	AS PER METHOD REFERENCE			
<b>SAMPLE QUANTITY/PACKING</b>	FILTER PAPER (PM <sub>10</sub> ): IXI NO., FILTER PAPER (PM <sub>2.5</sub> ): IXI NO. SO <sub>2</sub> : 30MLXI NO. PVC BOTTLE, NO <sub>2</sub> : 30MLXI NO. PVC BOTTLE RUBBER BLADDER: IXI NO.			

**Test Method and NAAQM Standard for Ambient Air Quality Monitoring**

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-1	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182(Part 10):1999, RA 2003	4.0
Mercury (Hg)	EPA Method TO-5	---

**TEST REPORT**

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
02.09.2022	54	22	12	28	0.5	N.D.
05.09.2022	60	28	14	22	0.2	N.D.
09.09.2022	58	20	18	25	0.8	N.D.
12.09.2022	50	22	09	29	0.6	N.D.
16.09.2022	52	24	14	22	0.2	N.D.
19.09.2022	56	28	08	24	0.4	N.D.
23.09.2022	50	22	12	28	0.8	N.D.
26.09.2022	58	24	16	22	0.6	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

**Terms & conditions**

- The report for publication, circulation or as legal document is forbidden
- This report will be returned for 12 days after issue of test report unless otherwise agreed with customer
- This is for information as the page has asked for please email us

 01/10/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/10/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----



HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph: 0771 - 4027777 | Email : ullimatenviro@gmail.com

Recognized by Ministry of Environment Forest and Climate Change under EP act 1986

<i>Name &amp; Address Of The Customer</i>		REPORT NO	UES/TR/22-23/0354	
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA – IV/4, COAL MINE, VILLAGE – BANKHETA, POST -MILUPARA, DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/AAQM/0417-424	
		DATE OF SAMPLING	04/04/2022 to 29/04/2022	
		DATE OF RECEIPT	05/04/2022 to 30/04/2022	
		DATE OF REPORT	02/05/2022	
		DATE OF ANALYSIS	START:05/04/2022	END:02/05/2022
<b>SAMPLE DETAILS</b>				
MONITORING FOR	AMBIENT AIR QUALITY MONITORING	CUSTOMER REF. NO. & DATE	N/PO/SRV/2122/0045, DTD. 24-JULY-2021	
SAMPLING LOCATION	PIT OFFICE AREA, BANKHETA			
DURATION OF SAMPLING	24 HOURS	SAMPLE COLLECTED BY	LABORATORY CHEMIST	
SAMPLING PROCEDURE	AS PER METHOD REFERENCE			
SAMPLE QUANTITY/PACKING	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.			

### Test Method and NAAQM Standard for Ambient Air Quality Monitoring

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019CPCBGuidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182 (Part 10):1999, RA 2003	4.0
Mercury (Hg)	EPA Method IO-5	--

### TEST REPORT

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
04.04.2022	86	36	14	12	0.8	N.D.
08.04.2022	82	30	12	14	0.5	N.D.
11.04.2022	78	32	16	26	0.6	N.D.
15.04.2022	72	38	18	22	0.2	N.D.
18.04.2022	64	28	08	24	0.8	N.D.
22.04.2022	60	30	10	28	0.2	N.D.
25.04.2022	88	32	14	22	0.4	N.D.
29.04.2022	72	34	18	26	0.6	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

#### Terms & conditions

- This report is for information, not for legal or regulatory purposes.
- That sample will be released for 15 days after issue of final report unless otherwise agreed with customer.
- This is for information on the party (our client) for above listed only.

 02/05/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  02/05/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----

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HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

Recognized by Ministry of Environment Forest and Climate Change under EP act 1986

<i>Name &amp; Address Of The Customer</i>		REPORT NO	UES/TR/22-23/0989	
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA,</b> <b>POST -MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/AAQM/01736-01743	
		DATE OF SAMPLING	02/05/2022 to 27/05/2022	
		DATE OF RECEIPT	03/05/2022 to 28/05/2022	
		DATE OF REPORT	01/06/2022	
		DATE OF ANALYSIS	START: 04/05/2022	END: 31/05/2022
<b>SAMPLE DETAILS</b>				
MONITORING FOR	AMBIENT AIR QUALITY MONITORING	CUSTOMER REF. NO. & DATE	N/PO/SRV/2122/0045, DTD. 24-JULY-2021	
SAMPLING LOCATION	PIT OFFICE AREA, BANKHETA			
DURATION OF SAMPLING	24 HOURS	SAMPLE COLLECTED BY	LABORATORY CHEMIST	
SAMPLING PROCEDURE	AS PER METHOD REFERENCE			
SAMPLE QUANTITY/PACKING	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLXI NO. PVC BOTTLE, NO <sub>2</sub> : 30MLXI NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.			

#### Test Method and NAAQM Standard for Ambient Air Quality Monitoring

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019CPCBGuidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182(Part 10):1999, RA 2003	4.0
Mercury (Hg)	EPA Method IO-5	--

#### TEST REPORT

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
02.05.2022	88	30	12	38	0.9	N.D.
06.05.2022	80	38	10	22	0.5	N.D.
09.05.2022	86	34	18	28	0.8	N.D.
13.05.2022	74	30	12	26	0.3	N.D.
16.05.2022	68	32	06	20	0.7	N.D.
20.05.2022	66	38	12	24	0.9	N.D.
23.05.2022	84	48	18	28	0.5	N.D.
27.05.2022	78	42	16	22	0.4	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

#### Terms & conditions

- The report for publication, distribution or its legal dispute is forbidden.
- Test sample will be retained for 14 days after issue of test report unless otherwise agreed with customer.
- This is for information as the party has asked for above test(s) only.

 01/06/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/06/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----



HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

Recognized by Ministry of Environment Forest and Climate Change under EP act 1986

<b>Name &amp; Address of The Customer</b>		REPORT NO	UES/TR/22-23/01969	
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/4, COAL MINE, VILLAGE - BANKHETA, POST -MILUPARA, DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/AAQM/02347-02354	
		DATE OF SAMPLING	03/06/2022 to 27/06/2022	
		DATE OF RECEIPT	04/06/2022 to 26/06/2022	
		DATE OF REPORT	01/07/2022	
		DATE OF ANALYSIS	START: 05/06/2022	END: 30/06/2022
<b>SAMPLE DETAILS</b>				
MONITORING FOR	AMBIENT AIR QUALITY MONITORING	CUSTOMER REF. NO. & DATE	N/PO/SRV/2122/0045, DTD. 24-JULY-2021	
SAMPLING LOCATION	FIT OFFICE AREA, BANKHETA			
DURATION OF SAMPLING	24 HOURS	SAMPLE COLLECTED BY	LABORATORY CHEMIST	
SAMPLING PROCEDURE	AS PER METHOD REFERENCE			
SAMPLE QUANTITY/PACKING	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.			

### Test Method and NAAQM Standard for Ambient Air Quality Monitoring

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019CPCBGuidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182(Part 10):1999, RA 2003	4.0
Mercury (Hg)	EPA Method IO-5	--

### TEST REPORT

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
03.06.2022	80	28	10	32	0.8	N.D.
06.06.2022	76	30	14	26	0.4	N.D.
10.06.2022	82	36	16	20	0.6	N.D.
13.06.2022	78	32	10	24	0.4	N.D.
17.06.2022	64	38	08	28	0.8	N.D.
22.06.2022	68	36	10	22	0.2	N.D.
24.06.2022	76	44	14	24	0.9	N.D.
27.06.2022	70	40	18	28	0.3	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

#### Terms & conditions

- The report for public domain, advertisement or as legal document is forbidden.
- Test sample will be retained for 15 days after issue of test report unless otherwise instructed.
- This is for information as the party has asked for above (test) only.

 01/07/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/07/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----

AN ISO : 9001:2015 / ISO: 14001:2015 / ISO 45001:2018 CERTIFIED LABORATORY





HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

Recognized by Ministry of Environment Forest and Climate Change under EP act 1986

<b>Name &amp; Address of The Customer</b>		<b>REPORT NO</b>	UES/TR/22-23/01804
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/4, COAL MINE, VILLAGE - BANKHETA, POST -MILUPARA, DISTT. - RAIGARH (C.G.) 496107</b>		<b>LAB REF NO</b>	UES/22-23/AAQM/03633-03640
		<b>DATE OF SAMPLING</b>	04/07/2022 to 28/07/2022
		<b>DATE OF RECEIPT</b>	05/07/2022 to 29/07/2022
		<b>DATE OF REPORT</b>	01/08/2022
		<b>DATE OF ANALYSIS</b>	START:06/07/2022    END:01/08/2022
		<b>SAMPLE DETAILS</b>	
<b>MONITORING FOR</b>	AMBIENT AIR QUALITY MONITORING	<b>CUSTOMER REF. NO. &amp; DATE</b>	N/PO/SRV/2122/0045, DTD. 24-JULY-2021
<b>SAMPLING LOCATION</b>	FIT OFFICE AREA, BANKHETA		
<b>DURATION OF SAMPLING</b>	24 HOURS	<b>SAMPLE COLLECTED BY</b>	LABORATORY CHEMIST
<b>SAMPLING PROCEDURE</b>	AS PER METHOD REFERENCE		
<b>SAMPLE QUANTITY/PACKING</b>	FILTER PAPER (PM <sub>10</sub> ): 1KI NO., FILTER PAPER (PM <sub>2.5</sub> ): 1KI NO. SO <sub>2</sub> : 30MLXI NO. PVC BOTTLE, NO <sub>2</sub> : 30MLXI NO. PVC BOTTLE RUBBER BLADDER: 1KI NO.		

#### Test Method and NAAQM Standard for Ambient Air Quality Monitoring

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-1	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019CPCBGuidelines Vol.-1	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 21): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182(Part 10):1999, RA 2003	4.0
Mercury (Hg)	EPA Method 10-5	--

#### TEST REPORT

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
04.07.2022	60	26	12	30	0.7	N.D.
07.07.2022	66	32	10	28	0.5	N.D.
11.07.2022	72	38	08	22	0.2	N.D.
15.07.2022	68	30	12	26	0.9	N.D.
19.07.2022	58	32	08	22	0.4	N.D.
21.07.2022	62	38	14	24	0.6	N.D.
25.07.2022	74	30	10	28	0.2	N.D.
28.07.2022	68	34	16	22	0.8	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

#### Terms & conditions

- The report for publication, circulation or as legal document is prohibited.
- Test sample will be retained for 15 days after issue of test report unless otherwise specified with Customer.
- This is for information as the party has asked for above test(s) only.

 01/08/22 <b>REVIEWED BY</b>		<b>For ULTIMATE ENVIROLYTICAL SOLUTIONS</b>  01/08/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----

AN ISO : 9001:2015 / ISO: 14001:2015 / ISO 45001:2018 CERTIFIED LABORATORY

<i>Name &amp; Address Of The Customer</i>		REPORT NO	UES/TR/22-23/02819	
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA,</b> <b>POST -MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/AAQM/07868-07875	
		DATE OF SAMPLING	01/08/2022 to 29/08/2022	
		DATE OF RECEIPT	02/08/2022 to 30/08/2022	
		DATE OF REPORT	02/09/2022	
		DATE OF ANALYSIS	START: 03/08/2022	END: 02/09/2022
<b>SAMPLE DETAILS</b>				
MONITORING FOR	AMBIENT AIR QUALITY MONITORING	CUSTOMER REF. NO. & DATE	VERBAL COMMUNICATION.	
SAMPLING LOCATION	PIT OFFICE AREA, BANKHETA			
DURATION OF SAMPLING	24 HOURS	SAMPLE COLLECTED BY	LABORATORY CHEMIST	
SAMPLING PROCEDURE	AS PER METHOD REFERENCE			
SAMPLE QUANTITY/PACKING	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.			

Test Method and NAAQM Standard for Ambient Air Quality Monitoring		
Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019CPCBGuidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182 Part 10):1999, RA 2003	4.0
Mercury (Hg)	EPA Method 10-5	--

TEST REPORT						
Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
01.08.2022	68	28	10	30	0.8	N.D.
04.08.2022	60	32	14	26	0.2	N.D.
08.08.2022	66	30	12	22	0.5	N.D.
16.08.2022	64	24	18	24	0.8	N.D.
18.08.2022	58	24	08	28	0.4	N.D.
22.08.2022	56	20	10	22	0.2	N.D.
25.08.2022	64	28	14	24	0.6	N.D.
29.08.2022	58	24	12	28	0.2	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

**Terms & conditions**

- The report for publication, circulation or as legal document is forbidden.
- Test samples will be retained for 15 days after issue of test report unless otherwise agreed with customer.
- This is for information as the party has asked for above listed only.

 02/09/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  02/09/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----



HDD-272, Phase III - Near JP Chowk  
 Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
 Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

<i>Name &amp; Address Of The Customer</i>		REPORT NO	UES/TR/22-23/03279
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA,</b> <b>POST -MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/AAQM/08492-08499
		DATE OF SAMPLING	02/09/2022 to 26/09/2022
		DATE OF RECEIPT	03/09/2022 to 27/09/2022
		DATE OF REPORT	01/10/2022
		DATE OF ANALYSIS	START:04/09/2022    END:01/10/2022
<b>SAMPLE DETAILS</b>			
MONITORING FOR	AMBIENT AIR QUALITY MONITORING	CUSTOMER REF. NO. & DATE	P.O.13552310211, DATED: 07.09.2022
SAMPLING LOCATION	PIT OFFICE AREA, BANKHETA		
DURATION OF SAMPLING	24 HOURS	SAMPLE COLLECTED BY	LABORATORY CHEMIST
SAMPLING PROCEDURE	AS PER METHOD REFERENCE		
SAMPLE QUANTITY/PACKING	FILTER PAPER (PM <sub>10</sub> ): LXI NO., FILTER PAPER (PM <sub>2.5</sub> ): LXI NO. SO <sub>2</sub> : 30MLXI NO. PVC BOTTLE, NO <sub>2</sub> : 30MLXI NO. PVC BOTTLE RUBBER BLADDER: LXI NO.		

**Test Method and NAAQM Standard for Ambient Air Quality Monitoring**

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-1	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019CPCBGuidelines Vol.-1	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-1	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-1	80
Carbon Monoxide (CO)*	IS 5182 (Part 10):1999, RA 2003	4.0
Mercury (Hg)	EPA Method 10-5	--

**TEST REPORT**

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
02.09.2022	58	22	14	22	0.7	N.D.
05.09.2022	50	30	12	24	0.9	N.D.
09.09.2022	56	22	18	28	0.2	N.D.
12.09.2022	54	28	16	22	0.8	N.D.
16.09.2022	68	22	06	26	0.4	N.D.
19.09.2022	66	24	12	20	0.6	N.D.
23.09.2022	54	22	10	28	0.2	N.D.
26.09.2022	62	28	18	22	0.8	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

*Terms & conditions*

- The report for publication, circulation or in legal dispute is forbidden.
- Test samples will be retained for 15 days after issue of this report unless otherwise agreed with customer.
- This is for information as the party has asked for above mentioned.

 01/10/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/10/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----





HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

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<i>Name &amp; Address Of The Customer</i>		REPORT NO	UES/TR/22-23/0366	
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/5, MILUPARA U/G COAL MINE, VILLAGE - MILUPARA, BLOCK-TAMNAR, DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/AAQM/0446-0453	
		DATE OF SAMPLING	04/04/2022 to 29/04/2022	
		DATE OF RECEIPT	05/04/2022 to 30/04/2022	
		DATE OF REPORT	02/05/2022	
		DATE OF ANALYSIS	START:05/04/2022	END:02/05/2022
<b>SAMPLE DETAILS</b>				
MONITORING FOR	AMBIENT AIR QUALITY MONITORING	CUSTOMER REF. NO. & DATE	M/PO/SRV/2122/0049, DTD- 24-JULY-2021	
SAMPLING LOCATION	MAIN OFFICE AREA, MILUPARA			
DURATION OF SAMPLING	24 HOURS	SAMPLE COLLECTED BY	LABORATORY CHEMIST	
SAMPLING PROCEDURE	AS PER METHOD REFERENCE			
SAMPLE QUANTITY/PACKING	FILTER PAPER (PM10): 1X1 NO., FILTER PAPER (PM2.5): 1X1 NO. SO2: 30MLX1 NO. PVC BOTTLE, NO2: 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.			

#### Test Method and NAAQM Standard for Ambient Air Quality Monitoring

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182 (Part 10): 1999, RA 2003	4.0
Mercury (Hg)	EPA Method IO-5	--

#### TEST REPORT

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
04.04.2022	76	34	10	29	0.7	N.D.
08.04.2022	68	28	14	24	0.6	N.D.
11.04.2022	82	42	09	28	0.2	N.D.
15.04.2022	64	38	12	20	0.8	N.D.
18.04.2022	78	32	10	24	0.5	N.D.
22.04.2022	62	34	16	20	0.2	N.D.
25.04.2022	78	42	08	28	0.4	N.D.
29.04.2022	84	38	12	22	0.7	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

#### Terms & conditions

- The report for publication, circulation or as legal evidence is restricted.
- Our reports will be released for 15 days after issue of test report unless otherwise agreed with customer.
- This is for information as the only data used for above test(s) only.

 02/05/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  02/05/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----

AN ISO : 9001:2015 / ISO: 14001:2015 / ISO 45001:2018 CERTIFIED LABORATORY



HDD-272, Phase III - Near JP Chowk  
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Name & Address Of The Customer		REPORT NO	UES/TR/22-23/01105	
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED, GARE</b> <b>PALMA - IV/5, MILUPARA U/G COAL</b> <b>MINE, VILLAGE - MILUPARA,</b> <b>BLOCK-TAMNAR,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/AAQM/01082-01089	
		DATE OF SAMPLING	02/05/2022 to 27/05/2022	
		DATE OF RECEIPT	03/05/2022 to 28/05/2022	
		DATE OF REPORT	01/06/2022	
		DATE OF ANALYSIS	START: 04/05/2022	END: 31/05/2022
<b>SAMPLE DETAILS</b>				
MONITORING FOR	AMBIENT AIR QUALITY MONITORING	CUSTOMER REF. NO. & DATE	M/PO/SRV/2122/0049, DTD. 24-JULY-2021	
SAMPLING LOCATION	MAIN OFFICE AREA, MILUPARA			
DURATION OF SAMPLING	24 HOURS	SAMPLE COLLECTED BY	LABORATORY CHEMIST	
SAMPLING PROCEDURE	AS PER METHOD REFERENCE			
SAMPLE QUANTITY/PACKING	FILTER PAPER (PM10): 1X1 NO., FILTER PAPER (PM2.5): 1X1 NO. SO2: 30MLX1 NO. PVC BOTTLE, NO2: 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.			

**Test Method and NAAQM Standard for Ambient Air Quality Monitoring**

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182 (Part 10): 1999, RA 2003	4.0
Mercury (Hg)	EPA Method IO-5	--

**TEST REPORT**

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO <sup>+</sup> mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
02.05.2022	80	30	14	34	0.8	N.D.
06.05.2022	78	38	12	30	0.6	N.D.
09.05.2022	68	42	09	24	0.2	N.D.
13.05.2022	62	38	12	28	0.8	N.D.
16.05.2022	76	30	08	22	0.6	N.D.
20.05.2022	70	36	06	26	0.2	N.D.
23.05.2022	78	42	12	38	0.8	N.D.
27.05.2022	82	44	18	32	0.4	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

- Terms & conditions**
- The report for publication, circulation or as legal document is forbidden.
  - Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.
  - This is for information as the party has asked for electronic report only.

 01/06/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/06/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----





HDD-272, Phase III - Near JP Chowk  
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 Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

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<b>Name &amp; Address Of The Customer</b>		REPORT NO	UES/TR/22-23/01087
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/5, MILUPARA U/G COAL MINE, VILLAGE - MILUPARA, BLOCK-TAMNAR, DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/AAQM/02382-02389
		DATE OF SAMPLING	03/06/2022 to 27/06/2022
		DATE OF RECEIPT	04/06/2022 to 28/06/2022
		DATE OF REPORT	01/07/2022
		DATE OF ANALYSIS	START: 05/06/2022      END: 30/06/2022
		<b>SAMPLE DETAILS</b>	
MONITORING FOR	AMBIENT AIR QUALITY MONITORING	CUSTOMER REF. NO. & DATE	M/PO/SRV/2122/0049, DTD. 24-JULY-2021
SAMPLING LOCATION	MAIN OFFICE AREA, MILUPARA		
DURATION OF SAMPLING	24 HOURS	SAMPLE COLLECTED BY	LABORATORY CHEMIST
SAMPLING PROCEDURE	AS PER METHOD REFERENCE		
SAMPLE QUANTITY/PACKING	FILTER PAPER (PM10): 1X1 NO., FILTER PAPER (PM2.5): 1X1 NO. SO2: 30MLX1 NO. PVC BOTTLE, NO2: 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.		

**Test Method and NAAQM Standard for Ambient Air Quality Monitoring**

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-1	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182(Part 10):1999, RA 2003	4.0
Mercury (Hg)	EPA Method 10-5	--

**TEST REPORT**

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
03.06.2022	80	34	10	34	0.6	N.D.
06.06.2022	86	36	16	30	0.2	N.D.
10.06.2022	72	40	10	28	0.8	N.D.
13.06.2022	76	34	12	20	0.4	N.D.
17.06.2022	68	38	08	24	0.6	N.D.
20.06.2022	72	32	06	26	0.9	N.D.
24.06.2022	78	48	12	32	0.2	N.D.
27.06.2022	86	42	18	28	0.8	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

**Terms & conditions**

- The report for publication, arbitration or as legal dispute is forbidden
- Test sample will be retained for 15 days after issue of test report unless otherwise instructed by customer
- This is the information as the party has asked for above tests only

 REVIEWED BY		For ULTIMATE ENVIROLYTICAL-SOLUTIONS  AUTHORIZED SIGNATORY
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-----End of the test report-----



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Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

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<b>Name &amp; Address Of The Customer</b>		<b>REPORT NO</b>	UES/TR/22-23/01815
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED, GARE</b> <b>PALMA - IV/5, MILUPARA U/G COAL</b> <b>MINE, VILLAGE - MILUPARA,</b> <b>BLOCK-TAMNAR,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		<b>LAB REF NO</b>	UES/22-23/AAQM/03662-03669
		<b>DATE OF SAMPLING</b>	04/07/2022 to 28/07/2022
		<b>DATE OF RECEIPT</b>	05/07/2022 to 29/07/2022
		<b>DATE OF REPORT</b>	01/08/2022
		<b>DATE OF ANALYSIS</b>	START:06/07/2022      END: 01/08/2022
<b>SAMPLE DETAILS</b>			
<b>MONITORING FOR</b>	AMBIENT AIR QUALITY MONITORING	<b>CUSTOMER REF. NO. &amp; DATE</b>	M/PO/SRV/2122/0045, DTD. 24-JULY-2021
<b>SAMPLING LOCATION</b>	MAIN OFFICE AREA, MILUPARA		
<b>DURATION OF SAMPLING</b>	24 HOURS	<b>SAMPLE COLLECTED BY</b>	LABORATORY CHEMIST
<b>SAMPLING PROCEDURE</b>	AS PER METHOD REFERENCE		
<b>SAMPLE QUANTITY/PACKING</b>	FILTER PAPER (PM10): 1X1 NO., FILTER PAPER (PM2.5): 1X1 NO. SO2: 30MLX1 NO. PVC BOTTLE, NO2: 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.		

#### Test Method and NAAQM Standard for Ambient Air Quality Monitoring

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182 (Part 10) 1999, RA 2003	4.0
Mercury (Hg)	EPA Method 10-5	--

#### TEST REPORT

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
04.07.2022	72	38	12	32	0.2	N.D.
07.07.2022	76	32	14	28	0.6	N.D.
11.07.2022	68	34	10	34	0.4	N.D.
15.07.2022	62	30	12	26	0.8	N.D.
19.07.2022	74	28	09	25	0.2	N.D.
21.07.2022	58	30	08	22	0.8	N.D.
25.07.2022	62	36	10	30	0.6	N.D.
28.07.2022	75	30	11	26	0.7	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

#### Terms & conditions

- The report for publication, arbitration or as legal dispute is not valid.
- Your sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.
- This is for information as the party has asked for above test's only.

 01/08/22 <b>REVIEWED BY</b>		<b>For ULTIMATE ENVIROLYTICAL SOLUTIONS</b>  01/08/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----

AN ISO : 9001:2015 / ISO: 14001:2015 / ISO 45001:2018 CERTIFIED LABORATORY





HDD-272, Phase III - Near JP Chowk  
 Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
 Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

Name & Address Of The Customer:		REPORT NO	UES/TR/22-23/02849	
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED, GARE</b> <b>PALMA - IV/5, MILUPARA U/G COAL</b> <b>MINE,VILLAGE - MILUPARA,</b> <b>BLOCK-TAMNAR,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/AAQM/07933-07940	
		DATE OF SAMPLING	01/08/2022 TO 29/08/2022	
		DATE OF RECEIPT	02/08/2022 TO 30/08/2022	
		DATE OF REPORT	02/09/2022	
		DATE OF ANALYSIS	START: 03/08/2022	END: 02/09/2022
<b>SAMPLE DETAILS</b>				
MONITORING FOR:	AMBIENT AIR QUALITY MONITORING	CUSTOMER REF. NO. & DATE	VERBAL COMMUNICATION.	
SAMPLING LOCATION	MAIN OFFICE AREA, MILUPARA			
DURATION OF SAMPLING	24 HOURS	SAMPLE COLLECTED BY	LABORATORY CHEMIST	
SAMPLING PROCEDURE	AS PER METHOD REFERENCE			
SAMPLE QUANTITY/PACKING	FILTER PAPER (PM10): 1X1 NO., FILTER PAPER (PM2.5): 1X1 NO. SO2: 30MLX1 NO. PVC BOTTLE, NO2: 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.			

**Test Method and NAAQM Standard for Ambient Air Quality Monitoring**

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182(Part 10):1999, RA 2003	4.0
Mercury (Hg)	EPA Method 10-5	--

**TEST REPORT**

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
01.08.2022	50	20	10	20	0.5	N.D.
04.08.2022	68	28	16	24	0.8	N.D.
08.08.2022	58	32	08	26	0.4	N.D.
16.08.2022	52	28	10	22	0.6	N.D.
18.08.2022	66	20	09	26	0.2	N.D.
22.08.2022	60	26	05	28	0.8	N.D.
25.08.2022	68	32	10	32	0.4	N.D.
29.08.2022	52	34	16	30	0.6	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

**Terms & conditions**

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- Test sample will be retained for 10 days after issue of test report unless otherwise agreed with customer.
- This is for information as the party has asked for above tests only.

 02/09/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  02/09/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----



HDD-272, Phase III - Near JP Chowk  
 Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
 Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

<b>Name &amp; Address Of The Customer</b>		<b>REPORT NO</b>	UES/TR/22-23/03293
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/5, MILUPARA U/G COAL MINE, VILLAGE - MILUPARA, BLOCK-TAMNAR, DISTT. - RAIGARH (C.G.) 496107</b>		<b>LAB REF NO</b>	UES/22-23/AAQM/08540-08547
		<b>DATE OF SAMPLING</b>	02/09/2022 to 26/09/2022
		<b>DATE OF RECEIPT</b>	03/09/2022 to 27/09/2022
		<b>DATE OF REPORT</b>	01/10/2022
		<b>DATE OF ANALYSIS</b>	START: 04/09/2022      END: 01/10/2022
<b>SAMPLE DETAILS</b>			
<b>MONITORING FOR</b>	AMBIENT AIR QUALITY MONITORING	<b>CUSTOMER REF. NO. &amp; DATE</b>	P.O.13552310212, DATED: 07.09.2022
<b>SAMPLING LOCATION</b>	MAIN OFFICE AREA, MILUPARA		
<b>DURATION OF SAMPLING</b>	24 HOURS	<b>SAMPLE COLLECTED BY</b>	LABORATORY CHEMIST
<b>SAMPLING PROCEDURE</b>	AS PER METHOD REFERENCE		
<b>SAMPLE QUANTITY/PACKING</b>	FILTER PAPER (PM10): 1X1 NO., FILTER PAPER (PM2.5): 1X1 NO. SO2: 30MLX1 NO. PVC BOTTLE, NO2: 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.		

<b>Test Method and NAAQM Standard for Ambient Air Quality Monitoring</b>		
Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182 (Part 10): 1999, RA 2003	4.0
Mercury (Hg)	EPA Method 10-5	--

<b>TEST REPORT</b>						
Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
02.09.2022	42	28	08	26	0.6	N.D.
05.09.2022	46	22	12	22	0.2	N.D.
09.09.2022	52	36	06	28	0.8	N.D.
12.09.2022	44	24	14	24	0.4	N.D.
16.09.2022	48	28	12	22	0.6	N.D.
19.09.2022	52	22	08	20	0.2	N.D.
23.09.2022	46	28	18	26	0.8	N.D.
26.09.2022	58	26	10	24	0.5	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

**Terms & conditions**  
 - The report for publication, arbitration or as legal document is not valid.  
 - Test sample will be returned for 15 days after issue of test report.  
 - This is for information as the party has asked for above mentioned.

 01/10/2022 <b>REVIEWED BY</b>		 01/10/22 <b>AUTHORIZED SIGNATORY</b> For ULTIMATE ENVIROLYTICAL SOLUTIONS
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-----End of the test report-----



HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

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<i>Name &amp; Address Of The Customer</i>		REPORT NO	UES/TR/22-23/0367	
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/5, MILUPARA U/G COAL MINE,VILLAGE - MILUPARA, BLOCK-TAMNAR, DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/AAQM/0454-0461	
		DATE OF SAMPLING	04/04/2022 to 29/04/2022	
		DATE OF RECEIPT	05/04/2022 to 30/04/2022	
		DATE OF REPORT	02/05/2022	
		DATE OF ANALYSIS	START: 05/04/2022	END: 02/05/2022
<b>SAMPLE DETAILS</b>				
MONITORING FOR	AMBIENT AIR QUALITY MONITORING	CUSTOMER REF. NO. & DATE	M/PO/SRV/2122/0049, DTD. 24-JULY-2021	
SAMPLING LOCATION	STAFF QUARTER, MILUPARA			
DURATION OF SAMPLING	24 HOURS	SAMPLE COLLECTED BY	LABORATORY CHEMIST	
SAMPLING PROCEDURE	AS PER METHOD REFERENCE			
SAMPLE QUANTITY/PACKING	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.			

#### Test Method and NAAQM Standard for Ambient Air Quality Monitoring

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182 (Part 10): 1999, RA 2003	4.0
Mercury (Hg)	EPA Method IO-5	--

#### TEST REPORT

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
04.04.2022	72	38	14	22	0.5	N.D.
08.04.2022	88	32	10	29	0.2	N.D.
11.04.2022	72	24	08	22	0.8	N.D.
15.04.2022	66	28	14	24	0.6	N.D.
18.04.2022	88	30	10	28	0.2	N.D.
22.04.2022	80	32	16	22	0.8	N.D.
25.04.2022	78	34	14	26	0.5	N.D.
29.04.2022	82	46	12	28	0.9	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

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- > This is for information as the party has asked for above test(s) only.

 02/05/22 REVIEWED BY		 02/05/22 For ULTIMATE ENVIROLYTICAL SOLUTIONS AUTHORIZED SIGNATORY
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-----End of the test report.-----





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<i>Name &amp; Address Of The Customer</i>		REPORT NO	UES/TR/22-23/01106	
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/5, MILUPARA U/G COAL MINE, VILLAGE - MILUPARA, BLOCK-TAMNAR, DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/AAQM/01090-01097	
		DATE OF SAMPLING	02/05/2022 to 27/05/2022	
		DATE OF RECEIPT	03/05/2022 to 28/05/2022	
		DATE OF REPORT	01/06/2022	
		DATE OF ANALYSIS	START: 04/05/2022	END: 31/05/2022
<b>SAMPLE DETAILS</b>				
MONITORING FOR	AMBIENT AIR QUALITY MONITORING	CUSTOMER REF. NO. & DATE	M/PO/SRV/2122/0049, DTD. 24-JULY-2021	
SAMPLING LOCATION	STAFF QUARTER, MILUPARA			
DURATION OF SAMPLING	24 HOURS	SAMPLE COLLECTED BY	LABORATORY CHEMIST	
SAMPLING PROCEDURE	AS PER METHOD REFERENCE			
SAMPLE QUANTITY/PACKING	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.			

#### Test Method and NAAQM Standard for Ambient Air Quality Monitoring

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182 (Part 10): 1999, RA 2003	4.0
Mercury (Hg)	EPA Method IO-5	--

#### TEST REPORT

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO <sup>+</sup> mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
02.05.2022	76	30	08	20	0.5	N.D.
06.05.2022	72	36	12	28	0.9	N.D.
09.05.2022	66	32	08	24	0.6	N.D.
13.05.2022	70	28	10	20	0.5	N.D.
16.05.2022	88	30	16	24	0.2	N.D.
20.05.2022	82	42	10	28	0.8	N.D.
23.05.2022	78	32	14	22	0.4	N.D.
27.05.2022	84	44	10	28	0.6	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

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 01/06/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/06/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----



HDD-272, Phase III - Near JP Chowk  
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<b>Name &amp; Address Of The Customer</b>		<b>REPORT NO</b>	UES/TR/22-23/01088
<b>TO,</b>		<b>LAB REF NO</b>	UES/22-23/AAQM/02390-02397
<b>HINDALCO INDUSTRIES LIMITED, GARE</b>		<b>DATE OF SAMPLING</b>	03/06/2022 to 27/06/2022
<b>PALMA - IV/5, MILUPARA U/G COAL</b>		<b>DATE OF RECEIPT</b>	04/06/2022 to 28/06/2022
<b>MINE, VILLAGE - MILUPARA,</b>		<b>DATE OF REPORT</b>	01/07/2022
<b>BLOCK-TAMNAR,</b>		<b>DATE OF ANALYSIS</b>	START: 05/06/2022    END: 30/06/2022
<b>DISTT. - RAIGARH (C.G.) 496107</b>			
SAMPLE DETAILS			
<b>MONITORING FOR</b>	AMBIENT AIR QUALITY MONITORING	<b>CUSTOMER REF. NO. &amp; DATE</b>	M/PG/SRV/2122/0049, DTD. 24-JULY-2021
<b>SAMPLING LOCATION</b>	STAFF QUARTER, MILUPARA		
<b>DURATION OF SAMPLING</b>	24 HOURS	<b>SAMPLE COLLECTED BY</b>	LABORATORY CHEMIST
<b>SAMPLING PROCEDURE</b>	AS PER METHOD REFERENCE		
<b>SAMPLE QUANTITY/PACKING</b>	FILTER PAPER (PM <sub>10</sub> ): 1XI NO., FILTER PAPER (PM <sub>2.5</sub> ): 1XI NO. SO <sub>2</sub> : 30MLXI NO. PVC BOTTLE, NO <sub>2</sub> : 30MLXI NO. PVC BOTTLE RUBBER BLADDER: 1XI NO.		

#### Test Method and NAAQM Standard for Ambient Air Quality Monitoring

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 21): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182 (Part 10): 1999, RA 2003	4.0
Mercury (Hg)	EPA Method IO-5	--

#### TEST REPORT

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
03.06.2022	72	36	14	22	0.2	N.D.
06.06.2022	66	32	12	26	0.8	N.D.
10.06.2022	62	38	08	20	0.6	N.D.
13.06.2022	70	22	16	28	0.2	N.D.
17.06.2022	84	36	12	22	0.8	N.D.
20.06.2022	80	48	18	24	0.4	N.D.
24.06.2022	76	32	14	28	0.2	N.D.
27.06.2022	70	44	16	22	0.9	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

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- This is for information as the party has asked for above.

 01/07/22 <b>REVIEWED BY</b>	 <b>For ULTIMATE ENVIROLYTICAL SOLUTIONS</b>	 01/07/22 <b>AUTHORIZED SIGNATORY</b>
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End of the test report.....





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Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

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Name & Address Of The Customer		REPORT NO	UES/TR/22-23/01816
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED, GARE</b> <b>PALMA - IV/5, MILUPARA U/G COAL</b> <b>MINE, VILLAGE - MILUPARA,</b> <b>BLOCK-TAMNAR,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/AAQM/03670-03678
		DATE OF SAMPLING	04/07/2022 to 28/07/2022
		DATE OF RECEIPT	05/07/2022 to 29/07/2022
		DATE OF REPORT	01/08/2022
		DATE OF ANALYSIS	START:06/07/2022    END:01/08/2022
<b>SAMPLE DETAILS</b>			
MONITORING FOR	AMBIENT AIR QUALITY MONITORING	CUSTOMER REF. NO. & DATE	M/PO/SRV/2122/0049, DTD. 24-JULY-2021
SAMPLING LOCATION	STAFF QUARTER, MILUPARA		
DURATION OF SAMPLING	24 HOURS	SAMPLE COLLECTED BY	LABORATORY CHEMIST
SAMPLING PROCEDURE	AS PER METHOD REFERENCE		
SAMPLE QUANTITY/PACKING	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.		

#### Test Method and NAAQM Standard for Ambient Air Quality Monitoring

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 7): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182 (Part 10): 1999, RA 2003	4.0
Mercury (Hg)	EPA Method IO-5	--

#### TEST REPORT

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
04.07.2022	68	35	12	29	0.7	N.D.
07.07.2022	60	39	10	28	0.5	N.D.
11.07.2022	70	30	09	22	0.9	N.D.
15.07.2022	62	28	12	26	0.2	N.D.
19.07.2022	68	32	14	28	0.8	N.D.
21.07.2022	76	36	18	20	0.4	N.D.
25.07.2022	70	32	12	24	0.7	N.D.
28.07.2022	78	38	10	28	0.6	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

##### Terms & conditions

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- > This is for information as the party has asked for above test only.

 01/08/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/08/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----



HDD-272, Phase III - Near JP Chowk  
 Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
 Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

Name & Address Of The Customer		REPORT NO	UES/TR/22-23/02850	
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED, GARE</b> <b>PALMA - IV/5, MILUPARA U/G COAL</b> <b>MINE,VILLAGE - MILUPARA,</b> <b>BLOCK-TAMNAR,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/AAQM/07941-07948	
		DATE OF SAMPLING	01/08/2022 TO 29/08/2022	
		DATE OF RECEIPT	02/08/2022 TO 30/08/2022	
		DATE OF REPORT	02/09/2022	
		DATE OF ANALYSIS	START: 03/08/2022	END: 02/09/2022
<b>SAMPLE DETAILS</b>				
MONITORING FOR	AMBIENT AIR QUALITY MONITORING	CUSTOMER REF. NO. & DATE	VERBAL COMMUNICATION.	
SAMPLING LOCATION	STAFF QUARTER, MILUPARA			
DURATION OF SAMPLING	24 HOURS	SAMPLE COLLECTED BY	LABORATORY CHEMIST	
SAMPLING PROCEDURE	AS PER METHOD REFERENCE			
SAMPLE QUANTITY/PACKING	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.			

**Test Method and NAAQM Standard for Ambient Air Quality Monitoring**

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182 (Part 10): 1999, RA 2003	4.0
Mercury (Hg)	EPA Method 10-5	--

**TEST REPORT**

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
01.08.2022	66	20	10	28	0.6	N.D.
04.08.2022	62	26	14	25	0.2	N.D.
08.08.2022	56	22	09	20	0.8	N.D.
16.08.2022	60	28	12	24	0.4	N.D.
18.08.2022	68	20	14	26	0.6	N.D.
22.08.2022	52	32	08	22	0.2	N.D.
25.08.2022	68	22	16	28	0.8	N.D.
29.08.2022	54	34	12	21	0.4	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

**Terms & conditions**

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- Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.
- This is for information as the party has asked for above test(s) only.

 02/09/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  02/09/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----



HDD-272, Phase III - Near JP Chowk  
 Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
 Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

<b>Name &amp; Address Of The Customer</b>		<b>REPORT NO</b>	UES/TR/22-23/03294
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/5, MILUPARA U/G COAL MINE,VILLAGE - MILUPARA, BLOCK-TAMNAR, DISTT. - RAIGARH (C.G.) 496107</b>		<b>LAB REF NO</b>	UES/22-23/AAQM/08548-08555
		<b>DATE OF SAMPLING</b>	02/09/2022 to 26/09/2022
		<b>DATE OF RECEIPT</b>	03/09/2022 to 27/09/2022
		<b>DATE OF REPORT</b>	01/10/2022
		<b>DATE OF ANALYSIS</b>	START:04/09/2022    END:01/10/2022
<b>SAMPLE DETAILS</b>			
<b>MONITORING FOR</b>	AMBIENT AIR QUALITY MONITORING	<b>CUSTOMER REF. NO. &amp; DATE</b>	P.O.13552310212, DATED:07.09.2022
<b>SAMPLING LOCATION</b>	STAFF QUARTER, MILUPARA		
<b>DURATION OF SAMPLING</b>	24 HOURS	<b>SAMPLE COLLECTED BY</b>	LABORATORY CHEMIST
<b>SAMPLING PROCEDURE</b>	AS PER METHOD REFERENCE		
<b>SAMPLE QUANTITY/PACKING</b>	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.		

**Test Method and NAAQM Standard for Ambient Air Quality Monitoring**

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	50
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182 (Part 10):1999, RA 2003	4.0
Mercury (Hg)	EPA Method 10-5	--

**TEST REPORT**

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
02.09.2022	44	24	16	22	0.8	N.D.
05.09.2022	58	22	10	28	0.6	N.D.
09.09.2022	42	28	06	22	0.2	N.D.
12.09.2022	46	24	18	20	0.8	N.D.
16.09.2022	52	26	12	22	0.4	N.D.
19.09.2022	48	24	09	28	0.2	N.D.
23.09.2022	46	26	18	22	0.6	N.D.
26.09.2022	42	22	10	24	0.8	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

**Terms & conditions**

- > The report for publication, utilization or as legal document is restricted
- > Test sample will be returned for 15 days after issue of test report unless otherwise agreed with customer
- > This is for information as the party has asked for above tests only

 01/10/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/10/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----





HDD-272, Phase III - Near JP Chowk  
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<b>Name &amp; Address Of The Customer</b>		<b>REPORT NO</b>	UES/TR/22-23/0368	
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/5, MILUPARA U/G COAL MINE,VILLAGE - MILUPARA, BLOCK-TAMNAR, DISTT. - RAIGARH (C.G.) 496107</b>		<b>LAB REF NO</b>	UES/22-23/AAQM/0462-0469	
		<b>DATE OF SAMPLING</b>	04/04/2022 to 29/04/2022	
		<b>DATE OF RECEIPT</b>	05/04/2022 to 30/04/2022	
		<b>DATE OF REPORT</b>	02/05/2022	
		<b>DATE OF ANALYSIS</b>	START: 05/04/2022	END: 02/05/2022
<b>SAMPLE DETAILS</b>				
<b>MONITORING FOR</b>	AMBIENT AIR QUALITY MONITORING	<b>CUSTOMER REF. NO. &amp; DATE</b>	M/PO/SRV/2122/0049, DTD. 24-JULY-2021	
<b>SAMPLING LOCATION</b>	HIL COLONY, KONDREL	<b>SAMPLE COLLECTED BY</b>	LABORATORY CHEMIST	
<b>DURATION OF SAMPLING</b>	24 HOURS	<b>SAMPLING PROCEDURE</b>	AS PER METHOD REFERENCE	
<b>SAMPLE QUANTITY/PACKING</b>	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.			

### Test Method and NAAQM Standard for Ambient Air Quality Monitoring

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182 (Part 10): 1999, RA 2003	4.0
Mercury (Hg)	EPA Method IO-5	--

### TEST REPORT

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
04.04.2022	80	26	18	28	0.8	N.D.
08.04.2022	76	32	12	24	0.2	N.D.
11.04.2022	58	28	16	34	0.6	N.D.
15.04.2022	64	24	10	26	0.4	N.D.
18.04.2022	78	28	12	22	0.8	N.D.
22.04.2022	70	32	18	28	0.2	N.D.
25.04.2022	76	28	10	24	0.5	N.D.
29.04.2022	80	26	12	22	0.7	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

#### Terms & conditions

- The report for publication, circulation or any legal dispute is forbidden.
- Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.
- This is for information as the party has asked for above listed tests.

 02/05/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  02/05/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----



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<b>Name &amp; Address Of The Customer</b>		<b>REPORT NO</b>	UES/TR/22-23/01107	
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/5, MILUPARA U/G COAL MINE, VILLAGE - MILUPARA, BLOCK-TAMNAR, DISTT. - RAIGARH (C.G.) 496107</b>		<b>LAB REF NO</b>	UES/22-23/AAQM/01098-01105	
		<b>DATE OF SAMPLING</b>	02/05/2022 to 27/05/2022	
		<b>DATE OF RECEIPT</b>	03/05/2022 to 28/05/2022	
		<b>DATE OF REPORT</b>	01/06/2022	
		<b>DATE OF ANALYSIS</b>	START: 04/05/2022	END: 31/05/2022
<b>SAMPLE DETAILS</b>				
<b>MONITORING FOR</b>	AMBIENT AIR QUALITY MONITORING	<b>CUSTOMER REF. NO. &amp; DATE</b>	M/PO/SRV/2122/0049, DTD. 24-JULY-2021	
<b>SAMPLING LOCATION</b>	HIL COLONY, JONDHEL	<b>SAMPLE COLLECTED BY</b>	LABORATORY CHEMIST	
<b>DURATION OF SAMPLING</b>	24 HOURS	<b>SAMPLING PROCEDURE</b>	AS PER METHOD REFERENCE	
<b>SAMPLE QUANTITY/PACKING</b>	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.			

#### Test Method and NAAQM Standard for Ambient Air Quality Monitoring

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182 (Part 10): 1999, RA 2003	4.0
Mercury (Hg)	EPA Method IO-5	--

#### TEST REPORT

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
02.05.2022	88	40	10	28	0.9	N.D.
06.05.2022	78	38	08	22	0.5	N.D.
09.05.2022	66	30	14	38	0.2	N.D.
13.05.2022	60	28	10	22	0.7	N.D.
16.05.2022	78	34	16	36	0.6	N.D.
20.05.2022	72	42	10	24	0.2	N.D.
23.05.2022	68	32	14	20	0.8	N.D.
27.05.2022	76	30	08	28	0.4	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

#### Terms & conditions

1. This report for publication, circulation or as legal document is forbidden.
2. Test samples will be retained for 15 days after issue of test report unless otherwise agreed with customer.
3. This is for information as the party has signed for above finding only.

 01/06/22 <b>REVIEWED BY</b>		<b>For ULTIMATE ENVIROLYTICAL SOLUTIONS</b>  01/06/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----





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<b>Name &amp; Address Of The Customer</b> <b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/5, MILUPARA U/G COAL MINE, VILLAGE - MILUPARA, BLOCK-TAMNAR, DISTT. - RAIGARH (C.G.) 496107</b>		REPORT NO	UES/TR/22-23/01089	
		LAB REF NO	UES/22-23/AAQM/02398-02405	
		DATE OF SAMPLING	03/06/2022 to 27/06/2022	
		DATE OF RECEIPT	04/06/2022 to 28/06/2022	
		DATE OF REPORT	01/07/2022	
		DATE OF ANALYSIS	START: 05/06/2022	END: 30/06/2022
<b>SAMPLE DETAILS</b>				
MONITORING FOR	AMBIENT AIR QUALITY MONITORING	CUSTOMER REF. NO. & DATE	M/PO/SRV/2122/0049, DTD. 24-JULY-2021	
SAMPLING LOCATION	HIL COLONY, KONDOL			
DURATION OF SAMPLING	24 HOURS	SAMPLE COLLECTED BY	LABORATORY CHEMIST	
SAMPLING PROCEDURE	AS PER METHOD REFERENCE			
SAMPLE QUANTITY/PACKING	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.			

**Test Method and NAAQM Standard for Ambient Air Quality Monitoring**

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182 (Part 10): 1999, RA 2003	4.0
Mercury (Hg)	EPA Method IO-5	--

**TEST REPORT**

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
03.06.2022	86	40	15	26	0.4	N.D.
06.06.2022	78	38	12	28	0.6	N.D.
10.06.2022	68	22	10	38	0.9	N.D.
13.06.2022	60	38	16	22	0.2	N.D.
17.06.2022	72	36	12	34	0.8	N.D.
20.06.2022	64	42	10	22	0.4	N.D.
24.06.2022	68	38	14	26	0.6	N.D.
27.06.2022	70	34	18	24	0.3	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

**Terms & conditions**

- The report for publications, exhibition or as legal evidence is forbidden.
- Test sample will be retained for 15 days after issue of test report unless agreed with customer.
- This is for information of the party who ask of for above test(s) only.

 REVIEWED BY		For ULTIMATE ENVIROLYTICAL SOLUTIONS  AUTHORIZED SIGNATORY
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-----End of the test report-----



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Name & Address Of The Customer		REPORT NO	UES/TR/22-23/01817
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED, GARE</b> <b>PALMA - IV/5, MILUPARA U/G COAL</b> <b>MINE, VILLAGE - MILUPARA,</b> <b>BLOCK-TAMNAR,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/AAQM/03679-03686
		DATE OF SAMPLING	04/07/2022 to 28/07/2022
		DATE OF RECEIPT	05/07/2022 to 29/07/2022
		DATE OF REPORT	01/08/2022
		DATE OF ANALYSIS	START:06/07/2022      END:01/08/2022
<b>SAMPLE DETAILS</b>			
MONITORING FOR	AMBIENT AIR QUALITY MONITORING	CUSTOMER REF. NO. & DATE	M/PO/SRV/2122/0049, DTD. 24-JULY-2021
SAMPLING LOCATION	MIL COLONY, KONDREL		
DURATION OF SAMPLING	24 HOURS	SAMPLE COLLECTED BY	LABORATORY CHEMIST
SAMPLING PROCEDURE	AS PER METHOD REFERENCE		
SAMPLE QUANTITY/PACKING	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.		

**Test Method and NAAQM Standard for Ambient Air Quality Monitoring**

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182 (Part 10):1999, RA 2003	4.0
Mercury (Hg)	EPA Method IO-5	--

**TEST REPORT**

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
04.07.2022	76	26	12	28	0.5	N.D.
07.07.2022	70	30	10	22	0.9	N.D.
11.07.2022	64	28	18	36	0.2	N.D.
15.07.2022	62	38	14	20	0.8	N.D.
19.07.2022	70	32	12	28	0.4	N.D.
21.07.2022	62	24	16	20	0.6	N.D.
25.07.2022	60	30	12	24	0.2	N.D.
28.07.2022	76	32	10	28	0.8	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

**Terms & conditions**

- The report for publication, arbitration or as legal document is dependent.
- Test sample will be retained for 14 days after issue of test report unless otherwise specified by customer.
- This is for information as the party has asked for above result only.

 01/08/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/08/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----





HDD-272, Phase III - Near JP Chowk  
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<b>Name &amp; Address Of The Customer</b>		<b>REPORT NO</b>	UES/TR/22-23/02051
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/5, MILUPARA U/G COAL MINE,VILLAGE - MILUPARA, BLOCK-TAMNAR, DISTT. - RAIGARH (C.G.) 496107</b>		<b>LAB. REF. NO</b>	UES/22-23/AAQM/07949-07956
		<b>DATE OF SAMPLING</b>	01/08/2022 TO 29/08/2022
		<b>DATE OF RECEIPT</b>	02/08/2022 TO 30/08/2022
		<b>DATE OF REPORT</b>	02/09/2022
		<b>DATE OF ANALYSIS</b>	START: 03/08/2022      END:02/09/2022
<b>SAMPLE DETAILS</b>			
<b>MONITORING FOR</b>	AMBIENT AIR QUALITY MONITORING	<b>CUSTOMER REF. NO. &amp; DATE</b>	VERBAL COMMUNICATION.
<b>SAMPLING LOCATION</b>	HIL COLONY,KONKREL		
<b>DURATION OF SAMPLING</b>	24 HOURS	<b>SAMPLE COLLECTED BY</b>	LABORATORY CHEMIST
<b>SAMPLING PROCEDURE</b>	AS PER METHOD REFERENCE		
<b>SAMPLE QUANTITY/PACKING</b>	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO., SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, RUBBER BLADDER: 1X1 NO.		

Test Method and NAAQM Standard for Ambient Air Quality Monitoring		
Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182 (Part 10):1999, RA 2003	4.0
Mercury (Hg)	EPA Method 10-5	--

TEST REPORT						
Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
01.08.2022	58	20	12	22	0.5	N.D.
04.08.2022	68	28	08	26	0.6	N.D.
08.08.2022	56	22	10	30	0.4	N.D.
16.08.2022	50	24	08	24	0.8	N.D.
18.08.2022	68	30	16	28	0.2	N.D.
22.08.2022	62	36	14	22	0.6	N.D.
25.08.2022	58	28	12	26	0.4	N.D.
29.08.2022	66	24	10	22	0.2	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

**Terms & conditions**

- The report for publication, circulation or as legal document is forbidden.
- Test sample will be retained for 15 days after issue of final report unless otherwise agreed with customer.
- This is the information on the entry fees unless for above tested only.

 02/09/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  02/09/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----





HDD-272, Phase III - Near JP Chowk  
 Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
 Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED, GARE</b> <b>PALMA - IV/5, MILUPARA U/G COAL</b> <b>MINE,VILLAGE - MILUPARA,</b> <b>BLOCK-TAMNAR,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>	REPORT NO	UES/TR/22-23/03295	
	LAB REF NO	UES/22-23/AAQM/08556-08563	
	DATE OF SAMPLING	02/09/2022 to 26/09/2022	
	DATE OF RECEIPT	03/09/2022 to 27/09/2022	
	DATE OF REPORT	01/10/2022	
	DATE OF ANALYSIS	START:04/09/2022	END:01/10/2022

SAMPLE DETAILS			
MONITORING FOR	AMBIENT AIR QUALITY MONITORING	CUSTOMER REF. NO. & DATE	F.O.13552310212, DATED: 07.09.2022
SAMPLING LOCATION	HIL COLONY, KONDREL		
DURATION OF SAMPLING	24 HOURS	SAMPLE COLLECTED BY	LABORATORY CHEMIST
SAMPLING PROCEDURE	AS PER METHOD REFERENCE		
SAMPLE QUANTITY/PACKING	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.		

**Test Method and NAAQM Standard for Ambient Air Quality Monitoring**

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 7): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182 (Part 10): 1999, RA 2003	4.0
Mercury (Hg)	EPA Method IO-5	--

**TEST REPORT**

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
02.09.2022	42	18	18	28	0.8	N.D.
05.09.2022	56	22	13	24	0.2	N.D.
09.09.2022	42	28	12	22	0.6	N.D.
12.09.2022	54	22	06	28	0.4	N.D.
16.09.2022	42	28	14	24	0.8	N.D.
19.09.2022	46	22	18	26	0.2	N.D.
23.09.2022	52	24	10	20	0.8	N.D.
26.09.2022	48	22	14	28	0.6	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

**Terms & conditions**

- The report for publication, circulation or as legal document is applicable.
- The sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.
- This is for information as the party has asked for above terms only.

 01/10/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/10/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----



HDD-272, Phase III - Near JP Chowk  
 Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
 Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

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<i>Name &amp; Address Of The Customer</i>		REPORT NO	UES/TR/22-23/0369
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/5, MILUPARA U/G COAL MINE,VILLAGE - MILUPARA, BLOCK-TAMNAR, DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/AAQM/0470-0478
		DATE OF SAMPLING	04/04/2022 to 29/04/2022
		DATE OF RECEIPT	05/04/2022 to 30/04/2022
		DATE OF REPORT	02/05/2022
		DATE OF ANALYSIS	START: 05/04/2022    END: 02/05/2022
<b>SAMPLE DETAILS</b>			
MONITORING FOR	AMBIENT AIR QUALITY MONITORING	CUSTOMER REF. NO. & DATE	M/PO/SRV/2122/0049, DTD. 24-JULY-2021
SAMPLING LOCATION	ETP AREA, KONDHOL		
DURATION OF SAMPLING	24 HOURS	SAMPLE COLLECTED BY	LABORATORY CHEMIST
SAMPLING PROCEDURE	AS PER METHOD REFERENCE		
SAMPLE QUANTITY/PACKING	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.		

**Test Method and NAAQM Standard for Ambient Air Quality Monitoring**

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182 (Part 10): 1999, RA 2003	4.0
Mercury (Hg)	EPA Method IO-5	--

**TEST REPORT**

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
04.04.2022	62	30	08	20	0.9	N.D.
08.04.2022	78	38	06	28	0.5	N.D.
11.04.2022	80	32	09	22	0.8	N.D.
15.04.2022	86	46	10	24	0.2	N.D.
18.04.2022	70	32	14	28	0.7	N.D.
22.04.2022	68	36	12	22	0.5	N.D.
25.04.2022	84	44	16	28	0.2	N.D.
29.04.2022	78	38	12	30	0.6	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

*Terms & conditions*  
 \* The report for publication, circulation or as legal document is prohibited.  
 \* Test sample will be retained for 18 days after issue of test report unless otherwise agreed with customer.  
 \* This is for information as the party test order for above test(s) only.

 02/05/22 REVIEWED BY		For ULTIMATE ENVIROLYTICAL SOLUTIONS  02/05/22 AUTHORIZED SIGNATORY
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-----End of the test report-----





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<b>Name &amp; Address Of The Customer</b>		<b>REPORT NO</b>	UES/TR/22-23/01108
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/5, MILUPARA U/G COAL MINE, VILLAGE - MILUPARA, BLOCK-TAMNAR, DISTT. - RAIGARH (C.G.) 496107</b>		<b>LAB REF NO</b>	UES/22-23/AAQM/01106-01113
		<b>DATE OF SAMPLING</b>	02/05/2022 to 27/05/2022
		<b>DATE OF RECEIPT</b>	03/05/2022 to 28/05/2022
		<b>DATE OF REPORT</b>	01/06/2022
		<b>DATE OF ANALYSIS</b>	START: 04/05/2022    END: 31/05/2022
<b>SAMPLE DETAILS</b>			
<b>MONITORING FOR</b>	AMBIENT AIR QUALITY MONITORING	<b>CUSTOMER REF. NO. &amp; DATE</b>	M/PO/SRV/2122/0049, DTD. 24-JULY-2021
<b>SAMPLING LOCATION</b>	EYP AREA, KONDKEL		
<b>DURATION OF SAMPLING</b>	24 HOURS	<b>SAMPLE COLLECTED BY</b>	LABORATORY CHEMIST
<b>SAMPLING PROCEDURE</b>	AS PER METHOD REFERENCE		
<b>SAMPLE QUANTITY/PACKING</b>	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.		

**Test Method and NAAQM Standard for Ambient Air Quality Monitoring**

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182 (Part 10): 1999, RA 2003	4.0
Mercury (Hg)	EPA Method IO-5	--

**TEST REPORT**

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
02.05.2022	78	32	08	22	0.9	N.D.
06.05.2022	84	34	06	28	0.5	N.D.
09.05.2022	70	38	09	25	0.7	N.D.
13.05.2022	84	42	12	20	0.6	N.D.
16.05.2022	72	38	10	26	0.2	N.D.
20.05.2022	84	44	14	28	0.8	N.D.
23.05.2022	88	40	12	22	0.5	N.D.
27.05.2022	78	46	18	28	0.8	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

**Terms & conditions**  
 \* The report the publisher, annotation or in legal disputes to facilities.  
 \* Test sample will be required for 10 days after issue of test report unless otherwise agreed with customer.  
 \* This is for information to the party who asked for above test only.

 01/06/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/06/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----



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<b>Name &amp; Address Of The Customer</b>		<b>REPORT NO</b>	UES/TR/22-23/01090
<b>TO,</b>		<b>LAB REF NO</b>	UES/22-23/AAQM/02406-02413
<b>HINDALCO INDUSTRIES LIMITED, GARE</b>		<b>DATE OF SAMPLING</b>	03/06/2022 to 27/06/2022
<b>PALMA - IV/5, MILUPARA U/G COAL</b>		<b>DATE OF RECEIPT</b>	04/06/2022 to 28/06/2022
<b>MINE, VILLAGE - MILUPARA,</b>		<b>DATE OF REPORT</b>	01/07/2022
<b>BLOCK-TAMNAR,</b>		<b>DATE OF ANALYSIS</b>	START: 05/06/2022    END: 30/06/2022
<b>DISTT. - RAIGARH (C.G.) 496107</b>			
SAMPLE DETAILS			
<b>MONITORING FOR</b>	AMBIENT AIR QUALITY MONITORING	<b>CUSTOMER REF. NO. &amp; DATE</b>	M/PO/ERV/2122/0049, DTD. 24-JULY-2021
<b>SAMPLING LOCATION</b>	ETP AREA, KONKEL		
<b>DURATION OF SAMPLING</b>	24 HOURS	<b>SAMPLE COLLECTED BY</b>	LABORATORY CHEMIST
<b>SAMPLING PROCEDURE</b>	AS PER METHOD REFERENCE		
<b>SAMPLE QUANTITY/PACKING</b>	FILTER PAPER (PM <sub>10</sub> ): 1XI NO., FILTER PAPER (PM <sub>2.5</sub> ): 1XI NO. SO <sub>2</sub> : 30MLXI NO. PVC BOTTLE, NO <sub>2</sub> : 30MLXI NO. PVC BOTTLE RUBBER BLADDER: 1XI NO.		

### Test Method and NAAQM Standard for Ambient Air Quality Monitoring

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182 (Part 10): 1999, RA 2003	4.0
Mercury (Hg)	EPA Method 10-5	--

### TEST REPORT

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO <sup>+</sup> mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
03.06.2022	64	30	12	22	0.6	N.D.
06.06.2022	78	38	18	28	0.2	N.D.
10.06.2022	72	32	10	22	0.8	N.D.
13.06.2022	80	46	14	26	0.4	N.D.
17.06.2022	79	30	19	20	0.8	N.D.
20.06.2022	84	44	12	24	0.2	N.D.
24.06.2022	86	48	18	28	0.9	N.D.
27.06.2022	72	42	16	22	0.2	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

#### Terms & conditions

- The report for publication, arbitration or as legal dispute is forbidden.
- Test reports will be retained for 13 days after issue of test report unless otherwise stated with customer.
- This is for information as the party has asked for above result only.

 REVIEWED BY		For-ULTIMATE ENVIROLYTICAL SOLUTIONS  AUTHORIZED SIGNATORY
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-----End of the test report-----





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Name & Address of The Customer		REPORT NO	UES/TR/22-23/01818
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/5, MILUPARA U/G COAL MINE, VILLAGE - MILUPARA, BLOCK-TAMNAR, DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/AAQM/03687-03694
		DATE OF SAMPLING	04/07/2022 to 28/07/2022
		DATE OF RECEIPT	05/07/2022 to 29/07/2022
		DATE OF REPORT	01/08/2022
		DATE OF ANALYSIS	START:06/07/2022    END:01/08/2022
<b>SAMPLE DETAILS</b>			
MONITORING FOR	AMBIENT AIR QUALITY MONITORING	CUSTOMER REF. NO. & DATE	M/PO/SRV/2122/0049, DTD. 24-JULY-2021
SAMPLING LOCATION	KTP AREA, KONGKEL		
DURATION OF SAMPLING	24 HOURS	SAMPLE COLLECTED BY	LABORATORY CHEMIST
SAMPLING PROCEDURE	AS PER METHOD REFERENCE		
SAMPLE QUANTITY/PACKING	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.		

#### Test Method and NAAQM Standard for Ambient Air Quality Monitoring

Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 21): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182 (Part 10): 1999, RA 2003	4.0
Mercury (Hg)	EPA Method IO-5	--

#### TEST REPORT

Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
04.07.2022	60	36	10	26	0.5	N.D.
07.07.2022	74	30	16	22	0.9	N.D.
11.07.2022	78	38	12	24	0.7	N.D.
15.07.2022	68	42	18	28	0.5	N.D.
19.07.2022	60	38	10	22	0.9	N.D.
21.07.2022	68	30	14	28	0.7	N.D.
25.07.2022	60	36	16	20	0.4	N.D.
28.07.2022	70	38	12	28	0.6	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

#### Terms & conditions:

- The report for public work, substantial or as legal document is for information.
- Test sample will be retained for 11 days after issue of test report unless otherwise specified by customer.
- This is for information as the party has asked for above result only.

 REVIEWED BY		For ULTIMATE ENVIROLYTICAL SOLUTIONS  AUTHORIZED SIGNATORY
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-----End of the test report-----

AN ISO : 9001:2015 / ISO: 14001:2015 / ISO 45001:2018 CERTIFIED LABORATORY



HDD-272, Phase III - Near JP Chowk  
 Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
 Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

<b>Name &amp; Address Of The Customer</b> <b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED, GARE</b> <b>PALMA - IV/5, MILUPARA U/G COAL</b> <b>MINE,VILLAGE - MILUPARA,</b> <b>BLOCK-TAMNAR,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>	REPORT NO	UES/TR/22-23/02852	
	LAB REF NO	UES/22-23/AAQM/07957-07964	
	DATE OF SAMPLING	01/08/2022 TO 29/08/2022	
	DATE OF RECEIPT	02/08/2022 TO 30/08/2022	
	DATE OF REPORT	02/09/2022	
	DATE OF ANALYSIS	START:03/08/2022	END:02/09/2022

SAMPLE DETAILS			
MONITORING FOR	AMBIENT AIR QUALITY MONITORING	CUSTOMER REF. NO. & DATE	VERBAL COMMUNICATION.
SAMPLING LOCATION	ETP AREA, KONDREL		
DURATION OF SAMPLING	24 HOURS	SAMPLE COLLECTED BY	LABORATORY CHEMIST
SAMPLING PROCEDURE	AS PER METHOD REFERENCE		
SAMPLE QUANTITY/PACKING	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.		

Test Method and NAAQM Standard for Ambient Air Quality Monitoring		
Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	80
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 21): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182(Part 10):1999, RA 2003	4.0
Mercury (Hg)	EPA Method 10-5	--

TEST REPORT						
Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
01.08.2022	58	22	10	20	0.6	N.D.
04.08.2022	54	24	08	24	0.8	N.D.
08.08.2022	60	28	16	28	0.2	N.D.
16.08.2022	54	22	14	22	0.9	N.D.
18.08.2022	62	38	12	28	0.4	N.D.
22.08.2022	54	24	10	24	0.5	N.D.
25.08.2022	60	30	14	26	0.2	N.D.
29.08.2022	58	36	18	22	0.7	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

**Terms & conditions**  
 - This report for publication, circulation or as legal document is forbidden.  
 - Test sample will be returned for 15 days after issue of test report unless otherwise agreed with customer.  
 - This is for information as the party has asked for above test(s) only.

 02/09/22 <b>REVIEWED BY</b>	 <b>For ULTIMATE ENVIROLYTICAL SOLUTIONS</b>  02/09/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----

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 Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
 Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

<b>Name &amp; Address Of The Customer</b>		<b>REPORT NO</b>	UES/TR/22-23/03296
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/5, MILUPARA U/G COAL MINE,VILLAGE - MILUPARA, BLOCK-TAMNAR, DISTT. - RAIGARH (C.G.) 496107</b>		<b>LAB REF NO</b>	UES/22-23/AAQM/08564-08571
		<b>DATE OF SAMPLING</b>	02/09/2022 to 26/09/2022
		<b>DATE OF RECEIPT</b>	03/09/2022 to 27/09/2022
		<b>DATE OF REPORT</b>	01/10/2022
		<b>DATE OF ANALYSIS</b>	START:04/09/2022    END:01/10/2022
<b>SAMPLE DETAILS</b>			
<b>MONITORING FOR</b>	AMBIENT AIR QUALITY MONITORING	<b>CUSTOMER REF. NO. &amp; DATE</b>	P. O.13552310212, DATED: 07.09.2022
<b>SAMPLING LOCATION</b>	ETP AREA, NONKHEL		
<b>DURATION OF SAMPLING</b>	24 HOURS	<b>SAMPLE COLLECTED BY</b>	LABORATORY CHEMIST
<b>SAMPLING PROCEDURE</b>	AS PER METHOD REFERENCE		
<b>SAMPLE QUANTITY/PACKING</b>	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.		

<b>Test Method and NAAQM Standard for Ambient Air Quality Monitoring</b>		
Parameter	Method Reference	NAAQM Standard
Particulate Matter size less than 10 microns (PM <sub>10</sub> )	IS 5182 (Part 23): 2006 & CPCB Guidelines Vol.-I	100
Particulate Matter size less than 2.5 microns (PM <sub>2.5</sub> )	IS 5182 (Part 24): 2019 CPCB Guidelines Vol.-I	60
Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 21): 2001, RA 2006 & CPCB Guidelines Vol.-I	80
Nitrogen Dioxide (NO <sub>2</sub> )	IS 5182 (Part 6): 2006 & CPCB Guidelines Vol.-I	80
Carbon Monoxide (CO)*	IS 5182 (Part 10):1999, RA 2003	4.0
Mercury (Hg)	EPA Method 10-2	--

<b>TEST REPORT</b>						
Date of Sampling	PM <sub>10</sub> µg/m <sup>3</sup>	PM <sub>2.5</sub> µg/m <sup>3</sup>	SO <sub>2</sub> µg/m <sup>3</sup>	NO <sub>2</sub> µg/m <sup>3</sup>	CO* mg/m <sup>3</sup>	Hg ng/m <sup>3</sup>
02.09.2022	52	26	12	26	0.8	N.D.
05.09.2022	58	28	09	22	0.4	N.D.
09.09.2022	50	21	14	24	0.6	N.D.
12.09.2022	56	28	12	26	0.8	N.D.
16.09.2022	60	32	18	20	0.2	N.D.
19.09.2022	58	23	12	28	0.8	N.D.
23.09.2022	52	28	16	22	0.4	N.D.
26.09.2022	56	24	14	24	0.6	N.D.

Remarks: \* Duration of sampling for CO - 1 Hour, N.D. - Not Detected

**Terms & conditions**  
 - The report for publication, withdrawal or any legal dispute is forbidden.  
 - Test sample will be available for 15 days after issue of test report unless agreed with customer.  
 - This is the information as the party has added for their benefit only.

 01/10/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/10/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----

# Annexure-26A



**CONTINUOUS AMBIENT AIR QUALITY MONITORING SYSTEM (CAAQMS - 01 Nos.) AT GARE PALMA IV/4 COAL MINE, BANJIKHOL, RAIGARH**



# Annexure-27



**HDD-272, PHASE III- NEAR JP CHOWK,  
RING ROAD NO - 2, KABIR NAGAR, RAIPUR, C.G. -492099  
PH - 0771 - 4027777 /email - ultimatenviro@gmail.com**

<b>Name &amp; Address Of The Customer</b>		<b>REPORT NO</b>	UES/TR/22-23/04351	
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/4, COAL MINE, VILLAGE - BANKHETA, POST -MILUPARA, DISTT. - RAIGARH (C.G.) 496107</b>		<b>LAB REF NO</b>	UES/22-23/AAQM/010243	
		<b>DATE OF SAMPLING</b>	26/09/2022	
		<b>DATE OF RECEIPT</b>	27/09/2022	
		<b>DATE OF REPORT</b>	01/10/2022	
		<b>DATE OF ANALYSIS</b>	START:27/09/2022	END:01/10/2022
<b>SAMPLE DETAILS</b>				
<b>MONITORING FOR</b>	AMBIENT AIR QUALITY MONITORING	<b>CUSTOMER REF. NO. &amp; DATE</b>	P.O.13552310211, DATED:07.09.2022	
<b>SAMPLING LOCATION</b>	PIT OFFICE AREA, BANKHETA			
<b>DURATION OF SAMPLING</b>	24 HOURS	<b>SAMPLE COLLECTED BY</b>	LABORATORY CHEMIST	
<b>SAMPLING PROCEDURE</b>	AS PER METHOD REFERENCE			
<b>SAMPLE QUANTITY/PACKING</b>	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.			

<b>TEST REPORT</b>					
SR. NO.	PARAMETER	UNIT	RESULT	NAAQM STANDARD	METHOD REFERENCE
1	Arsenic (as As)	ng/m <sup>3</sup>	0.6	6.0	CPCB Guidelines (AAS Method)
2	Nickel (as Ni)	ng/m <sup>3</sup>	0.9	20	CPCB Guidelines (AAS Method)
3	Lead (as Pb)	µg/m <sup>3</sup>	0.03	1.0	IS 5182(Part 22):2004
4	Mercury (Hg)	ng/m <sup>3</sup>	N.D.	-	EPA Method IO-5
5	Chromium (as Cr)	µg/m <sup>3</sup>	N.D.	-	EPA Method IO-5
6	Cadmium (as Cd)	µg/m <sup>3</sup>	N.D.	-	EPA Method IO-5
7	Ozone (O <sub>3</sub> )*	µg/m <sup>3</sup>	8.4	180	CPCB Guidelines Vol-I
8	Ammonia (NH <sub>3</sub> )	µg/m <sup>3</sup>	15.0	400	CPCB Guidelines Vol-I
9	Benzene (C <sub>6</sub> H <sub>6</sub> )	µg/m <sup>3</sup>	N.D.	5.0	IS 5182(Part 11):2006
10	Benzo (a) Pyrene	ng/m <sup>3</sup>	N.D.	1.0	IS 5182(Part 12):2014

Note: All results are on the basis of 24 hour sampling.

**REMARKS: \* THESE RESULTS ARE ON THE BASIS OF 1 HOUR SAMPLING, N.D.: NOT DETECTED**

#### Terms & conditions

- The report for publication, arbitration or as legal dispute is forbidden.
- Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.
- This is for information as the party has asked for above test(s) only.

 <b>REVIEWED BY</b>	 <b>For ULTIMATE ENVIROLYTICAL SOLUTIONS</b>	 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----



**HDD-272, PHASE III- NEAR JP CHOWK,  
RING ROAD NO - 2, KABIR NAGAR, RAIPUR, C.G. -492099  
PH - 0771 - 4027777 /email - ultimatenviro@gmail.com**

<b>Name &amp; Address Of The Customer</b>		<b>REPORT NO</b>	UES/TR/22-23/04352	
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/4, COAL MINE, VILLAGE - BANKHETA, POST -MILUPARA, DISTT. - RAIGARH (C.G.) 496107</b>		<b>LAB REF NO</b>	UES/22-23/AAQM/010244	
		<b>DATE OF SAMPLING</b>	26/09/2022	
		<b>DATE OF RECEIPT</b>	27/09/2022	
		<b>DATE OF REPORT</b>	01/10/2022	
		<b>DATE OF ANALYSIS</b>	START:27/09/2022	END:01/10/2022
<b>SAMPLE DETAILS</b>				
<b>MONITORING FOR</b>	AMBIENT AIR QUALITY MONITORING	<b>CUSTOMER REF. NO. &amp; DATE</b>	P.O.13552310211, DATED:07.09.2022	
<b>SAMPLING LOCATION</b>	ETP AREA, BANJIKHOL			
<b>DURATION OF SAMPLING</b>	24 HOURS	<b>SAMPLE COLLECTED BY</b>	LABORATORY CHEMIST	
<b>SAMPLING PROCEDURE</b>	AS PER METHOD REFERENCE			
<b>SAMPLE QUANTITY/PACKING</b>	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.			

<b>TEST REPORT</b>					
<b>SR. NO.</b>	<b>PARAMETER</b>	<b>UNIT</b>	<b>RESULT</b>	<b>NAAQM STANDARD</b>	<b>METHOD REFERENCE</b>
1	Arsenic (as As)	ng/m <sup>3</sup>	0.4	6.0	CPCB Guidelines (AAS Method)
2	Nickel (as Ni)	ng/m <sup>3</sup>	1.2	20	CPCB Guidelines (AAS Method)
3	Lead (as Pb)	µg/m <sup>3</sup>	0.05	1.0	IS 5182(Part 22):2004
4	Mercury (Hg)	ng/m <sup>3</sup>	N.D.	-	EPA Method IO-5
5	Chromium (as Cr)	µg/m <sup>3</sup>	N.D.	-	EPA Method IO-5
6	Cadmium (as Cd)	µg/m <sup>3</sup>	N.D.	-	EPA Method IO-5
7	Ozone (O <sub>3</sub> )*	µg/m <sup>3</sup>	7.2	180	CPCB Guidelines Vol-I
8	Ammonia (NH <sub>3</sub> )	µg/m <sup>3</sup>	18.6	400	CPCB Guidelines Vol-I
9	Benzene (C <sub>6</sub> H <sub>6</sub> )	µg/m <sup>3</sup>	N.D.	5.0	IS 5182(Part 11):2006
10	Benzo (a) Pyrene	ng/m <sup>3</sup>	N.D.	1.0	IS 5182(Part 12):2014

Note: All results are on the basis of 24 hour sampling.

**REMARKS: \* THESE RESULTS ARE ON THE BASIS OF 1 HOUR SAMPLING, N.D.: NOT DETECTED**

#### Terms & conditions

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- This is for information as the party has asked for above test(s) only.

 <b>REVIEWED BY</b>		For <b>ULTIMATE ENVIROLYTICAL SOLUTIONS</b>  <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----





**HDD-272, PHASE III- NEAR JP CHOWK,  
RING ROAD NO - 2, KABIR NAGAR, RAIPUR, C.G. -492099  
PH - 0771 - 4027777 /email - ultimatenviro@gmail.com**

<b>Name &amp; Address Of The Customer</b>		<b>REPORT NO</b>	UES/TR/22-23/04353	
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/4, COAL MINE, VILLAGE - BANKHETA, POST -MILUPARA, DISTT. - RAIGARH (C.G.) 496107</b>		<b>LAB REF NO</b>	UES/22-23/AAQM/010245	
		<b>DATE OF SAMPLING</b>	26/09/2022	
		<b>DATE OF RECEIPT</b>	27/09/2022	
		<b>DATE OF REPORT</b>	01/10/2022	
		<b>DATE OF ANALYSIS</b>	<b>START:27/09/2022</b>	<b>END:01/10/2022</b>
<b>SAMPLE DETAILS</b>				
<b>MONITORING FOR</b>	<b>AMBIENT AIR QUALITY MONITORING</b>	<b>CUSTOMER REF. NO. &amp; DATE</b>	P.O.13552310211, DATED:07.09.2022	
<b>SAMPLING LOCATION</b>	OFFICE AREA, BANJIKHOL			
<b>DURATION OF SAMPLING</b>	24 HOURS	<b>SAMPLE COLLECTED BY</b>	LABORATORY CHEMIST	
<b>SAMPLING PROCEDURE</b>	AS PER METHOD REFERENCE			
<b>SAMPLE QUANTITY/PACKING</b>	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.			

<b>TEST REPORT</b>					
<b>SR. NO.</b>	<b>PARAMETER</b>	<b>UNIT</b>	<b>RESULT</b>	<b>NAAQM STANDARD</b>	<b>METHOD REFERENCE</b>
1	Arsenic (as As)	ng/m <sup>3</sup>	0.7	6.0	CPCB Guidelines (AAS Method)
2	Nickel (as Ni)	ng/m <sup>3</sup>	1.5	20	CPCB Guidelines (AAS Method)
3	Lead (as Pb)	µg/m <sup>3</sup>	0.08	1.0	IS 5182(Part 22):2004
4	Mercury (Hg)	ng/m <sup>3</sup>	N.D.	-	EPA Method IO-5
5	Chromium (as Cr)	µg/m <sup>3</sup>	N.D.	-	EPA Method IO-5
6	Cadmium (as Cd)	µg/m <sup>3</sup>	N.D.	-	EPA Method IO-5
7	Ozone (O <sub>3</sub> )*	µg/m <sup>3</sup>	8.6	180	CPCB Guidelines Vol-I
8	Ammonia (NH <sub>3</sub> )	µg/m <sup>3</sup>	20.6	400	CPCB Guidelines Vol-I
9	Benzene (C <sub>6</sub> H <sub>6</sub> )	µg/m <sup>3</sup>	N.D.	5.0	IS 5182(Part 11):2006
10	Benzo (a) Pyrene	ng/m <sup>3</sup>	N.D.	1.0	IS 5182(Part 12):2014

Note: All results are on the basis of 24 hour sampling.

**REMARKS: \* THESE RESULTS ARE ON THE BASIS OF 1 HOUR SAMPLING, N.D.: NOT DETECTED**

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- This is for information as the party has asked for above test(s) only.

 <b>REVIEWED BY</b>	 <b>For ULTIMATE ENVIROLYTICAL SOLUTIONS</b>	 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----



**HDD-272, PHASE III- NEAR JP CHOWK,  
RING ROAD NO - 2, KABIR NAGAR, RAIPUR, C.G. -492099  
PH - 0771 - 4027777 /email - ultimatenviro@gmail.com**

<b>Name &amp; Address Of The Customer</b>		<b>REPORT NO</b>	UES/TR/22-23/04354		
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/4, COAL MINE, VILLAGE - BANKHETA, POST -MILUPARA, DISTT. - RAIGARH (C.G.) 496107</b>		<b>LAB REF NO</b>	UES/22-23/AAQM/010246		
		<b>DATE OF SAMPLING</b>	26/09/2022		
		<b>DATE OF RECEIPT</b>	27/09/2022		
		<b>DATE OF REPORT</b>	01/10/2022		
		<b>DATE OF ANALYSIS</b>	START:27/09/2022	END:01/10/2022	
		<b>SAMPLE DETAILS</b>			
<b>MONITORING FOR</b>	AMBIENT AIR QUALITY MONITORING	<b>CUSTOMER REF. NO. &amp; DATE</b>	P.O.13552310211, DATED:07.09.2022		
<b>SAMPLING LOCATION</b>	OFFICE AREA, BANKHETA				
<b>DURATION OF SAMPLING</b>	24 HOURS	<b>SAMPLE COLLECTED BY</b>	LABORATORY CHEMIST		
<b>SAMPLING PROCEDURE</b>	AS PER METHOD REFERENCE				
<b>SAMPLE QUANTITY/PACKING</b>	FILTER PAPER (PM <sub>10</sub> ): 1X1 NO., FILTER PAPER (PM <sub>2.5</sub> ): 1X1 NO. SO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE, NO <sub>2</sub> : 30MLX1 NO. PVC BOTTLE RUBBER BLADDER: 1X1 NO.				

<b>TEST REPORT</b>					
<b>SR. NO.</b>	<b>PARAMETER</b>	<b>UNIT</b>	<b>RESULT</b>	<b>NAAQM STANDARD</b>	<b>METHOD REFERENCE</b>
1	Arsenic (as As)	ng/m <sup>3</sup>	0.8	6.0	CPCB Guidelines (AAS Method)
2	Nickel (as Ni)	ng/m <sup>3</sup>	1.4	20	CPCB Guidelines (AAS Method)
3	Lead (as Pb)	µg/m <sup>3</sup>	0.06	1.0	IS 5182(Part 22):2004
4	Mercury (Hg)	ng/m <sup>3</sup>	N.D.	-	EPA Method IO-5
5	Chromium (as Cr)	µg/m <sup>3</sup>	N.D.	-	EPA Method IO-5
6	Cadmium (as Cd)	µg/m <sup>3</sup>	N.D.	-	EPA Method IO-5
7	Ozone (O <sub>3</sub> )*	µg/m <sup>3</sup>	9.8	180	CPCB Guidelines Vol-I
8	Ammonia (NH <sub>3</sub> )	µg/m <sup>3</sup>	20.2	400	CPCB Guidelines Vol-I
9	Benzene (C <sub>6</sub> H <sub>6</sub> )	µg/m <sup>3</sup>	N.D.	5.0	IS 5182(Part 11):2006
10	Benzo (a) Pyrene	ng/m <sup>3</sup>	N.D.	1.0	IS 5182(Part 12):2014

Note: All results are on the basis of 24 hour sampling.

**REMARKS: \* THESE RESULTS ARE ON THE BASIS OF 1 HOUR SAMPLING, N.D.: NOT DETECTED**

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- > This is for information as the party has asked for above test(s) only.

 <b>REVIEWED BY</b>	 <b>For ULTIMATE ENVIROLYTICAL SOLUTIONS</b>	 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----

# Annexure-28





HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

Recognized by Ministry of Environment Forest and Climate Change under EP act 1986

<i>Name &amp; Address of The Customer</i>		<b>REPORT NO.</b>	UES/TR/22-23/0363
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/4, COAL MINE, VILLAGE - BANKHETA, POST - MILUPARA, DISTT. - RAIGARH (C.G.) 496107</b>		<b>LAB REF NO.</b>	UES/22-23/N/0433-442
		<b>DATE OF REPORT</b>	02/05/2022
		<b>DATE OF SAMPLING</b>	25/04/2022 to 26/04/2022
		<b>SAMPLE DETAILS</b>	
<b>MONITORING FOR</b>	NOISE LEVEL MONITORING		
<b>CUSTOMER REF. NO. &amp; DATE</b>	N/PO/SRV/2122/0045, DTD. :24-JULY-2021		
<b>SAMPLING LOCATION</b>	INSIDE COAL MINE & OUTSIDE COAL MINE (AS DESCRIBED BELOW)		
<b>SAMPLE COLLECTED BY</b>	LABORATORY CHEMIST		
<b>SAMPLING PROCEDURE</b>	MANUFACTURER'S INSTRUCTION		

<b>TEST REPORT</b>					
LOCATION	UNIT	RESULT		LIMIT (INDUSTRIAL ZONE)	
		DAY TIME	NIGHT TIME	DAY TIME	NIGHT TIME
OFFICE AREA, BANJIKHOL	dB(A)	60	54	75	70
INCLINE AREA, BANJIKHOL	dB(A)	58	50		
BUNKER AREA, BANJIKHOL	dB(A)	66	62		
DG SET AREA, BANJIKHOL	dB(A)	68	58		
WEIGHBRIGE AREA, BANJIKHOL	dB(A)	56	46		
TRUCK PARKING AREA, BANJIKHOL	dB(A)	62	52		
OFFICE AREA, BANKHETA	dB(A)	56	48		
WEIGHBRIGE AREA, BANKHETA	dB(A)	70	58		
LOCATION	UNIT	RESULT		LIMIT (RESIDENTIAL ZONE)	
		DAY TIME	NIGHT TIME	DAY TIME	NIGHT TIME
<b>Outside Plant</b>					
BANJIKHOL VILLAGE (NEAR ANGANBADI)	dB(A)	50	44	55	45
BELJOR VILLAGE (NEAR MANBODH HOUSE)	dB(A)	48	42		

**REMARKS: RESULTS ARE AS ABOVE**

**Terms & conditions**

- > The report for publication, arbitration or as legal dispute is forbidden.
- > Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.
- > This is for information as the party has asked for above test(s) only.

 <b>REVIEWED BY</b>	 <b>For ULTIMATE ENVIROLYTICAL SOLUTIONS</b>	 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----





HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

Recognized by Ministry of Environment Forest and Climate Change under EP act 1986

Name & Address of The Customer		REPORT NO.	UES/TR/21-23/0998
TO, <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA,</b> <b>POST - MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO.	UES/22-23/N/01752-01761
		DATE OF REPORT	01/06/2022
		DATE OF SAMPLING	20/05/2022 to 21/05/2022
		SAMPLE DETAILS	
MONITORING FOR	NOISE LEVEL MONITORING		
CUSTOMER REF. NO. & DATE	N/PO/SRV/2122/0045, DTD.:24-JULY-2021		
SAMPLING LOCATION	INSIDE COAL MINE & OUTSIDE COAL MINE (AS DESCRIBED BELOW)		
SAMPLE COLLECTED BY	LABORATORY CHEMIST		
SAMPLING PROCEDURE	MANUFACTURER'S INSTRUCTION		

<b>TEST REPORT</b>					
LOCATION	UNIT	RESULT		LIMIT (INDUSTRIAL ZONE)	
		DAY TIME	NIGHT TIME	DAY TIME	NIGHT TIME
OFFICE AREA, BANJIKHOL	dB(A)	68	50	75	70
INCLINE AREA, BANJIKHOL	dB(A)	58	45		
BUNKER AREA, BANJIKHOL	dB(A)	62	56		
DG SET AREA, BANJIKHOL	dB(A)	56	40		
WEIGHBRIGE AREA, BANJIKHOL	dB(A)	64	50		
TRUCK PARKING AREA, BANJIKHOL	dB(A)	69	54		
OFFICE AREA, BANKHETA	dB(A)	52	40		
WEIGHBRIGE AREA, BANKHETA	dB(A)	70	52		
LOCATION	UNIT	RESULT		LIMIT (RESIDENTIAL ZONE)	
		DAY TIME	NIGHT TIME	DAY TIME	NIGHT TIME
<b>Outside Plant</b>					
BANJIKHOL VILLAGE (NEAR ANGANBADI)	dB(A)	52	40	55	45
BELJOR VILLAGE (NEAR MANBODH HOUSE)	dB(A)	48	43		

**REMARKS: RESULTS ARE AS ABOVE**

**Terms & conditions**

- The report for publication, arbitration or as legal dispute is forbidden.
- Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.
- This is for information as the party has asked for above test(s) only.

 01/06/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/06/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----





HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

Recognized by Ministry of Environment Forest and Climate Change under EP act 1986

<i>Name &amp; Address of The Customer</i>		REPORT NO.	UES/TR/22-23/01978
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/4, COAL MINE, VILLAGE - BANKHETA, POST - MILUPARA, DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO.	UES/22-23/N/02363-02372
		DATE OF REPORT	01/07/2022
		DATE OF SAMPLING	22/06/2022 to 23/06/2022
		<b>SAMPLE DETAILS</b>	
MONITORING FOR	NOISE LEVEL MONITORING		
CUSTOMER REF. NO. & DATE	N/PO/SRV/2122/0045, DTD.:24-JULY-2021		
SAMPLING LOCATION	INSIDE COAL MINE & OUTSIDE COAL MINE (AS DESCRIBED BELOW)		
SAMPLE COLLECTED BY	LABORATORY CHEMIST		
SAMPLING PROCEDURE	MANUFACTURER'S INSTRUCTION		

<b>TEST REPORT</b>					
LOCATION	UNIT	RESULT		LIMIT (INDUSTRIAL ZONE)	
		DAY TIME	NIGHT TIME	DAY TIME	NIGHT TIME
OFFICE AREA, BANJIKHOL	dB(A)	60	48	75	70
INCLINE AREA, BANJIKHOL	dB(A)	68	50		
BUNKER AREA, BANJIKHOL	dB(A)	64	54		
DG SET AREA, BANJIKHOL	dB(A)	70	58		
WEIGHBRIGE AREA, BANJIKHOL	dB(A)	71	60		
TRUCK PARKING AREA, BANJIKHOL	dB(A)	67	64		
OFFICE AREA, BANKHETA	dB(A)	61	50		
WEIGHBRIGE AREA, BANKHETA	dB(A)	64	62		
LOCATION	UNIT	RESULT		LIMIT (RESIDENTIAL ZONE)	
		DAY TIME	NIGHT TIME	DAY TIME	NIGHT TIME
<b>Outside Plant</b>					
BANJIKHOL VILLAGE (NEAR ANGANBADI)	dB(A)	53	43	55	45
BELJOR VILLAGE (NEAR MANBODH HOUSE)	dB(A)	50	42		

**REMARKS: RESULTS ARE AS ABOVE**

**Terms & conditions**

- The report for publication, arbitration or as legal dispute is forbidden.
- Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.
- This is for information as the party has asked for above test(s) only.

 01/07/22 <b>REVIEWED BY</b>	 <b>ULTIMATE ENVIROLYTICAL SOLUTIONS</b> HARE NAGAR RING ROAD NO. 2, RAIGARH (C.G.)	For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/07/22 <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----





HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

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<i>Name &amp; Address of The Customer</i>		REPORT NO.	UES/TR/22-23/01813
<b>TO,</b>		LAB REF NO.	UES/22-23/N/3650-03659
<b>HINDALCO INDUSTRIES LIMITED,</b>		DATE OF REPORT	01/08/2022
<b>GARE PALMA - IV/4, COAL MINE,</b>		DATE OF SAMPLING	25/07/2022 to 26/07/2022
<b>VILLAGE - BANKHETA,</b>			
<b>POST - MILUPARA,</b>			
<b>DISTT. - RAIGARH (C.G.) 496107</b>			
SAMPLE DETAILS			
MONITORING FOR	NOISE LEVEL MONITORING		
CUSTOMER REF. NO. & DATE	N/PO/SRV/2122/0045, DTD.:24-JULY-2021		
SAMPLING LOCATION	INSIDE COAL MINE & OUTSIDE COAL MINE (AS DESCRIBED BELOW)		
SAMPLE COLLECTED BY	LABORATORY CHEMIST		
SAMPLING PROCEDURE	MANUFACTURER'S INSTRUCTION		

### TEST REPORT

LOCATION	UNIT	RESULT		LIMIT (INDUSTRIAL ZONE)	
		DAY TIME	NIGHT TIME	DAY TIME	NIGHT TIME
OFFICE AREA, BANJIKHOL	dB(A)	62	50	75	70
INCLINE AREA, BANJIKHOL	dB(A)	64	52		
BUNKER AREA, BANJIKHOL	dB(A)	60	58		
DG SET AREA, BANJIKHOL	dB(A)	68	54		
WEIGHBRIGE AREA, BANJIKHOL	dB(A)	70	62		
TRUCK PARKING AREA, BANJIKHOL	dB(A)	68	60		
OFFICE AREA, BANKHETA	dB(A)	64	56		
WEIGHBRIGE AREA, BANKHETA	dB(A)	62	54		
LOCATION	UNIT	RESULT		LIMIT (RESIDENTIAL ZONE)	
		DAY TIME	NIGHT TIME	DAY TIME	NIGHT TIME
<b>Outside Plant</b>					
BANJIKHOL VILLAGE (NEAR ANGANBADI)	dB(A)	52	42	55	45
BELJOR VILLAGE (NEAR MANBODH HOUSE)	dB(A)	48	44		

REMARKS: RESULTS ARE AS ABOVE

#### Terms & conditions

- The report for publication, arbitration or as legal dispute is forbidden.
- Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.
- This is for information as the party has asked for above test(s) only.

 01/08/22 REVIEWED BY		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/08/22 AUTHORIZED SIGNATORY
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-----End of the test report-----



<b>Name &amp; Address of The Customer</b>  <b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA,</b> <b>POST - MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>	REPORT NO.	UES/TR/22-23/02828
	LAB REF NO.	UES/22-23/N/07884-07893
	DATE OF REPORT	01/09/2022
	DATE OF SAMPLING	24/09/2022 to 25/09/2022

**SAMPLE DETAILS**

MONITORING FOR	NOISE LEVEL MONITORING
CUSTOMER REF. NO. & DATE	VERBAL COMMUNICATION.
SAMPLING LOCATION	INSIDE COAL MINE & OUTSIDE COAL MINE (AS DESCRIBED BELOW)
SAMPLE COLLECTED BY	LABORATORY CHEMIST
SAMPLING PROCEDURE	MANUFACTURER'S INSTRUCTION

**TEST REPORT**

LOCATION	UNIT	RESULT		LIMIT (INDUSTRIAL ZONE)	
		DAY TIME	NIGHT TIME	DAY TIME	NIGHT TIME
OFFICE AREA, BANJIKHOL	dB(A)	64	56	75	70
INCLINE AREA, BANJIKHOL	dB(A)	52	48		
BUNKER AREA, BANJIKHOL	dB(A)	60	52		
DG SET AREA, BANJIKHOL	dB(A)	58	44		
WEIGHBRIGE AREA, BANJIKHOL	dB(A)	60	52		
TRUCK PARKING AREA, BANJIKHOL	dB(A)	66	58		
OFFICE AREA, BANKHETA	dB(A)	50	42		
WEIGHBRIGE AREA, BANKHETA	dB(A)	68	54		

LOCATION	UNIT	RESULT		LIMIT (RESIDENTIAL ZONE)	
		DAY TIME	NIGHT TIME	DAY TIME	NIGHT TIME
<b>Outside Plant</b>					
BANJIKHOL VILLAGE (NEAR ANGANBADI)	dB(A)	50	38	55	45
BELJOR VILLAGE (NEAR MANBODH HOUSE)	dB(A)	46	40		

**REMARKS: RESULTS ARE AS ABOVE**

**Terms & conditions**

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 01/09/22  <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/09/22  <b>AUTHORIZED SIGNATORY</b>
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-----End of the test report-----



<i>Name &amp; Address of The Customer</i>		REPORT NO.	UES/TR/22-23/03288
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA,</b> <b>POST - MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO.	UES/22-23/N/08508-08517
		DATE OF REPORT	03/10/2022
		DATE OF SAMPLING	27/09/2022 to 28/09/2022
		<b>SAMPLE DETAILS</b>	
MONITORING FOR	NOISE LEVEL MONITORING		
CUSTOMER REF. NO. & DATE	P.O.13552310211, DATED: 07.09.2022		
SAMPLING LOCATION	INSIDE COAL MINE & OUTSIDE COAL MINE (AS DESCRIBED BELOW)		
SAMPLE COLLECTED BY	LABORATORY CHEMIST		
SAMPLING PROCEDURE	MANUFACTURER'S INSTRUCTION		

<b>TEST REPORT</b>					
LOCATION	UNIT	RESULT		LIMIT (INDUSTRIAL ZONE)	
		DAY TIME	NIGHT TIME	DAY TIME	NIGHT TIME
OFFICE AREA, BANJIKHOL	dB(A)	54	50	75	70
INCLINE AREA, BANJIKHOL	dB(A)	62	52		
BUNKER AREA, BANJIKHOL	dB(A)	50	44		
DG SET AREA, BANJIKHOL	dB(A)	58	42		
WEIGHBRIGE AREA, BANJIKHOL	dB(A)	56	46		
TRUCK PARKING AREA, BANJIKHOL	dB(A)	62	52		
OFFICE AREA, BANKHETA	dB(A)	58	48		
WEIGHBRIGE AREA, BANKHETA	dB(A)	62	50		
LOCATION	UNIT	RESULT		LIMIT (RESIDENTIAL ZONE)	
		DAY TIME	NIGHT TIME	DAY TIME	NIGHT TIME
<b>Outside Plant</b>					
BANJIKHOL VILLAGE (NEAR ANGANBADI)	dB(A)	52	40	55	45
BELJOR VILLAGE (NEAR MANBODH HOUSE)	dB(A)	48	42		

**REMARKS: RESULTS ARE AS ABOVE**

*Terms & conditions*

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- Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.
- This is for information as the party has asked for above test(s) only.

*Belle*  
03/10/22

**REVIEWED BY**



For ULTIMATE ENVIROLYTICAL SOLUTIONS

*[Signature]*  
03/10/22

**AUTHORIZED SIGNATORY**

# Annexure-29

ETP of capacity 50 m<sup>3</sup>/day at Bankheta–GP IV/4 Coal Mine



Effluent Treatment Plant – 50 KLD - Bankheta

# Annexure-30





HDD-272, Phase III - Near JP Chowk  
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<i>Name &amp; Address Of The Customer</i>		<b>REPORT NO</b>	UES/TR/22-23/0359	
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/4, COAL MINE, VILLAGE - BANKHETA, POST MILUPARA, DISTT. - RAIGARH (C.G.) 496107</b>		<b>LAB REF NO</b>	UES/22-23/W/0429	
		<b>DATE OF SAMPLING</b>	25/04/2022	
		<b>DATE OF RECEIPT</b>	26/04/2022	
		<b>DATE OF REPORT</b>	02/05/2022	
		<b>DATE OF ANALYSIS</b>	START: 26/04/2022	END: 02/05/2022
<b>SAMPLE DETAILS</b>				
<b>SAMPLE TYPE</b>	WASTE WATER	<b>ORDER /REFERENCE:</b>	N/PO/SRV/2122/0045, JULY-2021	DTD. 24-
<b>CUSTOMER SAMPLE ID</b>	ETP INLET & OUTLET, BANKHETA	<b>SAMPLE CONDITION AT RECEIPT</b>	OK	
<b>PACKING OF SAMPLE</b>	3 L X 1 NO. PVC CAN 1 L X 1 NO. PVC CAN 1 L X 1 NO. GLASS BOTTLE	<b>SAMPLE COLLECTED BY</b>	CHEMIST	
<b>SAMPLING PROCEDURE</b>	IS:3025 (PART I):1987 RA 2003; APHA 22ND ED. 2012, 1060-B, 1-39	<b>QUANTITY RECEIVED</b>	5 LTR	

Report No.0359

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-VI] PART-A INLAND SURFACE WATER	BHANKETA ETP INLET	BANKHETA ETP OUTLET
1	Colour	Hazen	APHA 22 <sup>nd</sup> Ed. 2012,2120-B,2-6	See 6 of Annexure-I	5.5	<1.0
2	Odour	-	APHA 22 <sup>nd</sup> Ed. 2012,2120-B,2-6	See 6 of Annexure-I	Agreeable	Agreeable
3	Temperature	°C	APHA 22 <sup>nd</sup> Ed.2012,2130-B,2-13	Shall not exceed 5°C above the receiving water temperature	26.2	25.4
4	pH	-	APHA 22 <sup>nd</sup> Ed.2012,4500-H <sup>+</sup> -B,4-92	5.5 to 9.0	7.84	7.26
5	Total Residual Chlorine	mg/L	APHA 22 <sup>nd</sup> Ed.2012,4500-C1-G,4-69	1.0	N.D.	N.D.
6	Total Suspended Solids	mg/L	APHA 22 <sup>nd</sup> Ed.2012,2540- D, 2-66	100	164.0	20.0
7	Dissolved Phosphate (as P)	mg/L	APHA 22 <sup>nd</sup> Ed.2012,4500-P-C,4-153	5.0	0.68	0.26
8	Fluoride (as F)	mg/L	APHA 22 <sup>nd</sup> Ed.2012,4500-F-B &D,4-84 & 87	2.0	0.26	0.12
9	Lead (as Pb)	mg/L	APHA 22 <sup>nd</sup> Ed.2012,3111-B, 3-18	0.1	N.D.	N.D.
10	Zinc (as Zn)	mg/L	APHA 22 <sup>nd</sup> Ed.2012,3111-B, 3-18	5.0	0.34	0.06
11	Copper (as Cu)	mg/L	APHA 22 <sup>nd</sup> Ed.2012,3111-B, 3-18	3.0	N.D.	N.D.
12	Cadmium (as Cd)	mg/L	APHA 22 <sup>nd</sup> Ed.2012,3500-Cd, 3-105	2.0	N.D.	N.D.
13	Mercury (as Hg)	mg/L	APHA 22 <sup>nd</sup> Ed.2012,3112-B, 3-23	0.01	N.D.	N.D.
14	Arsenic (as As)	mg/L	APHA 22 <sup>nd</sup> Ed.2012,3114-C, 3-38	0.2	N.D.	N.D.
15	Selenium (as Se)	mg/L	APHA 22 <sup>nd</sup> Ed.2012,3114-C, 3-38	0.05	N.D.	N.D.
16	Total Chromium (as Cr)	mg/L	APHA 22 <sup>nd</sup> Ed.2012,3500-Cr-B,3-69	2.0	N.D.	N.D.





HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
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Report No. 0359

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-VI] PART-A INLAND SURFACE WATER	BHANKETA ETP INLET	BANKHETA ETP OUTLET
17	Chemical Oxygen Demand (COD)	mg/L	APHA 22 <sup>nd</sup> Ed.2012, 5520-B, 5-17	250	104.0	34.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS 3025 (Part 44):1993, RA 2003	30	14.6	6.4
19	Oil & Grease	mg/L	IS 3025 (Part 39):1991, RA 2003	10	N.D.	N.D.
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	IS 3025 (Part 43):1992, RA 2003	1.0	N.D.	N.D.

**REMARKS:** mg/lit.: milligram per liter, N.D.-Not Detected.

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For ULTIMATE ENVIROLYTICAL SOLUTIONS

AUTHORIZED SIGNATORY

-----End of the test report-----





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<i>Name &amp; Address Of The Customer</i>		<b>REPORT NO</b>	UES/TR/22-23/0994	
<b>TO, HINDALCO INDUSTRIES LIMITED, GARE PALMA - IV/4, COAL MINE, VILLAGE - BANKHETA, POST MILUPARA, DISTT. - RAIGARH (C.G.) 496107</b>		<b>LAB REF NO</b>	UES/22-23/W/01748	
		<b>DATE OF SAMPLING</b>	20/05/2022	
		<b>DATE OF RECEIPT</b>	21/05/2022	
		<b>DATE OF REPORT</b>	01/06/2022	
		<b>DATE OF ANALYSIS</b>	START:22/05/2022	END:27/05/2022
		<b>SAMPLE DETAILS</b>		
<b>SAMPLE TYPE</b>	WASTE WATER	<b>ORDER /REFERENCE:</b>	N/PO/SRV/2122/0045, DTD. 24- JULY-2021	
<b>CUSTOMER SAMPLE ID</b>	ETP INLET & OUTLET, BANKHETA	<b>SAMPLE CONDITION AT RECEIPT</b>	OK	
<b>PACKING OF SAMPLE</b>	3 L X 1 NO. PVC CAN 1 L X 1 NO. PVC CAN 1 L X 1 NO. GLASS BOTTLE	SEALED	<b>SAMPLE COLLECTED BY</b>	CHEMIST
<b>SAMPLING PROCEDURE</b>	IS:3025(PART I):1987 RA 2003; APHA 22ND ED. 2012, 1060-B, 1-39	<b>QUANTITY RECEIVED</b>	5 LTR	

Report No. 0994

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-VI] PART-A INLAND SURFACE WATER	BHANKETA ETP INLET	BANKHETA ETP OUTLET
1	Colour	Hazen	APHA 23 <sup>rd</sup> Ed. 2012,2120-B,2-6	See 6 of Annexure-I	5.5	<1.0
2	Odour	-	APHA 23 <sup>rd</sup> Ed. 2012,2120-B,2-6	See 6 of Annexure-I	Agreeable	Agreeable
3	Temperature	°C	APHA 23 <sup>rd</sup> Ed.2012,2130-B,2-13	Shall not exceed 5°C above the receiving water temperature	25.4	24.6
4	pH	-	APHA 23 <sup>rd</sup> Ed.2012,4500-H <sup>+</sup> -B,4-92	5.5 to 9.0	7.46	7.28
5	Total Residual Chlorine	mg/L	APHA 23 <sup>rd</sup> Ed.2012,4500-Cl-G, 4 - 6	1.0	N.D.	N.D.
6	Total Suspended Solids	mg/L	APHA 23 <sup>rd</sup> Ed.2012,2540- D, 2-66	100	184.0	26.0
7	Dissolved Phosphate (as P)	mg/L	APHA 23 <sup>rd</sup> Ed.2012,4500-P-C, 4-153	5.0	0.68	0.18
8	Fluoride (as F)	mg/L	APHA 23 <sup>rd</sup> Ed.2012,4500-F-B&D,4-84 & 8	2.0	0.5	0.2
9	Lead (as Pb)	mg/L	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	0.1	N.D.	N.D.
10	Zinc (as Zn)	mg/L	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	5.0	0.36	0.15
11	Copper (as Cu)	mg/L	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	3.0	N.D.	N.D.
12	Cadmium (as Cd)	mg/L	APHA 23 <sup>rd</sup> Ed.2012,3500-Cd, 3-105	2.0	N.D.	N.D.
13	Mercury (as Hg)	mg/L	APHA 23 <sup>rd</sup> Ed.2012,3112-B, 3-23	0.01	N.D.	N.D.
14	Arsenic (as As)	mg/L	APHA 23 <sup>rd</sup> Ed.2012,3114-C, 3-38	0.2	N.D.	N.D.
15	Selenium (as Se)	mg/L	APHA 23 <sup>rd</sup> Ed.2012,3114-C, 3-38	0.05	N.D.	N.D.
16	Total Chromium (as Cr)	mg/L	APHA 23 <sup>rd</sup> Ed.2012,3500-Cr-B,3-69	2.0	N.D.	N.D.





HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
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Report No. 0994

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-VI] PART-A INLAND SURFACE WATER	BHANKETA ETP INLET	BANKHETA ETP OUTLET
17	Chemical Oxygen Demand (COD)	mg/L	APHA 23 <sup>rd</sup> Ed.2012, 5520-B,5-17	250	68.0	32.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS 3025 (Part 44):1993, RA 2003	30	16.4	4.8
19	Oil & Grease	mg/L	IS 3025 (Part 39):1991, RA 2003,	10	N.D.	N.D.
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	IS 3025 (Part 43):1992, RA 2003	1.0	N.D.	N.D.

REMARKS: mg/lit.: milligram per liter, N.D.-Not Detected.

**Terms & conditions**

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- Test sample will be retained for 15days after issue of test report unless otherwise agreed with customer.
- This is for information as the party has asked for above test(s) only.

*Shuchi*  
01/06/22

REVIEWED BY



For ULTIMATE ENVIROLYTICAL SOLUTIONS

*[Signature]*  
01/06/22

AUTHORIZED SIGNATORY

-----End of the test report-----





HDD-272, Phase III - Near JP Chowk  
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Name & Address Of The Customer		REPORT NO	UES/TR/22-23/01974	
<b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA, POST MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		LAB REF NO	UES/22-23/W/02359	
		DATE OF SAMPLING	22/06/2022	
		DATE OF RECEIPT	23/06/2022	
		DATE OF REPORT	01/07/2022	
		DATE OF ANALYSIS	START : 23/06/2022	END : 30/06/2022
<b>SAMPLE DETAILS</b>				
SAMPLE TYPE	WASTE WATER	ORDER /REFERENCE:	N/PO/SRV/2122/0045, DTD. 24-JULY-2021	
CUSTOMER SAMPLE ID	ETP INLET & OUTLET, BANKHETA	SAMPLE CONDITION AT RECEIPT	OK	
PACKING OF SAMPLE	3 L X 1 NO. PVC CAN 1 L X 1 NO. PVC CAN 1 L X 1 NO. GLASS BOTTLE	SEALED	SAMPLE COLLECTED BY	CHEMIST
SAMPLING PROCEDURE	IS:3025(PART I):1987 RA 2003; APHA 22ND ED. 2012, 1060-B, 1-39	QUANTITY RECEIVED	5 LTR	

Report No. 01974

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-VI] PART-A INLAND SURFACE WATER	BHANKETA ETP INLET	BANKHETA ETP OUTLET
1	Colour	Hazen	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	10.5	<1.0
2	Odour	-	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	Agreeable	Agreeable
3	Temperature	°C	APHA 23 <sup>rd</sup> Ed.2012, 2130-B, 2-13	Shall not exceed 5°C above the receiving water temperature	25.6	25.2
4	pH	-	APHA 23 <sup>rd</sup> Ed.2012, 4500-H'-B, 4-92	5.5 to 9.0	7.52	7.31
5	Total Residual Chlorine	mg/L	APHA 23 <sup>rd</sup> Ed.2012, 4500-C1-G, 4 - 6	1.0	N.D.	N.D.
6	Total Suspended Solids	mg/L	APHA 23 <sup>rd</sup> Ed.2012, 2540- D, 2-66	100	162.0	28.0
7	Dissolved Phosphate (as P)	mg/L	APHA 23 <sup>rd</sup> Ed.2012, 4500-P-C, 4-153	5.0	0.54	0.16
8	Fluoride (as F)	mg/L	APHA 23 <sup>rd</sup> Ed.2012, 4500-F-B&D, 4-84 & 8	2.0	0.4	0.2
9	Lead (as Pb)	mg/L	APHA 23 <sup>rd</sup> Ed.2012, 3111-B, 3-18	0.1	N.D.	N.D.
10	Zinc (as Zn)	mg/L	APHA 23 <sup>rd</sup> Ed.2012, 3111-B, 3-18	5.0	0.46	0.13
11	Copper (as Cu)	mg/L	APHA 23 <sup>rd</sup> Ed.2012, 3111-B, 3-18	3.0	N.D.	N.D.
12	Cadmium (as Cd)	mg/L	APHA 23 <sup>rd</sup> Ed.2012, 3500-Cd, 3-105	2.0	N.D.	N.D.
13	Mercury (as Hg)	mg/L	APHA 23 <sup>rd</sup> Ed.2012, 3112-B, 3-23	0.01	N.D.	N.D.
14	Arsenic (as As)	mg/L	APHA 23 <sup>rd</sup> Ed.2012, 3114-C, 3-38	0.2	N.D.	N.D.
15	Selenium (as Se)	mg/L	APHA 23 <sup>rd</sup> Ed.2012, 3114-C, 3-38	0.05	N.D.	N.D.
16	Total Chromium (as Cr)	mg/L	APHA 23 <sup>rd</sup> Ed.2012, 3500-Cr-B, 3-69	2.0	N.D.	N.D.





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Report No. 01974

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-VI] PART-A INLAND SURFACE WATER	BHANKETA ETP INLET	BANKHETA ETP OUTLET
17	Chemical Oxygen Demand (COD)	mg/L	APHA 23 <sup>rd</sup> Ed.2012, 5520-B, 5-17	250	84.0	42.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS 3025 (Part 44):1993, RA 2003	30	18.6	6.8
19	Oil & Grease	mg/L	IS 3025 (Part 39):1991, RA 2003,	10	N.D.	N.D.
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	IS 3025 (Part 43):1992, RA 2003	1.0	N.D.	N.D.

REMARKS: mg/lit.: milligram per liter, N.D.-Not Detected.

*Terms & conditions*

- The report for publication, arbitration or as legal dispute is forbidden.
- Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.
- This is for information as the party has asked for above test.

*[Signature]*  
01/07/22

REVIEWED BY



For ULTIMATE ENVIROLYTICAL SOLUTIONS

*[Signature]*  
01/07/22

AUTHORIZED SIGNATORY

-----End of the test report-----





HDD-272, Phase III - Near JP Chowk  
Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

Recognized by Ministry of Environment Forest and Climate Change under EP act 1986

<i>Name &amp; Address Of The Customer</i>		<b>REPORT NO</b>	UES/TR/22-23/01809	
<b>TO,</b>		<b>LAB REF NO</b>	UES/22-23/W/03645-03646	
<b>HINDALCO INDUSTRIES LIMITED,</b>		<b>DATE OF SAMPLING</b>	25/07/2022	
<b>GARE PALMA - IV/4, COAL MINE,</b>		<b>DATE OF RECEIPT</b>	26/07/2022	
<b>VILLAGE - BANKHETA, POST MILUPARA,</b>		<b>DATE OF REPORT</b>	01/08/2022	
<b>DISTT. - RAIGARH (C.G.) 496107</b>		<b>DATE OF ANALYSIS</b>	START: 26/07/2022	END: 01/08/2022
SAMPLE DETAILS				
<b>SAMPLE TYPE</b>	WASTE WATER		<b>ORDER /REFERENCE:</b>	N/PO/SRV/2122/0045, DTD. 24-JULY-2021
<b>CUSTOMER SAMPLE ID</b>	ETP INLET & OUTLET, BANKHETA		<b>SAMPLE CONDITION AT RECEIPT</b>	OK
<b>PACKING OF SAMPLE</b>	3 L X 1 NO. PVC CAN 1 L X 1 NO. PVC CAN 1 L X 1 NO. GLASS BOTTLE	SEALED	<b>SAMPLE COLLECTED BY</b>	CHEMIST
<b>SAMPLING PROCEDURE</b>	IS:3025(PART I):1987 RA 2003; APHA 22ND ED. 2012, 1060-B, 1-39		<b>QUANTITY RECEIVED</b>	5 LTR

Report No. 01809

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-VI] PART-A INLAND SURFACE WATER	BHANKETA ETP INLET	BANKHETA ETP OUTLET
1	Colour	Hazen	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	15.5	<1.0
2	Odour	-	APHA 23 <sup>rd</sup> Ed. 2012, 2120-B, 2-6	See 6 of Annexure-I	Agreeable	Agreeable
3	Temperature	°C	APHA 23 <sup>rd</sup> Ed. 2012, 2130-B, 2-13	Shall not exceed 5°C above the receiving water temperature	25.4	24.8
4	pH	-	APHA 23 <sup>rd</sup> Ed. 2012, 4500-H <sup>+</sup> -B, 4-92	5.5 to 9.0	7.86	7.46
5	Total Residual Chlorine	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-C1-G, 4 - 6	1.0	N.D.	N.D.
6	Total Suspended Solids	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 2540- D, 2-66	100	146.0	24.0
7	Dissolved Phosphate (as P)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-P-C, 4-153	5.0	0.34	0.11
8	Fluoride (as F)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 4500-F-B&D, 4-84 & 8	2.0	0.36	0.21
9	Lead (as Pb)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	0.1	N.D.	N.D.
10	Zinc (as Zn)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	5.0	0.31	0.14
11	Copper (as Cu)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3111-B, 3-18	3.0	N.D.	N.D.
12	Cadmium (as Cd)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cd, 3-105	2.0	N.D.	N.D.
13	Mercury (as Hg)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3112-B, 3-23	0.01	N.D.	N.D.
14	Arsenic (as As)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.2	N.D.	N.D.
15	Selenium (as Se)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3114-C, 3-38	0.05	N.D.	N.D.
16	Total Chromium (as Cr)	mg/L	APHA 23 <sup>rd</sup> Ed. 2012, 3500-Cr-B, 3-69	2.0	N.D.	N.D.



Report No. 01809

**TEST REPORT**

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-VI] PART-A INLAND SURFACE WATER	BHANKETA ETP INLET	BANKHETA ETP OUTLET
17	Chemical Oxygen Demand (COD)	mg/L	APHA 23 <sup>rd</sup> Ed.2012, 5520-B, 5-17	250	94.0	34.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS 3025 (Part 44):1993, RA 2003	30	14.6	8.4
19	Oil & Grease	mg/L	IS 3025 (Part 39):1991, RA 2003,	10	N.D.	N.D.
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	IS 3025 (Part 43):1992, RA 2003	1.0	N.D.	N.D.

REMARKS: mg/lit.: milligram per liter, N.D.-Not Detected.

*Terms & conditions*

- > The report for publication, arbitration or as legal dispute is forbidden.
- > Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.
- > This is for information as the party has asked for above test(s) only.

*Relle*  
01/08/22

REVIEWED BY



For ULTIMATE ENVIROLYTICAL SOLUTIONS

*[Signature]*  
01/08/22  
AUTHORIZED SIGNATORY

-----End of the test report-----



<b>Name &amp; Address Of The Customer</b> <b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA, POST MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		REPORT NO	UES/TR/22-23/02824	
		LAB REF NO	UES/22-23/W/07880	
		DATE OF SAMPLING	24/08/2022	
		DATE OF RECEIPT	25/08/2022	
		DATE OF REPORT	01/09/2022	
		DATE OF ANALYSIS	START:26/08/2022	END:01/09/2022
<b>SAMPLE DETAILS</b>				
SAMPLE TYPE	WASTE WATER	ORDER /REFERENCE:	VERBAL COMMUNICATION.	
CUSTOMER SAMPLE ID	ETP INLET & OUTLET, BANKHETA	SAMPLE CONDITION AT RECEIPT	OK	
PACKING OF SAMPLE	3 L X 1 NO. PVC CAN 1 L X 1 NO. PVC CAN 1 L X 1 NO. GLASS BOTTLE	SEALED	SAMPLE COLLECTED BY	CHEMIST
SAMPLING PROCEDURE	IS:3025 (PART I):1987 RA 2003; APHA 22ND ED. 2012, 1060-B, 1-39	QUANTITY RECEIVED	5 LTR	

Report No. 02824

### TEST REPORT

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-VI] PART-A INLAND SURFACE WATER	BHANKETA ETP INLET	BANKHETA ETP OUTLET
1	Colour	Hazen	APHA 23 <sup>rd</sup> Ed. 2012,2120-B,2-6	See 6 of Annexure-I	5.0	<1.0
2	Odour	-	APHA 23 <sup>rd</sup> Ed. 2012,2120-B,2-6	See 6 of Annexure-I	Agreeable	Agreeable
3	Temperature	°C	APHA 23 <sup>rd</sup> Ed.2012,2130-B,2-13	Shall not exceed 5°C above the receiving water temperature	25.2	24.8
4	pH	-	APHA 23 <sup>rd</sup> Ed.2012,4500-H <sup>+</sup> -B,4-92	5.5 to 9.0	7.62	7.34
5	Total Residual Chlorine	mg/L	APHA 23 <sup>rd</sup> Ed.2012,4500-C1-G, 4 - 6	1.0	N.D.	N.D.
6	Total Suspended Solids	mg/L	APHA 23 <sup>rd</sup> Ed.2012,2540- D, 2-66	100	192.0	22.0
7	Dissolved Phosphate (as P)	mg/L	APHA 23 <sup>rd</sup> Ed.2012,4500-P-C, 4-153	5.0	0.54	0.16
8	Fluoride (as F)	mg/L	APHA 23 <sup>rd</sup> Ed.2012,4500-F-B&D,4-84 & 8	2.0	0.3	0.1
9	Lead (as Pb)	mg/L	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	0.1	N.D.	N.D.
10	Zinc (as Zn)	mg/L	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	5.0	0.23	0.18
11	Copper (as Cu)	mg/L	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	3.0	N.D.	N.D.
12	Cadmium (as Cd)	mg/L	APHA 23 <sup>rd</sup> Ed.2012,3500-Cd, 3-105	2.0	N.D.	N.D.
13	Mercury (as Hg)	mg/L	APHA 23 <sup>rd</sup> Ed.2012,3112-B, 3-23	0.01	N.D.	N.D.
14	Arsenic (as As)	mg/L	APHA 23 <sup>rd</sup> Ed.2012,3114-C, 3-38	0.2	N.D.	N.D.
15	Selenium (as Se)	mg/L	APHA 23 <sup>rd</sup> Ed.2012,3114-C, 3-38	0.05	N.D.	N.D.
16	Total Chromium (as Cr)	mg/L	APHA 23 <sup>rd</sup> Ed.2012,3500-Cr-B,3-69	2.0	N.D.	N.D.



Report No. 02824

**TEST REPORT**

SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-VI] PART-A INLAND SURFACE WATER	BHANKETA ETP INLET	BANKHETA ETP OUTLET
17	Chemical Oxygen Demand (COD)	mg/L	APHA 23 <sup>rd</sup> Ed.2012, 5520-B,5-17	250	72.0	34.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS 3025 (Part 44):1993, RA 2003	30	18.6	6.8
19	Oil & Grease	mg/L	IS 3025 (Part 39):1991, RA 2003,	10	N.D.	N.D.
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	IS 3025 (Part 43):1992, RA 2003	1.0	N.D.	N.D.

REMARKS: mg/lit.: milligram per liter, N.D.-Not Detected.

**Terms & conditions**

- > The report for publication, arbitration or as legal dispute is forbidden.
- > Test sample will be retained for 15 days after issue of test report unless otherwise agreed with customer.
- > This is for information as the party has asked for above test(s) only.

 01/09/22 <b>REVIEWED BY</b>		For ULTIMATE ENVIROLYTICAL SOLUTIONS  01/09/22 <b>AUTHORIZED SIGNATORY</b>
---	--	---

-----End of the test report-----

<b>Name &amp; Address Of The Customer</b> <b>TO,</b> <b>HINDALCO INDUSTRIES LIMITED,</b> <b>GARE PALMA - IV/4, COAL MINE,</b> <b>VILLAGE - BANKHETA, POST MILUPARA,</b> <b>DISTT. - RAIGARH (C.G.) 496107</b>		<b>REPORT NO</b>	UES/TR/22-23/03284	
		<b>LAB REF NO</b>	UES/22-23/W/08504	
		<b>DATE OF SAMPLING</b>	27/09/2022	
		<b>DATE OF RECEIPT</b>	28/09/2022	
		<b>DATE OF REPORT</b>	03/10/2022	
		<b>DATE OF ANALYSIS</b>	START:29/09/2022	END:03/10/2022
<b>SAMPLE DETAILS</b>				
<b>SAMPLE TYPE</b>	WASTE WATER	<b>ORDER /REFERENCE :</b>	P.O.13552310211, DATED:07.09.2022	
<b>CUSTOMER SAMPLE ID</b>	ETP INLET & OUTLET, BANKHETA	<b>SAMPLE CONDITION AT RECEIPT</b>	OK	
<b>PACKING OF SAMPLE</b>	3 L X 1 NO. PVC CAN 1 L X 1 NO. PVC CAN 1 L X 1 NO. GLASS BOTTLE	SEALED	<b>SAMPLE COLLECTED BY</b>	CHEMIST
<b>SAMPLING PROCEDURE</b>	IS:3025(PART I):1987 RA 2003; APHA 22ND ED. 2012, 1060-B, 1-39	<b>QUANTITY RECEIVED</b>	5 LTR	

Report No. 03284

<b>TEST REPORT</b>						
<b>SR. NO.</b>	<b>PARAMETER</b>	<b>UNIT</b>	<b>METHOD OF TEST</b>	<b>THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-VI] PART-A INLAND SURFACE WATER</b>	<b>BHANKETA ETP INLET</b>	<b>BANKHETA ETP OUTLET</b>
1	Colour	Hazen	APHA 23 <sup>rd</sup> Ed. 2012,2120-B,2-6	See 6 of Annexure-I	10.5	<1.0
2	Odour	-	APHA 23 <sup>rd</sup> Ed. 2012,2120-B,2-6	See 6 of Annexure-I	Agreeable	Agreeable
3	Temperature	°C	APHA 23 <sup>rd</sup> Ed.2012,2130-B,2-13	Shall not exceed 5°C above the receiving water temperature	25.4	24.6
4	pH	-	APHA 23 <sup>rd</sup> Ed.2012,4500-H <sup>+</sup> -B,4-92	5.5 to 9.0	7.42	7.11
5	Total Residual Chlorine	mg/L	APHA 23 <sup>rd</sup> Ed.2012,4500-C1-G, 4 - 6	1.0	N.D.	N.D.
6	Total Suspended Solids	mg/L	APHA 23 <sup>rd</sup> Ed.2012,2540- D, 2-66	100	164.0	24.0
7	Dissolved Phosphate (as P)	mg/L	APHA 23 <sup>rd</sup> Ed.2012,4500-P-C, 4-153	5.0	0.68	0.11
8	Fluoride (as F)	mg/L	APHA 23 <sup>rd</sup> Ed.2012,4500-F-B&D,4-84 & 8	2.0	0.22	0.16
9	Lead (as Pb)	mg/L	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	0.1	N.D.	N.D.
10	Zinc (as Zn)	mg/L	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	5.0	0.32	0.19
11	Copper (as Cu)	mg/L	APHA 23 <sup>rd</sup> Ed.2012,3111-B, 3-18	3.0	N.D.	N.D.
12	Cadmium (as Cd)	mg/L	APHA 23 <sup>rd</sup> Ed.2012,3500-Cd, 3-105	2.0	N.D.	N.D.
13	Mercury (as Hg)	mg/L	APHA 23 <sup>rd</sup> Ed.2012,3112-B, 3-23	0.01	N.D.	N.D.
14	Arsenic (as As)	mg/L	APHA 23 <sup>rd</sup> Ed.2012,3114-C, 3-38	0.2	N.D.	N.D.
15	Selenium (as Se)	mg/L	APHA 23 <sup>rd</sup> Ed.2012,3114-C, 3-38	0.05	N.D.	N.D.
16	Total Chromium (as Cr)	mg/L	APHA 23 <sup>rd</sup> Ed.2012,3500-Cr-B,3-69	2.0	N.D.	N.D.





HDD-272, Phase III - Near JP Chowk  
 Ring Road No.-2, Kabir Nagar, Raipur (C.G.) - 492099  
 Ph : 0771 - 4027777 | Email : ultimatenviro@gmail.com

Report No. 03284

TEST REPORT						
SR. NO.	PARAMETER	UNIT	METHOD OF TEST	THE ENVIRONMENT (PROTECTION) RULES, 1986 [SCHEDULE-VI] PART-A INLAND SURFACE WATER	BHANKETA ETP INLET	BANKHETA ETP OUTLET
17	Chemical Oxygen Demand (COD)	mg/L	APHA 23 <sup>rd</sup> Ed.2012, 5520-B,5-17	250	84.0	42.0
18	Biochemical Oxygen Demand (BOD)	mg/L	IS 3025(Part 44):1993,RA 2003	30	22.8	12.8
19	Oil & Grease	mg/L	IS 3025(Part 39):1991,RA 2003,	10	N.D.	N.D.
20	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/L	IS 3025(Part 43):1992,RA 2003	1.0	N.D.	N.D.

REMARKS: mg/lit.: milligram per liter, N.D.-Not Detected.

Terms & conditions

- > The report for publication, arbitration or as legal dispute is forbidden.
- > Test sample will be retained for 15days after issue of test report unless otherwise agreed with customer.
- > This is for information as the party has asked for above test(s) only.

*[Signature]*  
03/10/22

REVIEWED BY



For ULTIMATE ENVIROLYTICAL SOLUTIONS

*[Signature]*  
03/10/22

AUTHORIZED SIGNATORY

-----End of the test report-----



# Annexure-31

## Form 59

[See rules 115 (2)]

**Pollution Under Control Certificate**

Authorised By :  
Government of Odisha

**Date** : **06/07/2022**  
**Time** : **15:40:46 PM**  
**Validity upto** : **05/07/2023**



Certificate SL. No. : OR01600090002236  
Registration No. : OD16H9126  
Date of Registration : 09/Jul/2021  
Month & Year of Manufacturing : June-2021  
Valid Mobile Number : \*\*\*\*\*3050  
Emission Norms : BHARAT STAGE VI  
Fuel : DIESEL  
PUC Code : OR0160009  
GSTIN : 21APRPC0385A1ZH  
Fees : Rs.177.00  
(GST to be paid extra as applicable)  
MIL observation : No

Vehicle Photo with Registration plate  
60 mm x 30 mm



Sr. No.	Pollutant (as applicable)	Units (as applicable)	Emission limits	Measured Value (upto 2 decimal places)
1	2	3	4	5
Idling Emissions	Carbon Monoxide (CO)	percentage (%)		
	Hydrocarbon, (THC/HC)	ppm		
High idling emissions	CO	percentage (%)		
	RPM	RPM	2500 ± 200	
	Lambda	-	1 ± 0.03	
Smoke Density	Light absorption coefficient	1/metre	1.62	0.97

This PUC certificate is system generated through the national register of motor vehicles and does not require any signature.

Note : 1. Vehicle owners to link their mobile numbers to registered vehicle by logging to <https://vahan.parivahan.gov.in>

Authorised Signature with stamp of PUC operator  
60mm x 20 mm

*Manu*  
(Signature)

## Form 59

[See rules 115 (2)]

**Pollution Under Control Certificate**

Authorised By :  
Government of Odisha

**Date** : **06/07/2022**  
**Time** : **16:28:33 PM**  
**Validity upto** : **05/07/2023**



Certificate SL. No. : OR01600090002238  
Registration No. : OD16H9145  
Date of Registration : 09/Jul/2021  
Month & Year of Manufacturing : June-2021  
Valid Mobile Number : \*\*\*\*\*3050  
Emission Norms : BHARAT STAGE VI  
Fuel : DIESEL  
PUC Code : OR0160009  
GSTIN : 21APRPC0385A1ZH  
Fees : Rs.177.00  
(GST to be paid extra as applicable)  
MIL observation : No

Vehicle Photo with Registration plate  
60 mm x 30 mm



Sr. No.	Pollutant (as applicable)	Units (as applicable)	Emission limits	Measured Value (upto 2 decimal places)
1	2	3	4	5
Idling Emissions	Carbon Monoxide (CO)	percentage (%)		
	Hydrocarbon, (THC/HC)	ppm		
High idling emissions	CO	percentage (%)		
	RPM	RPM	2500 ± 200	
	Lambda	-	1 ± 0.03	
Smoke Density	Light absorption coefficient	1/metre	1.62	0.87

This PUC certificate is system generated through the national register of motor vehicles and does not require any signature.

Note : 1. Vehicle owners to link their mobile numbers to registered vehicle by logging to <https://vahan.parivahan.gov.in>

Authorised Signature with stamp of PUC operator  
60mm x 20 mm

Non  
899

## Form 59

[See rules 115 (2)]

**Pollution Under Control Certificate**

Authorised By :  
Government of Odisha

**Date** : **06/07/2022**  
**Time** : **16:32:07 PM**  
**Validity upto** : **05/07/2023**



Certificate SL. No. : OR01600090002240  
Registration No. : OD16H9152  
Date of Registration : 09/Jul/2021  
Month & Year of Manufacturing : June-2021  
Valid Mobile Number : \*\*\*\*\*3050  
Emission Norms : BHARAT STAGE VI  
Fuel : DIESEL  
PUC Code : OR0160009  
GSTIN : 21APRPC0385A1ZH  
Fees : Rs.177.00  
(GST to be paid extra as applicable)  
MIL observation : No

Vehicle Photo with Registration plate  
60 mm x 30 mm



Sr. No.	Pollutant (as applicable)	Units (as applicable)	Emission limits	Measured Value (upto 2 decimal places)
1	2	3	4	5
Idling Emissions	Carbon Monoxide (CO)	percentage (%)		
	Hydrocarbon, (THC/HC)	ppm		
High idling emissions	CO	percentage (%)		
	RPM	RPM	2500 ± 200	
	Lambda	-	1 ± 0.03	
Smoke Density	Light absorption coefficient	1/metre	1.62	1.4

This PUC certificate is system generated through the national register of motor vehicles and does not require any signature.

Note : 1. Vehicle owners to link their mobile numbers to registered vehicle by logging to <https://vahan.parivahan.gov.in>

Authorised Signature with stamp of PUC operator  
60mm x 20 mm

*Manu*  
901



[See rules 115 (2)]

**Pollution Under Control Certificate**

Authorised By :  
Government of Chhattisgarh

Date : 30/06/2022  
Time : 11:15:22 AM  
Validity upto : 29/06/2023



Certificate SL. No. : CG01300060000783  
Registration No. : CG13AC8939  
Date of Registration : 17/Jul/2018  
Month & Year of Manufacturing : June-2018  
Valid Mobile Number : \*\*\*\*\*2175  
Emission Norms : BHARAT STAGE IV  
Fuel : DIESEL  
PUC Code : CG0130006  
GSTIN :  
Fees : Rs.150.00  
(GST to be paid extra as applicable)  
MIL observation : No

Vehicle Photo with Registration plate  
60 mm x 30 mm

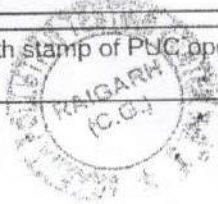


Sr. No.	Pollutant (as applicable)	Units (as applicable)	Emission limits	Measured Value (upto 2 decimal places)
1	2	3	4	5
Idling Emissions	Carbon Monoxide (CO)	percentage (%)		
	Hydrocarbon, (THC/HC)	ppm		
High idling emissions	CO	percentage (%)		
	RPM	RPM	2500 ± 200	
	Lambda	-	1 ± 0.03	
Smoke Density	Light absorption coefficient	1/metre	1.62	0.99

This PUC certificate is system generated through the national register of motor vehicles and does not require any signature.

Note : 1. Vehicle owners to link their mobile numbers to registered vehicle by logging to <https://vahan.parivahan.gov.in>

Authorised Signature with stamp of PUC operator  
60mm x 20 mm



902  
12/7/22  
R

[See rules 115 (2)]

**Pollution Under Control Certificate**

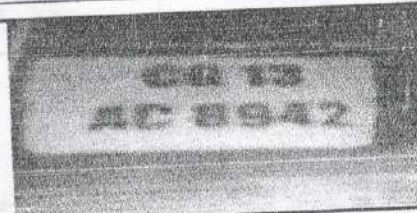
Authorised By :  
Government of Chhattisgarh

Date : 30/06/2022  
Time : 11:10:19 AM  
Validity upto : 29/06/2023



Certificate SL. No. : CG01300060000782  
Registration No. : CG13AC8942  
Date of Registration : 17/Jul/2018  
Month & Year of Manufacturing : June-2018  
Valid Mobile Number : \*\*\*\*\*2175  
Emission Norms : BHARAT STAGE IV  
Fuel : DIESEL  
PUC Code : CG0130006  
GSTIN :  
Fees : Rs.150.00  
(GST to be paid extra as applicable)  
MIL observation : No

Vehicle Photo with Registration plate  
60 mm x 30 mm

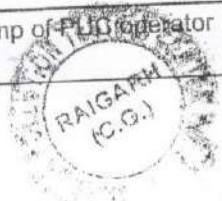


Sr. No.	Pollutant (as applicable)	Units (as applicable)	Emission limits	Measured Value (upto 2 decimal places)
1	2	3	4	5
Idling Emissions	Carbon Monoxide (CO)	percentage (%)		
	Hydrocarbon, (THC/HC)	ppm		
High idling emissions	CO	percentage (%)		
	RPM	RPM	2500 ± 200	
Smoke Density	Lambda	-	1 ± 0.03	
	Light absorption coefficient	1/metre	1.62	0.91

This PUC certificate is system generated through the national register of motor vehicles and does not require any signature.

Note : 1. Vehicle owners to link their mobile numbers to registered vehicle by logging to <https://vahan.parivahan.gov.in>

Authorised Signature with stamp of PUC operator  
60mm x 20 mm



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Form 59

[See rules 115 (2)]

**Pollution Under Control Certificate**

Authorised By :  
Government of Odisha

Date : 06/07/2022  
Time : 16:24:23 PM  
Validity upto : 05/07/2023



Certificate SL. No. : OR01600090002237  
Registration No. : OD16H9136  
Date of Registration : 09/Jul/2021  
Month & Year of Manufacturing : June-2021  
Valid Mobile Number : \*\*\*\*\*3050  
Emission Norms : BHARAT STAGE VI  
Fuel : DIESEL  
PUC Code : OR0160009  
GSTIN : 21APRPC0385A1ZH  
Fees : Rs.177.00  
(GST to be paid extra as applicable)  
MIL observation : No

Vehicle Photo with Registration plate  
60 mm x 30 mm



Sr. No.	Pollutant (as applicable)	Units (as applicable)	Emission limits	Measured Value (upto 2 decimal places)
1	2	3	4	5
Idling Emissions	Carbon Monoxide (CO)	percentage (%)		
	Hydrocarbon, (THC/HC)	ppm		
High idling emissions	CO	percentage (%)		
	RPM	RPM	2500 ± 200	
	Lambda	-	1 ± 0.03	
Smoke Density	Light absorption coefficient	1/metre	1.62	0.97

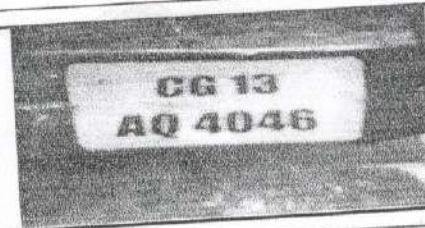
This PUC certificate is system generated through the national register of motor vehicles and does not require any signature.

Note : 1. Vehicle owners to link their mobile numbers to registered vehicle by logging to <https://vahan.parivahan.gov.in>

Authorised Signature with stamp of PUC operator  
60mm x 20 mm

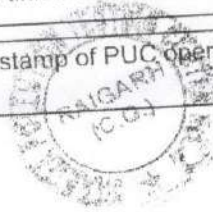
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[See rules 115 (2)]

**Pollution Under Control Certificate**Authorised By :  
Government of ChhattisgarhDate : 01/07/2022  
Time : 13:20:08 PM  
Validity upto : 30/06/2023Certificate SL. No. : CG01300060000797  
Registration No. : CG13AQ4046  
Date of Registration : 11/Aug/2017  
Month & Year of Manufacturing : May-2017  
Valid Mobile Number : \*\*\*\*\*2175  
Emission Norms : BHARAT STAGE IV  
Fuel : DIESEL  
PUC Code : CG0130006  
GSTIN :  
Fees : Rs.150.00  
(GST to be paid extra as applicable)  
MIL observation : NoVehicle Photo with Registration plate  
60 mm x 30 mm

Sr. No.	Pollutant (as applicable)	Units (as applicable)	Emission limits	Measured Value (upto 2 decimal places)
1	2	3	4	5
Idling Emissions	Carbon Monoxide (CO)	percentage (%)		
	Hydrocarbon, (THC/HC)	ppm		
High idling emissions	CO	percentage (%)	2500 ± 200	
	RPM	RPM	1 ± 0.03	
Smoke Density	Lambda		1.62	1.41
	Light absorption coefficient	1/metre		

This PUC certificate is system generated through the national register of motor vehicles and does not require any signature.

Note : 1. Vehicle owners to link their mobile numbers to registered vehicle by logging to <https://vahan.parivahan.gov.in>Authorised Signature with stamp of PUC operator  
60mm x 20 mm941  
New  
14/7/22



## Form 59

[See rules 115 (2)]

**Pollution Under Control Certificate**Authorised By :  
Government of OdishaDate : 19/07/2022  
Time : 16:31:50 PM  
Validity upto : 18/07/2023

Certificate SL. No. : OR01600090002259  
 Registration No. : OD16H9487  
 Date of Registration : 22/Jul/2021  
 Month & Year of Manufacturing : June-2021  
 Valid Mobile Number : \*\*\*\*\*3050  
 Emission Norms : BHARAT STAGE VI  
 Fuel : DIESEL  
 PUC Code : OR0160009  
 GSTIN : 21APRPC0385A1ZH  
 Fees : Rs.177.00  
 (GST to be paid extra as applicable)  
 MIL observation : No

Vehicle Photo with Registration plate  
60 mm x 30 mm



Sr. No.	Pollutant (as applicable)	Units (as applicable)	Emission limits	Measured Value (upto 2 decimal places)
1	2	3	4	5
Idling Emissions	Carbon Monoxide (CO)	percentage (%)		
	Hydrocarbon, (THC/HC)	ppm		
High idling emissions	CO	percentage (%)		
	RPM	RPM	2500 ± 200	
	Lambda	-	1 ± 0.03	
Smoke Density	Light absorption coefficient	1/metre	1.62	0.85

This PUC certificate is system generated through the national register of motor vehicles and does not require any signature.

Note : 1. Vehicle owners to link their mobile numbers to registered vehicle by logging to <https://vahan.parivahan.gov.in>

Authorised Signature with stamp of PUC operator  
60mm x 20 mm

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[See rules 115 (2)]

**Pollution Under Control Certificate**

Authorised By :  
Government of Odisha

**Date** : 19/07/2022  
**Time** : 16:36:13 PM  
**Validity upto** : 18/07/2023



Certificate SL. No. : OR01600090002261  
Registration No. : OD16H9491  
Date of Registration : 22/Jul/2021  
Month & Year of Manufacturing : June-2021  
Valid Mobile Number : \*\*\*\*\*3050  
Emission Norms : BHARAT STAGE VI  
Fuel : DIESEL  
PUC Code : OR0160009  
GSTIN : 21APRPC0385A1ZH  
Fees : Rs.177.00  
(GST to be paid extra as applicable)  
MIL observation : No

Vehicle Photo with Registration plate  
60 mm x 30 mm



Sr. No.	Pollutant (as applicable)	Units (as applicable)	Emission limits	Measured Value (upto 2 decimal places)
1	2	3	4	5
Idling Emissions	Carbon Monoxide (CO)	percentage (%)		
	Hydrocarbon, (THC/HC)	ppm		
High idling emissions	CO	percentage (%)		
	RPM	RPM	2500 ± 200	
	Lambda	-	1 ± 0.03	
Smoke Density	Light absorption coefficient	1/metre	1.62	0.99

This PUC certificate is system generated through the national register of motor vehicles and does not require any signature.

Note : 1. Vehicle owners to link their mobile numbers to registered vehicle by logging to <https://vahan.parivahan.gov.in>

Authorised Signature with stamp of PUC operator  
60mm x 20 mm

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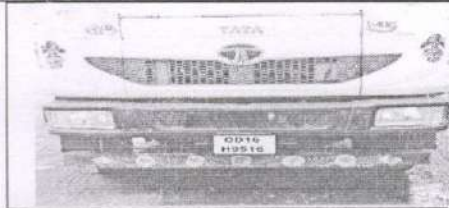


[See rules 115 (2)]

**Pollution Under Control Certificate**Authorised By :  
Government of OdishaDate : 19/07/2022  
Time : 17:16:12 PM  
Validity upto : 18/07/2023

Certificate SL. No. : OR01600090002270  
 Registration No. : OD16H9516  
 Date of Registration : 22/Jul/2021  
 Month & Year of Manufacturing : June-2021  
 Valid Mobile Number : \*\*\*\*\*3050  
 Emission Norms : BHARAT STAGE VI  
 Fuel : DIESEL  
 PUC Code : OR0160009  
 GSTIN : 21APRPC0385A1ZH  
 Fees : Rs.177.00  
 (GST to be paid extra as applicable)  
 MIL observation : No

Vehicle Photo with Registration plate  
60 mm x 30 mm



Sr. No.	Pollutant (as applicable)	Units (as applicable)	Emission limits	Measured Value (upto 2 decimal places)
1	2	3	4	5
Idling Emissions	Carbon Monoxide (CO)	percentage (%)		
	Hydrocarbon, (THC/HC)	ppm		
High idling emissions	CO	percentage (%)		
	RPM	RPM	2500 ± 200	
	Lambda	-	1 ± 0.03	
Smoke Density	Light absorption coefficient	1/metre	1.62	1.08

This PUC certificate is system generated through the national register of motor vehicles and does not require any signature.

Note : 1. Vehicle owners to link their mobile numbers to registered vehicle by logging to <https://vahan.parivahan.gov.in>

Authorised Signature with stamp of PUC operator  
60mm x 20 mm †

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## Form 59

[See rules 115 (2)]

**Pollution Under Control Certificate**

Authorised By :  
Government of Odisha

Date : 19/07/2022  
Time : 16:25:11 PM  
Validity upto : 18/07/2023



Certificate SL. No. : OR01600090002257  
Registration No. : OD16H9485  
Date of Registration : 22/Jul/2021  
Month & Year of Manufacturing : June-2021  
Valid Mobile Number : \*\*\*\*\*3050  
Emission Norms : BHARAT STAGE VI  
Fuel : DIESEL  
PUC Code : OR0160009  
GSTIN : 21APRPC0385A1ZH  
Fees : Rs.177.00  
(GST to be paid extra as applicable)  
MIL observation : No

Vehicle Photo with Registration plate  
60 mm x 30 mm



Sr. No.	Pollutant (as applicable)	Units (as applicable)	Emission limits	Measured Value (upto 2 decimal places)
1	2	3	4	5
Idling Emissions	Carbon Monoxide (CO)	percentage (%)		
	Hydrocarbon, (THC/HC)	ppm		
High idling emissions	CO	percentage (%)		
	RPM	RPM	2500 ± 200	
	Lambda	-	1 ± 0.03	
Smoke Density	Light absorption coefficient	1/metre	1.62	0.99

This PUC certificate is system generated through the national register of motor vehicles and does not require any signature.

Note : 1. Vehicle owners to link their mobile numbers to registered vehicle by logging to <https://vahan.parivahan.gov.in>

Authorised Signature with stamp of PUC operator  
60mm x 20 mm



## Form 59

[See rules 115 (2)]

**Pollution Under Control Certificate**

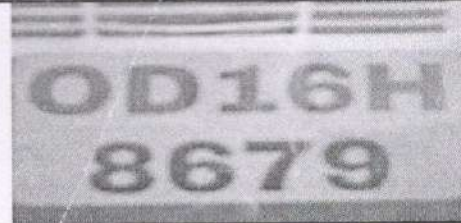
Authorised By :  
Government of Odisha

Date : 28/06/2022  
Time : 11:56:05 AM  
Validity upto : 27/06/2023



Certificate SL. No. : OR01600070000728  
Registration No. : OD16H8679  
Date of Registration : 28/Jun/2021  
Month & Year of Manufacturing : March-2021  
Valid Mobile Number : \*\*\*\*\*3050  
Emission Norms : BHARAT STAGE VI  
Fuel : DIESEL  
PUC Code : OR0160007  
GSTIN : 21ACCPN6705H1ZY  
Fees : Rs.177.0  
MIL observation : No

Vehicle Photo with Registration plate  
60 mm x 30 mm



Sr. No.	Pollutant (as applicable)	Units (as applicable)	Emission limits	Measured Value (upto 2 decimal places)
1	2	3	4	5
Idling Emissions	Carbon Monoxide (CO)	percentage (%)		
	Hydrocarbon, (THC/HC)	ppm		
High idling emissions	CO	percentage (%)		
	RPM	RPM	2500 ± 200	
	Lambda	-	1 ± 0.03	
Smoke Density	Light absorption coefficient	1/metre	1.62	0.78

This PUC certificate is system generated through the national register of motor vehicles and does not require any signature.

Note : 1. Vehicle owners to link their mobile numbers to registered vehicle by logging to <https://vahan.parivahan.gov.in>

Authorised Signature with stamp of PUC operator  
60mm x 20 mm

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## Form 59

[See rules 115 (2)]

**Pollution Under Control Certificate**

Authorised By :  
Government of Odisha

Date : 19/07/2022  
Time : 17:26:11 PM  
Validity upto : 18/07/2023



Certificate SL. No. : OR01600090002272  
Registration No. : OD16H9539  
Date of Registration : 22/Jul/2021  
Month & Year of Manufacturing : June-2021  
Valid Mobile Number : \*\*\*\*\*3050  
Emission Norms : BHARAT STAGE VI  
Fuel : DIESEL  
PUC Code : OR0160009  
GSTIN : 21APRPC0385A1ZH  
Fees : Rs.177.00  
(GST to be paid extra as applicable)  
MIL observation : No

Vehicle Photo with Registration plate  
60 mm x 30 mm



Sr. No.	Pollutant (as applicable)	Units (as applicable)	Emission limits	Measured Value (upto 2 decimal places)
1	2	3	4	5
Idling Emissions	Carbon Monoxide (CO)	percentage (%)		
	Hydrocarbon, (THC/HC)	ppm		
High idling emissions	CO	percentage (%)		
	RPM	RPM	2500 ± 200	
	Lambda	-	1 ± 0.03	
Smoke Density	Light absorption coefficient	1/metre	1.62	1.33

This PUC certificate is system generated through the national register of motor vehicles and does not require any signature.

Note : 1. Vehicle owners to link their mobile numbers to registered vehicle by logging to <https://vahan.parivahan.gov.in>

Authorised Signature with stamp of PUC operator  
60mm x 20 mm



[See rules 115 (2)]

**Pollution Under Control Certificate**

Authorised By :  
Government of Odisha

**Date** : **19/07/2022**  
**Time** : **16:48:07 PM**  
**Validity upto** : **18/07/2023**



Certificate SL. No. : OR01600090002268  
Registration No. : OD16H9509  
Date of Registration : 22/Jul/2021  
Month & Year of Manufacturing : June-2021  
Valid Mobile Number : \*\*\*\*\*3050  
Emission Norms : BHARAT STAGE VI  
Fuel : DIESEL  
PUC Code : OR0160009  
GSTIN : 21APRPC0385A1ZH  
Fees : Rs.177.00  
(GST to be paid extra as applicable)  
MIL observation : No

Vehicle Photo with Registration plate  
60 mm x 30 mm



Sr. No.	Pollutant (as applicable)	Units (as applicable)	Emission limits	Measured Value (upto 2 decimal places)
1	2	3	4	5
Idling Emissions	Carbon Monoxide (CO)	percentage (%)		
	Hydrocarbon, (THC/HC)	ppm		
High idling emissions	CO	percentage (%)		
	RPM	RPM	2500 ± 200	
	Lambda	-	1 ± 0.03	
Smoke Density	Light absorption coefficient	1/metre	1.62	1.34

This PUC certificate is system generated through the national register of motor vehicles and does not require any signature.

Note : 1. Vehicle owners to link their mobile numbers to registered vehicle by logging to <https://vahan.parivahan.gov.in>

Authorised Signature with stamp of PUC operator  
60mm x 20 mm

**Pollution Under Control Certificate**

Authorised By :  
Government of Odisha

Date : 06/07/2022  
Time : 15:27:51 PM  
Validity upto : 05/07/2023



Certificate SL. No. : OR01600090002233  
Registration No. : OD16H9117  
Date of Registration : 09/Jul/2021  
Month & Year of Manufacturing : June-2021  
Valid Mobile Number : \*\*\*\*\*3050  
Emission Norms : BHARAT STAGE VI  
Fuel : DIESEL  
PUC Code : OR0160009  
GSTIN : 21APRPC0385A1ZH  
Fees : Rs.177.00  
(GST to be paid extra as applicable)  
MIL observation : No

Vehicle Photo with Registration plate  
60 mm x 30 mm



Sr. No.	Pollutant (as applicable)	Units (as applicable)	Emission limits	Measured Value (upto 2 decimal places)
1	2	3	4	5
Idling Emissions	Carbon Monoxide (CO)	percentage (%)		
	Hydrocarbon, (THC/HC)	ppm		
High idling emissions	CO	percentage (%)		
	RPM	RPM	2500 ± 200	
	Lambda	-	1 ± 0.03	
Smoke Density	Light absorption coefficient	1/metre	1.62	0.96

This PUC certificate is system generated through the national register of motor vehicles and does not require any signature.

Note : 1. Vehicle owners to link their mobile numbers to registered vehicle by logging to <https://vahan.parivahan.gov.in>

Authorised Signature with stamp of PUC operator  
60mm x 20 mm

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# Annexure-32



National Accreditation Board for  
Testing and Calibration Laboratories

**CERTIFICATE OF ACCREDITATION**

**ULTIMATE ENVIROLYTICAL SOLUTIONS**

has been assessed and accredited in accordance with the standard

**ISO/IEC 17025:2017**

**"General Requirements for the Competence of Testing &  
Calibration Laboratories"**

for its facilities at

HDD 272, PHASE-III, KABIR NAGAR, RAIPUR, CHHATTISGARH, INDIA

in the field of

**TESTING**

Certificate Number: TC-6065

Issue Date: 27/10/2021

Valid Until: 26/10/2023

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.

(To see the scope of accreditation of this laboratory, you may also visit NABL website [www.nabl-india.org](http://www.nabl-india.org))

Name of Legal Identity : ULTIMATE ENVIROLYTICAL SOLUTIONS

Signed for and on behalf of NABL



N. Venkateswaran  
Chief Executive Officer



## छत्तीसगढ़ पर्यावरण संरक्षण मंडल

पर्यावास भवन, सेक्टर - 19,

नवा रायपुर अटल नगर, जिला-रायपुर (छ.ग.) 492002

Email add - [hocecb@gmail.com](mailto:hocecb@gmail.com)

क्रमांक 1007 मुख्या/वैज्ञा./छ.ग.प.सं.मं./2022  
प्रति,

नवा रायपुर, अटल नगर, दिनांक 12/5/2022

श्री अनुराग श्रीवास्तव,  
मैनेजिंग पार्टनर/क्वालिटी मैनेजर,  
मेसर्स अल्टीमेट इन्वायरोलाईटिकल सॉल्यूशन्स,  
272-एच.डी.डी., फेस-3, कबीर नगर, रिंग रोड नं. 2,  
जिला - रायपुर (छ.ग.)

विषय :- प्रदेश में संचालित निजी प्रयोगशाला को छत्तीसगढ़ पर्यावरण संरक्षण मंडल द्वारा प्रदत्त मान्यता के संबंध में।

संदर्भ :- 1. आपका आवेदन पत्र क्रमांक UES/22-23/027 दिनांक 04/05/2022.  
2. मंडल मुख्यालय का पत्र क्रमांक 3398 दिनांक 17/08/2021.  
3. National Accreditation Board for Testing and Calibration Laboratories का सर्टिफिकेट नं. TC-6065 दिनांक 27/10/2021.

---:OO:---

उपरोक्त विषयांतर्गत संदर्भित पत्रों का अवलोकन करें। लेख है कि मंडल मुख्यालय द्वारा पत्र क्रमांक 3398 दिनांक 17/08/2021 के माध्यम से आपके निजी प्रयोगशाला को जल (प्रदूषण निवारण तथा नियंत्रण) अधिनियम, 1974 की धारा 17 (2) एवं वायु (प्रदूषण निवारण तथा नियंत्रण) अधिनियम, 1981 की धारा 17 (2) के अंतर्गत मान्यता प्रदान की गई थी, जिसकी वैधता दिनांक 25/06/2022 तक है। संदर्भ - 3 पर उल्लेखित सर्टिफिकेट नं. TC-6065 दिनांक 27/10/2021 के अनुक्रम में छत्तीसगढ़ पर्यावरण संरक्षण मंडल द्वारा जल (प्रदूषण निवारण तथा नियंत्रण) अधिनियम, 1974 की धारा 17 (2) एवं वायु (प्रदूषण निवारण तथा नियंत्रण) अधिनियम, 1981 की धारा 17 (2) के अंतर्गत प्रदत्त मान्यता की वैधता दिनांक 26/10/2023 तक बढ़ाई जाती है। कृपया आपकी प्रयोगशाला में प्रचालकों की अद्यतन विश्लेषण दर सूची से मंडल को अवगत कराते हुए इस पत्र की पावती भेजे।



सदस्य सचिव

छत्तीसगढ़ पर्यावरण संरक्षण मंडल,  
नवा रायपुर अटल नगर, रायपुर (छ.ग.)

पृ.क्रमांक मुख्या/वैज्ञा./छ.ग.प.सं.मं./2022

प्रतिलिपि: क्षेत्रीय अधिकारी, क्षेत्रीय कार्यालय,  
रायपुर/भिलाई-दुर्ग/बिलासपुर/कोरबा/रायगढ़/अंबिकापुर/जगदलपुर की ओर सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।

नवा रायपुर अटल नगर, दिनांक / /2022

छत्तीसगढ़ पर्यावरण संरक्षण मंडल,  
नवा रायपुर अटल नगर, रायपुर (छ.ग.)

सदस्य सचिव

छत्तीसगढ़ पर्यावरण संरक्षण मंडल,  
नवा रायपुर अटल नगर, रायपुर (छ.ग.)





केन्द्रीय प्रदूषण नियंत्रण बोर्ड  
CENTRAL POLLUTION CONTROL BOARD  
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय भारत सरकार  
MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE GOVT. OF INDIA

F. No. LB/99/7/2021-INST LAB-HO-CPCB-HO/Pvt/ 4564

Dated: 28<sup>th</sup> September, 2022

Provisional Certificate

To,  
Head of Laboratory,  
M/s Ultimate Envirollytical Solutions,  
HDD272, Phase-III, Kabir Nagar,  
Raipur -492099, Chhattisgarh.

Subject: Recognition of M/s Ultimate Envirollytical Solutions, HDD272, Phase-III, Kabir Nagar, Raipur -492099, Chhattisgarh, as Environmental laboratory under the Environmental (Protection) Act-1986.

Sir,

I am directed to refer the online application, dated 24/05/2022 for recognition of your laboratory under Environmental (Protection) Act, 1986. Based on the recommendations of the concerned Division, approval of Competent Authority for recognition of Environmental laboratories and your acceptance of the revised terms and conditions at Annexure-III & IV of the guidelines for recognition of environmental laboratories, CPCB approves the renewal of recognition of M/s Ultimate Envirollytical Solutions, HDD272, Phase-III, Kabir Nagar, Raipur -492099, Chhattisgarh, as shall be notified in the Gazette of India. Considering the current requirement of mandatory accreditation/ certifications of the laboratory, **this recognition shall be valid up to 26/10/2023 in continuation to earlier recognition.**

2. As sought in the aforementioned application M/s Ultimate Envirollytical Solutions, HDD272, Phase-III, Kabir Nagar, Raipur -492099, Chhattisgarh, may undertake the following tests:

- i. **Physical Tests-** Conductivity, Colour, pH, Fixed & Volatile Solids, Total Solids, Total Dissolved Solids, Total Suspended Solids, Turbidity, Temperature, Velocity & Discharge measurement, Flocculation test (Jar test), Odour, Salinity, Settleable Solids and Sludge Volume Index (SVI).
- ii. **Inorganic (General and Non-Metallic):** Acidity, Alkalinity, Ammonical Nitrogen, Chloride, Chlorine residual, Dissolved Oxygen, Fluoride, Total Hardness, Total Kjeldahl Nitrogen (TKN), Nitrite Nitrogen, Nitrate Nitrogen, Phosphate, Sulphate, Bromide, Chlorine Demand, Iodine, Sulphite, Silica, Cyanide and Sulphide.
- iii. **Inorganic (Trace Metals):** Boron, Cadmium, Calcium, Chromium Total, Chromium Hexavalent, Copper, Iron, Lead, Magnesium, Mercury, Nickel, Potassium, Sodium, Sodium Absorption Ratio (SAR), Zinc, Arsenic, Aluminium, Barium, Manganese, Selenium and Vanadium.
- iv. **Organics (General) and Trace Organics:** Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Oil and Grease, Phenolic Compounds, Pesticides (each) (Organochlorine and Organo nitrogen-phosphorus), Total Organic Carbon, Poly-Chlorinated Biphenyl (PCB's) each, Polynuclear Aromatic Hydrocarbon (PAH) each, and Organic Carbon (in solid).
- v. **Microbiological Test:** Total Coliform, Faecal Coliform, *E. coli*, *Faecal Streptococci* and Total Plate Count.
- vi. **Toxicological Tests:** Bioassay method for evaluation of toxicity using fish and Measurement of toxicity using Daphnia or Other Organism.
- vii. **Characterization of Hazardous waste:** Preparation of Leachate (TCLP extract/water extract), Corrosivity, Ignibility (Flash point), Reactivity and Measurement of heavy metals/pesticides in the waste and leachate.

Contd.

'परिवेश भवन' पूर्वी अर्जुन नगर, दिल्ली-110032

Parivesh Bhawan, East Arjun Nagar, Delhi-110032

दूरभाष/Tel : 43102030, 22305792, वेबसाइट/Website : www.cpcb.nic.in



- viii. **Soil/Sludge/Sediment and Solid Waste:** Boron, Cation Exchange Capacity (CEC), Electrical Conductivity, Nitrogen (available), Organic Carbon/matter (Chemical method), pH, Phosphorous (available), Phosphate (ortho), Phosphate (total), Potassium, SAR in Soil Extract, Sodium, Soil Moisture, TKN, Calorific Value, Ammonia, Bicarbonate, Calcium, Calcium Carbonate, Chloride, Colour, Exchangeable Sodium Percentage (ESP), Heavy metal, Magnesium, Nitrate, PAH, Pesticide and Sulphate.
- ix. **Ambient Air/ Fugitive Emissions:** Nitrogen Dioxide (NO<sub>2</sub>), Sulphur Dioxide (SO<sub>2</sub>), Total Suspended Particulate Matter, Respirable Suspended Particulate Matter (PM<sub>10</sub>), Ammonia, Carbon Monoxide, Chlorine, Fluoride, Lead, Ozone, and PM<sub>2.5</sub>.
- x. **Stack Gases/ Source Emission:** Particulate Matter, Sulphur Dioxide, Velocity & Flow, Carbon Dioxide, Carbon Monoxide, Temperature, Oxygen, Oxides of Nitrogen, Acid mist, Ammonia, Fluoride (Gaseous), Chlorine and Hydrogen Sulphide.
- xi. **Noise Level:** Noise Level Measurement (20-140 dBa) and Ambient Noise and Source Specific Noise.
- xii. **Meteorological:** Ambient Temperature, Wind Direction, Wind Speed, Relative Humidity, and Rainfall.

3. Further, the following analysts have been approved as Government Analysts.

- i. Sh. Anurag K. Shrivastava
- ii. Smt. Snehal Akulwar
- iii. Sh. Pramod Choubey

2. The laboratory shall compulsorily participate in the Analytical Quality Exercise conducted by the Central Pollution Control Board (CPCB) to ascertain the capability of the laboratory and analysis carried out and shall submit quarterly progress report to CPCB.
3. The surprise inspection/periodic surveillance of the recognized environment laboratory will be undertaken by CPCB to assess its proper functioning systematic operation and reliability of data generated at the laboratory.
4. It is also mandatory for the laboratory to have requisite accreditations of the ISO: 17025 (NABL) and ISO:45001 (OH&SMS) and its renewal as per accreditation rules. This recognition is subject to such accreditations and renewals as applicable. The laboratory is required to apply online for further renewal of recognition through CPCB web portal after renewal of the mandatory accreditations / certifications concerned.
5. The laboratory should compulsorily follow the accepted terms and conditions. In case of serious non-compliance of any of the terms and conditions, the laboratory may be black listed for a minimum period of two years and civil/criminal proceedings, as applicable, may be initiated for performing functions on behalf of the Government in an unauthorized manner.

Yours faithfully,

 28/7/22

(Dr. K. Ranganathan)  
Scientist-E & Divisional Head  
Instrumentation Laboratory

# Annexure-33

## IME PME REPORT OF LAST 3 YEAR UP TO 2020 TO 2022

### IME & PME REPORT CY 2020

Month	IME IV/4 2020				PME IV/4 2020		
	MANAGEMENT	DEPARTMENT	GET/TRAINEE	CONTRACT	MANAGEMENT	COMPANY	CONTRACT
	STAFF	ASSOCIATE					
Jan-20	0	0	0	16	0	0	0
Feb-20	0	0	5	16	0	0	0
Mar-20	0	0	0	5	23	6	0
Apr-20	0	0	0	0	0	0	0
May-20	0	0	0	2	0	0	0
Jun-20	0	0	0	2	0	0	0
Jul-20	0	0	0	11	0	0	0
Aug-20	0	0	0	0	0	0	0
Sep-20	0	0	0	0	0	0	0
Oct-20	0	0	0	0	0	0	0
Nov-20	0	0	2	1	0	0	0
Dec-20	0	0	0	9	14	11	0
<b>TOTAL</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>62</b>	<b>37</b>	<b>17</b>	<b>0</b>

### IME & PME REPORT CY 2021

Month	IME-IV/4 2021				PME IV/4 2021		
	DEPARTMENT	DEPARTMENT	GET/TRAINEE	CONTRACT	DEPARTMENT	DEPARTMENT	CONTRACT
	STAFF	ASSOCIATE					
Jan-21	0	0	0	27	13	6	0
Feb-21	0	0	0	18	17	4	0
Mar-21	0	0	0	50	0	0	46
Apr-21	0	0	0	7	0	0	0
May-21	0	0	0	6	0	0	0
Jun-21	0	0	0	4	0	0	0
Jul-21	0	0	0	1	1	0	0
Aug-21	0	0	0	0	14	14	0
Sep-21	0	0	0	2	0	0	0
Oct-21	0	0	5	6	0	0	0
Nov-21	0	0	3	22	0	0	0
Dec-21	0	0	2	24	0	0	6
<b>TOTAL</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>167</b>	<b>45</b>	<b>24</b>	<b>52</b>

### IME & PME REPORT CY 2022

Month	IME-IV/4 2022				PME IV/4 2022		
	DEPARTMENT	DEPARTMENT	GET/TRAINEE	CONTRACT	DEPARTMENT	DEPARTMENT	CONTRACT
	STAFF	ASSOCIATE					
Jan-22	0	0	0	1	0	0	0
Feb-22	0	0	0	7	0	0	0
Mar-22	0	0	0	13	2	13	31
Apr-22	0	0	12	56	0	0	0
May-22	0	0	2	23	0	0	0
Jun-22	0	0	0	38	0	0	0
Jul-22	0	0	0	30	15	1	0
Aug-22	0	0	0	17	1	8	43
Sep-22	0	0	0	11	0	0	4
<b>TOTAL</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>196</b>	<b>18</b>	<b>22</b>	<b>78</b>

<b>SUB TOTAL</b>	<b>0</b>	<b>0</b>	<b>26</b>	<b>425</b>	<b>100</b>	<b>63</b>	<b>130</b>
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Medical Officer  
 I/MS, Gare Palma, U/G. Coal Mine  
 Millupara, Raigarh (C.G.)



PME

## FORM O

[See Rule 29 F(2) and 29 L]

### Report of Medical Examination under Rule 29 B

(To be issued in triplicate)

Periodic Medical Check Up

Certificate No. 604654432/006/046/604666/MMCP/14072022161835 | 400

Certified that shri/Shrimati\* Mr. TIKESHWAR YADAV employed as ASSOCIATE, in HIL GP COAL MINES IV/4 Mine, Form B No 334 has been examined for an initial/periodical\* medical examination. He/She appears to be 31 years of age. The findings of the examining authority are given in the attached sheet. It is considered that Shri/Shrimati\* Mr. TIKESHWAR YADAV

**\*(a) is medically fit for any employment in mines**

**\*(b) is suffering from and is Medically unfit for**

- (i) Any employment in mine
- (ii) Any employment below ground; or
- (iii) Any employment or work

**\*(c) is suffering from and should get this disability\* and should be again examined within a period of months. He/She will appear from re-examination with the result of test of \*\* and the opinion of specialist from He/She\* may be to carry on his/her\* duties during this period.**



Place: MUKUPARA  
Date: 14/07/2022

Signature of the Examining Authority

Name and Designation in Block letters

**Dr. SHANKAR SARKAR**

Medical Officer

Hindalco Industries Limited

Gare-Palma Mines

Mukupara, Tamnar

Dist. Raigarh (C.G.)

\* Delete whatever not applicable.

\*\* One copy of the certificate shall be handed over the person concerned and another copy shall be sent to Manager of the mine concerned by registered post; and the third copy shall be retained by the examining authority.



# REPORT OF THE EXAMINING AUTHORITY

(To be filled for every medical examination whether initial or periodical or re-examination or after cure/control of disability)

Annexure to Certificate No. 400..... as a result of  
Medical examination on 14/07/2022.....

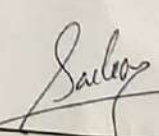
Identification of mark: **BLACK MOLE ON LEFT CHEEK**

Left Thumb impression of candidate



1. General development: Good
2. Height: 174.00 Cms.
3. Weight: 55.00 Kgs.
4. Eyes: (i) Visual acuity - Distant vision Without glasses  
Right eye: 6/6      Left eye: 6/6  
(ii) any organic disease of eye: No  
\*(iii) night blindness: No  
\*(iv) colour blindness: No  
\*(v) Squint: No  
(\* to be tested in special cases)
5. Ears: (i) Hearing- Right ear: Normal      Left ear: Normal  
(ii) any organic disease: No
6. Respiratory system: Chest measurement: (i) after full inspiration 92.00 Cms.  
(ii) after full expiration 87.00 Cms.
7. Circulatory system: Blood pressure: 110 / 70 (mmHg)      Pulse 74 /Min
8. Abdomen : Tenderness: No      Liver: Not Palpable  
Spleen: Not Palpable      Tumour: NO
9. Nervous system: History of fits or epilepsy: No  
Paralysis: No  
Mental health: Clinically NAD
10. Locomotors system: Clinically NAD
11. Skin: Normal
12. Hernia: NO
13. Hydrocele: NO
14. Any other abnormality: No
15. Urine : Reaction: Acidic  
Albumin: Nil  
Sugar: Nil
16. Skiagram of chest: Normal
17. Any other 'c' test considered necessary by examining authority: No
18. Any opinion of specialist considered necessary: No

Place: MILUPARA  
Date: 14/07/2022

  
Signature of the Examining Authority  
**Dr. SHANKAR SARKAR**  
Medical Officer  
Hindalco Industries Limited  
Gare-Palma Mines  
Milupara Tamnar  
Dist. Raigarh (C.G.)

Report of Medical Examination as per the recommendations of  
National Safety Conferences in Mines  
(To be used in continuation with Form O)

Certificate No. 604654432/006/046/604666/MMCP/14072022161835/400

Name: Mr. TIKESHWAR YADAV

Identification of mark: BLACK MOLE ON LEFT CHEEK

1. Cardiology Assessment

S1: Present

S2: Present

Additional Sound: No

Electrocardiograph (12 leads) findings: Normal Sinus Rhythm

2. Neurological Assessment

Superficial Reflexes : Clinically Normal

Deep Reflexes : Clinically Normal

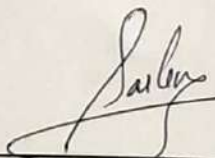
Peripheral Circulation : Clinically Normal

Vibration Syndromes : Clinically Normal

3. ILO Classification Chest Radiograph

Profusion of Pneumoconiotic opacities	Grades	Types
Absent	X	X

Place: MILUPARA  
Date: 14/07/2022

  
Signature of the Examining Authority  
Dr. SHANKAR SARKAR  
Medical Officer  
Hindalco Industries Limited  
Gare-Palma Mines  
Milupara, Tamnar  
Dist. Raigarh (C.G.)

#### 4. Audiometry Findings

Condition Type	Left Ear	Right Ear
Ear Conduction	Normal	Normal
Bone Conduction		

#### 5. Pathological Microbiological Investigations

Test	Findings
1. Blood Tc, Dc, Hb, ESR, Platelets	WNL
2. Blood Sugar - Fasting & PP	WNL
3. Lipid Profile	WNL
4. Blood Urea, Creatinine	WNL
5. Urine Routine	WNL
6. Stool Routine	

#### 6. Special Tests for Mn exposure

Behavioural Disturbances: Not Present

Neurological Disturbances

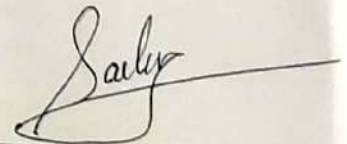
Special Defect: Not Present

Tremor: Not Present

Adia Docokinesia: Not Present

Emotional Changes: Not Present

Any Other Special Test Required : No



Signature of the Examining Authority

**Dr. SHANKAR SARKAR**  
Medical Officer  
Hindalco Industries Limited  
Gare-Palma Mines  
Milupara, Tamnar  
Dist. Raigarh (C.G.)



ID: 0 **CARDIOPRINT**

TIKESHWAR YADAV

Male 30Years

14-07-2022 10:56:58

HR : 64 bpm

P : 98 ms

PR : 157 ms

QRS : 91 ms

QT/QTc : 375/390 ms

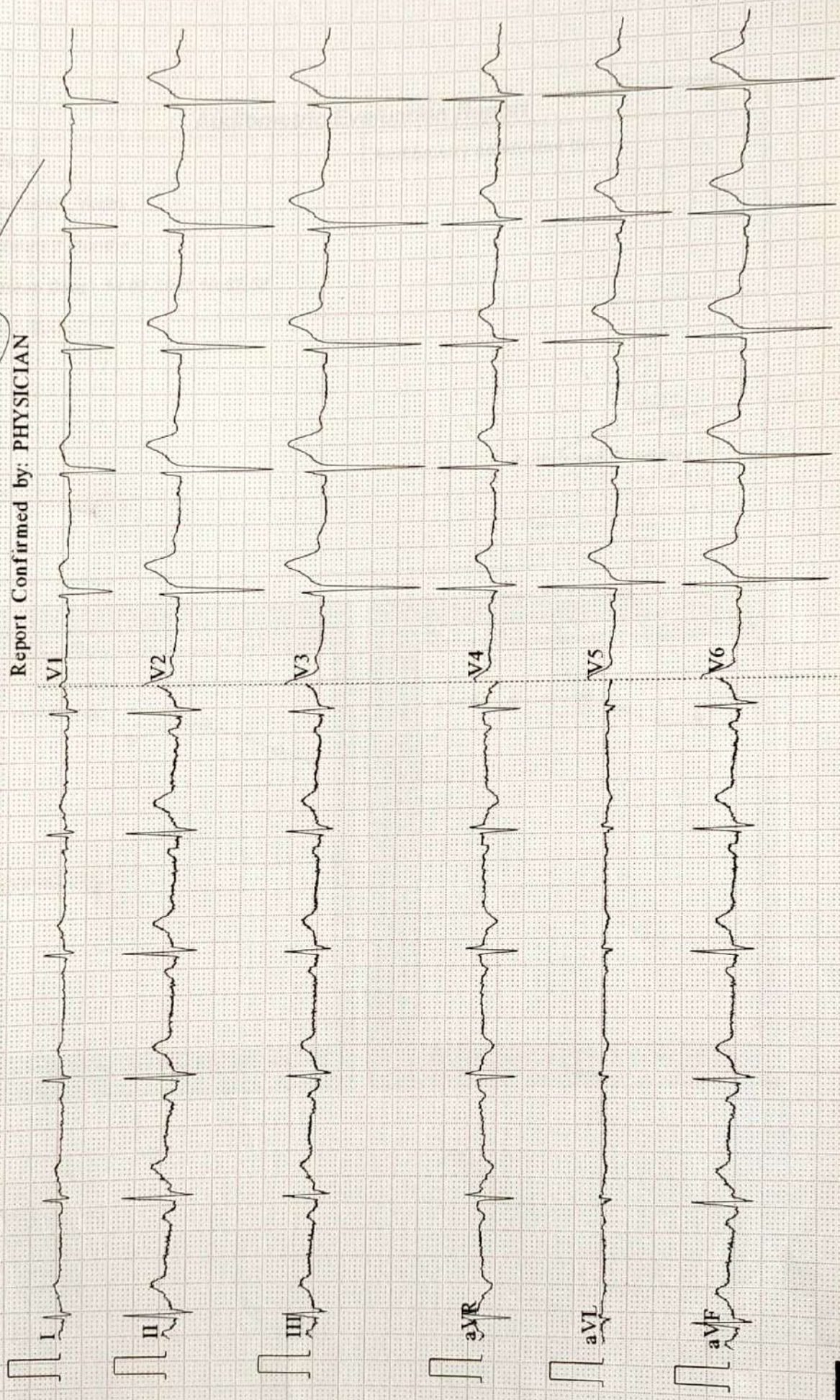
P/QRS/T : 74/67/73 °

RV5/SV1 : 1.503/0.871 mV

Diagnosis Inform: Sinus Rhythm

\*\*\*Normal ECG\*\*\*

Report Confirmed by: PHYSICIAN



0.67-100Hz AC50 25mm/s 10mm/mV 2\*5.0s ♥64 V2.2 SEMIP V1.81 HHC GP IV 5 MILUPARA



## Audiometric Evaluation Report

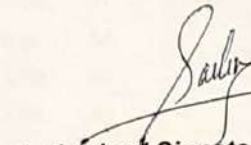
**Patient:**

Tikeshwar Yadav  
Male  
31 Years 3 Months

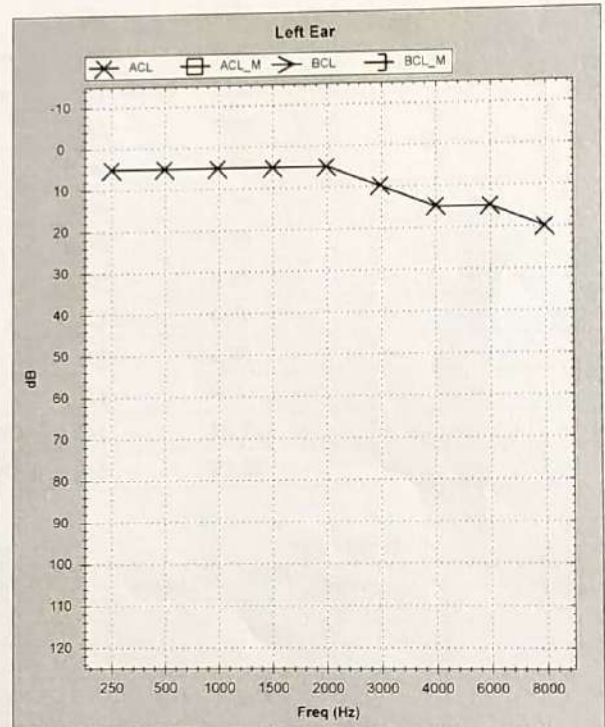
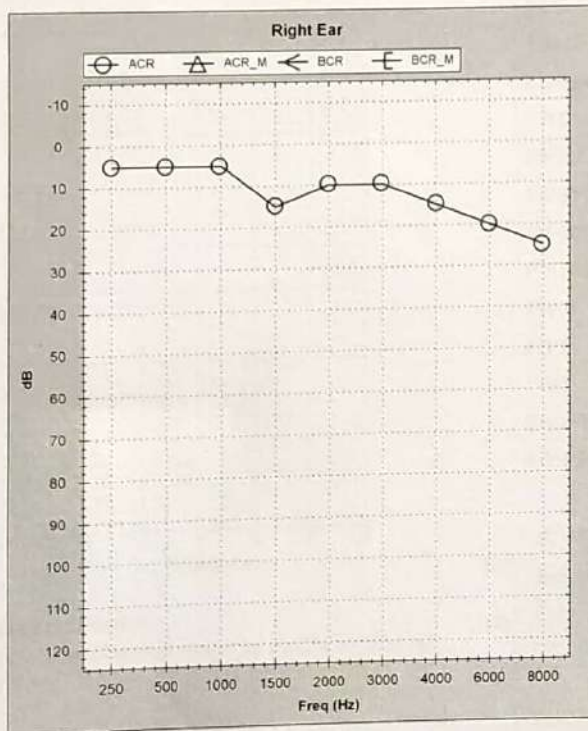
Session Date : 14-07-2022 10:52:58

**Audiometry conducted by:**

**Comments:**



**Authorized Signatory**  
**Dr. SHANKAR SARKAR**  
Medical Officer  
Hindalco Industries Limited  
Gare-Palma Mines  
Milupara, Tamnar  
Dist Raigarh (C.G.)



29627300 - TIKESHWAR YADAV

31 Years / Male / Ht 174 Cms / 55 Kgs / Non-Smoker

**FVC TEST**

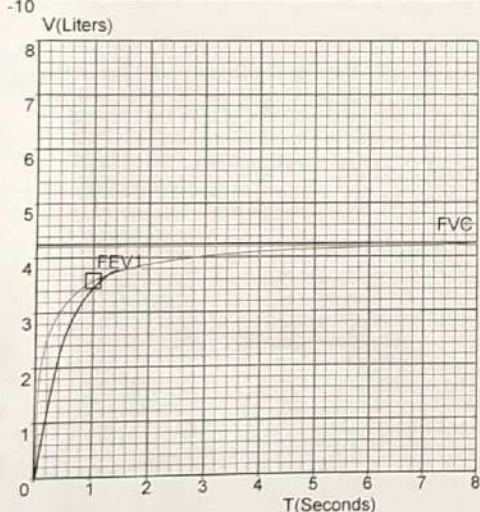
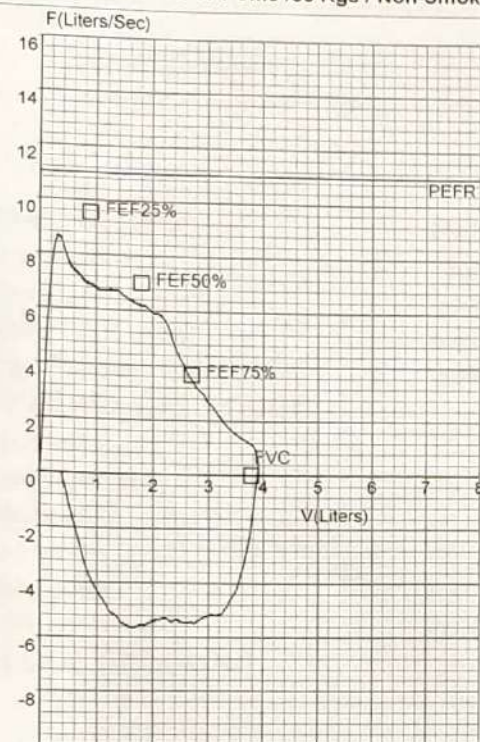
Date: 14-07-2022 (T7)

Pred Eqn : CLARITY

Eth.Corr : 100

Temp : 0°C

Ref By : NONE

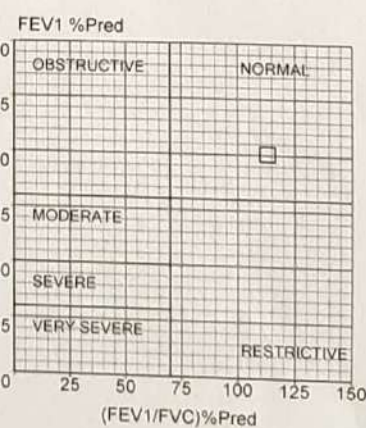
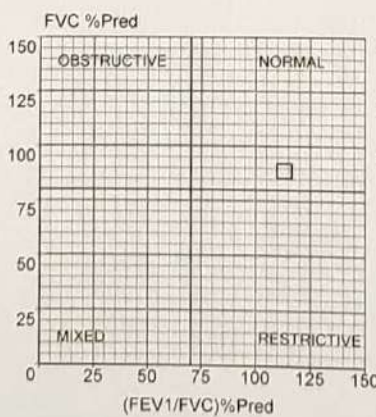


Parameter	Pred	Pre	Pre%	Post	Post%	Imp%
FVC	[L]	3.78	3.35	89	--	--
FEV1	[L]	3.18	3.19	100	--	--
FEV.5	[L]	--	2.48	--	--	--
FEV3	[L]	3.66	--	--	--	--
FEV6	[L]	--	--	--	--	--
PEFR	[L/s]	9.45	7.45	79	--	--
FEF25-75	[L/s]	4.42	4.79	108	--	--
FEF75-85	[L/s]	--	2.07	--	--	--
FEF.2-1.2	[L/s]	7.71	5.95	77	--	--
FEF25%	[L/s]	8.20	6.88	84	--	--
FEF50%	[L/s]	5.99	5.63	94	--	--
FEF75%	[L/s]	3.15	2.65	84	--	--
FEV.5/FVC	[%]	--	74.07	--	--	--
FEV1/FVC	[%]	84.19	95.37	113	--	--
FEV3/FVC	[%]	97.00	--	--	--	--
FEV6/FVC	[%]	--	--	--	--	--
FEV1/FEV6	[%]	--	--	--	--	--
FET	[S]	--	1.20	--	--	--
ExpiTime	[S]	--	0.05	--	--	--
LungAge	[Y]	31.00	31.00	100	--	--
FIVC	[L]	--	3.00	--	--	--
PIFR	[L/s]	--	4.89	--	--	--
FIF25%	[L/s]	--	7.04	--	--	--
FIF50%	[L/s]	--	5.96	--	--	--
FIF75%	[L/s]	--	4.26	--	--	--
FIV.5	[L]	--	0.76	--	--	--
FIV1	[L]	--	2.80	--	--	--
FIV3	[L]	--	--	--	--	--
FIV.5/FIVC	[%]	--	25.26	--	--	--
FIV1/FIVC	[%]	--	93.38	--	--	--

- Pre Medication Report :  
Spirometry within Normal range as FVC% >= 80 And FEV1/FVC% > 70

- Pre COPD Severity Report:  
Pre Test within Normal range

- Doctor's Comments :



Note: The results may be clinically correlated.

*Shankar Sarkar*  
**Dr. SHANKAR SARKAR**  
Medical Officer  
**EXAMINING AUTHORITY**  
Hindalco Industries Limited  
Gare-Palma Mines  
Milupara, Tamnar  
Dist Raigarh (C.G.)





AT&#43;POST-MILUPARA, BLOCK-TAMNAR,DISTRICT-RAIGARH CHHATTISGARH,PIN CODE-496107

hind-hkd.ohcgp@adityabirla.com | 9111003019

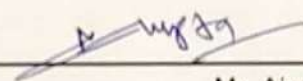
OHC MILUPARA

Name	Age	Gender	Employee ID	Patient ID
Mr. TIKESHWAR YADAV	31 Y, 3 M	Male	296273	29627300

Date : 14-Jul-2022

### Hematology

NAME OF TEST	RESULT	UNIT	NORMAL RANGE
Haemoglobin	12.4	gm%	F-11-16   M-12-17   C-13-18
Total W.B.C count	4800	per Cumm	4000-11000
Total R.B.C count	5.41	Million/Cumm	M-4.5-5.5   F-3.8-4.8
Total Platelet Count	2.39	Lakh/Cumm	1.5-3.5
<b>DIFFERENTIAL COUNT</b>			
Neutrophil	50	%	(55-65)
Lymphocytes	43	%	(30-40)
Eosinophils	04	%	(0-6)
Basophils	00	%	(0-1)
Monocytes	03	%	(2-8)
ESR	08	mm fall in 1st Hrs.  mm fall in 2nd Hrs.	(0-5)
<b>BLOOD GROUPING</b>	O+		

  
Mr. Ajay Gupta  
Laboratory Technician



AT&#43; POST-MILUPARA, BLOCK-TAMNAR, DISTRICT-RAIGARH CHHATTISGARH, PIN CODE-496107  
hind-hkd.ohcgp@adityabirla.com | 9111003019

OHC MILUPARA

Name	Age	Gender	Employee ID	Patient ID
Mr. TIKESHWAR YADAV	31 Y, 3 M	Male	296273	29627300

Date : 14-Jul-2022

### Biochemistry

#### DIABETIC PROFILE

	RESULT	UNIT	NORMAL RANGE
FBS	92	mg/dl	60-110 mg/dl
PPBS/PGBS (1st Hr)	103	mg/dl	70-140 mg/dl

#### RENAL FUNCTION TEST

	RESULT	UNIT	NORMAL RANGE
Serum Urea	26	mg/dl	14-50 mg/dl
Serum Creatinine	0.84	mg/dl	0.6-1.4 mg/dl

#### LIPID PROFILE

	RESULT	UNIT	NORMAL RANGE
Total Cholesterol	184	mg/dl	150-200 mg/dl
Triglycerides	136	mg/dl	80-175 mg/dl
HDL Cholesterol	28	mg/dl	mg/dl
LDL Cholesterol	129	mg/dl	< 150 mg/dl
VLDL Cholesterol	27	mg/dl	< 35 mg/dl
Total Cholesterol:HDL Ratio	6.57		

Mr. Ajay Gupta  
Laboratory Technician





AT&#43;POST-MILUPARA, BLOCK-TAMNAR, DISTRICT-RAIGARH CHHATTISGARH, PIN CODE-496107

hind-hkd.ohcgp@adityabirla.com | 9111003019

OHC MILUPARA

Name	Age	Gender	Employee ID	Patient ID
Mr. TANKESHWAR SAHU	39 Y, 5 M	Male	296630	29663000

Date : 14-Jul-2022

## Urine Examination

### PHYSICAL

COLOUR	Straw Yellow
TRANSPARENCY	Clear
SEDIMENT	Clear
SP. GRAVITY	1
QUANTITY	10

### CHEMICAL

REACTION	Acidic
ALBUMIN	Nil
SUGAR	Nil
PHOSPHATE	Nil
BILE SALT	Nil
BILE PIGMENT	Nil
KETONE BODIES	Nil

### MICROSCOPICAL

EP. CELLS	1-2
PUS CELLS	1-2
R.B.C	Nil
CASTS	Nil
CRYSTALS	Nil
BACTERIALS	Nil
PARASITES	Nil
SPERMATOZOA	Nil
YEAST	Nil

Mr. Ajay Gupta  
Laboratory Technician



AT&#43;POST-MILUPARA, BLOCK-TAMNAR, DISTRICT-RAIGARH CHHATTISGARH, PIN CODE-496107  
hind-hkd.ohcgp@adityabirla.com | 9111003019

OHC MILUPARA

Name	Age	Gender	Patient ID
Mr. TIKESHWAR YADAV	31 Years 3 Months	Male	29627300

Date : 14-Jul-2022

## X Ray - Chest PA View

### Description

Bony rib cage and soft tissue shadow appears normal  
B/L Lung field & parenchyma appears normal.  
Trachea visualized centrally.  
B/L C.P. Angle appears clear.  
CT ratio is within normal limit.

IMPRESSION: No remarkable abnormality seen

### Interpretation

Normal

Mr. Dilip Khamari  
Radiology Technician

Deco/IME

## FORM O

[See Rule 29 F(2) and 29 L]

### Report of Medical Examination under Rule 29 B

(To be issued in triplicate)

Pre-Employment

Certificate No. 604655129/006/046/604666/MMCP/18072022153252/5791

Certified that shri/~~Shrimati~~\* Mr. NANDAN TANTI employed as ASST MECHANIC, in HIL GP COAL MINES IV/4 Mine, Form B No ..... has been examined for an initial/~~periodical~~\* medical examination. He/~~She~~ appears to be 30 years of age. The findings of the examining authority are given in the attached sheet. It is considered that Shri/~~Shrimati~~\* Mr. NANDAN TANTI

✓\*(a) is medically fit for any employment in mines

\* (b) is suffering from and is Medically unfit for

- (i) Any employment in mine
- (ii) Any employment below ground; or
- (iii) Any employment or work

\* (c) is suffering from and should get this disability\* and should be again examined within a period of months. He/She will appear from re-examination with the result of test of \*\* and the opinion of specialist from . He/She\* may be to carry on his/her\* duties during this period.

Blood group: 'AB' +ve



Place: OHE Melupara ~~WHA~~  
Date: 18.07.2022

Signature of the Examining Authority  
Name and Designation in Block letters  
DR. PRATIMA SARKAR  
.....  
Medical Officer  
IV/5, Gare Palimā, U/G: Coal Mine  
Milupara, Raigarh (C.G.)

\* Delete whatever not applicable.

\*\* One copy of the certificate shall be handed over the person concerned and another copy shall be sent to Manager of the mine concerned by registered post; and the third copy shall be retained by the examining authority.



# REPORT OF THE EXAMINING AUTHORITY

(To be filled for every medical examination whether initial or  
~~periodical~~ or re-examination or after cure/control of disability)

Annexure to Certificate No. 5791 ..... as a result of

Medical examination on 18.07.2022 .....



Left Thumb impression of candidate

Identification of mark: BLACK MOLE ON NECK

1. General development: Good
2. Height: 166.00 Cms.                      3. Weight: 70.00 Kgs.
4. Eyes: (i) Visual acuity - Distant vision Without glasses  
Right eye: 6/6                      Left eye: 6/6  
(ii) any organic disease of eye: No  
\*(iii) night blindness: No  
\*(iv) colour blindness: No  
\*(v) Squint: No  
(\* to be tested in special cases)
5. Ears: (i) Hearing- Right ear: Normal                      Left ear: Normal  
(ii) any organic disease: No
6. Respiratory system: Chest measurement: (i) after full inspiration 95.00 Cms.  
(ii) after full expiration 90.00 Cms.
7. Circulatory system: Blood pressure: 122 / 80 (mmHg)                      Pulse 81 /Min
8. Abdomen : Tenderness: No                      Liver: Not Palpable  
Spleen: Not Palpable                      Tumour: NO
9. Nervous system: History of fits or epilepsy: No  
Paralysis: No  
Mental health: Clinically NAD
10. Locomotors system: Clinically NAD
11. Skin: Normal
12. Hernia: NO
13. Hydrocele: NO
14. Any other abnormality: No
15. Urine : Reaction: Acidic  
Albumin: Nil  
Sugar: Nil
16. Skiagram of chest: Normal
17. Any other 'c' test considered necessary by examining authority: No
18. Any opinion of specialist considered necessary: No

Place: OH2 Melupara'  
Date: 18.07.2022

Signature of the Examining Authority

Medical Officer

IV/5, Gare Palma, U/G. Coal Mine  
Milupara, Raigarh (C.G.)



Report of Medical Examination as per the recommendations of  
National Safety Conferences in Mines  
(To be used in continuation with Form O)

Certificate No. 604655129/006/046/604666/MMCP/18072022153252 15791

Name: Mr. NANDAN TANTI

Identification of mark: BLACK MOLE ON NECK

1. Cardiology Assessment

S1: present

S2: present

Additional Sound: No

Electrocardiograph (12 leads) findings: Normal Sinus Rhythm

2. Neurological Assessment

Superficial Reflexes : Clinically Normal

Deep Reflexes : Clinically Normal

Peripheral Circulation : Clinically Normal

Vibration Syndromes : Clinically Normal

3. ILO Classification Chest Radiograph

Profusion of Pneumoconiotic opacities

Grades

Types


Absent

X

X

Place: OHE Milupara'

Date: 18.07.2022

  
Signature of the Examining Authority  
Medical Officer  
IV/5, Gare Palma, U/G. Coal Mine  
Milupara, Raigarh (C.G.)

#### 4. Audiometry Findings

Condition Type	Left Ear	Right Ear
Ear Conduction	Normal	Normal
Bone Conduction		

#### 5. Pathological Microbiological Investigations

Test	Findings
1. Blood Tc, Dc, Hb, ESR, Platelets	WNL
2. Blood Sugar - Fasting & PP	WNL
3. Lipid Profile	WNL
4. Blood Urea, Creatinine	WNL
5. Urine Routine	WNL
6. Stool Routine	

#### 6. Special Tests for Mn exposure

Behavioural Disturbances: Not Present

Neurological Disturbances

Special Defect: Not Present

Tremor: Not Present

Adia Docokinesia: Not Present

Emotional Changes: Not Present

Any Other Special Test Required : No

Signature of the Examining Authority

Medical Officer  
IV/5, Gare Palma, U/G. Coal Mine  
Milupada, Raigarh (C.G.)



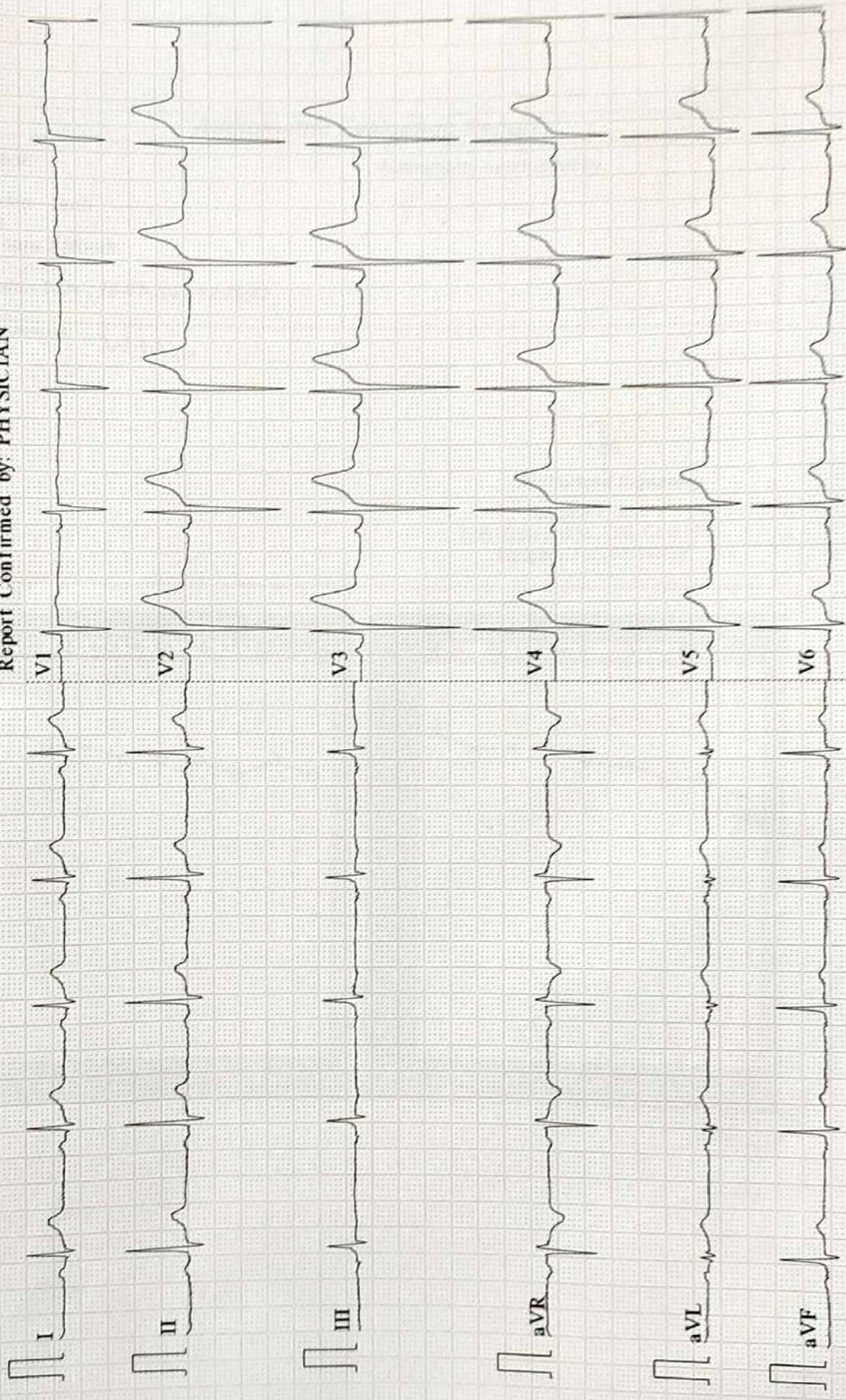
NAND, N FANTI  
Male 30Years

HR : 4 bpm  
P : 109 ms  
PR : 167 ms  
QRS : 87 ms  
QT/QTc : 382/395 ms  
P/QRS/T : -7/56/23 °  
RV5/SV1 : 1.665/0.923 mV

Diagnosis Information:  
Sinus Rhythm  
\*\*\*Normal ECG\*\*\*

*Dr*

Report Confirmed by: PHYSICIAN





# Audiometric Evaluation Report

Patient:

Nandan Tanti  
Male  
30 Years 1 Month

Session Date : 18-07-2022 12:29:42

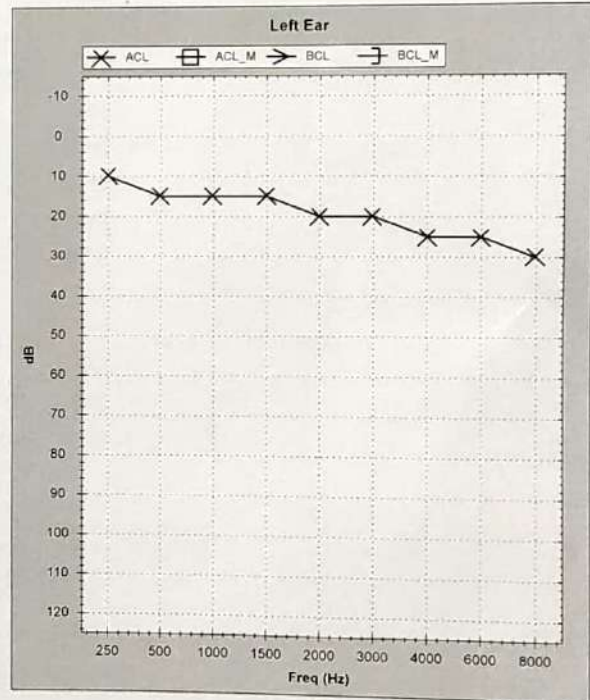
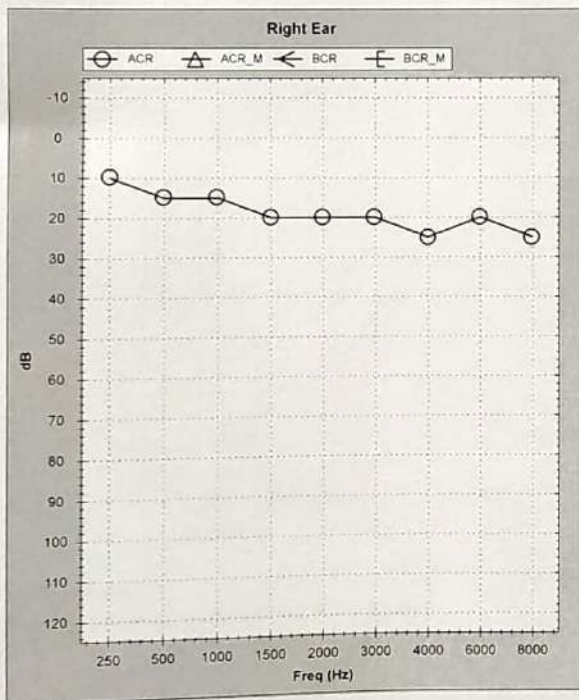
Audiometry conducted by:

Comments:

WNL

Authorized Signatory

Medical Officer  
IV/5, Gare Palma, U/G. Coal Mine  
Milupara, Raigarh (C.G.)

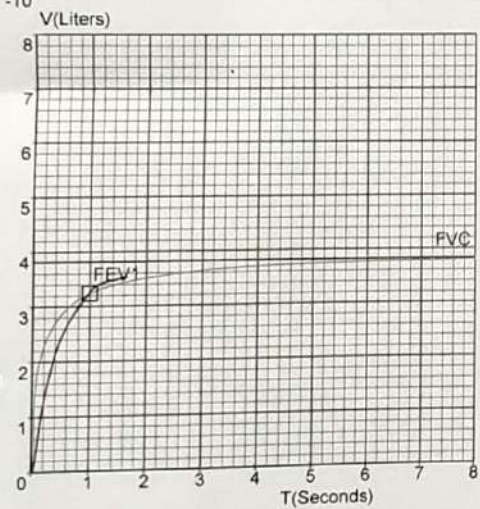
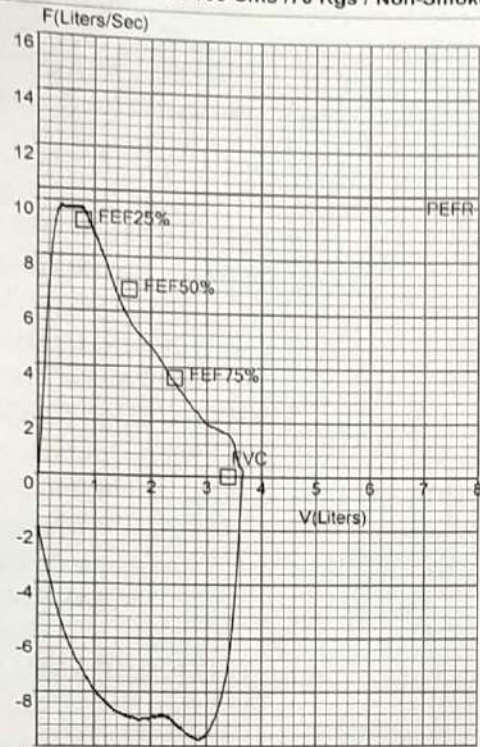




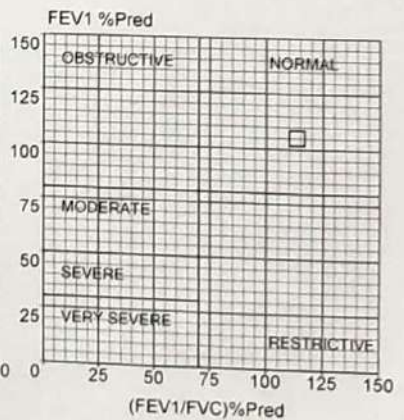
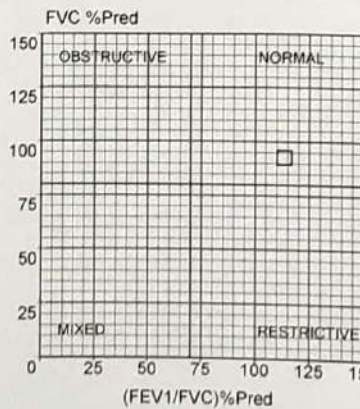
V460183 - NANDAN TANTI  
30 Years / Male / Ht 166 Cms / 70 Kgs / Non-Smoker

**FVC TEST**  
Date: 18-07-2022 (T1)

Pred Eqn : CLARITY Eth.Corr : 100 Temp : 0°C  
Ref By : NONE



Parameter	Pred	Pre	Pre%	Post	Post%	Imp%
FVC	[L]	3.39	3.14	93	--	--
FEV1	[L]	2.88	3.03	105	--	--
FEV.5	[L]	--	2.37	--	--	--
FEV3	[L]	3.29	--	--	--	--
FEV6	[L]	--	--	--	--	--
PEFR	[L/s]	8.92	8.44	95	--	--
FEF25-75	[L/s]	4.31	4.66	108	--	--
FEF75-85	[L/s]	--	1.84	--	--	--
FEF.2-1.2	[L/s]	7.37	7.31	99	--	--
FEF25%	[L/s]	7.94	8.36	105	--	--
FEF50%	[L/s]	5.82	5.10	88	--	--
FEF75%	[L/s]	3.07	2.10	68	--	--
FEV.5/FVC	[%]	--	75.64	--	--	--
FEV1/FVC	[%]	84.96	96.51	114	--	--
FEV3/FVC	[%]	97.00	--	--	--	--
FEV6/FVC	[%]	--	--	--	--	--
FEV1/FEV6	[%]	--	--	--	--	--
FET	[S]	--	1.34	--	--	--
ExpiTime	[S]	--	0.07	--	--	--
LungAge	[Y]	30.00	28.00	93	--	--
FIVC	[L]	--	3.25	--	--	--
PIFR	[L/s]	--	8.41	--	--	--
FIF25%	[L/s]	--	8.53	--	--	--
FIF50%	[L/s]	--	5.30	--	--	--
FIF75%	[L/s]	--	2.73	--	--	--
FIV.5	[L]	--	0.07	--	--	--
FIV1	[L]	--	3.10	--	--	--
FIV3	[L]	--	--	--	--	--
FIV.5/FIVC	[%]	--	2.22	--	--	--
FIV1/FIVC	[%]	--	95.30	--	--	--



- Pre Medication Report :  
Spirometry within Normal range as FVC% >= 80 And FEV1/FVC% > 70

- Pre COPD Severity Report:  
Pre Test within Normal range

- Doctor's Comments : **NAD**

EXAMINING AUTHORITY

Medical Officer

IV/5, Gare Palma, U/G. Coal Mine  
Milupara, Raigarh (C.G.)

Note: The results may be clinically correlated.



AT&#43;POST-MILUPARA, BLOCK-TAMNAR, DISTRICT-RAIGARH CHHATTISGARH, PIN CODE-496107  
hind-hkd.ohcgp@adityabirla.com | 9111003019

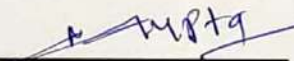
OHC MILUPARA

<b>Name</b>	<b>Age</b>	<b>Gender</b>	<b>Employee ID</b>	<b>Patient ID</b>
Mr. NANDAN TANTI	30 Y, 1 M	Male		V460183

Date : 18-Jul-2022

### Hematology

NAME OF TEST	RESULT	UNIT	NORMAL RANGE
Haemoglobin	16.4	gm%	F-11-16   M-12-17   C-13-18
Total W.B.C count	9600	per Cumm	4000-11000
Total R.B.C count	5.44	Million/Cumm	M-4.5-5.5   F-3.8-4.8
Total Platelet Count	1.74	Lakh/Cumm	1.5-3.5
<b>DIFFERENTIAL COUNT</b>			
Neutrophil	62	%	(55-65)
Lymphocytes	34	%	(30-40)
Eosinophils	03	%	(0-6)
Basophils	00	%	(0-1)
Monocytes	01	%	(2-8)
ESR	6	mm fall in 1st Hrs.  mm fall in 2nd Hrs.	(0-5)
<b>BLOOD GROUPING</b>	AB+		

  
Mr. Ajay Gupta  
Laboratory Technician





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hind-hkd.ohcgp@adityabirla.com | 9111003019

OHC MILUPARA

<b>Name</b>	<b>Age</b>	<b>Gender</b>	<b>Employee ID</b>	<b>Patient ID</b>
Mr. NANDAN TANTI	30 Y, 1 M	Male		V460183

Date : 18-Jul-2022

### Biochemistry

#### DIABETIC PROFILE

	RESULT	UNIT	NORMAL RANGE
FBS	86	mg/dl	60-110 mg/dl
PPBS/PGBS (1st Hr)	107	mg/dl	70-140 mg/dl

#### RENAL FUNCTION TEST

	RESULT	UNIT	NORMAL RANGE
Serum Urea	19	mg/dl	14-50 mg/dl
Serum Creatinine	0.84	mg/dl	0.6-1.4 mg/dl

#### LIPID PROFILE

	RESULT	UNIT	NORMAL RANGE
Total Cholesterol	183	mg/dl	150-200 mg/dl
Triglycerides	131	mg/dl	80-175 mg/dl
HDL Cholesterol	29	mg/dl	mg/dl
LDL Cholesterol	128	mg/dl	< 150 mg/dl
VLDL Cholesterol	26	mg/dl	< 35 mg/dl
Total Cholesterol:HDL Ratio	6.31		

Mr. Ajay Gupta  
Laboratory Technician



AT&#43; POST-MILUPARA, BLOCK-TAMNAR, DISTRICT-RAIGARH CHHATTISGARH, PIN CODE-496107  
hind-hkd.ohcgp@adityabirla.com | 9111003019

OHC MILUPARA

Name	Age	Gender	Employee ID	Patient ID
Mr. NANDAN TANTI	30 Y, 1 M	Male		V460183

Date : 18-Jul-2022

## Urine Examination

### PHYSICAL

COLOUR	Straw Yellow
TRANSPARENCY	Clear
SEDIMENT	Clear
SP. GRAVITY	1
QUANTITY	10

### CHEMICAL

REACTION	Acidic
ALBUMIN	Nil
SUGAR	Nil
PHOSPHATE	Nil
BILE SALT	Nil
BILE PIGMENT	Nil
KETONE BODIES	Nil

### MICROSCOPICAL

EP. CELLS	2-4
PUS CELLS	2-4
R.B.C	Nil
CASTS	Nil
CRYSTALS	Nil
BACTERIALS	Nil
PARASITES	Nil
SPERMATOOZA	Nil
YEAST	Nil

Mr. Ajay Gupta  
Laboratory Technician





OHC MILUPARA

AT&#43; POST-MILUPARA, BLOCK-TAMNAR, DISTRICT-RAIGARH CHHATTISGARH, PIN CODE-496107  
hind-hkd.ohcgp@adityabirla.com | 9111003019

Name	Age	Gender	Patient ID
Mr. NANDAN TANTI	30 Years 1 Months	Male	V460183

Date : 18-Jul-2022

## X Ray - Chest PA View

### Description

Bony rib cage and soft tissue shadow appears normal  
B/L Lung field & parenchyma appears normal.  
Trachea visualized centrally.  
B/L C.P. Angle appears clear.  
CT ratio is within normal limit.

IMPRESSION: No remarkable abnormality seen

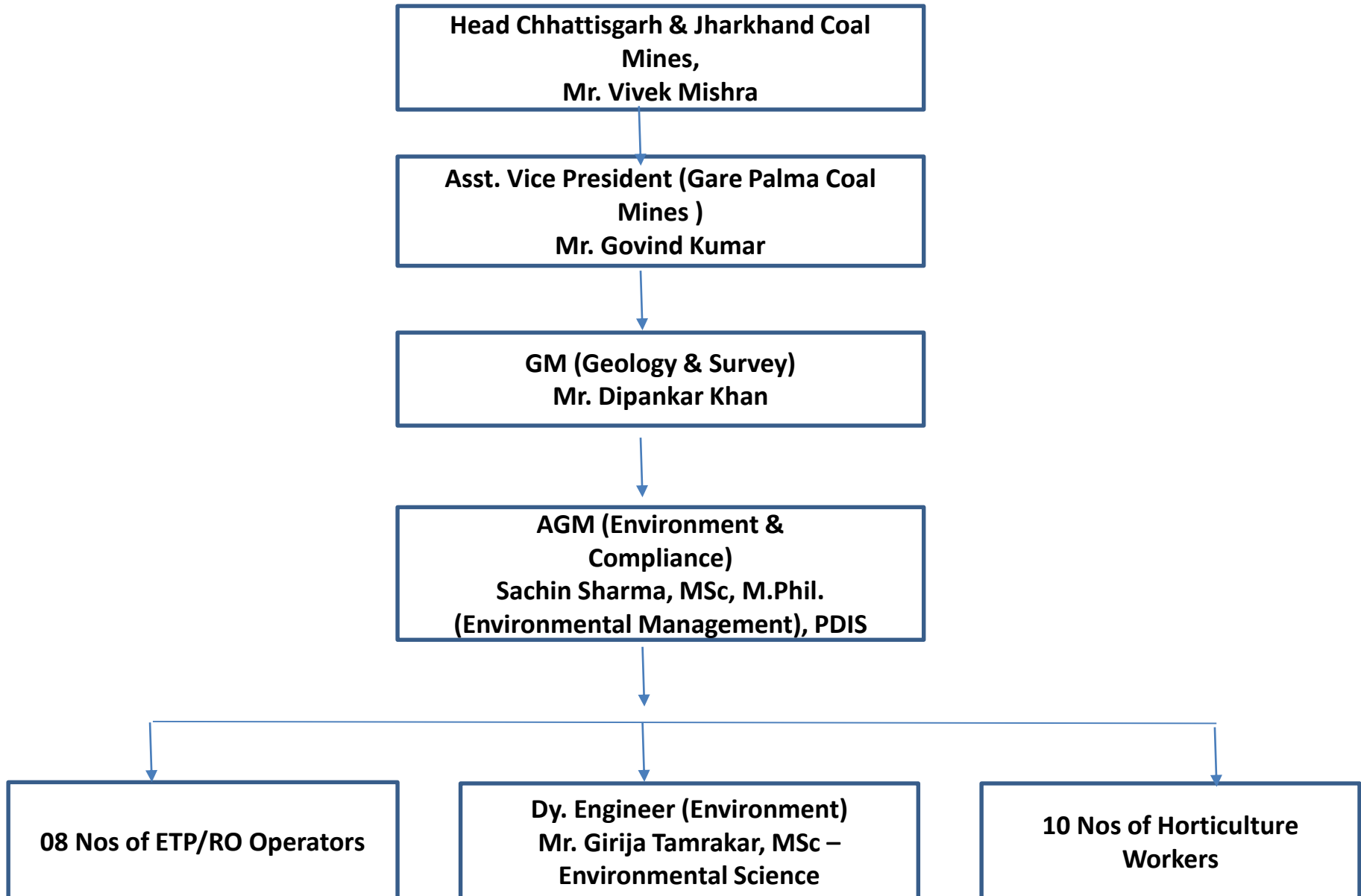
### Interpretation

Normal

Mr. Dilip Khamari  
Radiology Technician

# Annexure-34

# Organisation Chart of Environment Management Cell (GP IV/4 Coal Mines)



# Annexure-35



**Environmental Expenditure Details for FY 2022-23**  
**(April 2022 to September 2022)**

**M/s Hindalco Industries Limited, Gare Palma Mines IV/4**

<b>Particulars</b>	<b>Amount (Lakh)</b>
Water Quality Management	13.61
Air Quality Management	8.84
Plantation, Green Belt Development	13.47
Others	8.86
<b>Total</b>	<b>44.78</b>