



Ref.: 1070/NTPC/DLCMP/EC/HCY/18

Date: 29.07.2023

To

**Dy. Director General of Forest (Central),**  
Govt. of India,  
Ministry of Environment, Forests and Climate Change,  
Integrated Regional Office,  
A-3 Chandrashekharpur,  
Bhubaneswar-751023, Odisha

**Subject:** Dulanga Opencast Coal Mining Project (7 MTPA in an area of 785.37Ha.; Latitude 21° 50'40" N to 22° 01'30" N and Longitude 83° 42' 06" E to 83° 53' 43" E, of M/s National Thermal Power Corporation Ltd. (NTPC), Ib Valley Coalfields, Dist: Sundargarh, Odisha - **Submission of Half Yearly Report on the status of compliance of the stipulated Environmental Clearance conditions.**

**Ref.:** MoEFCC Environmental Clearance Letter Number- J-11015/1140/2007-IA.II (M) dated 03<sup>rd</sup> March, 2014, J-11015/1140/2007-IA.II (M) dated 9<sup>th</sup> February, 2016 and J-11015/1140/2007-IA-II (M) dated 8<sup>th</sup> August, 2018.

Dear Sir,

With reference to the above, we are submitting herewith the Half Yearly Report on the status of compliance of the stipulated Environmental Clearance conditions including results of monitored data **for the period from October 2022 to March 2023** with reference to the above-mentioned EC Order issued by the Ministry of Environment, Forests and Climate Change, Govt. of India, for your kind information and necessary record please.

The same is being mailed to the email id: [roez.bsr-mef@nic.in](mailto:roez.bsr-mef@nic.in).

Thanking You,

Yours Faithfully,

  
(Arindam Pattnaik)  
Sr Manager (Envt. Mgmt.)

Encl.: As above

Copy to:

- The Central Pollution Control Board,**  
Zonal Office, Southern Conclave, Block -502, 5<sup>th</sup> & 6<sup>th</sup> Floors,  
1582 Rajdanga Main Road, Kolkata – 700107
- The Member Secretary,**  
State Pollution Control Board, Odisha,  
A/118, Nilakantha Nagar, Unit – VIII, Bhubaneswar – 751012

Dulanga Coal Mining Project, Khapurikachhar, PO – Sanghumuda, Tehsil-Hemgir, Dist-Sundargarh 770013

दुलंगा कोल माइनिंग प्रोजेक्ट, खापुरिकछार, पोस्ट - संघुमुदा, तहसील - हेमगीर, जिला - सुंदरगढ़ ७७००१३

पंजीकृत कार्यालय: एन टी पी सी भवन, स्कोप कॉम्प्लेक्स, 7 इंस्टीट्यूशनल एरिया, लोधी रोड, नई दिल्ली ११०००३

कॉर्पोरेट पहचान नंबर: L40101DL1975GOI007966, टेलीफोन नं: 011-24387333, फैक्स नं: 011-24361018, ई मेल: [ntpccc@ntpc.co.in](mailto:ntpccc@ntpc.co.in), वेबसाइट: [www.ntpc.co.in](http://www.ntpc.co.in)

Registered Office: NTPC Bhavan, Scope Complex, 7 Institutional Area, Lodhi Road, New Delhi – 110003

Corporate Identification No: L40101DL1975GOI007966, Telephone No: 011-24387333, Fax No: 011-24361018, Email: [ntpccc@ntpc.co.in](mailto:ntpccc@ntpc.co.in), Website: [www.ntpc.co.in](http://www.ntpc.co.in)

**DULANGA COAL MINING PROJECT (7.0 MTPA)  
SIX MONTHLY COMPLIANCE STATUSES OF ENVIRONMENTAL CLEARANCE  
CONDITIONS (PERIOD: October 2022 to March 2023)**

**Name of the Project:** Dulanga Opencast Coal Mining Project (7MTPA) in an area of 785.37 ha = (803.71 ha - 18.34 ha = 785.37 ha); Latitude 21°50'40"N to 22°01'30' N and Longitude 83°42'06"E to 83°53'43"E) of M/s NTPC Limited, Ib Valley Coalfields, Dist. Sundargarh, Odisha.

**Introduction:**

The said project is an Opencast Coal Mining Project with rated production capacity of 7.0 Million Tonne per Annum as per EC granted, is located in Sundargarh District, Odisha. The proposed project of NTPC Limited has been planned to cater the coal requirement of Darlipali Thermal Power Plant of NTPC Limited. The project has also obtained Consent to Establish (NOC) from Odisha State Pollution Control Board vide consent order no. 23564/Ind-II-NOC dated 27-11-2012 and Stage-II Forest Clearance from MoEF &CC (FC Division), GOI vide letter: F. No.8-23/2013 -FC dated 23<sup>rd</sup> December, 2015.

This project has been granted environmental clearance by the Ministry of Environment, Forests & Climate Change (MoEF&CC) the then Ministry of Environment & Forest, (MOEF), Govt. of India, New Delhi, vide letter no. J-11015/1140/2007-IA.II (M) dated 03<sup>rd</sup> March, 2014 and subsequently amended vide letter no. J-11015/1140/2007-IA.II (M) dated 09<sup>th</sup> February, 2016. Further, the said EC has again been amended vide letter no. J-11015/1140/2007-IA-II (M) dated 8<sup>th</sup> August, 2018, 4<sup>th</sup> July 2019 and 7<sup>th</sup> January 2020.

**Present Status of the Project:**

The Mining Operations have commenced from this block w.e.f. 28/02/2018 and has produced **70,00,000** Tonnes of Coal in the last financial year 2022-2023.

**Submission of Six-monthly Compliance Status Report of Environmental Clearance Conditions:**

This report is being submitted as per the General condition no. xvii in the Environmental Clearance Order. The point-wise six monthly compliance status of conditions stipulated in the environmental clearance accorded by MoEF&CC vide letter No. J-11015/1140/2007-IA.II (M) dated 03<sup>rd</sup> March, 2014 in respect of Dulanga Coal Mining Project for the period **from October 2022 to March 2023** is furnished hereunder.

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**Point wise Compliance Report of Conditions specified in Environmental Clearance**

Ref. Ltr. No. J-11015/1140/2007-IA.II (M) dated 03<sup>rd</sup> March, 2014 and amendment as on date

<b>ECC. No.</b>	<b>Specific EC Conditions</b>	<b>Compliance Status as on 31.03.2023</b>
(i)	The maximum production from the mine at any given time shall not exceed the limit as prescribed in the EC.	<p><b>Being Complied</b></p> <p>As per the EC granted and as per approved Mining Plan, the rated peak production capacity of DLCMP is 7.0 MTPA.</p> <p>During the FY 2022-23, 7.0 MT Coal has been produced against EC/CTO prescribed production limit of 7.0 MMT.</p> <p>Coal Produced in Last five years are as follows:</p> <p>FY 18-19: 5,00,948.49 Tonnes  FY 19-20: 15,40,002.71 Tonnes  FY 20-21: 31,23,840.00 Tonnes  FY 21-22: 52,92,094.00 Tonnes  FY 22-23: 70,00,00,000 Tonnes</p>
(ii)	The Forest Clearance has been granted for 304.75 ha (273.68 ha within the Dulanga Coal Block and 31.07 ha of forest land outside the Coal Block including 4.94 ha of forest land coming within the safety zone in Dulanga Coal Mining Project) vide letter no. 8-23/2013-FC dated 10.01.2014. FC for balance 18.34 ha has not been granted. No mining activity shall be carried out in forest land for which FC has not been granted.	<p><b>Being Complied</b></p> <p>Presently mining activity is restricted within the forest land diverted to Dulanga Coal Mining Project.</p> <p>Working Plan showing the present mining activity is attached as <b>Annexure-I</b>.</p>
(iii)	OB dump along the western side of an area of 244 ha would be brought to almost ground level for post-mining land use by re-handling of an estimated 112 Mm <sup>3</sup> of OB during 5 years after end of mine life (EOL). However, the dump along the east would be about 30m above ground level.	<p><b>Noted and Agreed to Comply</b></p> <p>This has been incorporated in the Mine Closure Plan and shall be ensured at the time of mine closure.</p>

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<b>ECC. No.</b>	<b>Specific EC Conditions</b>	<b>Compliance Status as on 31.03.2023</b>
(iv)	An estimated 112 Mm <sup>3</sup> of OB is proposed to be re-handled from the eastern and western OB dumps.	<p><b>Noted and Agreed to Comply</b></p> <p>Presently dumping of the OB in the eastern and western OB dumps are being done. Same shall be rehandled at the mine closure.</p>
(v)	It was stated that an area of 286.74 ha within the ML (which includes an area of 226.23 ha of quarry area) and an area of 179.72 ha outside the ML would be developed with plantation.	<p><b>Noted and Agreed to Comply</b></p> <p>Plantation in quarry area will be done in phases in the available area after completion of mining and internal dumping is over.</p> <p>So far, 42,742 nos. of plants have been planted in the vacant areas inside and outside the Mining Lease area.</p> <p>6120 nos. of sapling have been planted and 1200 kg of Stylo Hamata grass seeds have been spread all along the slope of inactive portion of OB dump over 1.5 Ha.</p> <p>1200 kg of Stylo Hamata seeds all along the slope of Topsoil Dump and about 400 nos. of tree sapling over 1.27 Ha of area along the topsoil dump have been done.</p> <p>Total 10,157 numbers of sapling have been planted during last monsoon period and total 42742 nos. of plants have been planted (including distribution) since inception of the mine.</p> <p>Copy of map and Photos of Plantation activities carried out in different region is attached as <b>Annexure – II(a) &amp; II(b)</b>.</p>
(vi)	No fly ash from the linked TPPs shall be used in backfilling of the void without undertaking an environmental feasibility study and without prior approval of this Ministry under EIA Notification, 2006.	<p><b>Noted and Agreed to Comply.</b></p> <p>Presently no fly ash is being dumped in the backfilling area.</p>
(vii)	Option-3 be adopted, as committed by the proponent, as the most feasible option for diversion of Garia Nala, Baidhara Nala and Nala B and its realignment, whereby the plan for their diversion to be taken up	<p><b>Being Complied</b></p> <p>Permission obtained from Dept. of Water Resources, Govt. of Odisha for diversion of Garia Nalla and its tributaries (Baidhar Nallah and Nallah-B) flowing within the coal block boundary of Dulanga Coal Mining</p>

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ECC. No.	Specific EC Conditions	Compliance Status as on 31.03.2023
	during the 8th and 10th year.	<p>Project vide letter dated. 23.08.2021. Copy of permission letter is enclosed as <b>Annexure-III</b>.</p> <p>Presently, work for diversion of Gari Nallah, Baidhar Nallah &amp; Nallah-B is in progress as per the approved diversion plan. Diversion Work of Garia Nallah and Baidhar Nallah is likely to be completed by July 2023.</p>
(viii)	The fluoride in the groundwater both in dug wells and by installing piezometers in the study area at appropriate locations be monitored.	<p><b>Being Complied</b></p> <p>Groundwater quality including Fluoride is being monitored by an NABL Accredited laboratory at eight different locations in Core and Buffer zone.</p> <p>Three (3) nos. of Piezometers have been installed at Site Office area, Inside Mines and R&amp;R Colony.</p> <p>Also, Water level is being monitored through network of eight (8) abstraction structures (borewells/dugwells) in core and buffer zone of DLCMP.</p> <p>The analysis report wrt fluoride in groundwater collected from the different locations within the study area for the period from the month of <b>October 2022 to March 2023</b> is annexed. <b>Annexure - IV</b>.</p>
(ix)	Transport of coal to Darlipalli TPS located at a distance of about 10km shall be by MGR.	<p><b>Noted &amp; Agreed</b></p> <p>Coal produced from the DLCMP is being transported to Darlipalli Super Thermal Power Plant through MGR.</p>
(x)	An integrated calendar plan of production including the details re-handling separately in external and internal dumps should be furnished to MOEF for record.	<p><b>Being Complied</b></p> <p>Integrated calendar plan of production including details of re-handling of external and internal dumps has been submitted to MoEF &amp; CC vide letter no. 0100/DLCMP/FD/ES/02/0814 dated 25.08.2014. Copy of letter attached as <b>Annexure-V</b>.</p>
(xi)	Temporary OB dumps which require re-handling should be stabilized with grass and shrubs.	<p><b>Being Complied</b></p> <p>Presently, OB dumps are active, and dumping is being done over there as per the approved mining plan.</p>

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ECC. No.	Specific EC Conditions	Compliance Status as on 31.03.2023
		<p>However, the inactive portion of the OB dump over 1.5 Ha has been stabilized with grassing and planting the tree sapling.</p> <p>Photos of the same is attached as <b>Annexure-VI.</b></p>
(xii)	<p>Data available with the Rajiv Gandhi National Drinking Water Mission, Department of Rural Development be studied and recommendations therein for removal / treatment of fluorides, TDS, etc, in drinking water be followed for providing safe drinking water to R&amp;R colony and to the nearby villages.</p>	<p><b>Being Complied</b></p> <p>Level of Fluorides, TDS etc. in the tube well and drinking water to R&amp;R Colony is being monitored through NABL Accredited laboratory.</p> <p>The concentration level is well within the prescribed limits.</p> <p>Water is being supplied to all the dwelling units in the R&amp;R Colony through overhead tank after treatment in water treatment plant.</p> <p>Additionally, UV Water purifiers have been provided to all the dwelling units of R&amp;R Colony for ensuring safe drinking water.</p> <p>Copy of Ground water quality report attached as <b>Annexure-IV</b> &amp; photographs of UV Purifier, WTP &amp; OHT is attached as <b>Annexure-VII.</b></p>
(xiii)	<p>Mining shall be carried out as per statute at a safe distance from Garia Nala and its diversion canal and the diverted Baidhara nala and nala'B' Nala flowing within the lease boundary. The bund /embankment to be constructed along diverted canal of Garia nala shall be designed taking into account the highest flood level, based on past data, so as to guard against mine inundation.</p>	<p><b>Being Complied</b></p> <p>Mining is being carried out as per statute at a safe distance from Garia Nala and its diversion canal and Baidhara nala and under diversion Nala'B' Nala flowing within the lease boundary.</p> <p>The embankment is designed taking into account the highest flood level and approved by the Water Resource Department, Govt. of Odisha.</p> <p>Presently working has been carried out with the safety distance of 40m from Garia Nalla.</p>
(xiv)	<p>Topsoil shall be stacked properly within the ML with proper slope at earmarked site of 3.84 ha and shall be concurrently used for</p>	<p><b>Being Complied</b></p> <p>Topsoil is being stacked within ML with proper slope at earmarked site.</p> <p>6,00,000.00 m<sup>3</sup> of topsoil has been stacked</p>

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ECC. No.	Specific EC Conditions	Compliance Status as on 31.03.2023
	reclamation and development of green belt within a year of its generation.	at the earmarked site as on 31.03.2023. As on 31.03.2023, a total of 1.27 Ha of Topsoil Dump has been stabilized with grassing of Stylo Hamata grass. Photographs attached as <b>Annexure - VIII.</b>
(xv)	A temporary external OB dump in an area of 106.62 ha and of 60m height for the initial period of 2.5 years shall be created for dumping 38.5 Mm <sup>3</sup> of OB, which would be reclaimed with plantation and after 2.5 to 3 year. There would be no external OB dumping from 5th year onwards. The temporary OB dumps which require re-handling shall be stabilized with grass and shrubs.	<p><b>Noted and Agreed to Comply</b></p> <p>Initially the external OB dump was planned in 106.62 ha area, but while granting the forest clearance, an area of 18.34 ha forest land and 2.95 ha of Govt land was excluded hence the present area for the external OB dump is reduced to 86 ha, accordingly only 28.5 mill.CuM shall be accommodated in the external OB dump.</p> <p>However, due to local law &amp; order issues (i.e., resistance from the villagers for rehabilitation activities), the total proposed quantity i.e., 28.5 million Cu.M is unable to accommodate in the external OB Dump.</p> <p>Till end of Mar-23, approx.10.0 million CuM of OB is accommodated and the balance OB Quantity to be accommodated at the earliest.</p> <p>Presently dumping activities are being carried out at Khapurikachhar OB dump, Beldihi OB Dump and In pit dump.</p> <p>Inactive OB dump of Khapurikhachhar having 1.5 ha. has been grassed with different varieties along with local sapling planted and along the slope with Stylo Hamata grass.</p> <p>Photographs attached as <b>Annexure-VI.</b></p>
(xvi)	Area brought under afforestation shall be not less than 466.46 ha which includes 286.74 ha within the ML and 179.72 ha outside the ML would be reclaimed with plantation, which includes 351.23 ha of reclaimed quarry, 106.50 ha of reclaimed external OB dump, 3.84 ha of topsoil dump, 2.75 ha of coal stockyard, 2.14 ha of surface water reservoir and an	<p><b>Noted and Agreed to Comply</b></p> <p>The stipulation shall be followed.</p> <p>Plantation in quarry area will be done in phases in the available area after completion of mining and internal dumping is over.</p> <p>So far, 42,742 nos. of plants have been planted in the vacant areas inside and outside the Mining Lease area.</p> <p>6120 nos. of sapling have been planted</p>

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ECC. No.	Specific EC Conditions	Compliance Status as on 31.03.2023
	<p>area of 83.74 ha undisturbed shall be developed into green belt within the first 3 years.</p>	<p>and 1200 kg of Stylo Hamata grass seeds have been spread all along the slope of inactive portion of OB dump.</p> <p>1200 kg of Stylo Hamata seeds all along the slope of Topsoil Dump and about 400 nos. of tree sapling over 1.27 Ha of area along the topsoil dump have been done.</p> <p>Total 10,157 numbers of sapling have been planted during last monsoon period and total 42742 nos. of plants have been planted (including distribution) since inception of the mine.</p> <p>Copy of map and Photos of Plantation activities carried out in different region is attached as <b>Annexure – II(a) &amp; II(b)</b>.</p>
(xvii)	<p>Catch drains and siltation ponds of appropriate size shall be constructed to arrest silt and sediment flows from soil, OB and mineral dumps. The water so collected shall be utilized for watering the mine area, roads, green belt development, etc. The drains shall be regularly desilted and maintained properly.</p>	<p><b>Being Complied</b></p> <p>Catch drains of 6 Kms length and siltation ponds of appropriate size are constructed to arrest silt and sediment flows from topsoil, OB and mineral dumps. Garland drain is so designed that it will discharge the rainwater to settling pond.</p> <p>Garland drains having width and depth of 1.5m to 2.0m have been constructed along OB Dumps. All the garland drains are connected to settling pond before discharging the rainwater to Gariya Nala.</p> <p>Details of the same is as under:</p> <ul style="list-style-type: none"> <li>➤ OB dump-1A: 2350 m.</li> <li>➤ OB dump-1B: 2840 m.</li> <li>➤ Khuntijharia OB dump: 2578 m.</li> <li>➤ Beldihi OB dump: 860 m.</li> <li>➤ Up-side of the mine: 2350 m. this prevents entry of outside storm water into the mine pit.</li> </ul> <p>Sedimentation pond/ settling pond has been de-Silted periodically. Also, embankment of adequate size has been provided along the Garia Nalla.</p> <p>Photos of garland drains, sedimentation pond and dust suppression are attached as.</p>

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ECC. No.	Specific EC Conditions	Compliance Status as on 31.07.2023
		Photographs attached as <b>Annexure - 1.</b>
(xviii)	The entire transportation of 21,210 TPD of coal from the mine to the linked Darlipali Super Thermal Power plant shall be by MGR only with wagon loading by Silo. Transportation of coal by road is not permitted.	<p><b>Noted and Agreed to Comply</b></p> <p>Coal transportation to Darlipalli Super Thermal Power Plant is through MGR with wagon loading.</p> <p>In the event of Silo maintenance wagon loading is done through loaders ensuring proper dust prevention and suppression measures.</p> <p>Photos of Coal Silo and rail wagons are enclosed as <b>Annexure - 2.</b></p>
(xix)	An STP shall be provided for the township/ colony to treat the domestic effluents to prescribed standards and for their reuse in project activities.	<p><b>Being Complied</b></p> <p>For offices a septic tank followed by a soak pit has been provided.</p> <p>The township of NTPC Dulanga is integrated with NTPC Darlipalli and STP of 1200 KLD is provided in the integrated township.</p> <p>The treated effluents are as per prescribed standards and are being reused for horticultural purpose.</p> <p>Photograph of STP at Darlipali Township is attached as <b>Annexure-3.</b></p>
(xx)	Area brought under afforestation shall be not less than 466.46 ha which includes 286.74 ha within the ML and 179.72 ha outside the ML would be reclaimed with plantation, which includes 351.23 ha of reclaimed quarry, 106.50 ha of reclaimed external OB dump, 3.84 ha of topsoil dump, 2.75 ha of coal stockyard, 2.14 ha of surface water reservoir and an area of 83.74 ha undisturbed shall be developed into green belt within the first 3 years.	<p><b>Noted and Agreed to Comply</b></p> <p>Plantation in quarry area will be done in phases in the available area after completion of mining and internal dumping is over.</p> <p>So far, 42,742 nos. of plants have been planted in the vacant areas inside and outside the Mining Lease area.</p> <p>6120 nos. of sapling have been planted and 1200 kg of Stylo Hamata grass seeds have been spread all along the slope of inactive portion of OB dump.</p> <p>1200 kg of Stylo Hamata seeds all along the slope of Topsoil Dump and about 400 nos. of tree sapling over 1.27 Ha of area along the topsoil dump have been done.</p> <p>Total 10,157 numbers of sapling have been planted during last monsoon period</p>

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ECC. No.	Specific EC Conditions	Compliance Status as on 31.03.2023
		<p>and total 42742 nos. of plants have been planted since inception of the mine.</p> <p>Copy of map and Photos of Plantation activities carried out in different region is attached as <b>Annexure – II(a) &amp; II(b)</b>.</p>
(xxi)	<p>A Project specific Wildlife Conservation Plan prepared for Rs 73 lakhs as capital costs and Rs.61 lakhs (annual) for the project for conservation of wild fauna including Elephant, Sloth Bear and a number of Schedule-II fauna found in the study area and for conservation of their habitat shall be implemented in consultation with the Forest and Wildlife Departments of the State Government. The Plan shall include creation of a passageway (undisturbed area through the block as a passage for the free movement of the elephants and for wild animals which may venture into the coal mine areas) at all stages of the mine operation in conjunction with the neighboring mines which come up in the area to allow movement of these fauna through the project area. The passageway shall be forested with species from the natural habitat to provide connectivity to enable them to reach the neighboring forests unhindered. Solar fencing would be done along the quarry which would be shifted as the mine develops. Grasslands shall be developed as part of Habitat Restoration in the study area and tree and plant species such as bamboo which constitute the natural diet of the elephants and plant species suitable for bears shall be developed as part of mine reclamation and eco-regeneration of the study area regularly visited by the elephants. At the post</p>	<p><b>Being Complied</b></p> <p>The Site-specific Wildlife Conservation Plan as approved by the Chief Wildlife Warden; Odisha vide letter no. 9597/1WL(C) SSP-270/2012 dated 03/12/2013 is under implementation.</p> <p>Copy of the approval letter &amp; deposit slip is enclosed as <b>Annexure-IX</b>.</p> <p>Funds for implementation of the same in the buffer zone by the State Forest Department have already been deposited in Ad-hoc CAMPA account vide UIR No. SBIN714073448793 dated 14/03/2014 for Rs.4,49,70,000/-.</p>

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ECC. No.	Specific EC Conditions	Compliance Status as on 31.03.2023
	<p>mining stage, the mine shall be restored as a habitat for the wildlife found in the pre-mining stage. The WL Plan shall include the use of sirens to alert the animals during MGR movement, sensitizing the rail drivers and minimizing speed during such crossings shall also be implemented.</p>	
(xxii)	<p>The project authorities shall also participate in a Regional Conservation Plan as and when prepared in the future by the State Govt. for the conservation of flora-fauna found in the region as a whole.</p>	<p><b>Being Complied</b></p> <p>Funds for the Regional Wildlife Conservation Plan have already been deposited in Ad-hoc CAMPA as per the revised rate fixed by the State Govt. @ Rs. 43,000/- per Ha for the total leasehold area vide UTR No. SBIN714073453867 dated 14/03/2014 for Rs.3,27,84,060/-.</p> <p>Copy of the approval letter &amp; deposit acknowledgement is enclosed as <b>Annexure-IX.</b></p>
(xxiii)	<p>The progress made on the implementation of the Wildlife Conservation Plan shall be monitored by the creation of a Committee which includes experts in ecology and wildlife.</p> <p>The status of budgetary provision of capital and revenue expenditure on the various activities under the Project specific and Regional WL Conservation Plan and the status of the Plans shall be regularly reported to the MOEF RO, Bhubaneswar and also uploaded on the company website.</p>	<p>For third party monitoring of implementation of WL Conservation Plan; College of Forestry, OUAT, Bhubaneswar has been engaged.</p> <p>Dr Nirakar Bhol, I/C Head of the Department-cum-Principal Investigator of the Monitoring Project oversees the third-party monitoring.</p> <p>The 1<sup>st</sup> Six monthly report received from College of Forestry, OUAT, Bhubaneswar for the year 2022-23 is attached as <b>Annexure-X.</b></p>
(xxiv)	<p>Third Party monitoring of implementation of WL Conservation Plan shall be carried out and for monitoring the utilization of funds earmarked for implementation of the WL Plan.</p>	<p><b>Being Complied</b></p> <p>For third party monitoring of implementation of WL Conservation Plan; College of Forestry, OUAT, Bhubaneswar has been engaged.</p> <p>Dr Nirakar Bhol, I/C Head of the Department-cum-Principal Investigator of</p>

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ECC. No.	Specific EC Conditions	Compliance Status as on 31.03 2023
		<p>the Monitoring Project oversees the third-party monitoring.</p> <p>The 1<sup>st</sup> Six monthly report received from College of Forestry, OUAT, Bhubaneswar for the year 2022-23 is attached as <b>Annexure-X</b>.</p>
(xxv)	<p>A detailed R&amp;R Plan shall be formulated for the 417 PAPs and 309 homestead losers as per R&amp;R Policy of the State Govt. and shall be completed within December 2014; R&amp;R shall include specific income generation schemes, skill development and capacity building, etc. The details of status of implementation and expenditure on the various activities under the R&amp;R Action Plan for the total budget of R&amp;R shall be uploaded on the company website.</p>	<p><b>Being Complied</b></p> <p>A detailed R&amp;R Plan for the project affected families of Dulanga Coal Mining Project has been approved by the District Magistrate &amp; Collector, Sundargarh with a total financial outlay of Rs. 112 Crores.</p> <p>The plan is being implemented accordingly for all eligible PAPs in phases.</p> <p>Expenditure incurred up to March 2023:</p> <ol style="list-style-type: none"> <li>1. R &amp; R Colony Construction: Rs 97 Crores</li> <li>2. R &amp; R benefits (Incl Annuity): Rs 154.47 Cr (Rs 100.28 Cr for R&amp;R + Rs 54.19 Cr for Annuity).</li> </ol> <p>Details of the R&amp;R grants provided to PAPs of NTPC Dulanga is uploaded on to NTPC Website. The same can be accessed through <a href="https://www.ntpc.co.in/about-us/corporate-functions/corporate-citizenship/rehabilitation-resettlement">https://www.ntpc.co.in/about-us/corporate-functions/corporate-citizenship/rehabilitation-resettlement</a>.</p>
(xxvi)	<p>CSR Plan with a total budgetary provision of Rs 15.92 crores (capital) and 7.34 crore/annum recurring cost) shall be implemented for the life of the project. The details of village-wise activities undertaken for the amount of Rs 67.69 lakhs already spent on CSR shall be uploaded on the company website and further, details of village-wise activities for provision of Rs 30-40 Cr for CSR for the first 5 years and Rs5/T of coal as recurring expenditure shall also be provided in the annual report and the compliance report furnished to MOEF RO,</p>	<p><b>Being Complied</b></p> <p>The budgetary provision of Rs. 15.92 crores (Capital) and 7.34 crore/ annum (recurring cost) pertains to the Environment Management Plan for the project and shall be implemented during mining operations for the life of the project.</p> <p>NTPC Dulanga Coal Mining Project has spent a total of approx. <b>Rs 1.61 Cr</b> under different heads like health, education, infrastructure, drinking water, capacity building / skill development during FY 2022-23.</p> <p>As on date an amount of Rs 41.7 Crores has been spent on CSR activities.</p> <p>Expenditure incurred on CD activity in FY</p>

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ECC. No.	Specific EC Conditions	Compliance Status as on 31.03.2023
	Bhubaneswar.	2022-23 is enclosed as <b>Annexure-XI</b> .
(xxvii)	A detailed R&R Plan shall be formulated in consultation with the various stakeholders as per prevalent R&R Policies and would cover R&R for individuals and for the displaced community as a whole.	<b>Being Complied</b> R&R plan for the individuals and for the displaced community as a whole has been prepared in-line with the National R&R Policy & the OPRR Policy and the same has been duly approved of by the District Magistrate & Collector, Sundargarh. Copy of the R&R plan is enclosed as <b>Annexure-XII</b> .
(xxviii)	Various activities under R&R Plan should be completed within time-schedule. The detailed R&R and CSR Action Plans be prepared and implemented.	<b>Noted and Agreed to Comply</b> Detailed R&R plan has already been prepared, approved of and has been implemented. Copy of the R&R plan is enclosed as <b>Annexure-XII</b> .
(xxix)	An amount of 67.69 lakhs has been already spent on CSR and further, a provision of Rs 30-40 crores shall be earmarked for CSR for the first 5 years and 5/T of coal as recurring expenditure adjusted to the annual inflation rate.	<b>Noted and Agreed to Comply</b> NTPC Dulanga Coai Mining Project has spent a total of approx. Rs 1.61 Cr under different heads like health, education, infrastructure, drinking water, capacity building / skill development during FY 2022-23. As on date an amount of Rs 41.7 Crores has been spent on CSR activities. Expenditure Incurred on CD activity in FY 2022-23 is enclosed as <b>Annexure-XI</b> .
(xxx)	An amount of Rs.1592 lakhs (capital costs) and Rs.734 lakhs (recurring) costs earmarked for EMP shall be implemented and detail thereof furnished as part of the compliance report and also uploaded on the company website.	<b>Noted and Agreed to Comply</b> Amount earmarked for EMP are being utilized for implementation and being complied with. Year wise expenditure incurred on environment protection measures is enclosed as <b>Annexure-XIII</b> .
(xxxii)	Coal transportation in pit: Rear Dumper, Surface to Siding through Conveyor belts and loading at siding by rail.	<b>Being complied</b> Presently transportation is being done in rear dumpers from coal face to CHP – Hopper and wagon loading of coal through RLS.
(xxxii)	The production shall be within the same Mining Lease area.	<b>Being Complied</b>

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<b>ECC. No.</b>	<b>Specific EC Conditions</b>	<b>Compliance Status as on 31.03.2023</b>
(xxxiii)	The OB shall be completely re-handled at the end of the mining.	<p><b>Noted and Agreed to Comply</b></p> <p>The OB will be completely re-handled at the end of the mining as per the approved Mining Plan.</p>
(xxxiv)	Final mine void depth will not be more than 40m. The void area will be converted into water body. The rest of the area will be back filled upto the ground level and covered with about a meter thick top soil and put to use.	<p><b>Noted and Agreed to Comply</b></p> <p>Mining is being done as per the approved Mining Plan for the project. After completion of the mining the mine shall be closed as per the approved mine closure plan.</p>
(xxxv)	Garland drains be provided.	<p><b>Being Complied</b></p> <p>Garland drains having width and depth of 1.5m to 2.0m have been constructed along OB Dumps. All the garland drains are connected to settling pond before discharging the rainwater to Gariya Nala.</p> <p>Details of the same is as under:</p> <ul style="list-style-type: none"> <li>➤ OB dump-1A: 2350 m.</li> <li>➤ OB dump-1B: 2840 m.</li> <li>➤ Khuntijharia OB dump: 2578 m.</li> <li>➤ Beldihi OB dump: 860 m.</li> <li>➤ Up-side of the mine: 2350 m. this prevents entry of outside storm water into the mine pit.</li> </ul>
(xxxvi)	The land after mining shall be brought back for agriculture purpose.	<p><b>Noted and Agreed to Comply</b></p> <p>Mining is being done as per the approved Mining Plan for the project. After completion of the mining the mine shall be closed as per the approved mine closure plan.</p>
(xxxvii)	Mine water should be treated for discharge into the lagoon. The quality of lagoon water shall be regularly monitored, and mitigation measures taken.	<p><b>Noted and Agreed to Comply</b></p> <p>Presently, no Mine Water is being discharged in lagoons. All the mine water is being re-used for dust suppression and vehicle washing purposes.</p>
(xxxviii)	Everybody in the core area should be provided with mask for protection against fugitive dust emissions.	<p><b>Being Complied</b></p> <p>All the persons working in the dust prone area are being provided with dust mask for protection against fugitive dust emissions as</p>

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<b>ECC. No.</b>	<b>Specific EC Conditions</b>	<b>Compliance Status as on 31.03.2023</b>
		a part of PPE during mining operations. Photographs attached as <b>Annexure-4.</b>
(xxxix)	Dust mask to be provided to everyone working in the mining area.	<b>Being Complied</b> All the persons working in the dust prone area are being provided with dust mask for protection against fugitive dust emissions as a part of PPE during mining operations.
(xl)	The supervisory staff should be held personally responsible for ensuring compulsory regarding wearing of dust mask in the core area.	<b>Being Complied</b> All the persons working in the dust prone area are being provided with dust mask for protection against fugitive dust emissions as a part of PPE during mining operations. Ensuring the use of dust mask by the worken's has been made part of duty of the supervisory staffs.
(xli)	People working in the core area should be periodically tested for the lung diseases and the burden of cost on account of working in the coal mine area.	<b>Being Complied</b> All the personnel engaged in mining are tested under Occupational Health Checkup. Further, periodical health checkups are done for identification of lungs diseases through Chest X – Ray. All Test Reports are available at site. Format of health checkup is enclosed as <b>Annexure-XIV.</b>
(xlii)	The mining area should be grounded by green belt having thick closed thick canopy of the tree cover.	<b>Being Complied</b> Plantation of trees having thick canopy have been done in the safety zone of the Dulanga Coal mining project Photographs of Safety Zone Gap Plantation along with Fencing is attached as <b>Annexure-5.</b>
(xliii)	The embankment constructed along the river boundary shall be of suitable dimensions and critical patches shall be strengthened by stone pitching on the river front side and stabilized with plantation so as to withstand the peak water flow and prevent mine inundation.	<b>Being Complied</b> The work is in progress for diversion of Garia Nallah, Baidhar Nallah & Nallah B as per the approved diversion plan. The embankment is designed taking into account the highest flood level and approved by the competent authority i.e. Water Resource Department

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<b>ECC. No.</b>	<b>Specific EC Conditions</b>	<b>Compliance Status as on 31.03.2023</b>
		Extensive plantation activities shall be carried out on either sides after completion of the embankment.
(xliv)	There shall be no overflow of OB into the river and into the agricultural fields and massive plantation of native species shall be taken up in the area between the river and the project.	<p><b>Being Complied</b></p> <p>No Surface runoff from OB Stacks /dump being discharged into any nearby agricultural fields.</p> <p>Already available plantation in the area between the river and the project have not been disturbed. Also, additional plantation have been done in the available gaps.</p>
(xlv)	OB shall be stacked at one earmarked external OB dumpsite(s) only. The ultimate slope of the dump shall not exceed 28°. Monitoring and management of existing reclaimed dumpsites shall continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment & Forest and its concerned Regional office on yearly basis.	<p><b>Being Complied</b></p> <p>Only one external dump has been formed. Presently dumping of the OB is going on in the external OB Dump. The ultimate height of the external OB shall be maintained as per the approval. And the ultimate slope angle of the OB dump shall be maintained as 28 deg.</p>
(xlvi)	Garland drains (size, gradient and length) and sump capacity shall be designed keeping 50% adjoining the mine site. Sump capacity shall also provide adequate retention period to allow proper setting of silt material.	<p><b>Being Complied</b></p> <p>As per the stipulation, Garland drains (size, gradient and length) and sump capacity have been designed keeping 50% adjoining the mine site.</p> <p>Dimensions vary from 2m to 4m with the gradient of 1:30.</p> <p>Sump capacity has been provided with adequate retention period to allow proper settling of silt materials.</p> <p>Photograph of the Settling Pond is enclosed as <b>Annexure-XV</b>.</p>
(xlvii)	Dimension of the retaining wall at the toe of the dumps and OB benches within the mine to check run-off and siltation shall be based on the rainfall data.	<p><b>Being Complied</b></p> <p>Dimension of the retaining wall at the toe of the dumps and OB benches within the mine to check run-off and siltation will be designed based on the rainfall data of the</p>

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ECC. No.	Specific EC Conditions	Compliance Status as on 31.03.2023
		<p>area.</p> <p>Construction of retaining wall will be carried out once we reach the optimum height and area section wise.</p>
(xlviii)	<p>Crushers at the CHP of adequate capacity for the expansion project shall be operated with high efficiency bag filters, water sprinkling system shall be provided to check fugitive emissions from crushing operations, conveyor system, haulage roads, transfer points, etc.</p>	<p><b>Being Complied</b></p> <p>CHP of capacity 1325 tph is constructed and operational with inbuilt mist type dust suppression system in conveyors.</p> <p>Dust suppression arrangements such as fixed water sprinkling system have also been provided to check fugitive emissions from crushing operations, haulage roads, transfer points, etc.</p> <p>Photographs attached as <b>Annexure-6</b>.</p>
(xlix)	<p>Drills shall be wet operated.</p>	<p><b>Being Complied</b></p> <p>Wet operated drills are being used during drilling operation.</p> <p>Photographs of wet drilling is enclosed as <b>Annexure-XVI</b>.</p>
(i)	<p>The project authorities shall undertake regular repairing and tarring of roads used for mineral transportation. A3-tier green belt comprising of a mix of native species shall be developed all along the major approach roads.</p>	<p><b>Being Complied</b></p> <p>Coal transportation to Darlipalli Super Thermal Power Plant is being done through MGR with wagon loading by Silo.</p> <p>Also, avenue plantation has been taken up during the monsoon season along the roads constructed by NTPC – DLCMP.</p>
(ii)	<p>Controlled blasting shall be practiced with use of delay detonators and only during daytime. The mitigative measures for control of ground vibrations and to arrest the fly rocks and boulders shall be implemented.</p>	<p><b>Being Complied</b></p> <p>Controlled blasting during daytime are practiced with the use of delay detonators.</p> <p>Further, Scientific study of controlled blasting designed by ISM, Dhanbad. Additionally, all stipulations made by DGMS to this effect is being duly adhered to.</p> <p>The mitigative measures for control of ground vibrations and to arrest the fly rocks and boulders are being implemented.</p> <p>Ground vibrations due to blasting are also being monitored regularly.</p>

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ECC. No.	Specific EC Conditions	Compliance Status as on 31.03.2023
(lii)	<p>A Progressive Mine Closure Plan shall be implemented by reclamation and afforestation of 351.23 ha of the total quarry area of 567.19 ha by planting native plant species in consultation with the local DFO/Agriculture Department. The density of the trees shall be around 2500 plants per ha. The balance 159.55 ha decoaled area being converted into a water reservoir of 45-50m depth at the post mining stage shall be gently sloped along the upper benches an stabilized and reclaimed with plantation</p>	<p><b>Being Complied</b></p> <p>Mine Closure Plan has already been approved as a part of Mining Plan and it envisages the stipulations as made herein by the Ministry.</p> <p>Progressive Mine Closure Plan is being implemented and annual report in this regard is being submitted the Coal Controller of India, Kolkata.</p> <p>Copy of the annual mine closure report is enclosed as <b>Annexure-XVII</b>.</p>
(liii)	<p>A temporary external OB dump in an area of 106.62 ha and of 60m height for the initial period of 2.5 years shall be created for dumping 38.5 Mm<sup>3</sup> of OB, which would be reclaimed with plantation and after 2.5 to 3 years. There would be no external OB dumping from 5th year onwards. The temporary OB dumps which require re-handling shall be stabilized with grass and shrubs.</p>	<p><b>Noted and Agreed to Comply</b></p> <p>Initially the external OB dump was planned in 106.62 ha area, but while granting the forest clearance, an area of 18.34 ha forest land and 2.95 ha of Govt land was excluded hence the present area for the external OB dump is reduced to 86 ha, accordingly only 28.5 mill.CuM shall be accommodated in the external OB dump.</p> <p>However, due to local law &amp; order issues (i.e., resistance from the villagers for rehabilitation activities), the total proposed quantity i.e., 28.5 million Cu.M is unable to accommodate in the external OB Dump.</p> <p>Till end of Mar-23, approx.10.0 million CuM of OB is accommodated and the balance OB Quantity to be accommodated at the earliest.</p> <p>Presently dumping activities are being carried out at Khapurikhachar OB dump, Beldihi OB Dump and In pit dump.</p> <p>Inactive OB dump of Khapurikhachar having 1.5 ha. has been grassed with different varieties along with local sapling planted and along the slope with Stylo Hamata grass.</p>
(liv)	<p>The proponent should prepare restoration and reclamation plan</p>	<p><b>Noted and Agreed to Comply</b></p>

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ECC. No.	Specific EC Conditions	Compliance Status as on 31.03.2023
	for the degraded area. The land be used in a productive and sustainable manner.	<p>Mine Closure Plan has already been approved as a part of Mining Plan and it envisages the stipulations as made herein by the Ministry.</p> <p>Progressive Mine Closure Plan is being implemented and annual report in this regard is being submitted the Coal Controller of India, Kolkata.</p> <p>Copy of the annual mine closure report is enclosed as <b>Annexure-XVII.</b></p>
(iv)	Compensatory Ecological & Restoration of waste land, other degraded land and OB dumps in lieu of breaking open the land be carried out	<p><b>Noted and Agreed to Comply</b></p> <p>Mine Closure Plan has already been approved as a part of Mining Plan and it envisages the stipulations as made herein by the Ministry.</p> <p>Progressive Mine Closure Plan is being implemented and annual report in this regard is being submitted the Coal Controller of India, Kolkata.</p> <p>Copy of the annual mine closure report is enclosed as <b>Annexure-XVII.</b></p>
(vi)	The mining should be phased out in sustainable manner. No extra over burden dumps are permitted.	<p><b>Noted and Agreed to Comply</b></p> <p>Only one external OB dump has been made at DLCMP. Mining is being done as per the approved mining plan. For phasing out of the mining activity, Mine Closure Plan has already been prepared and approved by the MoC. Same is under implementation.</p>
(vii)	No groundwater shall be used for mining operations.	<p><b>Being Complied</b></p> <p>Rainwater collected into the mine sump and seepage water is being used for mining purposes. Ground water is being used only for potable use.</p> <p>NOC for abstraction of ground water has been obtained from the Central Ground Water Authority, New Delhi vide letter No. 21-4 (513)/ SER/ CGWA/ 2013-1982 dated 04<sup>th</sup> Dec. 2017 and renewed vide NOC No. CGWA/ NOC/MIN/REN/2/2022/7124 which is valid from 04<sup>th</sup> Dec. 2021 to 03<sup>rd</sup> Dec 2023.</p> <p>Copy of the NOC is enclosed as <b>Annexure-</b></p>

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ECC. No.	Specific EC Conditions	Compliance Status as on 31.03.2023
		<b>XVIII.</b>
(viii)	Regular monitoring of groundwater level and quality shall be carried out by establishing a network of existing wells and construction of new piezometers. The monitoring for quantity shall be done four times a year in pre-monsoon (May), monsoon (August), post-monsoon (November) and winter (January) seasons and for quality in May. Data thus collected shall be submitted to the Ministry of Environment & Forests and to the Central Pollution Control Board quarterly within one month of monitoring.	<p><b>Being Complied</b></p> <p>Regular monitoring of groundwater level and quality is being carried out through NABL Accredited as well as OSPCB empaneled laboratory.</p> <p>The frequency of monitoring is as per the schedule mentioned.</p> <p>Record of Ground water level for the year 2022-23 is attached as <b>Annexure -XIX.</b></p> <p>The ground water quality report for the month of <b>October 2022 to March 2023</b> is annexed for your kind reference and necessary record. <b>Annexure – IV.</b></p>
(lix)	The Company shall put up artificial groundwater recharge measures for augmentation of groundwater resource in case monitoring indicates a decline in water table. The project authorities shall meet water requirement of nearby village(s) in case the village wells go dry due to dewatering of mine.	<p><b>Being Complied</b></p> <p>Water level is being monitored through network of eight (8) abstraction structures (borewells/dugwells) in core and buffer zone of DLCMP.</p> <p>To augment the ground water in the area, rainwater harvesting structures have been constructed in the Vocational Training Centre &amp; Coal Laboratory building and Pond construction activities in R&amp;R Colony and Pond deepening activities have been undertaken in the nearby villagers as water conservation measures.</p> <p>Further, water tankers are also being deployed in nearby villages during summer season as a part of Community development activity.</p>
(lx)	Sewage treatment plant shall be installed in the existing colony. ETP shall also be provided for workshop and CHP wastewater.	<p><b>Being Complied</b></p> <p>For offices a septic tank followed by a soak pit has been provided.</p> <p>The township of NTPC Dulanga is integrated with NTPC Darlipalli and STP of 1200 KLD is provided in the integrated township.</p> <p>The treated effluents are as per prescribed standards and are being reused for horticultural purpose.</p>

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ECC. No.	Specific EC Conditions	Compliance Status as on 31.03.2023
		<p>ETP having 50KLD capacity has been constructed and is being used for treatment of Effluent water generated during vehicle washing.</p> <p>Inlet and outlet water samples of ETP is being monitored. All the parameters are under permissible limit. Copy of report for period <b>October 2022 to March 2023</b> is annexed at <b>Annexure-XX</b>.</p>
(lxi)	<p>Besides carrying out regular periodic health check-up of their workers, 10% of the workers identified from workforce engaged in active mining operations shall be subjected to health check-up for occupational diseases and hearing impairment, if any, through an specialized agency/ institution within the District/State and the results reported to this Ministry and to DGMS.</p>	<p><b>Being Complied</b></p> <p>All the personnel engaged in mining are tested under Occupational Health Checkup. Further, periodical health checkups are done for identification of lungs diseases through Chest X – Ray and hearing impairment, if any, through a specialist in the field.</p> <p>Format of health checkup is enclosed as <b>Annexure-XIV</b>.</p>
(lxii)	<p>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 3 years (for any one particular season which is consistent in the time series), and the report submitted to MOEF and its concerned Regional office.</p>	<p><b>Being Complied</b></p> <p>Mining operation started in the month of February 2018. Copy of Notice of Opening of Mine submitted to DGMS, Dhanbad is enclosed as <b>Annexure-XXI</b>.</p> <p>Land use map for both core and buffer has been prepared on a scale of 1: 5000 based on Satellite Imagery path available in 2021 and was submitted with last half yearly compliance.</p> <p>The land use pattern monitoring study shall be carried out this year i.e., 2023.</p> <p>Copy of LULC Map attached as <b>Annexure-7</b>.</p>
(lxiii)	<p>A detailed Final Mine Closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment &amp; forests within 6 months of grant of Environmental Clearance.</p>	<p><b>Being Complied</b></p> <p>An ESCROW account for depositing of the Mine Closure cost have been opened for the DLCMP. Till date Rs 19.57 Cr. has been deposited in the ESCROW account.</p> <p>Detailed Final Mine Closure Plan have already submitted to the MoEF &amp; CC vide our letter ref no: 0100/ DLCMP/FD/ES/ 02/</p>

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<b>ECC. No.</b>	<b>Specific EC Conditions</b>	<b>Compliance Status as on 31.03.2023</b>
		0814 dated 25/08/2014. Copy of the letter is enclosed as <b>Annexure-V.</b>
(lxiv)	The project authorities shall in consultation with the Panchayats of the local villages and administration identify socio-economic and welfare measures under CSR to be carried out over the balance life of the mine.	<b>Being Complied</b> Various socio-economic and welfare measures are being undertaken as initial community development in consultation with the Panchayats of the local villages and administration and the same is being carried out accordingly. This practice shall be followed over the entire life of the mine.
(lxv)	The commitment made by the Proponent to the issue raised during Public Hearing shall be implemented by the Proponent.	<b>Being Complied</b> All the commitment made during Public Hearing have been implemented. The status of implementation is attached as <b>Annexure-8.</b>
(lxvi)	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 or 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. d. To have proper checks and balances, the company shall have a well laid down system of reporting of non-	<b>Being Complied</b> The Corporate Environment Responsibility Policy of NTPC already exists and the same is also being revised from time to time. Recently Corporate Environment Policy has been revised in 2021 Copy of the said Policy has been attached as <b>Annexure-9.</b> <b>Hierarchical System of the Environment Management Cell is given below:</b> <ul style="list-style-type: none"> <li>• Chairman: Head of the Project</li> <li>• Vice Chairman: Mine Agent</li> <li>• Member Secretary: AGM (Env Mgmt)</li> <li>• 2 nos. Advisors: Mining, Safety</li> <li>• 3 nos. Members: Process Managers</li> <li>• Convenor: Sr Manager (Env Mgmt)</li> </ul> Copy attached as <b>Annexure-10.</b> <b>System of Reporting of Reporting of occurrence of any non-compliance of EC conditions is as give below:</b> <ul style="list-style-type: none"> <li>• Regular meeting of Environment</li> </ul>

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<b>ECC. No.</b>	<b>Specific EC Conditions</b>	<b>Compliance Status as on 31.03.2023</b>
	compliances/violations of environmental norms to the Board of Directors of the company and/or shareholders or stakeholders at large.	Management Cell <ul style="list-style-type: none"> <li>• Discussion and review of action taken on points of previous meeting.</li> <li>• Discussion on Pending Issues</li> <li>• Formulation of points for future</li> <li>• Discussion on OFI, if any.</li> <li>• Discussion of such OFI reports during meeting of EMC for early rectification.</li> </ul>

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ECC. No.	General EC Conditions	Compliances Status as on 31.03.2023
(i)	No change in mining technology and scope of working shall be made without prior approval of the Ministry of Environment and Forests.	<p><b>Noted and Agreed to Comply</b></p> <p>Necessary approval shall be obtained from the MoEF &amp; CC for any changes in mining technology and scope of working.</p>
(ii)	No change in the calendar plan of production for quantum of mineral coal shall be made.	<p><b>Being Complied</b></p> <p>There will be no change in the calendar plan of production for quantum of coal.</p>
(iii)	Four ambient air quality monitoring stations shall be established in the core zone as well as in the buffer zone for PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , and NO <sub>x</sub> 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>Four nos. of ambient air quality monitoring stations have already been established in consultation with the Odisha State Pollution Control Board at different locations in the core zone as well as in the buffer zone for monitoring of air quality parameters as mentioned such as PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, and NO<sub>x</sub>.</p> <p>Heavy metals such as Hg, As, Ni, Cd and Cr. etc. are also carried out once in six months.</p> <p>The AAQ monitoring reports for the period from <b>October 2022 to March 2023</b> is enclosed for your kind reference and necessary record. <b>Annexure – XXII.</b></p> <p>Also 01 (One) No. Continuous Ambient Air Quality Monitoring Station has been installed at our site to monitor the air quality. Photograph has been attached as <b>Annexure – XXIII.</b></p>
(iv)	Data on ambient air quality (PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , and NO <sub>x</sub> ) and heavy metals such as Hg, As, Ni, Cd, Cr, and other monitoring data shall be regularly submitted to the Ministry including its concerned Regional Office and to the State Pollution Control Board and the Central Pollution Control Board once in six months. Random verification of samples through analysis from independent laboratories recognized under the EPA rules,	<p><b>Being Complied</b></p> <p>Monitoring is being carried out through NABL accredited laboratory and the monitoring reports are being submitted monthly to concerned Regional Office and to the State Pollution Control Board and along with compliance report biannually to IRO, MoEF&amp;CC.</p> <p>The AAQ monitoring reports for the period from <b>October 2022 to March 2023</b> are enclosed as <b>Annexure – XXII.</b></p>

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ECC. No.	General EC Conditions	Compliances Status as on 31.03.2023
	1986 shall be furnished as part of compliance report.	
(v)	Adequate measures shall be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in blasting and drilling operations, operation of HEMM, etc. shall be provided with ear plugs/muffs.	<p><b>Being Complied</b></p> <p>Planned periodic maintenance of the equipment engaged in the mining is being done to prevent excessive noise.</p> <p>Adequate measures are taken for control of noise levels below 85 dBA in the work environment during the operation phase of mining block.</p> <p>Workers in high noise environment are also provided with ear plugs/muffs.</p>
(vi)	Industrial wastewater (workshop and wastewater from the mine) shall be properly collected, treated so as to conform to the standards prescribed under GSR 422(E) dated 19th May 1993 and 31st December 1993 or as amended from time to time before discharge. Oil and grease trap shall be installed before discharge of workshop effluents.	<p><b>Being Complied</b></p> <p>ETP having 50KLD capacity has been constructed and is being used for treatment of Effluent water generated during vehicle washing.</p> <p>Inlet and outlet water samples of ETP is being monitored. All the parameters are under permissible limit. Copy of report is annexed at</p> <p><b>Annexure-XX.</b></p> <p>The treated wastewater is being reused for vehicle washing.</p> <p>Photograph of ETP is attached as <b>Annexure-11.</b></p>
(vii)	Vehicular emissions shall be kept under control and regularly monitored. Vehicles used for transporting the mineral shall be covered with tarpaulins and optimally loaded.	<p><b>Being Complied</b></p> <p>Regular pollution monitoring of all vehicles involved in the mining project are in practice to control emission during operation of the mine.</p> <p>Copy of sample PUC is enclosed as <b>Annexure-XXIV.</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	<p><b>Being Complied</b></p> <p>Monitoring of environmental quality parameters are being carried out through establishment of adequate number and type of pollution monitoring and analysis equipment in consultation with the Regional Office, State Pollution Control</p>

*Rak*

ECC. No.	General EC Conditions	Compliances Status as on 31.03.2023
	laboratory recognized under EPA Rules, 1986.	Board (SPCB), Jharsuguda and data is being analyzed through a laboratory recognized under EPA Rules, 1986.
(ix)	Personnel working in dusty areas shall wear protective respiratory devices and they shall also be provided with adequate training and information on safety and health aspects.	<b>Being Complied</b> Protective respiratory devices are provided to the personnel working in dusty areas. They are provided with adequate training and information on safety & health aspects regularly.
(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 measures, if needed, and records maintained thereof. The quality of environment due to outsourcing and the health and safety issues of the outsourced manpower should be addressed by the company while outsourcing.	<b>Being Complied</b> Initial medical examination of all the workers deployed in the mine has been taken and periodically health check-ups are being done. A schedule is prepared for implementation of Occupational Health Surveillance Program of workers to determine the impact due to exposure to dust and to take corrective measures for the same. Compliances regarding environment quality, health issues of outsourced manpower are taken care of during outsourcing.
(xi)	A separate environmental 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 Cell (EMC) under the control of senior executive who directly reports to the head of the company already exists for the project. EMC meetings are held regularly. Details of EMC is mentioned at ECC no. LXVI.
(xii)	The funds earmarked for environment 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 its concerned Regional Office.	<b>Being Complied</b> The requisite funds for environmental protection measures have been included in the project cost. Financial provision stipulated towards environment protection measures will not be diverted for other purpose. Year wise expenditure incurred on environment protection measures is enclosed as <b>Annexure-XIII</b> .
(xiii)	The Project authorities shall advertise at least in two local newspapers widely circulated	<b>Complied</b> The advertisement was published in The Samaj (Kolkata, Baleswar, Brahmapur,

*And*

ECC. No.	General EC Conditions	Compliances Status as on 31.03.2023
	<p>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 &amp; Forests at <a href="http://envfor.nic.in">http://envfor.nic.in</a>.</p>	<p>Vishakapatnam, Sambalpur, Bhubaneswar, Cuttack, Rourkela) on 08.03.2014. A copy of the same is enclosed as <b>Annexure-XXV</b>.</p>
(xiv)	<p>A copy of the 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 also be displayed on company's website.</p>	<p><b>Complied</b> Copy of EC is uploaded in the company website.</p>
(xv)	<p>A copy of the 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.</p>	<p><b>Complied</b></p>
(xvi)	<p>The clearance letter shall be uploaded on the company's website. The compliance status of the stipulated environmental clearance condition shall also be uploaded by the project authorities on their website and updated 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 PM<sub>10</sub>,</p>	<p><b>Complied</b> The clearance letter has been uploaded on the company's website. The monitoring data of the stipulated environmental quality parameters being displayed at the entrance of the mine office. The photograph of display has been enclosed as <b>Annexure-12</b>. The compliance status has been uploaded on the NTPC website.</p>

*Rak*

<b>ECC. No.</b>	<b>General EC Conditions</b>	<b>Compliances Status as on 31.03.2023</b>
	PM <sub>2.5</sub> , SO <sub>2</sub> , and NO <sub>x</sub> (ambient) and critical sectorial parameters shall also be displayed at the entrance of the project premises and mine office and in corporate office and on company's website.	
(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 Offices of CPCB and the SPCB.	<p><b>Being Complied</b></p> <p>Six-monthly progress reports are being submitted regularly.</p> <p>The last Six-monthly progress reports for the period April 2022 to Sept 2022 was submitted vide our Ltr. No. DCMP/F&amp;E/ES/06/819 dated 30.11.2022. Copy enclosed as</p> <p><b>Annexure-XXVI.</b></p>
(xviii)	The Regional Office of this Ministry located in the Region 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.	<p><b>Noted and agreed</b></p>
(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 also be uploaded on the company's website along with the status of compliance of EC conditions and shall be sent to the respective Regional Office of the MoEF by e-mail.	<p><b>Being Complied</b></p> <p>The Environmental Statement for each financial year ending 31<sup>st</sup> March are being submitted to the Odisha State Pollution Control Board and Regional Office of MoEF &amp; CC in prescribed Form-V and the same is also being uploaded on NTPC website.</p> <p>Last submission was made for FY 2021-22 is submitted on 24.09.2022.</p> <p>The copy of the same has been uploaded on NTPC website.</p>
5.	The proponent shall abide by all the commitments and recommendations made in the EIA/EMP report so also during their presentation to the EAC.	<p><b>Complied</b></p>
6.	The proponent is required to obtain all necessary	<p><b>Noted and agreed</b></p>

*Ad*

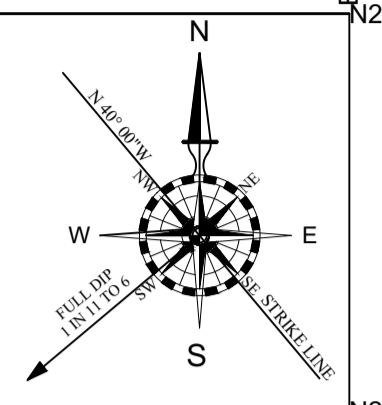
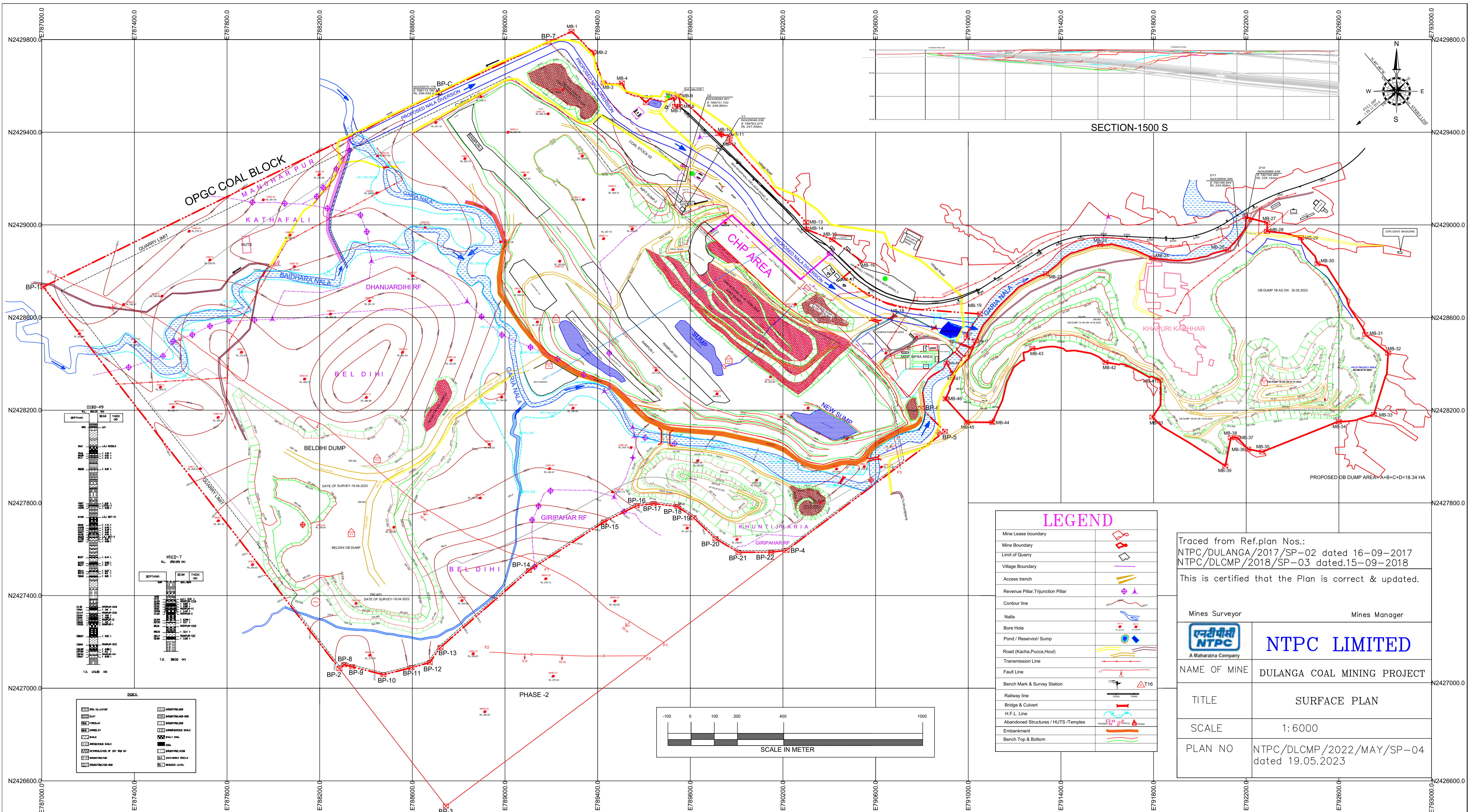
ECC. No.	General EC Conditions	Compliances Status as on 31.03.2023
	clearances/approvals that may be required before the start of the project. The Ministry or any other competent authority may stipulate any further condition for environmental protection.	All necessary clearances/approvals that are required for the project are obtained. We abide by the further condition for environmental protection issued by the Ministry or any other competent authority.
7.	The Proponent shall setup an Environment Audit cell with responsibility and accountability to ensure implementation of all the EC Conditions.	<b>Being Complied</b> An Environment Audit Cell has been set up with responsibility and accountability to ensure implementation of all the EC Conditions.
8.	The Ministry or any other competent authority may stipulate any further condition for environmental protection.	<b>Noted and agreed</b> Agreed to Comply any additional condition stipulated by the Ministry or any other competent authority.
9.	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 and agreed</b>
10.	The above conditions 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 Environment (Protection) Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and Rules. The proponent shall ensure to undertake and provide for the costs incurred for taking up remedial measures in case of soil contamination, contamination of groundwater and surface water, and occupational and other diseases due to the mining operations.	<b>Noted and agreed</b>

*Rah*  
29/7/2023

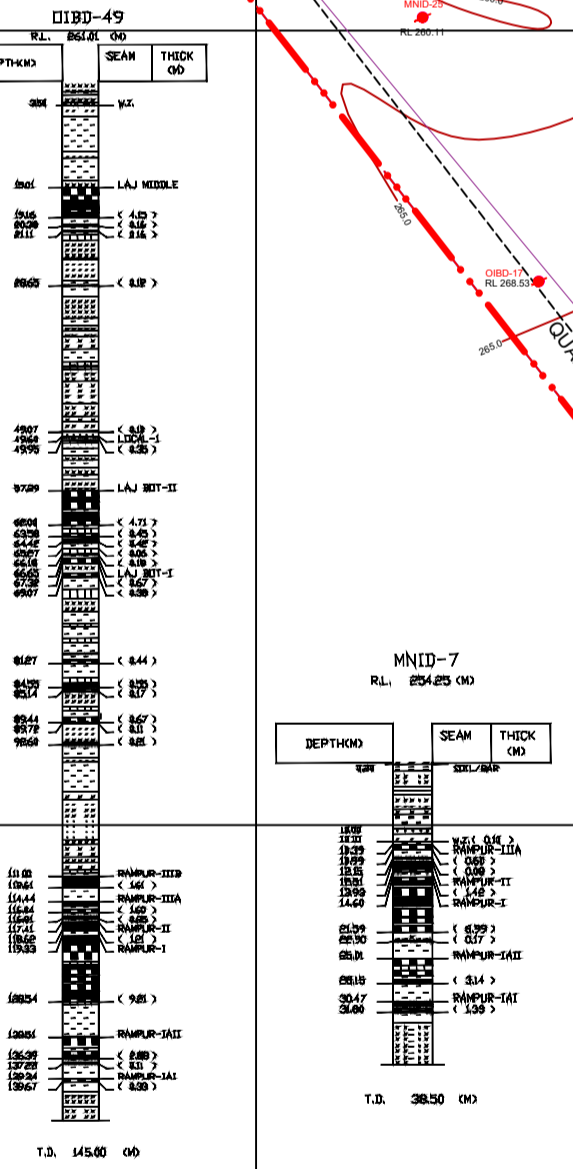
(Arindam Pattnaik)

Sr Manager (Env. Mgmt.)

NTPC Ltd., Dulanga Coal Mining Project



SECTION-1500 S




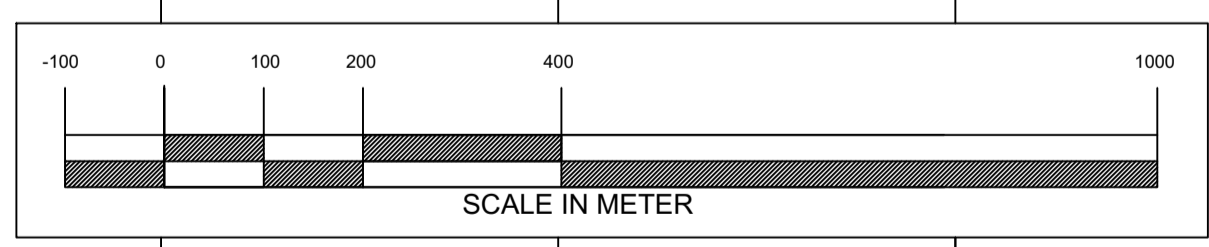
### LEGEND

Mine Lease boundary	[Symbol]
Mine Boundary	[Symbol]
Limit of Quarry	[Symbol]
Village Boundary	[Symbol]
Access trench	[Symbol]
Revenue Pillar, Trijunction Pillar	[Symbol]
Contour line	[Symbol]
Nalla	[Symbol]
Bore Hole	[Symbol]
Pond / Reservoir / Sump	[Symbol]
Road (Kacha, Pucca, Hou)	[Symbol]
Transmission Line	[Symbol]
Fault Line	[Symbol]
Bench Mark & Survey Station	[Symbol]
Railway line	[Symbol]
Bridge & Culvert	[Symbol]
H.F.L. Line	[Symbol]
Abandoned Structures / HUTS / Temples	[Symbol]
Embankment	[Symbol]
Bench Top & Bottom	[Symbol]

Traced from Ref.plan Nos.:  
 NTPC/DULANGA/2017/SP-02 dated 16-09-2017  
 NTPC/DLCMP/2018/SP-03 dated.15-09-2018

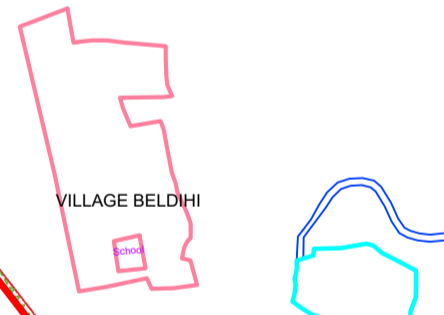
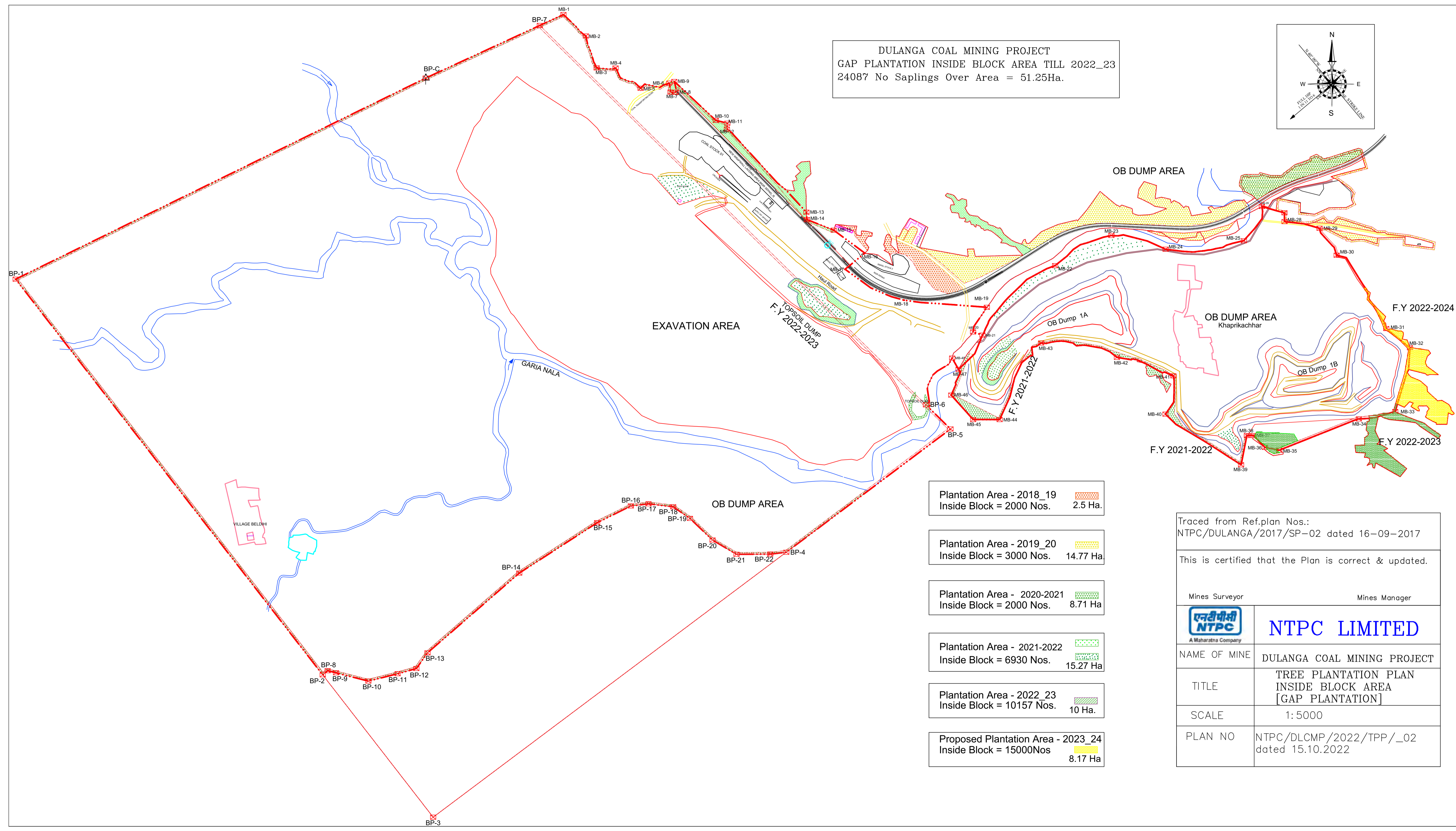
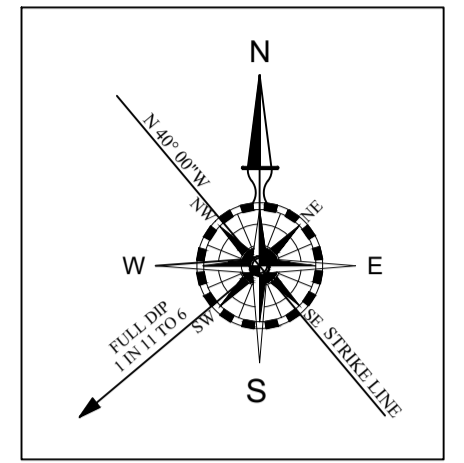
This is certified that the Plan is correct & updated.

Mines Surveyor	Mines Manager
 A Maharatna Company	<b>NTPC LIMITED</b>
NAME OF MINE	DULANGA COAL MINING PROJECT
TITLE	SURFACE PLAN
SCALE	1:6000
PLAN NO	NTPC/DLCMP/2022/MAY/SP-04 dated 19.05.2023




PHASE -2

DULANGA COAL MINING PROJECT  
 GAP PLANTATION INSIDE BLOCK AREA TILL 2022\_23  
 24087 No Saplings Over Area = 51.25Ha.



Plantation Area - 2018_19 Inside Block = 2000 Nos.	2.5 Ha.
Plantation Area - 2019_20 Inside Block = 3000 Nos.	14.77 Ha.
Plantation Area - 2020-2021 Inside Block = 2000 Nos.	8.71 Ha.
Plantation Area - 2021-2022 Inside Block = 6930 Nos.	15.27 Ha.
Plantation Area - 2022_23 Inside Block = 10157 Nos.	10 Ha.
Proposed Plantation Area - 2023_24 Inside Block = 15000Nos	8.17 Ha.

Traced from Ref.plan Nos.: NTPC/DULANGA/2017/SP-02 dated 16-09-2017	
This is certified that the Plan is correct & updated.	
Mines Surveyor	Mines Manager
	<b>NTPC LIMITED</b>
NAME OF MINE	DULANGA COAL MINING PROJECT
TITLE	TREE PLANTATION PLAN INSIDE BLOCK AREA [GAP PLANTATION]
SCALE	1: 5000
PLAN NO	NTPC/DLCMP/2022/TPP/_02 dated 15.10.2022

**Avenue Plantation**



## Plantation in Infra Office



## Vacant Area Plantation



## Plantation Near View Point



## Plantation along MGR



## Sapling Distribution





Government of Odisha  
Department of Water Resources

\*\*\*\*\*

No. 21250 /WR,  
WR-MAJII-WRC-0009/2016 (OSWAS).  
Irr.-II-WRC-161/21 (Physical)

Date: 23/8/2021

COPY  
- AGM (Civil)  
- AGM (Mining)  
- DAM (OTS)

From

Ms Archana Pattnaik, IAS,  
Special Secretary to Government.

To

The General Manager, M/s NTPC Ltd.,  
Dulunga Coal Mining Project, 2<sup>nd</sup> Floor,  
Mogha Matlahar, Mission Road, Sundargarh.

Sub: Permission for diversion of Garia Nalla and its tributaries (Baidhar Nallah and Nallah -B) flowing within the coal block boundary of Dulunga Coal Mining Project allotted to NTPC Ltd.

Sir,

In inviting reference to your Correspondence No-0100/ NTPC/DLCMP/MDO/2017/17 dated 05.04.2017 on the subject noted above I am directed to say that Government in Water Resources Department have been pleased to accord permission in favour of your industry for diversion of Garia Nalla and its tributaries (Baidhar Nallah and Nallah -B) flowing within the coal block boundary of Dulunga Coal Mining Project allotted to NTPC Ltd. with the following terms & conditions:-

**Terms & Conditions:-**

1. NTPC shall divert the Garia Nalla and its tributaries (Baidhar Nallah and Nalla -B) in accordance with the provisions made in the mining plan of Dulunga Coal Block which has been approved by Ministry of Coal, Government of India and as per the condition(s) stipulated in the Environment clearance granted for Dulunga Coal Block by MOEF&CC.
2. NTPC shall divert the Garia Nalla and its tributaries namely Baidhar Nallah and Nalla -B within the land under their possession on its own cost. All direct or indirect and annual expenditure on maintenance of the above said nallahs shall be borne by NTPC.
3. Any adverse impact noticed due to the diversion must be set right by NTPC at its own cost.
4. The gradient of the original nallah shall be maintained in the proposed diverted route by NTPC.
5. The regime channel section shall be maintained in the proposed diversion alignment by NTPC. Smooth transition shall be provided between diversion and original nallah section by NTPC.

P.T.O.

6. Safe distance shall be maintained by NTPC from the diversion channel to the mining operation boundary for safety point of view following Govt. norms.
7. NTPC shall ensure that riparian rights of the people residing in the downstream area shall not be affected upon diversion of Garia Nallah and its tributaries namely Baidhar Nallah and Nallah -B.
8. The water quality shall be maintained in the nallah by NTPC to ensure the protection of the riparian right of people living in the d/s of the diversion channel. NTPC shall not discharge/dispose any untreated and contaminated waste material into the nallahs so that the flora and fauna will be in peril.
9. Ecological and environmental damages, if any, arising during and after diversion of nallahs shall be the sole responsibility of NTPC for which they shall be treated as per law. NTPC shall have to obtain permission or clearance from Competent Authorities on ecology, environment and forest aspects as necessary.
10. The diverted nallahs shall be treated as public property.
11. Any construction activities /interference should be consistent with the hydraulic compulsions and structural safety standards.
12. NTPC shall ensure that diversion portion of nallah is adequate to carry design flood discharge. In case of failure, change of path of nallahs is noticed after diversion, NTPC is liable for reconstruction at their cost and pay compensation if damages occur to public/private properties.
13. Necessary safety arrangement shall be the responsibility of NTPC while executing the diversion work of nallahs. The Company shall have to provide barricading, display boards and other necessary caution boards while executing the work.
14. Cutting of any tree or removal of any utility services along the proposed diversion alignment if required, NTPC shall have to obtain clearances from concerned approving authorities.
15. NTPC shall procure insurance from reputed insurance Company against damages during execution. In case of damage caused to any assets due to diversion of nallahs, DoWR shall not be accountable or liable in any manner whatsoever.
16. NTPC shall intimate Revenue official's viz. Tahasildar & Collector of the district regarding such diversion in order to incorporate it in the cadastral map & ROR.
17. DoWR shall reserve the right to review/modify/revoke the permission in case of violation of terms and conditions of the permission.
18. NTPC shall construct peripheral drains for discharge of flood water of the catchments s Mining Lease area if required.
19. The diverted nallahs are to be properly fenced and protected against accidents.
20. The interest of the local villagers is to be suitably addressed in the event of diversion.

- 21. NTPC shall make necessary arrangement so that seepage water from diverted Nallah shall not enter into the mining area.
- 22. The work should be executed in accordance with the Codal Provision with the overall objective of environmental safeguards. Latest codal provision and National/International best practices must be followed. DoWR shall not be responsible for any breach of the safeguards.
- 23. DoWR shall have the right to order such works as may be necessary to maintain the integrity of the nallahs at any time during or after the execution not covered in approved scheme. NTPC shall be bound to execute the same as per instruction of DoWR at their own cost.

Yours faithfully

*[Signature]*  
23/08/2021

Special Secretary to Government

Memo No. 21251 /WR, Dtd. 23/8/2021

Copy forwarded to the E.I.C., Odisha, Bhubaneswar/ CE & BM, Mahanadi Basin, Burla/ CE Designs, Bhubaneswar for information and necessary action.

*[Signature]*  
23/08/2021

Under Secretary to Government

Memo No. 21252 /WR, Dtd. 23/8/2021

Copy forwarded to Industries Department / Steel & Mines Department/ IPICOL / IDCO for information and necessary action.

*[Signature]*  
23/08/2021

Under Secretary to Government

Memo No. 21253 /WR, Dtd. 23/8/2021

Copy forwarded to Collector & District Magistrate, Sundargarh for information and necessary action.

*[Signature]*  
23/08/2021

Under Secretary to Government

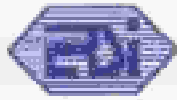
Memo No. 21254 /WR, Dtd. 23/8/2021

Copy forwarded to Executive Engineer, Sundargarh Irrigation Division, Sundargarh for information and necessary action.

*[Signature]*  
23/08/2021

Under Secretary to Government

GSTIN : 21AAACE6224D1ZE



## Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025:2017 (NABL) Accredited Laboratory, OISPCB Empanelled Laboratory and ISO 9001:2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

ULR-TC744022000000453F

Test Report Format No.: ERSIPL/FM/40

### TEST REPORT (Water/ Waste-Water)

Pg No: 1 of 1

Date: 01 Nov 2022

Test Report No: ERSIPL/TR/WA/248

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.  
Date of Sampling : 11.10.2022  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of Customer  
Sample Received on : 21.10.2022  
Analysis Started on : 21.10.2022  
Analysis Completed on : 01.11.2022  
Method of Sampling : IS 3025: Part 1: 1987, Reaffirmed 2019  
Quantity of Sample : 2ltrs  
Type of Container : Glass Bottle & HDPE Bottle  
Environment Condition : All Tests carried out in Room Temperature

Sample ID. No.

1. ERSIPL/WA/546
2. ERSIPL/WA/547
3. ERSIPL/WA/548
4. ERSIPL/WA/549

Locations

1. Open well in Village Kalamegha
2. Open well in Village Kathfali
3. Open well in Village Khuntjharis
4. Bore well in Village Bengalmunra

**TEST FINDINGS:**

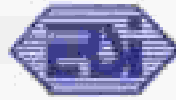
Sl	Parameters Analysed	Test Method	Unit	Permissible Limit as per IS:10500, 2012	Result			
					ERSIPL/WA/546	ERSIPL/WA/547	ERSIPL/WA/548	ERSIPL/WA/549
01	pH value	IS 3025:Part 11: 1983 Reaffirmed-2017	--	6.5 to 8.5	7.17	6.86	6.54	7.25
02	Turbidity	IS 3025:Part 10: 1984 Reaffirmed-2017	NTU	1.0	0.66	0.57	0.48	0.63
03	Total Hardness as CaCO <sub>3</sub>	IS 3025:Part 21: 2009 Reaffirmed-2019	mg/L	200.0	216.0	26.0	92.0	282.0
04	Total Iron	IS 3025:Part 53: 2003 Reaffirmed-2019	mg/L	0.3	0.06	0.06	0.07	0.09
05	Chloride	IS 3025:Part 32: 1988 Reaffirmed-2019	mg/L	250.0	53.22	16.75	35.48	84.75
06	Total Dissolved Solids	IS 3025:Part 16: 1984 Reaffirmed-2019	mg/L	500.0	599.0	52.6	237.0	761.0
07	Calcium as Ca	IS 3025:Part 40: 1991 Reaffirmed-2019	mg/L	75.0	35.27	5.61	22.41	28.86
08	Sulphate as SO <sub>4</sub>	IS 3025:Part 24: 1986 Reaffirmed-2019	mg/L	200.0	27.44	3.72	16.92	25.77
09	Fluoride	IS 3025:Part 60: 2008 Reaffirmed-2019	mg/L	1.0	<0.1	<0.1	<0.1	<0.1
10	Total Alkalinity as CaCO <sub>3</sub>	IS 3025:Part 23: 1986 Reaffirmed-2019	mg/L	200.0	416.0	38.0	74.0	466.0

..END OF TEST REPORT...

(Authorized Signatory)  
S.P.Pattanayak



CIN - U73100OR1995PTC003889



GSTIN : 21AAACE6224D1ZE

# Environmental Research and Services (India) Pvt. Ltd.

(OSPCB 'A' Category Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-8, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

## Test Report Format No.: ERSIPL/FM/40 TEST REPORT (Water/ Waste Water)

Pg No: 1 of 2

Date: 01 Nov 2022

Test Report No: ERSIPL/TR/WA/T-248

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.

Date of Sampling : 11.10.2022

Sample Collected by : Representative of ERS (I) Pvt. Ltd.

Sample Collected in presence of : Representative of Customer

Sample Received on : 21.10.2022

Analysis Started on : 21.10.2022

Analysis Completed on : 01.11.2022

Method of Sampling : IS 3025: Part 1: 1987, Reaffirmed 2019

Quantity of Sample : 2ltrs

Type of Container : Glass Bottle &amp; HDPE Bottle

Environment Condition : All Tests carried out in Room Temperature

### Sample ID. No.

1. ERSIPL/WA/546
2. ERSIPL/WA/547
3. ERSIPL/WA/548
4. ERSIPL/WA/549

### Locations

1. Open well in Village Kalamegha
2. Open well in Village Kathfali
3. Open well in Village Khuntjharia
4. Bore well in Village Rengalmunra

### TEST FINDINGS:

Sl	Parameters Analysed	Test Method	Unit	Permissible Limit as per IS:10500, 2012	Result			
					ERSIPL/WA/546	ERSIPL/WA/547	ERSIPL/WA/548	ERSIPL/WA/549
01	Colour	IS 3025:Part 04: 1983 Reaffirmed-2017	Hazen	5.0	<5.0	<5.0	<5.0	<5.0
02	Odour	IS 3025:Part 05: 1983 Reaffirmed-2017	--	Agreeable (A)	A	A	A	A
03	Taste	IS 3025:Part 07,08: 1984 Reaffirmed-2017	--	Agreeable (A)	A	A	A	A
04	Nitrate as NO <sub>3</sub>	IS 3025:Part 34: 1983 Reaffirmed-2019	mg/l	45.0	<5.0	<5.0	<5.0	<5.0
05	Residual Free Chlorine	IS 3025:Part 26: 1985 Reaffirmed-2019	mg/l	0.2 (min)	Nil	Nil	Nil	Nil
06	Copper	IS 3025:Part 42: 1992 Reaffirmed-2019	mg/l	0.05	ND	ND	ND	ND
07	Manganese	IS 3025:Part 59: 2006 Reaffirmed-2017	mg/l	0.1	ND	ND	ND	ND
08	Phenolic Compound	IS 3025:Part 43: 1992 Reaffirmed-2019	mg/l	0.001	ND	ND	ND	ND
09	Mercury	IS 3025:Part 48: 1994 Reaffirmed-2019	mg/l	0.001	ND	ND	ND	ND
10	Cadmium	IS 3025:Part 41: 1992 Reaffirmed-2019	mg/l	0.003	ND	ND	ND	ND



CIN : U73100JK1993PL000389



GSTIN : 21AAACE6224D1ZE

# Environmental Research and Services (India) Pvt. Ltd.


(OSPCB 'A' Category Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

Pg No: 2 of 2

11	Selenium	IS 3025:Part 56: 2003 Reaffirmed-2019	mg/L	0.01	ND	ND	ND	ND
12	Total Arsenic	IS 3025:Part 37: 1988 Reaffirmed-2019	mg/L	0.01	ND	ND	ND	ND
13	Cyanide	IS 3025:Part 27: 1986 Reaffirmed-2019	mg/L	0.05	ND	ND	ND	ND
14	Lead	IS 3025:Part 47: 1994 Reaffirmed-2019	mg/L	0.01	ND	ND	ND	ND
15	Zinc	IS 3025:Part 49: 1994 Reaffirmed-2019	mg/L	5.0	ND	ND	ND	ND
16	Anionic detergents	IS 13428 :2005 Reaffirmed-2019	mg/L	0.2	ND	ND	ND	ND
17	Total Chromium	IS 3025:Part 52: 2003 Reaffirmed-2019	mg/L	0.05	ND	ND	ND	ND
18	Polynuclear aromatic hydrocarbons	APHA 6440	mg/L	0.0001	ND	ND	ND	ND
19	Mineral Oil	IS 3025:Part 39: 1991 Reaffirmed-2019	mg/L	0.5	ND	ND	ND	ND
20	Pesticides	USEPA gas-liquid chromatography	mg/L	---	ND	ND	ND	ND
21	Aluminium	IS 3025:Part 55: 2003 Reaffirmed-2019	mg/L	0.03	ND	ND	ND	ND
22	Boron	IS 3025:Part 57: 2005 Reaffirmed-2017	mg/L	0.5	ND	ND	ND	ND
23	Nickel	IS 3025:Part 54: 2003 Reaffirmed-2019	mg/L	0.02	ND	ND	ND	ND

ND-Not Detected



(Authorized Signatory)  
S.P. Pattanayak  
Tech. Manager

...END OF TEST REPORT...



# Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025 : 2017 (NABL) Accredited Laboratory, O.S.P.C.B Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

ULR-TC744022000000454F

Test Report Format No.: ERSIPL/FM/40

## TEST REPORT (Water/ Waste Water)

Pg No: 1 of 1

Date: 01 Nov 2022

Test Report No: ERSIPL/TR/WA/249

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.  
Date of Sampling : 10-11.10.2022  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of Customer  
Sample Received on : 21.10.2022  
Analysis Started on : 21.10.2022  
Analysis Completed on : 01.11.2022  
Method of Sampling : IS 3025: Part 1: 1987, Reaffirmed 2019  
Quantity of Sample : 2ltrs  
Type of Container : Glass Bottle & HDPE Bottle  
Environment Condition : All Tests carried out in Room Temperature

**Sample ID, No.**

1. ERSIPL/WA/550
2. ERSIPL/WA/551

**Locations**

1. Open well in Village Bendrichua
2. Bore Well R & R Colony, Kalamegha

**TEST FINDINGS:**

Sl	Parameters Analysed	Test Method	Unit	Permissible Limit as per IS:10500, 2012	Result	
					ERSIPL/WA/550	ERSIPL/WA/551
01	pH value	IS 3025:Part 11: 1983 Reaffirmed-2017	--	6.5 to 8.5	5.87	6.89
02	Turbidity	IS 3025:Part 10: 1984 Reaffirmed-2017	NTU	1.0	0.60	0.48
03	Total Hardness as CaCO <sub>3</sub>	IS 3025:Part 21: 2009 Reaffirmed-2019	mg/L	200.0	38.0	142.0
04	Total Iron	IS 3025:Part 53: 2003 Reaffirmed-2019	mg/L	0.3	0.06	0.08
05	Chloride	IS 3025:Part 32: 1988 Reaffirmed-2019	mg/L	250.0	20.70	22.67
06	Total Dissolved Solids	IS 3025:Part 16: 1984 Reaffirmed-2019	mg/L	500.0	47.0	277.0
07	Calcium as Ca	IS 3025:Part 40: 1991 Reaffirmed-2019	mg/L	75.0	6.41	32.06
08	Sulphate as SO <sub>4</sub>	IS 3025:Part 24: 1986 Reaffirmed-2019	mg/L	200.0	3.59	18.85
09	Fluoride	IS 3025:Part 60: 2008 Reaffirmed-2019	mg/L	1.0	<0.1	<0.1
10	Total Alkalinity as CaCO <sub>3</sub>	IS 3025:Part 23: 1986 Reaffirmed-2019	mg/L	200.0	40.0	184.0

(Authorized Signatory)  
S.P. Parianayak  
Tech. Manager



CIN - U73100OR1995PTC003889



GSTIN : 21AAACE6224D1ZE

# Environmental Research and Services (India) Pvt. Ltd.

(OSPCB 'A' Category Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha

Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

## Test Report Format No.: ERSIPL/FM/40 TEST REPORT (Water/ Waste Water)

Pg No: 1 of 2

Date: 01 Nov 2022

Test Report No: ERSIPL/TR/WA/T-249

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.

Date of Sampling : 10-11.10.2022

Sample Collected by : Representative of ERS (I) Pvt. Ltd.

Sample Collected in presence of : Representative of Customer

Sample Received on : 21.10.2022

Analysis Started on : 21.10.2022

Analysis Completed on : 01.11.2022

Method of Sampling : IS 3025: Part 1: 1987, Reaffirmed 2019

Quantity of Sample : 2ltrs

Type of Container : Glass Bottle &amp; HDPE Bottle

Environment Condition : All Tests carried out in Room Temperature

### Sample ID. No.

1. ERSIPL/WA/550

2. ERSIPL/WA/551

### Locations

1. Open well in Village Bendrichua

2. Bore Well R &amp; R Colony, Kalamegha

### TEST FINDINGS:

Sl	Parameters Analysed	Test Method	Unit	Permissible Limit as per IS:10500, 2012	Result	
					ERSIPL/WA/550	ERSIPL/WA/551
01	Colour	IS 3025:Part 04: 1983 Reaffirmed-2017	Hazen	5.0	<5.0	<5.0
02	Odour	IS 3025:Part 05: 1983 Reaffirmed-2017	--	Agreeable (A)	A	A
03	Taste	IS 3025:Part 07,08: 1984 Reaffirmed-2017	--	Agreeable (A)	A	A
04	Nitrate as NO <sub>3</sub>	IS 3025:Part 34: 1983 Reaffirmed-2019	mg/L	45.0	<5.0	<5.0
05	Residual Free Chlorine	IS 3025:Part 26: 1986 Reaffirmed-2019	mg/L	0.2 (min)	Nil	Nil
06	Copper	IS 3025:Part 42: 1992 Reaffirmed-2019	mg/L	0.05	ND	ND
07	Manganese	IS 3025:Part 59: 2006 Reaffirmed-2017	mg/L	0.1	ND	ND
08	Phenolic Compound	IS 3025:Part 43: 1992 Reaffirmed-2019	mg/L	0.001	ND	ND
09	Mercury	IS 3025:Part 48: 1994 Reaffirmed-2019	mg/L	0.001	ND	ND
10	Cadmium	IS 3025:Part 41: 1992 Reaffirmed-2019	mg/L	0.003	ND	ND



CIN - U73100OR1995PTC003889



GSTIN : 21AAACE6224D1ZE

## Environmental Research and Services (India) Pvt. Ltd.

(OSPCB 'A' Category Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

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Tel: +91-9437021932, +91-9937690329, E-mail: [ersibbsr@gmail.com](mailto:ersibbsr@gmail.com)

Pg No: 2 of 2

11	Selenium	IS 3025:Part 56: 2003 Reaffirmed-2019	mg/L	0.01	ND	ND
12	Total Arsenic	IS 3025:Part 37: 1988 Reaffirmed-2019	mg/L	0.01	ND	ND
13	Cyanide	IS 3025:Part 27: 1986 Reaffirmed-2019	mg/L	0.05	ND	ND
14	Lead	IS 3025:Part 47: 1994 Reaffirmed-2019	mg/L	0.01	ND	ND
15	Zinc	IS 3025:Part 49: 1994 Reaffirmed-2019	mg/L	5.0	ND	ND
16	Anionic detergents	IS 13428 :2005 Reaffirmed-2019	mg/L	0.2	ND	ND
17	Total Chromium	IS 3025:Part 52: 2003 Reaffirmed-2019	mg/L	0.05	ND	ND
18	Polynuclear aromatic hydrocarbons	APHA 6440	mg/L	0.0001	ND	ND
19	Mineral Oil	IS 3025:Part 39: 1991 Reaffirmed-2019	mg/L	0.5	ND	ND
20	Pesticides	USEPA gas-liquid chromatography	mg/L	---	ND	ND
21	Aluminium	IS 3025:Part 55: 2003 Reaffirmed-2019	mg/L	0.03	ND	ND
22	Boron	IS 3025:Part 57: 2005 Reaffirmed-2017	mg/L	0.5	ND	ND
23	Nickel	IS 3025:Part 54: 2003 Reaffirmed-2019	mg/L	0.02	ND	ND

ND-Not Detected

(Authorized Signatory)

S.P.Pattanayak  
Tech. Manager

...END OF TEST REPORT...



# Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025:2017 (NABL) Accredited Laboratory, ISO/IEC 17025 Certified Laboratory and ISO 9001:2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

ULR-TC744022000000518F

Test Report Format No.: ERSIPL/FM/40

## TEST REPORT (Water/ ~~Waste Water~~)

Pg No: 1 of 1

Date: 02 Dec 2022

Test Report No: ERSIPL/TR/WA/282

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.  
Date of Sampling : 07.11.2022  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of Customer  
Sample Received on : 24.11.2022  
Analysis Started on : 24.11.2022  
Analysis Completed on : 02.12.2022  
Method of Sampling : IS 3025: Part 1: 1987, Reaffirmed 2019  
Quantity of Sample : 2ltrs  
Type of Container : Glass Bottle & HDPE Bottle  
Environment Condition : All Tests carried out in Room Temperature

### Sample ID. No.

1. ERSIPL/WA/612
2. ERSIPL/WA/613
3. ERSIPL/WA/614
4. ERSIPL/WA/615

### Locations

1. Open well in Village Kalamegha
2. Open well in Village Kathfall
3. Open well in Village Khuntjhar
4. Bore well in Village Bengalmunra

### TEST FINDINGS:

Sl	Parameters Analysed	Test Method	Unit	Permissible Limit as per IS:10500, 2012	Result			
					ERSIPL/WA/612	ERSIPL/WA/613	ERSIPL/WA/614	ERSIPL/WA/615
01	pH value	IS 3025:Part 11: 1983 Reaffirmed-2017	-	6.5 to 8.5	7.02	6.89	6.74	7.05
02	Turbidity	IS 3025:Part 10: 1994 Reaffirmed-2017	NTU	1.0	0.51	0.37	0.28	0.33
03	Total Hardness as CaCO <sub>3</sub>	IS 3025:Part 21: 2009 Reaffirmed-2019	mg/L	200.0	210.0	20.0	86.0	280.0
04	Total Iron	IS 3025:Part 53: 2003 Reaffirmed-2019	mg/L	0.3	0.09	0.08	0.05	0.06
05	Chloride	IS 3025:Part 32: 1988 Reaffirmed-2019	mg/L	250.0	52.23	14.78	33.51	83.77
06	Total Dissolved Solids	IS 3025:Part 16: 1984 Reaffirmed-2019	mg/L	500.0	587.0	49.6	217.0	736.0
07	Calcium as Ca	IS 3025:Part 40: 1991 Reaffirmed-2019	mg/L	75.0	33.67	4.81	20.84	27.25
08	Sulphate as SO <sub>4</sub>	IS 3025:Part 24: 1986 Reaffirmed-2019	mg/L	200.0	26.15	2.69	15.51	25.38
09	Fluoride	IS 3025:Part 60: 2008 Reaffirmed-2019	mg/L	1.0	<0.1	<0.1	<0.1	<0.1
10	Total Alkalinity as CaCO <sub>3</sub>	IS 3025:Part 73: 1986 Reaffirmed-2019	mg/L	200.0	402.0	32.0	72.0	460.0

TS

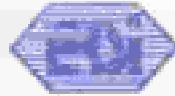
..END OF TEST REPORT..

(Authorized Signatory)

S.P. Pattenayek  
Tech. Manager



CIN - U73100OR1995PTC003889



GSTIN : 21AAACE6224D1ZE

## Environmental Research and Services (India) Pvt. Ltd.

(OSPCB 'A' Category Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

### Test Report Format No.: ERSIPL/FM/40 TEST REPORT (Water/ Waste-Water)

Pg No: 1 of 2

Date: 02 Dec 2022

Test Report No: ERSIPL/TR/WA/T-282

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.  
Date of Sampling : 07.11.2022  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of Customer  
Sample Received on : 24.11.2022  
Analysis Started on : 24.11.2022  
Analysis Completed on : 02.12.2022  
Method of Sampling : IS 3025: Part 1: 1987, Reaffirmed 2019  
Quantity of Sample : 2ltrs  
Type of Container : Glass Bottle & HDPE Bottle  
Environment Condition : All Tests carried out in Room Temperature

**Sample ID. No.**

1. ERSIPL/WA/612
2. ERSIPL/WA/613
3. ERSIPL/WA/614
4. ERSIPL/WA/615

**Locations**

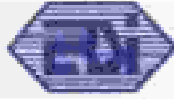
1. Open well in Village Kalamegha
2. Open well in Village Kathfali
3. Open well in Village Khuntjharia
4. Bore well in Village Rengalmunra

**TEST FINDINGS:**

Sl	Parameters Analysed	Test Method	Unit	Permissible Limit as per IS:10500, 2012	Result			
					ERSIPL/WA/612	ERSIPL/WA/613	ERSIPL/WA/614	ERSIPL/WA/615
01	Colour	IS 3025:Part 04: 1983 Reaffirmed-2017	Hazen	5.0	<5.0	<5.0	<5.0	<5.0
02	Odour	IS 3025:Part 05: 1983 Reaffirmed-2017	-	Agreeable (A)	A	A	A	A
03	Taste	IS 3025:Part 07,08: 1984 Reaffirmed-2017	-	Agreeable (A)	A	A	A	A
04	Nitrate as NO <sub>3</sub>	IS 3025:Part 34: 1983 Reaffirmed-2019	mg/L	45.0	<5.0	<5.0	<5.0	<5.0
05	Residual Free Chlorine	IS 3025:Part 26: 1986 Reaffirmed-2019	mg/L	0.2 (min)	Nil	Nil	Nil	Nil
06	Copper	IS 3025:Part 42: 1992 Reaffirmed-2019	mg/l	0.05	ND	ND	ND	ND
07	Manganese	IS 3025:Part 59: 2006 Reaffirmed-2017	mg/L	0.1	ND	ND	ND	ND
08	Phenolic Compound	IS 3025:Part 43: 1992 Reaffirmed-2019	mg/L	0.001	ND	ND	ND	ND
09	Mercury	IS 3025:Part 48: 1994 Reaffirmed-2019	mg/L	0.001	ND	ND	ND	ND
10	Cadmium	IS 3025:Part 41: 1992 Reaffirmed-2019	mg/L	0.003	ND	ND	ND	ND



CDN - U73100OR1995PTC003889



GSTIN : 21AAACE6224D1ZE

# Environmental Research and Services (India) Pvt. Ltd.

(OSPCB 'A' Category Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

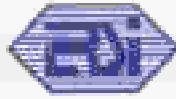
Pg No: 2 of 2

11	Selenium	IS 3025-Part 56: 2003 Reaffirmed-2019	mg/L	0.01	ND	ND	ND	ND
12	Total Arsenic	IS 3025-Part 37: 1988 Reaffirmed-2019	mg/L	0.01	ND	ND	ND	ND
13	Cyanide	IS 3025-Part 27: 1986 Reaffirmed-2019	mg/L	0.05	ND	ND	ND	ND
14	Lead	IS 3025-Part 47: 1994 Reaffirmed-2019	mg/L	0.01	ND	ND	ND	ND
15	Zinc	IS 3025-Part 49: 1994 Reaffirmed-2019	mg/L	5.0	ND	ND	ND	ND
16	Anionic detergents	IS 13428 :2005 Reaffirmed-2019	mg/L	0.2	ND	ND	ND	ND
17	Total Chromium	IS 3025-Part 52: 2003 Reaffirmed-2019	mg/L	0.05	ND	ND	ND	ND
18	Polynuclear aromatic hydrocarbons	APHA 6440	mg/L	0.0001	ND	ND	ND	ND
19	Mineral Oil	IS 3025-Part 39: 1991 Reaffirmed-2019	mg/L	0.5	ND	ND	ND	ND
20	Pesticides	USCPA gas-liquid chromatography	mg/L	---	ND	ND	ND	ND
21	Aluminium	IS 3025-Part 55: 2003 Reaffirmed-2019	mg/L	0.03	ND	ND	ND	ND
22	Boron	IS 3025-Part 57: 2005 Reaffirmed-2017	mg/L	0.5	ND	ND	ND	ND
23	Nickel	IS 3025-Part 54: 2003 Reaffirmed-2019	mg/L	0.02	ND	ND	ND	ND

ND-Not Detected

  
(Authorized Signatory)  
S.P. Pattanayak  
Tech. Manager

...END OF TEST REPORT...



# Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025:2017 (HABL) Accredited Laboratory, OSCP & Expanded Laboratory and ISO 9001:2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

ULR-TC74402200000519F

Test Report Format No.: ERSIPL/FM/40

## TEST REPORT (Water/ Waste Water)

Pg No: 1 of 1

Date: 02 Dec 2022

Test Report No: ERSIPL/TR/WA/283

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.

Date of Sampling : 07.11.2022

Sample Collected by : Representative of ERS (I) Pvt. Ltd.

Sample Collected in presence of : Representative of Customer

Sample Received on : 24.11.2022

Analysis Started on : 24.11.2022

Analysis Completed on : 02.12.2022

Method of Sampling : IS 3025: Part 1: 1987, Reaffirmed 2019

Quantity of Sample : 2ltrs

Type of Container : Glass Bottle & HDPE Bottle

Environment Condition : All Tests carried out in Room Temperature

### Sample ID, No.

1. ERSIPL/WA/616

2. ERSIPL/WA/617

### Locations

1. Open well in Village Bendrichua

2. Bore Well R &amp; R Colony, Kalamegha

### TEST FINDINGS:

Sl	Parameters Analysed	Test Method	Unit	Permissible Limit as per IS:10500, 2012	Result	
					ERSIPL/WA/616	ERSIPL/WA/617
01	pH value	IS 3025:Part 11: 1983 Reaffirmed-2017	-	6.5 to 8.5	5.99	6.98
02	Turbidity	IS 3025:Part 10: 1984 Reaffirmed-2017	NTU	1.0	0.37	0.38
03	Total Hardness as CaCO <sub>3</sub>	IS 3025:Part 21: 2009 Reaffirmed-2019	mg/L	200.0	28.0	138.0
04	Total Iron	IS 3025:Part 53: 2003 Reaffirmed-2019	mg/L	0.3	0.06	0.07
05	Chloride	IS 3025:Part 32: 1988 Reaffirmed-2019	mg/L	250.0	19.71	20.70
06	Total Dissolved Solids	IS 3025:Part 16: 1984 Reaffirmed-2019	mg/L	500.0	45.0	257.0
07	Calcium as Ca	IS 3025:Part 40: 1991 Reaffirmed-2019	mg/L	75.0	5.61	31.26
08	Sulphate as SO <sub>4</sub>	IS 3025:Part 24: 1986 Reaffirmed-2019	mg/L	200.0	2.82	17.31
09	Fluoride	IS 3025:Part 60: 2008 Reaffirmed-2019	mg/L	1.0	<0.1	<0.1
10	Total Alkalinity as CaCO <sub>3</sub>	IS 3025:Part 23: 1986 Reaffirmed-2019	mg/L	200.0	36.0	176.0

(Authorized Signatory)  
S.P. Pattanayak  
Tech. Manager

...END OF TEST REPORT...



CIN - U73100OR1995PTC003889



GSTIN : 21AAACE6224D1ZE

# Environmental Research and Services (India) Pvt. Ltd.

(QSPCB 'A' Category Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: [ersibbsr@gmail.com](mailto:ersibbsr@gmail.com)

## Test Report Format No.: ERSIPL/FM/40 TEST REPORT (Water/ Waste Water)

Pg No: 1 of 2

Date: 02 Dec 2022

Test Report No: ERSIPL/TR/WA/T-283

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.

Date of Sampling : 07.11.2022

Sample Collected by : Representative of ERS (I) Pvt. Ltd.

Sample Collected in presence of : Representative of Customer

Sample Received on : 24.11.2022

Analysis Started on : 24.11.2022

Analysis Completed on : 02.12.2022

Method of Sampling : IS 3025: Part 1: 1987, Reaffirmed 2019

Quantity of Sample : 2ltrs

Type of Container : Glass Bottle &amp; HDPE Bottle

Environment Condition : All Tests carried out in Room Temperature

### Sample ID. No.

1. ERSIPL/WA/616
2. ERSIPL/WA/617

### Locations

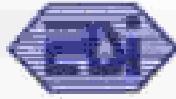
1. Open well in Village Bendrichua
2. Bore Well R & R Colony, Kalamegha

### TEST FINDINGS:

Sl	Parameters Analysed	Test Method	Unit	Permissible Limit as per IS:10500, 2012	Result	
					ERSIPL/WA/616	ERSIPL/WA/617
01	Colour	IS 3025-Part 04: 1983 Reaffirmed-2017	Hazen	5.0	<5.0	<5.0
02	Odour	IS 3025-Part 05: 1983 Reaffirmed-2017	--	Agreeable (A)	A	A
03	Taste	IS 3025-Part 07,08: 1984 Reaffirmed-2017	--	Agreeable (A)	A	A
04	Nitrate as NO <sub>3</sub>	IS 3025-Part 34: 1983 Reaffirmed-2019	mg/L	45.0	<5.0	<5.0
05	Residual Free Chlorine	IS 3025-Part 26: 1986 Reaffirmed-2019	mg/L	0.2 (min)	Nil	Nil
06	Copper	IS 3025-Part 42: 1992 Reaffirmed-2019	mg/L	0.05	ND	ND
07	Manganese	IS 3025-Part 59: 2006 Reaffirmed-2017	mg/L	0.1	ND	ND
08	Phenolic Compound	IS 3025-Part 43: 1992 Reaffirmed-2019	mg/L	0.001	ND	ND
09	Mercury	IS 3025-Part 48: 1994 Reaffirmed-2019	mg/L	0.001	ND	ND
10	Cadmium	IS 3025-Part 41: 1992 Reaffirmed-2019	mg/L	0.003	ND	ND



CIN - U73100OR1995PTC003889



GSTIN : 21AAACE6224D1ZE

## Environmental Research and Services (India) Pvt. Ltd.

(OSPCB 'A' Category Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

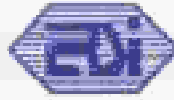
Pg No: 2 of 2

11	Selenium	IS 3025:Part 56: 2003 Reaffirmed-2019	mg/L	0.01	ND	ND
12	Total Arsenic	IS 3025:Part 37: 1988 Reaffirmed-2019	mg/L	0.01	ND	ND
13	Cyanide	IS 3025:Part 27: 1986 Reaffirmed-2019	mg/L	0.05	ND	ND
14	Lead	IS 3025:Part 47: 1994 Reaffirmed-2019	mg/L	0.01	ND	ND
15	Zinc	IS 3025:Part 49: 1994 Reaffirmed-2019	mg/L	5.0	ND	ND
16	Anionic detergents	IS 13428 :2005 Reaffirmed-2019	mg/L	0.2	ND	ND
17	Total Chromium	IS 3025:Part 52: 2003 Reaffirmed-2019	mg/L	0.05	ND	ND
18	Polynuclear aromatic hydrocarbons	APHA 6440	mg/L	0.0001	ND	ND
19	Mineral Oil	IS 3025:Part 39: 1991 Reaffirmed-2019	mg/L	0.5	ND	ND
20	Pesticides	USEPA gas-liquid chromatography	mg/L	---	ND	ND
21	Aluminium	IS 3025:Part 55: 2003 Reaffirmed-2019	mg/L	0.03	ND	ND
22	Boron	IS 3025:Part 57: 2005 Reaffirmed-2017	mg/L	0.5	ND	ND
23	Nickel	IS 3025:Part 54: 2003 Reaffirmed-2019	mg/L	0.02	ND	ND

ND-Not Detected

  
(Authorized Signatory)  
S.P. Pattanayek  
Tech. Manager

...END OF TEST REPORT...



# Environmental Research and Services (India) Pvt. Ltd.

(As ISO/IEC 17025:2017 (NABL) Accredited Laboratory, OI/PCB Empanelled Laboratory and ISO 9001:2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

ULR-TC744022000000582F

Test Report Format No.: ERSIPL/FM/40

## TEST REPORT (Water/ Waste Water)

Pg No: 1 of 1

Date: 29 Dec 2022

Test Report No: ERSIPL/TR/WA/318

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.  
Date of Sampling : 12-13.12.2022  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of Customer  
Sample Received on : 22.12.2022  
Analysis Started on : 22.12.2022  
Analysis Completed on : 29.12.2022  
Method of Sampling : IS 3025: Part 1: 1987, Reaffirmed 2019  
Quantity of Sample : 2ltrs  
Type of Container : Glass Bottle & HDPE Bottle  
Environment Condition : All Tests carried out in Room Temperature

### Sample ID, No.

1. ERSIPL/WA/690
2. ERSIPL/WA/691
3. ERSIPL/WA/692
4. ERSIPL/WA/693

### Locations

1. Open well in Village Kalamegha
2. Open well in Village Kathfali
3. Open well in Village Khuntjharja
4. Bore well in Village Rengalmunra

### TEST FINDINGS:

Sl	Parameters Analysed	Test Method	Unit	Permissible Limit as per IS:10500, 2012	Result			
					ERSIPL/WA/690	ERSIPL/WA/691	ERSIPL/WA/692	ERSIPL/WA/693
01	pH value	IS 3025:Part 11: 1983 Reaffirmed-2017	-	6.5 to 8.5	7.01	6.94	6.77	7.11
02	Turbidity	IS 3025:Part 10: 1984 Reaffirmed-2017	NTU	1.0	0.48	0.31	0.29	0.35
03	Total Hardness as CaCO <sub>3</sub>	IS 3025:Part 21: 2009 Reaffirmed-2019	mg/l	200.0	206.0	22.0	84.0	276.0
04	Total iron	IS 3025:Part 53: 2003 Reaffirmed-2019	mg/l	0.3	0.07	0.07	0.06	0.08
05	Chloride	IS 3025:Part 32: 1988 Reaffirmed-2019	mg/l	250.0	50.26	16.75	32.32	80.81
06	Total Dissolved Solids	IS 3025:Part 16: 1984 Reaffirmed-2019	mg/l	500.0	579.0	48.8	211.0	727.1
07	Calcium as Ca	IS 3025:Part 40: 1991 Reaffirmed-2019	mg/l	75.0	32.06	5.61	17.64	26.45
08	Sulphate as SO <sub>4</sub>	IS 3025:Part 24: 1986 Reaffirmed-2019	mg/l	200.0	25.26	2.95	15.13	19.74
09	Fluoride	IS 3025:Part 60: 2008 Reaffirmed-2019	mg/l	1.0	<0.1	<0.1	<0.1	<0.1
10	Total Alkalinity as CaCO <sub>3</sub>	IS 3025:Part 23: 1986 Reaffirmed-2019	mg/l	200.0	390.0	34.0	66.0	442.0

..END OF TEST REPORT..

(Authorized Signatory)  
S. P. Pattanayak  
Tech. Manager



CIN - U73100OR1995FTC003889



GSTIN : 21AAACE6224D1ZE

# Environmental Research and Services (India) Pvt. Ltd.

(OSPCB 'A' Category Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

## Test Report Format No.: ERSIPL/FM/40 TEST REPORT (Water/ Waste-Water)

Pg No: 1 of 2

Date: 29 Dec 2022

Test Report No: ERSIPL/TR/WA/T-318

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.  
Date of Sampling : 12-13.12.2022  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of Customer  
Sample Received on : 22.12.2022  
Analysis Started on : 22.12.2022  
Analysis Completed on : 29.12.2022  
Method of Sampling : IS 3025: Part 1: 1987, Reaffirmed 2019  
Quantity of Sample : 2ltrs  
Type of Container : Glass Bottle & HDPE Bottle  
Environment Condition : All Tests carried out in Room Temperature

**Sample ID. No.**

1. ERSIPL/WA/690
2. ERSIPL/WA/691
3. ERSIPL/WA/692
4. ERSIPL/WA/693

**Locations**

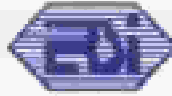
1. Open well in Village Kalamegha
2. Open well in Village Kathfali
3. Open well in Village Khuntjharia
4. Bore well in Village Rengalmunra

**TEST FINDINGS:**

Sl	Parameters Analysed	Test Method	Unit	Permissible Limit as per IS:10500, 2012	Result			
					ERSIPL/WA/690	ERSIPL/WA/691	ERSIPL/WA/692	ERSIPL/WA/693
01	Colour	IS 3025:Part 04: 1983 Reaffirmed-2017	Hazen	5.0	<5.0	<5.0	<5.0	<5.0
02	Odour	IS 3026:Part 05: 1983 Reaffirmed-2017	-	Agreeable (A)	A	A	A	A
03	Taste	IS 3025:Part 07,08: 1984 Reaffirmed-2017	-	Agreeable (A)	A	A	A	A
04	Nitrate as NO <sub>3</sub>	IS 3025:Part 34: 1983 Reaffirmed-2019	mg/L	45.0	<5.0	<5.0	<5.0	<5.0
05	Residual Free Chlorine	IS 3025:Part 26: 1986 Reaffirmed-2019	mg/L	0.2 (min)	Nil	Nil	Nil	Nil
06	Copper	IS 3025:Part 42: 1992 Reaffirmed-2019	mg/L	0.05	ND	ND	ND	ND
07	Manganese	IS 3025:Part 59: 2006 Reaffirmed-2017	mg/L	0.1	ND	ND	ND	ND
08	Phenolic Compound	IS 3025:Part 43: 1992 Reaffirmed-2019	mg/L	0.001	ND	ND	ND	ND
09	Mercury	IS 3025:Part 48: 1994 Reaffirmed-2019	mg/L	0.001	ND	ND	ND	ND
10	Cadmium	IS 3025:Part 41: 1992 Reaffirmed-2019	mg/L	0.003	ND	ND	ND	ND



CIN - U73100OR1995PTC003889



GSTIN : 21AAACE6224D1ZE

## Environmental Research and Services (India) Pvt. Ltd.


(OSPCB 'A' Category Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329 , E-mail: ersibbsr@gmail.com

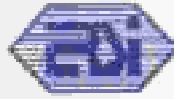
Pg No: 2 of 2

11	Selenium	IS 3025:Part 56: 2003 Reaffirmed-2019	mg/l	0.01	ND	ND	ND	ND
12	Total Arsenic	IS 3025:Part 37: 1988 Reaffirmed-2019	mg/l	0.01	ND	ND	ND	ND
13	Cyanide	IS 3025:Part 27: 1986 Reaffirmed-2019	mg/l	0.05	ND	ND	ND	ND
14	Lead	IS 3025:Part 47: 1994 Reaffirmed-2019	mg/l	0.01	ND	ND	ND	ND
15	Zinc	IS 3025:Part 49: 1994 Reaffirmed-2019	mg/l	5.0	ND	ND	ND	ND
16	Anionic detergents	IS 13428 :2005 Reaffirmed-2019	mg/l	0.2	ND	ND	ND	ND
17	Total Chromium	IS 3025:Part 52: 2003 Reaffirmed-2019	mg/l	0.05	ND	ND	ND	ND
18	Polynuclear aromatic hydrocarbons	APHA 6440	mg/l	0.0001	ND	ND	ND	ND
19	Mineral Oil	IS 3025:Part 39: 1991 Reaffirmed-2019	mg/l	0.5	ND	ND	ND	ND
20	Pesticides	USEPA gas-liquid chromatography	mg/l	---	ND	ND	ND	ND
21	Aluminium	IS 3025:Part 55: 2003 Reaffirmed-2019	mg/l	0.03	ND	ND	ND	ND
22	Boron	IS 3025:Part 57: 2005 Reaffirmed-2017	mg/l	0.5	ND	ND	ND	ND
23	Nickel	IS 3025:Part 54: 2003 Reaffirmed-2019	mg/l	0.02	ND	ND	ND	ND

ND-Not Detected

  
(Authorized Signatory)  
S.P. Pattanayak  
Tech. Manager

...END OF TEST REPORT...



# Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025 : 2017 (NABL) Accredited Laboratory, OSPCB Empowered Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

ULR-TC74402200000583F

Test Report Format No.: ERSIPL/FM/40

## TEST REPORT (Water/ Waste Water)

Pg No: 1 of 1

Date: 29 Dec 2022

Test Report No: ERSIPL/TR/WA/319

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.

Date of Sampling : 12-13.12.2022

Sample Collected by : Representative of ERS (I) Pvt. Ltd.

Sample Collected in presence of : Representative of Customer

Sample Received on : 22.12.2022

Analysis Started on : 22.12.2022

Analysis Completed on : 29.12.2022

Method of Sampling : IS 3025: Part 1: 1987, Reaffirmed 2019

Quantity of Sample : 2litrs

Type of Container : Glass Bottle & HDPE Bottle

Environment Condition : All Tests carried out in Room Temperature

### Sample ID. No.

1. ERSIPL/WA/694
2. ERSIPL/WA/695

### Locations

1. Open well in Village Bendrichua
2. Bore Well R & R Colony, Kalamegha

### TEST FINDINGS:

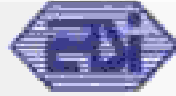
Sl	Parameters Analysed	Test Method	Unit	Permissible Limit as per IS:10500, 2012	Result	
					ERSIPL/ WA/694	ERSIPL/ WA/695
01	pH value	IS 3025:Part 11: 1983 Reaffirmed-2017	—	6.5 to 8.5	6.09	6.91
02	Turbidity	IS 3025:Part 10: 1984 Reaffirmed-2017	NTU	1.0	0.41	0.37
03	Total Hardness, as CaCO <sub>3</sub>	IS 3025:Part 21: 2009 Reaffirmed-2019	mg/L	200.0	26.0	134.0
04	Total Iron	IS 3025:Part 53: 2003 Reaffirmed-2019	mg/L	0.3	0.06	0.08
05	Chloride	IS 3025:Part 32: 1986 Reaffirmed-2019	mg/L	250.0	20.70	22.67
06	Total Dissolved Solids	IS 3025:Part 16: 1984 Reaffirmed-2019	mg/L	500.0	43.4	241.0
07	Calcium as Ca	IS 3025:Part 40: 1991 Reaffirmed-2019	mg/L	75.0	6.41	30.46
08	Sulphate as SO <sub>4</sub>	IS 3025:Part 24: 1986 Reaffirmed-2019	mg/L	200.0	4.23	16.41
09	Fluoride	IS 3025:Part 60: 2008 Reaffirmed-2019	mg/L	1.0	<0.1	<0.1
10	Total Alkalinity as CaCO <sub>3</sub>	IS 3025:Part 23: 1986 Reaffirmed-2019	mg/L	200.0	38.0	170.0

(Authorized Signatory)  
S.P. Pattanayak  
Tech. Manager

...END OF TEST REPORT...



CIN - U73100OR1995PTC003889



GSTIN : 21AAACE6224D1ZE

# Environmental Research and Services (India) Pvt. Ltd.

(OSPCB 'A' Category Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

## Test Report Form No.: ERSIPL/FM/40 TEST REPORT (Water/ Waste-Water)

Pg No: 1 of 2

Date: 29 Dec 2022

Test Report No: ERSIPL/TR/WA/T-319

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.

Date of Sampling : 12-13.12.2022

Sample Collected by : Representative of ERS (I) Pvt. Ltd.

Sample Collected in presence of : Representative of Customer

Sample Received on : 22.12.2022

Analysis Started on : 22.12.2022

Analysis Completed on : 29.12.2022

Method of Sampling : IS 3025: Part 1: 1987, Reaffirmed 2019

Quantity of Sample : 2ltrs

Type of Container : Glass Bottle &amp; HDPE Bottle

Environment Condition : All Tests carried out in Room Temperature

### Sample ID. No.

1. ERSIPL/WA/694
2. ERSIPL/WA/695

### Locations

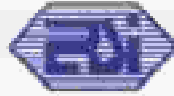
1. Open well in Village Bendrichua
2. Bore Well R & R Colony, Kalamegha

### TEST FINDINGS:

Sl	Parameters Analysed	Test Method	Unit	Permissible Limit as per IS:20500, 2012	Result	
					ERSIPL/WA/694	ERSIPL/WA/695
01	Colour	IS 3025-Part 04: 1983 Reaffirmed-2017	Hazen	5.0	<5.0	<5.0
02	Odour	IS 3025-Part 05: 1983 Reaffirmed-2017	—	Agreeable (A)	A	A
03	Taste	IS 3025-Part 07,08: 1984 Reaffirmed-2017	—	Agreeable (A)	A	A
04	Nitrate as NO <sub>3</sub>	IS 3025-Part 34: 1983 Reaffirmed-2019	mg/l	45.0	<5.0	<5.0
05	Residual Free Chlorine	IS 3025-Part 26: 1986 Reaffirmed-2019	mg/l	0.2 (min)	Nil	Nil
06	Copper	IS 3025-Part 42: 1992 Reaffirmed-2019	mg/l	0.05	ND	ND
07	Manganese	IS 3025-Part 59: 2006 Reaffirmed-2017	mg/l	0.1	ND	ND
08	Phenolic Compound	IS 3025-Part 43: 1992 Reaffirmed-2019	mg/l	0.001	ND	ND
09	Mercury	IS 3025-Part 48: 1994 Reaffirmed-2019	mg/l	0.001	ND	ND
10	Cadmium	IS 3025-Part 41: 1992 Reaffirmed-2019	mg/l	0.003	ND	ND



CIN - U73100OR1995PTC003889



GSTIN : 21AAACE6224D1ZE

## Environmental Research and Services (India) Pvt. Ltd.

(OSPCB 'A' Category Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

Pg No: 2 of 2

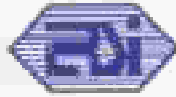
11	Selenium	IS 3025-Part 56: 2003 Reaffirmed-2019	mg/l	0.01	ND	ND
12	Total Arsenic	IS 3025-Part 37: 1988 Reaffirmed-2019	mg/l	0.01	ND	ND
13	Cyanide	IS 3025-Part 27: 1986 Reaffirmed-2019	mg/L	0.05	ND	ND
14	Lead	IS 3025-Part 47: 1994 Reaffirmed-2019	mg/l	0.01	ND	ND
15	Zinc	IS 3025-Part 49: 1994 Reaffirmed-2019	mg/l	5.0	ND	ND
16	Anionic detergents	IS 13428:2005 Reaffirmed-2019	mg/l	0.2	ND	ND
17	Total Chromium	IS 3025-Part 52: 2003 Reaffirmed-2019	mg/l	0.05	ND	ND
18	Polynuclear aromatic hydrocarbons	APHA 8440	mg/l	0.0001	ND	ND
19	Mineral Oil	IS 3025-Part 39: 1991 Reaffirmed-2019	mg/l	0.5	ND	ND
20	Pesticides	US EPA gas liquid chromatography	mg/l	---	ND	ND
21	Aluminium	IS 3025-Part 55: 2003 Reaffirmed-2019	mg/l	0.03	ND	ND
22	Boron	IS 3025-Part 57: 2005 Reaffirmed-2017	mg/l	0.5	ND	ND
23	Nickel	IS 3025-Part 54: 2003 Reaffirmed-2019	mg/l	0.02	ND	ND

ND-Not Detected

  
(Authorized Signatory)  
S.P. Pattanayek  
Tech. Manager

...END OF TEST REPORT...

GSTIN : 21AAACE6224D12E



# Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025:2017 (NABL) Accredited Laboratory, OSPCB Empanelled Laboratory and ISO 9001:2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

ULR-TC74402300000006F

Test Report Format No.: ERSIPL/FM/40

## TEST REPORT (Water/ Waste Water)

Pg No: 1 of 1

Date: 27 Jan 2023

Test Report No: ERSIPL/TR/WA/002

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.

Date of Sampling : 13.01.2023

Sample Collected by : Representative of ERS (I) Pvt. Ltd.

Sample Collected in presence of : Representative of Customer

Sample Received on : 16.01.2023

Analysis Started on : 16.01.2023

Analysis Completed on : 23.01.2023

Method of Sampling : IS 3025: Part 1: 1987, Reaffirmed 2019

Quantity of Sample : 2ltrs

Type of Container : Glass Bottle & HDPE Bottle

Environment Condition : All Tests carried out in Room Temperature

### Sample ID. No.

1. ERSIPL/WA/005
2. ERSIPL/WA/006
3. ERSIPL/WA/007
4. ERSIPL/WA/008

### Locations

1. Open well in Village Kalamegha
2. Open well in Village Kathfali
3. Open well in Village Khuntjharla
4. Bore well in Village Rengalmunra

### TEST FINDINGS:

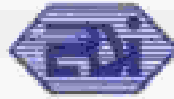
Sl	Parameters Analysed	Test Method	Unit	Permissible Limit as per IS: 10500, 2012	Result			
					ERSIPL/WA/005	ERSIPL/WA/006	ERSIPL/WA/007	ERSIPL/WA/008
01	pH value	IS 3025:Part 11: 1983 Reaffirmed-2017	--	6.5 to 8.5	6.97	6.91	6.72	7.02
02	Turbidity	IS 3025:Part 10: 1984 Reaffirmed-2017	NTU	1.0	0.57	0.48	0.39	0.54
03	Total Hardness as CaCO <sub>3</sub>	IS 3025:Part 11: 2009 Reaffirmed-2019	mg/L	200.0	205.0	26.0	88.0	278.0
04	Total Iron	IS 3025:Part 52: 2003 Reaffirmed-2019	mg/L	0.3	0.08	0.08	0.06	0.08
05	Chloride	IS 3025:Part 32: 1988 Reaffirmed-2019	mg/L	250.0	52.23	20.70	34.49	82.78
06	Total Dissolved Solids	IS 3025:Part 16: 1984 Reaffirmed-2019	mg/L	500.0	591.0	52.9	217.0	738.1
07	Calcium as Ca	IS 3025:Part 40: 1991 Reaffirmed-2019	mg/L	75.0	33.67	7.21	19.24	28.06
08	Sulphate as SO <sub>4</sub>	IS 3025:Part 24: 1986 Reaffirmed-2019	mg/L	200.0	27.05	3.72	16.41	20.64
09	Fluoride	IS 3025:Part 60: 2008 Reaffirmed-2019	mg/L	1.0	<0.1	<0.1	<0.1	<0.1
10	Total Alkalinity as CaCO <sub>3</sub>	IS 3025:Part 23: 1986 Reaffirmed-2019	mg/L	200.0	394.0	38.0	70.0	446.0

..END OF TEST REPORT..

(Authorized Signatory)  
S.P. Pattanayak  
Tech. Manager



CIN - U73100OR1995PTC003889



GSTIN : 21AAACE6224D1ZE

# Environmental Research and Services (India) Pvt. Ltd.

(OSPCB 'A' Category Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

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Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

## Test Report Format No.: ERSIPL/FM/40 TEST REPORT (Water/ Waste Water)

Pg No: 1 of 2

Date: 27 Jan 2023

Test Report No: ERSIPL/TR/WA/T-002

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.

Date of Sampling : 13.01.2023

Sample Collected by : Representative of ERS (I) Pvt. Ltd.

Sample Collected in presence of : Representative of Customer

Sample Received on : 16.01.2023

Analysis Started on : 16.01.2023

Analysis Completed on : 23.01.2023

Method of Sampling : IS 3025: Part 1: 1987, Reaffirmed 2019

Quantity of Sample : 2ltrs

Type of Container : Glass Bottle & HDPE Bottle

Environment Condition : All Tests carried out in Room Temperature

**Sample ID, No.**

1. ERSIPL/WA/005
2. ERSIPL/WA/006
3. ERSIPL/WA/007
4. ERSIPL/WA/008

**Locations**

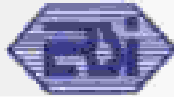
1. Open well in Village Kalamegha
2. Open well in Village Kathfali
3. Open well in Village Khuntjharja
4. Bore well in Village Rengalmunra

**TEST FINDINGS:**

Sl	Parameters Analysed	Test Method	Unit	Permissible Limit as per IS:10500, 2012	Result			
					ERSIPL/WA/005	ERSIPL/WA/006	ERSIPL/WA/007	ERSIPL/WA/008
01	Colour	IS 3025:Part 04: 1983 Reaffirmed-2017	Hazen	5.0	<5.0	<5.0	<5.0	<5.0
02	Odour	IS 3026:Part 05: 1983 Reaffirmed-2017	--	Agreeable (A)	A	A	A	A
03	Taste	IS 3025:Part 07,08: 1984 Reaffirmed-2017	--	Agreeable (A)	A	A	A	A
04	Nitrate as NO <sub>3</sub>	IS 3025:Part 34: 1983 Reaffirmed-2019	mg/l	45.0	<5.0	<5.0	<5.0	<5.0
05	Residual Free Chlorine	IS 3025:Part 26: 1986 Reaffirmed-2019	mg/l	0.2 (min)	Nil	Nil	Nil	Nil
06	Copper	IS 3025:Part 42: 1992 Reaffirmed-2019	mg/l	0.05	ND	ND	ND	ND
07	Manganese	IS 3025:Part 59: 2006 Reaffirmed-2017	mg/l	0.1	ND	ND	ND	ND
08	Phenolic Compound	IS 3025:Part 43: 1992 Reaffirmed-2019	mg/l	0.001	ND	ND	ND	ND
09	Mercury	IS 3025:Part 48: 1994 Reaffirmed-2019	mg/l	0.001	ND	ND	ND	ND
10	Cadmium	IS 3025:Part 41: 1992 Reaffirmed-2019	mg/l	0.003	ND	ND	ND	ND



CIN - U73100OR1995PTC003889



GSTIN : 21AAACE6224D1ZE

# Environmental Research and Services (India) Pvt. Ltd.


(OSPCB 'A' Category Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329 , E-mail: [ersibbsr@gmail.com](mailto:ersibbsr@gmail.com)

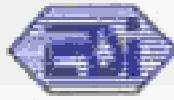
Pg No: 2 of 2

11	Selenium	IS 3025:Part 56: 2003 Reaffirmed-2019	mg/L	0.01	ND	ND	ND	ND
12	Total Arsenic	IS 3025:Part 37: 1988 Reaffirmed-2019	mg/L	0.01	ND	ND	ND	ND
13	Cyanide	IS 3025:Part 27: 1986 Reaffirmed-2019	mg/L	0.05	ND	ND	ND	ND
14	Lead	IS 3025:Part 47: 1994 Reaffirmed-2019	mg/L	0.01	ND	ND	ND	ND
15	Zinc	IS 3025:Part 49: 1994 Reaffirmed-2019	mg/L	5.0	ND	ND	ND	ND
16	Anionic detergents	IS 13428 :2005 Reaffirmed-2019	mg/l.	0.2	ND	ND	ND	ND
17	Total Chromium	IS 3025:Part 52: 2003 Reaffirmed-2019	mg/L	0.05	ND	ND	ND	ND
18	Polynuclear aromatic hydrocarbons	APHA 6440	mg/L	0.0001	ND	ND	ND	ND
19	Mineral Oil	IS 3025:Part 39: 1991 Reaffirmed-2019	mg/L	0.5	ND	ND	ND	ND
20	Pesticides	USEPA gas-liquid chromatograph.	mg/L	---	ND	ND	ND	ND
21	Aluminium	IS 3025:Part 55: 2003 Reaffirmed-2019	mg/L	0.03	ND	ND	ND	ND
22	Boron	IS 3025:Part 57: 2005 Reaffirmed-2017	mg/L	0.5	ND	ND	ND	ND
23	Nickel	IS 3025:Part 54: 2003 Reaffirmed-2019	mg/L	0.02	ND	ND	ND	ND

ND-Not Detected

  
(Authorized Signatory)  
**S.P. Pattansy**  
Tech. Manager

...END OF TEST REPORT...



# Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025 : 2017 (NABL) Accredited Laboratory, OJPCB Empanelled Laboratory and ISO 9001 : 2015 Certified Company) Certificate No.: TC-1448

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

ULR-TC74402300000007E

Test Report Format No.: ERSIPL/FM/40

## TEST REPORT (Water/ Waste-Water)

Pg.No: 1 of 1

Date: 27 Jan 2023

Test Report No: ERSIPL/TR/WA/003

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.  
Date of Sampling : 13.01.2023  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of Customer  
Sample Received on : 16.01.2023  
Analysis Started on : 16.01.2023  
Analysis Completed on : 23.01.2023  
Method of Sampling : IS 3025: Part 1: 1987, Reaffirmed 2019  
Quantity of Sample : 2ltrs  
Type of Container : Glass Bottle & HDPE Bottle  
Environment Condition : All Tests carried out in Room Temperature

### Sample ID. No.

- ERSIPL/WA/009
- ERSIPL/WA/010

### Locations

- Open well in Village Bendrichua
- Bore Well R & R Colony, Kalamegha

### TEST FINDINGS:

Sl	Parameters Analysed	Test Method	Unit	Permissible Limit as per IS-10500, 2012	Result	
					ERSIPL/WA/009	ERSIPL/WA/010
01	pH value	IS 3025:Part 11: 1983 Reaffirmed-2017	---	6.5 to 8.5	6.12	6.87
02	Turbidity	IS 3025:Part 10: 1984 Reaffirmed-2017	NTU	1.0	0.53	0.47
03	Total Hardness as CaCO <sub>3</sub>	IS 3025:Part 21: 2009 Reaffirmed-2019	mg/L	200.0	30.0	140.0
04	Total Iron	IS 3025:Part 53: 2008 Reaffirmed-2019	mg/L	0.3	0.07	0.07
05	Chloride	IS 3025:Part 32: 1988 Reaffirmed-2019	mg/L	250.0	22.67	25.62
06	Total Dissolved Solids	IS 3025:Part 16: 1984 Reaffirmed-2019	mg/L	500.0	52.4	258.0
07	Calcium as Ca	IS 3025:Part 40: 1991 Reaffirmed-2019	mg/L	75.0	8.02	33.67
08	Sulphate as SO <sub>4</sub>	IS 3025:Part 24: 1980 Reaffirmed-2019	mg/L	200.0	5.51	17.31
09	Fluoride	IS 3025:Part 60: 2008 Reaffirmed-2019	mg/L	1.0	<0.1	<0.1
10	Total Alkalinity as CaCO <sub>3</sub>	IS 3025:Part 23: 1986 Reaffirmed-2019	mg/L	200.0	42.0	174.0

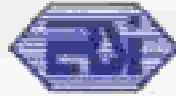
(Authorized Signatory)

S.P.Pattanayak  
Tech.Manager

...END OF TEST REPORT...



CIN - U73100OR1995PTC003889



GSTIN : 21AAACE6224D1ZE

# Environmental Research and Services (India) Pvt. Ltd.

(OSPCB 'A' Category Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com**Test Report Format No.: ERSIPL/FM/40****TEST REPORT (Water/ Waste-Water)**

Pg No: 1 of 2

Date: 27 Jan 2023

Test Report No: ERSIPL/TR/WA/T-003

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.

Date of Sampling : 13.01.2023

Sample Collected by : Representative of ERS (I) Pvt. Ltd.

Sample Collected in presence of : Representative of Customer

Sample Received on : 16.01.2023

Analysis Started on : 16.01.2023

Analysis Completed on : 23.01.2023

Method of Sampling : IS 3025: Part 1: 1987, Reaffirmed 2019

Quantity of Sample : 2ltrs

Type of Container : Glass Bottle &amp; HDPE Bottle

Environment Condition : All Tests carried out in Room Temperature

**Sample ID. No.**

1. ERSIPL/WA/009
2. ERSIPL/WA/010

**Locations**

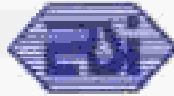
1. Open well in Village Bendrichua
2. Bore Well R & R Colony, Kalamagha

**TEST FINDINGS:**

Sl	Parameters Analysed	Test Method	Unit	Permissible Limit as per IS:10500, 2012	Result	
					ERSIPL/WA/009	ERSIPL/WA/010
01	Colour	IS 3025:Part 04: 1983 Reaffirmed-2017	Hazen	5.0	<5.0	<5.0
02	Odour	IS 3025:Part 05: 1983 Reaffirmed-2017	--	Agreeable (A)	A	A
03	Taste	IS 3025:Part 07,08: 1984 Reaffirmed-2017	--	Agreeable (A)	A	A
04	Nitrate as NO <sub>3</sub>	IS 3025:Part 34: 1983 Reaffirmed-2019	mg/l	45.0	<5.0	<5.0
05	Residual Free Chlorine	IS 3025:Part 26: 1986 Reaffirmed-2019	mg/l	0.2 (min)	Nil	Nil
06	Copper	IS 3025:Part 42: 1992 Reaffirmed-2019	mg/l	0.05	ND	ND
07	Manganese	IS 3025:Part 59: 2006 Reaffirmed-2017	mg/l	0.1	ND	ND
08	Phenolic Compound	IS 3025:Part 43: 1992 Reaffirmed-2019	mg/l	0.001	ND	ND
09	Mercury	IS 3025:Part 48: 1994 Reaffirmed-2019	mg/l	0.001	ND	ND
10	Cadmium	IS 3025:Part 41: 1992 Reaffirmed-2019	mg/l	0.003	ND	ND



CIN - U73100OR1995PTC003889



GSTIN : 21AAACE6224D1ZE

## Environmental Research and Services (India) Pvt. Ltd.

(OSPCB 'A' Category Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

Pg No: 2 of 2

11	Selenium	IS 3025:Part 56: 2003 Reaffirmed-2019	mg/l	0.01	ND	ND
12	Total Arsenic	IS 3025:Part 37: 1988 Reaffirmed-2019	mg/l	0.01	ND	ND
13	Cyanide	IS 3025:Part 27: 1986 Reaffirmed-2019	mg/l	0.05	ND	ND
14	Lead	IS 3025:Part 47: 1994 Reaffirmed-2019	mg/l	0.01	ND	ND
15	Zinc	IS 3025:Part 49: 1994 Reaffirmed-2019	mg/l	5.0	ND	ND
16	Anionic detergents	IS 13428 :2005 Reaffirmed-2019	mg/l	0.2	ND	ND
17	Total Chromium	IS 3025:Part 52: 2003 Reaffirmed-2019	mg/l	0.05	ND	ND
18	Polynuclear aromatic hydrocarbons	APHA 6440	mg/l	0.0001	ND	ND
19	Mineral Oil	IS 3025:Part 39: 1991 Reaffirmed-2019	mg/l	0.5	ND	ND
20	Pesticides	USEPA gas-liquid chromatography	mg/l	---	ND	ND
21	Aluminium	IS 3025:Part 55: 2003 Reaffirmed-2019	mg/l	0.03	ND	ND
22	Boron	IS 3025:Part 57: 2005 Reaffirmed-2017	mg/l	0.5	ND	ND
23	Nickel	IS 3025:Part 54: 2003 Reaffirmed-2019	mg/l	0.02	ND	ND

ND-Not Detected

  
(Authorized Signatory)  
S.P. Pattanayak  
Tech. Manager

...END OF TEST REPORT...



## Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025:2005 (NABL) Accredited Laboratory, OSPCB Empanelled Laboratory and ISO 9001:2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

ULR-TC74402300000090F

Test Report Format No.: ERSIPL/FM/40

### TEST REPORT (Water/ Waste-Water)

Pg No: 1 of 1

Date: 27 Feb 2023

Test Report No: ERSIPL/TR/WA/047

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.

Date of Sampling : 13.02.2023

Sample Collected by : Representative of ERS (I) Pvt. Ltd.

Sample Collected in presence of : Representative of Customer

Sample Received on : 21.02.2023

Analysis Started on : 21.02.2023

Analysis Completed on : 27.02.2023

Method of Sampling : IS 3025: Part 1: 1987, Reaffirmed 2019

Quantity of Sample : 2ltrs

Type of Container : Glass Bottle & HDPE Bottle

Environment Condition : All Tests carried out in Room Temperature

#### Sample ID. No.

1. ERSIPL/WA/106
2. ERSIPL/WA/107
3. ERSIPL/WA/108
4. ERSIPL/WA/109

#### Locations

1. Open well in Village Kalamegha
2. Open well in Village Kathfall
3. Open well in Village Khuntjharia
4. Bore well in Village Rengalmunra

#### TEST FINDINGS:

Sl	Parameters Analysed	Test Method	Unit	Permissible Limit as per IS:10500, 2012	Result			
					ERSIPL/WA/106	ERSIPL/WA/107	ERSIPL/WA/108	ERSIPL/WA/109
01	pH value	IS 3025:Part 11: 1983 Reaffirmed-2017	-	6.5 to 8.5	7.04	6.97	6.77	7.11
02	Turbidity	IS 3025:Part 10: 1984 Reaffirmed-2017	NTU	1.0	0.51	0.43	0.35	0.51
03	Total Hardness as CaCO <sub>3</sub>	IS 3025:Part 21: 2009 Reaffirmed-2019	mg/L	200.0	206.0	24.0	88.0	276.0
04	Total Iron	IS 3025:Part 53: 2003 Reaffirmed-2019	mg/L	0.3	0.08	0.06	0.08	0.08
05	Chloride	IS 3025:Part 32: 1988 Reaffirmed-2019	mg/L	250.0	50.26	18.72	32.52	80.81
06	Total Dissolved Solids	IS 3025:Part 16: 1984 Reaffirmed-2019	mg/L	500.0	588.0	51.8	215.0	728.4
07	Calcium as Ca	IS 3025:Part 40: 1991 Reaffirmed-2019	mg/L	75.0	33.67	5.61	18.44	26.45
08	Sulphate as SO <sub>4</sub>	IS 3025:Part 24: 1986 Reaffirmed-2019	mg/L	200.0	25.77	3.33	15.64	20.13
09	Fluoride	IS 3025:Part 60: 2008 Reaffirmed-2019	mg/L	1.0	<0.1	<0.1	<0.1	<0.1
10	Total Alkalinity as CaCO <sub>3</sub>	IS 3025:Part 23: 1986 Reaffirmed-2019	mg/L	200.0	390.0	34.0	68.0	440.0

(Authorized Signatory)

S.P. Pattanayak  
Tech. Manager

..END OF TEST REPORT..



CIN - U73100OR1995PTC003889



GSTIN : 21AAACE6224D1ZE

**Environmental Research and Services (India) Pvt. Ltd.**

(OSPCB 'A' Category Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha

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**Test Report Format No.: ERSIPL/FM/40  
TEST REPORT (Water/ Waste-Water)**

Pg No: 1 of 2

**Date: 27 Feb 2023****Test Report No: ERSIPL/TR/WA/T-047**

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.

Date of Sampling : 13.02.2023

Sample Collected by : Representative of ERS (I) Pvt. Ltd.

Sample Collected in presence of : Representative of Customer

Sample Received on : 21.02.2023

Analysis Started on : 21.02.2023

Analysis Completed on : 27.02.2023

Method of Sampling : IS 3025: Part 1: 1987, Reaffirmed 2019

Quantity of Sample : 2ltrs

Type of Container : Glass Bottle & HDPE Bottle

Environment Condition : All Tests carried out in Room Temperature

**Sample ID. No.**

1. ERSIPL/WA/106
2. ERSIPL/WA/107
3. ERSIPL/WA/108
4. ERSIPL/WA/109

**Locations**

1. Open well in Village Kalamegha
2. Open well in Village Kathfali
3. Open well in Village Khuntjharia
4. Bore well in Village Rengalmunra

**TEST FINDINGS:**

Sl	Parameters Analysed	Test Method	Unit	Permissible Limit as per IS:10500, 2012	Result			
					ERSIPL/WA/106	ERSIPL/WA/107	ERSIPL/WA/108	ERSIPL/WA/109
01	Colour	IS 3025:Part 04: 1983 Reaffirmed-2017	Hazen	5.0	<5.0	<5.0	<5.0	<5.0
02	Odour	IS 3025:Part 05: 1983 Reaffirmed-2017	--	Agreeable (A)	A	A	A	A
03	Taste	IS 3025:Part 07,08: 1984 Reaffirmed-2017	--	Agreeable (A)	A	A	A	A
04	Nitrate as NO <sub>3</sub>	IS 3025:Part 34: 1983 Reaffirmed-2019	mg/L	45.0	<5.0	<5.0	<5.0	<5.0
05	Residual Free Chlorine	IS 3025:Part 26: 1986 Reaffirmed-2019	mg/L	0.2 (min)	Nil	Nil	Nil	Nil
06	Copper	IS 3025:Part 42: 1992 Reaffirmed-2019	mg/L	0.05	ND	ND	ND	ND
07	Manganese	IS 3025:Part 59: 2006 Reaffirmed-2017	mg/L	0.1	ND	ND	ND	ND
08	Phenolic Compound	IS 3025:Part 43: 1992 Reaffirmed-2019	mg/L	0.001	ND	ND	ND	ND
09	Mercury	IS 3025:Part 48: 1994 Reaffirmed-2019	mg/L	0.001	ND	ND	ND	ND
10	Cadmium	IS 3025:Part 41: 1992 Reaffirmed-2019	mg/L	0.003	ND	ND	ND	ND



CIN - U73100OR1995PTC003889



GSTIN : 21AAACE6224D1ZE

## Environmental Research and Services (India) Pvt. Ltd.


(OSPCB 'A' Category Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

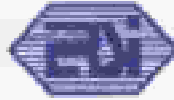
Pg No: 2 of 2

11	Selenium	IS 3025:Part 56: 2003 Reaffirmed-2019	mg/L	0.01	ND	ND	ND	ND
12	Total Arsenic	IS 3025:Part 37: 1988 Reaffirmed-2019	mg/L	0.01	ND	ND	ND	ND
13	Cyanide	IS 3025:Part 27: 1985 Reaffirmed-2019	mg/L	0.05	ND	ND	ND	ND
14	Lead	IS 3025:Part 47: 1994 Reaffirmed-2019	mg/L	0.01	ND	ND	ND	ND
15	Zinc	IS 3025:Part 49: 1994 Reaffirmed-2019	mg/L	5.0	ND	ND	ND	ND
16	Anionic detergents	IS 13428 :2005 Reaffirmed-2019	mg/L	0.2	ND	ND	ND	ND
17	Total Chromium	IS 3025:Part 52: 2003 Reaffirmed-2019	mg/L	0.05	ND	ND	ND	ND
18	Polynuclear aromatic hydrocarbons	APHA 6440	mg/L	0.0001	ND	ND	ND	ND
19	Mineral Oil	IS 3025:Part 39: 1991 Reaffirmed-2019	mg/L	0.5	ND	ND	ND	ND
20	Pesticides	USEPA gas-liquid chromatography	mg/L	—	ND	ND	ND	ND
21	Aluminium	IS 3025:Part 55: 2003 Reaffirmed-2019	mg/L	0.03	ND	ND	ND	ND
22	Boron	IS 3025:Part 57: 2005 Reaffirmed-2017	mg/L	0.5	ND	ND	ND	ND
23	Nickel	IS 3025:Part 54: 2003 Reaffirmed-2019	mg/L	0.02	ND	ND	ND	ND

ND-Not Detected

  
(Authorized Signatory)  
S.P. Pattanayak  
Tech. Manager

...END OF TEST REPORT...



## Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025 : 2005 (NABL) Accredited Laboratory, DSPCB Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

ULR-TC744023000000091F

Test Report Format No.: ERSIPL/FM/40

### TEST REPORT (Water/ Waste-Water)

Pg No: 1 of 1

Date: 27 Feb 2023

Test Report No: ERSIPL/TR/WA/048

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.  
Date of Sampling : 19.02.2023  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of Customer  
Sample Received on : 21.02.2023  
Analysis Started on : 21.02.2023  
Analysis Completed on : 27.02.2023  
Method of Sampling : IS 3025: Part 1: 1987, Reaffirmed 2019  
Quantity of Sample : 2ltrs  
Type of Container : Glass Bottle & HDPE Bottle  
Environment Condition : All Tests carried out in Room Temperature

**Sample ID. No.**

1. ERSIPL/WA/110
2. ERSIPL/WA/111

**Locations**

1. Open well in Village Bendrichua
2. Bore Well R & R Colony, Kalamegha

**TEST FINDINGS:**

Sl	Parameters Analysed	Test Method	Unit	Permissible Limit as per IS:10500, 2012	Result	
					ERSIPL/WA/110	ERSIPL/WA/111
01	pH value	IS 3025:Part 11: 1983 Reaffirmed-2017	--	6.5 to 8.5	6.21	6.91
02	Turbidity	IS 3025:Part 10: 1984 Reaffirmed-2017	NTU	1.0	0.43	0.40
03	Total Hardness as CaCO <sub>3</sub>	IS 3025:Part 21: 2009 Reaffirmed-2019	mg/L	200.0	30.0	140.0
04	Total Iron	IS 3025:Part 53: 2003 Reaffirmed-2019	mg/L	0.3	0.06	0.08
05	Chloride	IS 3025:Part 32: 1985 Reaffirmed-2019	mg/L	250.0	20.70	24.64
06	Total Dissolved Solids	IS 3025:Part 16: 1984 Reaffirmed-2019	mg/L	500.0	50.4	249.0
07	Calcium as Ca	IS 3025:Part 40: 1993 Reaffirmed-2019	mg/L	75.0	8.02	32.87
08	Sulphate as SO <sub>4</sub>	IS 3025:Part 24: 1986 Reaffirmed-2019	mg/L	200.0	5.26	16.03
09	Fluoride	IS 3025:Part 60: 2008 Reaffirmed-2019	mg/L	1.0	<0.1	<0.1
10	Total Alkalinity as CaCO <sub>3</sub>	IS 3025:Part 23: 1986 Reaffirmed-2019	mg/L	200.0	40.0	172.0

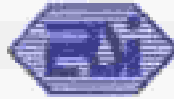
(Authorized Signatory)

S.P. Pattanayak  
Tech. Manager

END OF TEST REPORT...



CIN - U73100OR1995PTC003889



GSTIN : 21AAACE6224D1ZE

**Environmental Research and Services (India) Pvt. Ltd.**

(OSPCB 'A' Category Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha

Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

**Test Report Format No.: ERSIPL/FM/40  
TEST REPORT (Water/ Waste-Water)**

Pg No: 1 of 2

Date: 27 Feb 2023

Test Report No: ERSIPL/TR/WA/T-048

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.

Date of Sampling : 13.02.2023

Sample Collected by : Representative of ERS (I) Pvt. Ltd.

Sample Collected in presence of : Representative of Customer

Sample Received on : 21.02.2023

Analysis Started on : 21.02.2023

Analysis Completed on : 27.02.2023

Method of Sampling : IS 3025: Part 1: 1987, Reaffirmed 2019

Quantity of Sample : 2ltrs

Type of Container : Glass Bottle &amp; HDPE Bottle

Environment Condition : All Tests carried out in Room Temperature

**Sample ID. No.**

1. ERSIPL/WA/110
2. ERSIPL/WA/111

**Locations**

1. Open well in Village Bendrichua
2. Bore Well R & R Colony, Kalamegha

**TEST FINDINGS:**

Sl	Parameters Analysed	Test Method	Unit	Permissible Limit as per IS:10500, 2012	Result	
					ERSIPL/WA/110	ERSIPL/WA/111
01	Colour	IS 3025:Part 04: 1983 Reaffirmed-2017	Hazen	5.0	<5.0	<5.0
02	Odour	IS 3025:Part 05: 1983 Reaffirmed-2017	--	Agreeable (A)	A	A
03	Taste	IS 3025:Part 07,08: 1984 Reaffirmed-2017	--	Agreeable (A)	A	A
04	Nitrate as NO <sub>3</sub>	IS 3025:Part 34: 1983 Reaffirmed-2019	mg/L	45.0	<5.0	<5.0
05	Residual Free Chlorine	IS 3025:Part 26: 1986 Reaffirmed-2019	mg/L	0.2 (min)	Nil	Nil
06	Copper	IS 3025:Part 42: 1992 Reaffirmed-2019	mg/L	0.05	ND	ND
07	Manganese	IS 3025:Part 59: 2006 Reaffirmed-2017	mg/L	0.1	ND	ND
08	Phenolic Compound	IS 3025:Part 43: 1992 Reaffirmed-2019	mg/L	0.001	ND	ND
09	Mercury	IS 3025:Part 48: 1984 Reaffirmed-2019	mg/L	0.001	ND	ND
10	Cadmium	IS 3025:Part 41: 1992 Reaffirmed-2019	mg/L	0.003	ND	ND



CIN - U73100OR1995PTC003889



GSTIN : 21AAACE6224D1ZE

**Environmental Research and Services (India) Pvt. Ltd.**

(OSPCB 'A' Category Empanelled Laboratory and ISO 9001 : 2015 Certified Company)


Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha

Tel: +91-9437021932, +91-9937690329, E-mail: ersibsr@gmail.com

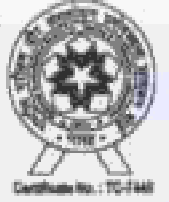
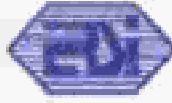
Pg No: 2 of 2

11	Selenium	IS 3025:Part 56: 2003 Reaffirmed-2019	mg/L	0.01	ND	ND
12	Total Arsenic	IS 3025:Part 37: 1988 Reaffirmed-2019	mg/L	0.01	ND	ND
13	Cyanide	IS 3025:Part 27: 1986 Reaffirmed-2019	mg/L	0.05	ND	ND
14	Lead	IS 3025:Part 47: 1994 Reaffirmed-2019	mg/L	0.01	ND	ND
15	Zinc	IS 3025:Part 49: 1994 Reaffirmed-2019	mg/L	5.0	ND	ND
16	Anionic detergents	IS 13428 :2005 Reaffirmed-2019	mg/L	0.2	ND	ND
17	Total Chromium	IS 3025:Part 52: 2003 Reaffirmed-2019	mg/L	0.05	ND	ND
18	Polynuclear aromatic hydrocarbons	APHA 6440	mg/L	0.0001	ND	ND
19	Mineral Oil	IS 3025:Part 39: 1991 Reaffirmed-2019	mg/L	0.5	ND	ND
20	Pesticides	USEPA gas-liquid chromatography	mg/L	---	ND	ND
21	Aluminium	IS 3025:Part 55: 2003 Reaffirmed-2019	mg/L	0.03	ND	ND
22	Boron	IS 3025:Part 57: 2005 Reaffirmed-2017	mg/L	0.5	ND	ND
23	Nickel	IS 3025:Part 54: 2003 Reaffirmed-2019	mg/L	0.02	ND	ND

ND-Not Detected

  
(Authorized Signatory)  
**S.P. Pattanayak**  
Tech. Manager

...END OF TEST REPORT...



## Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025:2017 (NABL) Accredited Laboratory, O5/PCB Empanelled Laboratory and ISO 9001:2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

URL-TC744023000000117F

Test Report Format No.: ERSIPL/FM/40

### TEST REPORT (Water/ Waste Water)

Pg No: 1 of 1

Date: 27 Mar 2023

Test Report No: ERSIPL/TR/WA/061

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.  
Date of Sampling : 14.03.2023  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of Customer  
Sample Received on : 21.03.2023  
Analysis Started on : 21.03.2023  
Analysis Completed on : 27.03.2023  
Method of Sampling : IS 3025: Part 1: 1987, Reaffirmed 2019  
Quantity of Sample : 2ltrs  
Type of Container : Glass Bottle & HDPE Bottle  
Environment Condition : All Tests carried out in Room Temperature

**Sample ID. No.**

1. ERSIPL/WA/144
2. ERSIPL/WA/145
3. ERSIPL/WA/146
4. ERSIPL/WA/147

**Locations**

1. Open well in Village Kalamegha
2. Open well in Village Kathfali
3. Open well in Village Khuntjharia
4. Bore well in Village Rengalmunra

**TEST FINDINGS:**

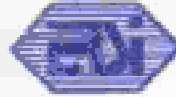
Sl	Parameters Analysed	Test Method	Unit	Permissible Limit as per IS-10500, 2012	Result			
					ERSIPL/WA/144	ERSIPL/WA/145	ERSIPL/WA/146	ERSIPL/WA/147
01	pH value	IS 3025:Part 11: 1983 Reaffirmed-2017	--	6.5 to 8.5	6.99	6.81	6.79	7.01
02	Turbidity	IS 3025:Part 10: 1984 Reaffirmed-2017	NTU	1.0	0.49	0.53	0.39	0.46
03	Total Hardness as CaCO <sub>3</sub>	IS 3025:Part 21: 2009 Reaffirmed-2019	mg/L	200.0	210.0	30.0	96.0	278.0
04	Total Iron	IS 3025:Part 53: 2003 Reaffirmed-2019	mg/L	0.3	0.07	0.06	0.08	0.06
05	Chloride	IS 3025:Part 32: 1988 Reaffirmed-2019	mg/L	250.0	52.23	20.70	34.49	82.78
06	Total Dissolved Solids	IS 3025:Part 16: 1984 Reaffirmed-2019	mg/L	500.0	598.0	52.8	222.0	731.4
07	Calcium as Ca	IS 3025:Part 40: 1991 Reaffirmed-2019	mg/L	75.0	36.07	8.02	20.04	28.06
08	Sulphate as SO <sub>4</sub>	IS 3025:Part 24: 1986 Reaffirmed-2019	mg/L	200.0	27.05	4.62	16.92	21.41
09	Fluoride	IS 3025:Part 60: 2008 Reaffirmed-2019	mg/L	1.0	<0.1	<0.1	<0.1	<0.1
10	Total Alkalinity as CaCO <sub>3</sub>	IS 3025:Part 23: 1986 Reaffirmed-2019	mg/L	200.0	394.0	38.0	70.0	442.0

(Authorized Signatory)

*S.P. Pattanayak*  
Tech. Manager



CIN - U73100OR1995PTC003889



GSTIN : 21AAACE6224D1ZE

**Environmental Research and Services (India) Pvt. Ltd.**

(OSPCB 'A' Category Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com**Test Report Format No.: ERSIPL/FM/40  
TEST REPORT (Water/ Waste Water)**

Pg No: 1 of 2

Date: 27 Mar 2023

Test Report No: ERSIPL/TR/WA/T-061

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.

Date of Sampling : 14.03.2023

Sample Collected by : Representative of ERS (I) Pvt. Ltd.

Sample Collected in presence of : Representative of Customer

Sample Received on : 21.03.2023

Analysis Started on : 21.03.2023

Analysis Completed on : 27.03.2023

Method of Sampling : IS 3025: Part 1: 1987, Reaffirmed 2019

Quantity of Sample : 2ltrs

Type of Container : Glass Bottle & HDPE Bottle

Environment Condition : All Tests carried out in Room Temperature

**Sample ID. No.**

1. ERSIPL/WA/144
2. ERSIPL/WA/145
3. ERSIPL/WA/146
4. ERSIPL/WA/147

**Locations**

1. Open well in Village Kalamegha
2. Open well in Village Kathfali
3. Open well in Village Khuntjharia
4. Bore well in Village Rengalmunra

**TEST FINDINGS:**

Sl	Parameters Analysed	Test Method	Unit	Permissible Limit as per IS:10500, 2012	Result			
					ERSIPL/WA/144	ERSIPL/WA/145	ERSIPL/WA/146	ERSIPL/WA/147
01	Colour	IS 3025:Part 04: 1983 Reaffirmed-2017	Hazen	5.0	<5.0	<5.0	<5.0	<5.0
02	Odour	IS 3025:Part 05: 1983 Reaffirmed-2017	--	Agreeable (A)	A	A	A	A
03	Taste	IS 3025:Part 07,08: 1984 Reaffirmed-2017	--	Agreeable (A)	A	A	A	A
04	Nitrate as NO <sub>3</sub>	IS 3025:Part 34: 1983 Reaffirmed-2019	mg/L	45.0	<5.0	<5.0	<5.0	<5.0
05	Residual Free Chlorine	IS 3025:Part 26: 1986 Reaffirmed-2019	mg/L	0.2 (min)	Nil	Nil	Nil	Nil
06	Copper	IS 3025:Part 42: 1992 Reaffirmed-2019	mg/L	0.05	ND	ND	ND	ND
07	Manganese	IS 3025:Part 59: 2006 Reaffirmed-2017	mg/L	0.1	ND	ND	ND	ND
08	Phenolic Compound	IS 3025:Part 43: 1992 Reaffirmed-2019	mg/L	0.001	ND	ND	ND	ND
09	Mercury	IS 3025:Part 48: 1994 Reaffirmed-2019	mg/L	0.001	ND	ND	ND	ND
10	Cadmium	IS 3025:Part 41: 1992 Reaffirmed-2019	mg/L	0.003	ND	ND	ND	ND



CIN - U73100OR1995PTC003889



GSTIN : 21AAACE6224D1ZE

**Environmental Research and Services (India) Pvt. Ltd.**

(OSPCB 'A' Category Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

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Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

Pg No: 2 of 2

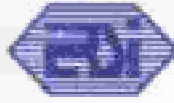
11	Selenium	IS 3025:Part 56: 2003 Reaffirmed-2019	mg/L	0.01	ND	ND	ND	ND
12	Total Arsenic	IS 3025:Part 37: 1988 Reaffirmed-2019	mg/L	0.01	ND	ND	ND	ND
13	Cyanide	IS 3025:Part 27: 1986 Reaffirmed-2019	mg/L	0.05	ND	ND	ND	ND
14	Lead	IS 3025:Part 47: 1994 Reaffirmed-2019	mg/L	0.01	ND	ND	ND	ND
15	Zinc	IS 3025:Part 49: 1994 Reaffirmed-2019	mg/L	5.0	ND	ND	ND	ND
16	Anionic detergents	IS 13428 :2005 Reaffirmed-2019	mg/L	0.2	ND	ND	ND	ND
17	Total Chromium	IS 3025:Part 52: 2003 Reaffirmed-2019	mg/L	0.05	ND	ND	ND	ND
18	Polynuclear aromatic hydrocarbons	APHA 6440	mg/L	0.0001	ND	ND	ND	ND
19	Mineral Oil	IS 3025:Part 39: 1991 Reaffirmed-2019	mg/L	0.5	ND	ND	ND	ND
20	Pesticides	USEPA gas-liquid chromatography	mg/L	---	ND	ND	ND	ND
21	Aluminium	IS 3025:Part 55: 2003 Reaffirmed-2019	mg/L	0.03	ND	ND	ND	ND
22	Boron	IS 3025:Part 57: 2005 Reaffirmed-2017	mg/L	0.5	ND	ND	ND	ND
23	Nickel	IS 3025:Part 54: 2003 Reaffirmed-2019	mg/L	0.02	ND	ND	ND	ND

ND-Not Detected

(Authorized Signatory)

**S.P. Pattanayak**  
Tech. Manager

...END OF TEST REPORT...



## Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025:2017 (NABL) Accredited Laboratory, OSPCB Empanelled Laboratory and ISO 9001:2015 Certified Company)

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Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

ULR-TC744023000000118F

Test Report Format No.: ERSIPL/FM/40

### TEST REPORT (Water/ Waste-Water)

Pg No: 1 of 1

Date: 27 Mar 2023

Test Report No: ERSIPL/TR/WA/062

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.

Date of Sampling : 14.03.2023

Sample Collected by : Representative of ERS (I) Pvt. Ltd.

Sample Collected in presence of : Representative of Customer

Sample Received on : 21.03.2023

Analysis Started on : 21.03.2023

Analysis Completed on : 27.03.2023

Method of Sampling : IS 3025: Part 1: 1987, Reaffirmed 2019

Quantity of Sample : 2ltrs

Type of Container : Glass Bottle & HDPE Bottle

Environment Condition : All Tests carried out in Room Temperature

#### Sample ID. No.

1. ERSIPL/WA/148
2. ERSIPL/WA/149

#### Locations

1. Open well in Village Bendrichua
2. Bore Well R & R Colony, Kalamegha

#### TEST FINDINGS:

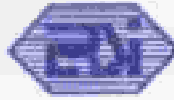
Sl	Parameters Analysed	Test Method	Unit	Permissible Limit as per IS:10500, 2012	Result	
					ERSIPL/WA/148	ERSIPL/WA/149
01	pH value	IS 3025:Part 11: 1983 Reaffirmed-2017	--	6.5 to 8.5	6.34	6.95
02	Turbidity	IS 3025:Part 10: 1984 Reaffirmed-2017	NTU	1.0	0.48	0.44
03	Total Hardness as CaCO <sub>3</sub>	IS 3025:Part 21: 2009 Reaffirmed-2019	mg/L	200.0	34.0	144.0
04	Total Iron	IS 3025:Part 53: 2003 Reaffirmed-2019	mg/L	0.3	0.06	0.07
05	Chloride	IS 3025:Part 32: 1988 Reaffirmed-2019	mg/L	250.0	22.67	26.61
06	Total Dissolved Solids	IS 3025:Part 16: 1984 Reaffirmed-2019	mg/L	500.0	65.4	259.1
07	Calcium as Ca	IS 3025:Part 40: 1991 Reaffirmed-2019	mg/L	75.0	8.82	34.47
08	Sulphate as SO <sub>4</sub>	IS 3025:Part 24: 1986 Reaffirmed-2019	mg/L	200.0	6.54	18.59
09	Fluoride	IS 3025:Part 60: 2008 Reaffirmed-2019	mg/L	1.0	<0.1	<0.1
10	Total Alkalinity as CaCO <sub>3</sub>	IS 3025:Part 23: 1986 Reaffirmed-2019	mg/L	200.0	42.0	172.0

(Authorized Signatory)

S.P. Pattanayak  
Tech. Manager



CIN - U73100OR1995PTC003889



GSTIN : Z1AAACE6224D1ZE

**Environmental Research and Services (India) Pvt. Ltd.**

(OSPCB 'A' Category Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com**Test Report Format No.: ERSIPL/FM/40  
TEST REPORT (Water/ Waste-Water)**

Pg No: 1 of 2

Date: 27 Mar 2023

Test Report No: ERSIPL/TR/WA/T-062

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.

Date of Sampling : 14.03.2023

Sample Collected by : Representative of ERS (I) Pvt. Ltd.

Sample Collected in presence of : Representative of Customer

Sample Received on : 21.03.2023

Analysis Started on : 21.03.2023

Analysis Completed on : 27.03.2023

Method of Sampling : IS 3025: Part 1: 1987, Reaffirmed 2019

Quantity of Sample : 2ltrs

Type of Container : Glass Bottle & HDPE Bottle

Environment Condition : All Tests carried out in Room Temperature

**Sample ID. No.**

1. ERSIPL/WA/148
2. ERSIPL/WA/149

**Locations**

1. Open well in Village Bendrichua
2. Bore Well R & R Colony, Kalamegha

**TEST FINDINGS:**

Sl	Parameters Analysed	Test Method	Unit	Permissible Limit as per IS:10500, 2012	Result	
					ERSIPL/WA/148	ERSIPL/WA/149
01	Colour	IS 3025:Part 04: 1983 Reaffirmed-2017	Hazen	5.0	<5.0	<5.0
02	Odour	IS 3025:Part 05: 1983 Reaffirmed-2017	---	Agreeable (A)	A	A
03	Taste	IS 3025:Part 07,08: 1984 Reaffirmed-2017	---	Agreeable (A)	A	A
04	Nitrate as NO <sub>3</sub>	IS 3025:Part 34: 1983 Reaffirmed-2019	mg/L	45.0	<5.0	<5.0
05	Residual Free Chlorine	IS 3025:Part 26: 1986 Reaffirmed-2019	mg/L	0.2 (min)	Nil	Nil
06	Copper	IS 3025:Part 42: 1992 Reaffirmed-2019	mg/L	0.05	ND	ND
07	Manganese	IS 3025:Part 59: 2006 Reaffirmed-2017	mg/L	0.1	ND	ND
08	Phenolic Compound	IS 3025:Part 43: 1992 Reaffirmed-2019	mg/L	0.001	ND	ND
09	Mercury	IS 3025:Part 48: 1994 Reaffirmed-2019	mg/L	0.001	ND	ND
10	Cadmium	IS 3025:Part 41: 1992 Reaffirmed-2019	mg/L	0.003	ND	ND



CIN - U73100OR1995PTC003889



GSTIN : 21AAACE6224D1ZE

**Environmental Research and Services (India) Pvt. Ltd.**

(OSPCB 'A' Category Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

Pg No: 2 of 2

11	Selenium	IS 3025:Part 56: 2003 Reaffirmed-2019	mg/L	0.01	ND	ND
12	Total Arsenic	IS 3025:Part 37: 1988 Reaffirmed-2019	mg/L	0.01	ND	ND
13	Cyanide	IS 3025:Part 27: 1986 Reaffirmed-2019	mg/L	0.05	ND	ND
14	Lead	IS 3025:Part 47: 1994 Reaffirmed-2019	mg/L	0.01	ND	ND
15	Zinc	IS 3025:Part 49: 1994 Reaffirmed-2019	mg/L	5.0	ND	ND
16	Anionic detergents	IS 13428 :2005 Reaffirmed-2019	mg/L	0.2	ND	ND
17	Total Chromium	IS 3025:Part 52: 2003 Reaffirmed-2019	mg/L	0.05	ND	ND
18	Polynuclear aromatic hydrocarbons	APHA 6440	mg/L	0.0001	ND	ND
19	Mineral Oil	IS 3025:Part 39: 1991 Reaffirmed-2019	mg/L	0.5	ND	ND
20	Pesticides	USEPA gas-liquid chromatography	mg/L	---	ND	ND
21	Aluminium	IS 3025:Part 55: 2003 Reaffirmed-2019	mg/L	0.03	ND	ND
22	Boron	IS 3025:Part 57: 2005 Reaffirmed-2017	mg/L	0.5	ND	ND
23	Nickel	IS 3025:Part 54: 2003 Reaffirmed-2019	mg/L	0.02	ND	ND

ND-Not Detected

(Authorized Signatory)

S.P. Pattanayak  
Tech. Manager

...END OF TEST REPORT...

000223

**एनटीपीसी लिमिटेड**  
(भारत सरकार का उद्यम)

**NTPC Limited**  
(A Govt. of India Enterprise)

दुलंगा कोल माइनिंग प्रोजेक्ट  
Dulanga Coal Mining Project



Ref.: 0100/DLCMP/FD/ES/02/0814

Date: 25.08.2014

To,

The Director  
Ministry of Environment, Forests & Climatic Change, Gov of India  
Indira Paryavaran Bhawan,  
Jorbagh, Allganj  
New Delhi - 110003

श्री. डॉ. कृष्ण कुमार शर्मा, सचिव  
Received by C.P. Section  
पर्यावरण व वन विभाग  
Ministry of Environment & Forests  
भारत सरकार / Govt. of India  
ए. ए. ए. भवन, जे. बी. रोड  
ए. ए. ए. कॉम्प्लेक्स, लोधी रोड  
ए. ए. ए. / New Delhi-110003

**Subject:** Compliance of Specific condition Nos. 4A(x) & 4A (ixii) of environmental clearance accorded for Dulanga Coal Mining project (7MTPA in an area of 785.37ha= (803.71ha-18.34ha=785.37ha); of M/s NTPC Limited, Ib valley coalfields, Dist. Sundargarh, Odisha.

**Reference:** Letter No.: J/11015/1140/2007-IA.II(M) dated 03.03.2014 issued by MoEF, Govt.

Sir,

With reference to above subject, it is to mention that the Ministry of Environment and Forests, Government of India have accorded Environmental clearance for Dulanga Coal Mining project (7MTPA in an area of 785.37ha= (803.71ha-18.34ha=785.37ha); of M/s NTPC Limited, Ib valley coalfields, Dist. Sundargarh, Odisha vide J/11015/1140/2007-IA.II(M) dated 03.03.2014. In compliance to the subject Specific conditions of Environmental clearance, the compliance details are furnished below and the same is also being furnished in soft in form of CD:

**Condition No. 4A (x) - An integrated calendar plan of production including the details re-handling separately in external and internal dumps should be furnished to MOEF for record.**

An integrated calendar plan of production including the details re-handling separately in external and internal dumps is furnished as **Annexure-I**,

**Condition No. 4A (ixii)** - A detailed Final Mine Closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment & forests within 6 months of grant of Environmental Clearance.

A brief note on detailed final mine closure plan along with details of corpus fund as per the Revised Mining Plan is enclosed as **Annexure-II**.

The Revised Mining Plan including **Mine Closure Plan** (1<sup>st</sup> Revision) (April 2012) of Dulanga Coal Block of IB valley Coalfield, Sundargarh District, Odissa has been approved by MoC, vide letter No 13016/27/2012-CA-I Dated 14<sup>th</sup> August, 2012.

The copy the approval letter of MoC and the relevant information on the detailed Final Mine Closure Plan along with details of Corpus Fund as per the Revised Mining Plan approved by MoC is enclosed at **Annexure-III**.

This is for your kind information in compliance to above conditions please.

Thanking You.

Yours Faithfully

  
(C. R. Barik) 20/8/14

**Add. General Manager (I/c)**

Enclosure: As above

## **ANNEXURE - I**

### **An integrated calendar plan of production including the details re-handling separately in external and internal dumps**

The mining method in the proposed Dulanga coal Mining Project is opencast mining method by shovel-dumper combination for excavation of OB and Surface miner as well as shovel-dumper combination for extraction coal. The extractable coal reserves is 152 Million Tonne. With the rated output of 7MTPA the life of mine computed as 24 years. In addition to this, there will be construction period of two years before commencement of actual production from the mine.

A total quantity of 394.00 Cum of overburden (including 3.65 M.Cu.m of top soil) will be removed from the quarry of the project during the life of 24 years of mining operations. In the initial years the excavated OB will be dumped in the external surface dump and the back filling operations will commence only after sufficient de-coaled areas is available within the quarry. With assessed overall stripping ratio of 2.59 cum/t and annual target of 7 MT, the yearly average overburden removal would be in the order of 18.4 M cum.

The OB generated during 1st & 2nd year will be exclusively disposed in external surface dump located at south eastern side of ML (Block) area, lying outside the allotted coal block boundary. In the 3rd and 4th year, disposal of waste will be partly in surface dump and partly in backfilling. From the start of 5th year and onward full scale backfilling will start. The external OB dump will expand over an area of 86 ha and the dump is designed to accommodate 28.5 Mcum.

About 7% of waste will be disposed on the proposed overburden dump. Remaining 93% of the total waste will be disposed of in the mined out de-coaled area.

The calendar programme of coal production and OB removal is furnished hereunder.

**Calendar Programme of coal production and OB removal in Dulanga Coal Block**

Year	Coal Progressive (Mt)	Coal Cumulative (Mt)	Total waste (OB) (Mcum) prog.	Total waste (OB) (Mcum) Cumulative	Stripping ratio (cum/t) prog	Stripping ratio (Cum/t)
C1						
C2						
1	1	1	4.5	4.5	4.5	4.5
2	2.5	3.5	10.5	15	4.2	4.29
3	4.5	8	5.5	30.5	3.44	3.81
4	7	15	18	48.5	2.57	3.23
5	7	22	18	66.5	2.57	3.02
6	7	29	18.4	84.9	2.63	2.93
7	7	36	18.4	103.3	2.63	2.87
8	7	43	18.4	121.7	2.63	2.83
9	7	50	18.4	140.1	2.63	2.8
10	7	57	18.4	158.5	2.63	2.78
11	7	64	18.4	176.9	2.63	2.76
12	7	71	18.4	195.3	2.63	2.75
13	7	78	18.4	213.7	2.63	2.74
14	7	85	18.4	232.1	2.63	2.73
15	7	92	18.4	250.5	2.63	2.72
16	7	99	18.4	268.9	2.63	2.72
17	7	106	18.4	287.3	2.63	2.71
18	7	113	18.4	305.7	2.63	2.71
19	7	120	18.4	324.1	2.63	2.7
20	7	127	18.4	342.5	2.63	2.7
21	7	134	18.4	360.9	2.63	2.69
22	7	141	18.4	379.3	2.63	2.69
23	6	147	10	389.3	1.67	2.65
24	5	152	4.7	394	0.94	2.59
Total	152		394			2.59

The dumping schedule is given in **Table below:**

**Dumping Schedule (Figure in Mm<sup>3</sup>)**

Year	External Dump		Internal Dump		Total	
	OB	Cumm OB	OB	Cumm OB	OB	Cumm OB
C1						
C2						
1	4.50	4.50	0.00	0.00	4.50	4.50
2	10.50	15.00	0.00	0.00	10.50	15.00
3	9.00	24.00	6.50	6.50	15.50	30.50
4	4.50	28.50	13.50	20.00	18.00	48.50
5	0.00	28.50	18.00	38.00	18.00	66.50
6	0.00	28.50	18.40	56.40	18.40	84.90
7	0.00	28.50	18.40	74.80	18.40	103.30
8	0.00	28.50	18.40	93.20	18.40	121.70
9	0.00	28.50	18.40	111.60	18.40	140.10
10	0.00	28.50	18.40	130.00	18.40	158.50
11	0.00	28.50	18.40	148.40	18.40	176.90
12	0.00	28.50	18.40	166.80	18.40	195.30
13	0.00	28.50	18.40	185.20	18.40	213.70
14	0.00	28.50	18.40	203.60	18.40	232.10
15	0.00	28.50	18.40	222.00	18.40	250.50
16	0.00	28.50	18.40	240.40	18.40	268.90
17	0.00	28.50	18.40	258.80	18.40	287.30
18	0.00	28.50	18.40	277.20	18.40	305.70
19	0.00	28.50	18.40	295.60	18.40	324.10
20	0.00	28.50	18.40	314.00	18.40	342.50
21	0.00	28.50	18.40	332.40	18.40	360.90
22	0.00	28.50	18.40	350.80	18.40	379.30
23	0.00	28.50	10.00	360.80	10.00	389.30
24	0.00	28.50	4.70	365.50	4.70	394.00
<b>TOTAL</b>	<b>28.50</b>		<b>365.50</b>		<b>394.00</b>	

Proper attention will be given to the stability of the external surface dump, backfilled dump and crown dump from failures and leaching out.

### **Re-handling of dump**

In view of recommendations of Expert Appraisal Committee (EAC) and Environmental Clearance (EC) granted by MoEF, the internal dumps (Western & Eastern) will be re-handled for void filling. Due to this re-handling, the depth of void will reduce from 255m to 40-50m and the whole area of 351.23Ha will be reclaimed. The height of east side internal dump reduced matching to surrounding ground level and afforested. The height of west side internal dump reduced upto 30m from surrounding ground level and afforested.

Year-wise re-handling of OB is furnished in table below.

Year	OB Rehandled (Mm3)	
	Progressive	Cumulative
25 <sup>th</sup>	22.4	22.4
26 <sup>th</sup>	22.4	44.8
27 <sup>th</sup>	22.4	67.2
28 <sup>th</sup>	22.4	89.6
29 <sup>th</sup>	22.4	112.0
Total	112.0	

Final topography shall confirm to the surrounding ground level except in some areas and final void area.

**BRIEF NOTE ON DETAILED FINAL MINE CLOSURE PLAN**  
**ALONG WITH DETAILS OF CORPUS FUND**

**BACKGROUND**

Revised Mining Plan including Mine Closure Plan (1<sup>st</sup> Revision) (April 2012) of Dulanga Coal Block of IB valley Coalfield, Distt. Sundergarh. Orissa was approved by MoC, vide letter No 13016/27/2012-CA-I Dated 14<sup>th</sup> August,2012 **(Copy Enclosed at Annexure-I)**

As this is a Progressive Mine Closure Plan (PMCP), only tentative cost estimate has been envisaged and estimated as per the guidelines issued by MoC. Detailed Mine Closure Plan shall be prepared 5 years prior to the actual closure of the mining operations.

**ANNUAL CLOSURE COST**

As mentioned above, the annual closure cost has been calculated as per the guidelines issued by MoC (vide letter no 55011-01-2009-CPAM dated 27/08/2009 & 18.02.2011). As per circulated guidelines of MoC the closure cost for an opencast mine is to be modified based on the Wholesale Price Index (WPI) as notified by Govt. of India.

The WPI for all commodities Issued from Office of Economic Advisor, Ministry of Commerce and Industry, Govt. of India (Base date: 2004-05) was 129.60 in Aug'09 and 148.10 in Feb'11. The closure cost was `6.00 Lakhs per ha in Aug'09. The current closure cost has been arrived by multiplying ` 6.00 Lakhs per ha by the ratio of WPI in Feb'11 and WPI in Aug'09 which comes to be ` 6.86 Lakhs per ha. The calculation methodology is as follows:

Total lease hold area Considered for mine closure <b>(A)</b>	: 890.63 ha
Mine closure cost per Ha for opencast mine in Aug'09	: ` 6.00 Lakhs

Mine closure cost per Ha for opencast mine in Feb'11(B) : ₹. 6.86 Lakhs

Life of the mine (C) : 26 years  
(Incl. 2 years of construction period)

Annual base price [(A X B)/C] (for 1<sup>st</sup> year) : ₹. 2.35 Crores

Total closure cost for opencast mine : ₹.120.05 Crores

(Compounding @ 5% annual escalation)

The year wise closure cost is tabulated in the following Table as per the approved Revised Mining Plan

#### YEAR WISE AMOUNT TO BE DEPOSITED IN ESCROW ACCOUNT

YEAR	AV. COST PER ANNUM (₹. CRORES)	YEAR WISE EXPENDITURE WITH 5 % ESCALATION (₹.CRORES)
C1	2.35	2.35
C2	2.35	2.47
P1	2.35	2.59
P2	2.35	2.72
P3	2.35	2.85
P4	2.35	3.00
P5	2.35	3.15
P6	2.35	3.30
P7	2.35	3.47
P8	2.35	3.64
P9	2.35	3.83
P10	2.35	4.02
P11	2.35	4.22
P12	2.35	4.43
P13	2.35	4.65
P14	2.35	4.88
P15	2.35	5.13
P16	2.35	5.38
P17	2.35	5.65
P18	2.35	5.94
P19	2.35	6.23
P20	2.35	6.54
P21	2.35	6.87

YEAR	AV. COST PER ANNUM (` .CRORES)	YEAR WISE EXPENDITURE WITH 5 % ESCALATION (` .CRORES)
P22	2.35	7.21
P23	2.35	7.57
P24	2.35	7.95
<b>TOTAL</b>	<b>61.07</b>	<b>120.05</b>

Total Estimated cost for completing the envisaged closure activities comes to **Rs 120.05 Crores**. This Estimated cost will be modified based on WPI as notified from Govt. of India from time to time.

### ABANDONMENT COST/CORPUS FUND

Tentative cost of likely closing activities as envisaged below has been estimated considering base date as Feb '2011. Actual closing activities and activity wise costs may change during the preparation of Final Mine Closure Plan which will be prepared 5 years before the likely cessation of mining operation. A time schedule for abandonment along with tentative fund requirement over the life of mine has been shown in the bar chart given below: **(Prepared inline with Table 11.9, Chapter XI of Approved Revised Mining Plan, Enclosed at Annexure-II)**

### Tentative Fund Requirement for Closure Activities (Without Escalation)

Sl. No.	Detailed Activities to be undertaken	P-5	P-10	P-15	P-20	P-24	End of Mine Closure
<b>1.0</b>	<b><u>Mine Area &amp; Waste Management</u></b>						
1.1	Plantation along the block boundary, embankment, approach road, CHP, Cross country conveyor, Railway siding etc and around the mine infrastructure area	██████████					
1.2	Physical reclamation of external dump (Levelling, Spreading of top soil, toe wall formation, drain etc.)	██████████					
1.3	Physical reclamation of internal and external dump (Levelling, Spreading of top soil, toe wall formation, drain etc.)		██████████	██████████	██████████	██████████	
1.4	Bio reclamation of above items	██████████	██████████	██████████	██████████	██████████	
1.5	Barbed wire fencing as per requirement	██████████	██████████	██████████	██████████	██████████	
<b>2.0</b>	<b><u>Environmental Management (Air, Water, Waste, Noise etc)</u></b>						
2.1	Treatment of mine water before discharging into nala/river	██████████	██████████	██████████	██████████	██████████	
2.2	Thorough inspection of external and stabilized internal dumps to find state of its stabilization & Bio reclamation.		██████████	██████████	██████████	██████████	

Sl. No.	Detailed Activities to be undertaken	P-5	P-10	P-15	P-20	P-24	End of Mine Closure
2.3	Action to stabilize & vegetate uncovered patches, if any.						
2.4	Inspection of garland drains & bunds around external dumps to prevent leachate water from entering natural water courses directly.						
2.5	Inspection of embankment to prevent entry of uncontrolled water to mine						
2.6	Strengthening of embankment						
2.7	Quarterly sampling of water,air,noise and soil and it's mitigation						
2.8	Record keeping, monitoring and reporting						
<b>3.0</b>	<b>Actions for safety &amp; security of local community due to abandonment of the mine or part of the mine</b>						
3.1	Regular inspection of the mined out area, O.B. dumps etc. for assessing the closure job.						
3.2	Action for making safe the drainage areas, fire areas etc.						
3.3	Making 2 meter high pucca wall/stone fencing around the top edge of the mined out area, where immediate void exists at the quarry edge (to avoid drowning).						
3.4	Making 2 meter high pucca wall/stone fencing around the external OB Dump in the north of the block (if required)						
3.5	Survey of the total project area for updating mine plans Under Coal Mine Regulation.						
<b>4.0</b>	<b>Social &amp; Economic Aspects</b>						
4.1	C.S.R activities						
<b>5.0</b>	<b>Execution &amp; Supervision</b>						
5.1	Purchasing / Hiring of equipment for closure activities etc.						
5.2	Execution & Supervision of the activities by mining and other statutory personal .						
<b>6.0</b>	Miscellaneous charges towards activities incidental/related to progressive mine closure including power cost, deployment of security personal, 3 years post closure environmental monitoring, supervision , rehandling of OB, protective & rehabilitation measures including their maintenance & monitoring etc.						
	<b>Total estimated expenditure incurred in Rs Crore</b>	<b>20.00</b>	<b>25.00</b>	<b>30.00</b>	<b>35.00</b>	<b>45.00</b>	<b>61.07</b>

(The amount deposited in the Escrow Account and the amount to be released does not include the interest accrued in the Escrow Account.)

## FINANCIAL ASSURANCE

As per guidelines for Mine Closure Plan, NTPC shall take following actions for ensuring the financial assurance to complete the mine closure activities:

- **Opening of a Escrow Account**

The proponent (NTPC) shall open an escrow Account with any Scheduled Bank. The beneficiary of this account shall be Coal Controller Organisation (on behalf of central Government). The proponent shall deposit the amount detailed in **Table No 11.10** ,Chapter XI of the Approved Revised Mining Plan, on yearly basis into this Escrow account.

Estimated cost will be modified based on WPI as notified by Government of India.

- **Condition for operating the Escrow Account**

An agreement, outlining detailed terms and conditions of operating the Escrow account, shall be finalized and executed amongst the project owners, concerned Bank and the Coal Controller. The agreement shall be executed before the grant of permission by the coal controller to open the mine.

- **Release of Funds from Escrow Account**

Mining will be carried out in a phased manner initiating afforestation/ Reclamation work in the mined out area of the first phase while commencing the mining in the second phase i.e. continuation of mining activities from one phase to other indicating the sequence of operations depending on the geo mining condition of the mine. Up to 80% of the total deposited amount including interest accrued in the escrow account will be released after every five years in line with the periodic examination of the closure plan as per Clause 3.1 of the Annexure of the Guidelines (**Mine Closure Guidelines issued by MoC**). The amount released will be equal to the expenditure incurred in the Progressive Mine Closure in past five years or 80% whichever is less. The balance amount at the end of the Final Mine Closure shall be released to mine owner/lease holder on compliance of all provisions of closure plan duly signed by the lessee. It will be certified that said closure of mine complied all statutory rules, regulations, orders made by the Central or State Govt, statutory organisations, court etc and duly certified by the coal controller.

## **RESPONSIBILITY OF MINE OWNER**

NTPC will ensure that protective measures contained in the Mine Closure Plan including reclamation and rehabilitation works have been carried out in accordance with the approved Mine Closure Plan and Final Mine Closure Plan.

NTPC shall submit the coal controller a yearly report before 1<sup>st</sup> July every year setting forth the extent of protective and rehabilitative works carried out as envisaged in the approved mine closure plans. Details of physical progress of the closure activities and expenses incurred will be included in the yearly report.

## **PROVISION FOR MINE CLOSURE**

The mine owner will obtain a mine closure certificate from coal controller to the effect that the protective, reclamation and rehabilitation works have been carried out by the mine owner in accordance with the mine closure plan/final mine closure plan for surrendering the reclaimed land to the State Government concerned.

This is to inform that, Dump management as suggested by EAC was studied in detail considering the geo-mining conditions of the block and it was found that backfilling of the void can be done within five years of post mining operations (exhaustion of coal resources in the present block boundary) by re-handling the Western and Eastern internal dumps as shown in the Final Stage Dump Plan(**Plate No. 48**).

As per the EAC suggestions, NTPC submitted a Revised Final Stage Dump Plan (**Plate No. 53**) with void of area of 159 ha, but the depth of void will be reduced from 255m to 50m from surface by re-handling the internal dumps.

Apart from the above, efforts have been made to rework the post mining topography conforming to the surrounding surface level. Instead of planting trees NTPC may resort to spread the bio reclaimed soil over the internal dumps and convert some portion of land based on the practicability, into agricultural land.

No. F3016/27/2012-CA-I  
Government of India  
Ministry of Coal

New Delhi, the 14 August, 2012

To,

~~Sri A.K. Dash,  
Addl. GM (PE-Mine Planning & Design)  
5<sup>th</sup> Floor, Engineering Officer Complex,  
Sector-24  
NTPC Limited,  
NOIDA- 201 301~~

**Subject: Approval of Revised Mining Plan including Mine Closure Plan (1<sup>st</sup> Revision) (April 2012) of Dulanga coal block of IB Valley Coalfield, Distt. Sundergarh, Orissa -Rcg.**

Sir,

I am directed to refer to your letter no. CC/PEM/7015/MP/50 dated 17<sup>th</sup> October, 2011 submitting therewith Revised Mining Plan including Mine Closure Plan (1<sup>st</sup> Revision) (April 2012) of Dulanga coal block of IB Valley coalfield, Distt Sundergarh, Orissa and to say that the matter has been considered and the approval of the Central Government thereon is hereby conveyed under Section 5(2)(b) of the Mines & Minerals (Development & Regulation) Act, 1957 subject to the following conditions:-

- (i) The mining company shall take all necessary precautions regarding safety of mine workings, persons deployed therein.
- (ii) Mining Lease to be acquired shall not encroach into any other coal block.
- (iii) The approval of the Mining Plan is without prejudice to the requirement of approvals from competent/prescribed authority under the relevant rules/regulations etc.

2. Two copies of the approved Revised Mining Plan including Mine Closure Plan (1<sup>st</sup> Revision) duly signed by the competent authority are returned herewith with the request that a copy of the approved Revised Mining Plan including Mine Closure Plan (1<sup>st</sup> Revision) may be submitted to the concerned State Government for necessary action and also a photocopy of the approved Revised Mining Plan including Mine Closure Plan (1<sup>st</sup> Revision) may be sent to the Coal Controller for monitoring the block.

Yours faithfully,

  
(Sandeep Gupta)

Under Secretary to the Govt. of India

Incl: as above

Copy to:

The Under Secretary, CPAM Section, Ministry of Coal for information and record.

## CHAPTER-XI

### PROGRESSIVE AND FINAL MINE CLOSURE PLAN

#### 11.1 INTRODUCTION

The present Mine Closure Plan is prepared for 890.83 ha, which includes rock area, external OB dump area, facilities, diversion of nala & road, colony etc.

Earlier Mine Closure Plan based on the Approved Mining Plan has already been submitted to MoC on 04.11.2010. The presentation to the standing committee was made on 07.03.2011. Observations from MoC received on 07.04.2011. The observations of MoC along with reply to the observations on the Earlier Mining Closure Plan are enclosed in **Annexure-XVI**.

In view of the reasons as explained in the Chapter-II, NTPC has prepared Revised Mining Plan based on which Progressive & Final Mine Closure Plan is also prepared which is in line with the MoC guidelines issued in this regard and covering all the aspects of Mine Closure Plan (already submitted to MoC). As per the Revised Mining Plan in Phase-I of mining operation the life of Mine is estimated as 26 years including 2 years of construction period.

NTPC has also envisaged approaching to MoEF during 20<sup>th</sup> year of mining operation for seeking permission of mining of 57 ha of forest land. If the permission is granted by the MoEF, life of mine will be enhanced by approximately 6 years and accordingly the mine closure activities will be applicable and implemented from the date of exhaustion of resources.

#### 11.1.1 REASONS FOR CLOSURE

Mine will be closed either

- after exhaustion of coal reserves or
- by any order of government or
- by any violation of statutory obligation or
- any other unforeseen reason

सचिव मंत्रालय  
अखिल भारतीय कोयला  
कार्यालय / Secretary  
Ministry of Coal  
भारत सरकार / Govt. of India  
नई दिल्ली / New Delhi-110001

Chapter-XI Progressive and Final Mine Closure Plan

*Singh*

NSP No. 1401 U/15/2009 (PAM) dated 27.09.10

### 11.1.2 STATUTORY OBLIGATIONS


All applicable statutory rules, regulations, bye-laws etc. and statutory requirement related to Govt. licenses, workers compensation, insurance etc. including minimum wage act for workers employed by the outside agency will be adhered.

Following statutory rules, regulations, bye laws etc will be adhered:

1. Coal Mines Regulation, 1957
2. Mines Act, 1952
3. Mines Rules, 1966
4. Vocational Training Rules, 1966
5. Indian Electricity Rules, 1956
6. DCMS circulars
7. Factories Act, 1948 (as applicable to mines)
8. Explosive Act and Rules.
9. Recommendations of National Safety Conferences, Tripartite Safety Review Committees.
10. Special guidelines issued by DCMS following accident's enquiries etc
11. ILO code of Safety & Health in opencast Mines (1991)
12. Special conditions imposed while execution of lease deed, approval of Mining Plan, directive issued by the Ministry of Coal, conditions imposed by the MoEF, State Pollution Control Board or by any other Government organization will be followed.

Mining Plan of this block has been approved. All conditions stipulated in approved Mining Plan, Environmental clearance and other statutory clearances which are still to come will be complied

List of clearances along with their status is as elaborated in Table No. 11.1

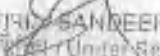
  
सहायक मुलायम, MoEF  
अवर सचिव, Under Secy  
कार्यालय, नए दिल्ली  
New Delhi, India

**TABLE NO. 11.1  
LIST OF CLEARANCES**

CLEARANCE/STUDY	STATUS	REMARKS
Approval of Mining Plan - MoC	Approved	All conditions as stipulated in received statutory clearances and other statutory clearances which are still to come will be completed
Public Hearing SPCB	Completed	
Environment clearance - MOEF	In process	
Approval from the State govt for Garjana river diversion	Awaited	
Forest clearance (MOEF)	In process	
Land Acquisition / surface rights State Govt/Govt of India	In Process	
Clearance for use of explosives and construction of magazine - Chief Controller of Explosives.	In Process	
Permission for opening of coal mine from DGMS	In Process	
Rehabilitation & Resettlement of displaced families	In Process	

### 11.1.3 CLOSURE PLAN PREPARATION

A Final Mine Closure plan shall be prepared 5 years before the likely cessation of mining operations. However conceptual Mine Closure Plan has been prepared by RQP and is being put up for approval by the competent authority.

  
 श्री श्री सन्दीप गुप्ता  
 Under Secretary  
 कर्म मंत्रालय (Ministry of Coal)  
 नई दिल्ली-110002

### 11.2 WATER QUALITY MANAGEMENT

Water is an essential resource that sustains all life supporting systems on the earth. It is an essential requirement for all human activities right from survival to the development. Therefore, quality and quantity of water are the utmost important factors for survival and sustainable development. Hydro geologically the district is mainly confined to Precambrian crystalline ground water and Gondwana ground water province.

#### 11.2.1 EXISTING SURFACE & GROUND WATER BODIES

##### 11.2.1.1 Surface Water Resources

The source of the surface water is mainly river Nalas and Ponds. The drainage system of the study area is dendritic to sub dendritic type and well developed. The drainages are flowing towards East and southeast directions. A major source of surface water in the study area is Bastardhwa, Gara, Bichna, Bagmora, Brahman, Bhesrakharu, Lilari and Tangramounda Jhari

Nala, Garia Nala, flows along the central part of the exploration block and more or less bisects the block into two sub blocks.

### 11.2.1.2 Ground water sources

The groundwater in sedimentary formation occurs under confined conditions and is limited to the thickness of the formation. The Barakar formation acts as a good aquifer due to high porosity and permeability in the formation. Predominantly western part of the study area comprises of hills and rugged topography the water level is at great depth as compared to the periplain areas. Mostly the rainwater gets runoff in this area and hence the percentage of recharge of ground water is very less. The water table of this area varies from 5m to 20m in the valley-fill areas, the water table is at shallow depth. The ground recharge in these areas is very high. The major source of drinking water is dug wells and hand pumps, which are available in almost all the villages in the study area.

### 11.2.2 EXISTING WATER QUALITY ( SURFACE & GROUNDWATER)

The ground water becomes the main source of drinking water in the rural areas. The ground water quality in the study area is of acceptable quality for drinking purpose. In some of the villages high percentage of iron content has been reported, which is beyond acceptable limit (i.e. Desirable limit: 0.3 and Permissible limit: 1.0) for drinking water purpose. Summarised water quality results are shown in Table 11.2 and Water analytical data from the villages of the study area is given in Table 11.3

TABLE 11.2  
SUMMARISED WATER QUALITY RESULTS

PARAMETER	LIMIT		OBSERVED RANGE	
	Desirable	Permissible	Ground Water	Surface Water
pH	6.5 - 8.5	6.5 - 8.5	6.89 - 7.88	6.94 - 7.36
Total Hardness (as CaCO <sub>3</sub> ),mg/l	300	600	60 - 292	44 - 64
Iron (as Fe),mg/l	0.3	1.0	0.02 - 0.75	0.1 - 0.37
Chlorides (as Cl),mg/l	250	1000	12 - 103	12 - 18
Total dissolved solids	500	2000	25 - 554	82 - 96
Calcium (as Ca), mg/l	75	200	8.1 - 94.8	8.2 - 14.7
Sulphate (as SO <sub>4</sub> ), mg/l	200	400	0.15 -	0.9 - 4.14
Nitrate (as NO <sub>3</sub> ), mg/l	45	100	1 - 89	5 - 6
Fluoride (as F), mg/l	1.0	1.5	0.1 - 0.77	0.11 - 0.14
Alkalinity	200	600	48 - 162	42 - 52

Chapter XI Progressive and Final Mine Closure Plan

RQP No. 34011/115/2015 (F.M) dated 27.05.10.

**TABLE 11.3**  
**WATER ANALYTICAL DATA FROM THE VILLAGES OF THE STUDY AREA**

DISTRICT: SUNDARGARH & JHARSUGUDA, ORISSA, RWSS DIVISION OFFICE			
SL. NO.	VILLAGE NAME	LOCATION OF WATER SOURCE	Fe
P.S. HEMGIR, DISTT. SUNDARGARH			
1	Kanika	Jhupudipara/Mahajit	0.20 -1.50
2	Durubaga	Near School/Near Post Office	0.3 -2.00
3	Duduka	Near Hoy's Hostel/Road side	0.4 -3.00
4	Garjanbahal	Bhaisalpara/U.P.School	0.3 -8.00
5	Kiripashira	Basti/ Iarijanpada	0.1 -8.00
6	Tithaitangara	School/Basti	0.03 -0.8
7	Laikera	Gahdapara/Harizanpara	0.2 -4.00
8	Chuanahal	Mission (K. Para)	0.3
9	Kanakatora	Mundapara/Junadihi	0.1 -1.5
10	Ratakhandi	Basti/School	0.02 -0.5
11	Kalamegha	Alekhpada/Dhammunda	0.2 -4.00
12	Dulanga	Basti/Basti	1-3
13	Manoharpur	Basty	1
14	Majnapada	Basti/School	0.1 -0.8
15	Khuntijhaaria	School	1
16	Tangardihi	Manipur/Ghanachal	0.5 -8.0
17	Telra	Basti	6.0
18	Singaribahal	Basti	0.3


### 11.2.3 IMPACT ON WATER QUALITY DUE TO MINING

#### 11.2.3.1 IMPACT ON SURFACE WATER

The surface water quality is likely to be affected with suspended solids by the following

- Wash off from dumps
- Soil erosion from mine and roads
- Pumping out mine water to surface water channels

The outside dump may contribute to the pollution of surface water in terms of suspended solids. Since dunting location proposed to be carried out at a safe distance from talas, it will have negligible impact on water pollution. The pumped out water during dewatering may carry higher levels of suspended

  
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 Secretary,  
 Jharsuguda District / Ministry of Coal  
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solids. Other sources of pollution are by oil spillage at the pit head and at the facilities viz. Workshop, resulting in oil and grease contamination of surface water if appropriate control measures are not adopted.

Ground water pollution can take place only if dumps and stock piles contain harmful chemical substances which may get leached by precipitation of water and percolate to the ground water table thus causing water pollution.

However, this is not the case with this mine as neither the coal nor the O/C contains any harmful ingredients which may leach down to the water table and pollute it. Therefore, no adverse impact on ground water quality is anticipated considering this aspect. The leaching down of pollutants (oil/grease etc.) to the ground water may render the water impotable and hence cannot be used by the local people. The percolation of sewage waste from the pit head as well as colony area will also pollute the ground water if control measures are not adopted as envisaged in the management plan.

#### 11.2.3.2 IMPACT ON WATER REGIME

No impact on the surface water resources is envisaged as the water is not proposed to be drawn from surface or ground water resources. The water from the mine sump will be used for all purposes. However, in view of availability of ground water at shallow levels, the ground water level in the surrounding vicinity of the mine will be lowered causing drying of wells upto certain distance.

#### 11.2.4 WATER REQUIREMENT

Industrial water required for HEMM washing, sprinkling on haul roads for dust suppression and for watering the mine site plantations, will be supplied from pumping installation at mine sump and surface reservoir (settling ponds). The drinking water will be supplied from mine sump after proper treatment and stored in overhead tank near the facilities area and distributed through pipe lines to different facilities area for drinking and domestic purposes during operational stage. However, during construction stage (till adequate water in mine sump is not available), potable water will be drawn from bore wells.

Total requirement of fresh water for mining and allied activities is estimated as 1500 m<sup>3</sup>/day besides the water which is reclaimed and reused for plantation from colony and canteen sewage effluent. The water requirements

for various activities are given in **Table 11.4**,

Out of total fresh requirement of 1500 cum/day, 653 cum/day is potable and hence 847 cum/day is for industrial use from mine water. Additional requirement is met by reclaimed water from colony ETP, canteen etc (435 cum). Hydrogeological study has been carried out and the report is attached with the earlier Mine Closure Plan.

**TABLE 11.4  
WATER REQUIREMENTS**

Sl. No	Particulars	Water (m <sup>3</sup> /day)
1	Sprinkling @ 68 m <sup>3</sup> /Mt of annual coal production excluding CHIP	480.00
2	CHIP excluding washery	160.00
3	Plantation @ 15 m <sup>3</sup> /ha for peak 40 ha in 3rd year - 600 m <sup>3</sup> recirculated from colony STP 408 m <sup>3</sup> - 27 m <sup>3</sup> from canteen	165.00
4	Vehicles washing @ 2 m <sup>3</sup> /vehicle/day for 30 Vehicles = 60 m <sup>3</sup> - 48 m <sup>3</sup> recirculated	12.00
5	Fire fighting water evaporation 10% of 45 m <sup>3</sup> /Mt of annual coal production	30.00
	<b>Sub - total (Industrial)</b>	<b>847.00</b>
6	Drinking at working place @ 45 lpd/head for about 1350 workers	60.00
7	Colony for 945 employees (70% satisfaction) @ 135 lpd/head	510.00
8	Canteen for 100 seater @ 68 lpd (500 persons)	34.00
9	Others (t.S)	49.00
	<b>Sub-total (Potable)</b>	<b>653.00</b>
	<b>Total</b>	<b>1500.00</b>

## 11.2.5 WATER POLLUTION CONTROL MEASURES

### 11.2.5.1 Effluent from Mine

To prevent surface and ground water contamination by oil/grease and sewage waste, following control measures are proposed to be implemented

Leak proof containers will be used for storage and transportation of oil/grease. In the store also, the container containing oil/grease will be kept in empty safe open containers of higher volume than the containers to avoid oil/grease spillage. The area over which oil/grease is handled will be kept effectively impervious. Any wash off from the oil/grease handling area or workshop will be drained through impervious drains.

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*[Signature]*

NTP No. 34011/(15)/2009 (PAM) dated 27.09.10.

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नई दिल्ली / New Delhi, India

SANJOY KUMAR J. J. GH  
Recognized Qualified Person  
No. 34011/(15)/2009-CPAM

collected in specially constructed pit and treated appropriately before releasing it into the natural drains.

- The sewage waste generated will be drained by underground impervious drains, lead to appropriately designed septic tanks and soak pits to prevent any pollution of surface or ground water

**11.2.5.2** The surface and ground water in and around the mine, loading plant and infrastructure will be regularly tested and appropriate control measures adopted in case of any pollutant is detected above the prescribed limit.

**11.2.5.3** All stacking and loading areas will be provided with proper garland drains equipped with baffles to prevent wash offs from reaching the downstream natural channels

### 11.2.6 CONTROL MEASURES FROM STORM WATER

Control measures to be adopted are briefly discussed below:

- Check dams will be provided to prevent solids from wash off and screen it any from the mine related activities.
- Peripheral bunds will be erected on the outer edge of the abandoned benches before reclamation so that the soil is not carried away by storm water.  
A water gradient of about 1 in 100 will be kept at every bench towards inside of the bench to prevent formation of gullies in the bench slopes causing serious erosion.
- Chutes will be constructed by using local stone or masonry to guide the water in areas with loose soil to prevent erosion and uncontrolled descent of water wherever necessary.

Construction of garland drains around freshly excavated and dumped areas so that flow of water with loose material is prevented. The mine water will be passed through specially constructed catch pits to arrest any loose material being carried away with water.

Any areas with loose debris within the lease hold will be planted.

### 11.2.7 MEASURE TO MINIMISE ADVERSE EFFECTS ON WATER REGIME

During the process of mine rehabilitation and with the completion of backfilling, a water body will be created in the mined out pit which will act as water reservoir improving the ground water recharge, source of attraction for

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fauna and will help in the maintenance of afforested areas. To enhance aesthetic appearance, parks and lawns will be made around the water body. Selected water quality parameters of ground and surface water resources within 10 km radius of the study area have been studied for assessing the water environment and evaluate anticipated impact of the proposed project. Secondary data shows that water quality in ground water sources is within permissible limits.

### 11.3 PROPOSED NALA DIVERSION

#### 11.3.1 GARIA NALA


As explained in Chapter-III Clause 3.9

#### 11.3.2 NALA A (BAIDHARA NALA) AND NALA B

As explained in Chapter-III Clause 3.9

#### 11.3.3 IMPACT OF NALA DIVERSION ON LOCAL COMMUNITY

The project affected persons will be suitably rehabilitated in the R&K colony earmarked for them located nearby. The impact of diversion does not have any impact on water availability for the local community.

  
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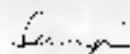
### 11.4 AIR QUALITY MANAGEMENT

There will be constant monitoring of air quality to keep within the prescribed norms. Dust pollutants are generated during blasting and while operating diesel equipment and these will be kept at minimum levels by ensuring good blast design and good equipment maintenance. Dust suppression system and dust extraction system will be in operative. Plantation around the quarry and OHP will put up a green belt for mitigating air pollution. External CR dump afforested.

#### 11.4.1 EXISTING AIR QUALITY STATUS

##### 11.4.1.1 Construction Phase

The sources of air pollution in the region are vehicular traffic, dust arising from unmetalled village roads, domestic fuel burning and fugitive emissions. The ambient air quality test results are given in **Table 11.5**.



RCF No. 31021/(15)/2009-CPAM dated 17.05.10

**TABLE 11.5**  
**AMBIENT AIR QUALITY TEST RESULTS ( $\mu\text{g}/\text{m}^3$ ) (Sep. To Nov.2009)**

LOCATION	RPM			SPM			SO <sub>2</sub>			NO <sub>x</sub>		
	Mi	Ma	98%il	Mi	Max	98%il	Mi	Ma	98%il	Min	Max	98%il
Durlanga	34	44	44	98	127	127	7.6	9.7	9.7	9.2	12.6	12.7
Bondrichus	34	44	44	96	125	125	6.5	9.9	9.8	9.7	13.4	13.4
Rangalmuna	35	46	48	102	131	130	8.7	10.	10.9	10.	14.5	13.9
Maroharpur	34	45	45	96	125	127	6.3	8.7	8.5	9.0	12.1	12.4
Karika	35	47	47	108	135	135	8.0	11	10.9	11.	14.9	14.9
Khunt Jharis	36	45	45	103	128	125	7.3	9.6	9.6	10.	12.7	12.7
Lamihara	35	44	44	99	127	126	6.1	9.7	9.7	9.9	12.8	12.7

#### 11.4.1.2 IMPACT ON AIR QUALITY DUE TO MINING

The main activities, which generally contribute to air pollution in mining industry, are:

- Drilling and blasting
- Excavation and loading
- Transportation
- Crushing at CHP

The excavation / loading of the OB/coal will be done by hydraulic shovels. The transportation of OB and coal will be carried out in the same way as is generally done in OC mining i.e. by dumpers. Dust generation by this is anticipated. Coal crushing at CHP will also generate dust.

The opencast mining operations are generally prone to generation of high levels of SPM and to a limited extent SO<sub>2</sub>, NO<sub>x</sub> and CO due to fossil fuel based vehicles, machines and blasting using explosive and fuel combustion etc. Air pollution due to SO<sub>2</sub>, NO<sub>x</sub> and SPM may result in irritation and inflammation of eyes and congestion of throat and oedema of lungs. Carbon monoxide can cause loss of haemoglobin in blood and subsequently stresses on those suffering from cardio-vascular and pulmonary diseases. High level of CO in the air is dangerous and may be fatal.

#### 11.4.2 AIR POLLUTION MITIGATION MEASURES

The mining operations and related activities are anticipated to increase the levels of SPM and gaseous pollutants to a limited extent. The control measures to be adopted are mentioned in the following paragraphs

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#### 11.4.2.1 Controlling fugitive dust

Dust particles which are normally generated during various mining, crushing operation and transportation deteriorate the ambient air quality. Adequate control measures are therefore, proposed to be taken during mining operations, transportation and crushing/loading operations. These control measures are discussed as follows:

#### 11.4.2.2 Mines

- a) Dust suppression systems (like water spraying) will be adopted at:
  - Faces before and after blasting
  - Faces while loading
- b) Dust extraction systems will be used in drill machines and crushing plant.
- c) Dust generation will also be reduced by using sharp drill bits for drilling holes; drifts with flushing system

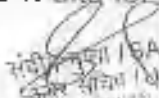
#### 11.4.2.3 Haul roads and stock-piles

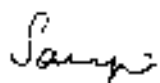
- Dust suppression system (like water spraying) would be adopted at roads which are used for transportation. Sprinklers (Whirling) have been proposed to be installed along the roads to suppress the dust
- Suitable dust extraction or suppression systems such as mist sprays with or without chemical will be provided at appropriate places for preventing dust pollution during handling and stockpiling of coal.

#### 11.4.2.4 Preventing dispersal of air borne dust

In addition to the control measures proposed during mining and transportation operations, following steps will be taken to prevent air pollution due to airborne dust:

- Dense tree belts will be planted around the mine and sites housing crushing and loading facilities.
- Plantation over already mined out area will be done after backfilling as per schedule (with minimum gap between excavation and afforestation).

  
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Under Secretary  
Ministry of Coal



- Dust masks will be provided as safety measure to the workers engaged at dust generation points like drills, loading/unloading points, crushers etc.

#### 11.4.2.5 Measures to mitigate CO levels

All heavy and light vehicles shall be tested for pollutants concentration in their exhausts regularly and well maintained. Strict vigil will be kept in and around the operational area for any fire which shall be immediately controlled.

#### 11.4.2.6 Measures to mitigate NOx levels

The main reasons of production of NOx gases are,

- a. Poor quality of explosive having large oxygen imbalance which can be due to following reasons:
  - Manufacturing defect
  - The use of expired explosives in which disintegration of ingredients has taken place.
- b. Incomplete detonation is caused mainly due to low primer: column ratio.

To ensure that NOx levels do not increase during the proposed mining operations, the following control measures will be adopted.

- i) Good quality explosives will be used for which the oxygen balance will be checked from time to time. The expired explosives will not be used for which a strict vigil will be kept on the date of manufacture. Even as a normal procedure, all explosives will be subjected to a visual inspection and if disintegrated ingredients are spotted, the explosives will not be used even if it is within expiry date.
- ii) Primer: Column ratio will be rationalised. The ratio thus established, for producing minimum NOx, will be adhered to.

The mine ambient air quality will be regularly tested to detect the presence of any pollutants above prescribed limits and appropriate measures will be adopted.

#### 11.4.2.7 Measures to control noise pollution

The following control measures will be adopted to keep the ambient noise levels below permissible limits 75 dB (A).

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- i. Provision and maintenance of thick tree belts to screen noise.
- ii. Avenue plantation within the project area to dampen the noise
- iii. Proper maintenance of noise generating machinery including the transport vehicles will be ensured.
- iv. Provision of the air silencer to modulate the noise generated by the machines will be made wherever required

To protect the workers from exposures to higher noise levels the following measures will be adopted

- i. Provision of protective devices like ear muffs/ear plugs to those workers who cannot be isolated from the source of noise
- ii. Confining the noise by isolating the source of noise
- iii. Reducing the exposure time of workers to the higher noise levels

#### 11.4.2.8 Measures to reduce ground vibrations due to blasting and prevent fly rocks

The vibrations due to blasting will be studied before the commencement of mining operations and the recommendations/suggestion given as per the result of the said study will be strictly adhered to especially the charge per delay.

### 11.5 WASTE MANAGEMENT

#### 11.5.1 TYPE OF ROCKS

The entire block is covered with Barakar formation. This formation constitutes fine to coarse grained white to grey feldspathic, micaceous sandstone, shale, fire clay and carbonaceous shale with economic coal horizons. The Kamarpai formation is noticed towards the east of village Dulanga. The rocks are mostly coarse to gritty, carbonaceous sandstone pebbly at places with unaltered fresh pink feldspar and quartz pieces. Few very thin carbonaceous shale and coal bands are also intersected in some boreholes. The block is free from any igneous intrusions.

As per the geological report, no major, minor and trace elemental analysis of different rock types was available. The chemical analysis of coal indicates presence of non toxic minerals. The sandstones of Barakar Formation constitute major part of area forms a principal aquifer. The chemical analysis of ground water shows the trace element like Cu, Mn, Hg, Cd, Se, As, Pb, Zn, Cr, Al and B are present below deduction limit. The ground water quality

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nding only enters the surface rocks on average. Hence, the rock of Dulanga block contains no toxic elements.

### 11.5.2 REMOVAL OF OVERBURDEN

As explained in Chapter V (Clause No. 5.7.4

### 11.5.3 TYPES OF SOLID WASTE

Four types of solid waste are likely to be generated through mining activities.

These are

- Overburden (both topsoil and waste)
- Sludge from washing HEMM
- Sludge created by mine water in settling pond.
- Municipal solid waste

The solid waste generated as mentioned above can have severe impacts on the health and surroundings of the area if proper management as suggested below is not done for handling these wastes. The solid waste dumping will lead to land degradation by occupying virgin area to an extent of about 73.84 Ha before the end of 3<sup>rd</sup> year. It will also cause an impact on topography and visual aesthetics due to its 80 m height.

### 11.5.4 PROTECTIVE MEASURES AND MANAGEMENT OF SOLID WASTES

#### 11.5.4.1 Management of Overburden

As explained in Chapter V, Clause No. 5.7.4 & Clause 5.7.5 The generation and disposal of total waste quantities for the life of the mine are shown in Table 11.6.

**TABLE 11.6**  
**CUMULATIVE WASTE DISPOSAL (TOPSOIL & OB)**

	Mined Area (ha)	Surface Dump (ha)	Backfilling (Mm <sup>3</sup> )	Top Soil (Mm <sup>3</sup> )	Total Waste (Mm <sup>3</sup> )	Backfilling Area (ha)
1st	29.06	4.5	0	0.17	4.67	0
2nd	37.47	10.5	0	0.17	10.67	0
3rd	35.4	13	2.5	0.17	15.67	24
4th	56.01	10.5	7.5	0.17	18.17	28
5th	39.28	0	18	0.17	18.17	15
<b>Conceptual (24th)</b>	<b>510.78</b>	<b>38.50</b>	<b>355.50</b>	<b>3.65</b>	<b>359.15</b>	<b>413</b>

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#### 11.5.4.2 Protective measures

- The dump will be stabilised and afforested. The top soil will be used for spreading over backfilled area and over OB dump for plantation. The area of top soil stack will be afforested.
- The area of ground disturbance will be minimized by progressively rehabilitating disturbed land.
- Reclamation of land will be carried out by landscaping, re-vegetation etc. As far as possible the reclamation activities will be taken up concurrently with the mining operations. For re-vegetation, the native plants and saplings suitable for the existing soils and site conditions will be considered.

#### 11.5.4.3 Steps to be taken to avoid Dump Slides

- Dumping of top soil will be avoided at the bottom of the dump as it leads to instability. Dumping of soil and clayey material will be done away from the working area that is on farther end of the dump so that formation of weak planes is avoided.
- Afforestation by planting trees will help a lot in improving stability of dumps by preventing erosion.
- Construction of retaining walls
- Construction of drains for drainage
- Provision of jute mesh for facilitating grass or vegetative growth on slopes
- Provision of good soil mixed with manure and subsequent irrigation for growth of grass for anchorage on slopes. Plantation mixed with indigenous and fast growing plant species
- The degraded area will be reclaimed and rehabilitated with local species of plantation in a phased manner
- Plantation will be carried out on waste dumps
- A belt of trees with thick canopy will be created along the mine boundary to intercept dust, gaseous pollutants and noise

  
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The void area of the excavated pit will ultimately become a water reservoir. The depth of the void will be reduced in the post mining stage by filling it with waste. This void area will also be suitably sloped, bunded and fenced.

#### 11.5.4.4 Management of Sludge from Oil/Water separator

Effluent from workshops, vehicle washing etc shall be passed through impermeable drains and will be treated in the oil/water separator. The skimmed oil & grease collected from oil and grease separator shall be sold to the authorised recycling vendors.

#### 11.5.4.5 Management of Sludge created by mine water in settling pond

Sludge from the mine water settling pond will be removed periodically and will be backfilled along with the OB.

#### 11.5.4.6 Sludge from domestic waste

Sludge from the domestic waste will be utilized as manure for the plantation in the mine lease area and on dump.

#### 11.5.4.7 Management of Municipal solid waste

The municipal solid waste e.g. from canteen, etc will be composted and used as manure for plantation along with the domestic sludge.

#### 11.5.4.8 LAND DEGRADATION CONTROL MEASURES

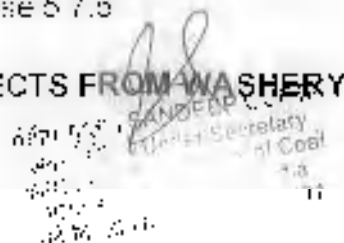
Land degradation is one of the major adverse outcomes of opencast mining activities and any effort to control adverse impacts is considered incomplete when appropriate land reclamation strategy is not adopted. Since the land degradation in this mine is partly in the form of excavated void and partly in the form of external and internal dumps, the reclamation strategy must include a programme for the reclamation of the disturbed land.

#### 11.5.5 TOPSOIL MANAGEMENT

As explained in Chapter V, Clause 5.7.5

#### 11.5.6 MANAGEMENT OF COAL REJECTS FROM WASHERY

Not Applicable

  
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NTPC Coal

### 11.6 DECOMMISSIONING OF INFRASTRUCTURE

The infrastructure consists of substation, CHP, Workshops, Mine office, blasting shelters rest shelters etc. The surface master plan showing proposed infrastructure is attached as **Plate IV**. The mine office & related infrastructure shall be handed over to state govt. for public use. The probable list of facilities which will be dismantled and those which will be retained has been furnished in **Table 11.7**

**TABLE 11.7**  
**LIST OF FACILITIES TO BE DISMANTLED OR RETAINED AT THE END OF LIFE OF DULANGA COAL BLOCK**

Sl. No.	Facilities	Remarks (Dismantled/Retained)	Corpus fund for maintenance
1.	Service buildings/ Infrastructure		
a	Project/Mine Office	To be retained.	Provision has been made in fund requirements as provided in Table 11.9
b	Workshop	To be retained.	
c	Store	To be retained.	
d	Canteen	To be retained.	
e	First aid centre	To be retained.	
f	Rest shelter	To be retained.	
g	Training centre	To be retained.	
h	Fire fighting station	To be retained.	
i	Pit head bath	To be retained.	
j	Magazines	To be retained.	
k	Environmental laboratory	To be retained.	
l	Dispensary	To be retained.	
2.	Mining Machinery	To be retained.	
3.	Pumps used in mines	To be retained.	
4.	Electrical/mechanical equipments used in workshop or other places	To be retained.	
5.	CHP, conveyors and railway siding	To be retained.	
6.	Sub-station	To be retained.	
7.	Furniture	To be retained.	
8.	Approach road and Culverts	To be retained.	
9.	Haul road and Culverts	To be retained.	
10.	Water supply arrangement	To be retained.	

*(Signature)*  
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11 Permanent Manpower	To be transferred to "Forest Area" in SE side or to any other projects of NTPC or VRS
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**11.7 DISPOSAL OF MINING MACHINERY**

Nearly all the mining machinery will be used for dip side/dedicated area. Only the scraps and non-usable machines, if any, will be auctioned.

**11.8 SAFETY & SECURITY**

Security Personnel will be detailed for a period of two years after mine closure for protecting new plantations in the reclamation area and look after the protective fence around the boundary of the mine to prevent any stray animal/man entering the area.


**11.9 ECONOMIC REPERCUSSIONS OF CLOSURE OF MINE AND MANPOWER RETRENCHMENTS**

The mine will be one of the highly mechanized open cast mine and will require services of highly skilled and semi skilled work force.

After closure of mining operations, local residents employed in the mine may be offered jobs elsewhere in the running projects of the Company. Employees who would be retrenched would get adequate compensation as per existing labour laws/ golden hand sack / VRS or any other scheme of the Company prevailing at the time of mine closure. In addition, parting employees can also utilize their savings accumulated during the period of employment for their own post-employment resettlement.

Number of persons engaged in the satellite occupations connected to the mining industry will be estimated during the preparation of Final Mine Closure Plan which will be prepared 5 years prior to likely cessation of mining operation. Those persons will be taken care of as per the Company's policy.

The Company would endeavour for harmonious relations with PAPs, not only during mining operation but there after also. But it would be prudent to develop their own ability to sustain their present life standard after the closure of the mine by self employment.

  
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 Joint Secretary  
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The Company would like continuance of the social welfare amenities created for the employees and PAPs and try to meet the expectations of the society under the given financial constraints. The persons will be imparted lectures on the financial mechanism for its sustenance after the mine closure.

**11.10 TIME SCHEDULING FOR ABANDONMENT**

Tentative details of likely closing activities with manpower requirement as envisaged below has been estimated based on the present mine closure plan. Actual closing activities and manpower requirement may change during the preparation of Final Mine Closure Plan which will be prepared 3 years before the likely cessation of mining operation. A time schedule for abandonment along with tentative manpower requirement has been shown in the bar chart given in **Table 11.8**.

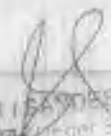
**TABLE 11.8  
TIME SCHEDULE FOR ABANDONMENT ALONG WITH MANPOWER  
REQUIREMENT FOR CLOSURE ACTIVITIES**

Sl. No.	Activities to be undertaken		1st Year		2nd Year		3rd Year		4th Year	
			1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half
1.0	<b>Mined Out Area &amp; Waste Management</b>	<b>Manpower of NTPC</b>								
1.1	Physical reclamation of internal and external dump (Levelling, Spreading of top soil, toe wall formation, drain etc.)	Outsourced (under the supervision of NTPC) Environmental Engr-1 Surveyor-2 Chairman-2								
1.2	Physical reclamation of land of batter and haul road									
1.3	Bio reclamation of item 1.1 & 1.2									
1.4	Making safe approach up to the wateragoon for future uses									
1.5	Barbed wire fencing etc.									
2.0	<b>Environmental Management (Air, Water, Waste, Noise etc)</b>									
2.1	Thorough inspection of external and stabilized internal dumps to find state of its stabilization & Bio reclamation.	Supervisors-2 in each shift Environmental Engineer-1 in each shift								

*Sanghi*

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Sl. No.	Activities to be undertaken		1st Year		2nd Year		3rd Year		4th Year	
			1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half
2.2	Action to stabilize & vegetate uncovered patches, if any	Job Outsourced								
2.3	Inspection of garland drains & bunds around external dumps to prevent leachate water from entering natural water courses directly	Supervisors-2 in each shift Mining Engineer-1 in each shift								
2.4	Inspection of embankment to prevent entry of uncontrolled water to mine	Supervisors-2 in each shift Engineer-1 in each shift								
2.5	Strengthening of embankment									
2.6	Quarterly sampling of water to know its quality status	Lab Assistant-1 Helper-1								
2.7	Record keeping, monitoring and reporting	Surveyor-1 Chainman-3								
3.0	<b>Management of Infrastructure &amp; Mining Machineries</b>									
3.1	Decommissioning of structural & semi-permanent constructions	Job Outsourced Civil Engineer-1, Supervisor-1								
3.2	Renovation of Mine/Project office, Canteen, Training centre, Rest shelter etc.	Supervisor-1 Surveyor-1, Chainman-2								
3.3	Clearing of land for vegetation over the area									
3.4	Dismantling of machineries									
4.0	<b>Actions for safety &amp; security of local community due to abandonment of the mine or part of the mine</b>									

  
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Sl. No.	Activities to be undertaken		1st Year		2nd Year		3rd Year		4th Year	
			1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half
4.1	Thorough inspection of the mined out area, O.R. dumps for assessing the closure job	Supervisors-2 in each shift Mining Engineer-1 in each shift								
4.2	Action, if required, for making safe, the drainage areas, fire areas etc.									
4.3	Making 2 meter high pucca wall on the slope of internal dumps, along the estimated water level.	Supervisor-1 in each shift Civil Eng near-1 in each shift								
4.4	Making 2 meter high masonry wall around the top edge of the mined out area, where immediate void exists at the quarry edge.									
4.5	Making 2 meter high pucca wall around the external OB Dump									
4.6	Closing with walling and gates in the haul road to prevent advent entry into water lagoon	Supervisor-1 in each shift								
4.7	Filling the haul road up to ground level, from surface up to sealing gate									
4.8	Survey of the total project area for undering mine plans (Inner Coal Mine Registration).	Supervisors-2 in each shift Mining Engineer-1 in each shift								
5.0	<b>Social &amp; Economic Aspects</b>									
5.1	Approval of one time grant as corpus fund for maintenance of some C.S.R activities.	Engineer-1 in R executive staff								
	<b>SUB-total</b>									
6.0	<b>Execution &amp; Supervisor</b>									

संदीप गुप्ता / Sandeep Gupta  
 Under Secretary  
 कोयला विभाग / Ministry of Coal  
 भारत सरकार / Government of India  
 नई दिल्ली / New Delhi-110001

*Sandeep*

Sl. No.	Activities to be undertaken		1st Year		2nd Year		3rd Year		4th Year	
			1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half
6.1	Executing & Supervision of the activities by mining personal.	Mining Engineer-1 HR executive/ staff-2								
7.0	Miscellaneous charges including power cost, deployment of security personal, 3 years post closure environmental monitoring, supervision, power cost etc.	Engineer-2 HR executive/ staff-3								

### 11.11 ABANDONMENT COST

#### 11.11.1 TENTATIVE ABANDONMENT COST

Tentative cost of likely closing activities as envisaged below has been estimated considering base date as Feb '2011 at current cost. Actual closing activities and activity wise costs may change during the preparation of Final Mine Closure Plan which will be prepared 5 years before the likely cessation of mining operation. A time schedule for abandonment along with tentative fund requirement has been shown in the bar chart given below at **Table No 11.9**

**TABLE 11.9  
ESTIMATED FUND REQUIREMENT FOR CLOSURE ACTIVITIES (WITHOUT  
ESCALATION, BASE YEAR-FEB '2011)**


Sl. No.	Activities to be undertaken	Fund Requirement	1st Year		2nd Year		3rd Year		4th Year	
			1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half
1.0	<u>Mined Out Area &amp; Waste Management</u>	Total (₹. Lakh)								
1.1	Physical reclamation of internal and external dump (Levelling, Spreading of top soil, toe wall formation, drain etc.)	79.65								
1.2	Physical reclamation of land of batter and haul road	52.62								

Chapter-XI Progressive and Final Mine Closure Plan

*S. Singh*  
SANGIV KUMAR SINGH  
Recognised Qualified Person  
No. 34011A/15/2009/CFM


RGP No. 34011/15/2009/CFM dated 27.02.15.

1.3	Bio reclamation of terr 1.1 & 1.2	64.69	
1.4	Making safe approach up to the water lagoon for future uses	120.37	
1.5	Barbed wire fencing	170.66	
	<b>Sub-total</b>	<b>487.99</b>	
2.0	<b>Environmental Management (Air, Water, Waste, Noise etc)</b>	0.00	
2.1	Thorough inspection of external and stabilized internal dumps to find state of its stabilization & Bio reclamation.	463.76	
2.2	Action to stabilize & vegetate uncovered patches if any	69.56	
2.3	Inspection of garland drains & bunds around external dumps to prevent leachate water from entering natural water courses directly	463.76	
2.4	Inspection of embankment to prevent entry of uncontrolled water to mine	463.76	
2.5	Strengthening of embankment	371.01	
2.6	Quarterly sampling of water to know its quality status	18.55	
2.7	Record keeping, monitoring and reporting	324.63	
	<b>Sub-total</b>	<b>2175.02</b>	
3.0	<b>Management of Infrastructure &amp; Mining Machineries</b>	0.00	
3.1	Decommissioning of structurals & semi-permanent constructions	284.75	

  
 सहायक निदेशक SANDHEEP GUPTA  
 आर जल निदेशक Under Secretary  
 राष्ट्रीय कोयला निदेशक Ministry of Coal  
 भारत सरकार Govt. of India  
 नई दिल्ली New Delhi-110001

*Sandeep*

3.2	Renovation of Mine: Project office, Car-teen Training centre, First shelter etc.	18.00	
3.3	Clearing of land for vegetation over the area	0.25	
3.4	Dismantling of machineries	92.75	
	<b>Sub-total</b>	<b>405.32</b>	
4.0	<b>Actions for safety &amp; security of local community due to abandonment of the mine or part of the mine</b>	<b>350</b>	
4.1	Thorough inspection of the mined out area, O.B. dumps for assessing the closure job.	324.63	
4.2	Action, if required, for making safe, the drainage areas, fire areas etc.	92.75	
4.3	Making 2 metre high pucca wall on the slope of internal dumps, along the estimated water level.	145.40	
4.4	Making 2 meter high pucca wall around the top edge of the mined out area, where immediate void exists at the quarry edge.	135.00	
4.5	Making 2 meter high pucca wall around the external OB Dump	92.75	
4.6	Closing with walling and gates in the haul road, to prevent inadvertent entry into water lagoon.	0.48	
4.7	Filling the haul road up to ground level, from surface up to sealing gate.	4.64	

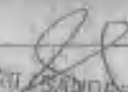
  
 सचिव सुरक्षा (SAND) कोयला  
 भारत सरकार (Ministry of Coal)  
 नई दिल्ली (New Delhi)  
 दिनांक: 27/09/2015

4.8	Survey of the total project area for updating mine plans Under Coal Mine Regulation.	463.76	
	<b>Sub-total</b>	<b>1312.90</b>	
5.0	<b>Social &amp; Economic Aspects</b>	0.00	
5.1	Approval of one lakh grant as corpus fund for maintenance of some C.S.R activities	793.49	
	<b>Sub-total</b>	<b>793.49</b>	
6.0	<b>Execution &amp; Supervisor</b>	0.00	
6.1	Purchasing / Hiring of equipment for closure activities etc	92.75	
6.2	Execution & Supervision of the activities by mining personal.	463.76	
	<b>Sub-total</b>	<b>556.51</b>	
7.0	<b>Miscellaneous charges including power cost, deployment of security personal, 3 years post closure environmental monitoring, supervision, power cost etc.</b>	375.36	
	<b>Total</b>	<b>6106.59</b>	

**11.11.2 ANNUAL CLOSURE COST**

The annual closure cost has been calculated as per new guidelines issued by MoC (vide letter no 55011/01-2009 CPAM dated 27/08/2009 & 18.02.2011). As per circulated guidelines of MoC the closure cost for an opencast mine is to be modified based on the Wholesale Price Index (WPI) as notified by Govt. of India.

The WPI for all commodities Issued from Office of Economic Advisor, Ministry of Commerce and Industry, Govt. of India (Base date, 2004 05) was 129.60 in Aug'09 and 148.10 in Feb'11. The closure cost was ₹.6.00 Lakhs per ha in

  
 सदीप गुप्ता / SANDEEP GUPTA  
 अवर सचिव / Under Secretary  
 कोयला / Coal / Ministry of Coal  
 भारत सरकार / Govt. of India  
 नई दिल्ली / New Delhi-110001

*San-p*

Aug'09. The current closure cost has been arrived by multiplying ₹ 6.00 Lakhs per ha by the ratio of WPI in Feb'11 and WPI in Aug'09 which comes to be ₹. 6.86 Lakhs per ha. The calculation methodology is as follows:

Total lease hold area Considered for mine closure (A)	890.63 ha
Mine closure cost per Ha for opencast mine in Aug'09	₹. 6.00 Lakhs
Mine closure cost per 1-ha for opencast mine in Feb'11(B)	₹. 6.86 Lakhs
Life of the mine (C) (Incl. 2 years of construction period)	26 years
Annual base price [(A X B)/C] (for 1 <sup>st</sup> year)	₹. 2.35 Crores
Total closure cost for opencast mine (Compounding @ 5% annual escalation)	₹. 120.05 Crores

The year wise closure cost is tabulated in Table 11.10.


**TABLE 11.10  
YEAR WISE AMOUNT TO BE DEPOSITED IN ESCROW ACCOUNT**

YEAR	AV. COST PER ANNUM (₹. CRORES)	YEAR WISE EXPENDITURE WITH 5 % ESCALATION (₹.CRORES)
C1	2.35	2.35
C2	2.35	2.47
P1	2.35	2.59
P2	2.35	2.72
P3	2.35	2.85
P4	2.35	2.99
P5	2.35	3.15
P6	2.35	3.30
P7	2.35	3.47
P8	2.35	3.64
P9	2.35	3.83
P10	2.35	4.02
P11	2.35	4.22

YEAR	AV. COST PER ANNUM (₹. CRORES)	YEAR WISE EXPENDITURE WITH 5 % ESCALATION (₹.CRORES)
P12	2.35	4.43
P13	2.35	4.65
P14	2.35	4.88
P15	2.35	5.13
P16	2.35	5.38
P17	2.35	5.65
P18	2.35	5.94
P19	2.35	6.25
P20	2.35	6.54
P21	2.35	6.87
P22	2.35	7.21
P23	2.35	7.57
P24	2.35	7.95
<b>TOTAL</b>	<b>61.07</b>	<b>120.05</b>

Total Estimated cost for completing the envisaged closure activities comes to **₹.120.05 Crores**. Estimated cost will be modified based on WPI as notified from Govt. of India from time to time.

#### 11.12 FINANCIAL ASSURANCE

  
 सदीप गुप्ता / SANDEEP GUPTA  
 अवर सचिव / Under Secretary  
 कार्यालय, मंत्रालय (Ministry of Coal)  
 ई-2, नई दिल्ली (New Delhi) 110001

As per guidelines for Mine Closure Plan, NTPC shall take following actions for ensuring the financial assurance to complete the mine closure activities:

- **Opening of a Escrow Account**

The proponent shall open an escrow Account with any Scheduled Bank. The beneficiary of this account shall be Coal Controller Organisation (on behalf of central Government). The proponent shall deposit the amount detailed in previous chapter, on yearly basis into this Escrow account.

Estimated cost will be modified based on WPI as notified by Government of India from time to time.

- **Condition for operating the Escrow Account**

An agreement, outlining detailed terms and conditions of operating the Escrow account, shall be finalized and executed amongst the project owners, concerned Bank and the Coal Controller. The agreement shall



**Grassing Activities along slope of Non-Active Overburden Dump.**

# Khapurikacchar OB Dump View



## View of Khapurikacchar from OB Dump



**OVER HEAD TANK**



**WATER TREATMENT PLANT**



**UV PURIFIER IN R&R COLONY**

**Grassing activities at Top Soil Dump**



**Before Grassing Activities along the slope.**



**After Grassing Activities along slope of Top Soil.**

**Garland Drains & Sedimentation Pond**



**Garland Drain**



**Garland Drain connected to settling pond**



**Settling Pond inside Mines**

## **Dust Suppression Measures**



**Water Sprinkling on Haul Roads inside Mines**



**Fixed Type Sprinkling on Haul Roads Near CHP**



**Interlocked Dust Suppression arrangement in Surface Miner**

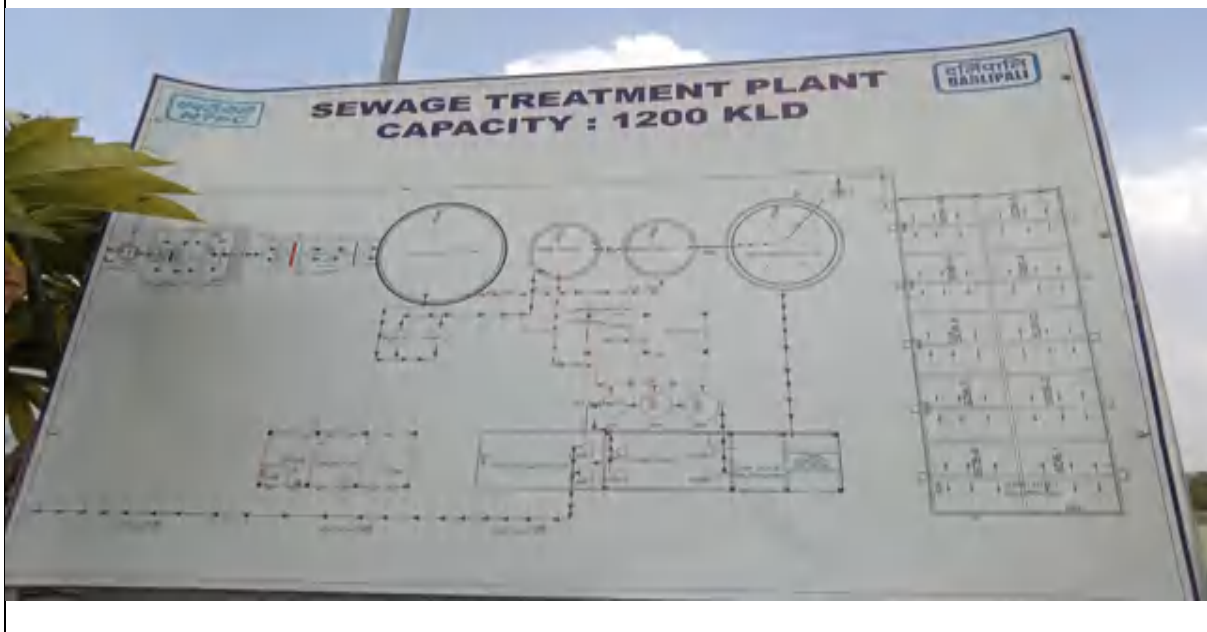


**Wet Drilling Arrangement**

**Silo Loading System with PLC based control system and transportation through Rail Wagon**



**Sewage Treatment Plant of 1200 KLD at Darlipali Township**



OFFICE OF THE PRINCIPAL CHIEF CONSERVATOR OF FORESTS (WILDLIFE)  
& CHIEF WILDLIFE WARDEN, ODISHA, BDA APARTMENT, 5<sup>TH</sup> FLOOR,  
PRAKRUTI BHAWAN, NILAKANTHA NAGAR, BHUBANESWAR  
Ph. No.0674-2564587, FAX No.0674-2565062  
(Website:odishawildlife.org, E. mail: odishawildlife@gmail.com)

Memo No. **7480**/1 WL(C)SSP-270/2012  
Dated, Bhubaneswar, the **30** Sept, 2014

To

The Principal Chief Conservator of Forests, Odisha,  
Bhubaneswar

Sub:

*Diversion of 304.75 hectares (originally applied 323.09 hectares) of forest land (273.68 hectares within the Dulanga coal block and 31.07 hectares of forest land outside the coal block) including 4.94 hectares of forest land coming within the safety zone area in Dulanga Coal Mining Projects spreads over Revenue villages of Dulanga, Majhapara, Manoharpur, Kathafali, Beldihi, Khuntijhuria and Khapurikachhar and Dhanuadihi RF, Giripahad RF and Satparlia RF in IB valley coalfields in favour of M/s National Thermal Power Corporation Ltd. in Sundargarh Forest Division of Sundargarh District, Odisha*

This is to inform you that a Site Specific Wildlife Conservation Plan at a financial outlay of ₹686.00 lakh in respect of the above Coal Mining project of M/s NTPC Ltd. has been approved and communicated to you in this office memo No.9597 dt 3.12.2013, in compliance to the Terms of Reference (TOR) No.(xv) prescribed in letter No.J-11015/1140/2007-IA.II(M) dt 17.1.2008 of Ministry of Environment & Forests, Govt. of India while considering the proposal for opening a new opencast coal mine project of 8 MTPA capacity in Ib Valley Coalfields in Sundargarh district, Odisha by M/s NTPC Ltd.

Subsequently, on the above diversion proposal, Govt. of India, MoEF vide their letter F. No.8-23/2013-FC dt 10.1.2014 granted stage-I approval alongwith some conditions to be fulfilled before grant of Stage-II forest clearance. Out of those, condition No. (xv) & (xvi) deal with deployment of watchers alongwith communication equipments to detect wild animals/elephants and warn the loco driver about movement of animals.

In the Site Specific Wildlife Conservation Plan approved for the above project, provisions have been made for engagement of watchers as well as supply of communication equipments to them. However, keeping in view of the observation of Govt. in F&E Deptt. vide their memo No.15413/F&E dt 21.8.2014, additional provisions at a cost of ₹27.29 lakh have been made in the Site Specific Wildlife Conservation Plan. These together with the financial outlay already approved comes to **₹713.29 lakh** (Rupees seven crore thirteen lakh twenty thousand) only for the following activities.

- |   |              |
|---|--------------|
| (i) For the Project Area:   |              |
| (a) Activities to be implemented in project area by M/s NTPC Ltd. in Sundargarh Division as per the SSWLCP already approved | ₹236.30 lakh |
| (b) Cost of engagement of watchers in loco cabin and supply of binoculars and search lights                                 | ₹25.13 lakh  |
| Sub -Total:   | ₹261.43 lakh |

P.T.O.

- (ii) For the Project Impact Area:
- |   |              |
|---|--------------|
| (a) For activities to be implemented by DFO, Sundargarh Divn. in project impact area as per the SSWLCP already approved | ₹449.70 lakh |
| (b) Cost of communication equipments and search lights to be supplied to watchers                                       | ₹2.16 lakh   |
| Sub -Total:   | ₹451.86 lakh |

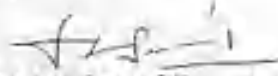
**Grand Total (i + ii): ₹713.29 lakh**

3. Various activities in the lease hold area will be executed by the Project proponent under the guidance of the Divisional Forest Officer, Sundargarh Divn. An additional amount of ₹2.16 lakh (already deposited ₹449.70 lakh) may be deposited in the CAMPA fund meant for the purpose for implementation of various activities within the project impact area by the Forest Deptt. as envisaged in the plan.

4. All other conditions of the approval letter issued vide this office memo No. 9597 dt 3.12.2013 remain unchanged.

5. Addendum to the already approved Site Specific Wildlife Conservation Plan incorporating the provisions of watchers and communication equipments in compliance to condition No. (xv) & (xvi) of stage-I approval order of Govt. of India, MoEF vide their letter F. No.8-23/2013-FC dt 10.1.2014 is approved herewith.

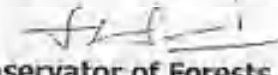
**Encl: 2 copies of addenda as above**

  
Principal Chief Conservator of Forests (WL)  
& Chief Wildlife Warden, Odisha

Memo No. 7481 /date 30-09-2014

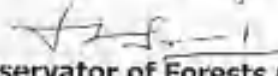
Copy forwarded to the Divisional Forest Officer, Sundargarh Division for information and necessary action in continuation of this office memo No.9598 dt 3.12.2013.

**Encl: As above**

  
Principal Chief Conservator of Forests (WL)  
& Chief Wildlife Warden, Odisha

Memo No. 7482 /date 30-09-2014

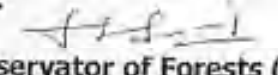
Copy forwarded to the Regional Chief Conservator of Forests, Rourkela Circle for information and necessary action in continuation of this office memo No.9599 dt 3.12.2013.

  
Principal Chief Conservator of Forests (WL)  
& Chief Wildlife Warden, Odisha

Memo No. 7483 /date 30-09-2014

Copy forwarded to the Special Secretary to Government of Odisha, F & E Deptt., Bhubaneswar for favour of information and necessary action with reference to Deptt. memo No.10F(cons)84/2014-15413/F&E dt 21.8.2014.


**Encl: As above**

  
Principal Chief Conservator of Forests (WL)  
& Chief Wildlife Warden, Odisha

Memo No. 7484 /date 30-09-2014

Copy forwarded to the Addl. General Manager (I/c), NTPC Ltd., Dulanga Coal Mining Project, Sundargarh for information and necessary action with reference to his letter dated 13.9.2014.

**Encl: As above**

  
Principal Chief Conservator of Forests (WL)  
& Chief Wildlife Warden, Odisha



Transforming lives

# NTPC Limited

Teacher Super Thermal Power Station  
P.O. DELPHI  
758147

Ref: 00100/2013289952/13.09.2014

Date: 13/09/2014

To,  
AD-HOC CAMPA ACCOUNT NO SBO 1025203  
CORPORATION BANK  
GOI, MOEF, PARYAVARAN BHAVAN  
CGO COMPLEX LODHI ROAD  
NEW DELHI 110003

Dear Sir / Madam,

We are pleased to inform you that the company has arranged to remit the amount as per the following details, directly to your bank CORPORATION BANK, LODHI COMPLEX BRANCH account number SB01025222.

Total Amount For	Total Amount Paid	44,970,000.00
------------------	-------------------	---------------

Amount (in words): Rupees Four Crore Forty-Nine Lakh Seventy Thousand Only.

The amount has been credited to your bank account as indicated above through Electronic Clearing Service and therefore, no service call is to be made by you to your bank.

If the amount is not received in your account kindly contact the person mentioned below giving the above reference number.

Yours Faithfully,

For NTPC Ltd.

Designation

UTR NO. SBIN 71407344 8753

OFFICE OF THE PRINCIPAL CHIEF CONSERVATOR OF FORESTS (WILDLIFE)  
& CHIEF WILDLIFE WARDEN, ODISHA, BDA APARTMENT, 5<sup>TH</sup> FLOOR,  
PRAKRUTI BHAWAN, NILAKANTHA NAGAR, BHUBANESWAR  
Ph. No.0674-2564587, FAX No.0674-2565062  
(Website:odishawildlife.org, E. mail: odishawildlife@gmail.com)

Memo No. **7480**/1 WL(C)SSP-270/2012  
Dated, Bhubaneswar, the **30** Sept, 2014

To

The Principal Chief Conservator of Forests, Odisha,  
Bhubaneswar

**Sub:**

***Diversion of 304.75 hectares (originally applied 323.09 hectares) of forest land (273.68 hectares within the Dulanga coal block and 31.07 hectares of forest land outside the coal block) including 4.94 hectares of forest land coming within the safety zone area in Dulanga Coal Mining Projects spreads over Revenue villages of Dulanga, Majhapara, Manoharpur, Kathafali, Beldihi, Khuntijhuria and Khapurikachhar and Dhanuadihi RF, Giripahad RF and Satparlia RF in IB valley coalfields in favour of M/s National Thermal Power Corporation Ltd. in Sundargarh Forest Division of Sundargarh District, Odisha***

This is to inform you that a Site Specific Wildlife Conservation Plan at a financial outlay of ₹686.00 lakh in respect of the above Coal Mining project of M/s NTPC Ltd. has been approved and communicated to you in this office memo No.9597 dt 3.12.2013, in compliance to the Terms of Reference (TOR) No.(xv) prescribed in letter No.J-11015/1140/2007-IA.II(M) dt 17.1.2008 of Ministry of Environment & Forests, Govt. of India while considering the proposal for opening a new opencast coal mine project of 8 MTPA capacity in Ib Valley Coalfields in Sundargarh district, Odisha by M/s NTPC Ltd.

Subsequently, on the above diversion proposal, Govt. of India, MoEF vide their letter F. No.8-23/2013-FC dt 10.1.2014 granted stage-I approval alongwith some conditions to be fulfilled before grant of Stage-II forest clearance. Out of those, condition No. (xv) & (xvi) deal with deployment of watchers alongwith communication equipments to detect wild animals/elephants and warn the loco driver about movement of animals.

In the Site Specific Wildlife Conservation Plan approved for the above project, provisions have been made for engagement of watchers as well as supply of communication equipments to them. However, keeping in view of the observation of Govt. in F&E Deptt. vide their memo No.15413/F&E dt 21.8.2014, additional provisions at a cost of ₹27.29 lakh have been made in the Site Specific Wildlife Conservation Plan. These together with the financial outlay already approved comes to **₹713.29 lakh** (Rupees seven crore thirteen lakh twenty thousand) only for the following activities.

(i) For the Project Area:

(a) Activities to be implemented in project area by M/s NTPC Ltd. in Sundargarh Division as per the SSWLCP already approved	₹236.30 lakh
(b) Cost of engagement of watchers in loco cabin and supply of binoculars and search lights	₹25.13 lakh
Sub -Total:	₹261.43 lakh

P.T.O.

- (ii) For the Project Impact Area:
- |   |              |
|---|--------------|
| (a) For activities to be implemented by DFO, Sundargarh Divn. in project impact area as per the SSWLCP already approved | ₹449.70 lakh |
| (b) Cost of communication equipments and search lights to be supplied to watchers                                       | ₹2.16 lakh   |
| Sub -Total:   | ₹451.86 lakh |

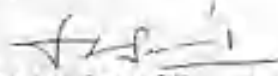
**Grand Total (i + ii): ₹713.29 lakh**

3. Various activities in the lease hold area will be executed by the Project proponent under the guidance of the Divisional Forest Officer, Sundargarh Divn. An additional amount of ₹2.16 lakh (already deposited ₹449.70 lakh) may be deposited in the CAMPA fund meant for the purpose for implementation of various activities within the project impact area by the Forest Deptt. as envisaged in the plan.

4. All other conditions of the approval letter issued vide this office memo No. 9597 dt 3.12.2013 remain unchanged.

5. Addendum to the already approved Site Specific Wildlife Conservation Plan incorporating the provisions of watchers and communication equipments in compliance to condition No. (xv) & (xvi) of stage-I approval order of Govt. of India, MoEF vide their letter F. No.8-23/2013-FC dt 10.1.2014 is approved herewith.

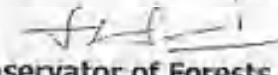
**Encl: 2 copies of addenda as above**

  
Principal Chief Conservator of Forests (WL)  
& Chief Wildlife Warden, Odisha

Memo No. 7481 /date 30-09-2014

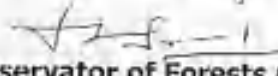
Copy forwarded to the Divisional Forest Officer, Sundargarh Division for information and necessary action in continuation of this office memo No.9598 dt 3.12.2013.

**Encl: As above**

  
Principal Chief Conservator of Forests (WL)  
& Chief Wildlife Warden, Odisha

Memo No. 7482 /date 30-09-2014

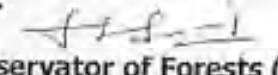
Copy forwarded to the Regional Chief Conservator of Forests, Rourkela Circle for information and necessary action in continuation of this office memo No.9599 dt 3.12.2013.

  
Principal Chief Conservator of Forests (WL)  
& Chief Wildlife Warden, Odisha

Memo No. 7483 /date 30-09-2014

Copy forwarded to the Special Secretary to Government of Odisha, F & E Deptt., Bhubaneswar for favour of information and necessary action with reference to Deptt. memo No.10F(cons)84/2014-15413/F&E dt 21.8.2014.


**Encl: As above**

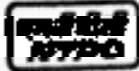
  
Principal Chief Conservator of Forests (WL)  
& Chief Wildlife Warden, Odisha

Memo No. 7484 /date 30-09-2014

Copy forwarded to the Addl. General Manager (I/c), NTPC Ltd., Dulanga Coal Mining Project, Sundargarh for information and necessary action with reference to his letter dated 13.9.2014.

**Encl: As above**

  
Principal Chief Conservator of Forests (WL)  
& Chief Wildlife Warden, Odisha



Transforming lives

# NTPC Limited

Talcher Super Thermal Power Station  
P.O. DEEPSHIKHA  
759147

Ref: UN10012013209901100002014

Date: 03/03/2014

To,  
AD-HOC CAMPA ACCOUNT NO SBO 1025203  
CORPORATION BANK  
GOV. MOEF, PARYAVARAN BHAVAN  
CEO COMPLEX LODHI ROAD  
NEW DELHI 110003

Dear Sir / Madam,

We are pleased to inform you that the company has arranged to remit the amount as per the following details, directly to your bank CORPORATION BANK, LODHI COMPLEX BRANCH account number **SB01025222**.

Total Amount Paid	32,784,000.00
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Amount (in words): ~~Rs. 32,784,000.00~~ Rupees Three Crore Twenty-Seven Lakh Eighty-Four Thousand Sixty Only.

The amount has been credited to your bank account as indicated above through Electronic Clearing Service (ECS) and therefore, no service charge is deductible by your bank.

If the amount is not received in your account, kindly contact the person mentioned below giving the above reference as other reference is not available.

Yours Faithfully,

For NTPC Ltd.

Designation

*UP No. & Date of amt of RTGS is reqd. to be mentioned.*

*CN 21164826*

*UTR NO: SBIN 714073453867*

# **PROGRESS REPORT**

## **(March 2022-August 2022)**

### **THIRD PARTY MONITORING AND EVALUATION OF SITE SPECIFIC WILDLIFE CONSERVATION ACTIVITIES IN DULANGA COAL MINING PROJECT OF NTPC LTD, SUNDARGARH**



*Submitted to*  
**Additional General Manager (Mining)**  
**NTPC Dulanga Coal Mining Project, Sundargarh**

*Submitted by*  
**Dr N. Bhol (Principal Investigator)**  
**College of Forestry**  
**Odisha University of Agriculture & Technology**  
**Bhubaneswar- 751 003**

# **PROGRESS REPORT**

## **(March 2022-August 2022)**

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The authorities of NTPC Ltd, SSC- Coal Mining (Ranchi) has engaged Odisha University of Agriculture and Technology, Bhubaneswar as 3<sup>rd</sup> Party in February 2022 for monitoring and evaluation of site specific wildlife conservation activities in Dulanga Coal Mining Project of NTPC, Sundargarh. Dr Nirakar Bhol, I/C of Silviculture & Agroforestry Department is the Principal Investigator and Dr Kumaresh Behera, Assistant Professor, Department of Livestock Production & Management, OUAT is the Co-Principal Investigator of the monitoring team.

A series of communication has been made with person concerned dealing the assigned activities of Dulanga Coal Mining Project, Khapuriakachhar, Sundargarh over phone and email. Also communication has been made with the Divisional Forest Office, Sundargarh regarding this work. The monitoring team has visited the sites during August 21-23, 2022 and physically verified the progress of works and documents. The team has visited the office of both Dulanga Coal Mining Project and DFO, Sundargarh and discussed with the concerned staff. By the end of August, 2022, the following progress of activities has been observed.

#### **A. CORE ZONE ACTIVITIES**

The Core Zone activities have been undertaken by Dulanga Coal Mining Authority of NTPC itself since 2018-19. The progress of activities done by NTPC by 31.8.2022 is as follows.

##### **1. Plantation development**

An area of 210 ha has been put under plantation over reclaimed area, overburden dump and safety zone with differential cost as in EMP. Departmental labours and outside labours have been used in such works. The following fund has been utilized for this purpose.

April, 2022	Rs 8320.00
May, 2022	Rs 8640.00
June, 2022	Rs 10500.00
July, 2022	Rs 32760.00
August, 2022	Rs 32760.00



**New plantation and grass seeding area**

## 2. Engagement of Van Sahayak

Three numbers of Van Sahayak have been engaged which were sanctioned in the project. The following amount has been paid to them during the assessment period.

April-May, 2022	Rs 88053.00
June, 2022	Rs 35940.00
July, 2022	Rs 36823.67
August, 2022	Rs 47257.04

The progress of this activity is satisfactory.



**Van Sahayaks doing forest nursery activities**

### 3. Engagement of Van Pal

One Van Pal has been engaged which is sanctioned in the project to supervise nursery and plantation activities. The following amount has been paid to them during the assessment period.

April-May, 2022	Rs 34299.02
June, 2022	Rs 13999.60
July, 2022	Rs 18674.52
August, 2022	Rs 18674.52

The progress of this activity is satisfactory.

### 4. Fire watchers

There is no fire watcher currently. Five numbers of fire watchers will be engaged during dry season from November, 2022 to March, 2023 as revealed by the Project Officials.

### 5. Grass seeding

In 2021-22, an area 2.77 ha has been covered under grass seeding. The coverage of grasses is found satisfactory.

### 6. Photo Voltaic Fencing

Fencing with normal barbed wire has been done for a length of 9.6 km against the provision of 15 km Photo Voltaic Fencing. As per the requirement of site, the rest fencing may be done.

### 7. Water harvesting structure

Water harvesting structures have already been developed as per EMP. The following structures were visited.

1. WHS at Masina village: 4800 m<sup>2</sup>
2. Dulinga site pond RNR: 2900 m<sup>2</sup>
3. External pond RNR: 9600 m<sup>2</sup>
4. WHS at Beldhi: 1500 m<sup>2</sup>



Different water harvesting structures

## 8. Water pollution abatement

Effluent Treatment Plant of 50 KLD and Sewerage Treatment Plant of 500 KLD have been established for water pollution abatement.



Sewerage Treatment Plant

## 9. Minimization of man-animal conflict during road transportation

Signboards have been displayed in important points to aware people and minimize man-animal conflict during road transportation.

## 10. Garbage control

Garbage control work is being done almost every month. During the assessment period, the following amounts have been utilized for this purpose.

April, 2022	Rs 106728.00
May, 2022	Rs 111175.00
June, 2022	Rs 106728.00
July, 2022	Rs 164155.70
August, 2022	Rs 164155.70

This has been mainly done in R&R colony.

#### **11. Weed control**

One person has been engaged for weed control and following money has been spent towards this.

April, 2022	Rs 1920.00
May, 2022	Rs 7360.00
June, 2022	Rs 10500.00
July, 2022	Rs 10500.00
August, 2022	Rs 10500.00

#### **12. Training and awareness promotion**

The World Environment Day has been celebrated on 5<sup>th</sup> June 1, 2022. On this occasion different competitions have organized among children, housewives, employees, etc. Rs 1, 02,740/- has been spent.

#### **13. Protection and monitoring vehicle**

Three vehicles haven provided for protection and monitoring of mechanical, electrical and mining departments. From 2021, old vehicles are replaced. GPS tagging is required in such vehicles.

**14. Provision of a 8-seater non-A/C vehicle (Bolero)** with a driver along with fuel and maintenance cost for Range Officer, Himgiri for protection and monitoring work.

This item has not been yet been done by Dulanga Coal Mining Project.

#### **Remarks**

The overall progress of activities in core zone is satisfactory. One 8-seater non-A/C vehicle (Bolero) with a driver along with fuel and maintenance cost should be provided at an early date to the Range Officer, Himgiri for protection and monitoring of site specific wildlife conservation activities as per EMP.

#### **B. BUFFER ZONE ACTIVITIES**

For Buffere Zone activities, DFO, Sundargarh is the implementing agency. Dulanga Coal Mining Project authorities have deposited the following amounts in the ADHOC CAMPA Account No. SB01025222 during 26.02.2014 – 15.7.2015 for this purpose as found from the bank statement.

Date of remittance	Amount (Rs)	Beneficiary Account Number	Beneficiary Name
26.02.2014	1,95,73,720.00	SB01025222	ADHOC CAMPA
14.03.2014	4,49,70,000.00	SB01025222	ADHOC CAMPA
14.03.2014	3,27,84,060.00	SB01025222	ADHOC CAMPA
11.06.2014	1,89,28,000.00	SB01025222	ADHOC CAMPA
11.06.2014	23,79,649.00	SB01025222	ADHOC CAMPA
11.06.2014	9,84,267.00	SB01025222	ADHOC CAMPA

This money is supposed to be transferred to the DFO, Sundargarh for doing different site specific wildlife conservation activities. The money has been given to utilize during planned 10 years period for following activities.

1. GIS map status to monitor forest fragmentation
2. Plantation in degraded forest (ANR) over 150 ha
3. Fire line 15 km layout
4. Fire watching activities
5. Habitat improvement through bamboo plantation over 320 ha/over existing forest land including protection and enhancement of regeneration for 10 years
6. Excavation of water holes with saltlicks
7. Erosion control trenches and check dams on nallas
8. Biodiversity monitoring every alternate year and documentation
9. Elephant tracking activities
10. Watch Tower construction
11. Solar lighting status
12. Corpus fund status
13. Cattle immunization status
14. Awareness activities
15. Anti-poaching and anti-smuggling measures- secret fund and rewards

Regarding assessment of above activities, the monitoring team met the officials of two concerned Forest Ranges such as Hemgiri and Gopalpur at their offices. They expressed that these works have not been carried out. On 23.8.2020 the team met the officials of DFO, Sundargarh at the office and queried about the progress of such activities. They verified their record and expressed that they have not received the fund and activities have not been

undertaken. After that again the DFO was requested through email to confirm the monitoring team about the status of buffer zone activities by them, but unfortunately no response was obtained.

### **Total fund utilized for Buffer Zone activities by DFO, Sundargarh**

No fund has been utilized by DFO office, Sundargarh till 31.8.2022 for buffer zone activities.

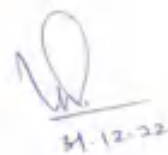
### **Remarks**

A huge amount of money has been given to state forest department since 2014-15 for various site specific wildlife conservation activities. Unfortunately no fund has been utilized by 31.8.2022. The officials have been contacted physically and through email to remind this issue, but their response is not satisfactory.

### **Action required**

The Principal Investigator Dr N. Bhol has contacted the office of PCCF (Wildlife) at Bhubaneswar and informed to take necessary steps in this regard. NTPC authorities should remind competent authorities of Odisha Forest Department to carryout various activities without further delay for which payment has been made. As cost of every activity is escalating every year and the fund is to be utilized within 10 planned year, the objective of this fund utilization is missing. Therefore, the funding agency should pursue this matter at an early date with the Forest Department.

Bhbaneswar  
Date: 31.12.2022



31.12.22

Dr Nirakar Bhol  
Principal Investigator  
College of Forestry, OUAT

<b>Community Development Expenditure at Dulanga Coal Mining Project</b>	
<b>(Headwise expenditure statement for 2022-23) (in Lakh INR)</b>	
<b>MAJOR HEADS</b>	<b>FY2022-23</b>
HEALTH	14.02
EDUCATION	2.89
WATER	10
INFRASTRUCTURE	110
SKILL DEVELOPMENT	7.08
NEED BASED	17.75
<b>Expenditure amount (in Lakhs)</b>	<b>161.74</b>

REHABILITATION AND RESETTLEMENT PLAN

of

NTPC Limited

DULANGA COAL MINING PROJECT



REHABILITATION AND RESETTLEMENT PLAN

NTPC LTD, DULANGA COAL MINING PROJECT,

SUNDARGARH, ODISHA

OFFICE OF THE LAND ACQUISITION OFFICER, HEMGIR

NO 398 ; Date: 12/09/14

TO

The Addl. General Manager (A/G)  
NTPC Dulanga Coal Mining Project  
Sundargarh

Sub: Approval of Rehabilitation & Resettlement (R&R) plan of Dulanga Coal Mining Project, NTPC Limited, Sundargarh

Ref: Your letter dated 09.09.2013

Sir,

Please find attached herewith the R&R plan of Dulanga Coal Mining Project of NTPC Limited, Sundargarh duly approved by the competent authority.

This is for your information and necessary action.

Thanking You.

Enclosure: As above.

Yours faithfully,

  
Land Acquisition Officer, Hemgir  
12.9.14

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## 1. Introduction

NTPC Limited is the largest, and an State owned electric utilities company which was set up in 1975 to accelerate power development in India. It is emerging as an integrated power major with presence across the entire energy value chain. With a current generating capacity of more than 40 GW, NTPC has embarked on plans to become a 75 GW company by 2017. NTPC Ltd has been allotted a total of Six(06) Coal Mining Blocks across three States, of which Dulanga Coal Mining Block is located in the state of Orissa. The excavated coal from the mine via railway corridor, would be used for Power generation in the Darlipalli Super Thermal Power Plant which is also located in the Sundergarh district.

While land for coal mining area for the block, shall be acquired under CBA Act-1957, the Land for OB Camp and Mine infrastructure including R&P Colony, CHP corridor, GISF colony etc shall be acquired under L.A Act. It is estimated that a total of 2044.10 acres of land would be utilized for the project, which would encompass lands of 8 villages namely, Dulanga, Mayapada, Beldini, Khuntaharia, Kahala, Manoharpur, Khapunkachar and Kalamagha spanning 2 Gram Panchayats of Sanghurua, Kanakura and Dindurga.

Due to the project, several families would be affected/relocated and there would be loss of lands coupled with loss of livelihoods. A Socio Economic Survey was conducted by Xavier Institute of Management, Bhubaneswar, in line with the Orissa R&R Policy, on the project affected villages. As per findings obtained from the survey report, about 500 families would be displaced and about 438 families would be affected by the project.

With a view to striking a balance between the company's business initiatives and the development needs of the project affected masses, the project seeks to follow the R&R package approved by Honourable Collector and District Magistrate, the Orissa Resettlement & Rehabilitation Policy and its subsequent amendments issued from time to time. It may be mentioned here that the R&R package, draws immense strength from implementation of past policies, best practices in other States and Orissa Government's Industrial Policy Resolution, 2001.

The current intervention of policy formulation has actually taken note of the lessons learnt through those past policies, which essentially reflects Government's genuine spirit of learning and introspection.

As mandated in the Orissa H&R Policy, emphasis has been given on the following

- Avoiding displacement wherever possible and minimize it exercising available options  
Otherwise
- Recognizing voices of displaced communities emphasizing the needs of the indigenous communities and vulnerable sections
- To ensure environmental sustainability through participatory and transparent process
- Help guiding the process of developing institutional mechanism for implementation, minimizing conflict resolution and grievance redressal

## 2. Methodology:

The Rehabilitation and Resettlement Plan emphasizes that the project shall play a positive role in the socio-economic upliftment and betterment of quality of life of the people residing in the area. In addition to providing the rightful compensation to the land owners, efforts have been made to ensure transparency in the process of planning and execution. The preparation of the plan included the following procedures

- 1) Conducting a Socio Economic Survey of the project affected families, which included collation of Primary and Secondary data through PRA exercises, Focus Group discussions, Personal interviews, door to door survey and focus group discussions etc with a specific focus on gender participation
- 2) Further Hemgir block falling under Scheduled areas list of the State, institutions of local self governance especially the Panchayati raj institutions were consulted and involved during the process. To ensure participation among the people and to involve all sections of the villages, Panch Sabhas, Gram gathas have been consulted. An Environmental public hearing has also been conducted to factor in all possible suggestions encompassing the needs and requirements of the villagers.
- 3) Discussions with the project affected families and village level micro planning has been taken up to ensure that proper weightage to issues

### 3. Details of Project Area and Extent of Displacement

The Dulanga Coal Mining Block has been allocated to NTPC Ltd for developing coal mines for its upcoming Durlipalli Super Thermal power Plant. The Coal Mining Block is situated in Hemgir Block and would involve acquisition of 2044.10 acres which would comprise of 870.45 acres of private land, 424.84 acres of Govt. land and 748.81 acres of forest Land. The land being acquired would be used for setting up of the Coal Mines, OS Dump, other Infrastructure and establishing a Resettlement and Rehabilitation colony.

A total of 0 villages, namely, Dulanga, Majhapada, Beddhi, Kathlah, Khunrijhara, Khapunkachar, Mandarpara, Kalamogna would be affected by the project. Efforts have been made to minimise the requirement of land for the project and thus also minimise displacement of people from the area. In order to identify the extent of displacement and effect of the project, a socio economic survey has been taken up in the project affected villages in line with the Odisha R&R policy. This survey would assess the vulnerability and level of impoverishment of villagers, under three broad parameters viz. demographic profile, social profile and economic profile. Apart from this, it would also help in providing a base for impact monitoring subsequent to displacement.

Sl	Type of Land	Mining Area Land (CBA Acl) (Acres)	Land (LA Acl) (Acres)			Grand Total (Acres)
			OS Dump & Infrastructure	R&R Colony	Total	
1	Private	460.58	370.88	39.19	410.07	870.45
2	Govt. Revenue	263.23	98.01	63.57	161.61	424.84
3	Forest	672.07	70.79	0.00	70.79	748.81
Total (Acres)		1395.88	545.56	102.79	648.47	2044.10

The land being acquired, is marked by the presence of good agricultural land and rich forest. The mainstay of the villagers is agriculture, mostly rainfed, with a single paddy crop. However, due to the presence of forests, there is a huge dependence for several minor forest

produces. It may be mentioned here that due to the presence of other coal mining projects in the area, the villagers are directly or indirectly involved in working in the mining area. The Dolanga coal Mining Project, which shall have an annual capacity of 7Mt tonnes per annum, shall create numerous skilled and unskilled job opportunities in the area. It is planned that the mining shall be done through (MDO) Mine Developer Cum Operator and would be highly mechanised. It is however expected that several semi skilled and unskilled jobs would arise out of the operations. As per the OPRR 2006 and its amendments, Clause-9(11-a), nominated members of the displaced and other affected families would be given utmost preference in the matter of employment. For jobs arising out of assignments to be taken up by other vendors also, preference shall be extended to project affected masses. Adequate arrangement to provide vocational training to at least one member of each displaced/other family so as to equip him/her to start a self or own small enterprise and refine his/her skills to take advantage of new job opportunities. For those engaged in traditional occupations/handicrafts/ handlooms, suitable training shall be organized at the cost of project authority to upgrade their existing skills. Emphasis would be given by the company on the overall development of the villagers, which would take into account, up gradation of existing infrastructure, providing new infrastructure, upliftment of standard of living, improvement in the quality of living, improving access to better quality of education, health facilities etc.

#### 4. Perceived impacts on environment due to execution of project

To assess the impacts of the Dolanga Coal Mining Project, NTPC Ltd, an Environment Impact Assessment study has been carried out and all possible perceived impacts have been outlined. Keeping in mind necessary guidelines issued by the MOEF, all possible impacts shall be taken care of and shall be implemented as per the Environment Management Plan approved by the MOEF. Utmost care shall be taken to avoid any adverse impact on the existing Bio diversity and overall environment, in the area.

#### 5. Details of Project Affected Persons of the Dolanga coal mining project

A socio-cultural, resource mapping and infrastructural survey is being conducted by Xavier Institute of Management, Bhubaneswar, an independent agency identified by the Government to ensure proper benchmarking. This survey aims at identification of the Project affected families and assess the extent of impoverishment of the families apart from outlining various assets (both private and government) existing in the area. The details of Project affected persons is enclosed as below.

Sl.No	Name of Village	Purpose of Land Acquisition	No of Affected families
1	DULINGA	Coal Block & Infrastructure	221
2	MAJHAPADA	Coal Block & Infrastructure	267
3	BELDIHI	Coal Block & CISF colony	177
4	KATKALI	Coal Block	28
5	MANOHARIPUR	Coal Block	04
6	KHUNTUJHARIA	Coal Block	31
7	KHAPURIKACHAR	OB Dump & Infrastructure	52
8	KALAMEGHA	P&R Colony	94
9	SAIPARLIA Reserve Forest	Infrastructure	00
10	CHANUARDHI Reserve Forest	Coal Block	00
11	GIRIPAHAD Reserve Forest	Coal Block	00
<b>TOTAL</b>			<b>947</b>

NB: The figures depicting the affected families are based on the Socio Economic Survey conducted by XIM, Bhubaneswar.

#### 6. Guiding Principles of the Rehabilitation and Resettlement Plan

**Eligibility:** As per the Rehabilitation and Resettlement Plan, all families who have been residing for a minimum of 3 years in the project area prior to the date of publication of Section 4 (i) Notification under LA Act-1954 and Section 7 Notification under CBA Act-1957 and on account of acquisition of his/her agricultural/homestead land are affected by the project.

**Time Frame:** The time frame for realisation and implementation of this Resettlement and Rehabilitation plan would be five (5) years from the date of approval of the plan.

**Impact Assessment:** After implementation of the plan, a Social Impact Evaluation (SIE) shall be taken up to provide a base for future interventions.

7. **Details of Land to be acquired:** Land shall be acquired for different purposes which are outlined below:

a) Land to be acquired for the Coal mining Block (Acquisition under CBA Act-1957)

Sl.No	Land Details	Area to be Acquired ( In Acres)
1	Private Land	450.08
2	Revenue Land ( Non Forest Land)	253.23
3	Forest Land	672.02
<b>TOTAL</b>		<b>1395.63 Ac</b>

For Land to be acquired under CBA Act- 1957, Section 11 notification has been published and the title is now vested with the NTPC Ltd. Payment for compensation for land is in process.

b) Land to be acquired for setting up of OB Dump & other Mine Infrastructure (Acquisition under L.A Act- 1954)

Sl.No	Land Details	Area to be Acquired ( In Acres)
1	Private Land	370.88
2	Revenue Land ( Non Forest Land)	98.01
3	Forest Land	76.78
<b>TOTAL</b>		<b>545.68</b>

Land acquisition is in advanced stages.

vi) Land to be acquired for setting up of R&R Colony (Acquisition under LA Act - 1954). The land for the R&R colony has been identified in consultation with the villagers in village Kalmegha of Kanakpura Gram Panchayat. A total of 102.79 acres of land is allocated for the purpose which shall contain the Rehabilitation Colony for the FAPs and other necessary infrastructure. The matter has been discussed in Panchsabhas, Gram Sabhas and in RPDCG meetings and the land acquisition is in advanced stages.

Sl.No	Land Details	Area to be Acquired ( In Acres)
1	Private Land	39.19
2	Revenue Land ( Non Forest Land)	63.60
TOTAL		102.79 Ac.

Based on the approval of the 3<sup>rd</sup> RPDCG meeting of Dulanga Coal Mining Project, on 28.04.2017 and subsequent deliberation Collector and District Magistrate, vide Letter no 1007 dated 25.09.2013, had approved the Compensation and R&R package for NTPC Ltd. Dulanga Coal Mining Project ( Copy Enclosed).

#### 4. Compensation for Assets:

As per the Socio Economic Survey being carried out in the project affected villages, enumeration of all immovable assets, community assets as well as government assets, is being done through PWD, Sundargarh. As per the guidelines issued by the Revenue department, Rural Development Department and as approved by district authorities, the cost of assets in terms of compensation would be distributed to the villagers.

As regards 'public property' like School Building, Club House, Hospital, Panchayat Govt electrical installation, place(s) of worship, roads etc, value of such property affected shall be deposited with the District Collector.

#### 5. Compensation for Trees:

Compensation for trees would be paid to the individual beneficiaries as per rate fixed by the District govt authorities.

#### 10. Compensation for Houses: For Houses, situated in the areas being acquired by the project, cost of the assets as ascertained by the District authorities, shall be paid to the

individual beneficiaries. For this, an Asset Valuation study is being taken up in the villages along with the Revenue and Building department, Sundargarh to ascertain the cost of assets. As regards 'public property' like School Building, Club House, Hospital, Panchayat Ghar, electrical installation, places of worship, value of such property affected shall be deposited with the concerned District Collector. Either Project or District Administration shall take up construction at the place as would be determined in consultation with representatives of displaced persons.

11. Compensation for other immovable Assets attached to land: Compensation for all immovable assets attached to land, like Ponds, Creeks, Check Dams, Bore wells, open Wells etc shall be paid to the individual beneficiaries.

## 12. RESETTLEMENT AND REHABILITATION

### Resettlement Benefits:

Families whose Houses would be acquired by the project and would get displaced, would be provided benefits as per the following two options

**Option-1: Families opting to resettle in R&R Colony-** The eligible displaced families shall submit their consent for resettlement in the R&R colony at Kalamegha, through an irrevocable affidavit on or before the cut off date as mentioned by the NTPC.

- a) Provision of Homestead land & house in R&R Colony: Each displaced family, who shall opt for resettlement in the R&R colony, shall be provided with land measuring Ac.0.10 Decimal for homestead purpose. Land (1/3rd) of the Homestead land, shall be provided to each family, at the time of handover of the individual house. Besides, NTPC shall provide a house of size @ 1000 sqft Super built area, including cowshed and staircase, constructed over the homestead land allotted to the above mentioned displaced families. (As per O.PRR-2006, Clause 5(d))
- b) Assistance in lieu of Temporary Shed: For families who are dismantling their houses/other structures in the village, turning over possession to Govt/NTPC and evacuating the village, in lieu of assistance for temporary shed, NTPC shall pay to the person, House rent assistance @ Rs.1000/- per month from the day of physical evacuation for a period of eighteen (18) months.

- c) Assistance for Transportation: NTPC shall provide transportation allowance of Rs.3000/- or free transportation for shifting to the resettlement location or their new place of habitation. If a displaced person is unable to carry all the materials, such as wood etc immediately after dismantling his/her house in the village and willing to keep it in his/her plot for some time till he/she transports it to his/her relocated area NTPC will facilitate for watch and ward for a period of 15 days. NTPC shall not be responsible for this material after 15 days.
- d) Maintenance Allowance: NTPC shall provide "Maintenance Allowance" @ Rs.3000/- per month to all the displaced families on vacation of land/house for a period of one year from the date of vacation.

Resettlement in R&R Colony- Cost Component: INR.86.04 Crores			
Description of Item	No of PAPs	Unit Cost ( In Lakh Rs.)	Total ( In Crs Rs.)
Cost of establishment of R&R Colony including plot and Basic Infrastructure	490		75.01
Grants for ml maintenance of R&R Colony@ 10% of total cost of R&R colony	490		7.501
Registration fee for transfer of plots in RC in the name individual PAP families	490	0.15	0.735
Maintenance Allowance/family	490	0.36	1.764
Transportation Grant/family	490	0.03	0.147
Assistance for Temporary Shed	490	0.18	0.882
<b>TOTAL</b>			<b>86.039</b>

Option-2: Families opting for Self Resettlement - The eligible displaced families shall submit their consent for self relocation elsewhere, through an irrevocable affidavit on or before the cut off date as mentioned by the NTPC.

- a) **Assistance for Self Relocation:** A displaced family, who chooses by providing consent through an affidavit for self relocation elsewhere, other than R&R Colony, shall be given cash grant of Rs. 75,000/- in lieu of house plot/allocated land.
- b) **Building Assistance:** A displaced family who chooses by providing consent through an affidavit for self relocation elsewhere, other than R&R Colony, shall receive House Building Assistance @ 60% of the construction cost assessed for the house constructed by NTPC in the rehabilitation habitat at Kalamegha or house building assistance provided in the R&R policy 2006, as on that date, i.e. Rs.6.60 Lakhs or whichever being higher.
- c) **Assistance in lieu of Temporary Shed:** For families who are dismantling their house/other structures in the village, handing over possession to Govt/NTPC and evacuating the village, in lieu of assistance for temporary shed, NTPC shall pay to the person, House rent assistance @ Rs.1000/- per month from the day of physical evacuation for a period of six (06) months.
- d) **Assistance for Transportation:** NTPC shall provide transportation allowance of Rs.3000/- in lieu transportation for shifting to the resettlement location or their new place of habitation. If a displaced person is unable to carry all the materials, such as wood etc immediately after dismantling his/her house in the village and willing to keep it in his/her plot for some time till he/she transports it to his/her relocated area, NTPC will facilitate for watch and ward for a period of 15 days. NTPC shall not be responsible for the material after 15 days.
- e) **Maintenance Allowance:** NTPC shall provide 'Maintenance Allowance' @ Rs.3000/- per month to all the displaced families on vacation of land/house for a period of one year from the date of vacation.

Resettlement benefits for PAPs opting for self relocation – Cost Component:  
Rs.4.99 Crores

Description of Item	No of PAPs	Unit Cost	Total
		[ In Lakh Rs.]	[ In Crs Rs.]
Cash in Lieu of Homestead Land	64	0.75	0.48
House Building assistance	64	0.60	4.224
Maintenance Allowance/family	64	0.36	0.23
Transportation Grant/family	64	0.07	0.019
Assistance for Temporary Shed	64	0.05	0.038
<b>TOTAL</b>			<b>4.991</b>

Provision for Encroachers: An encroacher family who is homestead less as defined in the Orissa Prevention of Land Encroachment Act, 1972 and is in possession of the encroached land at least for a period of ten years continuously prior to the date of notification under relevant law(s) declaring intention of land acquisition will get ex gratia equal to compensation for the similar category of homestead land against the encroached homestead land up to a maximum of 1/10th of an acre. While determining the extent of land for such compensation the homestead land held by him/her is to be taken into account. The ex gratia will be in addition to the actual cost of structures thereon. If the encroachment is found to be objectionable, (s)he will be entitled to the cost of structure only.

Financial outlay for Encroachers: Rs.35.25 Crores

Provisions for encroachers ( Land Cost has been taken as weighted average of cost of Govt land under CBA Act @ 6.705Lacs and Govt Land under LA Act @ 1.933 Lacs			
GM Land	82	15.00	1230.00
Forest Land	153	15.00	2295.00
<b>TOTAL</b>			<b>35.25 Crs</b>

**Additional Compensation for Multiple Displacement** In accordance with the provisions laid down by the Orissa R&R Policy, Clause 3(iv), additional compensation amounting to 50% of the normal compensation payable, shall be paid to each displaced family over and above the normal compensation in the form of ex-gratia. It is assumed that about 10 original families having land to the extent of 20 acres would be covered under the above mentioned provision.

**Additional compensation for multiple displacement – Cost Component:**

Rs.3.75 Crores

Description of Item	Extent of Land	Unit Cost (In Lakh Rs.)	Total (In Crs Rs.)
Additional compensation for multiple displacement @ 50% of normal compensation over & above compensation for land	50 acres	7.50	3.75

**Rehabilitation Benefits**

**Opportunities for Employment:**

NTFC shall not provide employment in its establishment directly to a person eligible for employment owing to displacement, as the mining activity shall be carried out through a Mining Developer and Operator (MDO), for the life of the Mine. For the jobs generated by MDO, PAFs would be accommodated based on their suitability and availability.

- e) **One time Cash Assistance in-lieu of employment** NTFC shall pay double the amount prescribed in the R&R policy 2006 for different categories, as on date of disbursement, as one time cash assistance in lieu of employment to the eligible persons as applicable to different eligible categories. The categories of PAFs shall be decided and approved by the State Govt viz:

**Categories as per CPRR-2006**

Categories	No of PAFs	Amount (Lakh Rs.)	Total
Category I: Displaced families losing all land including homestead land	318	14.94	47.51
Category II: Displaced families losing more than 2/3rd of agricultural land and homestead land	27	0.90	2.42

Category-III Families losing all agricultural land but not homestead land	30	5.90	2.33
Category-IV Displaced families losing more than 1/3rd of agricultural land and homestead land	142	3.0	4.26
Category-V Displaced families losing only homestead land but not agricultural land	215	3.0	6.45
Category-VI Families losing agricultural land in part but not homestead land	206	3.0	6.18
<b>SUB-TOTAL (b)</b>			<b>59.15 Crores</b>

b) Monthly Financial Assistance/ Annuity: NTPC shall provide monthly financial assistance through an approved Annuity Scheme of LIC of India or similar organization (as approved by IRDA) as a social security measure to all eligible families for employment as per the Orissa RRZ policy 2006 who avail one time cash assistance in lieu of employment. The features of the scheme shall be as follows:

- The scheme is mandatory for all families eligible for employment and receiving one time cash compensation, in order to ensure financial security on a long term.
- The scheme shall be applicable for people eligible for employment in the age group of 18 years and above. The benefit shall be available for a term of 25 years or till the life of the annuitant, whichever is earlier.
- The Annuity payable shall be Rs.3000/- per month (Rupees Three Thousand per month/ Rupees Thirty Six thousands annually), as per the proposal approved by IRDA.
- The scheme shall come into force six months after the date from which eligible person dismantles his/her house/ structures, hands over possession to Govt/NTPC, hands over possession of land and evacuates the village.

No. of PAPs eligible for employment	Amount (In Lakh Rs.) @ Rs.3000/- per month for 25 years	Amount (Rs.)
947	9.0	6.52 Crs

The estimated financial outlay for providing Annuity for 947 PAPs for 25 years, shall be Rs.6.52 Crores approximately.

c) **Training for Self-employment:** NTPC Ltd. DLOMP, under the guidance of the District Collector, Sundargarh concerned will make adequate arrangements for development of entrepreneurship, technical and professional skills for self employment. Vocational training shall be imparted to at least one member of each displaced other family so as to equip him/her to start his/her own small enterprise and refine his/her skills to take advantage of new job opportunities. Training on Tailoring, Tie and Dye, Applique & Patch Work, Machine Embroidery, Computer knowledge to women and Mobile repairing, Masonary, Plumbing, Electrician, Computer knowledge, Driving etc for men, are being imparted/ planned to be imparted. For those engaged in traditional occupations/ handicrafts/ handlooms, suitable training shall be organized at the cost of project authority to upgrade their existing skills. Training on food processing, mushroom cultivation, computer courses, poultry farming, dairy farming, sewing etc could open new avenues for self employment in the region.

The NTPC shall invite applications from trainees among affected families for training on various courses. Applicants would be required to submit their applications along with certificate of land acquired from the appropriate authority, income certificates, educational qualifications and caste certificate etc. The scheme is a welfare scheme for the PAFs and would in no way confer any right on the PAFs for financial assistance. In case provision of all infrastructural facilities are not available for conducting the training courses, concerned State Govt department shall be consulted to facilitate training to the applicants. Necessary expertise/ Resource persons required for the training program shall be drawn from professional agencies/ State Govt departments. All expenditures amounting to the same arising thereon, shall be borne by the user agency.

d) **Merit Scholarship Scheme:** To improve and encourage the literacy and educational standards in the project area and to create a pool of potential candidates, NTPC shall introduce a Merit Scholarship scheme for the wards of the Project affected families. If the wards from the affected families are not eligible/available, the same would be extended to the wards in the vicinity villages. The scholarship so decided, shall be applicable for the duration of the course. Applicants would be required to submit their applications along with certificate of land acquired from the appropriate authority, income certificates, educational qualifications and caste certificates etc. The requiring body would reserve the right to increase/decrease the number of beneficiaries or change the no of beneficiaries in different disciplines, depending on the availability of the students etc.

Currently, scholarship is being extended to candidates of wards from affected villages, undergoing technical course in various colleges. The amount of scholarship changes depending

upon the course. Rs. 1000/- per month for (VI) Rs. 1200/- per month for Diploma and Rs. 1500/- per month for Engineering.

Apart from this, it is being planned to set up a Polytechnic at Zinc colony jointly with Darlipalli STPP for the youths for imparting Diploma in Engineering, wherein training courses shall be provided on specific industry based traits.

e) **Shops and Service units:**

(i) **Shops and Service Units:** NTPC Ltd shall also construct shops and service units at leaseable locations at their own cost, which will be allotted in consultation with Collector to project displaced families opting for self employment. While allotting such units, preference will be given to physically challenged persons and members of displaced SC & ST families.

f) **Proposed Rehabilitation Colony**

1. The Rehabilitation and Resettlement colony has been proposed to be established in Kalamegha village.
2. Specific care has been taken to minimise the land requirement for the R&R colony, to ensure that there is no displacement arising out of acquisition of the land.
3. All displaced families having opted for resettling in the R&R colony shall be allotted land with houses in the colony.

g) **Salient features of the R&R Colony**

NTPC shall design and plan the resettlement villages at Kalamegha, Hengir Tuhail and shall construct individual houses. The Rehabilitation habitat shall have all the basic amenities and facilities like Road, Drainage, Electricity, Drinking water, School, Anganwadi, Community center, Religious place of worship, Cremation ground, Market place, Shopping center, Primary health center, Veterinary clinic, Village Pond, Bus Stand, Panchayat Ghar, Park, Grazing Ground etc, for the resettlement of the displaced families of the project.

Each family shall be provided with a house of size @ 1000 sq. ft. super built area, including cowshed and staircase, constructed over the homestead land allotted to all displaced families, who shall opt for resettlement in R&R Colony. Record of Rights of the land and houses allotted

to the displaced persons shall be handed over to the residing families by the District Administration while resettling them in the Resettlement colony.

**ESTIMATED COST OF R&R COLONY & INFRASTRUCTURE FACILITIES: Rs.75.01 Crs**

SL NO	Activity	Total Est. Value ( Lakhs Rs.)
1	Houses for PAFs (430 Nos)  Built up area for house= 99.02 Sq.mts including Covered and Staircase	5390.02
2	Other Misc Building  a) Primary School b) Anganwadi c) Community center d) Tribal Center e) Primary Health Center f) Veterinary Clinic g) Panchayat Office h) Shopping Center	568.75
3	Other Infrastructure  a) Worship Places b) Play Grounds c) Park d) Community Pond e) Pasture Land f) Durg/Cremation Ground	164.93
4	Hub Services  a) Road / Drains / Bridges and Culverts b) Boundary & gate complex c) Water supply d) Sewerage system (Sewage Disposal System Network and Sewage Treatment Plant) e) External electrification	1387.00
<b>SUB-TOTAL</b>		<b>7501.00</b>

- h) Special benefits to displaced indigenous families and primitive tribal groups :

As per the OPRR-2006, Clause- 13, special provisions have been kept for indigenous families and primitive tribal groups as mentioned below

- While developing the resettlement plans, the socio-cultural norms of indigenous and primitive tribal groups have been kept in mind.
- All attempts are being made to resettle the indigenous communities in a compact area close to their natural habitat.
- A programme for development of alternate fuel, fodder and non-timber forest produce (NTFP) resources on non-forest lands within a period of five years sufficient to meet requirements of tribal communities

### 13. Planning and Implementation of R&R Plan

In order to encourage participation of displaced people and their elected representatives in implementation and monitoring of R & R package, to oversee and monitor periphery development, a Rehabilitation and Periphery Development Advisory Committee (RPDAC) for the project has been formed (As per OPRR-2006, Clause-17). This committee under the chairmanship of the Revenue Divisional Commissioner, includes people's representatives, one or two leading NGOs of the affected area and select Government officers.

#### (a) State Level Council on Resettlement and Rehabilitation (SLCRR) :

At the State level, there will be a Council headed by the Chief Minister to advise, review and monitor implementation of Resettlement and Rehabilitation Policy. The Council may comprise of Ministers, select representatives of the people, leading social activists, academicians and experts of national and international repute and senior officials of the Government.

(b) IA and R & R Structure:

(a) State Level:

A Directorate of R & R will be constituted to discharge and oversee the implementation of the R&R Policy. Detailed structure and functions of this Directorate will be notified by the Government.

(b) District / Project Level:

Depending on magnitude of the RR works at the project level, there may be a Project Director, Resettlement and Rehabilitation (PD-RR), who shall be assisted by such other officers as Government may decide. The PD-RR shall be the Chief Coordinating Officer between all the line departments in the matter of resettlement and rehabilitation. He will be responsible for implementation of the Policy and timely execution of R & R works under the over all supervision and guidance of the Collector and the Directorate of R&R. (ii) Where R & R work is of lesser magnitude, the same can be undertaken by the LAO of the Collectorate.

(c) Budgetary Provision and Allotment:

Wherever required, adequate budget provision will be kept towards land acquisition and R & R establishments to ensure effective implementation of R & R Policy. The Directorate of R&R would submit such budgetary estimates works by 1st January of every year. Government will ensure timely release of allotment to the concerned authorities.

(d) Grievance Redressal Mechanism:

An effective Grievance Redressal Mechanism will be set up at District and Directorate level to deal with grievance of the project displaced people relating to land acquisition, resettlement and rehabilitation. Besides, all the project authorities shall be asked to set up an effective Grievance Redressal Mechanism relating to their project. Effective participation of the displaced communities will be ensured in the process.

14. Initial Community Development and Corporate Social responsibility activities

The Community Development projects of NTPC are aimed at communities of the targeted villages, the endeavour being to improve the quality of life of the people. In order to make a long term impact, the concentration would be on providing access to basic amenities on water, sanitation, roads, health, education and relevant infrastructure.

In this regard, under the chairmanship of the Collector and District Magistrate, a Periphery Development Society, has been formed with members comprising of several govt departments and other people representatives. The funds for community development would be deposited with the Committee in the ratio of 70, 30, 70 for the project allotted villages and periphery, Block level and District level respectively. A total of Rs. 30 crores ( Rupees thirty Crores) is planned to be earmarked for a period of 5 years (2016-2017).

As part of the company's commitment towards Corporate Social Responsibility, community development activities have been taken up across 5 major verticals of Education, Health, Training/Empowerment, Infrastructure Upgradation, few of which are mentioned as follows:


- Distribution of dresses to Anganwadi children
- Distribution of School Bags to children
- Distribution of Drum Set, Jersey set to schools
- Distribution of Cooking Kits to Anganwadis
- Sweaters to Senior and Anganwadi children
- Study kits to School students and Anganwadi kits to Anganwadi children
- Distribution of Cricket and Football kits to village clubs
- Providing Aquaguard to Govt office at block and district level
- Distribution of Durges to Anganwadis and village clubs
- Installation of Solar Street Lights in villages and govt offices
- Distribution of Solar Lanterns to meritorious students
- Distribution of Blankets and Mosquito nets to villages
- Providing assistance to education
- Organising competitions in schools
- Sponsoring Science Exhibition
- Sponsoring major sports events in the locality
- Cleaning and Deeping of village Ponds
- Organizing village Sanitation work
- Constructing temporary check dams across Nalas
- Providing Visiting Chair sets to Govt offices
- Renovation of Jagannath temple at Sundargarh
- Renovation of Cultural complex at Sundargarh
- Conducting regular Health check up camps in villages and free distribution of medicines
- Providing Water purifiers and Airers in Gram Panchayat offices

- Organizing Cataract operation camps
- Providing Musical instruments to cultural groups in villages
- Providing school infrastructures in schools
- Barbed wire fencing in schools
- Repair work and Whitewashing in schools
- Construction of Bridge at Kalamegha village
- Strengthening of Roads
- De-silting of Ponds
- Providing Culverts and Causeways
- Construction of Community halls/ Club houses
- Providing Drinking Water through Bore wells & Overhead tanks
- Sponsoring cultural celebrations in villages
- Providing training on Tailoring, Tie & Dye to women
- Driving Training to Men
- Computer Education training to villagers
- Summer Camps to promote extra-curricular abilities in children


Efforts are on to provide vocational training to at least one member of each displaced/other family so as to equip him/her to start his/her own small enterprise and refine his/her skills to take advantage of new job opportunities. For those engaged in traditional occupations/ handicrafts/ handlooms, suitable training shall be organized at the cost of project authority to upgrade their existing skills. As per need assessment survey conducted by the project with active participation from various govt departments, namely District Industries Commission, Women and Child welfare, etc, several areas for training have been identified, both individual and group based.

#### 15. TOTAL PROPOSED FINANCIAL OUTLAY FOR R&R PLAN:

Resettlement Package:	Rs. 91.03 Crores
Provision for Encroachers:	Rs. 35.25 Crores
Provision for Multiple Displacement:	Rs. 3.75 Crores
Rehabilitation package.	Rs. 77.67 Crores
Community development:	Rs. 30.00 Crores
<b>TOTAL</b>	<b>Rs.237.70 Crores</b>

  
 श्री. आर. बरिहिक A.R. BARIK  
 अवर महासंचालक-प्रभारी  
 Awer General Manager/IC  
 उद्योग विभाग, NITFC Limited  
 (एन एफ सी) कोयला क्षेत्र  
 Durgaga Coal Mining Project.

  
 LAND ACQUISITION OFFICER  
 HEMGAR

  
 COLLECTOR SONDARGARH

## Medical camp



## Free Medical check up & Cataract Operation



# ICD GALLERY (CAPACITY BUILDING)

Tailoring training at SEAM



## Tailoring training for Women



## Tie and Dye Training to project affected villages



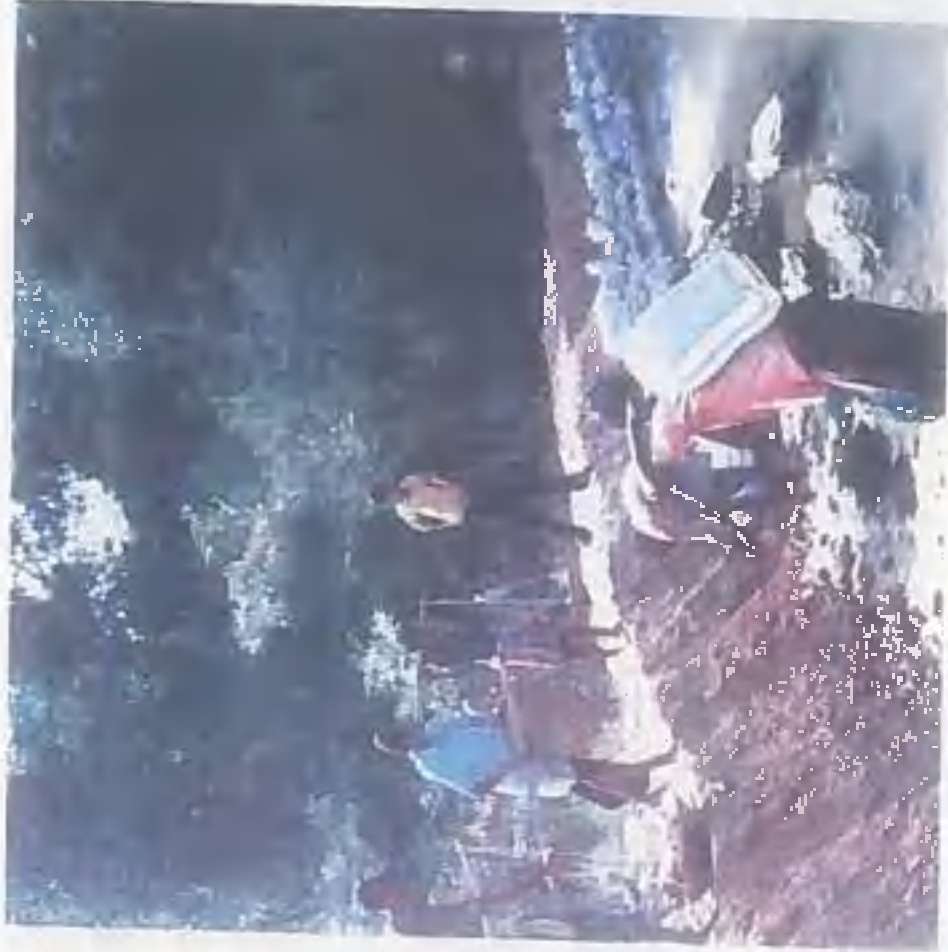
## DRIVING TRAINING



## Study kit & School Dress distribution



## Construction of check dam



**Cooking Kit & solar lantern**



## Solar street light distribution and sponsorship in science exhibition



Cricket Kit distribution at Majhapada



Cricket Kit distribution at Beldihi

## Mosquito net distribution and sponsorship for cricket tournament



## Distribution of School infrastructures and Lantern to Students



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At Old-age Home, Ravandihi



## Art and Music Training



## veterinary Training

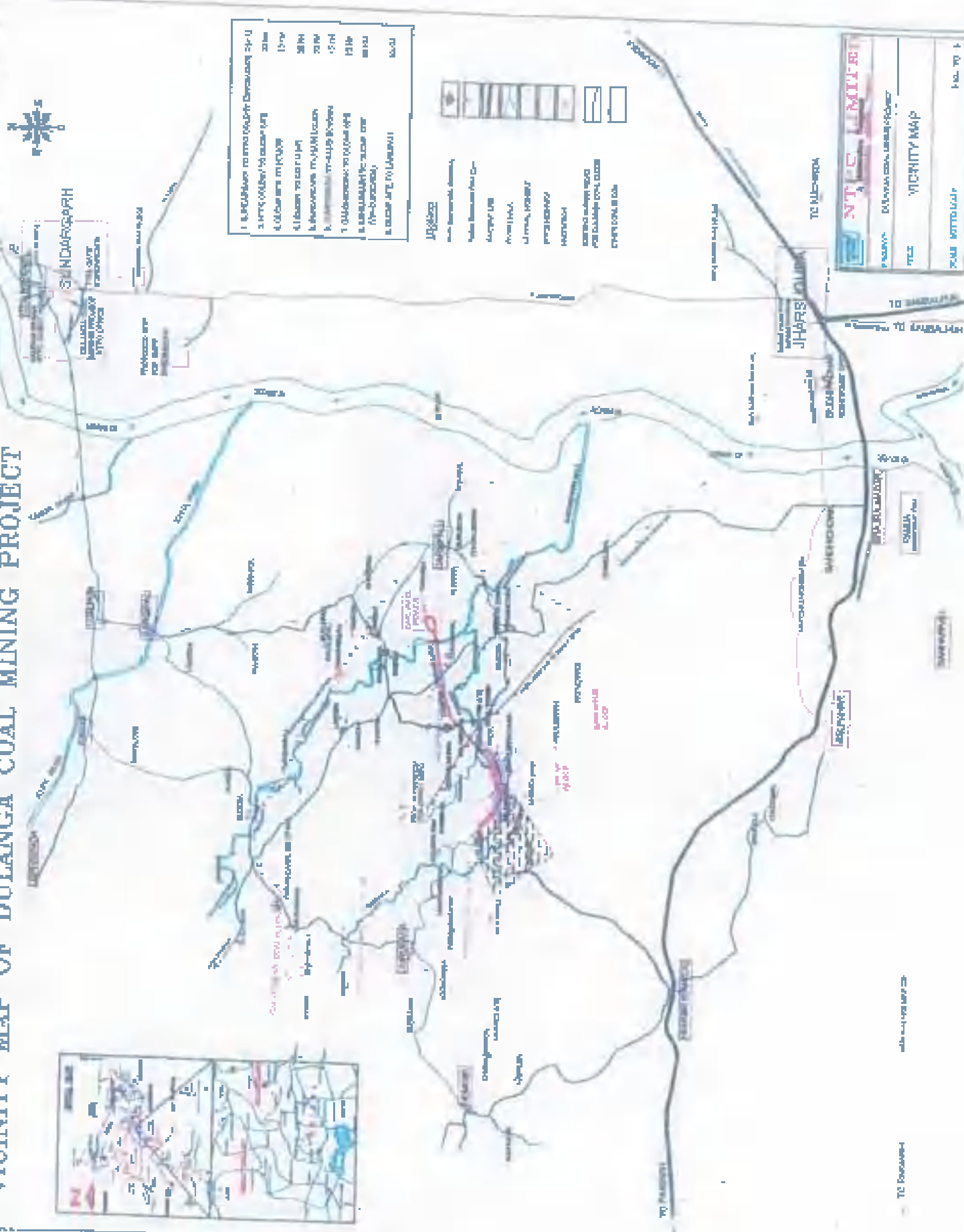
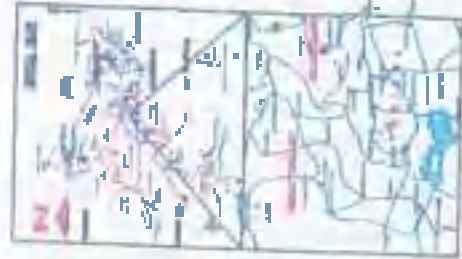


30.05.2013

## Mobile Repairing Training



# VICINITY MAP OF DULANGA COAL MINING PROJECT



Sl. No.	Particulars	Area (Hectares)	Total
1	Area reserved for the project	1000	1000
2	Area reserved for the project	1000	2000
3	Area reserved for the project	1000	3000
4	Area reserved for the project	1000	4000
5	Area reserved for the project	1000	5000
6	Area reserved for the project	1000	6000
7	Area reserved for the project	1000	7000
8	Area reserved for the project	1000	8000
9	Area reserved for the project	1000	9000
10	Area reserved for the project	1000	10000

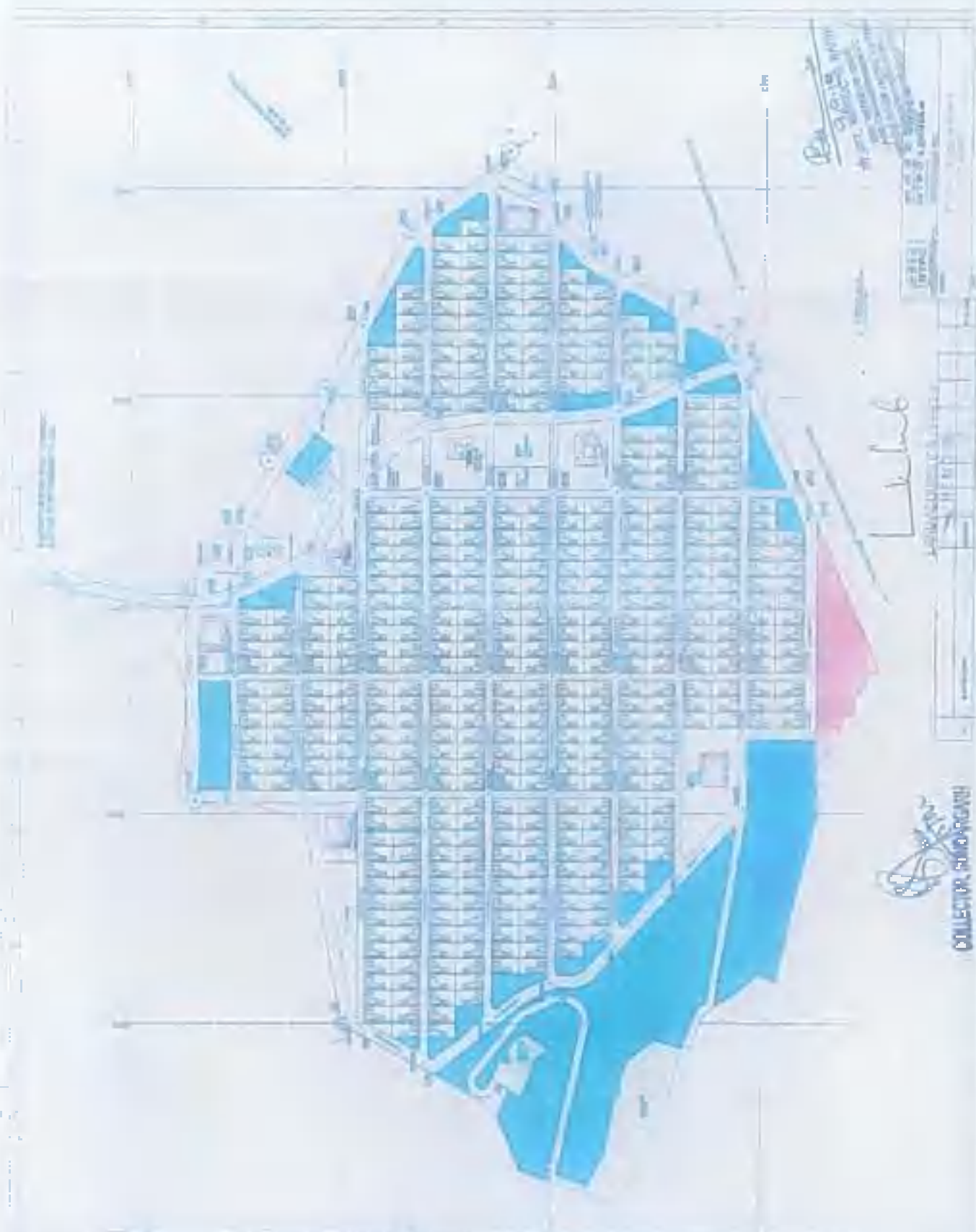
- 1. State Road
- 2. District Road
- 3. Village Road
- 4. Canal
- 5. River
- 6. Railway
- 7. Boundary
- 8. Forest
- 9. Cultivable
- 10. Uncultivable

**NTIC LIMITED**  
 National Technical Institute for Coal and Allied Industries  
 P.O. Box 10, Ranchi - 834 001, Jharkhand  
 Phone: 0659-2531111, 2531112, 2531113, 2531114, 2531115, 2531116, 2531117, 2531118, 2531119, 2531120, 2531121, 2531122, 2531123, 2531124, 2531125, 2531126, 2531127, 2531128, 2531129, 2531130, 2531131, 2531132, 2531133, 2531134, 2531135, 2531136, 2531137, 2531138, 2531139, 2531140, 2531141, 2531142, 2531143, 2531144, 2531145, 2531146, 2531147, 2531148, 2531149, 2531150, 2531151, 2531152, 2531153, 2531154, 2531155, 2531156, 2531157, 2531158, 2531159, 2531160, 2531161, 2531162, 2531163, 2531164, 2531165, 2531166, 2531167, 2531168, 2531169, 2531170, 2531171, 2531172, 2531173, 2531174, 2531175, 2531176, 2531177, 2531178, 2531179, 2531180, 2531181, 2531182, 2531183, 2531184, 2531185, 2531186, 2531187, 2531188, 2531189, 2531190, 2531191, 2531192, 2531193, 2531194, 2531195, 2531196, 2531197, 2531198, 2531199, 2531200

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**COLLECTOR**

**MAJOR**  
**FUNCTIONS**

OFFICE OF THE COLLECTOR AND DISTRICT MAGISTRATE, SUNDARGARH

No. 1006 /Dt. 06/09/2013

From

Bhupendra Singh Poonia, IAS  
Collector & District Magistrate,  
Sundargarh.

To

The Managing Director,  
Orissa Power Generation Corporation,  
Bhubaneswar.

Sub:

Payment of land rate for land owners of Mining project at  
Manoharpur.

Sir,

This is with reference to the above captioned subject, indicating the detailed outline of the land rate compensation as well as the R&R package for the project affected people of Manoharpur Coal Mining project.

As per the previous discussion and meetings held with the land loser of Manoharpur, Sundargarh basing on prevalent land price, demand of the local people and in consultation with all the stakeholders, a flat rate of Rs.15.00 Lakhs per acre for all types of land irrespective of class is approved keeping the R&R package offered by OPGC intact.

You are requested to take up the land compensation process at the earliest & inform my office about the project developments on regular basis.

Yours faithfully

Collector, Sundargarh

Memo No. 1007 /Dt. 06/09/2013


Copy to AGM, I/C Dulanga Coal Mining Project, NTPC Ltd., Sundargarh for information and necessary action. He is requested to go ahead with the land acquisition and payment of compensation process for Dulanga Coal Mining Project matching with the OPGC package which has been agreed upon in toto as per the communication made by the NTPC vide letter No.0100/NTPC/DLCMP/2190 dt.19.08.2013. A copy of the R&R package for NTPC Dulanga Coal Mining Project, Sundargarh to OPGC is enclosed for your reference.

Collector, Sundargarh

## RESETTLEMENT and REHABILITATION

The resettlement colony shall be set up at Kalamegha village as decided upon in the Gram Sabha and RPDAC meeting. The colony shall contain all basic infrastructures like Primary health Center, Primary school, Post Office, Bank, Panchayat Bhawan, Worship places, Playground, Park, Community pond, Burial Ground, Drainage and Water Supply.

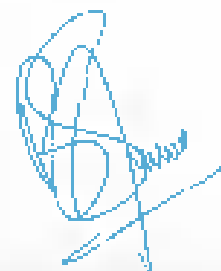
- I. Displaced family (ies) who have opted (through an affidavit) for self-relocation elsewhere, will receive all the benefits such as
  - a. Land compensation, compensation towards tree and structure cost if any.
  - b. Rehabilitation assistance as per R & R Policy 2006 comprising of onetime cash grant in lieu of homestead land, house building assistance, maintenance allowance, transport allowance, as applicable, shall be paid to the family only after dismantling the house / other structures in the village, handing over possession to Govt. / NTPC and physical evacuation from the village.
  - c. For families who are dismantling their house / other structures in the village, handing over possession to Govt. / NTPC and evacuating the village, in lieu of assistance for temporary shed, NTPC shall pay to the person house rent assistance @ Rs. 1000/- per month from the date of physical evacuation for a period of six (6) months. The persons concerned shall submit an affidavit to avail this benefit to Land Acquisition officer before any disbursement is made.

  
COLLECTOR  
SUNDARGARH

- d. If a displaced person is unable to carry all the materials such as wood etc immediately after dismantling his/her house in the village and willing to keep it in his/her own plot for some time till he / she transports it to his/her relocated area, NTPC will facilitate for watch and ward for a period of 15 days. NTPC shall not be responsible for this material after 15 days.

2. ...Displaced family -(ies)-who have opted (through an affidavit) for relocation to R&R colony will receive all the benefits such as

- a. Land compensation, compensation of tree and structure if any.
- b. Rehabilitation Assistance as per R & R Policy 2006 comprising of onetime cash grant in lieu of homestead land, house building assistance, maintenance allowance, transport allowance, as applicable will be paid to the family only after dismantling the house / other structures in the village and handing over possession to NTPC.
- c. For families who are dismantling their house / other structures in the village, handing over possession to Govt. / NTPC and evacuating the village, in lieu of assistance for temporary shed, NTPC shall pay to the person house rent assistance @ Rs. 1000/- per month from the day of physical evacuation for a period of eighteen (18) months. The persons concerned shall submit an affidavit to avail this benefit to Land Acquisition officer.
- d. If a displaced person is unable to carry all the materials such as wood etc immediately after dismantling his/her house in the village and willing to keep it in his/her own plot for some time transport to his/her relocated area, NTPC will facilitate for watch and ward for a period of 15 days. NTPC shall not be responsible for this material after 15 days.



## A. RESETTLEMENT

NTPC will design and plan the resettlement village at Kalamegha, Hengir Tahasil and will construct individual House. The Rehabilitation habitat shall have all the basic amenities and facilities like road, drainage, electricity, drinking water, school, anganwadi, children's park, community centre, PDS, ponds, religious shrine, grazing land, cremation ground, etc., for the resettlement of the displaced families of the project.

NTPC will provide land measuring Ac. 0.10 decimal for homestead purpose to each displaced family who shall opt to resettle himself / herself (consent through an affidavit) in the R&R colony. Land Patta of the Homestead land will be provided to each eligible family at the time of handover of the individual house. The displaced family (ies) who have opted for self relocation elsewhere shall be given cash grant Rs.75,000/- in-lieu of house plot.

NTPC shall provide a house of size @ 1000 sq. ft. super built area, including cow shed and staircase, constructed over the homestead land allotted to all displaced family who shall opt (consent through an affidavit) to resettle in the Resettlement Habitat at Kalamegha.

A displaced family who chooses by providing consent through an affidavit for self-relocation elsewhere shall receive house building assistance @60% of the construction cost assessed for the house constructed by NTPC in the rehabilitation habitat at Kalamegha or house building assistance provided in the R & R Policy 2006 as on that date, , i.e Rs.6.60 Lakhs or whichever is higher.

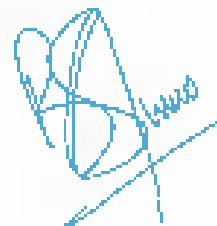
(As proposed by OPGC, the cost of constructing house in R&R colony would be Rs.11 Lakhs approx. Therefore house building assistance being proposed as 60% of the cost, would be Rs.6.60 Lakhs approx.)



1. If in a family more than one person is entitled for resettlement house in the Resettlement Habitat owing to his/her displacement and not wanting to have a constructed house on their allotted homestead land of Ac.0.10 decimal, such displaced person shall provide consent through an affidavit and he/she shall be entitled to receive house building assistance @60% of the construction cost assessed for the house constructed by NTPC in the rehabilitation habitat at Kalamegha or house building assistance provided in the R & R Policy 2006 as on that date, i.e Rs.6.60 Lakhs or whichever is higher.
2. The eligible displaced families are required to submit their preferences through an irrevocable affidavit on or before the cut off date mentioned by the company.

## **B. REHABILITATION**

1. NTPC shall not provide employment in its establishment directly to a person eligible for employment owing to displacement, as the mining activity shall be carried out through a Mining Developer and Operator (MDO), for the life of the Mine. For the jobs generated by MDO, PAPs would be accommodated based on their suitability and availability.
2. NTPC shall pay double the amount prescribed in the R & R Policy 2006 for different categories, as on date of disbursement, as one time cash assistance in-lieu of employment to the eligible persons as applicable to different eligible categories.

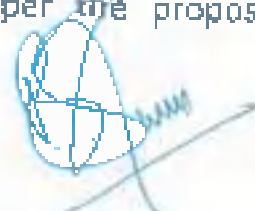


PAP Category	As per OPRR* (In Lakhs Rs.)	Proposed by NTPC* (In Lakhs Rs.)
Category-I	7.47	14.94
Category-II	4.48	8.96
Category-III	2.99	5.98
Category-IV	1.5	3.00
Category-V	1.5	3.00
Category-VI	1.5	3.00

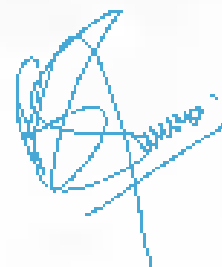
\*Rates are as per prevailing rates mentioned in OPRR-2006 & its subsequent amendments.

3. Besides the above, NTPC shall provide monthly financial assistance through an Approved Annuity Scheme of LIC of India or similar organization (as approved by IRDA) as a social security measure to all eligible families for employment as per the R&R Policy 2006, who avail one time onetime cash assistance in lieu of employment. The features of the scheme are as follows:

- a. The scheme is mandatory for all families eligible for employment and receiving one time cash compensation, in order to ensure financial security on a long term.
- b. The scheme shall be applicable for people eligible for employment in the age group of 18 years and above. The benefit will be available for a term of 25 years or till the life of the annuitant, whichever is earlier.
- c. The annuity payable will be @ Rs.3000/- per month (rupees three thousand per month / Rs.36,000/- annually), as per the proposal approved by IRDA.



- d. The scheme will come into force six (6) months after the date from which the eligible person dismantles his / her house / structures, hands over possession to Govt. / NTPC, hands over possession of land and evacuates the village.
4. NTPC will provide "Maintenance Allowance" @ Rs.3000/- per month to all the displaced families on vacation of land/house for a period of one year from the date of vacation.
  5. NTPC will provide transportation allowance of Rs.3,000/- or free transportation for shifting to the resettlement location or their new place of inhabitation.
  6. Skill development training will be given to displaced persons as per their eligibility and suitability to make them employable, so as to pursue employment opportunity in the mining or elsewhere.
  7. NTPC shall construct shops and service units at appropriate locations. It will be distributed to eligible displaced families as per the rule prescribed in Odisha R&R Policy 2006.
  8. NTPC will also provide vocational and capacity building training to all the project displaced persons to take up sustainable livelihood activities.



Proceedings of the meeting of the 3<sup>rd</sup> RPDAC of Dulanga Coal Mining Project of NTPC Ltd. under Hamgrh Tehasil of Sundargarh District held on 28.04.2012.

1. Meeting - 3<sup>rd</sup> meeting of the Rehabilitation & Periphery Development Advisory Committee of Dulanga Coal Mining Project of NTPC Ltd. for Sundargarh District.
2. Place - Pragati Mandap, Sundargarh.
3. Chairperson - Sri Kishore Chandra Barik, IAS, Revenue Divisional Commissioner, Northern Division, Sambalpur.
4. Date - 28.04.2012.
5. Time - 11.00 A.M.
6. Members - As per annexure-1.

The 3<sup>rd</sup> RPDAC of NTPC, Dulanga Coal Mining Project was held at Pragati Mandap, Sundargarh under the Chairmanship of Sri Kishore Chandra Barik, IAS, Revenue Divisional Commissioner, Northern Division, Sambalpur on 28.04.2012. The list of members and other official persons in the meeting is enclosed at Annexure 'A'. At the outset Collector, Sundargarh welcomed the chairman and other members of the RPDAC and briefly discussed the purpose of this meeting. She requested the Revenue Divisional Commissioner to preside over the meeting.

Initiating the discussion, the Revenue Divisional Commissioner advised NTPC to give a brief presentation on activity and present status of coal mines as to appraise the house. DGM(I/C), Dulanga Coal Mining Project informed the house that Dulanga Coal Mining Project (with 7 MT Capacity) has taken up various activities subsequent to 2nd RPDAC as detailed below :

**1) Peripheral developmental activity :**

Dulanga Coal Mining Project is taking up regular initial community development activities in various fields like Health, Education, Drinking water and other enabling work like construction of culverts, approach road at Kathfal, renovation of club house at Dulanga, providing drinking water through Bore well in

affected villages, facilitating driving training etc. In addition to above one year activity for the project as approved by the District Administration is being taken up. For the rest 4 years the committee has been constituted under the chairmanship of Sub-Collector is in the process of finalization actively.

**2) Acquisition of balance land at Village Beldih :**

DGM (1/C) informed that as advised by RDC in the 2<sup>nd</sup> RPDAC meeting proposal for acquisition of 65.25 acres in Beldih village has been put up to State Government through IDCO for which necessary administrative approval has already been accorded. The process for Section 4(1) notifications is in advance stage.

**3) Socio Economic Survey :**

M/s. KIMB is conducting the Socio- economic Survey in the project affected villagers. The reports shall be put up to the RPDAC after publication of Section 4(1) notification and subsequent finalization of report. Also the asset valuation for the remaining villagers shall be taken up shortly with the help of PWD.

**4) Employment for Project Affected Families (PAFs) :**

NTPC explained that the mining activities shall be done through Mine Developer Cum Operator (MDO). For the jobs generated by MDO, PAFs would be accommodated based of their suitability and eligibility.

In lieu of employment, cash compensation as mentioned for different categories under OPRR-2006 and its amendment shall be provided to the PAF.

**5) Rehabilitation and Resettlement :**

NTPC informed that as discussed in the 2<sup>nd</sup> RPDAC meeting, R&R Colony shall be established at Kalamegha for which private land measuring 39.19 acres has already been applied to State Government through IDCO. Administrative approval for the same has already been accorded by State Government. The Section 4(1) notification is to be processed by District office. For the balance 63.60 acres of Government land application has been submitted to State Government

through IDCO. On availability of land, NTPC shall take up construction of R&R colony and shall provide all basic infrastructure facilities in the colony as per OPRR-2005 and its amendments.

NTPC informed that scholarships shall be provided to eligible candidates from PAFs under taking ITI training.

#### 6) Land rate Finalisation :

Subsequently, Collector, Sundargarh informed the house there has been several meetings with the villagers for finalization of land rate. In this context, she requested the representatives from villagers to put up their opinions.

Villagers demanded for 20 lakhs/acre, 30 lakhs/acre & 40 lakhs/acre of compensation depending upon direct employment through NTPC, through MDO or no employment. OPGC proposed for a land rate of Rs 10 lakhs/acre (prevailing land rate in the project area + Exgratia) along with two times the amount for cash in lieu of employment as per the provisions of OPRR-2005 and its amendments (i.e.  $2 \times \text{Rs } 6.21 \text{ lakhs} = \text{Rs } 12.42 \text{ lakhs}$  for Category-A PAF and as applicable for other categories). NTPC in-principle agreed over the proposal. But Villagers didn't agree over the proposal. Finally RDC decided that the land rate sub-committee consisting of Village representatives, NTPC officials, state govt. and other stake holders under the chairmanship of Collector shall finalise the land rate. The next meeting of the sub-committee shall be held within a week.

The meeting was closed with vote of thanks to the chair & the participants.

Collector, Sundargarh  
& Convener, RPDAC

Revenue Divisional Commissioner,  
Northern Division, Sambalpur-cum-  
Chairperson, RPDAC

Memorandum - 797 dt. 1.6.12.

Copy to all members for kind confirmation.

LAND ACQUISITION OFFICER  
SUNDARGARH



# ORISSA RESETTLEMENT AND REHABILITATION POLICY, 2006

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# The Orissa Gazette

EXTRAORDINARY  
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No. 651, CUTTACK, MONDAY, MAY 15, 2006/ BAISAKHA 25, 1928

[No.18040-R & REH-1/06/R.]

REVENUE DEPARTMENT  
RESOLUTION

The 14th May 2006

Sub: ORISSA RESETTLEMENT AND REHABILITATION POLICY, 2006

In order to ensure sustained development through a participatory and transparent process, Government have framed a comprehensive resettlement and rehabilitation policy. Basic objectives of the policy are: —

1. to avoid displacement wherever possible and minimize it exercising available options otherwise,
2. to recognize voices of displaced communities emphasizing the needs of the indigenous communities and vulnerable sections,
3. to ensure environmental sustainability through participatory and transparent process, and
4. to help guiding the process of developing institutional mechanism for implementation, monitoring, conflict resolution and grievance redressal.

With the above objectives in view, Government has been pleased to lay down the following policy guidelines :

ORISSA RESETTLEMENT AND REHABILITATION POLICY, 2006

## PREAMBLE

Government of Orissa has been pursuing various development initiatives to improve the quality of lives. Ensuring social justice being one of the major cornerstones of development, the Government always proactively tries to make sure people's participation in development process. In spite of Government's intention to bring development to the people, development interventions do at times create undesirable consequences. Displacement due to large development projects is one such phenomenon. Government of Orissa has been responding to this problem through

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various projects specific Resettlement & Rehabilitation Policies and Plans. The current intervention of policy formulation has actually taken note of the lessons learnt through these past policies, which essentially reflects Government's genuine spirit of learning and retrospection. The present policy draws its strength from experiences from the implementation of past policies, best practices in other States and Orissa Government's Industrial Policy Resolution, 2001. Consultation with various direct and indirect stakeholders including civil society of the State has been conducted, and the views of the academicians and specialists in the field of resettlement and rehabilitation have been considered as a part of democratic response of the Government in Policy formulation. Limitations of the past policies have been acknowledged and analyzed and a flexible framework has been attempted, which nonetheless demonstrates the dynamism of the Government. Unlike many other policies, there is a strong focus on the modalities of implementation of this Policy that makes it a vibrant instrument to promote sustainable development in the State.

**2. Short Title, Application and Commencement :**

- (i) This Policy may be called as "The Orissa Resettlement and Rehabilitation Policy, 2008" and shall come into effect from the date of its publication in the Orissa Gazette.
- (ii) It shall apply to all those projects, for which acquisition of private land under Land Acquisition Act, 1894 or under any other law's for the time being in force or proclamation inviting objections in case of Government land is notified.
- (iii) This shall also be applicable to all projects for which land is acquired through negotiation under the provisions of this Policy.

**3. Definitions :** In this Policy unless the context requires otherwise

- (a) "Agricultural Land" means land used or capable of being used for raising of crops, grass or garden produce, horticulture, dairy farming, fish farming, breeding and keeping of live stock and used as pasture or for any other purpose where such use is ancillary to agriculture.
- (b) "Compensation" has the same meaning as assigned to it under the Land Acquisition Act, 1894.
- (c) "Cut-off Date" for the purpose of compensation shall be the date on which the notification declaring the intention to acquire land under the relevant Act or under the provisions of this Policy is published.

**Note:** For the purpose of declaring eligibility for R & R benefits, the list of displaced families, will be updated on the 1st of January of the year in which physical displacement is scheduled to

take place provided that those families who move into the project area after determination of the "cut-off date", will not be eligible for any benefit

- (d) "Displaced Family" means a family ordinarily residing in the project area prior to the date of publication of notification under the provisions of the relevant Act and on account of acquisition of his/her homestead land is displaced from such area or required to be displaced.
- (e) "District Compensation Advisory Committee (DCAC)" means the Committee constituted by Government under relevant provisions of this Policy.
- (f) "Family" means the person and his or her spouse, minor sons, unmarried daughters, minor brothers or unmarried sisters, father, mother and other members residing with him or her and dependent on him or her for his / her livelihoods.

Note: Each of the following categories will be treated as a separate family for the purpose of extending rehabilitation benefits under this Policy.

- (i) A major son irrespective of his marital status.
  - (ii) Unmarried daughter / sister more than 30 years of age.
  - (iii) Physically and mentally challenged person irrespective of age and sex, (duly certified by the authorized Medical Board). For this purpose, the blind / the deaf / the orthopaedically handicapped / mentally challenged person suffering from more than 40% permanent disability will only be considered as separate family.
  - (iv) Minor orphan, who has lost both his/her parents.
  - (v) A widow or a woman divorcee.
- (g) "Government" means the Government of Orissa in Revenue Department.
  - (h) "Land Acquisition Officer (LAO)" means an Officer appointed by the Government by an order to perform duties as such under Land Acquisition Act, 1894, for the project and shall also include a Special Land Acquisition Officer.
  - (i) "Non-Government Organization (NGO)" means any organization duly registered under the Society Registration Act, 1960 and functioning for public cause outside the Government.
  - (j) "Original Family" means the family, which at the time of Notification under provisions of relevant Act(s) is living together in a single household with a common kitchen.
  - (k) "Periphery" means the district(s) in which the project is geographically situated.
  - (l) "Project" means the construction, extension or improvement of any work such as reservoir, dam, canal, highway, industrial plant, factory, mining, national park, sanctuary,

etc. as notified by the Government from time to time and includes its offices and establishment within the State

(m) "Project area" for the purpose of extending R & R benefits means the land, which is acquired / alienated / purchased for establishment of any project

(n) "Project Director Resettlement & Rehabilitation (PD-RR)" means an Officer appointed by the Government by an order to perform such duties under R & R Policy of the State, for the project

(o) "Rehabilitation & Periphery Development Advisory Committee (RPDAC)" means the Committee constituted by the Government under relevant provisions of this Policy by Government to look after rehabilitation and periphery development matters.

(p) "State Level Compensation Advisory Committee" means a Committee constituted by Government under the relevant provisions of this Policy.

(q) "State Level Council on Resettlement & Rehabilitation (SLCRR)" means the Council headed by the Chief Minister constituted by a notification of Government to that effect

4. Policy Objectives - Objective of the Policy of the Government in general shall be:

(a) To avoid displacement where possible and minimize it, exercising available options otherwise.

(b) To facilitate resettlement/ rehabilitation process:

(i) Recognizing voices of the displaced communities (emphasizing the needs of the indigenous communities and vulnerable sections); and

(ii) Ensuring environmental sustainability through participatory and transparent process; and

(c) To help guiding the process of developing institutional mechanisms for implementation, monitoring, conflict resolution and grievance redressal.

5. Survey and Identification of Displaced Families :

(a) Ordinarily within two months of publication of notice for acquisition of land for the development project, a socio-economic survey would be undertaken in the manner to be decided by the Government for identification of displaced families and for preparing their socio-economic baseline. .

(b) The list of displaced families shall be placed before and approved by the respective RPDAC.

- (c) The list of displaced families so approved will be displayed at Collectorate / Block/ Taluq / Panchayat and other conspicuous locations for wider dissemination.
- (d) RDC shall realistically assess the requirement of land for acquisition before issue of notification under the relevant law(s) or under the provisions of this Policy.
- (e) A socio-cultural, resource mapping and infrastructural survey shall be conducted by an independent agency to be identified by the Government to ensure proper benchmarking. It will be the responsibility of the concerned Project Authority to conduct the survey within two months of notifying the intention to acquire land under the provisions of the relevant law(s) or under the provisions of this Policy.
- (f) A comprehensive communication plan for awareness creation shall be formulated and executed in the affected area. The detailed modalities of this exercise that include involvement of civil society will be notified by the Government. The cost of implementation of this communication plan shall be borne by the project(s).
- (g) Gram Sabha or Panchayats at the appropriate level shall be consulted in scheduled areas before initiating Land Acquisition Proposal.
- (h) Normal development programmes implemented by different agencies should be dovetailed with resettlement and rehabilitation package in resettlement habitats and made available to the displaced community on a priority basis.
- (i) An identity card shall be issued to each displaced family in a manner prescribed by Government.

**5. Project Types :**

For the purpose of R & R benefits under this Policy, Development Projects are classified into the following types:

- A. Industrial Projects;
- B. Mining Projects;
- C. Irrigation Projects, National Parks and Sanctuaries;
- D. Urban Projects and Linear Projects like roads and railways, power lines; and
- E. Any other Projects.

**7. Land Acquisition and Payment of Compensation/ Award:**

Procedure prescribed by Government shall be followed in acquiring land and other property and for payment of compensation / award. All compensation money due to the "displaced families" shall be paid through account payee cheques.

As regards "public property" like School Building, Club House, Hospital, Panchayat Ghar, electrical installation, place(s) of worship, value of such property affected shall be deposited with the concerned District Collector. Either Project or District Administration shall take up construction at the place as would be determined in consultation with representatives of displaced persons.

The Project proponent may opt for direct purchase of land on the basis of negotiated price after issue of notification requiring acquisition of land under relevant Act(s). If acquisition of land through direct purchase fails, other provisions of the relevant Act may be invoked.

Land not utilized by the Project within the prescribed time limit and for the required purposes shall be resumed.

#### B. Resettlement and Rehabilitation Plan:

Based on the list approved by Government and option of displaced families, Resettlement and Rehabilitation Plan shall be prepared by the Collector for resettlement and rehabilitation after due consultation with displaced communities in the manner determined by the Government. Such plan should address the specific needs of the women, vulnerable groups and indigenous communities. The same will be placed before the RPDAC for approval.

While preparing the plan, the following aspects should be taken into consideration:

- (i) Site for the resettlement habitat shall be selected by the RPDAC in consultation with the displaced families.
- (ii) No physical displacement shall be made before the completion of resettlement work as approved by the RPDAC. The certificate of completion of resettlement work will be issued by the Collector.
- (iii) Gram Sabha shall be consulted.
- (iv) Where there is multiple displacement additional compensation amounting to 50% of the normal compensation payable, shall be paid to each displaced family over and above the normal compensation in form of *ex-gratia*.
- (v) Provisions relating to rehabilitation will be given effect from the date of actual vacation of the land.
- (vi) Project Authority shall abide by the provisions laid down in this Policy and the decisions taken by RPDAC from time to time provided they are within the ambit of the approved Policy of the Government.
- (vii) District Administration and Project Authorities shall be jointly responsible for ensuring that the benefits of R & R reach the target beneficiaries in a time bound manner.

- (viii) Record of Rights of the land and houses allotted to the displaced persons should be handed over to them by the District Administration while resettling them in the Resettlement habitat. The District Administration shall take steps for immediate declaration of the new Resettlement habitat as a Revenue Village if it is not a part of an already existing Revenue Village.
- (ix) Steps will be taken by the Project Authorities for acclimatization of the resettled people in new habitat including development of cordial social relationship between the host and resettled communities and to ensure as far as practicable overall improvement of standard of living of the displaced families.
- (x) Subject to the details regarding provision of employment as enunciated elsewhere in the Policy the project authorities shall give preference in the matter of employment, both direct and indirect as well as through contractors employed by them, for execution, operation and maintenance of the project, to local persons as per the detailed guidelines issued by the State Government from time to time.

#### 9. Rehabilitation Assistance :

Rehabilitation Assistance will be specific to the 'type' of project as mentioned at Para. 6 above, because of difference in nature of projects, their source(s) of funding and magnitude of displacement / impact.

##### *1. Type A: Industrial Projects :*

(a) Employment: Families shall be eligible for employment, by the project causing displacement or loss of all agricultural land. For the purpose of employment, each original family will nominate one member of such family. However, the families as mentioned at Para. 2 (f), (i), (ii), (iii), (iv) or (v) will not be considered separately for employment. Any one from among these categories may, subject to eligibility, be nominated by the family as defined in Para. 2 (f) for the purpose of employment. The project proponent will give preference to the nominated members of the displaced / other families in the matter of employment. The order of preference will be as follows:

- (i) Displaced families losing all land including homestead land,
- (ii) Displaced families losing more than 2/3rd of agricultural land and homestead land,
- (iii) Displaced families losing more than 1/3rd of agricultural land and homestead land,
- (iv) Displaced families losing only homestead land but not agricultural land,

(v) Families losing all agricultural land but not homestead land

The Project Authority will make special efforts to facilitate skill up-gradation of the nominated member of each displaced/other family to make him/her 'employable' in their project.

1. In case of nominees of displaced/other families eligible for employment otherwise, the upper age limit shall be relaxed by five years.
2. Project Authorities should notify their employment capacity sufficiently in advance.
3. As far as practicable, the objective shall be to provide one member from each displaced/other family as mentioned above with employment in the project. However, where the same can not be provided because of reason to be explained in writing, cash compensation as mentioned below shall be provided to the displaced/other families. Displaced/other families, who do not opt for employment/self-employment as mentioned in sub Para. (a) and (b), shall be provided by the Project Authority with one time cash assistance in lieu of employment at the scale indicated below:

Categories of families referred to in clauses (i) to (v) of Para. 2 (f) shall not be considered separately for employment in the project. However, they will be paid one time cash compensation in lieu of employment:

Provided that if any industry is willing to offer employment to more than one member of a family, it may do so in lieu of one-time cash assistance:

Displaced/other families who are eligible to be considered for employment and families defined under clauses (i) to (v) shall be provided with one time cash assistance in lieu of employment/self-employment in the scale indicated below:

S). No.	Families under category as per sub-Para. (a) above	Amount of one time cash assistance (Rs. in lakhs)
(1)	(2)	(3)
(i)	Displaced Families coming under category (i)	5.00
(ii)	Displaced Families coming under category (ii)	3.00

(1)	(2)	(3)
(iii)	Displaced Families coming under category (ii)	2.00
(iv)	Families coming under category (iv) and (v)	1.00

- (b) **Training for Self-employment:** Project Authority under the guidance of the Collector concerned will make adequate arrangement to provide vocational training to at least one member of each displaced/other family so as to equip him/her to start his/her own small enterprise and refine his/her skills to take advantage of new job opportunities. For those engaged in traditional occupations/handicrafts/handlooms, suitable training shall be organized at the cost of project authority to upgrade their existing skills.
- (c) **Convertible Preference Share:** At the option of the displaced family and, subject to the provisions of relevant law(s) in force for the time being, the project authority may issue Convertible Preference Share(s) or Secured Bond(s) up to a maximum of 50% out of one time cash assistance as mentioned in sub-Para. (a) above.
- (d) **Provision for homestead land:** Subject to availability, each displaced family will be given at least 1/10th of an acre of land free of cost in a resettlement habitat for homestead purpose.
- (e) **Assistance for Self-relocation:** Each of the displaced family who opts for self-relocation elsewhere other than the Resettlement habitat shall be given a one time cash grant of Rs.50,000/- in lieu of homestead land.
- (f) **House Building Assistance:** Besides, Project Authority shall construct house for each of the displaced families in the resettlement habitat or provide house building assistance of Rs. 1,60,000/- to each of the displaced families settling in the Resettlement habitat or opting for self relocation elsewhere.
- (g) **Shops and Service Units:** Project Authorities will also construct shops and service units at feasible locations at their own cost, which will be allotted in consultation with Collector to project displaced families opting for self-employment. While allotting such units, preference will be given to physically challenged persons and members of displaced SC & ST families.

#### ***II. Type B: Mining Projects:***

- (a) **Employment:** Displaced and other affected families shall be eligible for employment, by the project causing displacement. For the purpose of employment, each family will nominate one member of the family. The project

proponent will give preference to the nominated members of the displaced and other affected families in the matter of employment. The order of preference will be as follows:

- (i) Displaced families losing all land including homestead land,
- (ii) Displaced families losing more than 2/3rd of agricultural land and homestead land,
- (iii) Families losing all agricultural land but not homestead land,
- (iv) Displaced families losing more than 1/3rd of agricultural land and homestead land,
- (v) Displaced families losing only homestead land but not agricultural land,
- (vi) Families losing agricultural land in part but not homestead land.

The Project Authority will make special efforts to facilitate skill up-gradation of the nominated member of the displaced family to make him/her 'employable' in their project.

1. In case of nominees of displaced families eligible for employment otherwise, the upper age limit shall be relaxed by five years.
2. Project Authorities should notify their employment capacity sufficiently in advance.
3. As far as practicable, the objective shall be to provide one member from each displaced/other family as mentioned above with employment in the project. However, where the same can not be provided because of reason to be explained in writing, cash compensation as mentioned below shall be provided to such families. Families, who do not opt for employment/ self-employment as mentioned in sub Para. (a) and (b), shall be provided by the Project Authority with one time cash assistance in lieu of employment at the scale indicated below:

Sl. No.	Families under category as per sub-Para. (a) above	Amount of one time cash assistance (Rs. in lakhs)
(1)	(2)	(3)
(i)	Displaced Families coming under category (i)	5.00
(ii)	Displaced Families coming under category (ii)	3.00
(iii)	Families coming under category (iii)	2.00
(iv)	Families coming under category (iv), (v) and (vi)	1.00

- (b) **Training for Self-employment:** Project Authority under the guidance of the Collector concerned will make adequate arrangement to provide vocational training to at least one member of each displaced/other family so as to equip him/her to start his/her own small enterprise and refine his/her skills to take advantage of new job opportunities. For those engaged in traditional occupations/ handicrafts/ handlooms, suitable training shall be organized at the cost of project authority to upgrade their existing skills.
- (c) **Convertible Preference Share:** At the option of the displaced family the project authority may issue convertible preference share upto a maximum of 50% out of the one-time cash assistance as mentioned in sub Para (a) above.
- (d) **Provision for homestead land:** Subject to availability, each displaced family will be given at least 1/10th of an acre of land free of cost in a resettlement habitat for homestead purpose.
- (e) **Assistance for Self-relocation:** Each of the displaced family who opts for self-relocation elsewhere other than the Resettlement habitat shall be given a one time cash grant of Rs.50,000/- in lieu of homestead land.
- (f) **House Building Assistance:** Besides, Project Authority shall construct house for each displaced families in the resettlement habitat or provide house building assistance of Rs. 1,50,000/- to each of the displaced family settling in the Resettlement habitat or opting for self relocation elsewhere.
- (g) **Shops and Service Units:** Project Authorities will also construct shops and service units at feasible locations at their own cost, which will be allotted in consultation with Collector to project displaced families opting for self-employment. While allotting such units, preference will be given to physically challenged persons and members of displaced SC & ST families.

### III. **Type C: Water Resources / National Parks and Sanctuary Rehabilitation Package for Displaced family (DF):**

- (a) **Homestead land @ 0.10 acre in Rehabilitation habitat or cash equivalent @ Rs. 50,000/-** to each displaced family opting for self-relocation elsewhere.
- (b) **House Building Assistance:** Rs. 1,50,000/- to each displaced family, which includes cattle shed. This will be admissible to all displaced families whether settling in a Resettlement habitat or elsewhere.
- (c) **Assistance for Agricultural Land:** Each Displaced Family belonging to ST category shall be provided two-and-a-half acres of irrigated agricultural land, or five acres of non-irrigated agricultural land.

Each Displaced Family belonging to all other categories shall be provided two acres of irrigated agricultural land, or four acres of non-irrigated agricultural land.

In case of non-availability of land, cash equivalent will be provided @ of Rs. 1,00,000/- per acre of irrigated land and Rs.50,000/- per acre of non-irrigated land, including the cost of reclamation or at the rate decided by the Government from time to time.

(d) Registration cost of land up to 5 acres of un-irrigated land or two and half acres of irrigated land in case of Indigenous households or 4 acres of un-irrigated land or 2 acres of irrigated land for other displaced households who opt for cash based rehabilitation in lieu of land shall be paid by the project authority within a period not exceeding five years from the date of displacement.

#### IV. Type D: Urban Projects and Linear Projects:

Each displaced Family will get

(a) Homestead land @ 1/10th of an acre in rural area and @ 1/25th of an acre in urban area or cash equivalent of Rs.50,000/- preferably near growth centers like land by the side of roads and important junctions, land by the side of railway stations, etc., subject to availability. If required, project authority may acquire such suitable land under the relevant Act for the purpose.

(b) House Building Assistance: Rs. 1,50,000/- to each displaced family will be admissible whether settling in a Resettlement habitat or elsewhere.

(c) If house/homestead land of any landholder is acquired for linear project or if there is total displacement due to acquisition for such project, the project authority shall provide employment to one of the members of such displaced family in the project. Wherever RPDAC decides that provision of such employment is not possible, one time cash assistance as decided by the Government will be paid by the project authority.

#### V. Type E: Any other Projects:

Government may issue separate Policy guidelines for any other projects not covered above specifying R & R packages to be extended to displaced families.

#### 10. Benefit to landless & homestead-less encroachers common to all categories:

(a) An encroacher family, who is landless as defined in the Orissa Prevention of Land Encroachment Act, 1972, and is in possession of the encroached land at least for a period of ten years continuously prior to the date of notification under relevant

law(s) declaring intention of land acquisition will get ex gratia equal to compensation admissible under the Land Acquisition Act, 1894 for a similar category of land to the extent of land under his/her physical possession up to a maximum of one standard acre, if the encroachment is unobjectionable.

While determining the extent of land for such compensation the jayab/ land held by him/her is to be taken into account.

(b) An encroacher family, who is homestead<sup>1</sup> as defined in the Orissa Prevention of Land Encroachment Act, 1972 and is in possession of the encroached land at least for a period of ten years continuously prior to the date of notification under relevant law(s) declaring intention of land acquisition will get ex gratia, equal to compensation for the similar category of homestead land, against the encroached homestead land up to a maximum of 1/10th of an acre in rural areas or 1/25th of an acre in urban areas, if the encroachment is unobjectionable. While determining the extent of land for such compensation the homestead land held by him/her is to be taken into account. The ex gratia will be in addition to the actual cost of structures thereon. If the encroachment is found to be objectionable, (s)he will be entitled to the cost of structure only.

11. Other Assistance Common to all categories of projects :

(a) Maintenance Allowance: In order to ensure timely vacation, an allowance of Rs.2,000/- per month per displaced family shall be provided on vacation of land/house for a period of one year from the date of vacation as determined by the Collector concerned.

(b) Assistance for Temporary Shed: An assistance of Rs.10,000/- shall be provided to each displaced family.

(c) Transportation Allowance: Transportation allowance of Rs.2,000/- or free transportation to the resettlement hablet or their new place of inhabitation, shall be provided to each displaced family by the Project Authority.

Provided that State Government in Revenue Department shall review and may revise the rate if necessary, once every two years basing on the index point.

12. Additional provisions for assistance:

Notwithstanding anything contained elsewhere in the Policy, the Government or the Project Authority may extend any additional benefits and provisions to the displaced families keeping in view the specific nature of displacement.

13. Special benefits to displaced Indigenous families and primitive tribal groups :

- (a) While developing the resettlement plans, the socio-cultural norms of Indigenous and primitive tribal groups will be respected.
- (b) Each displaced family of Indigenous category shall be given preferential allotment of land.
- (c) As far as practicable, Indigenous communities should be resettled in a compact area close to their natural habitat.
- (d) Indigenous displaced families resettled outside the district shall be given 25 per cent higher R & R benefits in monetary terms.

14. Indexation of Rehabilitation Grant :

Rehabilitation grant will be indexed to the Wholesale Price Index (WPI) with 01-04-2006 as the reference date and will be revised by the Government once in every two years thereafter on the basis of WPI.

15. Periphery Development :

The Project Authorities shall be responsible for periphery development as decided by the RPDAC within the guidelines issued from time to time by the State Government.

16. Compensation Advisory Committee :

Government in Revenue Department may constitute a District Compensation Advisory Committee (DCAC) under the chairmanship of the Collector to determine negotiated price. Adequate representation will be given to women and indigenous communities (wherever applicable) in the Committee.

If any dispute arises on recommendation of the DCAC, the matter will be referred to the State Level Compensation Advisory Committee (SCAC) chaired by the Member, Board of Revenue whose decisions shall be final and binding on all concerned. The composition of this State Level Compensation Advisory Committee will be notified by the Government.

17. Rehabilitation and Periphery Development Advisory Committee (RPDAC) :

In order to encourage participation of displaced people and their elected representatives in implementation and monitoring of R & R package, to oversee and monitor periphery development, the Government may constitute a Rehabilitation-cum-Periphery Development Advisory Committee (RPDAC) for each or a group of projects falling in one district. The detailed composition of the Committee shall be notified by the Government and it may include people's representatives, one or two leading NGOs of the affected area and select Government officers, and any other persons to

be notified by the Government. Adequate representation will be given to women and indigenous communities (wherever applicable) in the Committee. Chairman of the Committee will be at liberty to co-opt members for efficient discharge of its functions.

#### 18. State Level Council on Resettlement and Rehabilitation (SLCRR) :

At the State level, there will be a Council headed by the Chief Minister to advise, review and monitor implementation of Resettlement and Rehabilitation Policy. The Council may comprise of Ministers, select representatives of the people, leading social activists, academicians and experts of national and international repute and senior officials of the Government.

#### 19. LA and R & R Structure:

##### (a) State Level:

A Directorate of R & R will be constituted to discharge and oversee the implementation of the R&R Policy. Detailed structure and functions of this Directorate will be notified by the Government.

##### (b) District / Project Level:

(i) Depending on magnitude of the RR works at the project level, there may be a Project Director, Resettlement and Rehabilitation (PD-RR) who shall be assisted by such other officers as Government may decide. The PD-RR shall be the Chief Coordinating Officer between all the line departments in the matter of resettlement and rehabilitation. He will be responsible for implementation of the Policy and timely execution of R & R works under the over all supervision and guidance of the Collector and the Directorate of R&R.

(ii) Where R & R work is of lesser magnitude, the same can be undertaken by the LAC of the Collectorate.

#### 20. Budgetary Provision and Allotment:

Whenever required, adequate budget provision will be kept towards land acquisition and R & R establishments to ensure effective implementation of R & R Policy. The Directorate of R&R should submit such budgetary estimates/ works by 1st January of every year. Government will ensure timely release of allotment to the concerned authorities.

#### 21. Grievance Redressal Mechanism:

An effective Grievance Redressal Mechanism will be set up at District and Directorate level to deal with grievance of the project displaced people relating to land acquisition, resettlement and rehabilitation. Besides, all the project authorities shall be asked to set up an effective Grievance

Redressal Mechanism relating to their project. Effective participation of the displaced communities will be ensured in the process.

**22. Assessment of Policy Implementation:**

Government may from time to time undertake assessment of the Implementation of this Policy through appropriate agencies.

**23. Interpretation and Amendment:**

- (a) Any issues or doubts regarding this Policy shall be referred to Government in Revenue Department whose decision shall be final and binding on all concerned.
- (b) Government in Revenue Department may from time to time amend the provisions as contained in this Policy as considered necessary.
- (c) Government in Revenue Department shall have the powers to issue guidelines and instructions from time to time to operationalize this Policy.

**O R D E R**

Ordered that the resolution be published in the extra-ordinary issue of Orissa Gazette for the general information of the public and copies of the same be forwarded to Government of India, Ministry of Rural Development/Ministry of Tribal Affairs/Ministry of Social Justice and Empowerment/all Departments of Government/all Heads of Departments/all Revenue Divisional Commissioners/all Collectors/Secretary, Board of Revenue/GMD, IDCO/GMD, IPICOL/ A.G., Orissa, Bhubaneswar/DAG (Works), Orissa, Pur for information.

By order of the Governor

TARUN KANTI MISHRA

Principal Secretary to Government

Government of Odisha  
Revenue & Disaster Management Department

No. R&REH-60/12. 31790 R&DM, dated 18/7/2012

Resolution

Sub: Odisha Resettlement & Rehabilitation Policy, 2006 – 3rd biennial revision of the rehabilitation grants in monetary terms.

In pursuance of provision under paragraph 13 of the Odisha Resettlement & Rehabilitation Policy 2006, the State Government do hereby make the following revision of rehabilitation grants in monetary terms:-

Sl. No.	Description of the components	Relevant provision of the policy.	Existing rate as per Resolution No.51633 dt.15.12.2010.	Revised rate w.e.f. dt.01.04.2012
(1)	(2)	(3)	(4)	(5)
1.	Assistance for self-relocation (elsewhere other than the resettlement habitat)	Paragraph 8 I(e), 8 II(e), 8 III(a), 8 IV (a)	Rs.63,000/-	Rs.75,000/-
2.	House Building Assistance	Paragraph 8 I(f), 8 II(f), 8 III(b), 8 IV(b)	Rs.1,87,000/-	Rs.2,24,000/-
3.	One time financial assistance in lieu of employment for industrial projects	Paragraph 8.I (a) (i) Displaced families coming under Category (i)	Rs.6,21,000/-	Rs.7,47,000/-
		(ii) Displaced families coming under Category (ii)	Rs.3,73,000/-	Rs.4,48,000/-
		(iii) Displaced families coming under Category (iii)	Rs.2,49,000/-	Rs.2,99,000/-
		(iv) Families coming under Categories (iv) &(v)	Rs.1,25,000/-	Rs.1,50,000/-
4.	One time financial assistance in lieu of employment for mining projects	Paragraph 8.II.3 (i) Displaced families coming under Category (i)	Rs.6,21,000/-	Rs.7,47,000/-
		(ii) Displaced families coming under Category (ii)	Rs.3,73,000/-	Rs.4,48,000/-

		(iii) Displaced families coming under Category (iii)	Rs 2,49,000/-	Rs.2,99,000/-
		(iv) Families coming under Categories (iv), (v) & (vi)	Rs.1,25,000/-	Rs.1,50,000/-
5.	Assistance for agricultural land.	Paragraph-9.iii (c) per acre of irrigated land	Rs 1,25,000/-	Rs.1,50,000/-
		Per acre of non-irrigated land.	Rs.63,000/-	Rs.75,000/-
6.	Maintenance Allowance.	Paragraph-10 (a)	Rs 2,500/- per month.	Rs.3,000/- per month.
7.	Assistance for temporary shed.	Paragraph-10 (b)	Rs.12,500/-	Rs.15,000/-
8.	Transportation Allowance.	Paragraph-10 (c)	Rs.2,500/-	Rs.3,000/-

This has been concurred in by Finance Department vide their UOR No.3002/PSF dt.19.05.2012. and No.3488/PSF dated.22.06.2012

This Resolution will take effect from 1<sup>st</sup> April 2012

#### ORDER

Ordered that the Resolution be published in the extraordinary issue of Odisha Gazette for general information of the public and copies of the same be forwarded to Government of India, Ministry of Rural Development/Ministry of Tribal Affairs/Ministry of Social Justice & Empowerment/All Departments of Government/All Heads of Department/All Revenue Divisional Commissioners/All Collectors/Secretary, Board of Revenue/C.M.D., IDCO/M.D., IPICOLA G., Odisha, Bhubaneswar/D.A.G. (Works), Puri for information.

By Order of the Governor

*[Signature]*  
Principal Secretary to Government

Memo No. 31781 /R&DM, dated 10/3/2012

Copy along with soft copy (CD) forwarded to the Director, Printing, Stationery and Publication, Odisha, Cuttack / Commerce & Transport (Commerce) Department with a request to publish the Resolution in the Extraordinary issue of Odisha Gazette and supply 200 copies to this Department.

*[Signature]*  
Director, R&R and Ex-officio  
Addl. Secretary to Govt.

Memo No. 31782 IR&DM, dated 10/7/2012

Copy forwarded to All Departments of Government/All Heads of Departments/ All Revenue Divisional Commissioners / All Collectors /All LAGs/All Spl. LAGs/ All PO(R&R)/ All Zone officers for information and necessary action.

  
Director, R&R and Ex-officio  
Addl. Secretary to Govt.


Memo No. 31783 IR&DM, dated 10/7/2012

Copy forwarded to Accountant General, Odisha, Bhubaneswar/Deputy Accountant General (Works), Puri for kind information.

  
Director, R&R and Ex-officio  
Addl. Secretary to Govt.

Memo No. 31784 IR&DM, dated 10/7/2012

Copy forwarded to Principal Secretary to Chief Minister, Odisha for kind information.

  
Director, R&R and Ex-officio  
Addl. Secretary to Govt.

Memo No. 31785 IR&DM, dated 10/7/2012

Copy forwarded to P.S. to Minister, Revenue & Disaster Management/P.S. to Chief Secretary/P.S. to Principal Secretary to Government, Revenue & Disaster Management Department for kind information of the Hon'ble Minister/Chief Secretary/ Secretary /Principal Secretary


  
Director, R&R and Ex-officio  
Addl. Secretary to Govt.

Memo No. 31786 IR&DM, dated 10/7/2012

Copy to OIC, IMU/LA(A)/LA(B)/LA(C) Sections of Revenue & D.M. Department for information and necessary action.

  
Director, R&R and Ex-officio  
Addl. Secretary to Govt.

Memo No. 31787 IR&DM, dated 10/7/2012  
Copy to Guard file(R&R Cell) for record.

  
Director, R&R and Ex-officio  
Addl. Secretary to Govt.

REVENUE AND DISASTER MANAGEMENT DEPARTMENT

No. R & R E H -55/10-42308 IR&DM, Dated 20/10/2010

From -  
Sd R.A. Sharma  
Commissioner cum Secretary to Government.  
To  
All RD/2/ All Collectors.

Sub: Clarification on "Displaced / Affected families" with reference to Orissa R&R Policy, 2006.

Sir,

I am directed to say that it has been brought to the notice of the Government that there are instances of misuse of the provisions of R&R Policy, 2006 by persons who, anticipating acquisition of land for a development project in a particular area, purchase small extent of land and / or construct dwelling house thereon for availing benefits meant for displaced/ affected families.

The intention of the R&R Policy is to provide benefits to people who are actually displaced by projects or whose livelihood is affected by such projects. Persons who are not ordinarily residing in or near the project area, but purchase land just before the land acquisition can not be treated as affected or displaced families. In most such cases, the purpose of such transaction is to avail benefit from the resettlement and rehabilitation packages as per R&R Policy, 2006 often at the cost of the local original land owners who were actually residing in the project area for generations together.

Government after careful consideration have been pleased to clarify that the persons or families who were ordinarily not residing in or near the project area are not eligible for and shall not be enumerated as displaced or affected families for the purpose of Resettlement and Rehabilitation benefits. Persons or families who are normally residing in or near the project areas for a period of at least 3 (three) years prior to the date of section 4(1) notification (under Land acquisition Act) above may be considered as ordinarily residing therein for the purpose of R & R benefits.

The above clarification may be brought to the notice of all concerned.


Yours faithfully,



Commissioner cum Secretary to Government


Memo No. 42359 / R & DM., Dated 20/10/2010

Copy forwarded to All Departments of Government for information and necessary action.

  
Director(R & R) & Ex-Officio,  
Addl. Secy. to Govt.

Memo No. 42390 / R & DM., Dated 20/10/2010

Copy to Director (R&R) and Ex-Officio Additional Secretary to Government, Water Resources Department/ All Spl. LAO's / All PD(R&R): All Sub-Collectors/ All LAO's for Information and necessary action.

  
Director(R & R) & Ex-Officio,  
Addl. Secy. to Govt.


Memo No. 42391 / R & DM., Dated 20/10/2010

Copy forwarded to Secretary, Board of Revenue, Orissa, Cuttack for information and necessary action.

  
Director(R & R) & Ex-Officio,  
Addl. Secy. to Govt.


Memo No. 42392 / R & DM., Dated 20/10/2010

Copy forwarded to LA(A)/LA(B)/LA(C) Branch of R & DM Deptt. for information and necessary action.

  
Director(R & R) & Ex-Officio,  
Addl. Secy. to Govt.

Memo No. 42393 / R & DM., Dated 20/10/2010

Copy to Guard file of R&R Cell/ Spans copies (20)/ copy to all officers of Revenue & D.M. Department.

  
Director(R & R) & Ex-Officio,  
Addl. Secy. to Govt.

# The Odisha Gazette



EXTRAORDINARY  
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[No. 29828-R&REH-1/2013/R&DM.]

REVENUE & DISASTER MANAGEMENT DEPARTMENT

## RESOLUTION

The 5th August, 2013

In this Department Resolution No.18040-R&REH-1/2006-R&DM., dated the 14th May, 2006, published in the Orissa Gazette Extraordinary No. 651 of 15th May 2006, notifying the Orissa Resettlement and Rehabilitation Policy, 2006, which was subsequently amended vide this Department Resolution No. 21382/R&DM., dated the 4th June 2007, published in the Orissa Gazette Extraordinary No.990, dated the 6th June, 2007, the State Government, after careful consideration, do hereby make the following amendments, namely:—

### AMENDMENTS

1. In the Orissa Resettlement and Rehabilitation Policy, 2006, (hereinafter referred to as the said Policy), for the word "Orissa" appearing wherever in the said policy, the word "Odisha" shall be substituted and this substitution shall be deemed to have come into force on the 1st day of November, 2011.
2. In sub-clause (i) under clause (f) of Para. 2, for the words "A major son irrespective of his marital status", the words "A major son/grandson irrespective of his marital status" shall be substituted.
3. In sub-clause (ii) under clause (f) of Para. 2, for the words "Unmarried daughter/ sister more than 30 years of age", the words "Major unmarried daughter/ Major unmarried grand daughter/ Major unmarried sister" shall be substituted.

4. Amendment to Para. 2(f) (i) is made to clarify and restate the provision of the said policy. Therefore, it shall take retrospective effect from the date of commencement of the said Policy, i.e. 15th May, 2006.

5. Amendment to Para. 2(f) (ii) shall take effect from the date of issue of this Government Resolution.

#### ORDER

Ordered that the Resolution be published in the Extraordinary issue of *Odisha Gazette* for the general information of the public and copies of the same be forwarded to the Ministry of Rural Development, Government of India/ Ministry of Tribal Affairs, Government of India/Ministry of Social Justice and Empowerment, Government of India/all Departments of Government/all Heads of Departments/all Revenue Divisional Commissioners/all Collectors/ Secretary, Board of Revenue/ C.M.D, IDCO/C.M.D, IPICOL /A.G., Odisha, Bhubaneswar/DAG (Works), Odisha, Puri for information.

By Order of the Governor

TARA DATT

Additional Chief Secretary to Government

GOVERNMENT OF ODISHA  
REVENUE AND DISASTER MANAGEMENT DEPARTMENT

RDM-RRG-CLRFIC-0001-2012-46763

dt. 19-10-12

From,

S. S. Nayak  
Dir. (R&R) and Ex-officio  
Addl. Secretary to Govt.

To,

Collector, Jharsuguda

Sub:


Regarding R&R benefit to married daughter ( awardees)

Sir,

In inviting a reference to your L.No.5858 dated. 11.7.12 on the subject cited above, I am directed to say that after careful consideration, Government have been pleased to decide as follows in supersession of previous clarifications issued in the matter :-

1. A married daughter primarily residing in the project area along with her spouse and children for a period of not less than 3 years prior to the date of publication of notification for acquisition of land under the provisions of relevant Acts and declared as an awardee, will be eligible for R&R benefits as displaced family provided that neither that married daughter nor her spouse possess any homestead land and dwelling house anywhere else in the State of Odisha and if on account of acquisition of her homestead land with dwelling house her family is displaced from the project area.
2. A married daughter primarily residing in the project area along with her spouse and children for a period of not less than 3 years prior to the date of publication of notification for acquisition of land under the provisions of relevant Acts and declared as an awardee, will be eligible for R&R benefits as an affected family and for determination of benefits, total extent of land owned by her as well as her spouse will be taken into account.

Yours faithfully,

  
Dir. (R&R) and Ex-officio  
Addl. Secretary to Govt.

19-10-12

46766

Memo No. /R&DM dtd. 19.10.12

Copy forwarded to all Departments / Secretary, Board of Revenue, Odisha, Cuttack/all ROCs/all Collectors(Except Collector, Jharsuguda)/all LAOs/all Special LAOs for information & necessary action.

*[Signature]*  
19.10/12

Director, R&R and Ex-Officio  
Addl. Secretary to Government

46767

Memo No. /R&DM dtd. 19.10.12

Copy forwarded to all officers /all sections of R&DM Department for information & necessary action.

IMU Cell is requested to upload this clarification on the web portal of R&DM Department.

20(Twenty) copies to Guard File.

*[Signature]*  
19.10/12

Director, R&R and Ex-Officio  
Addl. Secretary to Government

112



Government of Odisha  
Revenue & District Management Department

14954 R.D.M. Dated 10.4.07  
R&R/P-7/06

PH

From: P.K. Pattnaik, OAS(S)  
Joint Secretary to Government

To: The Collector  
Angul

Sub: Clarification on R&R issues

Ref: Your letter No. 150 and 228 dated 2.3.2007

Sir,  
I am directed to comment on the clarifications raised in your letters under reference as below:

L.P.T

1. "Family already availed Rehabilitation and Resettlement benefit in one village prior to the R&R Policy, 1996, but now losing land along with home and homestead in other village, whether Rehabilitation & Resettlement benefit will be extended to them or not?"

1497  
10.4.07

R&R benefit is given to displaced persons. If somebody has already received R&R benefit in one village and the same family is losing land along with home and homestead in other village, he can be extended R&R benefit, if this home is housing the family at present. But if the family members have been provided with jobs, they can not nominate any member outside the family to be provided for jobs again and if the home from which they are being displaced now, is not their residence at present and it is a second home and homestead, R&R benefit may not be extended.

2. "Persons constructed house over Government land and losing agricultural and Ghorabari land in same village, whether, Rehabilitation and Resettlement benefit will be extended to them or not?"

For persons constructing houses on Government land, para 9 of R&R Policy, 2006 should apply. However, if the persons has other homestead land and has still encroached Government land, no compensation should be payable on the land or the dwelling unit constructed on Government land. This is because, we can not afford to encourage encroachment of Government land.

3. "Persons residing in the village permanently by constructing house over other's land, whether Rehabilitation and Resettlement benefit will be extended to them or not."

If a person has no separate land of his own and loses his home constructed on other's land, he may be compensated with the cost of construction of the house. For employment, his case may be considered after all other claimants to employment are satisfied.

4. "Whether payment of compensation to the recorded tenants for the land purchased after 4(1) and before Section 9 of CBA(A&D) Act will be made or not & whether Rehabilitation and Resettlement benefit will be extended to them or not."

Under CBA(A&D) Act, there is maximum period of three years allowed between notification of intention of Government U/s. 4(1) and final declaration of acquisition u/s. 7(1). Then, U/s. 9(1) the declaration gets authority for purchase. Payment of compensation should always be given to the recorded tenants not be extended to these purchases, as knowingly, they have purchased a land for displacement. But if this is not allowed to invalidate after three years and not fresh again and again the R&R benefit may be considered to the persons if the land is illegitimate to an outsider.

2/7

Yours faithfully,  
Joint Secretary to Government

Memo No. M285 R&DM, Bhubaneswar dated 10<sup>th</sup> April, 2007

Copy forwarded to Collector, Jhansu under Sambalpur for information and necessary action.

Joint Secretary to Government

Memo No. M286 R&DM, Bhubaneswar dated 10<sup>th</sup> April, 2007

Copy forwarded to Secretary to R&D.C (ND), Sambalpur for information and necessary action.

Joint Secretary to Government

Memo No. M287 R&DM, Bhubaneswar dated 10<sup>th</sup> April, 2007

Copy forwarded to C.M.D.M.S.L., Sambalpur for information and necessary action.

Joint Secretary to Government

<b>Environment Expenditure at NTPC Dulanga (In Lakh INR)</b>						
<b>Expenditure Head</b>	<b>2018-19</b>	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>2022-23</b>	<b>Total</b>
Dump Slope Stabilisation	170.71	221.77	16.49	270.69	546.66	1226.32
Dust Supression	12.36	33.39	61.24	63.44	86.48	256.91
Environment Monitoring	12.07	16.66	29.3	134.95	27.05	220.03
Env Staff Salary	1.35	5.72	7	10.17	10.17	34.41
Plantation	5.16	3	5.84	5.29	32.11	51.4
ETP + Water Purifier		15.9				15.9
Safety Zone & Protective measures			47.04			47.04
Awareness			0.12			0.12
Study on Fly ash utilisation			30.08			30.08
Pond Construction			2			2
	201.65	296.44	199.11	484.54	702.47	1884.21

**Use of PPEs in Mines**



(FORM - O)  
(See rule 29F (2) and 22L)  
Report of medical examination under rule 29B  
(To be issued in triplicate)\*\*

795

Certificate No... 784...  
Certified that Shri/Shrimati Benukhar Keshari \*employed as Electrical Trainee in  
mine, Form B No... 725... has been  
examined for an initial/periodical medical examination. He/she\* appears to be... 22...  
years of age. The findings of the the examining authority are given in the attached sheet. It is  
considered that Shri/Shrimati\* Benukhar Keshari

- (a)\* is medically fit for any employment in mines.
- (b)\* is suffering from.....And is medically unfit for
  - (i) any employment in mine; or
  - (ii) any employment below ground; or
  - (iii) any employment or work.....

©\* is suffering from..... should get this disability\* cured/controlled and  
should be again examined within a period of .....months. He/She will appear for  
re-examination with the result of test of..... and the opinion  
of.....Specialist from..... He/She may be permitted/not\*  
permitted to carry on his duties during this period.



Dr. HARISH CHANDRA DUTTA  
Specialist ENT Surgeon  
Junior Class (I)

Signature of the examining authority  
.....  
Name and designation in Block letters

Place :  
Date : 20.3.20

\* Delete whatever is not applicable.  
\*\* One copy of the certificate shall be handed over to the person concerned and another copy shall be sent to the manager of the mine concerned by registered post; and the third copy shall be retained by the examining authority.  
1 Inserted vide Notification No. GSR 656, dated 5.6.1980

Report of the examining authority

(to be filled in for every medical examination whether initial or periodical or re-examination or after cure/control of disability). Annexure to Certificate No. 2753 as a result of medical examination on 20-03-2020  
Identification Mark 21244

Left thumb impression of The candidate

1. General development- Good / Fair / Poor

2. Height 160 cms

3. Weight 47 kg

4. Eyes :

(i) Visual acuity-Distant vision (with or without glasses)

Right eye 6/6 Left eye 6/6

(ii) Any organic disease of eyes

(iii) Night blindness

(iv) Colour blindness

(v) Squint

(\* to be tested in special cases)

5. Ears :

(i) Hearing : right ear 6000m Left ear 6000m

(ii) Any organic diseases. NO

6. Respiratory system

Chest measurement :

(i) After full inspiration 34 cms

(ii) After full expiration 24 cms

7. Circulatory system:

Blood Pressure 110/70 mmHg

Pulse 72

8. Abdomen :

Tenderness. NO

Liver. Normal

Spleen. NO

Tumour. NO

9. Nervous system:

History of fits or epilepsy NO

Paralysis. NO

Mental health. Good NAD

10. Locomotory system

11. Skin. Normal

12. Hydrocele. NO

13. Hernia. NO

14. Any other abnormality NO

15. Urine :

Reaction. Acid

Albumin. NO

Sugar. NO

16. Skiagram of chest. NAD

17. Any other test considered necessary by the examining authority. NO

18. Any opinion of specialist considered necessary. NO

19. ECG: Normal

20. Liver function test: Normal

21. Spirometry: Normal

Place:

Signature of the examining authority

**FORM - 1**  
**(See rule 246 (3) and 247)**  
**Form of medical examination under rule 246**  
**(To be used in duplicate)**

Certificate No. 77 Abdoul Bari Abdoul Bari is  
 called for an initial medical examination under section 246 of the  
 Mines Act, 1926. The findings of the examining authority are given in the certificate below.

The findings of the examining authority are given in the certificate below.

(a) is fit for any employment in mines.

(b) is fit for any employment in mines.

(c) my employment in mines is

(d) my employment before any mine is

(e) my employment is not

(f) is fit for any employment in mines.

(g) is fit for any employment in mines.

(h) is fit for any employment in mines.

(i) is fit for any employment in mines.

Space for affixing  
 Passport Size  
 Photograph of the  
 Candidate.

Signature of the Examining Authority  
 Name and Designation of the Examining Authority

Place: Abdoul Bari

Date: 07-12-21

\* Delete whatever is not applicable.

\*\* One copy of the certificate shall be handed over to the person concerned and another copy shall be sent to the manager of the mine concerned by registered post; and the third copy shall be retained by the examining authority.

Revised vide Notification No. GSR 656, dated 5.6.1980

(FORM O - Cont.)

Report of the examining authority

(to be filled in for every medical examination whether initial or periodical or re-examination or after cure/control of disability). Annexure to Certificate No. ....  
Identification Mark.....  
Left thumb impression of The candidate

1. General development- Good / Fair / Poor

2. Height..... Cms.

3. Weight..... kg.

4 Eyes:

(i) Visual acuity-Distant vision (with or without glasses).  
Right eye..... Left eye.....

(ii) Any organic disease of eyes

(iii) Night blindness

(iv) Colour blindness

(v) Squint

(\* to be tested in special cases)

5. Ears: (N) (N)  
(i) Hearing: right ear..... Left ear.....

(ii) Any organic diseases. NO

6. Respiratory system.

Chest measurement: (N)

(i) After full inspiration..... cms.

(ii) After full expiration..... cms.

7. Circulatory system: (N)

Blood Pressure 130/90 mmHg

Pulse 65 13 per min

8. Abdomen:

Tenderness. (N)

Liver.

Spleen. (N)

Tumour. (N)

9. Nervous system: (N)

History of fits or epilepsy NO

Paralysis. NO

Mental health. Normal

10. Locomotory system. (N)

11. Skin. Normal

12. Hydrocele. NO

13. Hernia. NO

14. Any other abnormality NO

15. Urine:

Reaction. Acidic

Albumin. (A)

Sugar. Absent

16. Skiagram of chest. Normal

17. Any other test considered necessary by the examining authority.

18. Any opinion of specialist considered necessary.

19. ECG: Normal

20. Liver function test: Normal

21. Spirometry: Normal

Place:

Group: B +ve

*[Signature]*  
21/12/21

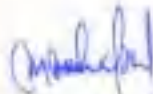
Medical Officer  
NIPUN  
Sanskrit Project  
Sundargarh

FORM 1  
Certificate of Examination under Rule 203  
(To be filled by the candidate)

Candidate No. 988 Abhinash Duan  
Occupation Shri/Shrimati employed in Department of  
Police since 24.11.2022 has been  
examined for an initial/periodical medical examination. He/She\* appears to be 25  
years of age. The findings of the examining authority are given in the attached sheet. It is  
considered that Shri/Shrimati\* Abhinash Duan

- (a)\* is medically fit for any employment in mines,  
(b)\* is suffering from..... And is medically unfit for  
(i) any employment in mine; or  
(ii) any employment below ground; or  
(iii) any employment in work.....  
(c)\* is suffering from..... should get this disability\* cured/controlled and  
should be again examined within a period of ..... months. He/She will appear for  
re-examination with the result of test of..... and the opinion  
of..... Specialist from..... He/She may be permitted/not\*  
permitted to carry on his duties during this period.

Space for affixing  
Passport Size  
Photograph of the  
Candidate.

  
Signature of the examining authority  
.....  
Name and designation in Block letters

Place: Kalamegha Dispensary  
Date: 23.11.20

\*Date of issue is not applicable.  
\*\* One copy of the certificate shall be handed over to the person concerned and another copy shall be sent  
to the manager of the mine concerned by registered post, and the third copy shall be retained by the  
examining authority.  
I issued this certificate on this 23/11/2020

(FORM - O)  
(See rule 29F (Z) and 23L)  
**Report of medical examination under rule 29B**  
(To be issued in triplicate)\*\*

Certificate No. 720 Chaitanya Deep (Chaitanya Deep)

Certified that Shri/Shrimati \*employed as..... in

.....mine, Form B No..... has been

examined for an initial/periodical medical examination. He/she\* appears to be...32...

years of age. The findings of the the examining authority are given in the attached sheet. It is

considered that Shri/Shrimati\*...Chaitanya Deep...

(a)\* is medically fit for any employment in mines.

(b)\* is suffering from.....And is medically unfit for

- (i) any employment in mine; or
- (ii) any employment below ground; or
- (iii) any employment or work.....

\* is suffering from..... should get this disability\* cured/controlled and

should be again examined within a period of .....months. He/She will appear for

re-examination with the result of test of..... and the opinion

of..... Specialist from..... He/She may be permitted/not\*

permitted to carry on his duties during this period.

Space for affixing  
Passport Size  
Photograph of the  
Candidate.

*U.S. Jaiswal*  
Signature of the examining authority  
**Dr. U. S. Jaiswal**

.....  
Name and Designation in Block letters

Place: Kalamegha Dispensary

Date: 27/11/2020

\* Delete whatever is not applicable.

\*\* One copy of the certificate shall be handed over to the person concerned and another copy shall be sent to the manager of the mine concerned by registered post; and the third copy shall be retained by the examining authority.

1 Inserted vide Notification No. GSR 656, dated 5.6.1980

(FORM O - Cont.)

Report of the examining authority

(to be filled in for every medical examination whether initial or periodical or re-examination or after cure/control of disability). Annexure to Certificate No. .... 720 ... as a result of medical examination on... 27/11/2020

Identification Mark: *byank... 27/11/2020*

Left thumb impression of The candidate

- 1. General development- Good / Fair / Poor
- 2. Height: ..... 160 ..... Cms.
- 3. Weight: ..... 61 ..... kg

- 4. Eyes:  (i) Visual acuity-Distant vision (with or without glasses):  
 Right eye..... 6/6 ..... Left eye..... 6/6 .....  
 (ii) Any organic disease of eyes  
 (iii) Night blindness  
 (iv) Colour blindness  
 (v) Squint  
 (\* to be tested in special cases) / NO

- 5. Ears:  (i) Hearing-right ear..... 6/0 ..... Left ear ..... 6/0 .....  
 (ii) Any organic diseases. NO

- 6. Respiratory system.  
 Chest measurement  (i) After full inspiration ..... 97 ..... cms.  
 (ii) After full expiration..... 94 ..... cms.

- 7. Circulatory system:  
 Blood Pressure  $\frac{130}{90}$   
 Pulse 72 P.M

- 8. Abdomen:  (i) Tenderness.  
 Liver: / Normal  
 Spleen: /  
 Tumour: NO

*Group 5/10 = B five.*

- 7. Nervous system:  (i) History of fits or epilepsy NO  
 Paralysis. NO  
 Mental health. Normal

- 10. Locomotory system: NO
- 11. Skin: Normal
- 12. Hydrocele: NO
- 13. Hernia: NO
- 14. Any other abnormality NO

- 15. Urine:  
 Reaction: Acidic  
 Albumin: (-)  
 Sugar: Absent

- 16. Skiagram of chest: NO
- 17. Any other test considered necessary by the examining authority. NO
- 18. Any opinion of specialist considered necessary. NO

- 19. ECG: Normal
- 20. Liver function test: Normal
- 21. Spirometry: Normal
- 22. Lipid profile: Normal

Place: *Katimgaha Dimpansung*  
 27-27/11/2020

*[Signature]*  
 Signature of the examining authority  
 Reg No. - 1116

252

(FORM - O)  
(See rule 29F (2) and 22L)  
Report of medical examination under rule 29B  
(To be issued in triplicate)\*\*

Certificate No. 336... Kusha Rohidas  
Certified that Shri/Shrimati \*employed as..... In  
.....mine, Form B No..... has been  
examined for an initial/periodical medical examination. He/she\* appears to be... 23...  
years of age. The findings of the the examining authority are given in the attached sheet. It is  
considered that Shri/Shrimati\*... K. Usha... R. Rohidas.

- (a)\* is medically fit for any employment in mines.
- (b)\* is suffering from..... And is medically unfit for
  - (i) any employment in mine; or
  - (ii) any employment below ground; or
  - (iii) any employment or work.....

©\* is suffering from..... should get this disability\* cured/controlled and  
should be again examined within a period of .....months. He/She will appear for  
re-examination with the result of test of..... and the opinion  
of..... Specialist from..... He/She may be permitted/not\*  
permitted to carry on his duties during this period.



*Dr. BIPLAV KESHARI NAIK*  
Signature of the examining authority  
M.B.S.  
SMASL

.....  
Name and designation in Block letters

Place: Kalamgha Dispensary.  
Date: 07.02.19

\* Delete whatever is not applicable.  
\*\* One copy of the certificate shall be handed over to the person concerned and another copy shall be sent  
to the manager of the mine concerned by registered post; and the third copy shall be retained by the  
examining authority,

(FORM O-Cont.)

Report of the examining authority

(to be filled in for every medical examination whether initial or periodical or reexamination or all /control of disability) Annexure to certificate No. 336 as a result of medical exam on 07.2.19

Identification Mark: Black mark on neck.

Left thumb Impression of the card

- 1. General development- Good/Fair/Poor
- 2. Height 160 Cms.
- 3. Weight 57.8 kg.
- 4. Eyes:
  - (i) Visual acuity- Distance vision (with or without glasses)  
Right eye 6/6 Left eye 6/6
  - (ii) Any organic disease of eyes
  - (iii) Night blindness
  - (iv) Color blindness } NO
  - (v) Squint
  - (\* to be tested in special cases)
- 5. Ears:
  - (i) Hearing: right ear 600.000. Left ear 600.000.
  - (ii) Any organic diseases. NO
- 6. Respiratory system:
  - Chest measurement:
    - (i) After full inspiration 88 cms.
    - (ii) After full expiration 83 cms.
- 7. Circulatory system:
  - Blood Pressure 120/80 mmHg.
  - Pulse 73 bpm
- 8. Abdomen:
  - Tenderness } Normal.
  - Liver } Normal.
  - Spleen } Normal.
  - Tumor NO
- 9. Nervous system:
  - History of fits or epilepsy NO
  - Paralysis NO
  - Mental health Normal.
- 10. Locomotory system Normal
- 11. Skin Normal
- 12. Hydrocele NO
- 13. Hernia NO
- 14. Any other abnormality NO
- 15. Urine:
  - Reaction Acidic
  - Albumin Nil
  - Sugar Nil
- 16. Skiagram of chest
- 17. Any other test considered necessary by the examining authority. NO
- 18. Any opinion of specialist considered necessary. Consult cardiologist
- 19. ECG Abnormal.
- 20. Liver function test: Normal
- 21. Spirometry: Normal

Grand total: 0 fine

Place: Kalamegha Dispensary

Dr. BIPLAV KESHARI NAIK  
Signature of the examining authority  
SMASL

(FORM-O)

(See rule 29 F(2) and 22L)

Report of medical examination under rule 29B

(To be issued in triplicate)\*\*

Certificate No. 1462

Certified that Shri/Shrimati M.D. Sabanukh employed as \_\_\_\_\_ in \_\_\_\_\_

\_\_\_\_\_ Mine, Form B No. \_\_\_\_\_ has been examined for an Initial/Periodical Medical examination. He/she appears to be 26 Years of age. The Findings of the Examining Authority are given in the attached sheet. It is considered that Shri/Shrimati M.D. Sabanukh

(A) is medically fit for any employment in mines.

(b) is suffering from \_\_\_\_\_ And is medically unfit for

- (i) Any Employment in Mine; or
- (ii) Any Employment below ground; or
- (iii) Any Employment or Work \_\_\_\_\_

(c) is suffering from \_\_\_\_\_ should get this disability cured/controlled and should be again examined within a period of \_\_\_\_\_ month. He/She will appear for re examination with the result of test of \_\_\_\_\_ and the opinion of \_\_\_\_\_ Specialist from \_\_\_\_\_. He/she may be permitted/not permitted to carry on his duties during this period.



*[Handwritten Signature]*  
Signature of the Examining Authority

Dr. SRUTI SOURAV MOHAPATRA  
MEDICAL OFFICER  
Name and designation in block letters  
Regd.No.26569/2021

Place: First Aid Centre

Date: 28-3-22

\*Delete whatever is not applicable

\*\*One copy of the certificate shall be handed over to the person concerned and another copy shall be sent to the manager of the mine concerned by registered post; and the third copy shall be retained by The Examining authority.

Inserted vide Notification no GSR656, dated 5.6.1980

Report of the Examining authority

(To be filled in for every medical examination whether initial or periodical or re-examination, or after cure/control of disability). Annexure to certificate No. 1142  
A result of medical examination on 25.2.22  
Identification Mark Place mole on R hand

Left thumb impression of the candidate

1. General development Good/fair/poor

2. Height 162 cm.

3. Weight 74 kg.

4. Eyes

(i) Visual acuity Distant Vision (with or without glasses)

Right eye 6/6 left eye 6/6

(ii) organic disease

(iii) Night blindness | NO

(iv) Colour blindness

(v) Squint

(\*to be tested in special cases)

5. Ears

(i) Hearing: right ear 6000 left ear 6000

(ii) Any organic diseases

6. Respiratory system:

Chest measurements:

(i) After full inspiration 115 cm.

(ii) After full expiration 110 cm.

7. Circulatory system:

Blood pressure 120/80

Pulse 76

8. Abdomen:

Tenderness

Liver

Spleen

Tumour.

9. Nervous system:

History of fits or epilepsy. NO

Paralysis. NO

Mental health. Good

10. Locomotory system

11. skin Normal

12. Hydrocele NO

13. Hernia NO

14. Any other abnormality NO

15. Urine:

Reaction Acidic

Albumin. present

Sugar. None

16. X-Ray.P & (PA)

17. Any other test considered necessary by examining authority.

18. Any opinion of specialist considered necessary.

19. ECG: Normal

20. Liver function test:

21. Spirometry

22. Lipid profile test: (Normal)

23. Renal Function test:

Place: Heart Aid Centre

Grouped Rhty: O +ve

*[Signature]*

Signature of the examining authority

Medical Officer  
NTPC/SMASL Dispensary  
Jalanga Coal Mining Project  
Sundargarh

507

(FORM - O)  
(See rule 29F (2) and 22L)  
Report of medical examination under rule 29B  
(To be issued in triplicate)\*\*

Certificate No. 492 Umesh Singh  
Certified that Shri/Umesh Singh \*employed as Dumper DR..... In  
.....mine, Form B No. 507..... has been  
examined for an initial/periodical medical examination. He/she appears to be 32  
years of age. The findings of the the examining authority are given in the attached sheet. It is  
considered that Shri/Umesh Singh \*.....

- (a)\* is medically fit for any employment in mines.  
(b)\* is suffering from.....And is medically unfit for  
(i) any employment in mine; or  
(ii) any employment below ground; or  
(iii) any employment or work.....

©\* is suffering from..... should get this disability\* cured/controlled and  
should be again examined within a period of .....months. He/She will appear for  
re-examination, with the result of test of..... and the opinion  
of.....Specialist from..... He/She may be permitted/not\*  
permitted to carry on his duties during this period.



*[Signature]*  
Signature of the examining authority  
.....  
Name and designation-in Block letters

Place: Kalamegha Dispensary  
Date: 17-10-19

\* Delete whatever is not applicable.  
\*\* One copy of the certificate shall be handed over to the person concerned and another copy shall be sent  
to the manager of the mine concerned by registered post; and the third copy shall be retained by the  
examining authority.  
† Inserted vide Notification No. GSR 656, dated 5.6.1980

(FORM O-Cont.)

Report of the examining authority

(to be filled in for every medical examination whether initial or periodic) or reexamination or after /control of disability) Annexure to certificate No. 492 as a result of medical examination on 17.11.19 Identification Mark. black mole on cheek.

Left thumb impression of the candidate

- 1. General development: Good/Fair/Poor
- 2. Height: 164 Cms.
- 3. Weight: 64 kg.
- 4. Eyes:
  - (i) Visual acuity-Distance vision (with or without glasses)
    - Right eye: 6/6 Left eye: 6/6
    - (ii) Any organic disease of eyes
    - (iii) Night blindness
    - (iv) Color blindness
    - (v) Squint

- 5. Ears:
  - (i) Hearing: right ear: 6/5.0m Left ear: 6/5.0m
  - (ii) Any organic diseases: NO

- 6. Respiratory system:
  - Chest measurement:
    - (i) After full inspiration: 92 cms.
    - (ii) After full expiration: 90 cms.

- 7. Circulatory system:
  - Blood Pressure: 130/90 mmHg
  - Pulse: 74/min.

- 8. Abdomen:
  - Tenderness: NO
  - Liver: Normal
  - Spleen: NO
  - Tumor: NO

- 9. Nervous system:
  - History of fits or epilepsy: NO
  - Paralysis: NO
  - Mental health: Normal

- 10. Locomotory system: Normal
- 11. Skin: Normal
- 12. Hydrocele: NO
- 13. Hernia: NO
- 14. Any other abnormality: NO

- 15. Urine:
  - Reaction: Acidic
  - Albumin: Trace
  - Sugar: Absent

- 16. Skiagram of chest: Normal
- 17. Any other test considered necessary by the examining authority: NO
- 18. Any opinion of specialist considered necessary: NO
- 19. ECG: Normal
- 20. Liver function test: Normal
- 21. Spirometry: Mild Restriction

Place: Kalamogha Dispensary

Group: B.Fve

Dr. BIPLAV K. SHAFI NAIK  
Signature of the examining authority  
SNASL

461

(FORM - O)  
(See rule 29F (2) and 22L)  
Report of medical examination under rule 29B  
(To be issued in triplicate)\*\*

Certificate No. 470  
Certified that Shri/Shrimati Vinay Kumar \*employed\* as..... In  
.....mine, Form B. No..... has been  
examined for an initial/periodical medical examination. He/she\* appears to be 27  
years of age. The findings of the the examining authority are given in the attached sheet. It is  
considered that Shri/Shrimati\*..... Vinay Kumar.....

- (a)\* is medically fit for any employment in mines. yes  
(b)\* is suffering from..... And is medically unfit for  
(i) any employment in mine; or  
(ii) any employment below ground; or  
(iii) any employment or work.....

C\* is suffering from..... should get this disability\* -cured/controlled and  
should be again examined within a period of .....months. He/She will appear for  
re-examination with the result of test of..... and the opinion  
of..... Specialist from..... He/She may be permitted/not\*  
permitted to carry on his duties during this period.



Dr. BIPLAV KESHARI NAIK  
(M.B.B.S.)  
S.M.A.S.I.  
Signature of the examining authority

.....  
Name and designation in Block letters

Place: Kalamegha Dispensary  
Date: 28.8.19

\* Delete whatever is not applicable.  
\*\* One copy of the certificate shall be handed over to the person concerned and another copy shall be sent  
to the manager of the mine concerned by registered post, and the third copy shall be retained by the  
examining authority.  
† Inserted vide Notification No. GSR 656, dated 1.6.1980

(FORM O-Cont.)

Report of the examining authority

(to be filled in for every medical examination whether initial or periodical or reexamination or after /control of disability) Annexure to certificate No. 470 as a result of medical examination on Date 28/08/19  
Identification Mark place mole at side below nose

Left thumb impression of the candidate

- 1. General development- Good/Fair/Poor
- 2. Height 170 Cms.
- 3. Weight 70 kg.
- 4. Eyes: JO NO
  - (i) Visual acuity Distance vision (with or without glasses)  
Right eye 6/6 NO Left eye 6/6 NO
  - (ii) Any organic disease of eyes
  - (iii) Night blindness
  - (iv) Color blindness NO
  - (v) Squint
  - (\* to be tested in special cases)
- 5. Ears: NO
  - (i) Hearing: right ear 6000m Left ear 6000m
  - (ii) Any organic diseases. NO
- 6. Respiratory system: NO
  - Chest measurement:
    - (i) After full inspiration 97 cms.
    - (ii) After full expiration 92 cms.
- 7. Circulatory system:
  - Blood Pressure 120/80 mmHg
  - Pulse 72 BPM
- 8. Abdomen: NO
  - Tenderness
  - Liver Normal
  - Spleen
  - Tumor NO
- 9. Nervous system: NO
  - History of fits or epilepsy NO
  - Paralysis NO
  - Mental health. Normal
- 10. Locomotory system NO
- 11. Skin. Normal
- 12. Hydrocele
- 13. Hernia NO
- 14. Any other abnormality NO
- 15. Urine: NO
  - Reaction. Acidic
  - Albumin. NO
  - Sugar NO
- 16. Skiagram of chest. NO
- 17. Any other test considered necessary by the examining authc NO
- 18. Any opinion of specialist considered necessary. NO
- 19. ECG: Normal
- 20. Liver function test: Normal
- 21. Spirometry: Normal

Group & RHT: B. Fine

Dr. BIPLAKESHARI NAIK  
(M.B.B.S.)  
SMAS

Signature of the examining authority

Place: Kalamnagha Dnyaneshwari

# SAFETY ZONE FENCING & GAP PLANTATION



## SAFETY ZONE FENCING & GAP PLANTATION



Settling Pond inside mines



**Dust Suppression Activities in CHP Operation**



**Dust Suppression at Receiving Hopper**



**Dust suppression on haul roads near CHP**



**Dust suppression near MGR**

Use of Wet Operated Drill in Mining





एन टी पी सी लिमिटेड  
 (एन टी पी सी लिमिटेड)  
**NTPC Limited**  
 (A Govt. of India Enterprise)

दुलंगा/ Dulanga

Ref.: 1070/NTPC/DLCMP/CCO/253

Date: 30/06/2022

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

**Sub : Submission of Annual Mine Closure Activity Report for the period  
 2021-22 of Dulanga Coal Mining Project of NTPC Limited,  
 Sundargarh, Odisha**

Sir,

Please find attached herewith the Annual Mine Closure Activity Report for the period 2021-22 of Dulanga Coal Mining Project of NTPC Limited, Sundargarh, Odisha

Thanking You.

Yours Faithfully,

*S. Srivastava*

(Shivam Srivastava)

General Manager

Encl: as above

Copy to: The OSD,  
 Sambalpur Regional Office,  
 Sambalpur, Odisha.

Dulanga Coal Mining Project, Khapurikechhar, PO – Sanghumuda, Tehsil-Hemgix, Dist- Sundargarh 770013

दुलंगा कोल माइनिंग प्रोजेक्ट, खापुरिकेछार, पोस्ट - संघुमुडा, तहसील - हेमगीय, जिला - सुंदरगढ़ ७७००१३

पंजीकृत कार्यालय: एन टी पी सी भवन, स्कोप कॉम्प्लेक्स, ७ इंस्टीटयुशनल एरिया, लोधी रोड, नई दिल्ली ११०००३

कॉर्पोरेट पहचान नंबर: L40101DL1975G01C07966, टेलीफोन नं: 011-24387333, फैक्स नं: 011-24361018, ई मेल: ntpccc@ntpc.co.in, वेबसाइट: www.ntpc.co.in

Registered Office: NTPC Bhavan, Scope Complex, 7 Institutional Area, Lodhi Road, New Delhi - 110003

Corporate Identification No: L40101DL1975G01C07966, Telephone No: 011-24387333, Fax No: 011-24361018, Email: ntpccc@ntpc.co.in, Website: www.ntpc.co.in

# YEARLY REPORT OF MINE CLOSURE ACTIVITIES

(As per clause 7 of annexure of the Guidelines for preparation of Mine Closure Plan; No.55011-01-2009-CPAM dated 07.01.2013 to be submitted before 1<sup>st</sup> July of every year).

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

Date:30/06/2022

Sir,  
Please find herewith the yearly report of mine closure activities for the year 2020-21 for the **DULANGA COAL MINING PROJECT** mine of NTPC Ltd. company as given below.

1	Name of the coal/lignite mine/block	Dulanga Coal Mining Project
	a) Type: O/C/L/Mixed	Open Cast
	b) Total life of mine:	24 years of operation (additional 6 years for mine closure including filling of void)
	c) Balance life of the mine:	20Yrs
2	Name of the Owner:	NTPC Limited (Nominated Owner: Sh. C K Mondol , Director (Commercial))
3	Address of the Owner:	NTPC Limited, NTPC Bhawan, SCOPE Complex, 7 Institutional Area, Lodhi Road, New Delhi 110003
4	i) Leasehold Area of the Mine: ii) Project Area of the Mine:	762.42 Ha 7.62 Sq. Km,
5	Mine Closure Plan approved by: .....on(date)	Ministry of Coal, Dated 14.08.2012 (along with mining plan)
6	Escrow Account number:	A/c No: 35611468943
7	Name & Address of Escrow Agent:	State Bank of India 1. Corporate Office address – State Bank Bhawan, Corporate Centre, Madam Cama Marg, Naraina Point, Mumbai 400021) 2. Branch Address – CAG Branch, New Delhi, 11th and 12th Floor, Jawahar Vyapar Bhawan, 1 Tulsay Marg, New Delhi 110001
	Closure Cost deposited for the year 2021-22	Rs. 3,50,00,000.00(2021-22)
9	Cumulative Balance including interest in the account:	Rs. 17.21,06,946.76 (as on 31.03.2022)
10	Report being submitted for: (Progressive or Final Mine Closure)	Progressive for Dulanga Coal Mining Project of NTPC Limited for 2021-22
11	Specific condition imposed (if any, by Governmental agency):	NIL

## YEARLY REPORT OF MINE CLOSURE ACTIVITIES

12	Reserve of Coal/Lignite(as per Mining Plan): Coal/Lignite actually mined out during last year (2021-22)	Mineable Reserve - 152 Million Tonnes Coal Production in FY 2021-22 -52,92,094 Tonnes against the permitted coal production of 70,00,000 Tonnes.
13	Method of Mining:	Mechanized Opencast mining with Shovel, Dumper combination and Surface Miner
14	Area Mined out (Ha): (15th March '22)	Mining Operations started from 28th February, 2018. Approximately 150 Ha is broken for coal excavation as on 31.03.2022.
15	Area reclaimed:	<p>i) Physical - During 2021-22, 15,25,300 m<sup>3</sup> of Solid waste has been dumped in the void created after mining.</p> <p>ii) Biological - After attaining final height of physical reclamation of top dump, this will be taken up. Plantation and Grassing Activities has been carried over non-active Overburden Dump which spread across about 1.5 Ha with total 2500 nos of sapling over the Dump and 1200 kg of Style Harata ail along the slope of non-active dump.</p>
16	Details of afforestation:	The project has undertaken plantation activities from initial stage. During 2021- 22. Total 8,400 no of sapling has been carried out during monsoon period. Plantation Activities in different region has been attached in <b>Annexure-I</b> . Cumulatively, about 32,100 Nos of saplings have been planted/ distributed in and around the ML area.
17	Water Quality Management:	
	a) Water bodies available in household area:	Garia Nalla and its tributaries flow within the block boundary, which are seasonal in nature. These are to be diverted by 5th year of mining.
	b) Measures taken for protection: (Control of erosion, sedimentation, siltation, water treatment, diversion of water courses if any, measure for protection of contamination of groundwater from leaching etc shall be described)	<p>Measures taken for protection:</p> <p>Garland drain around top soil dump, overburden dump, embankment along nalla, plantation for erosion control, settling pond for sedimentation, ETP for waste water treatment.</p> <p>To manage soil erosion and to maintain the quality of the top soil, garland drain provided near the toe of dump.</p> <p>About 10.00 Km of catchment drain/ garland drain having width varying from 1.5m - 4m and depth 1.5m-4m have been excavated to protect mine workings/ to arrest the siltation of drained water from dumps, which is ultimately concerned to 5 Nos of sedimentation pond/ settling pit for</p>

## YEARLY REPORT OF MINE CLOSURE ACTIVITIES

		<p>collection of channelized run-off water. The drains and sedimentation ponds/ pits are regularly de-silted and maintained properly.</p> <p>ETP has been constituted for the treatment of water before reusing.</p> <p>The water so collected is being utilized for watering the mine area, roads, greening development, etc.</p>
	e) Quantity of water pumped out from mine/Quarry:	<p>NA</p> <p>All the mine seepage water / Effluent generated are being reused</p>
	d) Quality of water (as per test result):	<p>Water quality parameters are within the prescribed limits as per the test result of the water samples collected from the open well from the villages, Surface water from pond. For water sampling and analysis, NABL accredited lab, M/s Environmental Research &amp; Services (India) Pvt. Ltd., Bhubaneswar has been engaged. Water Quality report for 2021-22 is enclosed as <b>Annexure-II</b>.</p>
	e) Corrective measures taken conforming to the permissible limit:	The test results shows the water quality parameters are within the permissible limit.
	f) Is there any acid mine drainage? if yes, the treatment method taken:	None
18	<b>Air Quality Management:</b>	
	i) Existing air quality parameters:	<p>The existing air quality parameters being monitored are SPM, PM10, PM2.5, SO2, Nox, CO, Hg, Pb, Cr, As etc being tested by the NABL accredited laboratory M/s Environmental Research and Services (India) Pvt. Ltd, Bhubaneswar. All the air quality parameters are within the permissible limit. Air Quality report for 2021-22 is enclosed as <b>Annexure-III</b>.</p>
	ii) Corrective measures taken for prevention of air pollution:	<p>Water sprinkling in the mine area is being done by 3 nos of water tankers with 18KL capacity and 3 nos of water tanker with 14KL capacity are working for dust suppression in the haul road, working area etc.</p> <p>Fixed Sprinkler of about 900m has been installed along the permanent haul road.</p> <p>Drilling machines with wet drilling arrangements are being used.</p>

## YEARLY REPORT OF MINE CLOSURE ACTIVITIES

		<p>Surface Miners used for coal cutting are having water spraying arrangements at cutting drum. Regular Air quality monitoring is being done regularly as per MoEF&amp;CC guidelines.</p> <p>Plantation has been done in the safety zone area along the boundary and diversion road and plantation in the mine area will be continued concurrent to mining operations.</p>
19	<b>Waste Management</b>	
	a) Quantity of overburden removed:	<p>Overburden removal during FY 2021-22: 6908898.44 Cum (including Topsoil).</p> <p>Cumulative OB removal 15785181.61 Cum (including Topsoil).</p>
	b) Quantity of Coal/Lignite reject generated:	NIL
	c) Utilization of Waste Material done:	Waste materials are being used for making of haul roads and levelling of siding area. Rest all the wastes has been dumped in the dump yard.
	d) Protective Measures taken from prevention of siltation, erosion and dust generator for waste material:	Garland Drains made around the entire dump yard. Dust suppression carried out regularly for controlling fugitive emission and air borne.
	e) Quantity of waste material re-handled/back-filled:	During 2021-22, 15,25,300 m <sup>3</sup> of Solid waste has been dumped in the void created after mining.
	f) Height of dump and its stability measures taken:	<p>45m against the max permitted height 60m</p> <p>The stability measures taken are</p> <ul style="list-style-type: none"> <li>- Dedicated dozer deployed for proper dozing and compaction.</li> <li>- Dumping carried out under constant supervision.</li> <li>- Garland drain prepared to guide rain water away from dump area.</li> <li>- Scientific studies for stability carried out through NIT Rourkela and all recommendations thereof are followed.</li> <li>- One Slope monitoring Officer has been deployed for monitoring of slope and dump management.</li> </ul>

*Rohit*

20	<b>Top Soil Management</b>	
	a) Top Soil available at site:	Topsoil available at site is 3,66,000 m <sup>3</sup> (approx.) upto March 2022.
	b) Utilization of topsoil during 2021-22	4,963.78 m <sup>3</sup> of topsoil has been spread over inactive Overburden dump of 1.5 Ha during 2021.22 and has stabilised with Grassing and Sapling Plant over the Dump.
21	a) Coal beneficiation facilities adopted:	No beneficiation is being done
	b) Maintenance of coal washeries being done:	Not applicable
	c) Dismantling of structure of washery (describe briefly):	Not applicable

## YEARLY REPORT OF MINE CLOSURE ACTIVITIES

22. Subsidence management (for UG mine): Not Applicable as the subject mine is an opencast mine.

23. Infrastructure:

Existing infrastructural facilities available	Future Utilisation	Maintenance
Roads	Yes	Being maintained
Aerial ropeways	None	Not applicable
Conveyor Belts	Yes	Under Commissioning
Railways	Yes	Being maintained
Bridges, Culverts	Yes	Being repaired and maintained
Power lines	Yes	Being maintained
Building & Structures	Yes	Being maintained
Water Treatment Plant	Yes	Being maintained
Water Supply Sources	Nil	Not applicable
Gas Pipeline	None	Not applicable
Sewer Line	Nil	Not applicable
Telephone Cable	Yes	Being maintained
Underground Tunnels	Nil	Not applicable
Electric Cable	Yes	Being maintained
Transformers	Yes	Being maintained

Describe if decommissioning, dismantling or disposal is done of above items during 2021-22 (if any):

No dismantling, decommissioning or disposal done during 2021-22

24. Disposal of Machinery: Decommissioning of Mining Machinery and their possible post mining utilization:	Not applicable during I Y 2021-22
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25. Safety and Security:

a	Safety measures implemented to prevent access to surface opening for Underground working (barbed wire fencing done):	Not applicable
b	Safety measures implemented to prevent access to surface opening for excavation:	<p>Safety measures implemented to prevent access to surface opening for excavation:</p> <ul style="list-style-type: none"> <li>• Barbed wire fencing at the top of excavation area</li> <li>• Bund all along the excavation area with garland drain/ Trench cutting.</li> <li>• Installation of barriers and posting of security guards at the entry point/ check gates.</li> </ul> <p>Photograph has been Attached as <b>Annexure-IV</b></p>

## YEARLY REPORT OF MINE CLOSURE ACTIVITIES

c	Arrangement made up to the site being opened for general public:	Visitors are being allowed to enter in mines only after the permission of Mine Manager and are assisted by competent person during their visit.
d	Sealing of mine entries:	Not applicable

### 26. Economic Repercussions of Closure of Mine:

a	Number of local residents employed in the mine:	About 200 Nos of local residents have been appointed through different associated agencies till March 2022.
b	Compensation given to the employees concerning their sustenance:	Not applicable
c	Vocational / Skill development training for sustainable income of affected people:	Various skill development programmes are being undertaken. Training to employed persons for different skills like fitter, electrician, driving, welding, surface disinfectant making etc. are being taken up for the project affected people before employment in mine. Various other income generation schemes like H & dye training, mushroom cultivation, skill development etc. have been taken up. Project has spent a total of approx. Rs. 2.23Cr under different head like health, education, infrastructure, drinking water, capacity building / skill development in FY 2021-22. Different Programme has been attached as Annexure-V

27. Any other closure activities as per approved Mine Closure Plan: Manpower has been engaged in Mining, Survey, Environment, Geology, Chemist for executing the mine closure activities.

### OTHER CLOSURE ACTIVITIES AS PER APPROVED MINE CLOSURE PLAN

#### **1. Mined area and waste management**

1.1. Top soil has been soaked separately and will be spread over the slopes and dump area before plantation and gulland drain made around topsoil dump. Photograph has been attached Annexure-V

1.2. Overburden excavated from the mine is being dumped in the earmarked external dump Yard, partly over the coal bearing area after due approval of MHP&CC which will be re-handled afterwards to extract coal and partly over the De-Coaled area of mine. After completion of external dump yard, this waste dump will be completely vegetated.

1.3. Hazardous waste authorization for Workshop & store obtained from SPCB. Used oil

# YEARLY REPORT OF MINE CLOSURE

## ACTIVITIES

storage yard is provided at workshop with corner collection pit. Disposal of hazardous waste has been done to the authorised hazardous waste disposers on 07th July'21 and 06th Oct '21 and 28th Jan'22.

- 1.4. Barbed wire fencing has been done along the mine boundary for about 9.3 Km till Mar'22 and under progress for balance area. Photograph attached as Annexure-V1.

### **2. Environmental Management**

- 2.1. Plantation done / distributed during various occasions of environment and social functions inside the site office/ Pit Office, mine boundary and other vacant patches, During 2021-'22 total 8,400 no of sapling has been carried out during monsoon period. (Plantation Activities in different region. Cumulatively, about 24,000 No's of saplings have been planted/ distributed in and around the M. area.
- 2.2. Regular pollution monitoring of all vehicles involved in the mining project are in practice to control emission during operation of the mine.
- 2.3. Protective respiratory devices are available to personnel working in dusty areas. They are provided with adequate training and information on safety & health aspects once in a year.
- 2.4. Water sprinkling through 6 nos. of hydraulic pressure sprinkling mobile water tankers (i.e. 3nos 18 KL. and 3nos of 14 KL.) in the coal transportation and Mine Haul road route.
- 2.5. 0.9 km length of fixed water sprinkling system has been installed.
- 2.6. Water sprinkling through spray nozzles installed and under operation at Interim Crusher
- 2.7. Proper maintenance of haul road and other roads in around the mine is being taken up.
- 2.8. Wet drilling is being practiced for drilling OB benches for OB removal.
- 2.9. Surface Miner used for coal extraction are equipped with Water suppression measures through nozzles at cutting drum.
- 2.10. Transporting vehicles carrying the loaded materials are fully covered with tarpaulins covers to avoid dust generation and spillage.
- 2.11. Water seepage from the benches is drained to the sump in the bottom of the mine pit. Clear water from this sump is used in mining activity.
- 2.12. To reduce the mine working/ OB dump, Catchment water drain / Garland drain has been made. Sedimentation Pond /Settling Pond has been constructed or De-silted during 2021-'22 see as follows: -
- About 1910m of garland drain having width varies from 1.5m to 2m and depth varies from 1.5m to 2m has been constructed along the OB dump 7B with proper settling pond has been constructed before discharge of rainwater to Garia Nalla.
  - About 1620m. of garland drain having width varies from 1.5m to 2m and depth

## YEARLY REPORT OF MINE CLOSURE

### ACTIVITIES

- varies from 1.5m to 2m has been constructed along the O.B dump-1A with proper settling pond has been constructed before discharge of rainwater to Garia Nalla.
- About 455m of garland drain having width varies from 1.5m to 2m and depth varies from 1.5m to 2m has been constructed along the O.B dump-1A ( Near Garia Nalla side) with proper settling pond has been constructed before discharge of rain water to Garia Nalla.
  - About 2350m of garland drain having width varies from 1.5m to 2m and depth varies from 1.5m to 2m has been constructed along the dip side of mine and discharge to sedimentation pond before discharge to Garia Nalla and prevent outside water to rush inside. Adequate embankment has been provided along the Garia Nalla.
  - About 2578m of garland drain having width varies from 1.5m to 2m and depth varies from 1.5m to 2m has been constructed along O.B dump-2 and discharge to sedimentation pond before discharge to Garia Nalla.
- 2.13. UTP having 50KLD capacity has been started operational from January'20 onwards and is being used for treatment of Effluent water generated during Washing of Wheel.
- 2.14. For treatment of domestic water, a sewage treatment plant (STP) of 500 KLD capacity with MBBR (Moving Bed Biofilm Reactor) process technology are being installed (work in under construction) R & R Colony.
- 2.15. The water so collected is being utilized for watering the mine area, roads, green belt development, etc.
- 2.16. The project has de-silted ponds in the surrounding villages so far total 13 No's for recharge of the ground water.
- 2.17. The post project air / water / noise quality/ ground water level is being monitoring through a MoEF / NABL Accredited lab, Environmental Research and Services (India) Pvt. Ltd, Bhambaneswar.

### **3. Management of Infrastructure and Mining Machineries**

- 3.1.The site office/ Pit office has been established and is being maintained as per requirement of DGMS.
- 3.2.Coal handling plant and Syto for rapid loading has been under trial and will be in operational by financial year 2022-23.
- ### **4. Action for safety and security of local community around the mine or part of the mine**
- 4.1. For regular inspection of the OB Dumps, drains, a safety officer assisted with die mine overseer has been posted.

## YEARLY REPORT OF MINE CLOSURE ACTIVITIES

4.2. OHSF has been deployed to keep access control in the Mine area.

### 5. Social and Economic Aspects.

5.1. 300 No's of local residents have been appointed through different associated agencies till March 2022.

5.2. Project has spent a total of approx.. Rs. 2.23Cr towards CII/CSR activities under different head like health, education, infrastructure, drinking water, capacity building / skill development in FY 2021-22.

### 6. Execution and supervision

6.1. Two Nos of JCBs have been hired for the toe wall and gariand drains and de-silting.

6.2. Manager (EMG), Assistant Manager (Mining), Geologist, Chemist, Inv. Officer, Van Pai, Van sahayak (3Nos), 2 Nos mazdoors posted for execution of the progressive closure and environment related works.

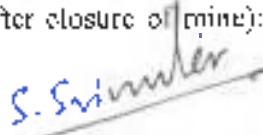
6.3. For catchment drain survey, boundary survey and demarcation of total project area and updating the quarterly plans, one Mine surveyor assisted with 2 nos of Asstt Surveyor, 1 nos chainman and 2 Nos Survey helper have been posted for survey related work for execution of the closure work.

6.4. For regular inspection of the OB Dumps, peripheral and internal drains, a safety officer assisted with the mine overman has been posted.

6.5. Towards medical service a dedicated team under the leadership of 1-7 executives assisted with 3 executives and 2 doctors assisted by dresser and attendants have been posted and also 24x7 two no's of ambulance has been deployed for the above.

6.6. Security personnel from Odisha Industrial security Force (OISF) have been deployed to keep access control in the mine and also for security of local communities.

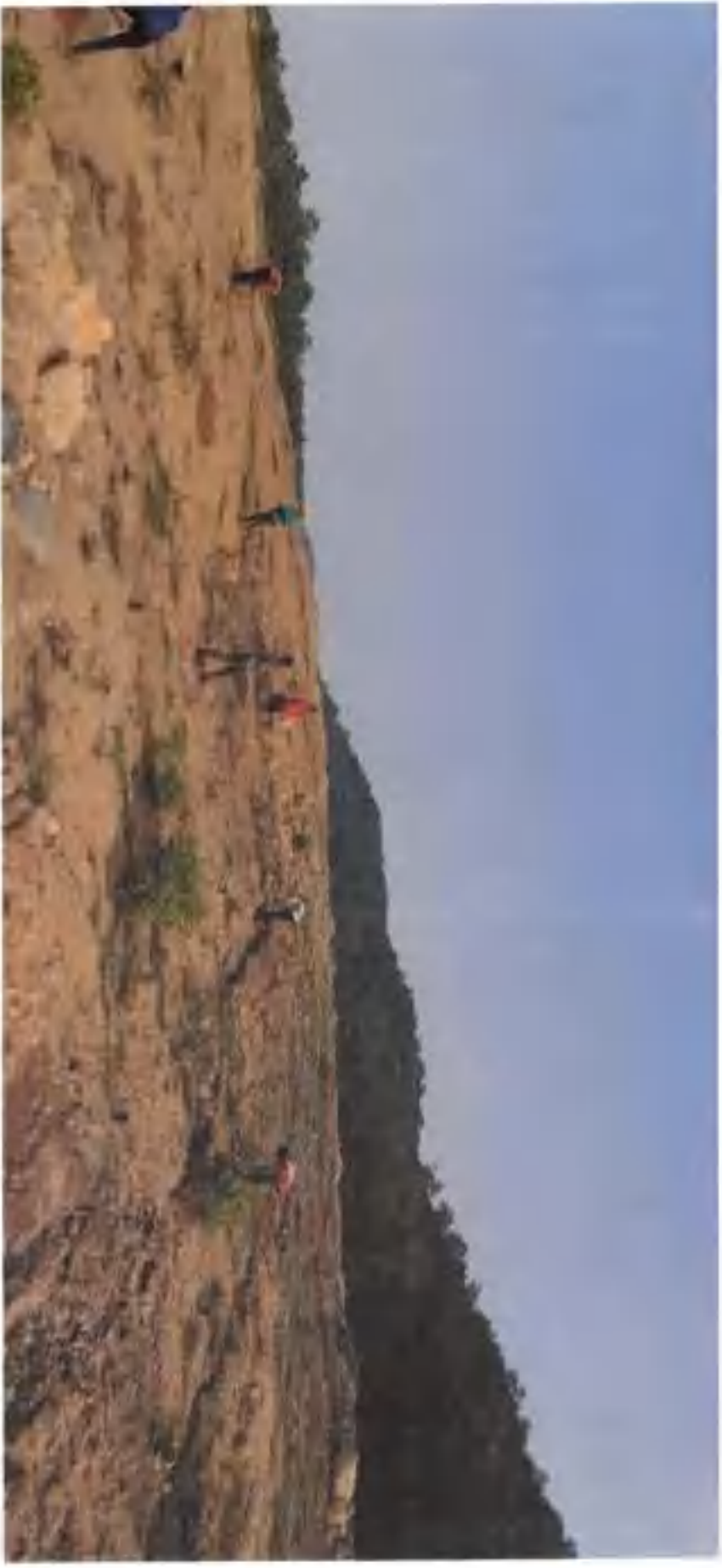
28. Post Environmental Monitoring for 3 years (to be given after closure of mine): Will be submitted after closure of the mine for the 3 years.

  
(Signature of Competent Authority)  
Name: शिवनी सिंग / Shivani Singh  
Designation: महाप्रबंधक (दुलगा) / General Mgr.  
Date with seal: दुलगा सी एम् ए / Dulanga C.M.P.

## Plantation Details

Area of the Mines (In Ha.)	Mandatory area to be covered under plantation (in Ha) (As per EC letter)	Plantation during 2021-22			
		Name of site	Area in Ha./ RKM*	Number of seedlings planted (Nos)	Remarks
762.42	Within ML area: 286.74 Outside ML area: 179.72	Kalamegha Dhuanmunda	4 K.M.	500	
		View point, Parking area, Near office Building	0.5 Ha.	1400	
		Over the Top Soil Dump	1.27 Ha	100	
		Over the Inactive Over Burden Dump	1.5 Ha	2500	
		Along Public Road	500 m.	70	
		Patch Area (Safety Zone)	-	2330	
		Distribution among Villager	R&R Colony	1200	
		Along the slope of Topsoil Dump	1.27 Ha	1200 Kg	1200 Kg of Stylo Hamata (Grassing activities all along the slope of Topsoil Dump)
		Along the slope of Inactive OB Dump	1.5 Ha	1200 Kg	1200 Kg of Stylo Hamata (Grassing activities all along the slope of Inactive OB Dump)

## Plantation Activities at different area.



Plantation over the Overburden. (1 of 2)



**Plantation over the Overburden. (2 of 2)**



Before Grassing Activities along the slope. (2013).



**Grassing Activities at Top Soil (2of3).**



Plantation at View Point DLCMP. (10/2).



Plantation at View Point DLCMP. (2012).



Plantation at different offices area.(1 of6)



Plantation at different offices area.(2 of 6)



**Plantation at different offices area.(3 of 6)**



**Plantation at different offices area.(4 of6)**



**Plantation at different offices area.(5 of6)**



**Plantation at different offices area. (5 of 6)**



**Grassing Activities along slope of Non-Active Overburden Dump.**



**Ground Water Sampling and Analysis Report**  
**Frequency of Monitoring – Monthly Once**  
**Ground Water Quality Analysis Report for the month of April 2021**  
**Date of Sampling: 14/04/2021**

Sl. No	Parameters Analyzed	Unit	Permissible Limit as per IS 10500:2012	Analysis Results		
				Village Bendrichua	Village Dalanga	Village Beldihi
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A
03	Taste	--	Agreeable (A)	A	A	A
04	pH value	-	6.5 to 8.5	6.21	7.08	6.51
05	Turbidity	NTU	1.0	0.8	0.4	0.5
06	Total Hardness as CaCO <sub>3</sub>	mg/l.	200.0	140.0	166.0	134.0
07	Total Iron	mg/L	0.3	<0.07	<0.07	<0.07
08	Chloride	mg/l.	250.0	37.45	61.10	23.65
09	Total Dissolved Solids	mg/l.	500.0	248.0	355.0	311.0
10	Calcium as Ca	mg/l.	75.0	48.10	43.29	29.66
11	Sulphate as SO <sub>4</sub>	mg/l.	200.0	32.2	28.5	26.5
12	Fluoride	mg/l.	1.0	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/L	200.0	106.0	142.0	118.0
14	Nitrate as NO <sub>3</sub>	mg/L	45.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/L	0.2 (min)	Nil	Nil	Nil
16	Copper	mg/L	0.05	ND	ND	ND
17	Manganese	mg/L	0.1	ND	ND	ND
18	Phenolic Compound	mg/l.	0.001	ND	ND	ND
19	Mercury	mg/L	0.001	ND	ND	ND

20	Cadmium	mg/l.	0.003	ND	ND	ND
21	Selenium	mg/l.	0.01	ND	ND	ND
22	Total Arsenic	mg/l.	0.01	ND	ND	ND
23	Cyanide	mg/L	0.05	ND	ND	ND
24	Lead	mg/l.	0.01	ND	ND	ND
25	Zinc	mg/L	5.0	ND	ND	ND
26	Anionic detergents	mg/l.	0.2	ND	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/l.	0.0001	ND	ND	ND
29	Mineral Oil	mg/l.	0.5	ND	ND	ND
30	Pesticides	mg/l.	...	ND	ND	ND
31	Aluminum	mg/L	0.03	ND	ND	ND
32	Boron	mg/L	0.5	ND	ND	ND
33	Nickel	mg/l.	0.02	ND	ND	ND

Note: ND = Not Detected

**Ground Water Quality Analysis Report for the month of April 2021**

**Date of Sampling: 14/04/2021**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500: 2012	Analysis Results			
				Village Kalamegha	Village Katrfuji	Village Khuntjharia	Village Rengulmura
01	Colour	Plazen	5.0	<5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A	A
03	Taste	--	Agreeable (A)	A	A	A	A
04	pH value	-	6.5 to 8.5	6.94	6.01	5.51	7.11
05	Turbidity	NTU	1.0	0.8	0.4	1.0	0.8
06	Total Hardness as CaCO <sub>3</sub>	mg/L	300.0	316.0	34.0	80.0	308.0
07	Total Iron	mg/L	0.3	0.07	< 0.07	0.08	< 0.07
08	Chloride	mg/L	250.0	44.35	25.62	29.57	80.81
09	Total Dissolved Solids	mg/L	500.0	583.0	59.2	119.5	633.4
10	Calcium as Ca	mg/L	75.0	62.52	11.22	29.66	45.69
11	Sulphate as SO <sub>4</sub>	mg/L	200.0	39.6	2.3	2.6	31.7
12	Fluoride	mg/L	1.0	<0.1	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/L	300.0	310.0	30.0	26.0	504.0
14	Nitrate as NO <sub>3</sub>	mg/L	45.0	< 5.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/L	0.2 (min)	Nil	Nil	Nil	Nil
16	Copper	mg/L	0.05	ND	ND	ND	ND
17	Manganese	mg/L	0.1	ND	ND	ND	ND
18	Phenolic Compound	mg/L	0.001	ND	ND	ND	ND
19	Mercury	mg/L	0.001	ND	ND	ND	ND
20	Cadmium	mg/L	0.003	ND	ND	ND	ND

21	Selenium	mg/l.	0.01	ND	ND	ND	ND
22	Total Arsenic	mg/l.	0.01	ND	ND	ND	ND
23	Cyanide	mg/L	0.05	ND	ND	ND	ND
24	Lead	mg/l.	0.01	ND	ND	ND	ND
25	Zinc	mg/L	5.0	ND	ND	ND	ND
26	Anionic detergents	mg/L	0.2	ND	ND	ND	ND
27	Total Chromium	mg/l.	0.05	ND	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/l.	0.0001	ND	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND	ND
30	Pesticides	mg/L	---	ND	ND	ND	ND
31	Aluminum	mg/l.	0.03	ND	ND	ND	ND
32	Boron	mg/l.	0.5	ND	ND	ND	ND
33	Nickel	mg/l.	0.02	ND	ND	ND	ND

Note: ND = Not Detected

**Ground Water Quality Analysis Report for the month of April 2021**  
**Date of Sampling: 13/04/2021**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500: 2012	Analysis Results	
				Bore well Near Pit (Inside Lease Area)	Bore well Near Labour Barrack (Inside the Lease Area)
01	Colour	Hzach	5.0	<5.0	<5.0
02	Odour	-	Agreeable (A)	A	A
03	Taste	-	Agreeable (A)	A	A
04	pH value	-	6.5 to 8.5	6.92	7.01
05	Turbidity	NTU	1.0	0.4	1.2
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	166.0	182.0
07	Total Iron	mg/l.	0.3	0.08	< 0.07
08	Chloride	mg/l.	250.0	47.30	76.87
09	Total Dissolved Solids	mg/L	500.0	359.0	287.1
10	Calcium as Ca	mg/l.	75.0	28.86	46.49
11	Sulphate as SO <sub>4</sub>	mg/l.	200.0	4.7	16.5
12	Fluoride	mg/L	1.0	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/l.	200.0	192.0	204.0
14	Nitrate as NO <sub>3</sub>	mg/L	45.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/l.	0.2 (min)	Nil	Nil
16	Copper	mg/l.	0.05	ND	ND
17	Manganese	mg/l.	0.1	ND	ND
18	Phenolic Compound	mg/l.	0.001	ND	ND
19	Mercury	mg/l.	0.001	ND	ND

20	Cadmium	mg/L	0.003	ND	ND
21	Selenium	mg/L	0.01	ND	ND
22	Total Arsenic	mg/L	0.01	ND	ND
23	Cyanide	mg/L	0.05	ND	ND
24	Lead	mg/L	0.01	ND	ND
25	Zinc	mg/L	5.0	ND	ND
26	Anionic detergents	mg/L	0.2	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND
30	Pesticides	mg/L	---	ND	ND
31	Aluminum	mg/L	0.03	ND	ND
32	Boron	mg/L	0.5	ND	ND
33	Nickel	mg/L	0.02	ND	ND

**Note: ND = Not Detected**

*Roth*

**Ground Water Quality Analysis Report for the month of May 2021**  
**Date of Sampling: 22-23/05/2021**

Sl. No	Parameters Analyzed	Unit	Permissible Limit as per IS 10500:2012	Analysis Results		
				Village Beatrichtra	Village Drlunga	Village Beldih
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A
03	Taste	--	Agreeable (A)	A	A	A
04	pH value	-	6.5 to 8.5	6.35	7.14	6.71
05	Turbidity	NTU	1.0	1.0	0.8	0.6
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	141.0	170.0	138.0
07	Total Iron	mg/L	0.3	<0.07	<0.07	<0.07
08	Chloride	mg/l.	250.0	39.42	63.07	25.62
09	Total Dissolved Solids	mg/l.	500.0	251.0	359.0	322.1
10	Calcium as Ca	mg/l.	75.0	48.90	44.89	31.26
11	Sulphate as SO <sub>4</sub>	mg/l.	200.0	32.70	30.5	27.4
12	Fluoride	mg/l	1.0	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/L	200.0	112.0	146.0	124.0
14	Nitrate as NO <sub>3</sub>	mg/L	45.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/L	0.2 (min)	Nil	Nil	Nil
16	Copper	mg/L	0.05	ND	ND	ND
17	Manganese	mg/l.	0.1	ND	ND	ND
18	Phenolic Compound	mg/l.	0.001	ND	ND	ND
19	Mercury	mg/L	0.001	ND	ND	ND
20	Cadmium	mg/l.	0.003	ND	ND	ND
21	Selenium	mg/l.	0.01	ND	ND	ND

22	Total Arsenic	mg/l.	0.01	ND	ND	ND
23	Cyanide	mg/l.	0.05	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND
25	Zinc	mg/l.	5.0	ND	ND	ND
26	Anionic detergents	mg/L	0.2	ND	ND	ND
27	Total Chromium	mg/l.	0.05	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	ng/l.	0.0001	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND
30	Pesticides	mg/l.	---	ND	ND	ND
31	Aluminium	mg/L	0.03	ND	ND	ND
32	Boron	mg/l.	0.5	ND	ND	ND
33	Nickel	mg/l.	0.02	ND	ND	ND

Note: ND - Not Detected

**Ground Water Quality Analysis Report for the month of May 2021**

**Date of Sampling: 22-23/05/2021**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500:2012	Analysis Results			
				Village Kalantegha	Village Kathfali	Village Ktrantjratia	Village Reugal mnr
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A	A
03	Taste	--	Agreeable (A)	A	A	A	A
04	pH value	-	6.5 to 8.5	7.01	6.24	5.87	7.14
05	Turbidity	NTU	1.0	0.6	0.5	0.8	0.6
06	Total Hardness as CaCO <sub>3</sub>	mg/l.	200.0	318.0	36.0	81.0	310.0
07	Total Iron	mg/l.	0.3	0.07	0.08	0.10	0.07
08	Chloride	mg/L	250.0	45.33	37.59	31.54	81.80
09	Total Dissolved Solids	mg/L	500.0	594.1	63.4	123.1	637.0
10	Caicium as Ca	mg/l.	75.0	64.13	13.63	31.26	46.49
11	Sulphate as SO <sub>4</sub>	mg/l.	200.0	40.6	2.7	3.2	32.7
12	Fluoride	mg/l.	1.0	<0.1	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/L	200.0	314.0	32.0	34.0	508.0
14	Nitrate as NO <sub>3</sub>	mg/l.	45.0	<5.0	<5.0	<5.0	<5.0
15	Residual Free Chlorine	mg/l.	0.2 (min)	Nil	Nil	Nil	Nil
16	Copper	mg/l.	0.05	ND	ND	ND	ND
17	Manganese	mg/L	0.1	ND	ND	ND	ND
18	Phenolic Compound	mg/l.	0.001	ND	ND	ND	ND

19	Mercury	mg/L	0.001	ND	ND	ND	ND
20	Cadmium	mg/L	0.003	ND	ND	ND	ND
21	Selenium	mg/l.	0.01	ND	ND	ND	ND
22	Total Arsenic	mg/L	0.01	ND	ND	ND	ND
23	Cyanide	mg/L	0.05	ND	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND	ND
25	Zinc	mg/L	5.0	ND	ND	ND	ND
26	Anionic detergents	mg/L	0.2	ND	ND	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND	ND
29	Mineral Oil	mg/l.	0.5	ND	ND	ND	ND
30	Pesticides	mg/L	---	ND	ND	ND	ND
31	Aluminum	mg/L	0.03	ND	ND	ND	ND
32	Boron	mg/L	0.5	ND	ND	ND	ND
33	Nickel	mg/l.	0.02	ND	ND	ND	ND

Note: ND Not Detected

*Rock*

**Ground Water Quality Analysis Report for the month of May 2021**  
**Date of Sampling: 22-23/05/2021**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500: 2012	Analysis Results	
				Bore well Near Pit Office (Inside the Lease Area)	Bore well Near Labour Barrack (Inside the Lease Area)
01	Colour	Hazen	5.0	<5.0	<5.0
02	Odour	-	Agreeable (A)	A	A
03	Taste	-	Agreeable (A)	A	A
04	pH value	-	6.5 to 8.5	6.99	7.18
05	Turbidity	NTU	1.0	0.5	0.8
06	Total Hardness as CaCO <sub>3</sub>	mg/l.	200.0	170.0	186.0
07	Total Iron	mg/l.	0.3	0.10	0.07
08	Chloride	mg/l.	250.0	48.29	78.84
09	Total Dissolved Solids	mg/l.	500.0	361.1	291.4
10	Calcium as Ca	mg/l.	75.0	29.66	48.10
11	Sulphate as SO <sub>4</sub>	mg/l.	200.0	5.7	17.4
12	Fluoride	mg/l.	1.0	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/l.	200.0	192.0	208.0
14	Nitrate as NO <sub>3</sub>	mg/l.	45.0	<5.0	<5.0
15	Residual Free Chlorine	mg/L	0.2 (min)	Nil	Nil
16	Copper	mg/L	0.05	ND	ND
17	Manganese	mg/l.	0.1	ND	ND
18	Pathogenic Contaminant	mg/l.	0.001	ND	ND
19	Mercury	mg/l.	0.001	ND	ND
20	Cadmium	mg/l.	0.003	ND	ND

*Reddy*

21	Selenium	mg/L	0.01	ND	ND
22	Total Arsenic	mg/L	0.01	ND	ND
23	Cyanide	mg/L	0.05	ND	ND
24	Lead	mg/L	0.01	ND	ND
25	Zinc	mg/L	5.0	ND	ND
26	Anionic detergents	mg/L	0.2	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND
30	Pesticides	mg/L	—	ND	ND
31	Aluminum	mg/L	0.03	ND	ND
32	Boron	mg/L	0.5	ND	ND
33	Nickel	mg/L	0.02	ND	ND

Note: ND = Not Detected

*Rodriguez*

**Ground Water Quality Analysis Report for the month of June 2021**  
**Date of Sampling: 12-13/06/2021.**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500:2012	Analysis Results			
				Village Mujhapar a	Village Bendrich na	Village Dulangu	Village Beldih
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A	A
03	Taste	--	Agreeable (A)	A	A	A	A
04	pH value	-	6.5 to 8.5	6.75	6.23	7.04	6.57
05	Turbidity	NTU	1.0	0.8	1.2	0.6	0.8
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	138.0	110.0	164.0	130.0
07	Total Iron	mg/l.	0.3	<0.07	<0.07	<0.07	<0.07
08	Chloride	mg/l.	250.0	63.07	37.45	61.10	21.68
09	Total Dissolved Solids	mg/L	500.0	366.0	244.0	351.0	318.0
10	Calcium as Ca	mg/L	75.0	28.06	47.29	42.48	30.46
11	Sulphate as SO <sub>4</sub>	mg/L	200.0	6.8	29.8	28.1	26.4
12	Fluoride	mg/L	1.0	<0.1	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/l.	200.0	94.0	106.0	142.0	120.0
14	Nitrate as NO <sub>3</sub>	mg/L.	45.0	< 5.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/l.	0.2 (min)	Nil	Nil	Nil	Nil
16	Copper	mg/l.	0.05	ND	ND	ND	ND
17	Manganese	mg/l.	0.1	ND	ND	ND	ND
18	Phenolic Compound	mg/L	0.001	ND	ND	ND	ND
19	Mercury	mg/l.	0.001	ND	ND	ND	ND
20	Cadmium	mg/L.	0.003	ND	ND	ND	ND
21	Selenium	mg/L.	0.01	ND	ND	ND	ND

22	Total Arsenic	mg/l.	0.01	ND	ND	ND	ND
23	Cyanide	mg/l.	0.05	ND	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND	ND
25	Zinc	mg/L	5.0	ND	ND	ND	ND
26	Anionic detergents	mg/l.	0.2	ND	ND	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/l.	0.0001	ND	ND	ND	ND
29	Mineral Oil	mg/l.	0.5	ND	ND	ND	ND
30	Pesticides	mg/l.	...	ND	ND	ND	ND
31	Aluminum	mg/l.	0.03	ND	ND	ND	ND
32	Boron	mg/l.	0.5	ND	ND	ND	ND
33	Nickel	mg/l.	0.02	ND	ND	ND	ND

Note: ND Not Detected

*Ratke*

**Ground Water Quality Analysis Report for the month of June 2021**  
**Date of Sampling: 12-13/06/2021**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500:2012	Analysis Results			Village Rengalapur
				Village Kalamegha	Village Kathfali	Village Khontjaria	
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0	<5.0
02	Odeur	--	Agreeable (A)	A	A	A	A
03	Taste	--	Agreeable (A)	A	A	A	A
04	pH value	-	6.5 to 8.5	6.91	6.18	5.77	7.01
05	Turbidity	NTU	1.0	0.8	0.6	1.0	0.8
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	308.0	30.0	80.0	304.0
07	Total Iron	mg/l.	0.3	< 0.07	< 0.07	0.08	< 0.07
08	Chloride	mg/L	250.0	42.38	25.62	29.57	79.83
09	Total Dissolved Solids	mg/L	500.0	577.0	59.4	119.8	617.1
10	Calcium as Ca	mg/L	75.0	62.52	12.83	29.66	44.09
11	Sulphate as SO <sub>4</sub>	mg/L	200.0	38.4	2.0	2.3	30.7
12	Fluoride	mg/l.	1.0	<0.1	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/L	200.0	308.0	28.0	32.0	502.0
14	Nitrate as NO <sub>3</sub>	mg/l.	45.0	< 5.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/l.	0.2 (min)	Nil	Nil	Nil	Nil
16	Copper	mg/L	0.05	ND	ND	ND	ND
17	Manganese	mg/L	0.1	ND	ND	ND	ND
18	Phenolic Compound	mg/L	0.001	ND	ND	ND	ND
19	Mercury	mg/L	0.001	ND	ND	ND	ND
20	Cadmium	mg/L	0.003	ND	ND	ND	ND
21	Selenium	mg/L	0.01	ND	ND	ND	ND
22	Total Arsenic	mg/L	0.01	ND	ND	ND	ND

*Rath*

23	Cyanide	mg/L	0.05	ND	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND	ND
25	Zinc	mg/L	5.0	ND	ND	ND	ND
26	Anionic detergents	mg/L	0.2	ND	ND	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND	ND
30	Pesticides	mg/L	---	ND	ND	ND	ND
31	Aluminum	mg/L	0.05	ND	ND	ND	ND
32	Boron	mg/L	0.5	ND	ND	ND	ND
33	Nickel	mg/L	0.02	ND	ND	ND	ND

**Note: ND = Not Detected**

*Roth*

**Ground Water Quality Analysis Report for the month of June 2021**  
**Date of Sampling: 13/06/2021**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500: 2012	Analysis Results	
				Bore well Near Pit (Inside the Lease Area)	Bore well Near Labour Barraek (Inside the Lease Area)
01	Colour	Hazen	5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A
03	Taste	--	Agreeable (A)	A	A
04	pH value	-	6.5 to 8.5	6.84	7.11
05	Turbidity	NTU	1.0	0.8	1.0
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	168.0	182.0
07	Total Iron	mg/l.	0.3	0.08	<0.07
08	Chloride	mg/L	250.0	46.32	76.87
09	Total Dissolved Solids	mg/L	500.0	353.1	284.4
10	Calcium as Ca	mg/L	75.0	28.06	45.69
11	Sulphate as SO <sub>4</sub>	mg/L	200.0	4.6	16.3
12	Fluoride	mg/L	1.0	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/l.	200.0	188.0	206.0
14	Nitrate as NO <sub>3</sub>	mg/l.	45.0	<5.0	<5.0
15	Residual Free Chlorine	mg/l.	0.2 (min)	Nil	Nil
16	Copper	mg/l.	0.05	ND	ND
17	Manganese	mg/L	0.1	ND	ND
18	Phenolic Compound	mg/l.	0.001	ND	ND
19	Mercury	mg/l.	0.001	ND	ND

*Rathin*

20	Cadmium	mg/L	0.003	ND	ND
21	Selenium	mg/L	0.01	ND	ND
22	Total Arsenic	mg/L	0.01	ND	ND
23	Cyanide	mg/l.	0.05	ND	ND
24	Lead	mg/l.	0.01	ND	ND
25	Zinc	mg/l.	5.0	ND	ND
26	Anionic detergents	mg/l.	0.2	ND	ND
27	Total Chromium	mg/l.	0.05	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/l.	0.0001	ND	ND
29	Mineral Oil	mg/l.	0.5	ND	ND
30	Pesticides	mg/l.	---	ND	ND
31	Aluminum	mg/L	0.03	ND	ND
32	Boron	mg/L	0.5	ND	ND
33	Nickel	mg/L	0.02	ND	ND

Note: ND = Not Detected

*Roth*

**Ground Water Quality Analysis Report for the month of July 2021**  
**Date of Sampling 14/07/2021**

Sl. No	Parameters Analyzed	Unit	Permissible Limit as per IS 10500:2012	Analysis Results		
				Village Bendiichuu	Village Dulauga	Village Beldihi
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A
03	Taste	--	Agreeable (A)	A	A	A
04	pH value	-	6.5 to 8.5	6.23	7.00	6.66
05	Turbidity	NTU	1.0	0.8	0.8	1.0
06	Total Hardness as CaCO <sub>3</sub>	mg/l.	200.0	146.0	170.0	136.0
07	Total Iron	mg/L	0.3	<0.07	<0.07	<0.07
08	Chloride	mg/L	250.0	40.41	63.07	25.62
09	Total Dissolved Solids	mg/L	500.0	251.0	357.0	322.0
10	Calcium as Ca	mg/l.	75.0	49.70	43.29	33.67
11	Sulphate as SO <sub>4</sub>	mg/l.	200.0	31.5	28.9	28.3
12	Fluoride	mg/l.	1.0	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/L	200.0	110.0	148.0	128.0
14	Nitrate as NO <sub>3</sub>	mg/l.	45.0	<5.0	<5.0	<5.0
15	Residual Free Chlorine	mg/l.	0.2 (min)	Nil	Nil	Nil
16	Copper	ug/l.	0.05	ND	ND	ND
17	Manganese	mg/L	0.1	ND	ND	ND
18	Phenolic Compound	mg/L	0.001	ND	ND	ND
19	Mercury	mg/l.	0.001	ND	ND	ND
20	Cadmium	mg/l.	0.003	ND	ND	ND
21	Selenium	mg/l.	0.01	ND	ND	ND

22	Total Arsenic	mg/L	0.01	ND	ND	ND
23	Cyanide	mg/L	0.05	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND
25	Zinc	mg/L	5.0	ND	ND	ND
26	Anionic detergents	mg/L	0.2	ND	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND
30	Pesticides	mg/L	---	ND	ND	ND
31	Aluminum	mg/L	0.03	ND	ND	ND
32	Boron	mg/L	0.5	ND	ND	ND
33	Nickel	mg/L	0.02	ND	ND	ND

Note: ND = Not Detected

*Roth*

**Ground Water Quality Analysis Report for the month of July 2021**  
**Date of Sampling 14/07/2021**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500:2012	Analysis Results			
				Village Kulanegha	Village Kathfali	Village Khuntharia	Village Rengatmuri
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A	A
03	Taste	--	Agreeable (A)	A	A	A	A
04	pH value	-	6.5 to 8.5	6.99	6.25	5.87	7.14
05	Turbidity	NTU	1.0	1.2	0.8	1.2	0.8
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	312.0	36.0	86.0	312.0
07	Total Iron	mg/l.	0.3	< 0.07	0.08	0.09	< 0.07
08	Chloride	mg/l.	250.0	15.33	28.58	32.52	83.77
09	Total Dissolved Solids	mg/l.	500.0	581.0	63.7	222.1	627.1
10	Calcium as Ca	mg/L	75.0	64.93	15.23	32.87	15.69
11	Sulphate as SO <sub>4</sub>	mg/L	200.0	40.0	3.5	4.0	32.0
12	Fluoride	mg/L	1.0	<0.1	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/l.	200.0	314.0	34.0	38.0	506.0
14	Nitrate as NO <sub>3</sub>	mg/l.	45.0	< 5.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/L	0.2 (min)	Nil	Nil	Nil	Nil
16	Copper	mg/l.	0.05	ND	ND	ND	ND
17	Manganese	mg/l.	0.1	ND	ND	ND	ND
18	Phenolic Compound	mg/l.	0.001	ND	ND	ND	ND
19	Mercury	mg/l.	0.001	ND	ND	ND	ND
20	Cadmium	mg/l.	0.003	ND	ND	ND	ND
21	Selenium	mg/l.	0.01	ND	ND	ND	ND

*Rath*

22	Total Arsenic	mg/l	0.01	ND	ND	ND	ND
23	Cyanide	mg/l	0.05	ND	ND	ND	ND
24	Lead	mg/l	0.01	ND	ND	ND	ND
25	Zinc	mg/l	5.0	ND	ND	ND	ND
26	Anionic detergents	mg/l	0.2	ND	ND	ND	ND
27	Total Chromium	mg/l	0.05	ND	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/l	0.0001	ND	ND	ND	ND
29	Mineral Oil	mg/l	0.5	ND	ND	ND	ND
30	Pesticides	mg/L	---	ND	ND	ND	ND
31	Aluminium	mg/l	0.03	ND	ND	ND	ND
32	Boron	mg/l	0.5	ND	ND	ND	ND
33	Nickel	mg/l	0.02	ND	ND	ND	ND

Note: ND = Not Detected

*Roth*

**Ground Water Quality Analysis Report for the month of July 2021**  
**Date of Sampling 14/07/2021**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500: 2012	Analysis Results	
				Bore well Near Office (Inside Lease Area)	Bore well Near Labour Barrack (Inside the Lease Area)
01	Colour	Hazen	5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A
03	Taste	-	Agreeable (A)	A	A
04	pH value	-	6.5 to 8.5	6.91	7.17
05	Turbidity	NTU	1.0	0.6	1.2
06	Total Hardness as CaCO <sub>3</sub>	mg/l.	200.0	176.0	190.0
07	Total Iron	mg/L	0.3	0.08	< 0.07
08	Chloride	mg/l.	250.0	50.26	79.83
09	Total Dissolved Solids	mg/l.	500.0	364.1	297.0
10	Calcium as Ca	mg/l.	75.0	29.66	48.90
11	Sulphate as SO <sub>4</sub>	mg/l.	200.0	5.8	18.3
12	Fluoride	mg/l.	1.0	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/l.	200.0	194.0	210.0
14	Nitrate as NO <sub>3</sub>	mg/L	45.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/L	0.2 (min)	Nil	Nil
16	Copper	mg/L	0.05	ND	ND
17	Manganese	mg/l.	0.1	ND	ND
18	Phenolic Compound	mg/L	0.001	ND	ND
19	Mercury	mg/l.	0.001	ND	ND

*Rath*

20	Cadmium	mg/L	0.003	ND	ND
21	Selenium	mg/L	0.01	ND	ND
22	Total Arsenic	mg/L	0.01	ND	ND
23	Cyanide	mg/L	0.05	ND	ND
24	Lead	mg/L	0.01	ND	ND
25	Zinc	mg/L	5.0	ND	ND
26	Anionic Detergents	mg/L	0.2	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND
30	Pesticides	mg/L	---	ND	ND
31	Aluminum	mg/L	0.03	ND	ND
32	Boron	mg/L	0.5	ND	ND
33	Nickel	mg/L	0.02	ND	ND

Note: ND = Not Detected

*Roth*

**Ground Water Quality Analysis Report for the month of August 2021**  
**Date of Sampling: 12/08/2021**

Sl. No	Parameters Analyzed	Unit	Permissible Limit as per IS 10500:2012	Analysis Results		
				Village Rendrichua	Village Dulanga	Village Beklihi
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A
03	Taste	--	Agreeable (A)	A	A	A
04	pH value	-	6.5 to 8.5	7.69	6.66	6.52
05	Turbidity	NTU	1.0	0.5	0.4	0.6
06	Total Hardness as CaCO <sub>3</sub>	mg/l.	200.0	190.0	118.0	104.0
07	Total Iron	mg/L	0.3	< 0.07	< 0.07	< 0.07
08	Chloride	mg/L	250.0	68.0	63.07	33.51
09	Total Dissolved Solids	mg/L	500.0	358.0	355.0	298.0
10	Calcium as Ca	mg/l.	75.0	60.12	36.07	32.06
11	Sulphate as SO <sub>4</sub>	mg/l.	200.0	35.2	32.6	29.3
12	Fluoride	mg/l.	1.0	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/L	200.0	188.0	161.0	168.0
14	Nitrate as NO <sub>3</sub>	mg/l.	45.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/l.	0.2 (min)	Nil	Nil	Nil
16	Copper	mg/l.	0.05	ND	ND	ND
17	Manganese	mg/l.	0.1	ND	ND	ND
18	Phenolic Compound	mg/l.	0.001	ND	ND	ND
19	Mercury	mg/l.	0.001	ND	ND	ND
20	Cadmium	mg/l.	0.003	ND	ND	ND
21	Selenium	mg/l.	0.01	ND	ND	ND

*Ratha*

22	Total Arsenic	mg/L	0.01	ND	ND	ND
23	Cyanide	mg/L	0.05	ND	ND	ND
24	Lead	mg/l.	0.01	ND	ND	ND
25	Zinc	mg/l.	5.0	ND	ND	ND
26	Anionic detergents	mg/l.	0.2	ND	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND
30	Pesticides	mg/l.	---	ND	ND	ND
31	Aluminium	mg/l.	0.03	ND	ND	ND
32	Boron	mg/L	0.5	ND	ND	ND
33	Nickel	mg/l.	0.02	ND	ND	ND

Note: ND = Not Detected

*Rolle*

**Ground Water Quality Analysis Report for the month of August 2021**  
**Date of Sampling: 12/08/2021**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500:2012	Analysis Results			
				Village Kalamegha	Village Kathfali	Village Khuntjhar	Village Rengatmuar
01	Colour	Haze U	5.0	<5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A	A
03	Taste	--	Agreeable (A)	A	A	A	A
04	pH value	-	6.5 to 8.5	7.99	5.89	5.69	7.19
05	Turbidity	NTU	1.0	0.8	0.1	0.5	0.5
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	326.0	34.0	52.0	298.0
07	Total Iron	mg/l.	0.3	< 0.07	< 0.07	0.08	0.07
08	Chloride	mg/l.	250.0	52.23	24.64	28.58	65.04
09	Total Dissolved Solids	mg/l.	500.0	567.0	63.1	135.2	756.0
10	Calcium as Ca	mg/L	75.0	68.94	9.62	10.42	51.30
11	Sulphate as SO <sub>4</sub>	mg/L	200.0	45.7	12.3	0.7	40.7
12	Fluoride	mg/L	1.0	<0.1	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/l.	200.0	324.0	68.0	30.0	562.0
14	Nitrate as NO <sub>3</sub>	mg/L	45.0	< 5.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/L	0.2 (min)	Nil	Nil	Nil	Nil
16	Copper	mg/l.	0.05	ND	ND	ND	ND
17	Manganese	mg/l.	0.1	ND	ND	ND	ND
18	Phenolic Compound	mg/l.	0.001	ND	ND	ND	ND
19	Mercury	mg/L	0.001	ND	ND	ND	ND
20	Cadmium	mg/L	0.003	ND	ND	ND	ND
21	Scenium	mg/l.	0.01	ND	ND	ND	ND

*Ratha*

22	Total Arsenic	mg/L	0.01	ND	ND	ND	ND
23	Cyanide	mg/L	0.05	ND	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND	ND
25	Zinc	mg/L	5.0	ND	ND	ND	ND
26	Anionic detergents	mg/L	0.2	ND	ND	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND	ND
30	Pesticides	mg/L	---	ND	ND	ND	ND
31	Aluminum	mg/L	0.03	ND	ND	ND	ND
32	Boron	mg/L	0.5	ND	ND	ND	ND
33	Nickel	mg/L	0.02	ND	ND	ND	ND

Note: ND = Not Detected

*Reddy*

**Ground Water Quality Analysis Report for the month of August 2021**  
**Date of Sampling: 12/08/2021**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500: 2012	Analysis Results	
				Bore well Near Office the Area)	Bore well Near Labour Barrack (Inside the Lease Area)
01	Colour	Hazen	5.0	<5.0	<5.0
02	Odoar	--	Agreeable (A)	A	A
03	Taste	--	Agreeable (A)	A	A
04	pH value	-	6.5 to 8.5	7.53	6.06
05	Turbidity	NTU	1.0	0.1	0.9
06	Total Hardness as CaCO <sub>3</sub>	mg/l.	200.0	200.0	68.0
07	Total Iron	mg/L	0.3	< 0.07	< 0.07
08	Chloride	mg/L	250.0	61.10	23.65
09	Total Dissolved Solids	mg/L	500.0	408.0	102.2
10	Calcium as Ca	mg/l.	75.0	32.87	6.41
11	Sulphate as SO <sub>4</sub>	mg/l.	200.0	9.0	12.3
12	Fluoride	mg/l.	1.0	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/l.	200.0	228.0	156.0
14	Nitrate as NO <sub>3</sub>	mg/L	45.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/L	0.2 (min)	Nil	Nil
16	Copper	mg/l.	0.05	ND	ND
17	Manganese	mg/L	0.1	ND	ND
18	Phenolic Compound	mg/L	0.001	ND	ND
19	Mercury	mg/L	0.001	ND	ND

*[Signature]*

20	Cadmium	mg/L	0.003	ND	ND
21	Selenium	mg/L	0.01	ND	ND
22	Total Arsenic	mg/L	0.01	ND	ND
23	Cyanide	mg/L	0.05	ND	ND
24	Lead	mg/L	0.01	ND	ND
25	Zinc	mg/L	5.0	ND	ND
26	Anionic detergents	mg/L	0.2	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND
30	Pesticides	mg/L	---	ND	ND
31	Aluminum	mg/L	0.03	ND	ND
32	Boron	mg/L	0.5	ND	ND
33	Nickel	mg/L	0.02	ND	ND

Note: ND = Not Detected

*Rodha*

**Ground Water Quality Analysis Report for the month of September 2021**  
**Date of Sampling: 14/09/2021**

Sl. No	Parameters Analyzed	Unit	Permissible Limit as per IS 10500:2012	Analysis Results		
				Village Bendorjehuu	Village Dnlanga	Village Beldibi
01	Colour	Hazer	5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (G)	A	A	A
03	Taste	--	Agreeable (A)	A	A	A
04	pH value	-	6.5 to 8.5	6.76	7.12	6.8
05	Turbidity	NTU	1.0	0.8	1.2	0.8
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	102.0	192.0	120.0
07	Total Iron	mg/l.	0.3	< 0.07	< 0.07	< 0.07
08	Chloride	mg/l.	250.0	35.18	80.81	44.35
09	Total Dissolved Solids	mg/l.	500.0	174.8	527.0	320.0
10	Calcium as Ca	mg/l.	75.0	30.84	52.91	33.67
11	Sulphate as SO <sub>4</sub>	mg/L	200.0	18.9	35.1	19.8
12	Fluoride	mg/L	1.0	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/l.	200.0	210.0	224.0	180.0
14	Nitrate as NO <sub>3</sub>	mg/l.	45.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/l.	0.2 (min)	Nil	Nil	Nil
16	Copper	mg/l.	0.05	ND	ND	ND
17	Manganese	mg/l.	0.1	ND	ND	ND
18	Phenolic Compound	mg/l.	0.001	ND	ND	ND
19	Mercury	mg/l.	0.001	ND	ND	ND
20	Cadmium	mg/L	0.003	ND	ND	ND
21	Selenium	mg/L	0.01	ND	ND	ND

*Ratha*

22	Total Arsenic	mg/L	0.01	ND	ND	ND
23	Cyanide	mg/l.	0.05	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND
25	Zinc	mg/l.	5.0	ND	ND	ND
26	Anionic detergents	mg/L.	0.2	ND	ND	ND
27	Total Chromium	mg/l.	0.05	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/l.	0.0001	ND	ND	ND
29	Mineral Oil	mg/L.	0.5	ND	ND	ND
30	Pesticides	mg/l.	---	ND	ND	ND
31	Aluminium	mg/L	0.03	ND	ND	ND
32	Boron	mg/l.	0.5	ND	ND	ND
33	Nickel	mg/L	0.02	ND	ND	ND

**Note: ND = Not Detected**

*Rodha*

**Ground Water Quality Analysis Report for the month of September 2021**  
**Date of Sampling: 14/09/2021**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500:2012	Analysis Results			Village Rengalmunr
				Village Kalamegha	Village Kathfali	Village Khumjaria	
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A	A
03	Taste	--	Agreeable (A)	A	A	A	A
04	pH value	-	6.5 to 8.5	7.97	5.96	6.34	7.7
05	Turbidity	NTU	1.0	1.0	0.5	0.5	0.6
06	Total Hardness as CaCO <sub>3</sub>	mg/l.	200.0	342.0	28.0	62.0	318.0
07	Total Iron	mg/l.	0.3	<0.07	0.07	0.09	0.08
08	Chloride	mg/l.	250.0	83.77	23.65	31.54	71.94
09	Total Dissolved Solids	mg/l.	500.0	620.0	56.9	167.1	816.0
10	Calcium as Ca	mg/l.	75.0	44.89	7.21	14.43	48.10
11	Sulphate as SO <sub>4</sub>	mg/l.	200.0	60.5	8.0	10.9	38.1
12	Fluoride	mg/L	1.0	<0.1	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/l.	200.0	502.0	40.0	56.0	640.0
14	Nitrate as NO <sub>3</sub>	mg/L	45.0	<5.0	<5.0	<5.0	<5.0
15	Residual Free Chlorine	mg/L	0.2 (min)	Nil	Nil	Nil	Nil
16	Copper	mg/l.	0.05	ND	ND	ND	ND
17	Manganese	mg/l.	0.1	ND	ND	ND	ND
18	Phenolic Compound	mg/l.	0.001	ND	ND	ND	ND
19	Mercury	mg/l.	0.001	ND	ND	ND	ND
20	Cadmium	mg/l.	0.005	ND	ND	ND	ND
21	Selenium	mg/l.	0.01	ND	ND	ND	ND

*Ratha*

22	Total Arsenic	mg/L	0.01	ND	ND	ND	ND
23	Cyanide	mg/L	0.05	ND	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND	ND
25	Zinc	mg/L	5.0	ND	ND	ND	ND
26	Anionic detergents	mg/L	0.2	ND	ND	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND	ND
30	Pesticides	mg/L	---	ND	ND	ND	ND
31	Aluminum	mg/L	0.03	ND	ND	ND	ND
32	Boron	mg/L	0.5	ND	ND	ND	ND
33	Nickel	mg/L	0.02	ND	ND	ND	ND

Note: ND = Not Detected

*Roth*

**Ground Water Quality Analysis Report for the month of September 2021**  
**Date of Sampling: 14/09/2021**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500: 2012	Analysis Results	
				Bore well Near Pit (Inside the Lease Area)	Bore well Near Labour Barrack (Inside the Lease Area)
01	Colour	Haizen	5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A
03	Taste	--	Agreeable (A)	A	A
04	pH value	-	6.5 to 8.5	7.8	6.34
05	Turbidity	NIL	1.0	0.8	1.2
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	180.0	60.0
07	Total Iron	mg/L	0.3	< 0.07	< 0.07
08	Chloride	mg/L	250.0	56.17	25.62
09	Total Dissolved Solids	mg/L	500.0	378.0	97.8
10	Calcium as Ca	mg/L	75.0	33.67	14.43
11	Sulphate as SO <sub>4</sub>	mg/L	200.0	14.1	1.5
12	Fluoride	mg/L	1.0	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/L	200.0	368.0	148.0
14	Nitrate as NO <sub>3</sub>	mg/L	45.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/L	0.2 (min)	Nil	Nil
16	Copper	mg/L	0.05	ND	ND
17	Manganese	mg/L	0.1	ND	ND
18	Phenolic Compound	mg/L	0.001	ND	ND
19	Mercury	mg/L	0.001	ND	ND

*Ratha*

20	Cadmium	mg/l.	0.003	ND	ND
21	Selenium	mg/l.	0.01	ND	ND
22	Total Arsenic	mg/l.	0.01	ND	ND
23	Cyanide	mg/l.	0.05	ND	ND
24	Lead	mg/l.	0.01	ND	ND
25	Zinc	mg/l.	5.0	ND	ND
26	Anionic detergents	mg/l.	0.2	ND	ND
27	Total Chromium	mg/l.	0.05	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/l.	0.0001	ND	ND
29	Mineral Oil	mg/l.	0.5	ND	ND
30	Pesticides	mg/l.	-	ND	ND
31	Aluminum	mg/l.	0.03	ND	ND
32	Boron	mg/l.	0.5	ND	ND
33	Nickel	mg/l.	0.02	ND	ND

Note: ND: Not Detected

*Ratha*

**Ground Water Quality Analysis Report for the month of October 2021**  
**Date of Sampling: 04/10/2021**

Sl. No	Parameters Analyzed	Unit	Permissible Limit as per IS 10500:2012	Analysis Results		
				Village Bendrichua	Village Dulanga	Village Beldibi
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A
03	Taste	--	Agreeable (A)	A	A	A
04	pH value	-	6.5 to 8.5	6.65	7.09	6.71
05	Turbidity	NTU	1.0	0.6	1.0	0.8
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	100.0	191.0	122.0
07	Total Iron	mg/l.	0.3	<0.05	<0.05	<0.05
08	Chloride	mg/L	250.0	33.5	79.8	46.3
09	Total Dissolved Solids	mg/L	500.0	161.3	497.0	331.0
10	Calcium as Ca	mg/L	75.0	18.44	53.71	32.87
11	Sulphate as SO <sub>4</sub>	mg/l.	200.0	20.44	33.16	19.55
12	Fluoride	mg/l.	1.0	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/L	200.0	212.0	220.0	184.0
14	Nitrate as NO <sub>3</sub>	mg/l.	45.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/l.	0.2 (min)	Nil	Nil	Nil
16	Copper	mg/L	0.05	ND	ND	ND
17	Manganese	mg/L	0.1	ND	ND	ND
18	Phenolic Compound	mg/l.	0.001	ND	ND	ND
19	Mercury	mg/l.	0.001	ND	ND	ND
20	Cadmium	mg/l.	0.003	ND	ND	ND
21	Selenium	mg/L	0.01	ND	ND	ND

*Rathna*

22	Total Arsenic	mg/l.	0.01	ND	ND	ND
23	Cyanide	mg/L	0.05	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND
25	Zinc	mg/l.	5.0	ND	ND	ND
26	Anionic detergents	mg/L	0.2	ND	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND
29	Mineral Oil	mg/l.	0.5	ND	ND	ND
30	Pesticides	mg/L	---	ND	ND	ND
31	Aluminum	mg/L	0.03	ND	ND	ND
32	Boron	mg/L	0.5	ND	ND	ND
33	Nickel	mg/l.	0.02	ND	ND	ND

Note: ND = Not Detected

*Roller*

**Ground Water Quality Analysis Report for the month of October 2021**  
**Date of Sampling: 04/10/2021**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500: 2012	Analysis Results			
				Village Kalamegha	Village Katifali	Village Khuntjaria	Village Rengalmur
01	Colour	Plaxon	5.0	<5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A	A
03	Taste	--	Agreeable (A)	A	A	A	A
04	pH value	-	6.5 to 8.5	7.84	5.94	6.25	7.59
05	Turbidity	NTU	1.0	1.1	0.4	0.4	0.7
06	Total Hardness as CaCO <sub>3</sub>	mg/l	200.0	338.0	24.0	60.0	316.0
07	Total Iron	mg/l	0.3	0.06	0.06	0.10	0.09
08	Chloride	mg/l	250.0	32.8	25.62	32.53	72.93
09	Total Dissolved Solids	mg/L	500.0	641.0	64.3	171.8	794.0
10	Calcium as Ca	mg/L	75.0	46.49	8.82	13.63	50.50
11	Sulphate as SO <sub>4</sub>	mg/L	200.0	61.47	8.91	11.21	40.43
12	Fluoride	mg/L	1.0	<0.1	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/l	200.0	504.0	44.0	54.0	636.0
14	Nitrate as NO <sub>3</sub>	mg/l	45.0	< 5.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/l	0.2 (min)	Nil	Nil	Nil	Nil
16	Copper	mg/l	0.05	ND	ND	ND	ND
17	Manganese	mg/l	0.1	ND	ND	ND	ND
18	Phenolic Compound	mg/L	0.001	ND	ND	ND	ND
19	Mercury	mg/L	0.001	ND	ND	ND	ND
20	Cadmium	mg/l	0.003	ND	ND	ND	ND

*Rath*

21	Selenium	mg/L	0.01	ND	ND	ND	ND
22	Total Arsenic	mg/L	0.01	ND	ND	ND	ND
23	Cyanide	mg/L	0.05	ND	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND	ND
25	Zinc	mg/L	5.0	ND	ND	ND	ND
26	Anionic detergents	mg/l.	0.2	ND	ND	ND	ND
27	Total Chromium	mg/l.	0.05	ND	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND	ND
30	Pesticides	mg/L	---	ND	ND	ND	ND
31	Aluminum	mg/l.	0.03	ND	ND	ND	ND
32	Boron	mg/L	0.5	ND	ND	ND	ND
33	Nickel	mg/L	0.02	ND	ND	ND	ND

Note: ND = Not Detected

*Rath*

**Ground Water Quality Analysis Report for the month of October 2021**  
**Date of Sampling: 04/10/2021**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500: 2012	Analysis Results	
				Bore well Near Pit (Inside the Lease Area)	Bore well Near Labour Barrack (Inside the Lease Area)
01	Colour	Hazen	5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A
03	Taste	--	Agreeable (A)	A	A
04	pH value	-	6.5 to 8.5	7.71	6.28
05	Turbidity	NTU	1.0	0.6	1.0
06	Total Hardness as CaCO <sub>3</sub>	mg/l.	200.0	184.0	62.0
07	Total Iron	mg/L	0.3	0.06	<0.05
08	Chloride	mg/L	250.0	54.20	26.61
09	Total Dissolved Solids	mg/l.	500.0	369.0	100.3
10	Calcium as Ca	mg/l.	75.0	32.06	16.03
11	Sulphate as SO <sub>4</sub>	mg/l.	200.0	16.47	1.21
12	Fluoride	mg/l.	1.0	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/L	200.0	370.0	146.0
14	Nitrate as NO <sub>3</sub>	mg/l.	45.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/l.	0.2 (min)	Nil	Nil
16	Copper	mg/L	0.05	ND	ND
17	Manganese	mg/L	0.1	ND	ND
18	Picnic Compound	mg/L	0.001	ND	ND
19	Mercury	mg/L	0.001	ND	ND

*Rath*

20	Cadmium	mg/L	0.005	ND	ND
21	Selenium	mg/L	0.01	ND	ND
22	Total Arsenic	mg/L	0.01	ND	ND
23	Cyanide	mg/L	0.05	ND	ND
24	Lead	mg/L	0.01	ND	ND
25	Zinc	mg/L	5.0	ND	ND
26	Anionic detergents	mg/L	0.2	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND
30	Pesticides	mg/L	--	ND	ND
31	Aluminum	mg/L	0.03	ND	ND
32	Boron	mg/L	0.5	ND	ND
33	Nickel	mg/L	0.02	ND	ND

Note: ND = Not Detected

*Roth*

**Ground Water Quality Analysis Report for the month of November 2021**  
**Date of Sampling: 11/11/2021**

Sl. No	Parameters Analyzed	Unit	Permissible Limit as per IS 10500:2012	Analysis Results			
				Village Bendiachua	Village Dulanga	Village Beldibi	Village Kutamegha
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A	A
03	Taste	--	Agreeable (A)	A	A	A	A
04	pH value	-	6.5 to 8.5	7.22	7.18	6.58	7.40
05	Turbidity	NTU	1.0	0.49	0.62	0.98	0.73
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	293.5	218.9	215.2	295.7
07	Total Iron	mg/l.	0.3	0.11	< 0.05	< 0.05	0.06
08	Chloride	mg/l.	250.0	55.10	72.20	24.70	52.25
09	Total Dissolved Solids	mg/L	500.0	350.0	491.0	210.0	583.0
10	Calcium as Ca	mg/L	75.0	58.48	52.33	27.70	50.79
11	Sulphate as SO <sub>4</sub>	mg/L	200.0	39.91	41.73	21.35	43.40
12	Fluoride	mg/L	1.0	<0.1	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/l.	200.0	130.0	112.0	128.0	358.0
14	Nitrate as NO <sub>3</sub>	mg/l.	45.0	< 5.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/l.	0.2 (min)	Nil	Nil	Nil	Nil
16	Copper	mg/l.	0.05	ND	ND	ND	ND
17	Manganese	mg/l.	0.1	ND	ND	ND	ND
18	Phenolic Compound	mg/l.	0.001	ND	ND	ND	ND
19	Mercury	mg/L	0.001	ND	ND	ND	ND
20	Cadmium	mg/l.	0.003	ND	ND	ND	ND
21	Selenium	mg/L	0.01	ND	ND	ND	ND

*Ratha*

22	Total Arsenic	mg/L	0.01	ND	ND	ND	ND
23	Cyanide	mg/l.	0.05	ND	ND	ND	ND
24	Lead	mg/l.	0.01	ND	ND	ND	ND
25	Zinc	mg/l.	5.0	ND	ND	ND	ND
26	Anionic detergents	mg/l.	0.2	ND	ND	ND	ND
27	Total Chromium	mg/l.	0.05	ND	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/l.	0.0001	ND	ND	ND	ND
29	Mineral Oil	mg/l.	0.5	ND	ND	ND	ND
30	Pesticides	mg/l.	--	ND	ND	ND	ND
31	Aluminum	mg/L	0.03	ND	ND	ND	ND
32	Boron	mg/l.	0.5	ND	ND	ND	ND
33	Nickel	mg/L	0.02	ND	ND	ND	ND

Note: ND - Not Detected

*Roth*

**Ground Water Quality Analysis Report for the month of November 2021**  
**Date of Sampling: 12/11/2021**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500:2012	Analysis Results		
				Village Kathfah	Village Khuntjharu	Village Rengalmanr
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A
03	Taste	--	Agreeable (A)	A	A	A
04	pH value	-	6.5 to 8.5	5.56	6.10	6.95
05	Turbidity	NTU	1.0	0.12	1.22	1.11
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	53.8	80.6	311.0
07	Total Iron	mg/l	0.3	< 0.05	0.08	0.09
08	Chloride	mg/l	250.0	18.05	33.25	71.25
09	Total Dissolved Solids	mg/l	500.0	46.7	210.0	746.0
10	Calcium as Ca	mg/l	75.0	7.70	18.47	35.40
11	Sulphate as SO <sub>4</sub>	mg/L	200.0	2.24	13.53	38.78
12	Fluoride	mg/L	1.0	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/l	200.0	20.0	36.0	420.0
14	Nitrate as NO <sub>3</sub>	mg/l	45.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/l	0.2 (min)	Nil	Nil	Nil
16	Copper	mg/L	0.05	ND	ND	ND
17	Manganese	mg/l	0.1	ND	ND	ND
18	Phenolic Compound	mg/l	0.001	ND	ND	ND

*Rath*

19	Mercury	mg/L	0.001	ND	ND	ND
20	Cadmium	mg/l.	0.003	ND	ND	ND
21	Scenium	mg/l.	0.01	ND	ND	ND
22	Total Arsenic	mg/l.	0.01	ND	ND	ND
23	Cyanide	mg/l.	0.05	ND	ND	ND
24	Lead	mg/l.	0.01	ND	ND	ND
25	Zinc	mg/L	5.0	ND	ND	ND
26	Anionic detergents	mg/L	0.2	ND	ND	ND
27	Total Chromium	mg/l.	0.05	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/l.	0.0001	ND	ND	ND
29	Mineral Oil	mg/l.	0.5	ND	ND	ND
30	Pesticides	mg/l.	---	ND	ND	ND
31	Aluminium	mg/L	0.03	ND	ND	ND
32	Boron	mg/L	0.5	ND	ND	ND
33	Nickel	mg/l.	0.02	ND	ND	ND

Note: ND = Not Detected

*Rath*

**Ground Water Quality Analysis Report for the month of November 2021**  
**Date of Sampling: 11/11/2021**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500: 2012	Analysis Results	
				Bore well Near Pil Office (Inside the Lease Area)	Bore well Near Labour Barrack (Inside the Lease Area)
01	Colour	Hazen	5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A
03	Taste	--	Agreeable (A)	A	A
04	pH value	-	6.5 to 8.5	7.12	5.68
05	Turbidity	NTU	1.0	0.98	4.12
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	192.0	84.5
07	Total Iron	mg/l.	0.3	< 0.05	0.10
08	Chloride	mg/l.	250.0	56.05	20.90
09	Total Dissolved Solids	mg/L	500.0	383.0	89.2
10	Calcium as Ca	mg/L	75.0	30.78	10.77
11	Sulphate as SO <sub>4</sub>	mg/L	200.0	12.24	11.22
12	Fluoride	mg/L	1.0	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/l.	200.0	210.0	58.0
14	Nitrate as NO <sub>3</sub>	mg/l.	45.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/l.	0.2 (min)	Nil	Nil
16	Copper	mg/l.	0.05	ND	ND
17	Manganese	mg/l.	0.1	ND	ND
18	Phenolic Compound	mg/L	0.001	ND	ND
19	Mercury	mg/L	0.001	ND	ND
20	Cadmium	mg/L	0.003	ND	ND

21	Selenium	mg/l.	0.01	ND	ND
22	Total Arsenic	mg/L	0.01	ND	ND
23	Cyanide	mg/l.	0.05	ND	ND
24	Lead	mg/L	0.01	ND	ND
25	Zinc	mg/L	5.0	ND	ND
26	Anionic detergents	mg/L	0.2	ND	ND
27	Total Chromium	mg/l.	0.05	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/l.	0.0001	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND
30	Pesticides	mg/l.	---	ND	ND
31	Aluminum	mg/l.	0.03	ND	ND
32	Barium	mg/l.	0.5	ND	ND
33	Nickel	mg/l.	0.02	ND	ND

Note: ND = Not Detected

*Roth*

**Ground Water Quality Analysis Report for the month of December 2021**  
**Date of Sampling: 07/12/2021**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500:2012	Analysis Results			
				Village Bendrichua	Village Dulanga	Village Biddihi	Village Kalamegha
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A	A
03	Taste	--	Agreeable (A)	A	A	A	A
04	pH value	-	6.5 to 8.5	7.14	7.21	6.78	7.12
05	Turbidity	NTU	1.0	0.41	0.57	0.77	0.84
06	Total Hardness as CaCO <sub>3</sub>	mg/l.	200.0	186.2	195.5	119.0	286.1
07	Total Iron	mg/l.	0.3	0.12	0.06	<0.05	0.09
08	Chloride	mg/l.	250.0	56.05	69.35	25.05	54.15
09	Total Dissolved Solids	mg/l.	500.0	367.0	487.0	257.0	591.0
10	Calcium as Ca	mg/L	75.0	57.72	51.61	30.01	51.56
11	Sulphate as SO <sub>4</sub>	mg/L	200.0	37.24	36.99	18.65	37.50
12	Fluoride	mg/L	1.0	<0.1	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/l.	200.0	126.0	102.0	132.0	324.0
14	Nitrate as NO <sub>3</sub>	mg/L	45.0	< 5.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/l.	0.2 (min)	Nil	Nil	Nil	Nil
16	Copper	mg/l.	0.05	ND	ND	ND	ND
17	Manganese	mg/l.	0.1	ND	ND	ND	ND
18	Phenolic Compound	mg/l.	0.001	ND	ND	ND	ND
19	Mercury	mg/L	0.001	ND	ND	ND	ND
20	Cadmium	mg/l.	0.005	ND	ND	ND	ND
21	Selenium	mg/L	0.01	ND	ND	ND	ND

*Ratha*

22	Total Arsenic	mg/L	0.01	ND	ND	ND	ND
23	Cyanide	mg/L	0.05	ND	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND	ND
25	Zinc	mg/L	5.0	ND	ND	ND	ND
26	Anionic detergents	mg/L	0.2	ND	ND	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND	ND
30	Pesticides	mg/L	---	ND	ND	ND	ND
31	Aluminum	mg/L	0.03	ND	ND	ND	ND
32	Boron	mg/L	0.5	ND	ND	ND	ND
33	Nickel	mg/L	0.02	ND	ND	ND	ND

Note: ND = Not Detected

*Roth*

**Ground Water Quality Analysis Report for the month of December 2021**  
**Date of Sampling: 07/12/2021**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500:2012	Analysis Results		
				Village Kathfali	Village Khuntjharin	Village Rengalmuar
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A
03	Taste	--	Agreeable (A)	A	A	A
04	pH value	-	6.5 to 8.5	5.91	6.47	7.11
05	Turbidity	NTU	1.0	0.74	0.97	0.88
06	Total Hardness as CaCO <sub>3</sub>	mg/l	200.0	59.5	86.1	303.4
07	Total Iron	mg/l	0.3	0.06	0.08	0.07
08	Chloride	mg/l	250.0	19.95	30.40	67.15
09	Total Dissolved Solids	mg/L	500.0	71.8	234.0	719.0
10	Calcium as Ca	mg/l	75.0	9.23	20.01	36.94
11	Sulphate as SO <sub>4</sub>	mg/l	200.0	3.78	18.14	36.99
12	Fluoride	mg/l	1.0	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/L	200.0	24.0	40.0	136.0
14	Nitrate as NO <sub>3</sub>	mg/L	45.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/l	0.2 (min)	Nil	Nil	Nil
16	Copper	mg/l	0.05	ND	ND	ND
17	Manganese	mg/L	0.1	ND	ND	ND
18	Phenolic Compound	mg/L	0.001	ND	ND	ND

*Ratha*

19	Mercury	mg/l.	0.001	ND	ND	ND
20	Cadmium	mg/l.	0.003	ND	ND	ND
21	Selenium	mg/L	0.01	ND	ND	ND
22	Total Arsenic	mg/l.	0.01	ND	ND	ND
23	Cyanide	mg/l.	0.05	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND
25	Zinc	mg/l.	5.0	ND	ND	ND
26	Anionic detergents	mg/l.	0.2	ND	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND
30	Pesticides	mg/l.	---	ND	ND	ND
31	Aluminum	mg/l.	0.03	ND	ND	ND
32	Barium	mg/l.	0.5	ND	ND	ND
33	Nickel	mg/L	0.02	ND	ND	ND

Note: ND = Not Detected

*Ratha*

**Ground Water Quality Analysis Report for the month of December 2021**  
**Date of Sampling: 07/12/2021**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500: 2012	Analysis Results	
				Bore well Near Pit Office (Inside the Lease Area)	Bore well Near Labour Barrack (Inside the Lease Area)
01	Colour	Hazen	5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A
03	Taste	--	Agreeable (A)	A	A
04	pH value	-	6.5 to 8.5	7.24	6.01
05	Turbidity	NTU	1.0	0.87	2.74
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	96.0	190.1
07	Total Iron	mg/L	0.3	< 0.05	0.06
08	Chloride	mg/L	250.0	53.20	18.05
09	Total Dissolved Solids	mg/L	500.0	399.0	94.1
10	Calcium as Ca	mg/L	75.0	32.32	12.31
11	Salphate as SO <sub>4</sub>	mg/L	200.0	13.53	10.06
12	Fluoride	mg/L	1.0	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/L	300.0	202.0	50.0
14	Nitrate as NO <sub>3</sub>	mg/L	45.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/L	0.2 (min)	Nil	Nil
16	Copper	mg/L	0.05	ND	ND
17	Manganese	mg/L	0.1	ND	ND
18	Phenolic Compound	mg/L	0.001	ND	ND
19	Mercury	mg/L	0.001	ND	ND

20	Cadmium	mg/L	0.003	ND	ND
21	Selenium	mg/L	0.01	ND	ND
22	Total Arsenic	mg/L	0.01	ND	ND
23	Cyanide	mg/L	0.05	ND	ND
24	Lead	mg/L	0.01	ND	ND
25	Zinc	mg/L	5.0	ND	ND
26	Anionic detergents	mg/L	0.2	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND
30	Pesticides	mg/L	---	ND	ND
31	Aluminium	mg/L	0.03	ND	ND
32	Mercur	mg/L	0.5	ND	ND
33	Nickel	mg/L	0.02	ND	ND

Note: ND = Not Detected

*Reddy*

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**Ground Water Quality Analysis Report for the month of January 2022**  
**Date of Sampling 06/01/2022**

Sl. No	Parameters Analyzed	Unit	Permissible Limit as per IS 10500:2012	Analysis Results		
				Village Bendiachma	Village Duranga	Village Beldihi
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A
03	Taste	--	Agreeable (A)	A	A	A
04	pH value	-	6.5 to 8.5	7.11	7.05	6.87
05	Turbidity	NTU	1.0	0.31	0.44	0.67
06	Total Hardness as CaCO <sub>3</sub>	mg/L	300.0	182.4	190.1	122.9
07	Total Iron	mg/l.	0.3	0.08	0.05	0.06
08	Chloride	mg/l.	250.0	58.90	67.45	27.55
09	Total Dissolved Solids	mg/L	500.0	371.0	198.0	269.0
10	Calcium as Ca	mg/L	75.0	53.87	50.02	34.63
11	Sulphate as SO <sub>4</sub>	mg/l.	200.0	26.86	31.99	16.09
12	Fluoride	mg/l.	1.0	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/L	300.0	130.0	108.0	126.0
14	Nitrate as NO <sub>3</sub>	mg/l.	45.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/l.	0.2 (min)	Nil	Nil	Nil
16	Copper	mg/l.	0.05	ND	ND	ND
17	Manganese	mg/L	0.1	ND	ND	ND
18	Phenolic Compound	mg/L	0.001	ND	ND	ND
19	Mercury	mg/l.	0.001	ND	ND	ND
20	Cadmium	mg/l.	0.003	ND	ND	ND
21	Selenium	mg/l.	0.01	ND	ND	ND

22	Total Arsenic	mg/L	0.01	ND	ND	ND
23	Cyanide	mg/L	0.05	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND
25	Zinc	mg/L	5.0	ND	ND	ND
26	Anionic detergents	ug/l.	0.2	ND	ND	ND
27	Total Chromium	mg/l.	0.05	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND
29	Mineral Oil	mg/l.	0.5	ND	ND	ND
30	Pesticides	mg/l.	---	ND	ND	ND
31	Aluminum	mg/L	0.03	ND	ND	ND
32	Boron	mg/L	0.5	ND	ND	ND
33	Nickel	mg/l.	0.02	ND	ND	ND

Note: ND = Not Detected

*Roth*

**Ground Water Quality Analysis Report for the month of January 2022**  
**Date of Sampling 06/01/2022**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500:2012	Analysis Results			
				Village Kalamegha	Village Kathfali	Village Khanjiraria	Village Rengalpur
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A	A
03	Taste	--	Agreeable (A)	A	A	A	A
04	pH value	-	6.5 to 8.5	7.01	5.98	6.44	7.01
05	Turbidity	NTU	1.0	0.97	0.44	0.68	0.78
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	278.4	63.4	92.2	297.6
07	Total Iron	mg/l.	0.3	0.07	0.08	0.06	0.09
08	Chloride	mg/l.	250.0	58.90	21.85	33.25	65.55
09	Total Dissolved Solids	mg/l.	500.0	603.0	77.8	229.0	701.0
10	Calcium as Ca	mg/L	75.0	51.56	11.54	20.01	36.94
11	Sulphate as SO <sub>4</sub>	mg/L	200.0	35.71	5.06	19.94	31.86
12	Fluoride	mg/L	1.0	<0.1	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/l.	200.0	318.0	30.0	42.0	420.0
14	Nitrate as NO <sub>3</sub>	mg/l.	45.0	<5.0	<5.0	<5.0	<5.0
15	Residual Free Chlorine	mg/l.	0.2 (min)	Nil	Nil	Nil	Nil
16	Copper	mg/l.	0.05	ND	ND	ND	ND
17	Manganese	mg/l.	0.1	ND	ND	ND	ND
18	Phenolic Compound	mg/L	0.001	ND	ND	ND	ND
19	Mercury	mg/L	0.001	ND	ND	ND	ND
20	Cadmium	mg/l	0.003	ND	ND	ND	ND
21	Selenium	mg/L	0.01	ND	ND	ND	ND

*Rath*

22	Total Arsenic	mg/L	0.01	ND	ND	ND	ND
23	Cyanide	mg/L	0.05	ND	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND	ND
25	Zinc	mg/L	5.0	ND	ND	ND	ND
26	Anionic detergents	mg/L	0.2	ND	ND	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND	ND
30	Pesticides	mg/L	---	ND	ND	ND	ND
31	Aluminum	mg/L	0.03	ND	ND	ND	ND
32	Boron	mg/L	0.5	ND	ND	ND	ND
33	Nickel	mg/L	0.02	ND	ND	ND	ND

**Note: ND = Not Detected**

*Rolle*

**Ground Water Quality Analysis Report for the month of January 2022**  
**Date of Sampling 06/01/2022**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500: 2012	Analysis Results		
				Bore well Near Office (Inside the Lease Area)	Bore well Near Labour Barrack (Inside the Lease Area)	Tap water inside NTPC site office
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A
03	Taste	--	Agreeable (A)	A	A	A
04	pH value	-	6.5 to 8.5	7.14	6.47	7.77
05	Turbidity	NTU	1.0	0.91	1.94	0.21
06	Total Hardness as CaCO <sub>3</sub>	mg/l.	200.0	99.8	86.4	144.0
07	Total Iron	mg/L	0.3	0.05	0.08	0.05
08	Chloride	mg/l.	250.0	54.15	20.90	31.35
09	Total Dissolved Solids	mg/l.	500.0	387.4	97.1	246.0
10	Calcium as Ca	mg/L	75.0	35.40	16.93	36.94
11	Sulphate as SO <sub>4</sub>	mg/L	200.0	14.94	11.35	12.24
12	Fluoride	mg/l.	1.0	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/l.	200.0	204.0	54.0	174.0
14	Nitrate as NO <sub>3</sub>	mg/L	45.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/L	0.2 (min)	Nil	Nil	Nil
16	Copper	mg/l.	0.05	ND	ND	ND
17	Manganese	mg/L	0.1	ND	ND	ND
18	Phenolic Compound	mg/L	0.001	ND	ND	ND
19	Mercury	mg/l.	0.001	ND	ND	ND

*Rath*

20	Cadmium	mg/l.	0.003	ND	ND	ND
21	Selenium	mg/l.	0.01	ND	ND	ND
22	Total Arsenic	mg/l.	0.01	ND	ND	ND
23	Cyanide	mg/l.	0.05	ND	ND	ND
24	Lead	mg/l.	0.01	ND	ND	ND
25	Zinc	mg/l.	5.0	ND	ND	ND
26	Anionic detergents	mg/l.	0.2	ND	ND	ND
27	Total Chromium	mg/l.	0.05	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/l.	0.0001	ND	ND	ND
29	Mineral Oil	mg/l.	0.5	ND	ND	ND
30	Pesticides	mg/l.	..	ND	ND	ND
31	Aluminum	mg/l.	0.03	ND	ND	ND
32	Boron	mg/l.	0.5	ND	ND	ND
33	Nickel	mg/l.	0.02	ND	ND	ND

Note: ND Not Detected

*Raha*

**Ground Water Quality Analysis Report for the month of February 2022**  
**Date of Sampling: 04/02/2022**

Sl. No	Parameters Analyzed	Unit	Permissible Limit as per IS 10500:2012	Analysis Results		
				Village Bendrichua	Village Dulanga	Village Beldibi
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A
03	Taste	--	Agreeable (A)	A	A	A
04	pH value	-	6.5 to 8.5	7.0	6.99	6.71
05	Turbidity	NTU	1.0	0.15	0.24	0.47
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	176.6	182.4	121.0
07	Total Iron	mg/L	0.3	0.07	0.06	0.08
08	Chloride	mg/l.	250.0	57.95	66.50	24.70
09	Total Dissolved Solids	mg/l.	500.0	387.0	514.0	284.0
10	Calcium as Ca	mg/L	75.0	52.33	47.71	31.55
11	Sulphate as SO <sub>4</sub>	mg/L	200.0	24.81	27.24	13.53
12	Fluoride	mg/L	1.0	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/l.	200.0	128.0	102.0	120.0
14	Nitrate as NO <sub>3</sub>	mg/l.	45.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/l.	0.2 (min)	Nil	Nil	Nil
16	Copper	mg/l.	0.05	ND	ND	ND
17	Manganese	mg/l.	0.1	ND	ND	ND
18	Phenolic Compound	mg/l.	0.001	ND	ND	ND
19	Mercury	mg/L	0.001	ND	ND	ND
20	Cadmium	mg/L	0.003	ND	ND	ND
21	Selenium	mg/L	0.01	ND	ND	ND

*Rath*

22	Total Arsenic	mg/l.	0.01	ND	ND	ND
23	Cyanide	mg/l.	0.05	ND	ND	ND
24	Lead	mg/l.	0.01	ND	ND	ND
25	Zinc	mg/l.	5.0	ND	ND	ND
26	Anionic detergents	mg/l.	0.2	ND	ND	ND
27	Total Chromium	mg/l.	0.05	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/l.	0.0001	ND	ND	ND
29	Mineral Oil	mg/l.	0.5	ND	ND	ND
30	Pesticides	mg/l.	---	ND	ND	ND
31	Aluminium	mg/l.	0.03	ND	ND	ND
32	Boron	mg/l.	0.5	ND	ND	ND
33	Nickel	mg/l.	0.02	ND	ND	ND

Note: ND = Not Detected

*Rath*

**Ground Water Quality Analysis Report for the month of February 2022**

Date of Sampling: 04/02/2022

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500:2012	Analysis Results			
				Village Kalamogha	Village Kathfali	Village Khamtjaria	Village Rengalmur
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A	A
03	Taste	--	Agreeable (A)	A	A	A	A
04	pH value	-	6.5 to 8.5	6.98	5.89	6.21	7.11
05	Turbidity	NTU	1.0	0.69	0.34	0.51	0.48
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	270.7	67.2	86.4	295.7
07	Total Iron	mg/l.	0.3	0.07	0.06	0.05	0.10
08	Chloride	mg/l.	250.0	57.0	19.95	32.30	61.60
09	Total Dissolved Solids	mg/L	500.0	598.4	82.4	251.0	714.1
10	Calcium as Ca	mg/l.	75.0	47.71	12.31	18.47	33.09
11	Sulphate as SO <sub>4</sub>	mg/L	200.0	28.91	3.78	17.37	26.99
12	Fluoride	mg/L	1.0	<0.1	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/l.	200.0	308.0	28.0	44.0	124.0
14	Nitrate as NO <sub>3</sub>	mg/l.	45.0	<5.0	<5.0	<5.0	<5.0
15	Residual Free Chlorine	mg/l.	0.2 (mln)	Nil	Nil	Nil	Nil
16	Copper	mg/l.	0.05	ND	ND	ND	ND
17	Manganese	mg/l.	0.1	ND	ND	ND	ND
18	Phenolic Compound	mg/l.	0.001	ND	ND	ND	ND
19	Mercury	mg/l.	0.001	ND	ND	ND	ND
20	Cadmium	mg/l.	0.003	ND	ND	ND	ND
21	Selenium	mg/l.	0.01	ND	ND	ND	ND

*Reddy*

22	Total Arsenic	mg/L	0.01	ND	ND	ND	ND
23	Cyanide	mg/L	0.05	ND	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND	ND
25	Zinc	mg/L	5.0	ND	ND	ND	ND
26	Anionic detergents	mg/L	0.2	ND	ND	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND	ND
30	Pesticides	mg/L	---	ND	ND	ND	ND
31	Aluminum	mg/L	0.03	ND	ND	ND	ND
32	Boron	mg/L	0.5	ND	ND	ND	ND
33	Nickel	mg/L	0.02	ND	ND	ND	ND

Note: ND = Not Detected

*Roth*

**Ground Water Quality Analysis Report for the month of February 2022**  
**Date of Sampling: 04/02/2022**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500: 2012	Analysis Results		
				Bore well Near Office (Inside the Lease Area)	Bore well Near Labone Barnek (Inside the Lease Area)	Tap water inside NTPC site office
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A
03	Taste	--	Agreeable (A)	A	A	A
04	pH value	-	6.5 to 8.5	7.04	6.54	7.58
05	Turbidity	NTU	1.0	0.72	0.91	0.17
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	96.0	78.7	140.2
07	Total Iron	mg/L	0.3	< 0.05	0.7	0.06
08	Chloride	mg/L	250.0	52.25	19.00	30.40
09	Total Dissolved Solids	mg/l.	500.0	377.9	93.5	255.1
10	Calcium as Ca	mg/L	75.0	32.32	15.39	35.40
11	Sulphate as SO <sub>4</sub>	mg/L	200.0	14.04	8.91	11.47
12	Fluoride	mg/L	1.0	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/l.	200.0	210.0	48.0	132.0
14	Nitrate as NO <sub>3</sub>	mg/L	45.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/l.	0.2 (min)	Nil	Nil	Nil
16	Copper	mg/l.	0.05	ND	ND	ND
17	Manganese	mg/l.	0.1	ND	ND	ND
18	Phenolic Compound	mg/l.	0.001	ND	ND	ND

*Rath*

19	Mercury	mg/L	0.001	ND	ND	ND
20	Cadmium	mg/L	0.003	ND	ND	ND
21	Selenium	mg/L	0.01	ND	ND	ND
22	Total Arsenic	mg/L	0.01	ND	ND	ND
23	Cyanide	mg/L	0.05	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND
25	Zinc	mg/L	5.0	ND	ND	ND
26	Anionic detergents	mg/L	0.2	ND	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND
30	Pesticides	mg/L	---	ND	ND	ND
31	Aluminum	mg/L	0.03	ND	ND	ND
32	Boron	mg/L	0.5	ND	ND	ND
33	Nickel	mg/L	0.02	ND	ND	ND

Note: ND = Not Detected

*Rath*

**Ground Water Quality Analysis Report for the month of March 2022**  
**Date of Sampling: 09/03/2022**

Sl. No	Parameters Analyzed	Unit	Permissible Limit as per IS 10500:2012	Analysis Results		
				Village Hendrichua	Village Dulanga	Village Beldihi
01	Colour	Placet	5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A
03	Taste	--	Agreeable (A)	A	A	A
04	pH value		6.5 to 8.5	7.01	7.11	6.85
05	Turbidity	NTU	1.0	0.45	0.34	0.27
06	Total Hardness as CaCO <sub>3</sub>	mg/l.	200.0	173.80	178.56	124.80
07	Total Iron	mg/l.	0.3	0.08	< 0.05	0.07
08	Chloride	mg/l.	250.0	62.09	67.03	27.59
09	Total Dissolved Solids	mg/l.	500.0	358.10	517.0	297.0
10	Calcium as Ca	mg/l.	75.0	48.48	49.25	34.63
11	Sulphate as SO <sub>4</sub>	mg/l.	200.0	22.88	24.68	11.35
12	Fluoride	mg/l.	1.0	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/l.	200.0	124.0	108.0	126.0
14	Nitrate as NO <sub>3</sub>	mg/l.	45.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/l.	0.2 (mic)	Nil	Nil	Nil
16	Copper	mg/l.	0.05	ND	ND	ND
17	Manganese	mg/l.	0.1	ND	ND	ND
18	Phenolic Compound	mg/l.	0.001	ND	ND	ND
19	Mercury	mg/l.	0.001	ND	ND	ND
20	Cadmium	mg/l.	0.005	ND	ND	ND
21	Selenium	mg/l.	0.01	ND	ND	ND

*Rath*

22	Total Arsenic	mg/l.	0.01	ND	ND	ND
23	Cyanide	mg/L	0.05	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND
25	Zinc	mg/l.	5.0	ND	ND	ND
26	Anionic detergents	mg/L	0.2	ND	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND
30	Pesticides	mg/L	---	ND	ND	ND
31	Aluminum	mg/L	0.03	ND	ND	ND
32	Boron	mg/L	0.5	ND	ND	ND
33	Nickel	mg/L	0.02	ND	ND	ND

Note: ND = Not Detected

*Rochelle*

**Ground Water Quality Analysis Report for the month of March 2022**  
**Date of Sampling: 09/03/2022**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500:2012	Analysis Results			
				Village Kalameghu	Village Kuthifali	Village Klurttiharia	Village Rengalmanar
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A	A
03	Taste	--	Agreeable (A)	A	A	A	A
04	pH value	-	6.5 to 8.5	7.01	5.99	6.33	7.04
05	Turbidity	NTU	1.0	0.51	0.44	0.40	0.37
06	Total Hardness as CaCO <sub>3</sub>	mg/l.	200.0	268.80	63.36	80.64	399.52
07	Total Iron	mg/L	0.3	0.06	0.08	0.07	0.07
08	Chloride	mg/L	250.0	62.09	23.65	35.48	64.06
09	Total Dissolved Solids	mg/L	500.0	601.40	87.80	269.20	701.50
10	Calcium as Ca	mg/l.	75.0	18.18	13.85	20.01	30.78
11	Sulphate as SO <sub>4</sub>	mg/l.	200.0	24.29	4.68	14.55	23.78
12	Fluoride	mg/l.	1.0	<0.1	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/L	200.0	302.0	32.0	50.0	418.0
14	Nitrate as NO <sub>3</sub>	mg/L	45.0	<5.0	<5.0	<5.0	<5.0
15	Residual Free Chlorine	mg/L	0.2 (min)	Nil	Nil	Nil	Nil
16	Copper	mg/L	0.05	ND	ND	ND	ND
17	Manganese	mg/l.	0.1	ND	ND	ND	ND
18	Phenolic Compound	mg/l.	0.001	ND	ND	ND	ND
19	Mercury	mg/l.	0.001	ND	ND	ND	ND
20	Cadmium	mg/l.	0.003	ND	ND	ND	ND
21	Selenium	mg/l.	0.01	ND	ND	ND	ND

*Reddy*

22	Total Arsenic	mg/L	0.01	ND	ND	ND	ND
23	Cyanide	mg/L	0.05	ND	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND	ND
25	Zinc	mg/L	5.0	ND	ND	ND	ND
26	Anionic detergents	mg/L	0.2	ND	ND	ND	ND
27	Total Calcium	mg/L	0.05	ND	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND	ND
30	Pesticides	mg/L	—	ND	ND	ND	ND
31	Aluminum	mg/L	0.03	ND	ND	ND	ND
32	Boron	mg/L	0.5	ND	ND	ND	ND
33	Nickel	mg/L	0.02	ND	ND	ND	ND

Note: ND = Not Detected

*Robb*

**Ground Water Quality Analysis Report for the month of March 2022**  
**Date of Sampling: 09/03/2022**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500: 2012	Analysis Results		
				Bore well Near Office (Inside the Lease Area)	Bore well Near Labour Barrack (Inside the Lease Area)	Tap water inside NPC site office
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A
03	Taste	--	Agreeable (A)	A	A	A
04	pH value	-	6.5 to 8.5	7.14	6.77	7.32
05	Turbidity	NTU	1.0	0.82	1.20	0.27
06	Total Hardness as CaCO <sub>3</sub>	mg/l.	200.0	97.92	80.64	144.0
07	Total Iron	mg/L	0.3	0.05	0.07	0.07
08	Chloride	mg/l.	250.0	56.17	20.70	34.49
09	Total Dissolved Solids	mg/l.	500.0	389.20	97.50	217.80
10	Calcium as Ca	mg/l.	75.0	35.40	17.70	33.86
11	Sulphate as SO <sub>4</sub>	mg/l.	200.0	13.14	9.68	8.78
12	Fluoride	mg/l.	1.0	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/l.	200.0	202.0	54.0	134.0
14	Nitrate as NO <sub>3</sub>	mg/L	45.0	<5.0	<5.0	<5.0
15	Residual Free Chlorine	mg/L	0.3 (min)	Nil	Nil	Nil
16	Copper	mg/L	0.05	ND	ND	ND
17	Manganese	mg/L	0.1	ND	ND	ND

*Ratha*

18	Phenolic Compound	mg/l.	0.001	ND	ND	ND
19	Mercury	mg/l.	0.001	ND	ND	ND
20	Cadmium	mg/l.	0.003	ND	ND	ND
21	Selenium	mg/l.	0.01	ND	ND	ND
22	Total Arsenic	mg/l.	0.01	ND	ND	ND
23	Cyanide	mg/l.	0.05	ND	ND	ND
24	Lead	mg/l.	0.01	ND	ND	ND
25	Zinc	mg/l.	5.0	ND	ND	ND
26	Anionic detergents	mg/l.	0.2	ND	ND	ND
27	Total Chromium	mg/l.	0.05	ND	ND	ND
28	Poly-nuclear aromatic hydrocarbons	mg/l.	0.0001	ND	ND	ND
29	Mineral Oil	mg/l.	0.5	ND	ND	ND
30	Pesticides	mg/l.	---	ND	ND	ND
31	Aluminum	mg/L	0.03	ND	ND	ND
32	Boron	mg/L	0.5	ND	ND	ND
33	Nickel	mg/L	0.02	ND	ND	ND

Note: ND = Not Detected

*Roth*

**Ambient Air Quality Monitoring Report**  
**Frequency of Monitoring: Monthly Twice**  
**(April 2021 to September 2021)**

Sl. No	Monitoring Stations	Month	Dt. of Monitoring	Analysis Result in $\mu\text{g}/\text{m}^3$					CO in $\text{mg}/\text{m}^3$
				SPM	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	
1	Near Site Office, Khapurikachhar (Core Zone)	April 2021	13/04/2021	207.17	74.16	32.37	7.73	11.27	< 1.14
			16/04/2021	218.18	70.27	33.83	6.31	12.41	< 1.14
		May 2021	21/05/2021	205.50	72.63	30.16	7.69	12.95	< 1.14
			24/05/2021	218.87	77.31	35.21	7.76	12.81	< 1.14
		June 2021	12/06/2021	204.47	69.15	30.75	7.52	12.65	< 1.14
			22/06/2021	209.86	74.22	32.34	7.30	13.54	< 1.14
		July 2021	13/07/2021	200.55	70.67	33.51	7.33	12.33	< 1.14
			21/07/2021	198.25	69.88	30.09	7.44	11.61	< 1.14
		August 2021	12/08/2021	186.36	71.16	32.32	7.72	10.51	< 1.14
			21/08/2021	210.38	78.95	34.55	8.54	13.20	< 1.14
		September 2021	13/09/2021	208.58	75.07	30.70	8.11	12.71	< 1.14
			19/09/2021	185.83	78.93	29.14	6.41	12.12	< 1.14
2	Near Coal Lab (Core Zone)	April 2021	13/04/2021	210.84	76.63	34.97	7.16	13.17	< 1.14
			16/04/2021	212.37	79.51	31.90	7.51	12.55	< 1.14
		May 2021	21/05/2021	210.59	78.74	36.52	8.40	14.56	< 1.14
			24/05/2021	205.76	78.33	32.19	8.63	14.15	< 1.14
		June 2021	12/06/2021	194.47	71.52	31.32	8.25	12.10	< 1.14
			22/06/2021	201.95	73.43	34.09	8.74	12.95	< 1.14
		July 2021	13/07/2021	189.97	69.17	35.04	7.59	13.00	< 1.14
			21/07/2021	202.77	72.15	32.82	8.81	12.18	< 1.14
		August 2021	12/08/2021	193.18	70.65	30.92	7.12	11.09	< 1.14
			21/08/2021	218.69	77.81	30.56	7.19	10.62	< 1.14
		September 2021	13/09/2021	182.87	71.91	33.56	7.77	12.09	< 1.14
			19/09/2021	198.65	70.68	34.25	8.57	11.92	< 1.14
3	Near Work Shop (Core Zone)	April 2021	13/04/2021	179.07	67.18	32.99	7.56	10.49	< 1.14
			16/04/2021	196.66	76.26	31.57	7.53	11.16	< 1.14
		May 2021	21/05/2021	194.00	72.77	29.83	8.01	14.10	< 1.14
			24/05/2021	192.92	74.29	32.76	8.57	14.80	< 1.14
		June 2021	12/06/2021	196.40	73.67	31.14	8.58	13.63	< 1.14
			22/06/2021	200.62	70.41	30.94	7.14	12.55	< 1.14
		July 2021	13/07/2021	201.17	70.88	29.29	8.06	12.10	< 1.14
			21/07/2021	197.64	72.03	30.71	8.35	12.37	< 1.14
		August 2021	12/08/2021	184.98	69.84	31.23	7.63	11.08	< 1.14
			21/08/2021	198.89	74.14	36.29	8.16	12.20	< 1.14
		September 2021	13/09/2021	191.98	71.38	29.15	8.38	11.90	< 1.14
			19/09/2021	213.15	64.05	35.95	8.09	12.05	< 1.14
Permissible Limits as per NAAQS, 2009				-	100	60	80	80	2.0

Sl. No	Monitoring Stations	Month	Dt. of Monitoring	Analysis Result in $\mu\text{g}/\text{m}^3$					CO in $\text{mg}/\text{m}^3$
				SPM	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	
4	Near Village Dulanga (Core Zone)	April 2021	13/04/2021	190.37	70.26	34.20	8.55	14.19	< 1.14
			16/04/2021	195.99	60.25	32.66	8.78	13.40	< 1.14
		May 2021	21/05/2021	181.21	63.79	31.26	7.93	10.35	< 1.14
			24/05/2021	188.47	68.15	29.43	7.88	10.97	< 1.14
		June 2021	12/06/2021	170.59	65.60	28.39	6.89	10.28	< 1.14
			22/06/2021	208.85	78.64	33.49	7.16	10.97	< 1.14
		July 2021	13/07/2021	192.14	73.59	33.06	8.41	14.16	< 1.14
			31/07/2021	200.07	69.79	32.72	7.88	11.83	< 1.14
		August 2021	12/08/2021	201.27	77.90	37.40	8.41	13.71	< 1.14
			31/08/2021	161.43	53.03	29.53	8.78	14.22	< 1.14
		September 2021	13/09/2021	186.75	62.55	35.20	8.11	14.65	< 1.14
			19/09/2021	204.81	71.79	33.30	9.11	13.13	< 1.14
5	Near Village Bendelchua (Buffer Zone)	April 2021	14/04/2021	207.66	71.51	38.96	8.48	13.82	< 1.14
			17/04/2021	201.39	70.51	35.08	7.56	11.94	< 1.14
		May 2021	22/05/2021	200.59	70.95	28.01	8.56	11.83	< 1.14
			25/05/2021	198.63	67.77	31.30	7.74	11.51	< 1.14
		June 2021	13/06/2021	206.33	70.02	30.87	7.79	12.58	< 1.14
			23/06/2021	221.77	79.66	34.58	8.07	15.71	< 1.14
		July 2021	14/07/2021	207.62	70.46	30.94	7.73	12.47	< 1.14
			22/07/2021	192.10	71.68	28.75	7.01	13.35	< 1.14
		August 2021	13/08/2021	231.29	79.01	30.88	8.99	14.10	< 1.14
			25/08/2021	207.64	77.27	31.61	7.60	11.27	< 1.14
		September 2021	14/09/2021	216.86	74.27	35.35	7.25	16.70	< 1.14
			20/09/2021	177.28	66.86	28.60	6.82	10.31	< 1.14
6	Near Village Rengalmurr (Buffer Zone)	April 2021	14/04/2021	204.51	68.08	31.20	7.09	13.52	< 1.14
			17/04/2021	209.30	67.59	30.06	8.04	14.15	< 1.14
		May 2021	22/05/2021	199.17	70.11	34.94	6.51	11.46	< 1.14
			25/05/2021	192.09	71.09	31.34	7.28	11.86	< 1.14
		June 2021	13/06/2021	171.01	69.35	28.36	6.57	10.01	< 1.14
			23/06/2021	198.86	70.03	29.90	6.94	11.12	< 1.14
		July 2021	14/07/2021	204.31	72.09	33.24	6.83	10.40	< 1.14
			22/07/2021	191.95	71.50	30.58	6.30	10.31	< 1.14
		August 2021	13/08/2021	199.91	78.73	34.30	8.87	14.15	< 1.14
			25/08/2021	187.39	68.96	28.96	7.08	10.93	< 1.14
		September 2021	14/09/2021	215.06	68.05	33.86	8.04	12.65	< 1.14
			20/09/2021	211.41	77.63	35.71	8.56	13.21	< 1.14
<b>Permissible Limits as per NAAQS, 2009</b>				-	100	60	80	80	2.0

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Sl. No	Monitoring Stations	Month	Dt. of Monitoring	Analysis Result in $\mu\text{g}/\text{m}^3$					CO in $\text{mg}/\text{m}^3$		
				SPM	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>			
7	Near Village Khurjharis (Buffer Zone)	April 2021	14/04/2021	176.87	64.26	29.71	6.23	11.80	<1.14		
			17/04/2021	185.30	69.29	30.72	8.43	12.91	<1.14		
		May 2021	22/05/2021	174.21	66.46	27.86	6.42	10.63	<1.14		
			25/05/2021	182.62	69.24	34.37	8.30	12.01	<1.14		
		June 2021	13/06/2021	188.39	71.35	32.40	8.19	12.94	<1.14		
			23/06/2021	194.74	70.08	30.91	7.35	13.33	<1.14		
		July 2021	14/07/2021	209.14	77.84	32.16	7.72	14.33	<1.14		
			22/07/2021	204.42	74.62	35.03	8.44	10.65	<1.14		
		August 2021	13/08/2021	188.10	68.12	29.18	7.85	13.07	<1.14		
			25/08/2021	191.02	63.46	31.33	6.48	12.07	<1.14		
		September 2021	14/09/2021	200.55	68.34	34.72	8.27	12.71	<1.14		
			20/09/2021	187.29	73.87	32.18	7.93	11.37	<1.14		
		8	Near Village Karfati (Buffer Zone)	April 2021	14/04/2021	185.37	54.01	30.61	6.63	11.72	<1.14
					17/04/2021	179.41	65.68	31.15	7.38	10.21	<1.14
May 2021	22/05/2021			189.46	69.15	29.36	7.31	12.33	<1.14		
	25/05/2021			198.97	67.77	29.34	6.24	10.41	<1.14		
June 2021	13/06/2021			176.34	66.30	27.08	6.52	10.59	<1.14		
	23/06/2021			207.96	73.92	31.39	8.16	11.69	<1.14		
July 2021	14/07/2021			189.41	71.19	29.34	6.31	10.24	<1.14		
	22/07/2021			200.31	70.96	30.92	7.88	11.17	<1.14		
August 2021	13/08/2021			218.40	74.47	32.50	7.84	11.94	<1.14		
	25/08/2021			183.24	61.83	30.83	8.96	12.17	<1.14		
September 2021	14/09/2021			197.68	71.00	33.46	8.20	10.31	<1.14		
	20/09/2021			194.36	69.81	34.76	8.49	12.61	<1.14		
<b>Permissible Limits as per NAAQS, 2009</b>				-	<b>100</b>	<b>60</b>	<b>80</b>	<b>80</b>	<b>2.0</b>		

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**Reports on Heavy Metals in Ambient Air Quality**  
**Frequency of Monitoring – Bi - Annual**  
**(September 2021)**

Sl. No	Monitoring Stations	Month	Date of Monitoring	Analysis Result				
				Hg in $\mu\text{g}/\text{m}^3$	Ni in $\mu\text{g}/\text{m}^3$	As in $\text{ng}/\text{m}^3$	Cr in $\mu\text{g}/\text{m}^3$	Cd in $\mu\text{g}/\text{m}^3$
1	Near Site Office, Krapurkaelhar	September 2021	13/09/2021 & 19/09/2021	ND	ND	ND	ND	ND
2	Near Coal Fan (Core Zone)	September 2021	13/09/2021 & 19/09/2021	ND	ND	ND	ND	ND
3	Near Workshop (Core Zone)	September 2021	13/09/2021 & 19/09/2021	ND	ND	ND	ND	ND
4	Near Village Durlanga (Core Zone)	September 2021	13/09/2021 & 19/09/2021	ND	ND	ND	ND	ND
5	Near Village Benfrichna (Buffer Zone)	September 2021	14/09/2021 & 20/09/2021	ND	ND	ND	ND	ND
6	Near Village Rengalantunt (Buffer Zone)	September 2021	14/09/2021 & 20/09/2021	ND	ND	ND	ND	ND
7	Near Village Khanjharis (Buffer Zone)	September 2021	14/09/2021 & 20/09/2021	ND	ND	ND	ND	ND
8	Near Village Kathiali (Buffer Zone)	September 2021	14/09/2021 & 20/09/2021	ND	ND	ND	ND	ND
<b>Permissible Limits as per NAAQS, 2009</b>				-	20	06	-	-

Note: ND: Not Detected

**Ambient Air Quality Monitoring Report**  
**Frequency of Monitoring: Monthly Twice**

*Rath*

(October 2021 to March 2022)

Sl. No	Monitoring Stations	Month	Dt. of Monitoring	Analysis Result in $\mu\text{g}/\text{m}^3$					CO in $\text{mg}/\text{m}^3$		
				SPM	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>			
1	Near Site Office, Khapurikachhar (Core Zone)	October 2021	04/10/2021	174.45	62.58	37.88	7.63	11.55	< 1.14		
			26/10/2021	208.61	72.27	32.39	8.31	13.23	< 1.14		
		November 2021	11/11/2021	195.12	72.06	33.80	8.27	12.87	< 1.14		
			16/11/2021	182.96	67.78	30.91	7.05	11.31	< 1.14		
		December 2021	07/12/2021	212.63	74.38	33.07	8.59	13.70	< 1.14		
			16/12/2021	181.71	73.14	33.79	9.57	14.07	< 1.14		
		January 2022	05/01/2022	201.47	70.56	35.61	8.06	13.92	< 1.14		
			19/01/2022	201.95	68.43	32.85	8.57	11.67	< 1.14		
		February 2022	04/02/2022	206.07	72.13	32.92	7.08	12.35	< 1.14		
			17/02/2022	189.74	73.25	30.07	6.98	10.73	< 1.14		
		March 2022	08/03/2022	202.26	73.17	34.65	8.61	13.50	< 1.14		
			22/03/2022	201.39	77.74	31.25	7.12	10.94	< 1.14		
		2	Near Coal Lab (Core Zone)	October 2021	04/10/2021	227.23	85.94	40.97	9.80	14.87	< 1.14
					26/10/2021	188.15	74.34	28.73	6.73	13.61	< 1.14
November 2021	11/11/2021			188.07	71.85	36.43	7.31	11.01	< 1.14		
	16/11/2021			190.21	73.13	29.06	7.27	10.22	< 1.14		
December 2021	07/12/2021			207.24	70.80	34.18	7.95	13.69	< 1.14		
	16/12/2021			229.14	72.15	35.42	8.91	12.31	< 1.14		
January 2022	05/01/2022			184.26	71.45	30.46	9.17	13.30	< 1.14		
	19/01/2022			203.08	72.23	36.78	9.11	14.56	< 1.14		
February 2022	04/02/2022			202.04	72.86	32.91	8.70	12.80	< 1.14		
	17/02/2022			212.33	75.75	36.90	8.97	14.32	< 1.14		
March 2022	08/03/2022			205.32	76.11	30.11	9.35	15.70	< 1.14		
	22/03/2022			195.03	70.14	33.50	9.06	14.48	< 1.14		
3	Near Work Shop (Core Zone)			October 2021	04/10/2021	181.02	67.49	34.43	7.65	13.30	< 1.14
					26/10/2021	200.89	71.91	31.29	7.29	10.76	< 1.14
		November 2021	11/11/2021	205.65	70.83	31.93	8.54	13.78	< 1.14		
			16/11/2021	182.76	70.80	32.22	8.85	12.77	< 1.14		
		December 2021	07/12/2021	200.64	69.12	32.03	7.13	14.57	< 1.14		
			16/12/2021	173.01	71.73	29.81	8.11	11.84	< 1.14		
		January 2022	05/01/2022	197.26	67.63	28.52	8.94	10.07	< 1.14		
			19/01/2022	196.16	71.06	33.60	8.41	11.99	< 1.14		
		February 2022	04/02/2022	212.15	74.16	36.10	8.81	14.61	< 1.14		
			17/02/2022	196.35	71.13	32.45	8.09	11.54	< 1.14		
		March 2022	08/03/2022	186.31	70.69	34.46	8.54	11.31	< 1.14		
			22/03/2022	204.70	71.57	30.54	8.41	13.49	< 1.14		
		Permissible Limits as per NAAQS, 2009				-	100	60	80	80	2.0
		Sl. No	Monitoring Stations	Month	Dt. of Monitoring	Analysis Result in $\mu\text{g}/\text{m}^3$					CO in $\text{mg}/\text{m}^3$
4	Near Village Dalanga (Core Zone)	October 2021	04/10/2021	151.99	76.83	19.85	9.67	11.50	< 1.14		
			26/10/2021	191.78	82.88	30.65	7.53	10.97	< 1.14		
		November 2021	11/11/2021	175.59	68.74	30.17	7.79	13.32	< 1.14		
			16/11/2021	185.75	64.05	30.96	8.92	10.74	< 1.14		

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5	Near Village Bendriuhma (Buffer Zone)	December 2021	07/12/2021	177.11	63.52	28.58	8.55	10.05	< 1.14
			16/12/2021	177.11	61.51	29.25	6.20	12.32	< 1.14
		January 2022	05/01/2022	171.33	59.39	31.74	7.55	11.61	< 1.14
			19/01/2022	190.29	71.92	29.03	7.22	12.11	< 1.14
		February 2022	04/02/2022	188.11	65.02	28.28	7.89	11.30	< 1.14
			17/02/2022	188.01	71.06	27.09	7.43	12.36	< 1.14
		March 2022	08/03/2022	180.53	69.96	30.15	7.67	10.98	< 1.14
			22/03/2022	154.53	69.74	32.0	8.10	13.60	< 1.14
		October 2021	05/10/2021	150.73	67.31	25.50	7.95	11.40	< 1.14
			27/10/2021	187.32	84.56	27.98	8.60	12.80	< 1.14
		November 2021	12/11/2021	166.32	64.91	28.07	7.90	10.79	< 1.14
			17/11/2021	186.89	65.66	28.49	6.60	11.67	< 1.14
		December 2021	08/12/2021	183.46	71.75	30.20	6.32	10.71	< 1.14
			17/12/2021	194.27	63.52	32.19	9.71	13.60	< 1.14
		January 2022	06/01/2022	194.70	60.79	30.79	7.50	12.69	< 1.14
			20/01/2022	189.17	66.92	27.88	7.26	10.04	< 1.14
		February 2022	05/02/2022	186.90	67.62	29.18	7.21	13.80	< 1.14
			18/02/2022	192.43	68.07	25.99	6.97	10.04	< 1.14
		March 2022	09/03/2022	195.97	70.90	32.51	8.36	11.41	< 1.14
			23/03/2022	180.68	70.80	29.10	7.10	12.27	< 1.14
October 2021	05/10/2021	164.15	83.95	21.24	6.39	11.51	< 1.14		
	27/10/2021	190.08	77.70	32.08	8.32	11.45	< 1.14		
November 2021	12/11/2021	173.80	53.93	26.31	6.98	10.94	< 1.14		
	17/11/2021	174.18	55.63	28.10	7.43	11.00	< 1.14		
December 2021	08/12/2021	196.42	67.03	34.65	7.93	11.40	< 1.14		
	17/12/2021	173.08	67.27	29.20	7.71	11.68	< 1.14		
January 2022	06/01/2022	175.08	62.09	27.97	6.90	12.92	< 1.14		
	20/01/2022	184.74	60.53	25.77	6.68	10.33	< 1.14		
February 2022	05/02/2022	192.38	68.22	31.49	7.91	11.37	< 1.14		
	18/02/2022	199.46	69.27	31.69	7.77	12.95	< 1.14		
March 2022	09/03/2022	195.10	70.41	30.09	8.25	11.91	< 1.14		
	23/03/2022	194.07	68.55	30.14	7.18	12.41	< 1.14		
Permissible Limits as per NAAQS, 2009					100	60	80	80	2.0

*Ratha*

Sl. No	Monitoring Stations	Month	Dt. of Monitoring	Analysis Result in $\mu\text{g}/\text{m}^3$					CO in $\text{mg}/\text{m}^3$		
				SPM	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>			
7	Near Village Khuncharia (Buffer Zone)	October 2021	05/10/2021	168.70	81.11	26.53	9.88	9.96	< 1.14		
			27/10/2021	177.71	69.39	30.45	9.41	10.50	< 1.14		
		November 2021	12/11/2021	169.25	63.20	25.93	7.88	11.11	< 1.14		
			17/11/2021	164.52	60.61	23.76	8.14	11.51	< 1.14		
		December 2021	08/12/2021	194.66	63.68	28.27	8.43	14.19	< 1.14		
			17/12/2021	202.70	68.44	31.07	8.48	10.25	< 1.14		
		January 2022	06/01/2022	181.60	69.35	31.14	7.90	10.13	< 1.14		
			20/01/2022	178.0	69.43	32.46	7.79	12.33	< 1.14		
		February 2022	05/02/2022	201.04	72.13	36.77	8.21	14.06	< 1.14		
			18/02/2022	200.59	69.12	32.01	9.72	11.56	< 1.14		
		March 2022	09/03/2022	199.88	71.72	29.19	8.59	14.27	< 1.14		
			23/03/2022	202.57	73.83	34.18	8.49	10.91	< 1.14		
		8	New Village Kachfali (Buffer Zone)	October 2021	05/10/2021	176.48	77.03	25.71	7.74	10.21	< 1.14
					27/10/2021	213.23	76.59	35.26	6.98	14.56	< 1.14
November 2021	12/11/2021			174.22	62.97	27.66	7.29	10.81	< 1.14		
	17/11/2021			156.42	57.68	26.83	6.37	10.23	< 1.14		
December 2021	08/12/2021			206.34	70.18	28.67	8.60	11.03	< 1.14		
	17/12/2021			173.63	64.93	25.78	7.33	10.56	< 1.14		
January 2022	06/01/2022			170.70	34.40	29.15	7.68	10.33	< 1.14		
	20/01/2022			198.71	63.46	25.98	7.95	10.53	< 1.14		
February 2022	05/02/2022			180.75	62.59	27.09	7.48	11.00	< 1.14		
	18/02/2022			187.25	65.35	27.57	7.49	12.14	< 1.14		
March 2022	09/03/2022			170.04	67.11	26.85	7.40	10.87	< 1.14		
	23/03/2022			188.6	67.68	27.19	7.38	12.20	< 1.14		
<b>Permissible Limits as per NAAQS, 2009</b>				-	<b>100</b>	<b>60</b>	<b>80</b>	<b>80</b>	<b>2.0</b>		

*Reddy*

**Reports on Heavy Metals in Ambient Air Quality**  
**Frequency of Monitoring – Bi - Annual**  
**(March 2022)**

Sl. No	Monitoring Stations	Month	Date of Monitoring	Analysis Result				
				Hg in $\mu\text{g}/\text{m}^3$	Ni in $\text{ng}/\text{m}^3$	As in $\text{ng}/\text{m}^3$	Cr in $\mu\text{g}/\text{m}^3$	Cd in $\mu\text{g}/\text{m}^3$
1	Near Site Office, Kluptmikachhar	March 2022	08/03/2022 & 22/03/2022	ND	ND	ND	ND	ND
2	Near Coal Lab (Core Zone)	March 2022	08/03/2022 & 22/03/2022	ND	ND	ND	ND	ND
3	Near Work shop (Core Zone)	March 2022	08/03/2022 & 22/03/2022	ND	ND	ND	ND	ND
4	Near Village Dulanga (Core Zone)	March 2022	08/03/2022 & 22/03/2022	ND	ND	ND	ND	ND
5	Near Village Beudrichma (Buffer Zone)	March 2022	09/03/2022 & 23/03/2022	ND	ND	ND	ND	ND
6	Near Village Rengalumar (Buffer Zone)	March 2022	09/03/2022 & 23/03/2022	ND	ND	ND	ND	ND
7	Near Village Kluantjhaeria (Buffer Zone)	March 2022	09/03/2022 & 23/03/2022	ND	ND	ND	ND	ND
8	Near Village Kashali (Buffer Zone)	March 2022	09/03/2022 & 23/03/2022	ND	ND	ND	ND	ND
Permissible Limits as per NAAQS, 2009				-	20	06	-	-

Note: ND: Not Detected

*Ratha*

**Reports on Heavy Metals in Ambient Air Quality  
Frequency of Monitoring – Bi - Annual  
(March 2022)**

Sl. No	Monitoring Stations	Month	Date of Monitoring	Analysis Result				
				Hg in $\mu\text{g}/\text{m}^3$	Ni in $\text{ng}/\text{m}^3$	As in $\mu\text{g}/\text{m}^3$	Cr in $\mu\text{g}/\text{m}^3$	Cd in $\mu\text{g}/\text{m}^3$
1	Near Site Office, Khaprikachhar	March 2022	08/03/2022 & 22/03/2022	ND	ND	ND	ND	ND
2	Near Coal Lab (Core Zone)	March 2022	08/03/2022 & 22/03/2022	ND	ND	ND	ND	ND
3	Near Workshop (Core Zone)	March 2022	08/03/2022 & 22/03/2022	ND	ND	ND	ND	ND
4	Near Village Dulanga (Core Zone)	March 2022	08/03/2022 & 22/03/2022	ND	ND	ND	ND	ND
5	Near Village Bendrichua (Buffer Zone)	March 2022	09/03/2022 & 23/03/2022	ND	ND	ND	ND	ND
6	Near Village Kongsimurr (Buffer Zone)	March 2022	09/03/2022 & 23/03/2022	ND	ND	ND	ND	ND
7	Near Village Khunjharia (Buffer Zone)	March 2022	09/03/2022 & 23/03/2022	ND	ND	ND	ND	ND
8	Near Village Kachfai (Buffer Zone)	March 2022	09/03/2022 & 23/03/2022	ND	ND	ND	ND	ND
<b>Permissible Limits as per NAAQS, 2009</b>				-	20	06	-	-

**Note: ND: Not Detected**

*Ratna*

## Continuous Ambient Air Quality Monitoring Station



*Radha*



**Monitoring data of the stipulated environmental quality parameters being displayed at the entrance of the mine office**

*Rochelle*

**Barbed Wire Fencing**





*Rolle*

**Highlights of CSR activities**



**Food Distribution drive during Covid-19 pandemic among workers and near-by villagers**

*Rathna*



Vaccination drive against Covid'19 among the  
Project Affected People



Sanitization at R&R Colony Majhapara

*Radha*



phenyl preparation programme among the project affected people

*Radha*



Distribution program among local people.

*Rothe*



*Ratha*

**Observation of International Girl child day for spreading awareness among the locals.**



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

(भूजल निकासी हेतु अनापत्ति प्रमाण पत्र)

**NO OBJECTION CERTIFICATE (NOC) FOR GROUND WATER ABSTRACTION**

Project Name:	M/s Ntpc Ltd.		
Project Address:	M/s Ntpc Ltd., Dulanga Coal Mining Project		
Village:	Dulinga	Block:	Hemgir
District:	Sundargarh	State:	Odisha
Pin Code:			
Communication Address:	M/s Ntpc Ltd, Dulanga Coal Mining Project, At- Khapurikachhar , P.o: Sanghumuda, Hemgir, Sundargarh, Odisha - 770013		
Address of CGWB Regional Office :	Central Ground Water Board South Eastern Region, Bhujal Bhawan, Khandagiri Square, Nh-5, Bhubaneswar, Khordha, Odisha - 750001		

1. <b>NOC No.:</b>	CGWA/NOC/MIN/REN/2/2022/7124											
2. Application No.:	21-4/513/OR/MIN/2013	3. Category: (GWRE 2020)	Safe									
4. Project Status:	Existing Ground Water	5. NOC Type:	Renewal									
6. <b>Valid from:</b>	04/12/2021	7. <b>Valid up to:</b>	03/12/2023									
8. Ground Water Abstraction Permitted:												
	Fresh Water		Saline Water	Dewatering		Total						
	m <sup>3</sup> /day	m <sup>3</sup> /year	m <sup>3</sup> /day	m <sup>3</sup> /year	m <sup>3</sup> /day	m <sup>3</sup> /year	m <sup>3</sup> /day	m <sup>3</sup> /year				
	91.00	33215.00			318.00	116070.00						
9. Details of ground water abstraction /Dewatering structures												
	<b>Total Existing No.:4</b>						<b>Total Proposed No.:2</b>					
	DW	DCB	BW	TW	MP	MPu	DW	DCB	BW	TW	MP	MPu
Abstraction Structure*	0	0	3	0	0	0	0	0	2	0	0	0
Dewatering Structure*	0	0	0	0	1	0	0	0	0	0	0	1
*DW- Dug Well; DCB-Dug-cum-Bore Well; BW-Bore Well; TW-Tube Well; MP-Mine Pit;MPu-Mine Pumps												
10. Ground Water Abstraction/Restoration Charges paid (Rs.):				304569.50								
11. Number of Piezometers(Observation wells) to be constructed/ monitored & Monitoring mechanism.				No. of Piezometers			Monitoring Mechanism					
							Manual	DWLR**	DWLR With Telemetry			
**DWLR - Digital Water Level Recorder				1			0	1	0			

(Compliance Conditions given overleaf)

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

18/11, जामनगर हाउस, मानसिंह रोड, नई दिल्ली - 110011 / 18/11, Jamnagar House, Mansingh Road, New Delhi-110011

Phone: (011) 23383561 Fax: 23382051, 23386743

Website: cgwa-noc.gov.in

पानी बचाये - जीवन बचाये  
SAVE WATER - SAVE LIFE

**Validity of this NOC shall be subject to compliance of the following conditions:**

**Mandatory conditions:**

- 1) Installation of tamper proof digital water flow meter with telemetry on all the abstraction structure(s) shall be mandatory for all users seeking No Objection Certificate and intimation regarding their installation shall be communicated to the CGWA within 30 days of grant of No Objection Certificate.
- 2) Proponents shall mandatorily get water flow meter calibrated from an authorized agency once in a year.
- 3) Construction of purpose-built observation wells (piezometers) for ground water level monitoring shall be mandatory as per Section 14 of Guidelines. Water level data shall be made available to CGWA through web portal. Detailed guidelines for construction of piezometers are given in Annexure-II of the guidelines.
- 4) Proponents shall monitor quality of ground water from the abstraction structure(s) once in a year. Water samples from bore wells/ tube wells / dug wells shall be collected during April/May every year and analysed in NABL accredited laboratories for basic parameters (cations and anions), heavy metals, pesticides/ organic compounds etc. Water quality data shall be made available to CGWA through the web portal.
- 5) In case of mining projects, additional key wells shall be established in consultation with the Regional Director, CGWB for ground water level monitoring four (4) times a year (January, May, August and November) in core as well as buffer zones of the mine.
- 6) In case of mining project the firm shall submit water quality report of mine discharge/ seepage from Govt. approved/ NABL accredited lab.
- 7) The firm shall report compliance of the NOC conditions online in the website ([www.cgwa-noc.gov.in](http://www.cgwa-noc.gov.in)) within one year from the date of issue of this NOC.
- 8) Industries abstracting ground water in excess of 100 m<sup>3</sup>/d shall undertake annual water audit through certified auditors and submit audit reports within three months of completion of the same to CGWA. All such industries shall be required to reduce their ground water use by at least 20% over the next three years through appropriate means.
- 9) Application for renewal can be submitted online from 90 days before the expiry of NOC. Ground water withdrawal, if any, after expiry of NOC shall be illegal & liable for legal action as per provisions of Environment (Protection) Act, 1986.
- 10) This NOC is subject to prevailing Central/State Government rules/laws/norms or Court orders related to construction of tube well/ground water abstraction structure / recharge or conservation structure/discharge of effluents or any such matter as applicable.

**General conditions:**

- 11) No additional ground water abstraction and/or de-watering structures shall be constructed for this purpose without prior approval of the Central Ground Water Authority (CGWA).
- 12) The proponent shall seek prior permission from CGWA for any increase in quantum of groundwater abstraction (more than that permitted in NOC for specific period).
- 13) Proponents shall install roof top rain water harvesting in the premise as per the existing building bye laws in the premise.
- 14) The project proponent shall take all necessary measures to prevent contamination of ground water in the premises failing which the firm shall be responsible for any consequences arising thereupon.
- 15) In case of industries that are likely to contaminate the ground water, no recharge measures shall be taken up by the firm inside the plant premises. The runoff generated from the rooftop shall be stored and put to beneficial use by the firm.
- 16) Wherever feasible, requirement of water for greenbelt (horticulture) shall be met from recycled / treated waste water.
- 17) Wherever the NOC is for abstraction of saline water and the existing wells (s) is /are yielding fresh water, the same shall be sealed and new tubewell(s) tapping saline water zone shall be constructed within 3 months of the issuance of NOC. The firm shall also ensure safe disposal of saline residue, if any.
- 18) Unexpected variations in inflow of ground water into the mine pit, if any, shall be reported to the concerned Regional Director, Central Ground Water Board.
- 19) In case of violation of any NOC conditions, the applicant shall be liable to pay the penalties as per Section 16 of Guidelines.
- 20) This NOC does not absolve the proponents of their obligation / requirement to obtain other statutory and administrative clearances from appropriate authorities.
- 21) The issue of this NOC does not imply that other statutory / administrative clearances shall be granted to the project by the concerned authorities. Such authorities would consider the project on merits and take decisions independently of the NOC.
- 22) In case of change of ownership, new owner of the industry will have to apply for incorporation of necessary changes in the No Objection Certificate with documentary proof within 60 days of taking over possession of the premises.
- 23) This NOC is being issued without any prejudice to the directions of the Hon'ble NGT/court orders in cases related to ground water or any other related matters.
- 24) Proponents, who have installed/constructed artificial recharge structures in compliance of the NOC granted to them previously and have availed rebate of upto 50% (fifty percent) in the ground water abstraction charges/ground water restoration charges, shall continue to regularly maintain artificial recharge structures.
- 25) Industries which are likely to cause ground water pollution e.g. Tanning, Slaughter Houses, Dye, Chemical/ Petrochemical, Coal washeries, pharmaceutical, other hazardous units etc. (as per CPCB list) need to undertake necessary well head protection measures to ensure prevention of ground water pollution as per Annexure III of the guidelines.
- 26) In case of new infrastructure projects having ground water abstraction of more than 20 m<sup>3</sup>/day, the firm/entity shall ensure implementation of dual water supply system in the projects.
- 27) In case of infrastructure projects, paved/parking area must be covered with interlocking/perforated tiles or other suitable measures to ensure groundwater infiltration/harvesting.
- 28) In case of coal and other base metal mining projects, the project proponent shall use the advance dewatering technology (by construction of series of dewatering abstraction structures) to avoid contamination of surface water.
- 29) The NOC issued is conditional subject to the conditions mentioned in the Public notice dated 27.01.2021 failing which penalty/EC/cancellation of NOC shall be imposed as the case may be.
- 30) This NOC is issued subject to the clearance of Expert Appraisal Committee (EAC) (if applicable).

**(Non-compliance of the conditions mentioned above is likely to result in the cancellation of NOC and legal action against the proponent.)**



CIN - U73100OR1995PTC003889



GSTIN : 21AAACE6224D1ZE

## Environmental Research and Services (India) Pvt. Ltd.

(OSPCB 'A' Category Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329 , E-mail: ersibbsr@gmail.com

### DEPTH OF GROUND WATER TABLE

Date: 29 Apr 2022

Name and Address of the Customer : Dulanga Coal Mine of M/s NTPC Limited in Sundargarh district, Odisha.

Date of Measurement : 09-10/04/2022

Measurement Taken by : Representative of ERS (I) Pvt. Ltd.

Measurement carried out in presence of: Representative of the Customer

Sl. No.	Location	Depth (Below Surface level in meter)
01	Open well in Village Khuntjharua	7.04
02	Open well in Village Bendrichua	3.85
03	Open well in Village Dulanga	8.08
04	Open well in Village Beldihi	3.96
05	Open well in Village Kathfali	1.75
06	Open well in Village Kalamegha	4.17
07	Borewell Near Central Canteen	4.12
08	Borewell Near Pit Office	57.35

(Authorized Signatory)  
S.P.Pattanayak  
Tech.Manager

.....END OF TEST REPORT.....



CIN - U73100OR1995PTC003889



GSTIN : 21AAACE6224D1ZE

## Environmental Research and Services (India) Pvt. Ltd.

(OSPCB 'A' Category Empanelled Laboratory and ISO 9001:2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

### DEPTH OF GROUND WATER TABLE

Date: 25 Aug 2022

Name and Address of the Customer : Dulanga Coal Mine of M/s NTPC Limited in Sundargarh district, Odisha.

Date of Measurement : 05/08/2022

Measurement Taken by : Representative of ERS (I) Pvt. Ltd.

Measurement carried out in presence of : Representative of the Customer

Sl. No.	Location	Depth (Below Surface level in meter)
01	Open well in Village Khuntiharia	4.47
02	Open well in Village Bendrichua	3.40
03	Open well in Village Dulanga	2.52
04	Open well in Village Beldhi	2.01
05	Open well in Village Kathfali	1.50
06	Open well in Village Kalamegha	2.34

  
(Authorized Signatory)  
S.P. Pattanayak  
Tech. Manager

.....END OF TEST REPORT.....



CIN - U73100OR1995PTC003889



GSTIN : 21AAACE6224D1ZE

## Environmental Research and Services (India) Pvt. Ltd.

(OSPCB 'A' Category Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

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Tel: +91-9437021932, +91-9937690329 , E-mail: ersibbsr@gmail.com

### DEPTH OF GROUND WATER TABLE

Date: 02 Dec 2022

Name and Address of the Customer : Dulanga Coal Mine of M/s NTPC Limited in Sundargarh district, Odisha.

Date of Measurement : 07-08/11/2022

Measurement Taken by : Representative of ERS (I) Pvt. Ltd.

Measurement carried out in presence of : Representative of the Customer

Sl. No.	Location	Depth (Below Surface level in meter)
01	Bore well inside NTPC Site Office	6.40
02	Bore Well R & R Colony, Kalamegha	10.39
03	Bore well near Pit Office	57.40
04	Open well in Village Khuntjharia	4.93
05	Open well in Village Bendrichua	2.16
06	Open well in Village Kathfali	1.83
07	Open well in Village Kalamegha	2.59

  
(Authorized Signatory)  
S.P. Pattanayak  
Tech. Manager

.....END OF TEST REPORT.....

GSTIN : 21AAACE6224D1ZE



## Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025 : 2017 (NABL) Accredited Laboratory, OSPCB Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Certificate No.: TC-7440

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

ULR-TC74402200000522F

Test Report Format No.: ERSIPL/FM/40

### TEST REPORT (WATER/WASTE WATER)

Pg No: 1 of 1

Date: 02 Dec 2022

Test Report No: ERSIPL/TR/WA/286

Name and Address of the Customer

: Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.

Date of Sampling

: 07.11.2022

Sample Collected by

: Representative of ERS (I) Pvt. Ltd.

Sample Collected in presence of

: Representative of Customer

Sample Received on

: 24.11.2022

**Analysis Started on****: 24.11.2022**

Analysis Completed on

: 02.12.2022

Method of Sampling

: IS 3025: Part 1: 1987, Reaffirmed 2019

Quantity of Sample

: 2ltrs

Type of Container

: Glass Bottle &amp; HDPE Bottle

Environment Condition

: All Tests carried out in Room Temperature

**Sample ID. No.**

1. ERSIPL/WA/607

2. ERSIPL/WA/608

**Location**

1. ETP Inlet Water

1. ETP Outlet Water

**TEST FINDINGS:**

S. No.	Test Parameters	Test Method	Unit	Result		Permissible Limit As per CTO Issued by SPCB
				ERSIPL/ WA/ 607	ERSIPL/ WA/ 608	
1	pH value	IS 3025: Part 11: 1983 Reaffirmed-2017	--	7.19	7.11	6.5 – 8.5
2	Total Suspended Solids	IS 3025: Part 17: 1984 Reaffirmed-2017	mg/L	7.5	3.7	50.0
3	Oil & Grease	IS 3025: Part 39: 1991 Reaffirmed-2019	mg/L	1.06	1.01	10.0
4	COD	IS 3025: Part 58:2006 Reaffirmed-2017	mg/L	16.0	8.0	150.0

(Authorized Signatory)  
 S.P. Paitanayak  
 Tech. Manager

.....END OF TEST REPORT.....

GSTIN : 21AAACE6224D1ZE



## Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025:2017 (NABL) Accredited Laboratory, OSPCB Empanelled Laboratory and ISO 9001:2015 Certified Company)

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Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

ULR-TC744022000000586F

Test Report Format No.: ERSIPL/FM/40

### TEST REPORT (WATER/WASTE WATER)

Pg No: 1 of 1

Date: 29 Dec 2022	Test Report No: ERSIPL/TR/WA/322
Name and Address of the Customer	: Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.
Date of Sampling	: 12.12.2022
Sample Collected by	: Representative of ERS (I) Pvt. Ltd.
Sample Collected in presence of	: Representative of Customer
Sample Received on	: 22.12.2022
Analysis Started on	: 22.12.2022
Analysis Completed on	: 29.12.2022
Method of Sampling	: IS 3025: Part 1: 1987, Reaffirmed 2019
Quantity of Sample	: 2ltrs
Type of Container	: Glass Bottle & HDPE Bottle
Environment Condition	: All Tests carried out in Room Temperature
<b>Sample ID. No.</b>	<b>Location</b>
1. ERSIPL/WA/685	1. ETP Inlet Water
2. ERSIPL/WA/686	1. ETP Outlet Water

#### TEST FINDINGS:

S. No.	Test Parameters	Test Method	Unit	Result		Permissible Limit As per CTO Issued by SPCB
				ERSIPL/ WA/ 685	ERSIPL/ WA/ 686	
1	pH value	IS 3025: Part 11: 1983 Reaffirmed-2017	--	7.11	7.02	6.5 – 8.5
2	Total Suspended Solids	IS 3025: Part 17: 1984 Reaffirmed-2017	mg/L	9.5	4.1	50.0
3	Oil & Grease	IS 3025: Part 39: 1991 Reaffirmed-2019	mg/L	2.76	2.01	10.0
4	COD	IS 3025: Part 58:2006 Reaffirmed-2017	mg/L	20.0	12.0	150.0

(Authorized Signatory)  
S.P. Pattanaya  
Tech. Manager

.....END OF TEST REPORT.....

GSTIN : 21AAACE6224D1ZE



## Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025 : 2017 (NABL) Accredited Laboratory, OSPCB Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

ULR-TC744023000000010F

Test Report Format No.: ERSIPL/FM/40

### TEST REPORT (WATER/WASTE WATER)

Page No: 1 of 1

Date: 27 Jan 2023

Test Report No: ERSIPL/TR/WA/006

Name and Address of the Customer

: Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.

Date of Sampling

: 13.01.2023

Sample Collected by

: Representative of ERS (I) Pvt. Ltd.

Sample Collected in presence of

: Representative of Customer

Sample Received on

: 16.01.2023

Analysis Started on

: 16.01.2023

Analysis Completed on

: 23.01.2023

Method of Sampling

: IS 3025: Part 1: 1987, Reaffirmed 2019

Quantity of Sample

: 2ltrs

Type of Container

: Glass Bottle & HDPE Bottle

Environment Condition

: All Tests carried out in Room Temperature

Sample ID. No.

1. ERSIPL/WA/001

Location

1. ETP Outlet Water

#### TEST FINDINGS:

S. No.	Test Parameters	Test Method	Unit	Result	Permissible Limit As per CTO Issued by SPCB
				ERSIPL/ WA/ 001	
1	pH value	IS 3025: Part 11: 1983 Reaffirmed-2017	--	7.04	6.5 – 8.5
2	Total Suspended Solids	IS 3025: Part 17: 1984 Reaffirmed-2017	mg/L	13.5	50.0
3	Oil & Grease	IS 3025: Part 39: 1991 Reaffirmed-2019	mg/L	3.56	10.0
4	COD	IS 3025: Part 58:2006 Reaffirmed-2017	mg/L	24.0	150.0

(Authorized Signatory)  
S.P. Pattanayak  
Tech. Manager

.....END OF TEST REPORT.....



**एन टी पी सी लिमिटेड**  
(भारत सरकार का उद्यम)  
**NTPC Limited**  
(A Govt. of India Enterprise)

**दुलंगा / Dulanga**  
Dated: 01.02.2018

Ref: 0100/NTPC/DLCMP/MIN/DGMS/01/122

To,

The Director General of Mine Safety,  
O/o the DGMS, Hirapur,  
Dhanbad, Jharkhand- 826001

Sub: Notice of opening under Sec.16 of Mines Act 1952 and Regulation 3 of the Coal Mines Regulation (CMR), 2017 for Dulanga Coal Mining Project.

Ref.: (1) NTPC Letter No-0100/NTPC/DLCMP/MIN/DGMS/01/59 dated 22.08.2017 for Notice of Opening of Dulanga Coal Mining Project.

(2) DGMS Letter No:S-29020/35/2017/CR/11121/3046/ Chaibasa dated 26/12/2017

Sir,

Vide NTPC letter cited in Ref. (1), the Notice of Opening for commencement of mining operations in Dulanga Coal Mining project of NTPC Limited under Section 16 of the Mines Act, 1952 & Reg. 3 of CMR, 1957 had been submitted in Form-I to your good office. The Mine is about to open shortly.

DGMS vide Ref. (2), have communicated to take suitable action as per the provisions of CMR-2017 enforced vide Gazette notification No. G.S.R. 1449 (E) dated 27<sup>th</sup> November, 2017.

In compliance to the requirement of **Reg. 3 of the CMR, 2017** pertaining to the **Notice of Opening for Commencement of Mining Operations**, we are hereby submitting the following documents along with Form-I (as prescribed in CMR 1957):

1. A copy of the **Surface Plan** No- NTPC/DLCMP/MIN/2017/SP-02, prepared under Clause (a) of Sub-regulation (1) of Reg. 65.
2. A copy of **Safety Management Plan** prepared under Reg. 104.

Further, as the Notice of opening in compliance to Section 16 of Mines Act and Reg.3 of erstwhile CMR 1957 had already been submitted to the DGMS vide Ref (1), we request your good office that the notice period of one month before the commencement of any mining operation shall be deemed to have been complied with under Sub-section 16(2) of Mines Act 1952.

This is for your information and kind consideration please.

Thanking you,

Yours faithfully,

(Vickram Chandra Dubey)

Agent

Designation: Addl. General Manager

Enclosure: As above

CC:

1. **The Dy. Director General of Mine Safety**, South Eastern Zone, CMPDIL Campass, 3<sup>rd</sup> floor, old building, Kanke Road, Ranchi, Jharkhand-834002.
2. **The Director of Mine Safety**, Chaibasa Region, Chaibasa, West Singbhum, Jharkhand-833201.
3. **The Collector and District Magistrate**, Sundargarh, Odisha-770001

दुलंगा कोल माइनिंग प्रोजेक्ट, द्वितीय तल, मेघ मल्लहार, मिशन रोड, सुन्दरगढ़-770001 (ओडिशा), दूरभाष : 06622-275501 (कार्यालय), फेस : 06622-275178  
Dulanga Coal Mining Project, 2nd Floor, Megh Mallahar, Mission Road, Sundargarh-770001 (Odisha), Phone : 06622-275501 (O), Fax : 06622-275178

पंजीकृत कार्यालय : एन टी पी सी भवन, स्कोप कॉम्प्लेक्स, 7 इन्स्टीट्यूशनल एरिया, लोधी रोड, नई दिल्ली - 110 003

कार्पोरेट पहचान नम्बर : L40101DL1975GOI007966, टेलीफोन नं. : 011-24387333, फेस नं. : 011-24361018, ईमेल : ntpccc@ntpc.co.in, वेबसाइट : www.ntpc.co.in

Registered Office : NTPC Bhawan, Scope Complex, 7 Institutional Area, Lodhi Road, New Delhi - 110 003

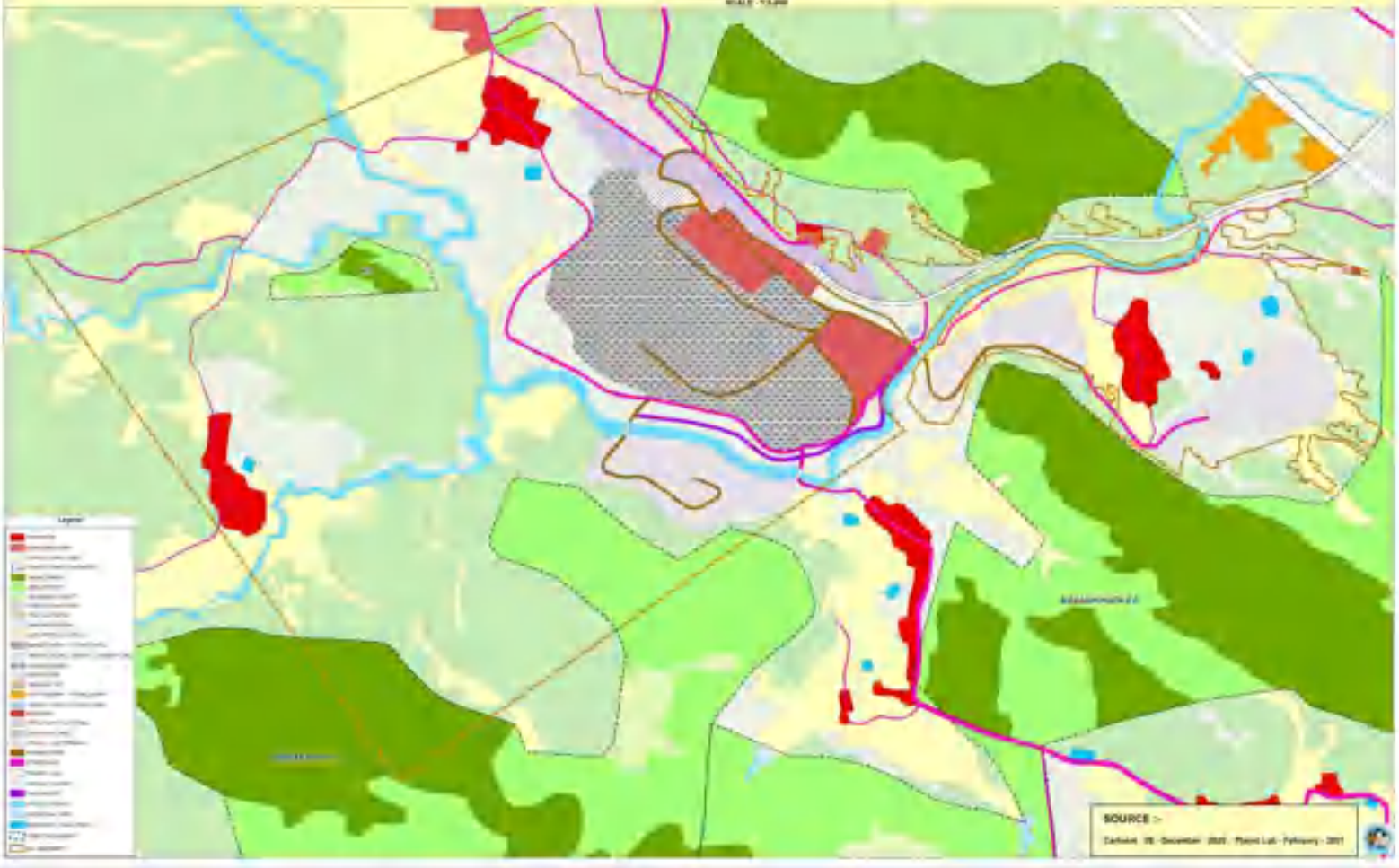
Corporate Identification No. : L40101DL1975GOI007966, Telephone No. : 011-24387333, Fax No. : 011-24361018, E-mail : ntpccc@ntpc.co.in, Web Site : www.ntpc.co.in

Cont....2/-



LANDUSE / LAND COVER MAP OF M.L. AREA OF DULANGA COAL MINES OF NTPC LTD.

0 500 1000 1500  
SCALE: 1:5000



## PUBLIC HEARING COMPLIANCE STATEMENT

Sl. No.	Points raised in Public Hearing	Compliance status latest as on 09.03.2023
1	The mine authority should submit a specific plan for development of Hemgir block	<p><b>Complied.</b></p> <p><i>Plan for carrying out developmental activities in Project affected villages and peripheral villages within Hemgir block is being prepared on an annual basis and is being implemented after getting the same duly approved by the Collector and District Magistrate, Sundargarh. These activities are being carried out by NTPC under its ICD banner.</i></p>
2	The mine authority should inform the public about mitigative measures to be adopted to address the problem due to blasting	<p><b>Complied.</b></p> <p><i>It is clarified herein that NTPC is carrying out Controlled Blasting methods so as to reduce the environmental nuisances due to generation of dusts, noises and also for controlling ground vibrations within specified levels.</i></p> <p><i>It is further clarified that such blasting is being carried out under the approval of DGMS based on a scientific study to be carried out through an Institute / Agency of repute.</i></p>
3	The mine authority should inform the public about peripheral development programme proposed for the area	<p><b>Complied.</b></p> <p><i>It is to state that all peripheral development activities undertaken by NTPC Dulanga CMP under its ICD banner over the years has been finalized based on requests from local villagers.</i></p> <p><i>Villagers have been actively made a part of our peripheral development activities and were well informed of the same.</i></p>
4	The mine authority should go for massive plantation and develop an artificial forest in region	<p><b>Complied / Being complied.</b></p> <p><i>NTPC Dulanga has already committed to the State Forest Department and the MoEF for carrying out plantation as per the stipulations laid down in its Stage-II Forest Clearance.</i></p> <p><i>Plantation and Grassing Activities has been carried out over non-active Overburden Dump which spread over about 1.5 Ha of area with total 6120 no's of sapling over the Dump and 1200 kg of Stylo Hamata seeds all along the slope of non-active dump.</i></p> <p><i>Additionally, Plantation and Grassing, activities have been carried out over the Top Soil. About 400 nos of sapling over 1.27 Ha of area with 1200 kg of Stylo Hamata seeds all along the slope of Top Soil Dump.</i></p> <p><i>Till the end of February 2023, total numbers 10,157 of sapling has been planted during last monsoon period. Cumulative 32042 saplings have been planted since inception and 10700 fruit bearing saplings distributed to villagers and planted by them taking the total plantation figure to 42,742</i></p> <p><i>Further activities planned in future:</i></p> <ul style="list-style-type: none"> <li>• <i>Plantation in Safety Zone</i></li> <li>• <i>Plantation in blank areas as and when they are developed during the course of mining.</i></li> </ul>

		<ul style="list-style-type: none"> <li>• <i>Plantation over area reclaimed in due course of mining operations.</i></li> </ul>
5	The mine authority should take initiation for maintenance of Ghodamunda Ghat road	<p><b>Complied and bettered.</b></p> <p><i>NTPC Dulanga CMP has undertaken additional road strengthening works as per the following:</i></p> <ul style="list-style-type: none"> <li>• <i>Road repairing, Guard Walls, Culvert repairing, road strengthening in Sanghumuda and Kanaktura GP (Rs. 33 Lakhs)</i></li> <li>• <i>Sarasmal, bandapali, kalobahal (Rs. 15 lakhs)</i></li> <li>• <i>CC Road in Khuntijharia (Rs. 49.5 lakhs)</i></li> <li>• <i>Masina, Luhurpada (Rs. 199.76 Lakhs)</i></li> <li>• <i>Tangarpali Block (Rs. 10 Lakhs)</i></li> <li>• <i>Diverted village road (Rs. 4 Crores)</i></li> <li>• <i>Bridge over Garia Nala (Rs. 60 Lakhs)</i></li> <li>• <i>Kanaktura village Bypass road (Rs 89 Lakhs)</i></li> </ul> <p><i>All such road strengthening and repair works have been undertaken by NTPC on requests from local villagers for general public use and in interest of Road Safety.</i></p>
6	The mine authority should establish a <i>Sishu Mandir</i> at Hemgir for primary education of the area	<p><b>Complied and bettered.</b></p> <p><i>In its commitment towards education, NTPC Dulanga CMP has undertaken the following infrastructure activities towards education in Hemgir block and in R&amp;R Colony, Kalamegha:</i></p> <ul style="list-style-type: none"> <li>• <i>Nodal Highschool building (including Primary &amp; Secondary classes) constructed by NTPC Dulanga at R&amp;R Colony, Kalamegha which caters to the students of the four displaced and 02 affected villages and other peripheral villages.</i></li> <li>• <i>Additional School building with boundary wall at Kalamegha, Dhumamunda (Rs. 36 Lakhs)</i></li> <li>• <i>School Development at Masina, Kanaktura, Kulamani (Rs. 22 Lakhs)</i></li> <li>• <i>Science Block at Duduka College (Rs. 12 Lakhs)</i></li> <li>• <i>Electrification of Schools and distribution of LED bulbs, fans (Rs. 6 Lakhs)</i></li> <li>• <i>Development of Navodaya Vidyalaya, Zinc Nagar Vidyalaya, Vivekanand English Medium School (Rs. 26 Lakhs)</i></li> </ul> <p><i>Apart from the above, NTPC has also contributed to the cause of education through:</i></p> <ol style="list-style-type: none"> <li><i>Utkarsh Merit Scholarship</i></li> <li><i>Furnitures (Desk, Benches, Computers) for schools and colleges</i></li> <li><i>Distribution of Study Kits, Test Papers, School Bags, Solar Lanterns etc.</i></li> <li><i>Distribution of Test papers to ClassX students.</i></li> <li><i>Smart Classrooms at R&amp;R Colony, Kalamegha, Kanaktura Highschool, Duduka College etc.</i></li> <li><i>Teachers training programme organised for enhancing the skills of teachers</i></li> <li><i>Career counselling programmes organised for the students of the peripheral schools.</i></li> </ol>
7	The mine authority should adopt necessary air pollution	<b>Complied / Being complied.</b>

	control measures to control fugitive emissions in the area to maintain SPM level	<p><i>Necessary air pollution control shall be adopted as mentioned hereunder by NTPC Dulanga CMP:</i></p> <ul style="list-style-type: none"> <li>• <i>Dust Suppression systems (like water spraying) at faces before and after blasting and at all loading / unloading points.</i></li> <li>• <i>Dust extraction systems in drill machines and crushing plant.</i></li> <li>• <i>Drill machines to be equipped with flushing system.</i></li> <li>• <i>Avoiding overloading on dumpers.</i></li> <li>• <i>Water sprinkling on roads.</i></li> <li>• <i>Effective blast design</i></li> </ul> <p><i>Presently, water sprinkling is being carried out regularly for dust suppression by deploying water tankers, fog cannons and installation of fixed type sprinklers on haul roads and near wharf areas.</i></p> <p><i>Also, monitoring of air quality parameters are being done on a regular basis and reports thereof are being submitted to MoEF&amp;CC along with half-yearly compliance reports.</i></p>																		
8	The mine authority should install a mine drainage treatment plant to treat the coal bearing mine drainage water before being discharged to outside agricultural fields and they should clarify whether the mine drainage water will reach Hirakud Reservoir or not	<p><b>Being complied.</b></p> <p><i>The mine drainage water is utilized in mining activity purposes like dust suppression, road sprinkling, washing etc. and waste water generated thereof from workshops is being treated in ETPs. Further, the mine drainage water is collected in mine sumps, mine voids and sedimentation ponds etc. which acts as natural rain water harvesting structures.</i></p> <p><i>It is further clarified that the mine drainage water is not being discharged into any surface water body and hence it shall not reach the Hirakud reservoir.</i></p>																		
9	The mine authority should carry out adequate water sprinkling on the coal transportation road from the mine to its Coal Handling plant and from there to its proposed Darlipali Power plant	<p><b>Being complied.</b></p> <p><i>At present, the coal is being transported through MGR to Darlipali Super Thermal Power Station.</i></p> <p><i>The mine has CHP of capacity 1325 TPH consisting of 2 nos of screen (-200mm and -50mm) and 1 no crusher of capacity 800 TPH. It has installed dust suppression system at the following points:-</i></p> <table border="1" data-bbox="671 1525 1377 2002"> <thead> <tr> <th><i>Dust generating areas</i></th> <th><i>Type of water Sprinklers</i></th> <th><i>Numbers</i></th> </tr> </thead> <tbody> <tr> <td><i>Ground Hopper (2 nos)</i></td> <td><i>Mist Type</i></td> <td><i>10 each</i></td> </tr> <tr> <td><i>Screen (-200 mm)</i></td> <td><i>Mist Type</i></td> <td><i>16</i></td> </tr> <tr> <td><i>Screen (-50 mm)</i></td> <td><i>Mist Type</i></td> <td><i>16</i></td> </tr> <tr> <td><i>Conveyor belts and Transfer House (5 nos)</i></td> <td><i>Mist Type</i></td> <td><i>75</i></td> </tr> <tr> <td><i>Silo (1 nos) of capacity 4000 T with two discharge chutes</i></td> <td><i>Mist Type provided at the telescopic chute of each silo</i></td> <td><i>10 each</i></td> </tr> </tbody> </table>	<i>Dust generating areas</i>	<i>Type of water Sprinklers</i>	<i>Numbers</i>	<i>Ground Hopper (2 nos)</i>	<i>Mist Type</i>	<i>10 each</i>	<i>Screen (-200 mm)</i>	<i>Mist Type</i>	<i>16</i>	<i>Screen (-50 mm)</i>	<i>Mist Type</i>	<i>16</i>	<i>Conveyor belts and Transfer House (5 nos)</i>	<i>Mist Type</i>	<i>75</i>	<i>Silo (1 nos) of capacity 4000 T with two discharge chutes</i>	<i>Mist Type provided at the telescopic chute of each silo</i>	<i>10 each</i>
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		<p><i>It has also a temporary skid mounted mobile crusher of capacity 350 TPH which is operated as per the requirement. The crusher is provided with water sprinkling arrangement for control of air pollution from emission of dust.</i></p> <p><i>However, as per MoEF&amp;CC Notification S.O. 1561(E) dtd 21.05.2020, coal may be transported out from the Delivery Point of the mine in covered trucks (by tarpaulin or other means), or any mechanized closed trucks by road to power plant as direct rail connectivity at Dulanga CMP with other power project is not available.</i></p>
10	The mine authority should give priority for health, education and local employment in the area.	<p><b>Complied.</b></p> <p><i>Health, Education has been a major activity head under its Initial Community Development (ICD) banner and is being ensured thereof.</i></p> <p><i>Some of the major activities undertaken in education have already been highlighted above under Sl. No 6.</i></p> <p><i>Activities undertaken in health front are given below:</i></p> <ul style="list-style-type: none"> <li>• <i>Free Medical Health Camps. Additionally, free medical check-up is being administered at dispensary on every Tuesday and Friday.</i></li> <li>• <i>Veterinary / Animal Health Camps</i></li> <li>• <i>Distribution of Mosquito Nets</i></li> <li>• <i>Construction of Dispensary building,</i></li> <li>• <i>Dedicated ambulance equipped with all facilities has been deployed at Site office.</i></li> <li>• <i>A PHC has been established with Doctor and paramedical staffs with distribution of free medicines for villagers.</i></li> </ul> <p><i>Activities undertaken for local employment are:</i></p> <ul style="list-style-type: none"> <li>• <i>Skill Development training (fully sponsored by NTPC) through CIPET, Bhubaneswar has been provided. 160 persons from PAPs has been trained</i></li> <li>• <i>Vehicle Training to 35 numbers of PAP's have been provided.</i></li> <li>• <i>Tailoring training for Women</i></li> <li>• <i>Tie and Dye training for Women</i></li> <li>• <i>Livelihood study, mapping &amp; training for village SHGs.</i></li> <li>• <i>About 30 nos of local employment has been provided by NTPC through different contractual agencies.</i></li> <li>• <i>Inducting local village youths as trainees with our Mine Developer cum Operator (MDO) for making them employable in mines.</i></li> <li>• <i>Preference to PAPs for employment based on their suitability is given through MDO.</i></li> <li>• <i>MDO has engaged PaPs of about 250 Nos from peripheral peripheral villages.</i></li> </ul>
11	The mine authority should take initiation to form a village coordination committee between the villagers and the mine authority to carry out	<p><b>Complied.</b></p> <p><i>Networks of village mobilisers have been established by appointing villagers from each village so as to form a link between the villages and NTPC Dulanga CMP. Those villagers</i></p>

	peripheral development works in the area.	<p><i>mobilisers are kept in action even after displacement of all project displaced families to R&amp;R Colony, Kalamegha.</i></p> <p><i>Such villagers have been entrusted with the task of conveying to NTPC, the request from village masses regarding their needs so as to incorporate the same while planning for peripheral development works.</i></p>
12	The mine authority should inform the public about the facilities to be provided to the Scheduled Tribe people of the area.	<p><b>Complied.</b></p> <p><i>Eligible meritorious Scheduled Tribe students are being provided with UTKARSH merit scholarship for their education.</i></p> <p><i>Skill Upgradation training has been provided for women folk in areas of tailoring, tie and dye and other livelihood mapping through reputed agencies.</i></p> <p><i>Skill Development training have been imparted for village youths.</i></p> <p><i>NTPC Dulanga CMP has also sponsored for Tribal sports like National Tribal Archery competition etc.</i></p> <p><i>A Tribal Centre/Training Centre has been constructed in its R&amp;R Colony for PAPs.</i></p>
13	The date and venue of the public hearing was not widely published and the villages were not properly informed about this for which there was less attendance in the meeting. Hence the public hearing should be rescheduled.	<p><b>Complied.</b></p> <p><i>Date and venue of Public hearing was published in accordance with provisions laid down by MoEF. Newspaper publications were done in two widely circulated newspapers namely, New Indian Express (English) dated 29<sup>th</sup> May 2010 and Pragatibadi (Odiya) dated 29<sup>th</sup> May 2010. Copy of newspaper notifications were also handed over to the Gram Panchayat offices and staffs from NTPC had visited these villages 4-5 days prior to the scheduled Public Hearing date so as to convey them the venue and date details.</i></p>

## Environment Policy-2021

### I. Purpose:

NTPC being country's largest power generator, with its presence across the energy value chain, recognizes that protection of environment is essential for sustainable business.

In the context of Environment Policy, the definition of environment covers all the domains of environment - Physical, Chemical, Biological and Socio- economic aspect.

NTPC hereby adopts Environment Policy-2021, superseding its earlier policy document of 2017.

The intent of this policy is to meet environmental expectations and provide actionable guidance, as NTPC strives to foster a culture of excellence and challenges itself for continual improvement.

### II. Policy Statement:

"To provide cleaner energy by committing to highest possible levels of performance in environmental compliance, practices and stewardship."

### III. Applicability:

This policy shall apply to all establishments of NTPC and each employee shall be made a partner in implementing the policy.

### IV. Principles:

This policy is based on the following principles:

1. Consideration of Environmental factors right from the stage of planning, design and operation of project/station to ensure that mandatory principles of conservation and sustainability are adhered to.

#### ***This document contains:***

- I. Purpose***
- II. Policy Statement***
- III. Applicability***
- IV. Principles***
- V. Institutional Framework***
- VI. Policy***
  - o Stewardship*
  - o Compliance & Assurance*
  - o Stakeholder Engagement*
  - o Capacity Building*
- VII. Review***



2. Adopting the best possible Environment management practices and state-of-the-art technology to minimize impact of business on Environment.
3. NTPC's commitment as a responsible corporate citizen is demonstrated by striving to achieve and setting benchmarks not limited to statutory compliance.
4. Innovation by carrying out Research & Developmental activities, coupled with enablers leading to continual improvement.
5. Accepting accountability for all operations and expeditiously respond to any aberration.
6. Continuous monitoring and sharing of environmental indicators with stakeholders.
7. Develop each employee as environmental steward by improving his awareness levels while soliciting his commitment.

## V. Institutional Framework:

Three tier structure for environmental systems implementation:

1. Corporate Level Functions - Engineering, planning and monitoring
2. Regional Level Functions – Compliance monitoring, Facilitators to stations and Coordination between Stations & Corporate.
3. Stations: Functions - Execution and reporting





Note: These charts do not reflect the organizational structure/reporting arrangement, but serve to identify responsible departments within NTPC.

## VI. Policy:

NTPC shall achieve these objectives by:

### 1. Stewardship:

NTPC shall:

- a. Adopt a pro-active approach, place environmental aspects as one of the prime consideration in decision-making process.
- b. Identify and manage environmental impacts due to business activities, by adopting possible latest environment management technologies and practices.
- c. Act to manage risks, as identified by Risk Management Committee (RMC)\*.
- d. Evaluate performance of Environment protection equipment, program and practices, with respect to legal provisions and prepare action plans for concerned functional groups.



- e. Ensure efficient and optimal use of resources such as land, water, fuel, construction materials, oils, and chemicals etc, especially the non-renewables.
- f. Spearhead waste management by 3Rs principles (reducing, re-using, and recycling) and safe disposal.
- g. Adopt more environment friendly and energy-efficient inputs.
- h. Provide innovative technological solutions to environment related issues.
- i. Benchmark parameters to establish and adopt best practices.
- j. Take up environmentally befitting projects in areas of climate change, renewable energy, conservation and responsible consumption of natural resources under Sustainable Development initiatives.
- k. Adopt principles of green procurement by incorporating appropriate provisions in contracts and procurements.
- l. To formulate and adopt separate Policies for Ash, Rehabilitation & Resettlement, Community Development – Corporate Social Responsibility and Sustainable Development.
- m. Creation of carbon sink by adding green cover in and around NTPC Stations.

\*RMC comprises of members from senior functionaries of management as per provisions of Companies Act 2016.

## 2. Compliance and Assurance:

- a. NTPC shall continue to comply with all relevant environmental regulations, standards and other codes of practice, by operating and maintaining the assets within the boundary of permits, consents, and licenses.
- b. Risk Management Committee, shall establish system for reporting environment related parameters, deviations and constraints to Management. Environmental risks perceived shall be reviewed through risk management mechanism for appropriate action.
- c. Concerned group shall oversee compliance assurance of operating stations through reviews and appraisals.



- d. Requirement stipulated in all obtained clearances shall be complied with, including in new establishments and expansions.

### **3. Stakeholder Engagement:**

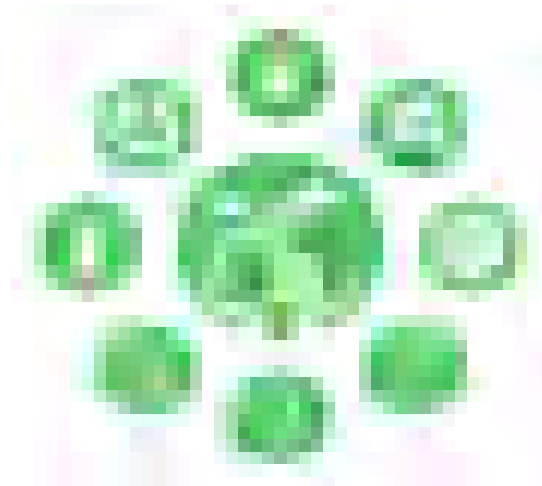
NTPC shall continue to identify all stakeholders and engage with them at appropriate levels, to exchange views on environmental concerns and mitigation measures thereof.

### **4. Capacity Building:**

- a. NTPC shall ensure all employees are made environmentally aware, to enable them to integrate its principles into their activities and decisions by conducting the suitable trainings/skill development programmes.
- b. Environment Management Group shall come up with focused requirements (including skill training and culture building), clearly bringing out the desired objectives, audience and responsibility.

## **VII. Review:**

This policy shall be reviewed at opportune time, but not later than once in three years.





दुलंगा / Dulanga

## ENVIRONMENT MANAGEMENT GROUP

### CIRCULAR

Ref. No: 1070/NTPC/DLCMP/EMG/EMC/08

Date: 24.04.2023

**Subject: Re-Constitution of Environment Management Cell of Dulanga Coal Mining Project**

In compliance to General Condition B(xi) of Environment Clearance accorded for Dulanga Coal Mining Project by MoEF&CC, Govt. of India vide Letter No. J/11015/1140/2007-IA.II (M) dated 03.03.2014, the Environment Management Cell of the project is re-constituted with the following executives:

NTPC Ltd.

1. Shri Neeraj Jalota (Head of Project) – Chairman
2. Shri Binay Kumar, Mine Agent/AGM (Mining) – Vice Chairman
3. Shri Birendra Kumar, AGM (Env. Mgmt) – Member Secretary
4. Shri S. Sadanand Chari, Mine Manager/DGM (Mining) – Advisor (Mining)
5. Shri Rajesh Ranjan, Safety Officer, DGM (Mining) – Advisor (Safety)
6. Shri Arindam Pattnaik, Sr Manager (Env. Mgmt) – Coordinator

SMASL (MDO)

1. Shri S.K.Singh, ED & Dulanga Site-in-charge
2. Shri Priyadarshi, Sr GM & Environment Head
3. Shri Avinash Paul, (Executive, Environment)

The above EMC members will meet regularly for discussion on environmental issues and onward implementation of various environmental safeguards for the project.

This issues with the approval of the competent authority.

  
Arindam Pattnaik  
Sr Manager (EMG)

Distribution:

- All Concerned

**Dulanga Coal Mining Project, Khapurikachhar, PO – Sanghumuda, Tehsil-Hemgir, Dist- Sundargarh 770013**

**दुलंगा कोल माइनिंग प्रोजेक्ट, खापुरिकछार, पोस्ट - संघुमुड़ा, तहसील - हेमगीर, ज़िला - सुंदरगढ़ ७७००१३**

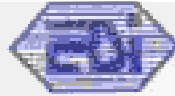
**पंजिकृत कार्यालय: एन टी पी सी भवन, स्कोप कॉम्प्लेक्स, 7 इंस्टीटयुशनल एरिया, लोधी रोड, नई दिल्ली ११०००३**

**कॉर्पोरेट पहचान नंबर: L40101DL1975GOI007966, टेलीफोन नं: 011-24387333, फैक्स नं: 011-24361018, ई मेल: ntpccc@ntpc.co.in, वेबसाइट: www.ntpc.co.in**

**Registered Office: NTPC Bhavan, Scope Complex, 7 Institutional Area, Lodhi Road, New Delhi – 110003**

**Corporate Identification No: L40101DL1975GOI007966, Telephone No: 011-24387333, Fax No: 011-24361018, Email: ntpccc@ntpc.co.in, Website: www.ntpc.co.in**

GSTIN : 21AAACE6224D1ZE



# Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025 : 2017 (NABL) Accredited Laboratory, GSPCB Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

DLR-TC744022000000448F

Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR)

Pg No: 1 of 1

Date: 01 Nov 2022

Test Report No: ERSIPL/TR/AA/168

Name and Address of the Customer : Dulanga open cast Coal Mining, Project of M/s NTPC Limited in Sundargarh district, Odisha.

Sample Collected by : Representative of ERS (I) Pvt. Ltd.

Sample Collected in presence of : Representative of Customer.

Date of Sampling/Monitoring : 10-11-10-2022

Sample Received on : 21-10-2022

Analysis Started on : 21-10-2022

Analysis Completed on : 01-11-2022

Method of Sampling : ERSIPL/MSP/06

Quantity of Sample : 01 sample for each parameter

Environment Condition : Sunny

Sample ID. No.

Locations (Core Zone)

1. ERSIPL/AA/599

1. Near Site Office (NTPC), Kapurikachhar

2. ERSIPL/AA/600

2. Near Coal Lab

3. ERSIPL/AA/601

3. Near Work Shop

4. ERSIPL/AA/602

4. Near Weigh Bridge 3 & 4 (Village Dulanga)

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Nov-2006	Results			
					ERSIPL/AA/599	ERSIPL/AA/600	ERSIPL/AA/601	ERSIPL/AA/602
1	Suspended Particulate Matter (SPM)	IS: 5182 (Part 4)- 1999, Reaffirmed 2019, Gravimetric Method	µg/m <sup>3</sup>	XX	199.24	201.39	188.42	189.70
2	Particulate Matter (size less than 10 µm) or PM <sub>10</sub>	IS 5182 (Part 23)- 2006, Reaffirmed -2017, Gravimetric Method	µg/m <sup>3</sup>	100.0	74.35	70.17	73.80	67.55
3	Particulate Matter (size less than 2.5 µm) or PM <sub>2.5</sub>	IS 5182 (Part 24): 2019, Gravimetric Method	µg/m <sup>3</sup>	60.0	31.37	28.76	32.32	32.26
4	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	µg/m <sup>3</sup>	80.0	7.88	9.03	7.51	8.84
5	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed -2017	µg/m <sup>3</sup>	80.0	12.13	11.26	12.07	14.20

(Authorized Signatory)  
S.P. Pattnayak  
Tech. Manager

.....END OF TEST REPORT.....



# Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025 : 2017 (NABL) Accredited Laboratory, CPCB Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Certificate No.: TC-240

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

ULR-TC744022000000449F

Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR)

Pg No: 1 of 1

<b>Date: 01 Nov 2022</b>	<b>Test Report No: ERSIPL/TR/AA/169</b>
Name and Address of the Customer :	Dulanga open cast Coal Mining, Project of M/s NTPC Limited in Sundargarh district, Odisha.
Sample Collected by :	Representative of ERS (I) Pvt. Ltd.
Sample Collected in presence of :	Representative of Customer
Date of Sampling/Monitoring :	11-12.10.2022
Sample Received on :	21.10.2022
Analysis Started on :	21.10.2022
Analysis Completed on :	01.11.2022
Method of Sampling :	ERSIPL/MSP/06
Quantity of Sample :	01 sample for each parameter
Environment Condition :	Sunny

### Sample ID. No.

1. ERSIPL/AA/603
2. ERSIPL/AA/604
3. ERSIPL/AA/605
4. ERSIPL/AA/606

### Locations (Buffer Zone)

1. Near Village Bendrichua
2. Near Village Rengalmunra
3. Near Village Khuntjharla
4. Near Village Kathfali

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQS Standards CPCB Nov-2009	Results			
					ERSIPL/AA/603	ERSIPL/AA/604	ERSIPL/AA/605	ERSIPL/AA/606
1	Suspended Particulate Matter (SPM)	IS: 5182 (Part 4)- 1999, Reaffirmed 2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	Nil	183.77	192.14	186.08	181.05
2	Particulate Matter (size less than 10 $\mu\text{m}$ ) or PM 10	IS 5182 (Part 23): 2006, Reaffirmed -2017, Gravimetric Method	$\mu\text{g}/\text{m}^3$	100.0	72.75	72.50	66.70	72.22
3	Particulate Matter (size less than 2.5 $\mu\text{m}$ ) or PM 2.5	IS 5182 (Part 24): 2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	60.0	30.39	31.37	33.16	33.60
4	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	$\mu\text{g}/\text{m}^3$	80.0	7.92	9.43	8.32	6.42
5	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed -2017	$\mu\text{g}/\text{m}^3$	80.0	13.27	12.56	12.98	10.70

(Authorized Signatory)  
S.P. Pattenayak  
Tech. Manager



CIN - U73100OR1995PTC003889



GSTIN : 21AAACE6224D1ZE

## Environmental Research and Services (India) Pvt. Ltd.

(OSPCB 'A' Category Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329 , E-mail: ersibbsr@gmail.com

### Test Report Format No.: ERSIPL/FM/37 TEST REPORT (AMBIENT AIR)

Pg-1/1

Date: 01 Nov 2022

Test Report No: ERSIPL/TR/AA/T:168-169

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of Customer.  
Date of Sampling/Monitoring : 10-12.10.2022  
Sample Received on : 21.10.2022  
Analysis Started on : 21.10.2022  
Analysis Completed on : 01.11.2022  
Method of Sampling : As per guidelines for sampling & measurement of notified AAQ parameters (NAAQS 2009)-CPCB  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny

Sample ID. No.

Locations

1. ERSIPL/AA/599
2. ERSIPL/AA/600
3. ERSIPL/AA/601
4. ERSIPL/AA/602
5. ERSIPL/AA/603
6. ERSIPL/AA/604
7. ERSIPL/AA/605
8. ERSIPL/AA/606

1. Near Site Office (NTPC), Kapurikachhar
2. Near Coal Lab
3. Near Work Shop
4. Near Weigh Bridge 3 & 4 (Village Dulanga)
5. Near Village Bendrichua
6. Near Village Rengalmunr
7. Near Village Khuntjharia
8. Near Village Kathfal

**TEST FINDINGS:**

Sl. No	Place of Monitoring/ Sample ID. No	Result of Parameters Analyzed
		Carbon Monoxide (CO) (in mg/m <sup>3</sup> )
1	ERSIPL/AA/599	<1.14
2	ERSIPL/AA/600	<1.14
3	ERSIPL/AA/601	<1.14
4	ERSIPL/AA/602	<1.14
5	ERSIPL/AA/603	<1.14
6	ERSIPL/AA/604	<1.14
7	ERSIPL/AA/605	<1.14
8	ERSIPL/AA/606	<1.14
	Permissible Limit	2.0

(Authorized Signatory)  
S.P.Pattanayak  
Tech. Manager



# Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025 : 2017 (NABL) Accredited Laboratory, DSPCB Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Certificate No.: TC-PM

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

ULR-TC744022000000450F

Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR)

Pg No: 1 of 1

Date: 01 Nov 2022

Test Report No: ERSIPL/TR/AA/170

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of Customer.  
Date of Sampling/Monitoring : 26-27.10.2022  
Sample Received on : 29.10.2022  
Analysis Started on : 29.10.2022  
Analysis Completed on : 01.11.2022  
Method of Sampling : ERSIPL/MSP/06  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Clody/Rainy

### Sample ID. No.

1. ERSIPL/AA/663
2. ERSIPL/AA/664
3. ERSIPL/AA/665
4. ERSIPL/AA/666

### Locations (Core Zone)

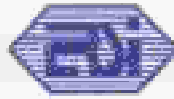
1. Near Site Office (NTPC), Kapurikachhar
2. Near Coal Lab
3. Near Work Shop
4. Near Weigh Bridge 3 & 4 (Village Dulanga)

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standard CPCB Nov-2009	Results			
					ERSIPL/AA/663	ERSIPL/AA/664	ERSIPL/AA/665	ERSIPL/AA/666
1	Suspended Particulate Matter (SPM)	IS: 5182 (Part 4)- 1999, Reaffirmed 2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	XX	131.79	133.39	141.93	132.11
2	Particulate Matter (size less than 10 $\mu\text{m}$ ) or PM 10	IS 5182 (Part 23): 2006, Reaffirmed -2017, Gravimetric Method	$\mu\text{g}/\text{m}^3$	100.0	63.38	51.01	53.73	59.55
3	Particulate Matter (size less than 2.5 $\mu\text{m}$ ) or PM 2.5	IS 5182 (Part 24): 2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	60.0	27.76	25.21	28.34	24.15
4	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, improved West & Gaeke Method	$\mu\text{g}/\text{m}^3$	80.0	7.16	7.89	6.67	7.31
5	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed -2017	$\mu\text{g}/\text{m}^3$	80.0	10.64	11.62	12.09	10.67

  
(Authorized Signatory)  
S.P.Pattenayak  
Tech. Manager

END OF TEST REPORT.....



# Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025:2017 (NABL) Accredited Laboratory, OSPCR Empanelled Laboratory and ISO 9001:2015 Certified Company) Certificate No.: 70-1446

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

ULR-YC744022000000451F

Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR)

Pg No: 1 of 1

Date: 01 Nov 2022

Test Report No: ERSIPL/TR/AA/171

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of Customer  
Date of Sampling/Monitoring : 27-28.10.2022  
Sample Received on : 29.10.2022  
Analysis Started on : 29.10.2022  
Analysis Completed on : 01.11.2022  
Method of Sampling : ERSIPL/MSP/06  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Rainy

### Sample ID. No.

1. ERSIPL/AA/667
2. ERSIPL/AA/668
3. ERSIPL/AA/669
4. ERSIPL/AA/670

### Locations (Buffer Zone)

1. Near Village Bendrichua
2. Near Village Rengalmunr
3. Near Village Khuntjharla
4. Near Village Kathfali

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit As per NAAQS Standards CPCB Nov-2008	Results			
					ERSIPL/AA/667	ERSIPL/AA/668	ERSIPL/AA/669	ERSIPL/AA/670
1	Suspended Particulate Matter (SPM)	IS: 5182 (Part 4)- 1999, Reaffirmed 2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	XX	146.19	132.58	139.51	126.14
2	Particulate Matter (size less than 10 $\mu\text{m}$ ) or PM 10	IS 5182 (Part 23): 2006, Reaffirmed -2017, Gravimetric Method	$\mu\text{g}/\text{m}^3$	100.0	65.25	54.76	62.62	55.82
3	Particulate Matter (size less than 2.5 $\mu\text{m}$ ) or PM 2.5	IS 5182 (Part 24): 2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	60.0	22.44	25.74	26.59	28.36
4	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	$\mu\text{g}/\text{m}^3$	80.0	6.13	6.32	8.08	7.18
5	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed -2017	$\mu\text{g}/\text{m}^3$	80.0	11.14	10.09	10.27	12.27

(Authorized Signatory)  
S.P.Pattanayak  
Tech. Manager

.....END OF TEST REPORT.....



CIN - U73100OR1995PTC003889



GSTIN : 21AAACE6224D1ZE

# Environmental Research and Services (India) Pvt. Ltd.

(OSPCB 'A' Category Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

## Test Report Format No.: ERSIPL/FM/37 TEST REPORT (AMBIENT AIR)

Pg-1/1

Date: 01 Nov 2022

Test Report No: ERSIPL/TR/AA/T:170-171

Name and Address of the Customer

Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.

Sample Collected by

Representative of ERS (I) Pvt. Ltd.

Sample Collected in presence of

Representative of Customer.

Date of Sampling/Monitoring

26-28.10.2022

Sample Received on

29.10.2022

Analysis Started on

29.10.2022

Analysis Completed on

01.11.2022

Method of Sampling

ERSIPL/MSP/06

Quantity of Sample

01 sample for each parameter

Environment Condition

Cloudy,Rainy

### Sample ID. No.

1. ERSIPL/AA/663
2. ERSIPL/AA/664
3. ERSIPL/AA/665
4. ERSIPL/AA/666
5. ERSIPL/AA/667
6. ERSIPL/AA/668
7. ERSIPL/AA/669
8. ERSIPL/AA/670

### Locations

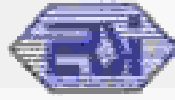
1. Near Site Office (NTPC), Kapurikachhar
2. Near Coal Lab
3. Near Work Shop
4. Near Weigh Bridge 3 & 4 (Village Dulanga)
5. Near Village Bendrichua
6. Near Village Rengaimunn
7. Near Village Khuntjharla
8. Near Village Kathfali

### TEST FINDINGS:

Sl. No	Place of Monitoring/ Sample ID. No	Result of Parameters Analyzed
		Carbon Monoxide (CO) (in mg/m <sup>3</sup> )
1	ERSIPL/AA/663	<1.14
2	ERSIPL/AA/664	<1.14
3	ERSIPL/AA/665	<1.14
4	ERSIPL/AA/666	<1.14
5	ERSIPL/AA/667	<1.14
6	ERSIPL/AA/668	<1.14
7	ERSIPL/AA/669	<1.14
8	ERSIPL/AA/670	<1.14
	Permissible Limit	2.0

(Authorized Signatory)  
S.P.Pattanayak  
Tech. Manager

.....END OF TEST REPORT.....



# Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025:2017 (NABL) Accredited Laboratory, OSPCR Empanelled Laboratory and ISO 9001:2015 Certified Company)

Certificate No.: TC/1440

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: [ersibbsr@gmail.com](mailto:ersibbsr@gmail.com)

ULR-TC744022000000513F

Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR)

Pg No: 1 of 1

Date: 02 Dec 2022

Test Report No: ERSIPL/TR/AA/193

Name and Address of the Customer :

Dulanga open cast Coal Mining, Project of M/s NTPC Limited in  
Sundargarh district, Odisha.

Sample Collected by :

Representative of ERS (I) Pvt. Ltd.

Sample Collected in presence of :

Representative of Customer.

Date of Sampling/Monitoring :

07-08.11.2022

Sample Received on :

24.11.2022

Analysis Started on :

24.11.2022

Analysis Completed on :

02.12.2022

Method of Sampling :

ERSIPL/MSP/06

Quantity of Sample :

01 sample for each parameter

Environment Condition :

Sunny

Sample ID. No.

Locations (Core Zone)

1. ERSIPL/AA/689

1. Near Site Office (NTPC), Kapurikachhar

2. ERSIPL/AA/690

2. Near Coal Lab

3. ERSIPL/AA/691

3. Near Work Shop

4. ERSIPL/AA/692

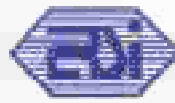
4. Near Weigh Bridge 3 & 4 (Village Dulanga)

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQS Standards CPCB Nov- 2009	Results			
					ERSIPL/ AA/ 689	ERSIPL/ AA/ 690	ERSIPL/ AA/ 691	ERSIPL/ AA/ 692
1	Suspended Particulate Matter (SPM)	IS: 5182 (Part 4): 1999, Reaffirmed 2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	NR	183.01	190.45	184.83	178.92
2	Particulate Matter (size less than 10 $\mu\text{m}$ ) or PM 10	IS 5182 (Part 23): 2006, Reaffirmed 2017, Gravimetric Method	$\mu\text{g}/\text{m}^3$	100.0	71.17	67.58	70.18	69.09
3	Particulate Matter (size less than 2.5 $\mu\text{m}$ ) or PM 2.5	IS 5182 (Part 24): 2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	60.0	32.11	29.38	31.14	31.17
4	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaekwad Method	$\mu\text{g}/\text{m}^3$	80.0	8.49	9.38	8.14	7.25
5	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed 2017	$\mu\text{g}/\text{m}^3$	80.0	12.11	10.84	11.92	12.60

(Authorized Signatory)  
S.P. Pattanayek  
Tech. Manager

.....END OF TEST REPORT.....



# Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025:2017 (NABL) Accredited Laboratory, USPCB Empaneled Laboratory and ISO 9001:2015 Certified Company)

Certificate No.: 75/1442

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
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ULR-TC744022000000514F

Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR)

Pg No: 1 of 1

Date: 02 Dec 2022

Test Report No: ERSIPL/TR/AA/194

Name and Address of the Customer : Dulanga open cast Coal Mining, Project of M/s NTPC Limited in Sundargarh district, Odisha.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of Customer  
Date of Sampling/Monitoring : 08-09-11-2022  
Sample Received on : 24.11.2022  
Analysis Started on : 24.11.2022  
Analysis Completed on : 02.12.2022  
Method of Sampling : ERSIPL/MSP/06  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny

### Sample ID. No.

1. ERSIPL/AA/693
2. ERSIPL/AA/694
3. ERSIPL/AA/695
4. ERSIPL/AA/696

### Locations (Buffer Zone)

1. Near Village Bendrichua
2. Near Village Rengalmunra
3. Near Village Khuntjaria
4. Near Village Kathfali

### TEST FINDINGS:

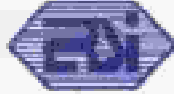
Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Nov-2009	Results			
					ERSIPL/AA/693	ERSIPL/AA/694	ERSIPL/AA/695	ERSIPL/AA/696
1	Suspended Particulate Matter (SPM)	IS: 5182 (Part 4)- 1999, Reaffirmed 2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	XX	189.31	182.07	186.01	196.00
2	Particulate Matter (size less than 10 $\mu\text{m}$ ) or PM 10	IS 5182 (Part 23)- 2006, Reaffirmed 2017, Gravimetric Method	$\mu\text{g}/\text{m}^3$	100.0	68.58	70.88	68.63	70.15
3	Particulate Matter (size less than 2.5 $\mu\text{m}$ ) or PM 2.5	IS 5182 (Part 24)- 2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	60.0	33.93	30.76	28.08	32.32
4	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2) 2001, Reaffirmed 2017, Improved West & Gaeke Method	$\mu\text{g}/\text{m}^3$	80.0	8.61	8.99	8.84	7.63
5	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6)- 2006, Reaffirmed - 2017	$\mu\text{g}/\text{m}^3$	80.0	13.55	11.97	11.20	13.59

(Authorized Signatory)  
S.P.Pattanayak  
Tech. Manager

..... END OF TEST REPORT.....



CIN - U73100OR1995PTC003889



GSTIN : 21AAACE6224D1ZE

# Environmental Research and Services (India) Pvt. Ltd.

(OSPCB 'A' Category Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR)

Pg-1/1

**Date: 02 Dec 2022**  
**Test Report No: ERSIPL/TR/AA/T:193-194**  
**Name and Address of the Customer :** Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.  
**Sample Collected by :** Representative of ERS (I) Pvt. Ltd.  
**Sample Collected in presence of :** Representative of Customer,  
**Date of Sampling/Monitoring :** 07-09.11.2022  
**Sample Received on :** 24.11.2022  
**Analysis Started on :** 24.11.2022  
**Analysis Completed on :** 02.12.2022  
**Method of Sampling :** As per guidelines for sampling & measurement of notified AAQ parameters (NAAQS 2009)-CPCB  
**Quantity of Sample :** 01 sample for each parameter  
**Environment Condition :** Sunny

### Sample ID. No.

### Locations

1. ERSIPL/AA/689
2. ERSIPL/AA/690
3. ERSIPL/AA/691
4. ERSIPL/AA/692
5. ERSIPL/AA/693
6. ERSIPL/AA/694
7. ERSIPL/AA/695
8. ERSIPL/AA/696

1. Near Site Office (NTPC), Kapurikachhar
2. Near Coal Lab
3. Near Work Shop
4. Near Weigh Bridge 3 & 4 (Village Dulanga)
5. Near Village Bendrichua
6. Near Village Rengalmunr
7. Near Village Khuntjharia
8. Near Village Kathfali

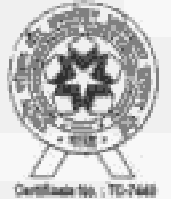
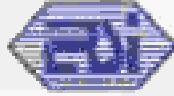
### TEST FINDINGS:

Sl. No	Place of Monitoring/ Sample ID. No	Result of Parameters Analyzed
		Carbon Monoxide (CO) (in mg/m <sup>3</sup> )
1	ERSIPL/AA/689	<1.14
2	ERSIPL/AA/690	<1.14
3	ERSIPL/AA/691	<1.14
4	ERSIPL/AA/692	<1.14
5	ERSIPL/AA/693	<1.14
6	ERSIPL/AA/694	<1.14
7	ERSIPL/AA/695	<1.14
8	ERSIPL/AA/696	<1.14
	Permissible Limit	2.0

(Authorized Signatory)

S.P.Pattanayak  
Tech. Manager

.....END OF TEST REPORT.....



# Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025 : 2017 (NABL) Accredited Laboratory, OJPCB Empowered Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
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ULR-TC744022000000516F

Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR)

Pg No: 1 of 1

Date: 02 Dec 2022

Test Report No: ERSIPL/TR/AA/196

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of Customer  
Date of Sampling/Monitoring : 24-25.11.2022  
Sample Received on : 28.11.2022  
Analysis Started on : 28.11.2022  
Analysis Completed on : 02.12.2022  
Method of Sampling : ERSIPL/MSP/06  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Cloudy

### Sample ID, No.

1. ERSIPL/AA/753
2. ERSIPL/AA/754
3. ERSIPL/AA/755
4. ERSIPL/AA/756

### Locations (Core Zone)

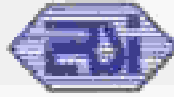
1. Near Site Office (NTPC), Kapurikachhar
2. Near Coal Lab
3. Near Work Shop
4. Near Weigh Bridge 3 & 4 (Village Dulanga)

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit As per NAAQ Standards CPCB Nov-2009	Results			
					ERSIPL/ AA/ 753	ERSIPL/ AA/ 754	ERSIPL/ AA/ 755	ERSIPL/ AA/ 756
1	Suspended Particulate Matter (SPM)	IS: 5182 (Part 4)- 1999, Reaffirmed -2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	XX	190.75	189.67	206.90	198.11
2	Particulate Matter (size less than 10 $\mu\text{m}$ ) or PM 10	IS 5182 (Part 23)- 2006, Reaffirmed -2017, Gravimetric Method	$\mu\text{g}/\text{m}^3$	100.0	71.39	68.26	69.71	70.27
3	Particulate Matter (size less than 2.5 $\mu\text{m}$ ) or PM 2.5	IS 5182 (Part 24)- 2019, Gravimetric Method.	$\mu\text{g}/\text{m}^3$	60.0	33.70	28.10	29.40	31.95
4	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2)- 2001, Reaffirmed 2017, Improved West & Ganku Method	$\mu\text{g}/\text{m}^3$	80.0	8.75	7.50	8.03	7.82
5	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6)- 2006, Reaffirmed -2017	$\mu\text{g}/\text{m}^3$	80.0	12.72	10.81	11.05	10.77

  
 (Authorized Signatory)  
 S.P. Pattanayak  
 Tech. Manager

...END OF TEST REPORT.....



# Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025 : 2017 (NABL) Accredited Laboratory, GSPCB Empanelled Laboratory and ISO 9001 : 2015 Certified Company)



Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

ULR-TC744022000000515F

Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR)

Pg No: 1 of 1

Date: 02 Dec 2022

Test Report No: ERSIPL/TR/AA/195

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.

Sample Collected by : Representative of ERS (I) Pvt. Ltd.

Sample Collected in presence of : Representative of Customer.

Date of Sampling/Monitoring : 25-26.11.2022

Sample Received on : 28.11.2022

Analysis Started on : 28.11.2022

Analysis Completed on : 02.12.2022

Method of Sampling : ERSIPL/MSP/06

Quantity of Sample : 01 sample for each parameter

Environment Condition : Sunny

### Sample ID. No.

1. ERSIPL/AA/757

2. ERSIPL/AA/758

3. ERSIPL/AA/759

4. ERSIPL/AA/760

### Locations (Buffer Zone)

1. Near Village Bendrichua

2. Near Village Rengalmunra

3. Near Village Khuntjharia

4. Near Village Kathfali

### TEST FINDINGS:

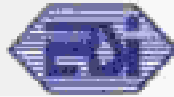
Sl. No.	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Nov-2009	Results			
					ERSIPL/AA/757	ERSIPL/AA/758	ERSIPL/AA/759	ERSIPL/AA/760
1	Suspended Particulate Matter (SPM)	IS-5182 (Part 4)-1999, Reaffirmed-2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	xx	193.03	181.10	196.91	201.47
2	Particulate Matter (size less than 10 $\mu\text{m}$ ) or PM <sub>10</sub>	IS-5182 (Part 23)-2006, Reaffirmed-2017, Gravimetric Method	$\mu\text{g}/\text{m}^3$	100.0	69.49	74.07	67.22	72.39
3	Particulate Matter (size less than 2.5 $\mu\text{m}$ ) or PM <sub>2.5</sub>	IS-5182 (Part 24)-2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	60.0	32.70	30.62	31.16	27.94
4	Sulphur Dioxide (SO <sub>2</sub> )	IS-5182 (Part 21)-2001, Reaffirmed-2017, Impromod West & Gaeke Method	$\mu\text{g}/\text{m}^3$	80.0	7.68	8.23	7.91	8.20
5	Oxides of Nitrogen (NO <sub>x</sub> )	IS-5182 (Part 6)-2006, Reaffirmed-2017	$\mu\text{g}/\text{m}^3$	80.0	11.97	12.69	10.18	12.01

  
 (Authorized Signatory)  
 S.P. Pattanayak  
 Tech. Manager

..... END OF TEST REPORT.....



CIN - U73100OR1995PTC003889



GSTIN : 21AAACE6224D1ZE

# Environmental Research and Services (India) Pvt. Ltd.

(OSPCB 'A' Category Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
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Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR)

Pg-1/1

**Date:** 02 Dec 2022  
**Test Report No:** ERSIPL/TR/AA/T:195-196  
**Name and Address of the Customer :** Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.  
**Sample Collected by :** Representative of ERS (I) Pvt. Ltd.  
**Sample Collected in presence of :** Representative of Customer.  
**Date of Sampling/Monitoring :** 24-26.11.2022  
**Sample Received on :** 28.11.2022  
**Analysis Started on :** 28.11.2022  
**Analysis Completed on :** 02.12.2022  
**Method of Sampling :** ERSIPL/MSP/06  
**Quantity of Sample :** 01 sample for each parameter  
**Environment Condition :** Cloudy/Sunny

**Sample ID, No.**

1. ERSIPL/AA/753
2. ERSIPL/AA/754
3. ERSIPL/AA/755
4. ERSIPL/AA/756
5. ERSIPL/AA/757
6. ERSIPL/AA/758
7. ERSIPL/AA/759
8. ERSIPL/AA/760

**Locations**

1. Near Site Office (NTPC), Kapurikachhar
2. Near Coal Lab
3. Near Work Shop
4. Near Weigh Bridge 3 & 4 (Village Dulanga)
5. Near Village Bendrichua
6. Near Village Rengalmunr
7. Near Village Khuntjharia
8. Near Village Kathfai

### TEST FINDINGS

Sl. No	Place of Monitoring/ Sample ID. No	Result of Parameters Analyzed
		Carbon Monoxide (CO) (in mg/m <sup>3</sup> )
1	ERSIPL/AA/753	<1.14
2	ERSIPL/AA/754	<1.14
3	ERSIPL/AA/755	<1.14
4	ERSIPL/AA/756	<1.14
5	ERSIPL/AA/757	<1.14
6	ERSIPL/AA/758	<1.14
7	ERSIPL/AA/759	<1.14
8	ERSIPL/AA/760	<1.14
	Permissible Limit	2.0

  
(Authorized Signatory)  
S.P. Pattanayak  
Tech. Manager

.....END OF TEST REPORT.....



# Environmental Research and Services (India) Pvt. Ltd.

(ISO/IEC 17025:2017 (NABL) Accredited Laboratory, OSPCL Empanelled Laboratory and ISO 9001:2015 Certified Company) Certificate No.: TC-7448

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

ULR-TC74402200000577F

Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR)

Pg No: 1 of 1

**Date: 29 Dec 2022**

**Test Report No: ERSIPL/TR/AA/214**

Name and Address of the Customer : Dulanga open cast Coal Mining, Project of M/s NTPC Limited in Sundargarh district, Odisha.

Sample Collected by : Representative of ERS (I) Pvt. Ltd.

Sample Collected in presence of : Representative of Customer.

Date of Sampling/Monitoring : 12-13.12.2022

Sample Received on : 22.12.2022

Analysis Started on : 22.12.2022

Analysis Completed on : 29.12.2022

Method of Sampling : ERSIPL/MSP/06

Quantity of Sample : 01 sample for each parameter

Environment Condition : Sunny

Sample ID. No.

Locations (Core Zone)

1. ERSIPL/AA/784

1. Near Site Office (NTPC), Kapurikachhar

2. ERSIPL/AA/785

2. Near Coal Lab

3. ERSIPL/AA/786

3. Near Work Shop

4. ERSIPL/AA/787

4. Near Weigh Bridge 3 & 4 (Village Dulanga)

**TEST FINDINGS:**

Sl. No.	Test Parameters	Test method	Unit	Permissible Limit as per NAAC Standards (OCS Reg-2008)	Results			
					ERSIPL/AA/784	ERSIPL/AA/785	ERSIPL/AA/786	ERSIPL/AA/787
1	Suspended Particulate Matter (SPM)	IS 5182 (Part 4): 1999, Reaffirmed 2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	XX	211.03	205.61	201.80	205.77
2	Particulate Matter (size less than 10 $\mu\text{m}$ ) or PM <sub>10</sub>	IS 5182 (Part 23): 2006, Reaffirmed 2017, Gravimetric Method	$\mu\text{g}/\text{m}^3$	100.0	74.02	77.48	71.48	74.09
3	Particulate Matter (size less than 2.5 $\mu\text{m}$ ) or PM <sub>2.5</sub>	IS 5182 (Part 24): 2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	60.0	35.73	34.34	31.88	32.30
4	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Caeke Method	$\mu\text{g}/\text{m}^3$	80.0	8.12	8.26	7.40	7.88
5	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 5): 2006, Reaffirmed 2017	$\mu\text{g}/\text{m}^3$	80.0	13.28	13.27	11.51	11.71

(Authorized Signatory)

S.P. Pattanayak

Tech. Manager

.....END OF TEST REPORT.....



# Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025 : 2017 (NABL) Accredited Laboratory, OISPER Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Certificate No.: 10-2448

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

UIR-TC744022000000578F

Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR)

Pg No: 1 of 1

Date: 29 Dec 2022

Test Report No: ERSIPL/TR/AA/215

Name and Address of the Customer : Dulanga open cast Coal Mining, Project of M/s NTPC Limited in Sundargarh district, Odisha.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of Customer  
Date of Sampling/Monitoring : 13-14.12.2022  
Sample Received on : 22.12.2022  
Analysis Started on : 22.12.2022  
Analysis Completed on : 29.12.2022  
Method of Sampling : ERSIPL/MSP/06  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny

### Sample ID. No.

1. ERSIPL/AA/788
2. ERSIPL/AA/789
3. ERSIPL/AA/790
4. ERSIPL/AA/791

### Locations (Buffer Zone)

1. Near Village Bendrichua
2. Near Village Bengalmunra
3. Near Village Khuntjharia
4. Near Village Kathfali

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Act-2009	Results			
					ERSIPL/AA/788	ERSIPL/AA/789	ERSIPL/AA/790	ERSIPL/AA/791
1	Suspended Particulate Matter (SPM)	IS 5182 (Part 4)- 1998, Reaffirmed -2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	XX	196.52	219.37	200.80	201.95
2	Particulate Matter (size less than 10 $\mu\text{m}$ ) or PM 10	IS 5182 (Part 23) 2006, Reaffirmed -2017, Gravimetric Method	$\mu\text{g}/\text{m}^3$	100.0	70.21	75.16	74.09	72.28
3	Particulate Matter (size less than 2.5 $\mu\text{m}$ ) or PM 2.5	IS 5182 (Part 24) 2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	60.0	29.26	31.81	32.28	31.05
4	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 3): 2001, Reaffirmed-2017, Improved West & Gaeke Method	$\mu\text{g}/\text{m}^3$	80.0	7.35	8.71	9.50	8.03
5	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed -2017	$\mu\text{g}/\text{m}^3$	80.0	10.76	11.60	13.53	11.25

(Authorized Signatory)  
S.P. Pattanayak  
Tech. Manager

..... END OF TEST REPORT.....



# Environmental Research and Services (India) Pvt. Ltd.

(OSPCB 'A' Category Empanelled Laboratory and ISO 9001:2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibber@gmail.com

Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR)

Pg-1/1

Date: 29 Dec 2022

Test Report No: ERSIPL/TR/AA/T:214-215

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.

Sample Collected by : Representative of ERS (I) Pvt. Ltd.

Sample Collected in presence of : Representative of Customer.

Date of Sampling/Monitoring : 12-14.12.2022

Sample Received on : 22.12.2022

Analysis Started on : 22.12.2022

Analysis Completed on : 29.12.2022

Method of Sampling : As per guidelines for sampling & measurement of notified AAQ parameters (NAAQS 2009) CPCB

Quantity of Sample : 01 sample for each parameter

Environment Condition : Sunny

### Sample ID. No.

### Locations

1. ERSIPL/AA/784
2. ERSIPL/AA/785
3. ERSIPL/AA/786
4. ERSIPL/AA/787
5. ERSIPL/AA/788
6. ERSIPL/AA/789
7. ERSIPL/AA/790
8. ERSIPL/AA/791

1. Near Site Office (NTPC), Kapurikachhar
2. Near Coal Lab
3. Near Work Shop
4. Near Weigh Bridge 3 & 4 (Village Dulanga)
5. Near Village Bendrichua
6. Near Village Bengalmunr
7. Near Village Khuntjharla
8. Near Village Kathfali

### TEST FINDINGS:

Sl. No	Place of Monitoring/ Sample ID. No	Result of Parameters Analyzed
		Carbon Monoxide (CO) (in mg/m <sup>3</sup> )
1	ERSIPL/AA/784	<1.14
2	ERSIPL/AA/785	<1.14
3	ERSIPL/AA/786	<1.14
4	ERSIPL/AA/787	<1.14
5	ERSIPL/AA/788	<1.14
6	ERSIPL/AA/789	<1.14
7	ERSIPL/AA/790	<1.14
8	ERSIPL/AA/791	<1.14
	Permissible Limit	2.0

  
(Authorized Signatory)  
S.P. Pattnayak  
Tech. Manager

.....END OF TEST REPORT.....



# Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025 : 2017 (NABL) Accredited Laboratory, BPL & Impurities Laboratory and ISO 9001 : 2015 (Certified Company) Certificate No. TC-144)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
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ULR-TC244022000000579F

Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR)

Pg No: 1 of 1

Date: 29 Dec 2022

Test Report No: ERSIPL/TR/AA/216

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of Customer  
Date of Sampling/Monitoring : 22-23.12.2022  
Sample Received on : 26.12.2022  
Analysis Started on : 26.12.2022  
Analysis Completed on : 29.12.2022  
Method of Sampling : ERSIPL/MSP/06  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny

### Sample ID. No.

1. ERSIPL/AA/832
2. ERSIPL/AA/833
3. ERSIPL/AA/834
4. ERSIPL/AA/835

### Locations (Core Zone)

1. Near Site Office (NTPC), Kapurikachhar
2. Near Coal Lab
3. Near Work Shop
4. Near Weigh Bridge 3 & 4 (Village Dulanga)

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards (PCB Nov-2008)	Results			
					ERSIPL/AA/832	ERSIPL/AA/833	ERSIPL/AA/834	ERSIPL/AA/835
1	Suspended Particulate Matter (SPM)	IS 5182 (Part 4) : 1999, Reaffirmed 2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	XX	196.64	194.13	203.77	189.40
2	Particulate Matter (size less than 10 $\mu\text{m}$ ) or PM <sub>10</sub>	IS 5182 (Part 28) : 2006, Reaffirmed 2017, Gravimetric Method	$\mu\text{g}/\text{m}^3$	100.0	71.63	69.87	72.64	69.66
3	Particulate Matter (size less than 2.5 $\mu\text{m}$ ) or PM <sub>2.5</sub>	IS 5182 (Part 24) : 2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	60.0	31.55	30.64	34.88	30.19
4	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 7) : 2001, Reaffirmed 2017, Improved Wet & Gas Method	$\mu\text{g}/\text{m}^3$	80.0	8.80	7.50	8.60	7.44
5	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6) : 2006, Reaffirmed 2017	$\mu\text{g}/\text{m}^3$	80.0	11.05	12.71	11.68	10.91

(Authorized Signatory)  
S.P. Patanayek  
Tech. Manager

.....END OF TEST REPORT.....



# Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025 : 2017 (NABL) Accredited Laboratory, CPCB Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Certificate No.: TD-7448

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

ULR-TC744022000000580F

Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR)

Pg No: 1 of 1

Date: 29 Dec 2022

Test Report No: ERSIPL/TR/AA/217

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.

Sample Collected by : Representative of ERS (I) Pvt. Ltd.

Sample Collected in presence of : Representative of Customer.

Date of Sampling/Monitoring : 23-24.12.2022

Sample Received on : 26.12.2022

Analysis Started on : 26.12.2022

Analysis Completed on : 29.12.2022

Method of Sampling : ERSIPL/MSP/06

Quantity of Sample : 01 sample for each parameter

Environment Condition : Sunny

### Sample ID. No.

1. ERSIPL/AA/836

2. ERSIPL/AA/837

3. ERSIPL/AA/838

4. ERSIPL/AA/839

### Locations (Buffer Zone)

1. Near Village Bendrichua

2. Near Village Rengalmunra

3. Near Village Khuntjharia

4. Near Village Kathali

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB (Nov-2008)	Results			
					ERSIPL/AA/836	ERSIPL/AA/837	ERSIPL/AA/838	ERSIPL/AA/839
1	Suspended Particulate Matter (SPM)	IS- 5187 (Part 4)- 1998, Reaffirmed -2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	KN	207.56	196.23	206.35	199.48
2	Particulate Matter (size less than 10 $\mu\text{m}$ ) or PM 10	IS- 5182 (Part 23)- 2006, Reaffirmed -2017, Gravimetric Method	$\mu\text{g}/\text{m}^3$	100.0	68.87	70.38	68.02	68.49
3	Particulate Matter (size less than 2.5 $\mu\text{m}$ ) or PM 2.5	IS- 5182 (Part 24)- 2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	60.0	33.51	28.86	33.35	32.28
4	Sulphur Dioxide (SO <sub>2</sub> )	IS- 5182 (Part 2)- 2001, Reaffirmed-2017, Improved West & Gaeke Method	$\mu\text{g}/\text{m}^3$	80.0	8.20	9.35	8.43	8.22
5	Oxides of Nitrogen (NO <sub>x</sub> )	IS- 5183 (Part 6)- 2006, Reaffirmed -2017	$\mu\text{g}/\text{m}^3$	80.0	12.77	10.59	10.84	12.53

(Authorized Signatory)

S.P. Pattnayak

Tech Manager

..... END OF TEST REPORT.....



# Environmental Research and Services (India) Pvt. Ltd.

(OSPCB 'A' Category Empanelled Laboratory and ISO 9001:2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

## Test Report Format No.: ERSIPL/FM/37 TEST REPORT (AMBIENT AIR)

Pg-1/1

**Date: 29 Dec 2022**      **Test Report No: ERSIPL/TR/AA/T-216-217**

**Name and Address of the Customer** : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.

**Sample Collected by** : Representative of ERS (I) Pvt. Ltd.

**Sample Collected in presence of** : Representative of Customer.

**Date of Sampling/Monitoring** : 22-24.12.2022

**Sample Received on** : 26.12.2022

**Analysis Started on** : 26.12.2022

**Analysis Completed on** : 29.12.2022

**Method of Sampling** : ERSIPL/MSP/06

**Quantity of Sample** : 01 sample for each parameter

**Environment Condition** : Sunny

**Sample ID. No.**


1. ERSIPL/AA/832
2. ERSIPL/AA/833
3. ERSIPL/AA/834
4. ERSIPL/AA/835
5. ERSIPL/AA/836
6. ERSIPL/AA/837
7. ERSIPL/AA/838
8. ERSIPL/AA/839

**Locations**

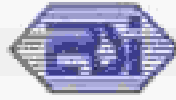
1. Near Site Office (NTPC), Kapurikachhar
2. Near Coal Lab
3. Near Work Shop
4. Near Weigh Bridge 3 & 4 (Village Dulanga)
5. Near Village Béndrichua
6. Near Village Rengalmunr
7. Near Village Khuntjharia
8. Near Village Kathali

**TEST FINDINGS:**

Sl. No	Place of Monitoring/ Sample ID. No	Result of Parameters Analyzed
		Carbon Monoxide (CO) (in mg/m <sup>3</sup> )
1	ERSIPL/AA/832	<1.14
2	ERSIPL/AA/833	<1.14
3	ERSIPL/AA/834	<1.14
4	ERSIPL/AA/835	<1.14
5	ERSIPL/AA/836	<1.14
6	ERSIPL/AA/837	<1.14
7	ERSIPL/AA/838	<1.14
8	ERSIPL/AA/839	<1.14
	<b>Permissible Limit</b>	<b>2.0</b>

  
(Authorized Signatory)  
S.P. Pattanayak  
Tech. Manager

.....END OF TEST REPORT.....



# Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025 : 2017 (NABL) Accredited Laboratory, CPCB Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Certificate No.: TC-1448

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

ULR-TC744023000000001F

Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR)

Pg No: 1 of 1

Date: 27 Jan 2023

Test Report No: ERSIPL/TR/AA/001

Name and Address of the Customer : Dulanga open cast Coal Mining, Project of M/s NTPC Limited in Sundargarh district, Odisha.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of Customer.  
Date of Sampling/Monitoring : 12-13.01.2023  
Sample Received on : 16.01.2023  
Analysis Started on : 16.01.2023  
Analysis Completed on : 23.01.2023  
Method of Sampling : ERSIPL/MSP/06  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny

Sample ID. No.

Locations (Core Zone)

1. ERSIPL/AA/001
2. ERSIPL/AA/002
3. ERSIPL/AA/003
4. ERSIPL/AA/004

1. Near Site Office (NTPC), Kapurikachhar
2. Near Coal Lab
3. Near Work Shop
4. Near Weigh Bridge 3 & 4 (Village Dulanga)

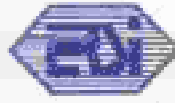
### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per (NAAQ) Standards (CPCB Nov-2008)	Results			
					ERSIPL/AA/001	ERSIPL/AA/002	ERSIPL/AA/003	ERSIPL/AA/004
1	Suspended Particulate Matter (SPM)	IS: 5182 (Part 4): 1989, Reaffirmed -2019, Gravimetric Method	ug/m <sup>3</sup>	NA	207.29	219.01	217.51	201.23
2	Particulate Matter (size less than 10 µm) or PM 10	IS: 5182 (Part 23): 2006, Reaffirmed -2017, Gravimetric Method	ug/m <sup>3</sup>	100.0	74.38	75.81	70.54	72.57
3	Particulate Matter (size less than 2.5 µm) or PM 2.5	IS: 5182 (Part 24): 2019, Gravimetric Method	ug/m <sup>3</sup>	60.0	33.52	35.33	32.92	35.22
4	Sulphur Dioxide (SO <sub>2</sub> )	IS: 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	ug/m <sup>3</sup>	80.0	8.49	9.21	7.90	7.48
5	Oxides of Nitrogen (NO <sub>x</sub> )	IS: 5182 (Part 6): 2006, Reaffirmed -2017	ug/m <sup>3</sup>	80.0	13.73	13.96	12.72	11.24

(Authorized Signatory)

S.P.Pattanayak  
Tech.Manager

.....END OF TEST REPORT.....



# Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025 : 2017 (NABL) Accredited Laboratory, O&PCB Empowered Laboratory and ISO 9001 : 2015 Certified Company) Certificate No.: TC-7440

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibsr@gmail.com

ULR-TC744023000000002F

Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR)

Pg No: 1 of 1

Date: 27 Jan 2023

Test Report No: ERSIPL/TR/AA/002

Name and Address of the Customer	:	Dulanga open cast Coal Mining, Project of M/s NTPC Limited in Sundargarh district, Odisha.
Sample Collected by	:	Representative of ERS (I) Pvt. Ltd.
Sample Collected in presence of	:	Representative of Customer
Date of Sampling/Monitoring	:	13-14.01.2023
Sample Received on	:	16.01.2023
Analysis Started on	:	16.01.2023
Analysis Completed on	:	23.01.2023
Method of Sampling	:	ERSIPL/MSP/06
Quantity of Sample	:	01 sample for each parameter
Environment Condition	:	Sunny

### Sample ID, No.

1. ERSIPL/AA/005
2. ERSIPL/AA/006
3. ERSIPL/AA/007
4. ERSIPL/AA/008

### Locations (Buffer Zone)

1. Near Village Bendrichua
2. Near Village Rengalmunra
3. Near Village Khuntjaria
4. Near Village Kathfali

### TEST FINDINGS:

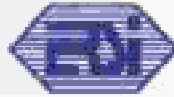
Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Nov-2009	Results			
					ERSIPL/AA/005	ERSIPL/AA/006	ERSIPL/AA/007	ERSIPL/AA/008
1	Suspended Particulate Matter (SPM)	IS 5182 (Part 4): 1999, Reaffirmed -2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	xx	192.45	198.41	201.18	196.92
2	Particulate Matter (size less than 10 $\mu\text{m}$ ) or PM 10	IS 5182 (Part 23): 2006, Reaffirmed -2017, Gravimetric Method	$\mu\text{g}/\text{m}^3$	100.0	69.77	69.32	70.09	71.38
3	Particulate Matter (size less than 2.5 $\mu\text{m}$ ) or PM 2.5	IS 5182 (Part 24): 2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	60.0	29.19	29.22	34.73	27.91
4	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gucke Method	$\mu\text{g}/\text{m}^3$	80.0	8.35	9.41	8.07	6.75
5	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed -2017	$\mu\text{g}/\text{m}^3$	80.0	12.58	12.27	14.55	12.53

(Authorized Signatory)  
S.P. Pattanayak  
Tech. Manager

END OF TEST REPORT



CIN - U73100OR1995PTC003889



GSTIN : 21AAACE6224D1ZE

# Environmental Research and Services (India) Pvt. Ltd.

(OSPCB 'A' Category Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329 , E-mail: ersibbsr@gmail.com

Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR)

Pg-1/1

Date: 27 Jan 2023

Test Report No: ERSIPL/TR/AA/T:001-002

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarb district, Odisha.

Sample Collected by : Representative of ERS (i) Pvt. Ltd.

Sample Collected in presence of : Representative of Customer.

Date of Sampling/Monitoring : 12-14.01.2023

Sample Received on : 16.01.2023

Analysis Started on : 16.01.2023

Analysis Completed on : 23.01.2023

Method of Sampling : As per guidelines for sampling & measurement of notified AAQ parameters (NAAQS 2009)-CPCB

Quantity of Sample : 01 sample for each parameter

Environment Condition : Sunny

### Sample ID. No.

### Locations

1. ERSIPL/AA/001
2. ERSIPL/AA/002
3. ERSIPL/AA/003
4. ERSIPL/AA/004
5. ERSIPL/AA/005
6. ERSIPL/AA/006
7. ERSIPL/AA/007
8. ERSIPL/AA/008

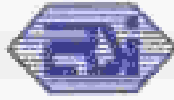
1. Near Site Office (NTPC), Kapurikachhar
2. Near Coal Lab
3. Near Work Shop
4. Near Weigh Bridge 3 & 4 (Village Dulanga)
5. Near Village Bendrichua
6. Near Village Rengalmunr
7. Near Village Khuntjharla
8. Near Village Kathfali

### TEST FINDINGS:

Sl. No	Place of Monitoring/ Sample ID. No	Result of Parameters Analyzed
		Carbon Monoxide (CO) (in mg/m <sup>3</sup> )
1	ERSIPL/AA/001	<1.14
2	ERSIPL/AA/002	<1.14
3	ERSIPL/AA/003	<1.14
4	ERSIPL/AA/004	<1.14
5	ERSIPL/AA/005	<1.14
6	ERSIPL/AA/006	<1.14
7	ERSIPL/AA/007	<1.14
8	ERSIPL/AA/008	<1.14
	Permissible Limit	2.0

(Authorized Signatory)  
S.P. Pattanayak  
Tech. Manager

END OF TEST REPORT



# Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025 : 2017 (NABL) Accredited Laboratory, OSPCB Empanelled Laboratory and ISO 9001 : 2015 Certified Company) Certificate No.: TG-248

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

ULR-TC74402300000003F

Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR)

Pg No: 1 of 1

Date: 27 Jan 2023

Test Report No: ERSIPL/TR/AA/003

Name and Address of the Customer :

Dulanga open cast Coal Mining project of M/s NTPC Limited in  
Sundargarh district, Odisha.

Sample Collected by :

Representative of IRS (I) Pvt. Ltd.

Sample Collected in presence of :

Representative of Customer

Date of Sampling/Monitoring :

16-17.01.2023

Sample Received on :

24.01.2023

Analysis Started on :

24.01.2023

Analysis Completed on :

27.01.2023

Method of Sampling :

ERSIPL/MSP/06

Quantity of Sample :

01 sample for each parameter

Environment Condition :

Sunny

### Sample ID. No.

1. ERSIPL/AA/033
2. ERSIPL/AA/034
3. ERSIPL/AA/035
4. ERSIPL/AA/036

### Locations (Core Zone)

1. Near Site Office (NTPC), Kapurikachhar
2. Near Coal Lab
3. Near Work Shop
4. Near Weigh Bridge 3 & 4 (Village Dulanga)

### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit 24 hrp NAAQS Standards CPCB Nov-2009	Results			
					ERSIPL/ AA/ 033	ERSIPL/ AA/ 034	ERSIPL/ AA/ 035	ERSIPL/ AA/ 036
1	Suspended Particulate Matter (SPM)	IS: 5182 (Part 4): 1999, Reaffirmed -2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	RM	208.72	204.08	203.55	211.43
2	Particulate Matter (size less than 10 $\mu\text{m}$ ) or PM 10	IS: 5182 (Part 23): 2006, Reaffirmed -2017, Gravimetric Method	$\mu\text{g}/\text{m}^3$	100.0	71.36	74.30	70.61	74.63
3	Particulate Matter (size less than 2.5 $\mu\text{m}$ ) or PM 2.5	IS: 5182 (Part 24): 2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	60.0	32.32	33.59	31.33	34.36
4	Sulphur Dioxide (SO <sub>2</sub> )	IS: 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	$\mu\text{g}/\text{m}^3$	80.0	8.50	7.48	8.34	7.56
5	Oxides of Nitrogen (NO <sub>x</sub> )	IS: 5182 (Part 6): 2006, Reaffirmed-2017	$\mu\text{g}/\text{m}^3$	80.0	11.80	14.57	11.21	12.56

(Authorized Signatory)  
S.P. Pattanayak  
Tech. Manager

.....END OF TEST REPORT.....



# Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025 : 2017 (NABL) Accredited Laboratory, OSPCB Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

ULR-TC744023000000004F

Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR)

Pg No: 1 of 1

Date: 27 Jan 2023

Test Report No: ERSIPL/TR/AA/004

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of Customer.  
Date of Sampling/Monitoring : 17-18.01.2023  
Sample Received on : 24.01.2023  
Analysis Started on : 24.01.2023  
Analysis Completed on : 27.01.2023  
Method of Sampling : ERSIPL/MSP/06  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny

### Sample ID. No.

- ERSIPL/AA/037
- ERSIPL/AA/038
- ERSIPL/AA/039
- ERSIPL/AA/040

### Locations (Buffer Zone)

- Near Village Bendrichua
- Near Village Rengalmunra
- Near Village Khuntjharia
- Near Village Kathfali

### TEST FINDINGS:

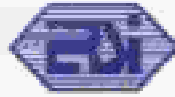
Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards (PCB Nov-2009)	Results			
					ERSIPL/AA/037	ERSIPL/AA/038	ERSIPL/AA/039	ERSIPL/AA/040
1	Suspended Particulate Matter (SPM)	IS: 5182 (Part 4): 1999, Reaffirmed-2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	xx	199.53	190.76	192.17	200.89
2	Particulate Matter (size less than 10 $\mu\text{m}$ ) or PM 10	IS: 5182 (Part-23): 2006, Reaffirmed-2017, Gravimetric Method	$\mu\text{g}/\text{m}^3$	100.0	71.14	67.93	70.56	72.72
3	Particulate Matter (size less than 2.5 $\mu\text{m}$ ) or PM 2.5	IS: 5182 (Part 24): 2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	60.0	34.43	31.39	31.36	33.29
4	Sulphur Dioxide (SO <sub>2</sub> )	IS: 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gankle Method	$\mu\text{g}/\text{m}^3$	80.0	9.41	8.38	7.56	8.03
5	Oxides of Nitrogen (NO <sub>x</sub> )	IS: 5182 (Part 6): 2006, Reaffirmed-2017	$\mu\text{g}/\text{m}^3$	80.0	10.47	13.40	13.35	12.11

(Authorized Signatory)  
S.P. Pattansayak  
Tech. Manager

..... END OF TEST REPORT.....



CIN - U73100OR1995PTC003889



GSTIN : 21AAACE6224D1ZE

# Environmental Research and Services (India) Pvt. Ltd.

(OSPCB 'A' Category Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329 , E-mail: ersibbsr@gmail.com

## Test Report Format No.: ERSIPL/FM/37 TEST REPORT (AMBIENT AIR)

Pg-1/1

Date: 27 Jan 2023

Test Report No: ERSIPL/TR/AA/T:003-004

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.

Sample Collected by : Representative of ERS (I) Pvt. Ltd.

Sample Collected in presence of : Representative of Customer.

Date of Sampling/Monitoring : 16-18.01.2023

Sample Received on : 24.01.2023

Analysis Started on : 24.01.2023

Analysis Completed on : 27.01.2023

Method of Sampling : ERSIPL/MSP/06

Quantity of Sample : 01 sample for each parameter

Environment Condition : Sunny

### Sample ID, No.

1. ERSIPL/AA/033
2. ERSIPL/AA/034
3. ERSIPL/AA/035
4. ERSIPL/AA/036
5. ERSIPL/AA/037
6. ERSIPL/AA/038
7. ERSIPL/AA/039
8. ERSIPL/AA/040

### Locations

1. Near Site Office (NTPC), Kapurikachhar
2. Near Coal Lab
3. Near Work Shop
4. Near Weigh Bridge 3 & 4 (Village Dulanga)
5. Near Village Bendrichua
6. Near Village Rengalmunr
7. Near Village Khuntjharia
8. Near Village Kathfali

### TEST FINDINGS:

Sl. No	Place of Monitoring/ Sample ID. No	Result of Parameters Analyzed
		Carbon Monoxide (CO) (in mg/m <sup>3</sup> )
1	ERSIPL/AA/033	<1.14
2	ERSIPL/AA/034	<1.14
3	ERSIPL/AA/035	<1.14
4	ERSIPL/AA/036	<1.14
5	ERSIPL/AA/037	<1.14
6	ERSIPL/AA/038	<1.14
7	ERSIPL/AA/039	<1.14
8	ERSIPL/AA/040	<1.14
	Permissible Limit	2.0

  
(Authorized Signatory)  
S.P. Patanayak  
Tech. Manager

.....END OF TEST REPORT.....



## Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025 : 2005 (NABL) Accredited Laboratory, OSPCB Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

ULR-TC744023000000085F

Test Report Format No.: ERSIPL/FM/37

### TEST REPORT (AMBIENT AIR)

Pg No: 1 of 1

Date: 27 Feb 2023

Test Report No: ERSIPL/TR/AA/030


Name and Address of the Customer : Dulanga open cast Coal Mining, Project of M/s NTPC Limited in Sundargarh district, Odisha.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of Customer.  
Date of Sampling/Monitoring : 13-14.02.2023  
Sample Received on : 21.02.2023  
Analysis Started on : 21.02.2023  
Analysis Completed on : 27.02.2023  
Method of Sampling : ERSIPL/MSP/06  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny  
Sample ID. No. Locations (Core Zone)

1. ERSIPL/AA/112
2. ERSIPL/AA/113
3. ERSIPL/AA/114
4. ERSIPL/AA/115

1. Near Site Office (NTPC), Kapurikachhar
2. Near Coal Lab
3. Near Work Shop
4. Near Weigh Bridge 3 & 4 (Village Dulanga)

#### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAC Standards CPCB Nov-2009	Results			
					ERSIPL/AA/112	ERSIPL/AA/113	ERSIPL/AA/114	ERSIPL/AA/115
1	Suspended Particulate Matter (SPM)	IS: 5182 (Part 4)-1999, Reaffirmed-2019, Gravimetric Method	µg/m <sup>3</sup>	XX	203.95	207.70	192.20	208.99
2	Particulate Matter (size less than 10 µm) or PM 10	IS 5182 (Part 23): 2006, Reaffirmed-2017, Gravimetric Method	µg/m <sup>3</sup>	100.0	75.39	73.30	72.40	74.11
3	Particulate Matter (size less than 2.5 µm) or PM 2.5	IS 5182 (Part 24): 2019, Gravimetric Method	µg/m <sup>3</sup>	60.0	34.02	32.96	33.74	34.16
4	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	µg/m <sup>3</sup>	80.0	9.11	8.95	8.91	7.68
5	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed-2017	µg/m <sup>3</sup>	80.0	13.54	12.75	13.77	11.41

  
(Authorized Signatory)  
S.P. Pattanayak  
Tech. Manager

.....END OF TEST REPORT.....



## Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025 : 2005 (NABL) Accredited Laboratory, OSPCB Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

ULR-TC744023000000086F

Test Report Format No.: ERSIPL/FM/37

### TEST REPORT (AMBIENT AIR)

Pg No: 1 of 1

<b>Date:</b> 27 Feb 2023	<b>Test Report No:</b> ERSIPL/TR/AA/031
<b>Name and Address of the Customer :</b>	Dulanga open cast Coal Mining, Project of M/s NTPC Limited in Sundargarh district, Odisha.
<b>Sample Collected by :</b>	Representative of ERS (I) Pvt. Ltd.
<b>Sample Collected in presence of :</b>	Representative of Customer
<b>Date of Sampling/Monitoring :</b>	14-15.02.2023
<b>Sample Received on :</b>	21.02.2023
<b>Analysis Started on :</b>	21.02.2023
<b>Analysis Completed on :</b>	27.02.2023
<b>Method of Sampling :</b>	ERSIPL/MSP/06
<b>Quantity of Sample :</b>	01 sample for each parameter
<b>Environment Condition :</b>	Sunny

#### Sample ID. No.


1. ERSIPL/AA/116
2. ERSIPL/AA/117
3. ERSIPL/AA/118
4. ERSIPL/AA/119

#### Locations (Buffer Zone)

1. Near Village Bendrichua
2. Near Village Rengalmunra
3. Near Village Khuntjharis
4. Near Village Kathfali

#### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Nov-2009	Results			
					ERSIPL/AA/116	ERSIPL/AA/117	ERSIPL/AA/118	ERSIPL/AA/119
1	Suspended Particulate Matter (SPM)	IS: 5182 (Part 4)- 1999, Reaffirmed -2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	XX	197.67	198.02	192.65	198.49
2	Particulate Matter (size less than 10 $\mu\text{m}$ ) or PM 10	IS 5182 (Part 23): 2006, Reaffirmed -2017, Gravimetric Method	$\mu\text{g}/\text{m}^3$	100.0	70.81	69.67	70.58	71.95
3	Particulate Matter (size less than 2.5 $\mu\text{m}$ ) or PM 2.5	IS 5182 (Part 24): 2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	60.0	28.36	29.41	30.64	31.05
4	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	$\mu\text{g}/\text{m}^3$	80.0	7.43	8.31	7.48	8.41
5	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed -2017	$\mu\text{g}/\text{m}^3$	80.0	10.99	11.07	12.47	11.67

  
 (Authorized Signatory)  
 S.P. Pattansyah  
 Tech. Manager

..... END OF TEST REPORT.....



CIN - U73100OR1995PTC003889



GSTIN : 21AAACE6224D1ZE

**Environmental Research and Services (India) Pvt. Ltd.**

(OSPCB 'A' Category Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha

Tel: +91-9437021932, +91-9937690329, E-mail: ersibsr@gmail.com

Test Report Format No.: ERSIPL/FM/37

**TEST REPORT (AMBIENT AIR)**

Pg-1/1

**Date: 27 Feb 2023****Test Report No: ERSIPL/TR/AA/T:030-031**

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.

Sample Collected by : Representative of ERS (I) Pvt. Ltd.

Sample Collected in presence of : Representative of Customer.

Date of Sampling/Monitoring : 13-15.02.2023

Sample Received on : 21.02.2023

Analysis Started on : 21.02.2023

Analysis Completed on : 27.02.2023

Method of Sampling : As per guidelines for sampling & measurement of notified AAQ parameters (NAAQS 2009)-CPCB

Quantity of Sample : 01 sample for each parameter

Environment Condition : Sunny

**Sample ID. No.**

1. ERSIPL/AA/112
2. ERSIPL/AA/113
3. ERSIPL/AA/114
4. ERSIPL/AA/115
5. ERSIPL/AA/116
6. ERSIPL/AA/117
7. ERSIPL/AA/118
8. ERSIPL/AA/119

**Locations**

1. Near Site Office (NTPC), Kapurikachhar
2. Near Coal Lab
3. Near Work Shop
4. Near Weigh Bridge 3 & 4 (Village Dulanga)
5. Near Village Bendrichua
6. Near Village Rengalmunn
7. Near Village Khuntjharia
8. Near Village Kathfali

**TEST FINDINGS:**

Sl. No	Place of Monitoring/ Sample ID. No	Result of Parameters Analyzed
		Carbon Monoxide (CO) (In mg/m <sup>3</sup> )
1	ERSIPL/AA/112	<1.14
2	ERSIPL/AA/113	<1.14
3	ERSIPL/AA/114	<1.14
4	ERSIPL/AA/115	<1.14
5	ERSIPL/AA/116	<1.14
6	ERSIPL/AA/117	<1.14
7	ERSIPL/AA/118	<1.14
8	ERSIPL/AA/119	<1.14
	Permissible Limit	2.0

(Authorized Signatory)  
**S.P.Pattanayak**  
 Tech. Manager

.....END OF TEST REPORT.....



## Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025-2005 (NABL) Accredited Laboratory, OSPCB Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

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ULR-TC744023000000087F

Test Report Format No.: ERSIPL/FM/37

### TEST REPORT (AMBIENT AIR)

Pg No: 1 of 1

Date: 27 Feb 2023

Test Report No: ERSIPL/TR/AA/032

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of Customer  
Date of Sampling/Monitoring : 19-20.02.2023  
Sample Received on : 21.02.2023  
Analysis Started on : 22.02.2023  
Analysis Completed on : 27.02.2023  
Method of Sampling : ERSIPL/MSP/06  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny

#### Sample ID, No.

1. ERSIPL/AA/131
2. ERSIPL/AA/132
3. ERSIPL/AA/133
4. ERSIPL/AA/134

#### Locations (Core Zone)

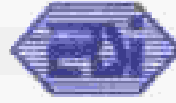
1. Near Site Office (NTPC), Kapurikachhar
2. Near Coal Lab
3. Near Work Shop
4. Near Weigh Bridge 3 & 4 (Village Dulanga)

#### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Nov-2009	Results			
					ERSIPL/AA/131	ERSIPL/AA/132	ERSIPL/AA/133	ERSIPL/AA/134
1	Suspended Particulate Matter (SPM)	IS: 5182 (Part 4)- 1999, Reaffirmed -2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	XX	203.55	212.23	196.62	208.74
2	Particulate Matter (size less than 10 $\mu\text{m}$ ) or PM 10	IS: 5182 (Part 23): 2006, Reaffirmed -2017, Gravimetric Method	$\mu\text{g}/\text{m}^3$	100.0	70.84	73.67	69.28	74.64
3	Particulate Matter (size less than 2.5 $\mu\text{m}$ ) or PM 2.5	IS: 5182 (Part 24): 2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	60.0	30.41	31.92	32.67	33.58
4	Sulphur Dioxide (SO <sub>2</sub> )	IS: 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	$\mu\text{g}/\text{m}^3$	80.0	8.22	7.37	8.17	8.89
5	Oxides of Nitrogen (NO <sub>x</sub> )	IS: 5182 (Part 6): 2006, Reaffirmed -2017	$\mu\text{g}/\text{m}^3$	80.0	11.66	13.76	11.38	13.63

(Authorized Signatory)  
S.P.Pattanayak  
Tech. Manager

.....END OF TEST REPORT.....



## Environmental Research and Services (India) Pvt. Ltd.

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ULR-TC744023000000088F

Test Report Format No.: ERSIPL/FM/37

### TEST REPORT (AMBIENT AIR)

Pg No: 1 of 1

Date: 27 Feb 2023

Test Report No: ERSIPL/TR/AA/033

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of Customer.  
Date of Sampling/Monitoring : 20-21.02.2023  
Sample Received on : 21.02.2023  
Analysis Started on : 22.02.2023  
Analysis Completed on : 27.02.2023  
Method of Sampling : ERSIPL/MSP/06  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny

Sample ID. No.

- ERSIPL/AA/135
- ERSIPL/AA/136
- ERSIPL/AA/137
- ERSIPL/AA/138

Locations (Buffer Zone)

- Near Village Bendrichua
- Near Village Rengalmunra
- Near Village Khuntjharia
- Near Village Kathfali

**TEST FINDINGS:**

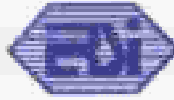
Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Nov-2008	Results			
					ERSIPL/AA/135	ERSIPL/AA/136	ERSIPL/AA/137	ERSIPL/AA/138
1	Suspended Particulate Matter (SPM)	IS: 5182 (Part 4)- 1999, Reaffirmed 2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	XX	202.08	199.40	205.09	208.12
2	Particulate Matter (size less than 10 $\mu\text{m}$ ) or PM 10	IS: 5182 (Part 23): 2006, Reaffirmed -2017, Gravimetric Method	$\mu\text{g}/\text{m}^3$	100.0	72.05	72.51	69.47	71.86
3	Particulate Matter (size less than 2.5 $\mu\text{m}$ ) or PM 2.5	IS: 5182 (Part 24): 2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	60.0	31.57	31.61	29.34	32.19
4	Sulphur Dioxide (SO <sub>2</sub> )	IS: 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeko Method	$\mu\text{g}/\text{m}^3$	80.0	8.27	7.73	8.28	7.60
5	Oxides of Nitrogen (NO <sub>x</sub> )	IS: 5182 (Part 6): 2006, Reaffirmed -2017	$\mu\text{g}/\text{m}^3$	80.0	12.30	10.59	13.14	11.70

(Authorized Signatory)  
S.P.Pattanayak  
Tech. Manager

..... END OF TEST REPORT.....



CIN - U73100OR1995PTC003889



GSTIN : 21AAACE6224D1ZE

**Environmental Research and Services (India) Pvt. Ltd.**

(OSPCB 'A' Category Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

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Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com**Test Report Format No.: ERSIPL/FM/37  
TEST REPORT (AMBIENT AIR)**

Pg-1/1

**Date: 27 Feb 2023****Test Report No: ERSIPL/TR/AA/T:032-033**

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.

Sample Collected by : Representative of ERS (I) Pvt. Ltd.

Sample Collected in presence of : Representative of Customer.

Date of Sampling/Monitoring : 19-21.02.2023

Sample Received on : 21.02.2023

Analysis Started on : 22.02.2023

Analysis Completed on : 27.02.2023

Method of Sampling : ERSIPL/MSP/05

Quantity of Sample : 01 sample for each parameter

Environment Condition : Sunny

**Sample ID. No.**


1. ERSIPL/AA/131
2. ERSIPL/AA/132
3. ERSIPL/AA/133
4. ERSIPL/AA/134
5. ERSIPL/AA/135
6. ERSIPL/AA/136
7. ERSIPL/AA/137
8. ERSIPL/AA/138

**Locations**

1. Near Site Office (NTPC), Kapurikachhar
2. Near Coal Lab
3. Near Work Shop
4. Near Weigh Bridge 3 & 4 (Village Dulanga)
5. Near Village Bendrichua
6. Near Village Rengalmunn
7. Near Village Khuntjharia
8. Near Village Kathfali

**TEST FINDINGS:**

Sl. No	Place of Monitoring/ Sample ID. No	Result of Parameters Analyzed
		Carbon Monoxide (CO) (in mg/m <sup>3</sup> )
1	ERSIPL/AA/131	<1.14
2	ERSIPL/AA/132	<1.14
3	ERSIPL/AA/133	<1.14
4	ERSIPL/AA/134	<1.14
5	ERSIPL/AA/135	<1.14
6	ERSIPL/AA/136	<1.14
7	ERSIPL/AA/137	<1.14
8	ERSIPL/AA/138	<1.14
	Permissible Limit	2.0

  
(Authorized Signatory)  
S.P. Pattanayak  
Tech. Manager

.....END OF TEST REPORT.....



## Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025:2017 (NABL) Accredited Laboratory, OSPCB Empanelled Laboratory and ISO 9001:2015 Certified Company)

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ULR-TC744023000000112F

Test Report Format No.: ERSIPL/FM/37

### TEST REPORT (AMBIENT AIR)

Pg No: 1 of 1

Date: 27 Mar 2023

Test Report No: ERSIPL/TR/AA/042

Name and Address of the Customer : Dulanga open cast Coal Mining, Project of M/s NTPC Limited in Sundargarh district, Odisha.

Sample Collected by : Representative of ERS (I) Pvt. Ltd.

Sample Collected in presence of : Representative of Customer.

Date of Sampling/Monitoring : 13-14.03.2023

Sample Received on : 21.03.2023

Analysis Started on : 21.03.2023

Analysis Completed on : 27.03.2023

Method of Sampling : ERSIPL/MSP/06

Quantity of Sample : 01 sample for each parameter

Environment Condition : Sunny

Sample ID. No.

Locations (Core Zone)

1. ERSIPL/AA/161
2. ERSIPL/AA/162
3. ERSIPL/AA/163
4. ERSIPL/AA/164

1. Near Site Office (NTPC), Kapurikachhar
2. Near Coal Lab
3. Near Work Shop
4. Near Weigh Bridge 3 & 4 (Village Dulanga)

#### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Nov-2009	Results			
					ERSIPL/AA/161	ERSIPL/AA/162	ERSIPL/AA/163	ERSIPL/AA/164
1	Suspended Particulate Matter (SPM)	IS: 5182 (Part 4)- 1999, Reaffirmed -2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	XX	210.44	201.53	208.25	201.35
2	Particulate Matter (size less than 10 $\mu\text{m}$ ) or PM 10	IS 5182, (Part 23): 2006, Reaffirmed -2017, Gravimetric Method	$\mu\text{g}/\text{m}^3$	100.0	74.14	74.27	72.37	70.20
3	Particulate Matter (size less than 2.5 $\mu\text{m}$ ) or PM 2.5	IS 5182 (Part 24): 2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	60.0	35.43	33.23	35.05	32.40
4	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	$\mu\text{g}/\text{m}^3$	80.0	9.44	8.38	8.19	8.09
5	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed -2017	$\mu\text{g}/\text{m}^3$	80.0	13.25	13.53	14.33	11.30

(Authorized Signatory)

S.P. Pattanayak  
Tech. Manager

.....END OF TEST REPORT.....



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ULR-TC744023000000113F

Test Report Format No.: ERSIPL/FM/37

### TEST REPORT (AMBIENT AIR)

Pg No: 1 of 1

Date: 27 Mar 2023

Test Report No: ERSIPL/TR/AA/043

Name and Address of the Customer : Dulanga open cast Coal Mining, Project of M/s NTPC Limited in Sundergarh district, Odisha.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of Customer  
Date of Sampling/Monitoring : 14-15.03.2023  
Sample Received on : 21.03.2023  
Analysis Started on : 21.03.2023  
Analysis Completed on : 27.03.2023  
Method of Sampling : ERSIPL/MSP/06  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Sunny

#### Sample ID. No.

1. ERSIPL/AA/165
2. ERSIPL/AA/166
3. ERSIPL/AA/167
4. ERSIPL/AA/168

#### Locations (Buffer Zone)

1. Near Village Bendrichua
2. Near Village Rengalmunra
3. Near Village Khuntjharua
4. Near Village Kathfalli

#### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Nov-2009	Results			
					ERSIPL/AA/165	ERSIPL/AA/166	ERSIPL/AA/167	ERSIPL/AA/168
1	Suspended Particulate Matter (SPM)	IS 5182 (Part 4)- 1999, Reaffirmed 2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	XX	200.59	201.37	199.88	199.29
2	Particulate Matter (size less than 10 $\mu\text{m}$ ) or PM 10	IS 5182 (Part 23): 2006, Reaffirmed -2017, Gravimetric Method	$\mu\text{g}/\text{m}^3$	100.0	74.82	71.12	70.59	69.47
3	Particulate Matter (size less than 2.5 $\mu\text{m}$ ) or PM 2.5	IS 5182 (Part 24): 2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	60.0	31.85	30.60	30.89	30.46
4	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	$\mu\text{g}/\text{m}^3$	80.0	7.06	7.98	8.47	7.76
5	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed -2017	$\mu\text{g}/\text{m}^3$	80.0	11.34	13.61	11.34	10.94

(Authorized Signatory)

S.P. Pattanayak  
S.P. Pattanayak

..... END OF TEST REPORT.....



CIN - U73100OR1995PTC003889



GSTIN : 21AAACE6224D1ZE

# Environmental Research and Services (India) Pvt. Ltd.

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Test Report Format No.: ERSIPL/FM/37

## TEST REPORT (AMBIENT AIR)

Pg-1/1

Date: 27 Mar 2023

Test Report No: ERSIPL/TR/AA/T:042-043

Name and Address of the Customer

: Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.

Sample Collected by

: Representative of ERS (I) Pvt. Ltd.

Sample Collected in presence of

: Representative of Customer.

Date of Sampling/Monitoring

: 13-15.03.2023

Sample Received on

: 21.03.2023

Analysis Started on

: 21.03.2023

Analysis Completed on

: 27.03.2023

Method of Sampling

: As per guidelines for sampling & measurement of notified AAQ parameters (NAAQS 2009)-CPCB

Quantity of Sample

: 01 sample for each parameter

Environment Condition

: Sunny

### Sample ID. No.

### Locations

1. ERSIPL/AA/161
2. ERSIPL/AA/162
3. ERSIPL/AA/163
4. ERSIPL/AA/164
5. ERSIPL/AA/165
6. ERSIPL/AA/166
7. ERSIPL/AA/167
8. ERSIPL/AA/168

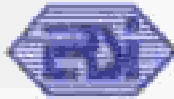
1. Near Site Office (NTPC), Kapurikachhar
2. Near Coal Lab
3. Near Work Shop
4. Near Weigh Bridge 3 & 4 (Village Dulanga)
5. Near Village Bendrichua
6. Near Village Rengalmunr
7. Near Village Khuntjharia
8. Near Village Kathfali

### TEST FINDINGS:

Place of Monitoring	Result of Parameters Analyzed					
	Mercury (Hg) (in $\mu\text{g}/\text{m}^3$ )	Arsenic (As) (in $\text{ng}/\text{m}^3$ )	Nickel (Ni) (in $\text{ng}/\text{m}^3$ )	Cadmium (Cd) (in $\mu\text{g}/\text{m}^3$ )	Chromium (Cr) (in $\mu\text{g}/\text{m}^3$ )	Carbon Monoxide (CO) (in $\text{mg}/\text{m}^3$ )
ERSIPL/AA/161	ND	ND	ND	ND	ND	<1.14
ERSIPL/AA/162	ND	ND	ND	ND	ND	<1.14
ERSIPL/AA/163	ND	ND	ND	ND	ND	<1.14
ERSIPL/AA/164	ND	ND	ND	ND	ND	<1.14
ERSIPL/AA/165	ND	ND	ND	ND	ND	<1.14
ERSIPL/AA/166	ND	ND	ND	ND	ND	<1.14
ERSIPL/AA/167	ND	ND	ND	ND	ND	<1.14
ERSIPL/AA/168	ND	ND	ND	ND	ND	<1.14
Permissible Limit	-	06	20.0	-	-	2.0

(Authorized Signatory)

S.P. Pattanayak  
Tech. Manager



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(An ISO/IEC 17025:2017 (NABL) Accredited Laboratory, OSPCB Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

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ULR-TC744023000000114F

Test Report Format No.: ERSIPL/FM/37

### TEST REPORT (AMBIENT AIR)

Pg No: 1 of 1

Date: 27 Mar 2023

Test Report No: ERSIPL/TR/AA/044

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of Customer  
Date of Sampling/Monitoring : 17-18.03.2023  
Sample Received on : 21.03.2023  
Analysis Started on : 21.03.2023  
Analysis Completed on : 27.03.2023  
Method of Sampling : ERSIPL/MSP/06  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Mostly Cloudy

Sample ID. No.

1. ERSIPL/AA/169
2. ERSIPL/AA/170
3. ERSIPL/AA/171
4. ERSIPL/AA/172

Locations (Core Zone)

1. Near Site Office (NTPC), Kapurikachhar
2. Near Coal Lab
3. Near Work Shop
4. Near Weigh Bridge 3 & 4 (Village Dulanga)

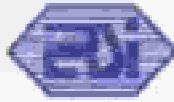
**TEST FINDINGS:**

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Nov-2009	Results			
					ERSIPL/AA/169	ERSIPL/AA/170	ERSIPL/AA/171	ERSIPL/AA/172
1	Suspended Particulate Matter (SPM)	IS: 5182 (Part 4)- 1999, Reaffirmed 2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	XX	212.82	208.55	208.16	205.47
2	Particulate Matter (size less than 10 $\mu\text{m}$ ) or PM 10	IS 5182 (Part 23): 2006, Reaffirmed -2017, Gravimetric Method	$\mu\text{g}/\text{m}^3$	100.0	73.68	72.39	73.35	74.48
3	Particulate Matter (size less than 2.5 $\mu\text{m}$ ) or PM 2.5	IS 5182 (Part 24): 2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	60.0	34.50	35.03	34.29	34.24
4	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	$\mu\text{g}/\text{m}^3$	80.0	8.75	7.10	8.95	9.55
5	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed -2017	$\mu\text{g}/\text{m}^3$	80.0	13.89	13.24	12.30	14.35

  
(Authorized Signatory)

S.P. Pattanayak  
Tech. Manager

.....END OF TEST REPORT.....



## Environmental Research and Services (India) Pvt. Ltd.

(An ISO/IEC 17025 : 2017 (NABL) Accredited Laboratory, OISPCB Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329, E-mail: ersibbsr@gmail.com

ULR-TC744023000000115F

Test Report Format No.: ERSIPL/FM/37

### TEST REPORT (AMBIENT AIR)

Pg No: 1 of 1

Date: 27 Mar 2023

Test Report No: ERSIPL/TR/AA/045

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.

Sample Collected by : Representative of ERS (I) Pvt. Ltd.

Sample Collected in presence of : Representative of Customer.

Date of Sampling/Monitoring : 18-19.03.2023

Sample Received on : 21.03.2023

Analysis Started on : 21.03.2023

Analysis Completed on : 27.03.2023

Method of Sampling : ERSIPL/MSP/06

Quantity of Sample : 01 sample for each parameter

Environment Condition : Mostly Cloudy

**Sample ID, No.**

1. ERSIPL/AA/173

2. ERSIPL/AA/174

3. ERSIPL/AA/175

4. ERSIPL/AA/176

**Locations (Buffer Zone)**

1. Near Village Bendrichua

2. Near Village Bengalmunra

3. Near Village Khuntjharia

4. Near Village Kathfali

#### TEST FINDINGS:

Sl. No	Test Parameters	Test method	Unit	Permissible Limit as per NAAQ Standards CPCB Nov-2009	Results			
					ERSIPL/AA/173	ERSIPL/AA/174	ERSIPL/AA/175	ERSIPL/AA/176
1	Suspended Particulate Matter (SPM)	IS: 5182 (Part 4)- 1999, Reaffirmed 2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	XX	216.80	201.53	209.72	196.34
2	Particulate Matter (size less than 10 $\mu\text{m}$ ) or PM 10	IS 5182 (Part 23): 2006, Reaffirmed -2017, Gravimetric Method	$\mu\text{g}/\text{m}^3$	100.0	72.96	76.11	74.50	71.80
3	Particulate Matter (size less than 2.5 $\mu\text{m}$ ) or PM 2.5	IS 5182 (Part 24): 2019, Gravimetric Method	$\mu\text{g}/\text{m}^3$	60.0	36.97	32.65	31.31	33.87
4	Sulphur Dioxide (SO <sub>2</sub> )	IS 5182 (Part 2): 2001, Reaffirmed-2017, Improved West & Gaeke Method	$\mu\text{g}/\text{m}^3$	80.0	8.84	8.45	8.87	7.07
5	Oxides of Nitrogen (NO <sub>x</sub> )	IS 5182 (Part 6): 2006, Reaffirmed -2017	$\mu\text{g}/\text{m}^3$	80.0	14.91	13.40	14.09	10.87

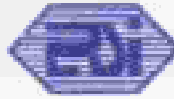
(Authorized Signatory)

S.P. Pattanayak  
Tech. Manager

..... END OF TEST REPORT.....



CIN - U73100OR1995PTC003889



GSTIN : 21AAACE6224D1ZE

## Environmental Research and Services (India) Pvt. Ltd.

(OSPCB 'A' Category Empanelled Laboratory and ISO 9001 : 2015 Certified Company)

Plot No: B-22, Sector-B, Industrial Estate Chandaka, Infocity Road, Bhubaneswar-751024, Odisha  
Tel: +91-9437021932, +91-9937690329 , E-mail: ersibbsr@gmail.com

Test Report Format No.: ERSIPL/FM/37

### TEST REPORT (AMBIENT AIR)

Pg-1/1

Date: 27 Mar 2023

Test Report No: ERSIPL/TR/AA/T:044-045

Name and Address of the Customer : Dulanga open cast Coal Mining project of M/s NTPC Limited in Sundargarh district, Odisha.  
Sample Collected by : Representative of ERS (I) Pvt. Ltd.  
Sample Collected in presence of : Representative of Customer.  
Date of Sampling/Monitoring : 17-19.03.2023  
Sample Received on : 21.03.2023  
Analysis Started on : 21.03.2023  
Analysis Completed on : 27.03.2023  
Method of Sampling : ERSIPL/MSP/06  
Quantity of Sample : 01 sample for each parameter  
Environment Condition : Mostly Cloudy

**Sample ID. No.**

1. ERSIPL/AA/169
2. ERSIPL/AA/170
3. ERSIPL/AA/171
4. ERSIPL/AA/172
5. ERSIPL/AA/173
6. ERSIPL/AA/174
7. ERSIPL/AA/175
8. ERSIPL/AA/176

**Locations**

1. Near Site Office (NTPC), Kapurikachhar
2. Near Coal Lab
3. Near Work Shop
4. Near Weigh Bridge 3 & 4 (Village Dulanga)
5. Near Village Bendrichua
6. Near Village Rengalmunr
7. Near Village Khuntjharia
8. Near Village Kathfali

**TEST FINDINGS:**

Place of Monitoring	Result of Parameters Analyzed					
	Mercury (Hg) (in $\mu\text{g}/\text{m}^3$ )	Arsenic (As) (in $\text{ng}/\text{m}^3$ )	Nickel (Ni) (in $\text{ng}/\text{m}^3$ )	Cadmium (Cd) (in $\mu\text{g}/\text{m}^3$ )	Chromium (Cr) (in $\mu\text{g}/\text{m}^3$ )	Carbon Monoxide (CO) (in $\text{mg}/\text{m}^3$ )
ERSIPL/AA/169	ND	ND	ND	ND	ND	<1.14
ERSIPL/AA/170	ND	ND	ND	ND	ND	<1.14
ERSIPL/AA/171	ND	ND	ND	ND	ND	<1.14
ERSIPL/AA/172	ND	ND	ND	ND	ND	<1.14
ERSIPL/AA/173	ND	ND	ND	ND	ND	<1.14
ERSIPL/AA/174	ND	ND	ND	ND	ND	<1.14
ERSIPL/AA/175	ND	ND	ND	ND	ND	<1.14
ERSIPL/AA/176	ND	ND	ND	ND	ND	<1.14
Permissible Limit	-	06	20.0	-	-	2.0

(Authorized Signatory)

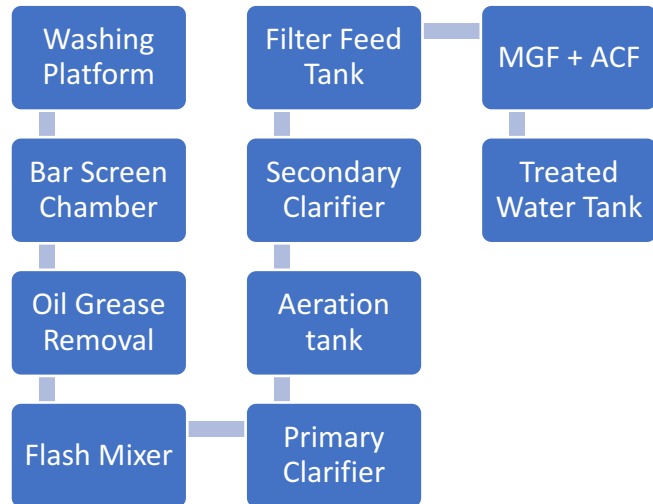
S.P. Pattanayak  
Tech. Manager

END OF TEST REPORT

**Continuous Ambient Air Quality Monitoring Station**



## ZERO DISCHARGE EFFLUENT TREATMENT PLANT OF 50 KLD



Washing Platform

Flow Chart of ETP



Clarifier



Filter Feed Tank



Activated Charcoal Filter(ACF)

[See rules 115 (2)]

**Pollution Under Control Certificate**

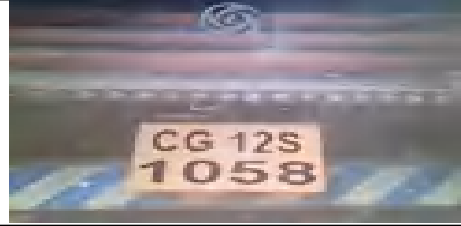
Authorised By :  
Government of Odisha

**Date** : **25/03/2023**  
**Time** : **11:55:46 AM**  
**Validity upto** : **24/09/2023**



Certificate SL. No. : OR02300140018834  
Registration No. : CG12S1058  
Date of Registration : 25/Feb/2011  
Month & Year of Manufacturing : November-2010  
Valid Mobile Number : \*\*\*\*\*7677  
Emission Norms : BHARAT STAGE III  
Fuel : DIESEL  
PUC Code : OR0230014  
GSTIN : 21BVDPP0961Q1ZA  
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	2.45	0.69

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://puc.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** : **25/03/2023**  
**Time** : **11:59:06 AM**  
**Validity upto** : **24/09/2023**



Certificate SL. No. : OR02300140018838  
Registration No. : CG12S2380  
Date of Registration : 07/May/2012  
Month & Year of Manufacturing : January-2012  
Valid Mobile Number : \*\*\*\*\*7677  
Emission Norms : BHARAT STAGE III  
Fuel : DIESEL  
PUC Code : OR0230014  
GSTIN : 21BVDPP0961Q1ZA  
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	2.45	0.62

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://puc.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** : **25/03/2023**  
**Time** : **11:57:43 AM**  
**Validity upto** : **24/09/2023**



Certificate SL. No. : OR02300140018836  
Registration No. : MP65GA0605  
Date of Registration : 09/Nov/2012  
Month & Year of Manufacturing : November-2012  
Valid Mobile Number : \*\*\*\*\*7677  
Emission Norms : BHARAT STAGE III  
Fuel : DIESEL  
PUC Code : OR0230014  
GSTIN : 21BVDPP0961Q1ZA  
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	2.45	0.48

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://puc.parivahan.gov.in>

Authorised Signature with stamp of PUC operator  
60mm x 20 mm

# Form 59

[See rules 115 (2)]

## Pollution Under Control Certificate

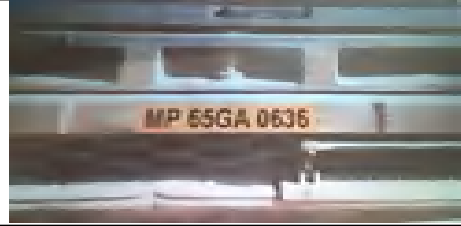
Authorised By :  
Government of Odisha

**Date** : **07/04/2023**  
**Time** : **12:30:59 PM**  
**Validity upto** : **06/10/2023**



Certificate SL. No. : OR02300140019159  
Registration No. : MP65GA0636  
Date of Registration : 22/Nov/2012  
Month & Year of Manufacturing : November-2012  
Valid Mobile Number : \*\*\*\*\*9877  
Emission Norms : BHARAT STAGE III  
Fuel : DIESEL  
PUC Code : OR0230014  
GSTIN : 21BVDPP0961Q1ZA  
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	2.45	1.37

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://puc.parivahan.gov.in>

Authorised Signature with stamp of PUC operator  
60mm x 20 mm













# NTPC Limited

(A Govt. of India Enterprise)

## DULANGA COAL MINING PROJECT NOTICE

It is to inform all concerned that Environmental Clearance has been accorded to Dulanga Coal Mining Project (7 MTPA) in Orissa Coalfields District - Sundergarh, Orissa by the Ministry of Environment and Forests on 03<sup>rd</sup> March, 2014. The copy of the clearance letter is available with the Orissa State Pollution Control Board and may be seen at the website of the Ministry of Environment and Forests at <http://www.mef.nic.in>.

AGM (C)  
NTPC Limited, Dulanga Coal Mining Project  
NH/20, Mecon Road, Sundergarh, PIN - 756001, Orissa

**Power of India**

## PFC CONSULTING LIMITED

**TIME EXTENSION FOR SUBMISSION OF RESPONSE TO BIDS FOR**  
"Consultancy assignment for development of coal blocks allocated for Orissa UMPP, Bidadahat, Odisha"

The last date of submission of Response to Bids which was earlier on March 10, 2014 on or before 11:00 hrs (IST) is extended to March 20, 2014 on or before 11:00 hrs (IST). The Response to Bids will be opened on the same day at 11:30 hrs (IST). The other time lines as specified in the Bid document shall stand extended accordingly. The Bid document is available on PFC & PFCL website [www.pfcindia.com](http://www.pfcindia.com) & [www.pfclodisha.com](http://www.pfclodisha.com).

Note: PFC Consulting Limited reserves the right to cancel or modify the process without assigning any reason and without any liability. This is not an offer.

Shwetabh Verma, Dy. Manager  
PFC Consulting Limited

A Wholly owned Subsidiary of Power Finance Corporation Ltd.  
(A Govt. of India Undertaking)

Registered Office: First Floor 'Utkal' Bldg., 1, Balaichand Lane, Connaught Place, New Delhi 110001, India Ph: 91-11-23456123; Fax: 91-11-23456170; e-mail: [odishacmp@pfcindia.com](mailto:odishacmp@pfcindia.com)



## COMPUTER CENTRE UTKAL UNIVERSITY VANI VIHAR, BHUBANESWAR-751004

### TENDER NOTICE

Sealed tenders are invited from the reputed Manufacturing Firm/ Authorized Dealers for supply of rack mounted Servers / up-gradation of existing three nos. of IBM X-3650 rack mounted servers, Desktop Computers, Digital Managed I2 switch, 5KVA on-line UPS, 0.5KVA offline UPS, Wireless LAN (bridging), Wi-Fi, IP Camera with NVR, Window AC, Water cooler with Water purifier, battery for UPS, Computer Paper, Repairing of existing computer chairs & cables, 11 watt ceiling mounted CFL Bulb (Philips), Computer Consumables, 18.5 LED Monitors, Server based Anti-Virus for the centre. Tender documents with terms & condition to be downloaded from our website [www.utkaluniversity.ac.in](http://www.utkaluniversity.ac.in) from 10.03.2014. Sealed tender complete in all respect along with EMD (amount mentioned in tender document) and Tender form cost of Rs. 500/- (non-refundable) in shape of Banker's cheque/DD in favour of Prof. in Charge, Computer Centre payable at Syndicate Bank, Utkal University Campus Branch, Bhubaneswar must reach the office of the undersigned on or before 22.03.2014 by 3.00 P.M. Tender will be opened on 22.03.2014 at 4.00 P.M. in presence of tenderers/their representatives. For repairing and up-gradation work the firm should inspect the location from 10.00 A.M. to 5.00 P.M. in working days.

The right to accept or reject the lowest or any tender in part or full without assigning any reason is reserved.

Sd/- Prof. in Charge

## PSPCL Punjab State Power Corporation Limited

Regd. Off: PSPCL H.O. The Mall, Patiala-147001

### NOTICE INVITING TENDER

OFFICE OF CHIEF ENGINEER/S&M S&M SECRETARIATE OPP.  
RAJ GATE NO. 1, PSPCL LUSHIANA

Tender Enquiry No. : GM/2014/Dated 03.03.2014

Tender Notice for : Supply of Mild Steel Sections of following sizes conforming to IS 2062/2062 with above dimensions (Grade A Quality) and PSPCL's specifications Q&A No. dated 03.03.2014.



## KARNATAKA

Sampige Road  
Phone: 080 - 23

No. ED/KEA/ADMNCR-12/2013-14

### ADMISSION TO PROFESSION

- Applications are invited from eligible candidates of Karnataka Courses detailed herein under for the seats to be notified.
- Academic Eligibility

Sl. No.	For Admission to 1st Year	In Qualifying
1.	Medical / Dental (MBBS / BDS)	Passed in 2nd PUC / Languages and old Physics, Chemistry, and 3B category can
2.	Ayurveda, Homoeopathy, Unani, Naturopathy and Yoga (ISM & H)	Passed in 2nd PUC / Languages and old Physics, Chemistry, and 3B category can
3.	Engineering / Technology (B.E. / B.Tech)	Passed in 2nd PUC / Languages and old Physics and Maths Biology / Electronics 3B category candidate
4.	Architecture (B.Arch)	Passed in 2nd PUC / Compulsory optional aggregate in all the category candidates
5.	B.Sc. (Agriculture), B.Sc. (Forestry), B.Sc. (Sericulture), B.Sc. (Agri. Biotech), B.Sc. (Horticulture), B.H.Sc. (Home Science)	Passed in 2nd PUC / and Biology as option
6.	Bachelor of Veterinary Science and Animal Husbandry (B.V.Sc. & A.H.)	Passed in 2nd PU aggregate minimum English subjects. (H candidates)
7.	B.Tech. (Food Technology), B.Tech. (Dairy Technology), B.F.Sc. (Bachelor of Fisheries Science), B.Tech. (Food Science & Tech.) and B.Sc. (Ag. Marketing and Co-operation)	Passed in 2nd PUC / Mathematics and Bio
8.	B.Tech. (Agriculture Engineering)	Passed in 2nd PUC / and Mathematics as c
9.	B-Pharma	Passed in 2nd PUC / and Biology or Phys. Minimum of 45% of M 1, 2A, 2B, 3A and 3B. Passed in Diploma in by the Pharmacy Co. and has secured min 3A and 3B category c
10.	2nd Year B. Pharma	Passed in Diploma in by the Pharmacy Co. and has secured min

**Monitoring data of the stipulated environmental quality parameters being displayed at the entrance of the mine office**



Ref.: /DCMP/F&E/ES/06/ 8/19

Date: 30.11.2022

To

**Dy. Director General of Forest (Central),**  
Govt. of India,  
Ministry of Environment, Forests and Climate Change,  
Integrated Regional Office,  
A-3 Chandrasekharpur,  
Bhubaneswar-751023, Odisha

**Subject:** Dulanga Opencast Coal Mining Project (7 MTPA in an area of 785.37Ha.; Latitude 21° 50' 40" N to 22° 01' 30" N and Longitude 83° 42' 06" E to 83° 53' 43" E, of M/s National Thermal Power Corporation Ltd. (NTPC), Its Valley Coalfields, Dist: Sundargarh, Odisha - **Submission of Half Yearly Report on the status of compliance of the stipulated Environmental Clearance conditions.**

**Ref.:** MoEFCC Environmental Clearance Letter Number- J-11015/1140/2007-IA-II (M) dated 03<sup>rd</sup> March, 2014, J-11015/1140/2007-IA-II (M) dated 9<sup>th</sup> February, 2016 and J-11015/1140/2007-IA-II (M) dated 8<sup>th</sup> August, 2018.

Dear Sir,

With reference to the above, we are submitting herewith the Half Yearly Report on the status of compliance of the stipulated Environmental Clearance conditions including results of monitored data for the period from April 2022 to September 2022 with reference to the above mentioned EC Order issued by the Ministry of Environment, Forests and Climate Change, Govt. of India, for your kind information and necessary record please.

The softcopy of the same is being mailed to the email id: [roez.bsr-mef@nic.in](mailto:roez.bsr-mef@nic.in)

Thanking You.

Yours Faithfully,



(Neeraj Jalota)

General Manager & Head of Project

Encl: As above

Copy to:

1. **The Central Pollution Control Board,**  
Zonal Office, Southern Conclave, Block -502, 5<sup>th</sup> & 6<sup>th</sup> Floors,  
1582 Rajdanga Main Road, Kolkata - 700107
2. **The Member Secretary,**  
State Pollution Control Board, Odisha,  
A/118, Nilakantha Nagar, Unit - VIII, Bhubaneswar - 751012

Page 1 of 25

दुलंगा कोल माइनिंग प्रोजेक्ट, द्वितीय चत, मेघ मल्लार, मिशन रोड, सुन्दरगढ़-770001 (ओडिशा), दूरभाष : 06622-275501(कार्यालय), फेस : 06622-275178  
Dulanga Coal Mining Project, 2nd Floor, Megh Malahar Mission Road, Sundargarh-770001 (Odisha), Phone : 06622-275501(C) Fax : 06622-275178

पंजीकृत कार्यालय : एन टी पी सी भवन, स्कोप कॉम्प्लेक्स, 7 इंस्टीट्यूशनल एरिया, लोधी रोड, नई दिल्ली - 110 003

कार्यालय पता नंबर : L40101 DL1975G01007098 डेलीफोन नं. : 011-24387333 फेस नं. : 011-24351014 ईमेल : [npsc@npsc.co.in](mailto:npsc@npsc.co.in), वेबसाइट : [www.npsc.co.in](http://www.npsc.co.in)

Registered Office : NTPC Bhawan, Scope Complex, 7 Institutional Area, Lodhi Road, New Delhi - 110 003

Company Identification No. : L40101DL1975G01007098 Telephone No. : 011-24387333 Fax No. : 011-24351014 E-mail : [npsc@npsc.co.in](mailto:npsc@npsc.co.in) Web Site : [www.npsc.co.in](http://www.npsc.co.in)

**DULANGA COAL MINING PROJECT (7.0 MTPA)  
SIX MONTHLY COMPLIANCE STATUSES OF ENVIRONMENTAL CLEARANCE  
CONDITIONS (PERIOD: April 2022 to September 2022)**

**Name of the Project:** Dulanga Opencast Coal Mining Project (7MTPA) in an area of 785.37 ha = (803.71 ha - 18.34 ha = 785.37 ha); Latitude 21°50'40"N to 22°01'30" N and Longitude 83°42'06"E to 83°53'43"E) of M/s NTPC Limited, Ib Valley Coalfields, Dist. Sundergarh, Odisha.

**Introduction:**

The said project is an Opencast Coal Mining Project with rated production capacity of 7.0 Million Tonne per Annum as per EC granted, is located in Sundergarh District, Odisha. The proposed project of NTPC Limited has been planned to cater the coal requirement of Darlipali Thermal Power Plant of NTPC Limited. The project has also obtained Consent to Establish (NOC) from Odisha State Pollution Control Board vide consent order no. 23564/Ind-II-NOC dated 27-11-2012 and Stage-II Forest Clearance from MoEF &CC (FC Division), GOI vide letter: F.No.8-23/2013-FC dated 23<sup>rd</sup> December, 2015.

This project has been granted environmental clearance by the Ministry of Environment, Forests & Climate Change (MoEF&CC) the then Ministry of Environment & Forest, (MOEF), Govt. of India, New Delhi, vide letter no. J-11015/1140/2007-LA.II (M) dated 03<sup>rd</sup> March, 2014 and subsequently amended vide letter no. J-11015/1140/2007-LA.II (M) dated 09<sup>th</sup> February, 2016. Further, the said EC has again been amended vide letter no. J-11015/1140/2007-LA-II (M) dated 8<sup>th</sup> August, 2018.

**Present Status of the Project:**

The Mining Operations have commenced from this block w.e.f. 28/02/2018 and had produced 52,92,094 Tonnes of Coal in the last financial year 2021-2022.

29,22,970.00 Tonnes of Coal produced till end of Sep-22 in Financial Year 2022-23

**Submission of Six-monthly Compliance Status Report of Environmental Clearance Conditions:**

This report is being submitted as per the condition stipulated in the Environmental Clearance Order. The point-wise six monthly compliance status of environmental clearance conditions of MoEF&CC Letter No. J-11015/1140/2007-LA.II (M) dated 03<sup>rd</sup> March, 2014 in respect of Dulanga Coal Mining Project for the period from April 2022 to September 2022 is furnished hereunder.

Page 2 of 25

**Point wise Compliance Report of Specific Conditions specified in Environmental Clearance Order is as given below**

Sl. No	Specific Conditions	Compliance Status
(i)	The maximum production from the mine at any given time shall not exceed the limit as prescribed in the EC.	The rated peak production capacity of the mine as per the EC granted and as per approved Mining Plan is 7.0 MTPA.  During the period from 1 <sup>st</sup> April, 2022 to 30 <sup>th</sup> September, 2022 the total production of coal is 29,22,970 Tonnes against the EC/CTO prescribed production limit of 7.0 MTPA.
(ii)	The Forest Clearance has been granted for 304.75 ha (273.68 ha within the Dulanga Coal Block and 31.07 ha of forest land outside the Coal Block including 4.94 ha of forest land coming within the safety zone in Dulanga Coal Mining Project) vide letter no. 8-23/2013-FC dated 10.01.2014. FC for balance 18.34 ha has not been granted. No mining activity shall be carried out in forest land for which FC has not been granted.	The Stage-I Forest Clearance (FC) has been accorded by MoEFCC for 304.75 ha (originally applied 323.09 ha.) of forest land (273.68 hectares within the Dulanga coal block and 31.07 hectares of forest land outside the coal block) including 4.94 hectares of forest land coming within safety zone in Dulanga coal mining project vide letter dated 10 <sup>th</sup> January 2014.  Forest Clearance for the balance 18.34Ha was not granted by MoEF&CC and hence no mining activity will be carried out in that 18.34 Ha of forest area; rather the area will be afforested by the State Forest Department from funds already deposited by NTPC with ad-hoc CAMPA.
(iii)	OB dump along the western side of an area of 244 ha would be brought to almost ground level for post-mining land use by re-handling of an estimated 112 Mm <sup>3</sup> of OB during 5 years after end of mine life (EOL). However, the dump along the east would be about 30m above ground level.	This has been incorporated in the Mine Closure Plan and shall be ensured at the time of mine closure.
(iv)	An estimated 112 Mm <sup>3</sup> of OB is proposed to be re-handled from the eastern and western OB dumps.	To be complied.

(v)	<p>It was stated that an area of 286.74 ha within the ML (which includes an area of 226.23 ha of quarry area) and an area of 179.72 ha outside the ML would be developed with plantation.</p>	<p>Plantation in quarry area will be done after mining and internal dumping is over in phases, based on availability of area.</p> <p>However, Plantation and Grassing Activities has been carried out over non-active Overburden Dump which spread over about 1.5 Ha of area with total 6120 no's of sapling over the Dump and 1200 kg of Stylo Hamata seeds all along the slope of non-active dump.</p> <p>Additionally, Plantation and Grassing, activities have been carried out over the Top Soil. About 400 nos of sapling over 1.27 Ha of area with 1200 kg of Stylo Hamata seeds all along the slope of Top Soil Dump.</p> <p>Till the end of September 2022, total numbers 10,157 of sapling has been planted during last monsoon period.</p> <p>Photos of Plantation activities carried out in different region enclosed as Annexure - I.</p> <p>We have already identified 320 Ha of area in Garjanpahad RF for carrying out bamboo plantation to improve wildlife (Elephant) Habitat. This has been envisaged in our approved Site Specific Wildlife Conservation Plan under activities to be implemented by DFO, Sundargarh. The entire funds for implementation of approved Site Specific Wildlife Conservation Plan in buffer zone by DFO, Sundargarh have been deposited with adhoc CAMPA.</p>
(vi)	<p>No fly ash from the linked TPPs shall be used in backfilling of the void without undertaking an environmental feasibility study and without prior approval of this Ministry under EIA Notification, 2006.</p>	<p>Noted.</p>
(vii)	<p>Option-3 be adopted, as committed by the proponent, as the most feasible option for diversion of Garia Nala, Baidhara Nala and Nala B and its realignment, whereby the plan for</p>	<p>Permission obtained from Dept. of Water Resources, Govt. Of Odisha for diversion of Garia Nalla and its tributaries (Baidhar Nallah and Nallah-B) flowing within the coal block boundary of Dulanga Coal Mining Project vide</p>

	their diversion to be taken up during the 8th and 10th year.	letter dated 23.08.2021.
(viii)	The fluoride in the groundwater both in dug wells and by installing peizometers in the study area at appropriate locations be monitored.	Fluoride in the groundwater from dug wells are being monitored at eight different locations in Core and Buffer areas by an NABL Accredited laboratory.  Peizometers being installed in the study area at different locations for monitoring of groundwater.  The analysis report of fluoride in groundwater collected from the different locations within the study area for the period from the month of April 2022 to September 2022 is annexed. Annexure - II.
(ix)	Transport of coal to Durlipalli TPS located at a distance of about 10kms shall be by MGR.	Coal transportation to Durlipalli Super Thermal Power Plant through MGR started from 04/01/2020. Coal transportation takes place through MGR only.
(x)	An integrated calendar plan of production including the details re-handling separately in external and internal dumps should be furnished to MOEF for record.	An integrated calendar plan of production including the details of re-handling separately in external and internal dumps has been furnished to MoEF&CC vide letter no. 0100/DLCMP/FD/ES/02/0814 dated 25/08/2014.
(xi)	Temporary OB dumps which require re-handling should be stabilized with grass and shrubs.	Currently we have two active O.B dumps which will be stabilized by proper Dozing and Grading.  Non-Active Part of OB dump has been stabilized with Grassing and Sapling Plant over the Dump. Photo has been attached as Annexure-III.
(xii)	Data available with the Rajiv Gandhi National Drinking Water Mission, Department of Rural Development be studied and recommendations therein for removal / treatment of fluorides, TDS, etc. in drinking water be followed for providing safe drinking water to R&R colony and to	Noted. UV Water purifiers have been provided to dwelling units of R&R Colony for ensuring safe drinking water.

	the nearby villages.	
(xiii)	Mining shall be carried out as per statute at a safe distance from Garia Nala and its diversion canal and the diverted Baidhara nala and nala 'B' Nala flowing within the lease boundary. The bund/embankment to be constructed along diverted canal of Garia nala shall be designed taking into account the highest flood level, based on past data, so as to guard against mine inundation.	Mining is being carried out as per statute at a safe distance from Garia Nala and its diversion canal and the diverted Baidhara nala and nala 'B' Nala flowing within the lease boundary. The design of the embankment shall be constructed as per the approved design of competent authority i.e. Water Resource Department. Presently working has been carried out with the safety distance of 40m from Garia Nalla.
(xiv)	Topsoil shall be stacked properly within the ML with proper slope at earmarked site of 3.84 ha and shall be concurrently used for reclamation and development of green belt within a year of its generation.	Topsoil is being stacked within ML with proper slope at earmarked site. 3,71,700.65 m <sup>3</sup> of topsoil has been stacked at the earmarked site as on 30/09/2022. During 2021-22 total 1.27 Ha of Topsoil Dump has been stabilized with grassing activities (Scientific Name-Style Hamata). Photograph has been attached as Annexure - IV.
(xv)	A temporary external OB dump in an area of 106.62 ha and of 60m height for the initial period of 2.5 years shall be created for dumping 38.5 Mm <sup>3</sup> of OB, which would be reclaimed with plantation and after 2.5 to 3 year. There would be no external OB dumping from 5th year onwards. The temporary OB dumps which require re-handling shall be stabilized with grass and shrubs.	In line with the Forest Clearance accorded by MoEF&CC, 18.34 Ha. of forest land initially involved in dump area has been left out and thereafter the revised dump area has been reduced to 86.0 Ha for accommodating 28.5 Million Cubic Meter of OB as per mining plan. The temporary OB dumps will be planted with grass and shrubs to avoid erosion and dust pollution.
(xvi)	Area brought under afforestation shall be not less than 466.46 ha which includes 286.74 ha within the ML and 179.72 ha outside the ML would be reclaimed with plantation, which includes 351.23 ha of reclaimed quarry, 106.50 ha of reclaimed external OB dump, 3.84 ha	The stipulation shall be followed. Plantation in quarry area will be done after mining and internal dumping is over in phases based on availability of area. 320 Ha in Garjanpohad RF Outside ML area has been earmarked for carrying out bamboo plantation to improve wildlife

	<p>of topsoil dump, 2.75 ha of coal stockyard, 2.14 ha of surface water reservoir and an area of 83.74 ha undisturbed shall be developed into green belt within the first 3 years.</p>	<p>(elephant) habitats envisaged in approved Site-Specific Wildlife Conservation Plan under activities to be implemented by DFO, Sundargarh.</p> <p>The entire funds for implementation of above plan in buffer zone by DFO, Sundargarh have been deposited with adhoc CAMPA.</p> <p>Till end of September 2022, total of 9388 numbers of saplings have been planted during 2022-23.</p>
(xvii)	<p>Catch drains and siltation ponds of appropriate size shall be constructed to arrest silt and sediment flows from soil, OB and mineral dumps. The water so collected shall be utilized for watering the mine area, roads, green belt development, etc. The drains shall be regularly desilted and maintained properly.</p>	<p>Catch drains and siltation ponds of appropriate size are constructed to arrest silt and sediment flows from soil, OB and mineral dumps. Garland drain is so designed that it will discharge the rainwater to settling pond.</p> <p>The Khapurikachhar, Khuntijharis and Beldihi OB dump yard garland drains are so designed that it will discharge the rainwater to Garia nala through overflow of Sedimentation Pond.</p> <p>To reduce the mine working/ OB dump, catchment water drain / Garland drain has been made. Sedimentation pond/ settling pond has been constructed or De-Silted.</p> <ul style="list-style-type: none"> <li>➤ About 2840m of garland drain with width varies from 1.5m to 2m and depth varies from 1.5m to 2m has been constructed along the OB dump-1B with proper settling pond before discharge of rainwater to Garia Nalla.</li> <li>➤ About 1620m of garland drain with width varies from 1.5m to 2m and depth varies from 1.5m to 2m has been constructed along the OB dump-1A with proper settling pond has been constructed before discharge of rainwater to Garia Nalla.</li> <li>➤ About 2350m of garland drain having width varies from 1.5m to 2m and depth varies</li> </ul>

		<p>from 1.5m to 2m has been constructed along the up-dip side of mine and discharge to sedimentation pond before discharge to Garia Nalla and prevent outside water to rush inside.</p> <ul style="list-style-type: none"> <li>➤ Adequate embankment has been provided along the Garia Nalla.</li> <li>➤ About 2578m of garland drain having width varies from 1.5m to 2m and depth varies from 1.5m to 2m has been constructed along Khuntijheria OB dump and discharge to sedimentation pond before discharge to Garia Nalla.</li> <li>➤ About 860m of garland drain having width varies from 1.5m to 2m and depth varies from 1.5m to 2m has been constructed along Beldihi OB dump and discharge to sedimentation pond before discharge to Garia Nalla.</li> </ul>
(xviii)	The entire transportation of 21,210 TPD of coal from the mine to the linked Darlipali Super Thermal Power plant shall be by MGR only with wagon loading by Silo. Transportation of coal by road is not permitted.	<p>Coal transportation to Darlipali through MGR started on 01.01.2020. Coal transportation take place through MGR Only.</p> <p>Coal transport may be carried out on requirement basis as per the recent circular no-E(P)Amendment Rule,2022 vide MoEF &amp; CC Gazette Notification-S.O. 1561(E) dated-21.05.2020 and OM Ref. F.No. J-13012/91/2008-1A.11(T).</p>
(xix)	An STP shall be provided for the township/ colony to treat the domestic effluents to prescribed standards and for their reuse in project activities.	For offices septic tank followed by soak pit has been provided. Construction has been made as per BIS specification.
(xx)	Area brought under afforestation shall be not less than 466.46 ha which includes 286.74 ha within the ML and 179.72 ha outside the ML would be reclaimed with plantation, which includes 351.23 ha of reclaimed quarry, 106.50 ha of reclaimed external OB dump, 3.84 ha of topsoil dump, 3.75 ha of coal	Noted and shall be complied with.

	<p>stockyard, 2.14 ha of surface water reservoir and an area of 83.74 ha undisturbed shall be developed into green belt within the first 3 years.</p>	
(xxi)	<p>A Project specific Wildlife Conservation Plan prepared for Rs 73 lakhs as capital costs and Rs.61 lakhs (annual) for the project for conservation of wild fauna including Elephant, Sloth Bear and a number of Schedule-II fauna found in the study area and for conservation of their habitat shall be implemented in consultation with the Forest and Wildlife Departments of the State Government. The Plan shall include creation of a passageway (undisturbed area through the block as a passage for the free movement of the elephants and for wild animals which may venture into the coal mine areas) at all stages of the mine operation in conjunction with the neighboring mines which come up in the area to allow movement of these fauna through the project area. The passageway shall be forested with species from the natural habitat to provide connectivity to enable them to reach the neighboring forests unhindered. Solar fencing would be done along the quarry which would be shifted as the mine develops. Grasslands shall be developed as part of Habitat Restoration in the study area and tree and plant species such as bamboo which constitute the natural diet of the elephants and plant species suitable for bears shall be developed as part of mine reclamation and eco-regeneration of the study area regularly visited by the elephants. At the post mining stage, the mine shall be restored as a habitat for the wildlife found in the</p>	<p>The Site specific Wildlife Conservation Plan as approved by the Chief Wildlife Warden, Odisha vide letter no. 9597/LWI.(C) SSP-274W2012 dated 03/12/2013 is under implementation.</p> <p>Funds for implementation of the same in the buffer zone by the State Forest Department has already been deposited in Ad-hoc CAMPA account vide UTR No. SBEN714073448793 dated 14/03/2014 for Rs.4,49,70,000/-.</p> <p>The stipulated conditions shall be complied with.</p>

	pre-mining stage. The WL Plan shall include the use of sirens to alert the animals during MGR movement, sensitizing the rail drivers and minimizing speed during such crossings shall also be implemented.	
(xxii)	The project authorities shall also participate in a Regional Conservation Plan as and when prepared in the future by the State Govt. for the conservation of flora-fauna found in the region as a whole.	Funds for the Regional Wildlife Conservation Plan have already been deposited in Ad-hoc CAMPA as per the revised rate fixed by the State Govt. @ Rs. 43,000/- per Ha for the total leasehold area vide UTR No. SBIN714073453867 dated 14/03/2014 for Rs.3,27,84,060/-.
(xxiii)	The progress made on the implementation of the Wildlife Conservation Plan shall be monitored by creation of a Committee which includes experts in ecology and wildlife. The status of budgetary provision of capital and revenue expenditure on the various activities under the Project specific and Regional WL Conservation Plan and the status of the Plans shall be regularly reported to the MOEF RO, Bhubaneswar and also uploaded on the company website.	Approved Site Specific Wildlife Conservation Plan already envisions for an executive committee under the chairmanship of DFO, Sundargarh with Mine manager, RO Hengir, RO Gopalpur, 3 VSS Presidents and mine worker representatives in effective implementation of the site specific wildlife conservation plan. This is under formation.  Additionally, we have Dr Nirakar Bhol DC Head of the Department, COLLEGE OF FORESTRY, QUAT, BHUBANESWAR an external expert in the field of ecology and wildlife as a part of our WLCP implementation committee.
(xxiv)	Third Party monitoring of implementation of WL Conservation Plan shall be carried out and for monitoring the utilization of funds earmarked for implementation of the WL Plan.	Dr Nirakar Bhol DC Head of the Department, COLLEGE OF FORESTRY, QUAT, BHUBANESWAR has been appointed for third party monitoring of implementation of WL Conservation Plan.
(xxv)	A detailed R&R Plan shall be formulated for the 417 PAPs and 309 homestead losers as per R&R Policy of the State Govt. and shall be completed within December 2014; R&R shall include specific income generation schemes, skill development and capacity building, etc. The details of status of	A detailed R&R Plan for the project affected families of Dulanga Coal Mining Project has been approved by the District Magistrate & Collector, Sundargarh with a total financial outlay of Rs. 112 Crores.  The plan is being implemented accordingly for all eligible PAPs in phases.

	implementation and expenditure on the various activities under the R&R Action Plan for the total budget of R&R shall be uploaded on the company website.	Expenditure incurred up to Sept 2022 : 1. R & R Colony Construction : Rs 97 Crores 2. R & R benefits (Incl Annuity) : Rs 154.47 Cr (Rs 100.28 Cr for R&R + Rs 54.19 Cr for Annuity)
(xxvi)	CSR Plan with a total budgetary provision of Rs 15.92 crores (capital) and 7.34 crore/annum recurring cost) shall be implemented for the life of the project. The details of village-wise activities undertaken for the amount of Rs 67.69 lakhs already spent on CSR shall be uploaded on the company website and further, details of village-wise activities for provision of Rs 30-40 Cr for CSR for the first 5 years and Rs5/T of coal as recurring expenditure shall also be provided in the annual report and the compliance report furnished to MOEF RO, Bhubaneswar.	The budgetary provision of Rs. 15.92 crores (Capital) and 7.34 crore/ annum (recurring cost) pertains to the Environment Management Plan for the project and shall be implemented during mining operations for the life of the project. NTPC Dulanga Coal Mining Project has spent a total of approx. Rs 0.5 Cr under different heads like health, education, infrastructure, drinking water, capacity building/ skill development during Apr 2022 to Sept 2022.
(xxvii)	A detailed R&R Plan shall be formulated in consultation with the various stakeholders as per prevalent R&R Policies and would cover R&R for individuals and for the displaced community as a whole.	R&R plan for the individuals and for the displaced community as a whole has been prepared in-line with the National R&R Policy & the OPRR Policy and the same has been duly approved of by the District Magistrate & Collector, Sundargarh.
(xxviii)	Various activities under R&R Plan should be completed within time-schedule. The detailed R&R and CSR Action Plans be prepared and implemented.	Detailed R&R plan has already been prepared, approved of and is being implemented in phases.
(xxix)	An amount of 67.69 lakhs has been already spent on CSR and further, a provision of Rs 30-40 crores shall be earmarked for CSR for the first 5 years and 5/T of coal as recurring expenditure adjusted to the annual inflation rate.	Noted and being adhered to. NTPC Dulanga Coal Mining Project has spent a total of approx. Rs. 0.5 Cr under different heads like health, education, infrastructure, drinking water, capacity building/ skill development during 2022-23 till Sept-2022. Photograph has been attached as Annexure-V.

(xxx)	An amount of Rs.1592 lakhs (capital costs) and Rs.734 lakhs (recurring) costs earmarked for EMP shall be implemented and detail thereof furnished as part of the compliance report and also uploaded on the company website.	Amount earmarked for EMP are being utilized for implementation and being complied with.
(xxxi)	Coal transportation in pit: Rear Dumper, Surface to Siding through Conveyor belts and loading at siding by rail.	Noted and being adhered to. Presently transportation is being done in rear dumpers from face to stock yard and wagon loading of coal through CHP commenced in April'22.
(xxxii)	The production shall be within the same Mining Lease area.	Adhered to.
(xxxiii)	The OB shall be completely re-handled at the end of the mining.	The OB will be completely re-handled at the end of the mining as per the approved Mining Plan.
(xxxiv)	Final mine void depth will not be more than 41m. The void area will be converted into water body. The rest of the area will be back filled upto the ground level and covered with about a meter thick top soil and put to use.	Shall be complied and the same has already been incorporated in the approved Mining Plan for the project.
(xxxv)	Garland drains be provided.	Catch drains and siltation ponds of appropriate size are constructed to arrest silt and sediment flows from soil, OB and mineral dumps. The Mine boundary garland drain is so designed that it will discharge the rain water to settling pond.  The Khapurikachhar, Khuntijharia and Beldihi OB dump yard garland drains are so designed that it will discharge the rainwater to Garia nala through overflow of Sedimentation Pond.  To reduce the mine working/ OB dump, catchment water drain / Garland drain has been made. Sedimentation pond/ settling pond has been constructed or De-Silted.  ➤ About 2840 m of garland drain will

		<p>width varies from 1.5m to 2m and depth varies from 1.5m to 2m has been constructed along the OB dump-1B with proper settling pond before discharge of rainwater to Garia Nalla.</p> <ul style="list-style-type: none"> <li>➤ About 1620m of garland drain with width varies from 1.5m to 2m and depth varies from 1.5m to 2m has been constructed along the OB dump-1A with proper settling pond has been constructed before discharge of rainwater to Garia Nalla.</li> <li>➤ About 2350m of garland drain having width varies from 1.5m to 2m and depth varies from 1.5m to 2m has been constructed along the up-dip side of mine and discharge to sedimentation pond before discharge to Garia Nalla and prevent outside water to rush inside.</li> <li>➤ Adequate embankment has been provided along the Garia Nulla.</li> <li>➤ About 2578m of garland drain having width varies from 1.5m to 2m and depth varies from 1.5m to 2m has been constructed along Khuntijharia OB dump and discharge to sedimentation pond before discharge to Garia Nalla.</li> <li>➤ About 860m of garland drain having width varies from 1.5m to 2m and depth varies from 1.5m to 2m has been constructed along Beldihi OB dump and discharge to sedimentation pond before discharge to Garia Nulla.</li> </ul>
(xxxvi)	The land after mining shall be brought back for agriculture purpose.	Noted
(xxxvii)	Mine water should be treated for discharge into the lagoon. The quality of lagoon water shall be regularly monitored and mitigation measures taken.	Shall be complied with. Presently, no Mine Water is being discharged in lagoons.
(xxxviii)	Everybody in the core area should be provided with mask for protection	Everybody in the core area are being provided with dust mask for protection against fugitive

	against fugitive dust emissions.	dust emissions as a part of PPE during mining operations.
(xxxix)	Dust mask to be provided to everyone working in the mining area.	Dust masks are being provided to all personnel working in the mining area.
(xl)	The supervisory staff should be held personally responsible for ensuring compulsory regarding wearing of dust mask in the core area.	The supervisory staffs are instructed to ensure wearing of in the core area and the same is being complied with.
(xli)	People working in the core area should be periodically tested for the lung diseases and the burden of cost on account of working in the coal mine area.	Being adhered with. Chest X - Ray is a part of Occupational Health Check up, Regular health check up has been carried out for the workers. As per instructions, Initial Medical Examination has already done for all the employees working in mining operations as well periodic health check-up of the workers are being carried out.
(xlii)	The mining area should be grounded by green belt having thick closed thick canopy of the tree cover.	The stipulations shall be adhered to.
(xliii)	The embankment constructed along the river boundary shall be of suitable dimensions and critical patches shall be strengthened by stone pitching on the river front side and stabilized with plantation so as to withstand the peak water flow and prevent mine inundation.	As per directions, design of the embankment will be made accordingly. Extensive plantation activities shall be carried out on either sides of the embankment.
(xliv)	There shall be no overflow of OB into the river and into the agricultural fields and massive plantation of native species shall be taken up in the area between the river and the project.	No Surface runoff from OB Stacks /dump being discharged into any nearby agricultural fields.
(xlv)	OB shall be stacked at one earmarked external OB dumpsite(s) only. The ultimate slope of the dump shall not exceed 28°. Monitoring and management of existing reclaimed	The stipulation shall be adhered to. Till end of Sept-22, 19,00,000 m <sup>3</sup> of solid waste has been dumped in the void created

	dumpsites shall continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment & Forest and its concerned Regional office on yearly basis.	after mining.
(xvi)	Garland drains (size, gradient and length) and sump capacity shall be designed keeping 50% adjoining the mine site. Sump capacity shall also provide adequate retention period to allow proper setting of silt material.	As per the stipulation, Garland drains (size, gradient and length) and sump capacity have been designed keeping 50% adjoining the mine site.  Dimensions vary like 2m, 4m & 3m with the gradient of 1:30.  Sump capacity has been provided with adequate retention period to allow proper settling of silt materials.
(xvii)	Dimension of the retaining wall at the toe of the dumps and OB benches within the mine to check run-off and siltation shall be based on the rainfall data.	Dimension of the retaining wall at the toe of the dumps and OB benches within the mine to check run-off and siltation will be designed based on the rainfall data of the area.  Construction of retaining wall will be carried out once we reach the optimum height and area section wise.  At present there is no run off from the OB.
(xlviii)	Crushers at the CHP of adequate capacity for the expansion project shall be operated with high efficiency bag filters, water sprinkling system shall be provided to check fugitive emissions from crushing operations, conveyor system, haulage roads, transfer points, etc.	CHP of capacity 1325 tph is constructed and operational since 28/01/2022 with inbuilt mist type dust suppression system in conveyors.  Dust suppression arrangements have also been provided to check fugitive emissions from crushing operations, haulage roads, transfer points, etc.
(xlix)	Drills shall be wet operated.	Wet operated drills are being used during drilling operation.
(l)	The project authorities shall undertake regular repairing and tarring of roads used for mineral transportation. A3-tier green belt comprising of a mix of native species shall be developed all along the	Being complied with.  Avenue Plantation has been taken up during the monsoon season along the roads constructed by NTPC – DCMP.  As of now 6 kms of road have been done with

	major approach roads.	avenue plantation.
(ii)	Controlled blasting shall be practiced with use of delay detonators and only during daytime. The mitigative measures for control of ground vibrations and to arrest the fly rocks and boulders shall be implemented.	Controlled blasting during daytime are in practiced with use of delay detonators and being done only in daytime. The mitigative measures for control of ground vibrations and to arrest the fly rocks and boulders are being implemented.  Scientific study of controlled blasting designed by ISM, Dhanbad. Regular controlled blasting done within the proposed design limit.  Additionally, all stipulations made by DCIMS to this effect shall duly adhered to.
(iii)	A Progressive Mine Closure Plan shall be implemented by reclamation and afforestation of 351.23 ha of the total quarry area of 567.19 ha by planting native plant species in consultation with the local DFO/Agriculture Department. The density of the trees shall be around 2500 plants per ha. The balance 159.55 ha degraded area being converted into a water reservoir of 45-50m depth at the post mining stage shall be gently sloped along the upper benches an stabilized and reclaimed with plantation	Mine Closure Plan has already been approved as a part of Mining Plan and it envisages the stipulations as made herein by the Ministry.  It shall be duly implemented.
(iii)	A temporary external OB dump in an area of 106.62 ha and of 60m height for the initial period of 2.5 years shall be created for dumping 38.5 Mm <sup>3</sup> of OB, which would be reclaimed with plantation and after 2.5 to 3 years. There would be no external OB dumping from 5th year onwards. The temporary OB dumps which require re-handling shall be stabilized with grass and shrubs.	As per Forest Clearance accorded by MoEF&CC, 18.34 Ha. of forest land involved in dump area has been left out and not approved for diversion. The revised dump area has been reduced to 86.0 Ha for accommodating 28.5 Million Cub Meter of OB for initial 4 years.  However, due to local law & order issues (i.e. resistance from the villagers for rehabilitation activities), total proposed quantity i.e. 28.5 Million Cu.M is unable to accommodate in the external OB Dump. Till end of Sep-22, approx.7.0 Million Cu.M of OB is accommodated and the balance OB Quantity to be accommodated at the earliest.

		<p>Presently dumping activities are being carried out at Khapurikhachar OB dump, Beldihi OB Dump and Inpit Dump.</p> <p>Inactive OB dump of Khapurikhachar having 1.5 Ha. has been grassed with different varieties along with local sapling planted and along the slope with Stylo Hamula grass.</p>
(iv)	The proponent should prepare restoration and reclamation plan for the degraded area. The land be used in a productive and sustainable manner.	Restoration and Reclamation plan for the degraded area will be prepared. The land shall be used in a productive and sustainable manner.
(iv)	Compensatory Ecological & Restoration of waste land, other degraded land and OB dumps in lieu of breaking open the land be carried out	It shall be implemented.
(vi)	The mining should be phased out in sustainable manner. No extra over burden dumps are permitted.	Stipulation shall be strictly adhered to during mining operations.
(vii)	No groundwater shall be used for mining operations.	<p>No groundwater shall be used for mining operations.</p> <p>However, ground water will be used for potable use. NOC for ground water withdrawal in respect of Dulanga coal mining project has been accorded by the Central Ground Water Authority, New Delhi vide letter No. 21-4 (513)/SER/CGWA/2013-1982 dated 04<sup>th</sup> Dec. 2017 and renewed vide NOC No. CGWA/NO/MIN/REN/2/2022/7124 which is valid from 04<sup>th</sup> Dec. 2021 to 03<sup>rd</sup> Dec 2023.</p>
(viii)	Regular monitoring of groundwater level and quality shall be carried out by establishing a network of existing wells and construction of new piezometers. The monitoring for quantity shall be done four times a year in pre-monsoon (May), monsoon (August), post-monsoon (November) and winter (January) seasons and for quality in May. Data	<ol style="list-style-type: none"> <li>1. Regular monitoring of groundwater level and quality has already been started by engaging an NABL Accredited as well as OSPCB empanelled laboratory.</li> <li>2. Frequency of monitoring is as per the schedule mentioned.</li> <li>3. Record of Ground water level for Pre Monsoon (April 2022) and Post Monsoon Season (August 2022) are annexed.</li> </ol>

	thus collected shall be submitted to the Ministry of Environment & Forests and to the Central Pollution Control Board quarterly within one month of monitoring.	Annexure -VI. 4. The ground water quality report for the month of April 2022 to September 2022 is annexed for your kind reference and necessary record. Annexure – VII.
(ix)	The Company shall put up artificial groundwater recharge measures for augmentation of groundwater resource in case monitoring indicates a decline in water table. The project authorities shall meet water requirement of nearby village(s) in case the village wells go dry due to dewatering of mine.	Shall be adhered with if required. We have already commenced construction of rain water harvesting structures in our temporary office building. However, water tankers are being deployed in nearby villages during summer season as a part of Community development activity.
(x)	Sewage treatment plant shall be installed in the existing colony. ETP shall also be provided for workshop and CHP wastewater.	ETP having 50KLD capacity has been constructed and is being used for treatment of Effluent water generated during Washing of Wheel. Inlet and outlet water of ETP whose water quality has been monitoring and all the parameter are under permissible limit and report has been annexed. Annexure-VIII.
(xi)	Besides carrying out regular periodic health check-up of their workers, 10% of the workers identified from workforce engaged in active mining operations shall be subjected to health check-up for occupational diseases and hearing impairment, if any, through an specialized agency/ institution within the District/State and the results reported to this Ministry and to DGMS.	As per instructions, periodic health check- up of the workers are being carried out concurrent with mining operation.
(xii)	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 3 years (for any one particular season which is consistent in the time series), and the report	Mining operation has been started in February 2018. Land use map for both core and buffer has been prepared on a scale of 1: 5000 based on Satellite Imagery path available on Feb 2021 and was submitted with last half yearly compliances.

	submitted to MOEF and its concerned Regional office.	
(xiii)	A detailed Final Mine Closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment & forests within 6 months of grant of Environmental Clearance.	Detailed Final Mine Closure Plan already submitted to the MoEF&CC vide our letter ref no: 0100/ DLCMP/ED/ES/ 02/ 0814 dated 25/08/2014.
(xiv)	The project authorities shall in consultation with the Panchayats of the local villages and administration identify socio-economic and welfare measures under CSR to be carried out over the balance life of the mine.	Various socio-economic and welfare measures are being undertaken as initial community development in consultation with the Panchayats of the local villages and administration and the same is being carried out accordingly. This practice shall be followed over the entire mine life.
(xv)	The commitment made by the Proponent to the issue raised during Public Hearing shall be implemented by the Proponent.	Being implemented accordingly
(xvi)	<p>Corporate Environment Responsibility :</p> <p>a. The Company shall have a well laid down Environment Policy approved by the Board of Directors.</p> <p>b. The Environment Policy shall prescribe for standard operating process/procedures to bring into focus any infringements/ deviation/violation of the environmental or forest norms/conditions.</p> <p>c. The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance</p>	<p>The Corporate Environment Responsibility Policy of NTPC already exists and the same is also being revised from time to time.</p> <p>Recently Corporate Environment policy has been revised in 2017 Copy of the said Policy already submitted at your office along with EC Return June 2018.</p> <p><b>Hierarchical System of the Environment Management Cell is given below:</b></p> <ul style="list-style-type: none"> <li>• Chairman (1.0 No.): Head of Project</li> <li>• Advisers (2.0 Nos) : Head of Departments</li> <li>• Members (3.0 Nos.): Env. Engineers</li> <li>• Secretary (1.0 No.): Mine Manager.</li> </ul> <p><b>System of Reporting of Reporting of occurrence of any non compliance of EC</b></p>

**चुनौती/ Challenge**

	<p>conditions shall be furnished.</p> <p>d. To have proper checks and balances, the company shall have a well laid down system of reporting of non-compliances/violations of environmental norms to the Board of Directors of the company and/or shareholders or stakeholders at large.</p>	<p>conditions is as give below:</p> <ul style="list-style-type: none"> <li>▪ Regular meeting of Environment Management Cell</li> <li>▪ Discussion on Pending Issues</li> <li>▪ Discussion and review on action taken on points of previous meeting.</li> <li>▪ Formulation of points for future</li> <li>▪ Discussion on Non-compliance</li> <li>▪ Discussion of such Non-Compliance reports during meeting of EMC for early rectification.</li> </ul>
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Sl. No	General Conditions	Compliances Status
(i)	No change in mining technology and scope of working shall be made without prior approval of the Ministry of Environment and Forests.	Any changes in mining technology and scope of working will be submitted to MoEF&CC well in advance for approval.
(ii)	No change in the calendar plan of production for quantum of mineral coal shall be made.	There will be no change in the calendar plan of production for quantum of coal.
(iii)	Four ambient air quality monitoring stations shall be established in the core zone as well as in the buffer zone for PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , and NO <sub>x</sub> 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>Four nos. of ambient air quality monitoring stations have already been established in consultation with the Odisha State Pollution Control Board at different locations in the core zone as well as in the buffer zone for monitoring of air quality parameters as mentioned such as PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, and NO<sub>x</sub>.</p> <p>Heavy metals such as Hg, As, Ni, Cd and Cr, etc. are also carried out once in six months.</p> <p>The abstract of monitoring reports for the period from April 2022 to September 2022 is enclosed for your kind reference and necessary record. <b>Annexure – IX.</b></p> <p>Also OI (One) No. Continuous Ambient Air Quality Monitoring Station has been installed at our site in monitor the air quality. Photograph has been attached as <b>Annexure – X.</b></p>

(iv)	<p>Data on ambient air quality (PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, and NO<sub>x</sub>) and heavy metals such as Hg, As, Ni, Cd, Cr, and other monitoring data shall be regularly submitted to the Ministry including its concerned Regional Office and to the State Pollution Control Board and the Central Pollution Control Board once in six months. Random verification of samples through analysis from independent laboratories recognized under the EPA rules, 1986 shall be furnished as part of compliance report.</p>	<p>Monitoring reports are being submitted biannually as per order to the following authorities,</p> <ol style="list-style-type: none"> <li><b>Dy Director General of Forest (Central),</b> Ministry of Environment, Forest and Climate Change (MoEF&amp;CC), Integrated Regional Office, A/3, Chandrasekharpur, Bhubaneswar - 751023, Odisha</li> <li><b>The Central Pollution Control Board,</b> Zonal Office, Southern Conclave, Block -502, 5<sup>th</sup> &amp; 6<sup>th</sup> Floors, 1582 Rajulanga Main Road, Kolkata - 700107, West Bengal</li> <li><b>The Member Secretary,</b> State Pollution Control Board, Odisha, A/11B, Nilakantha Nagar, Unit - VIII, Bhubaneswar - 751012, Odisha</li> </ol>
(v)	<p>Adequate measures shall be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in blasting and drilling operations, operation of HEMM, etc. shall be provided with ear plugs/muffs.</p>	<p>Adequate measures are taken for control of noise levels below 85 dBA in the work environment during the operation phase of mining block.</p> <p>Workers in high noise environment are also provided with ear plugs/muffs.</p>
(vi)	<p>Industrial wastewater (workshop and wastewater from the mine) shall be properly collected, treated so as to conform to the standards prescribed under GSR 422(E) dated 19th May 1993 and 31st December 1993 or as amended from time to time before discharge. Oil and grease trap shall be installed before discharge of workshop effluents.</p>	<p>There is provision of Effluent Treatment Plant (ETP) along with establishment of workshop at site within the leasehold area.</p> <p>The said ETP is under in service.</p> <p>The treated wastewater will be reused for vehicle washing. No wastewater from work shop allowed to be discharged to outside under any circumstances.</p>
(vii)	<p>Vehicle emissions shall be kept under control and regularly monitored. Vehicles used for transporting the mineral shall be covered with tarpaulins and optimally loaded.</p>	<p>Regular pollution monitoring of all vehicles involved in the mining project are in practice to control emission during operation of the mine.</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.	Monitoring of environmental quality parameters are being carried out through establishment of adequate number and type of pollution monitoring and analysis equipment in consultation with the Regional Office, State Pollution Control Board (SPCB), Jharsuguda and data is being analyzed through a laboratory recognized under EPA Rules, 1986.
(ix)	Personnel working in dusty areas shall wear protective respiratory devices and they shall also be provided with adequate training and information on safety and health aspects.	Protective respiratory devices are available to personnel working in dusty areas. They are provided with adequate training and information on safety & health aspects once in a year.
(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 measures, if needed and records maintained thereof. The quality of environment due to outsourcing and the health and safety issues of the outsourced manpower should be addressed by the company while outsourcing.	Initial medical examination of all the workers deployed in the mine has been taken and periodically health check-up is being done. A schedule is prepared for implementation of Occupational Health Surveillance Programme of workers to determine the impact due to exposure to dust and to take corrective measures for the same. Compliances regarding environment quality, health issues of outsourced manpower are taken care of during outsourcing.
(xi)	A separate environmental 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.	A separate Environmental Management Cell (EMC) under the control of senior executive who directly reports to the head of the company already exists for the project. EMC meetings are held regularly.
(xii)	The funds earmarked for environment 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 its concerned Regional Office.	The requisite funds for environment protection measures have been included in the project cost. Financial provision stipulated towards environment protection measures will not be diverted for other purpose.

(xiii)	The Project authorities 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 & Forests at <a href="http://envfor.nic.in">http://envfor.nic.in</a> .	Complied and compliance thereof has been mentioned in the first six-monthly EC compliance (April 2014 to Sept. 2014) vide letter dated 19/11/2016.
(xiv)	A copy of the 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 also be displayed on company's website.	Complied and compliance thereof has been mentioned in the first six-monthly EC compliance (April 2014 to Sept.2014) vide letter dated 19/11/2016.
(xv)	A copy of the 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.	Complied.
(xvi)	The clearance letter shall be uploaded on the company's website. The compliance status of the stipulated environmental clearance condition shall also be uploaded by the project authorities on their website and updated at least once every six months so as to bring the	The clearance letter has been uploaded on the company's website.  The compliance and the monitoring data of the stipulated environmental quality parameters being displayed at the entrance of the mine office and uploaded on the NTPC website.  Photograph has been attached as Annexure-XI.

	same in public domain. The monitoring data of environmental quality parameter (air, water, noise and soil) and critical pollutant such as PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> and NO <sub>x</sub> (ambient) and critical sectorial parameters shall also be displayed at the entrance of the project premises and mine office and in corporate office and on company's website.	
(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 Offices of CPCB and the SPCB.	Six monthly progress reports are being submitted regularly.  Six monthly progress report for the period April 2022 to September 2022 is submitted herewith.
(xviii)	The Regional Office of this Ministry located in the Region 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.	The project authorities always extend full cooperation to the office(s) of the Regional Office by furnishing the 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 also be uploaded on the company's website along with the status of compliance of EC conditions and shall be sent to the respective Regional Office of the MoEF by e-mail.	The Environmental Statement for each financial year ending 31 <sup>st</sup> March are being submitted to the Odisha State Pollution Control Board and Regional Office of MoEF&CC in prescribed Form-V and the same is also being uploaded on NTPC website.  Last submission was made for FY 2021-2022 is submitted on 24.09.2022.
5.	The proponent shall abide by all the commitments and recommendations made in the EIA/EMP report so also during their presentation to the EAC.	Shall abide with all the commitments and recommendations made in the EIA/EMP report so also during the presentation to the EAC.

6.	The proponent is required to obtain all necessary clearances/approvals that may be required before the start of the project. The Ministry or any other competent authority may stipulate any further condition for environmental protection.	All necessary clearances/approvals that are required for the project are obtained. We abide by the further condition for environmental protection issued by the Ministry or any other competent authority.
7.	The Proponent shall setup an Environment Audit cell with responsibility and accountability to ensure implementation of all the EC Conditions.	An Environment Audit Cell has been set up with responsibility and accountability to ensure implementation of all the EC Conditions.
8.	The Ministry or any other competent authority may stipulate any further condition for environmental protection.	Shall abide by the further condition for environmental protection issued by the Ministry or any other competent authority.
9.	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.	Shall abide by this stipulated condition.
10.	The above conditions 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 Environment (Protection) Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and Rules. The proponent shall ensure to undertake and provide for the costs incurred for taking up remedial measures in case of soil contamination, contamination of groundwater and surface water, and occupational and other diseases due to the mining operations.	Shall abide by this stipulated condition.

  
(Neeraj Jakota)

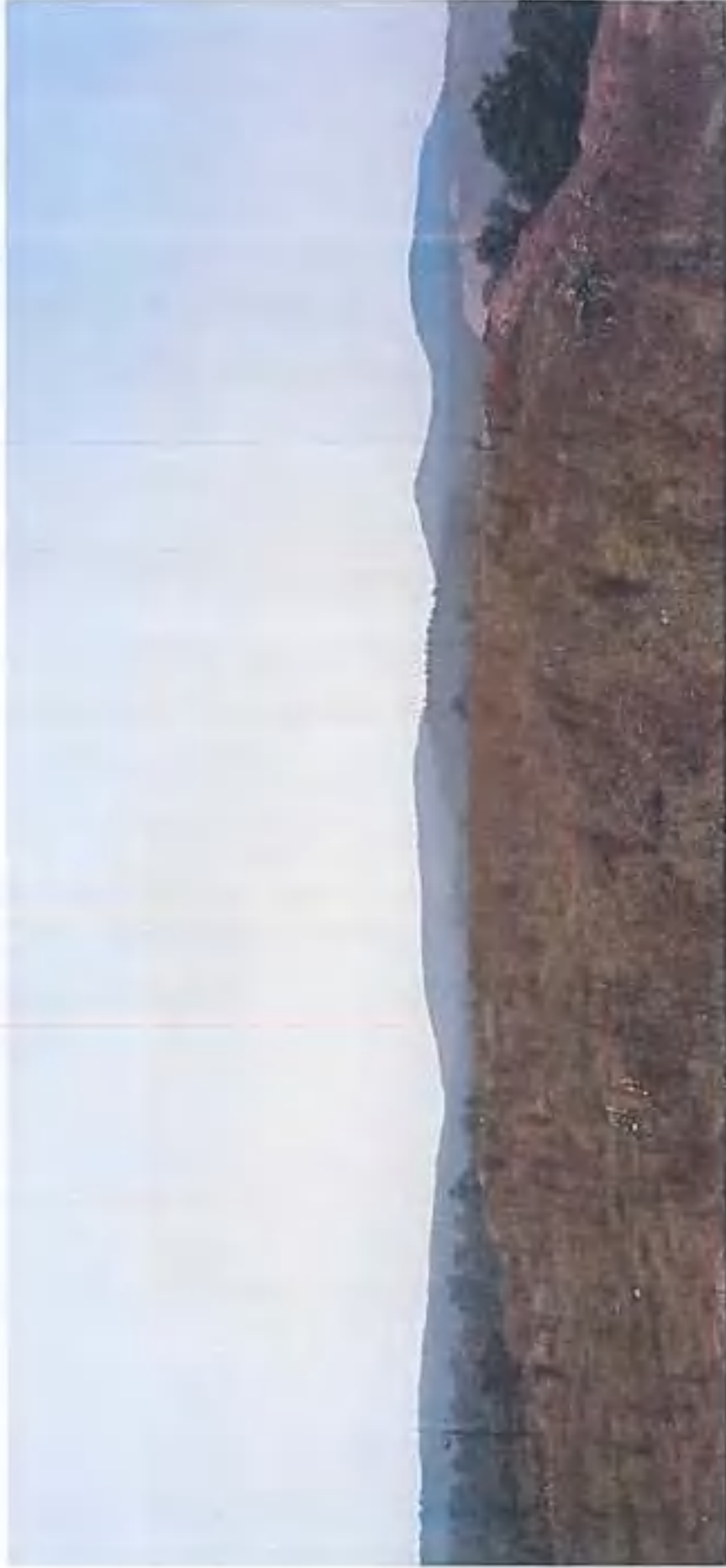
General Manager & Head of Project

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Plantation Activities at different area.



Plantation over the Overburden (1 of 2)



Plantation over the Overburden (2 of 2)



Grassing Activities at Top Soil (1 of 2).



**Grassing Activities at Top Soil (2012).**



Plantation over Earlier Coal Stock (Photo 1 of 2)



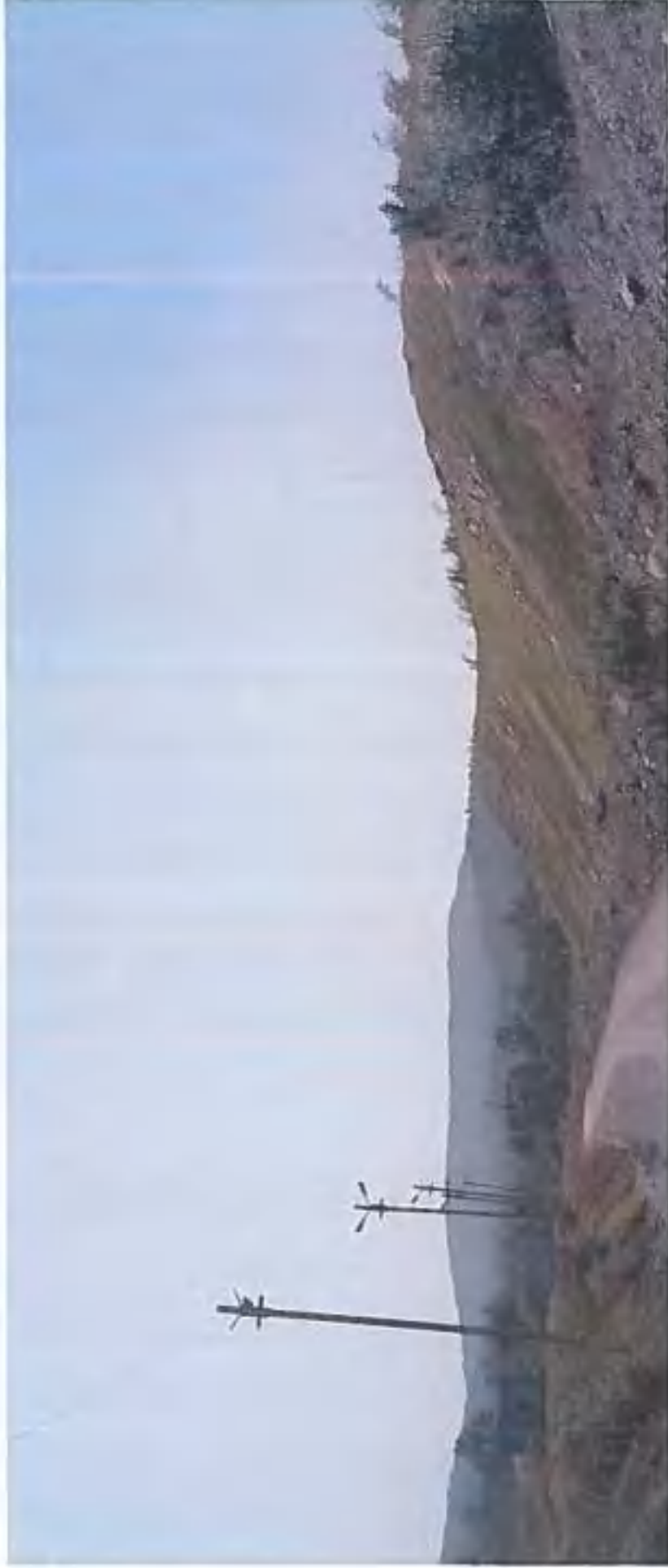
**Plantation over Earlier Coal Stock (Photo- 2 of 2)**

**Fluoride (as F) content in Ground Water**  
**Frequency of Monitoring: Monthly**  
**(April 2022 to September 2022)**

Sl. No	Monitoring Stations	Month	Date of Monitoring	Analysis Result in mg/L.	Permissible Limit as per IS 10500 :2012
1	Open well in village Bendrichua	April 2022	09/04/2022	<0.1	1.0 mg/L
		May 2022	07/05/2022	<0.1	1.0 mg/L
		June 2022	06/06/2022	< 0.1	1.0 mg/L
		July 2022	10/07/2022	< 0.1	1.0 mg/L
		August 2022	05/08/2022	< 0.1	1.0 mg/L
		September 2022	10/09/2022	< 0.1	1.0 mg/L
2	Open well in village Dulanga	April 2022	09/04/2022	<0.1	1.0 mg/L
		May 2022	07/05/2022	<0.1	1.0 mg/L
		June 2022	06/06/2022	< 0.1	1.0 mg/L
		July 2022	10/07/2022	< 0.1	1.0 mg/L
		August 2022	05/08/2022	< 0.1	1.0 mg/L
		September 2022	10/09/2022	< 0.1	1.0 mg/L
3	Open well in village Beldibi	April 2022	09/04/2022	<0.1	1.0 mg/L
		May 2022	07/05/2022	<0.1	1.0 mg/L
		June 2022	06/06/2022	< 0.1	1.0 mg/L
		July 2022	10/07/2022	< 0.1	1.0 mg/L
		August 2022	05/08/2022	< 0.1	1.0 mg/L
		September 2022	10/09/2022	< 0.1	1.0 mg/L
4	Open well in village Kathfali	April 2022	10/04/2022	<0.1	1.0 mg/L
		May 2022	07/05/2022	<0.1	1.0 mg/L
		June 2022	06/06/2022	<0.1	1.0 mg/L
		July 2022	10/07/2022	< 0.1	1.0 mg/L
		August 2022	05/08/2022	<0.1	1.0 mg/L
		September 2022	10/09/2022	<0.1	1.0 mg/L

Sl. No	Monitoring Stations	Month	Date of Monitoring	Analysis Result in mg/L	Permissible Limit as per IS 10500 :2012
5	Bore well in Village Rengalmunc	April 2022	10/04/2022	<0.1	1.0 mg/L
		May 2022	17/05/2022	<0.1	1.0 mg/L
		June 2022	06/06/2022	<0.1	1.0 mg/L
		July 2022	10/07/2022	< 0.1	1.0 mg/L
		August 2022	05/08/2022	<0.1	1.0 mg/L
		September2022	10/09/2022	<0.1	1.0 mg/L
6	Open Well in Village Khuntijhari	April 2022	10/04/2022	<0.1	1.0 mg/L
		May 2022	07/05/2022	<0.1	1.0 mg/L
		June 2022	06/06/2022	<0.1	1.0 mg/L
		July 2022	10/07/2022	< 0.1	1.0 mg/L
		August 2022	05/08/2022	<0.1	1.0 mg/L
		September2022	10/09/2022	<0.1	1.0 mg/L
7	Open Well in Village Kalamegha	April 2022	10/04/2022	<0.1	1.0 mg/L
		May 2022	07/05/2022	<0.1	1.0 mg/L
		June 2022	06/06/2022	<0.1	1.0 mg/L
		July 2022	10/07/2022	< 0.1	1.0 mg/L
		August 2022	05/08/2022	<0.1	1.0 mg/L
		September2022	10/09/2022	<0.1	1.0 mg/L

Sl. No	Monitoring Stations	Month	Date of Monitoring	Analysis Result in mg/L	Permissible Limit as per IS 10500 :2012
8	Bore well near Pit Office	April 2022	09/04/2022	<0.1	1.0 mg/L
		May 2022	07/05/2022	<0.1	1.0 mg/L
		June 2022	06/06/2022	<0.1	1.0 mg/L
		July 2022	10/07/2022	<0.1	1.0 mg/L
		August 2022	05/08/2022	<0.1	1.0 mg/L
		September 2022	10/09/2022	<0.1	1.0 mg/L
9	Bore well near Labour Barrack	April 2022	09/04/2022	<0.1	1.0 mg/L
		May 2022	07/05/2022	<0.1	1.0 mg/L
		June 2022	06/06/2022	<0.1	1.0 mg/L
		July 2022	10/07/2022	<0.1	1.0 mg/L
		August 2022	05/08/2022	<0.1	1.0 mg/L
		September 2022	10/09/2022	<0.1	1.0 mg/L
10	Tap water inside NTPC site office	April 2022	09/04/2022	<0.1	1.0 mg/L
		May 2022	07/05/2022	<0.1	1.0 mg/L
		June 2022	06/06/2022	<0.1	1.0 mg/L
		July 2022	10/07/2022	<0.1	1.0 mg/L
		August 2022	05/08/2022	<0.1	1.0 mg/L
		September 2022	10/09/2022	<0.1	1.0 mg/L



Grassing Activities along slope of Non-Active Overburden Dump.

**Grassing activities at Top Soil Dump**

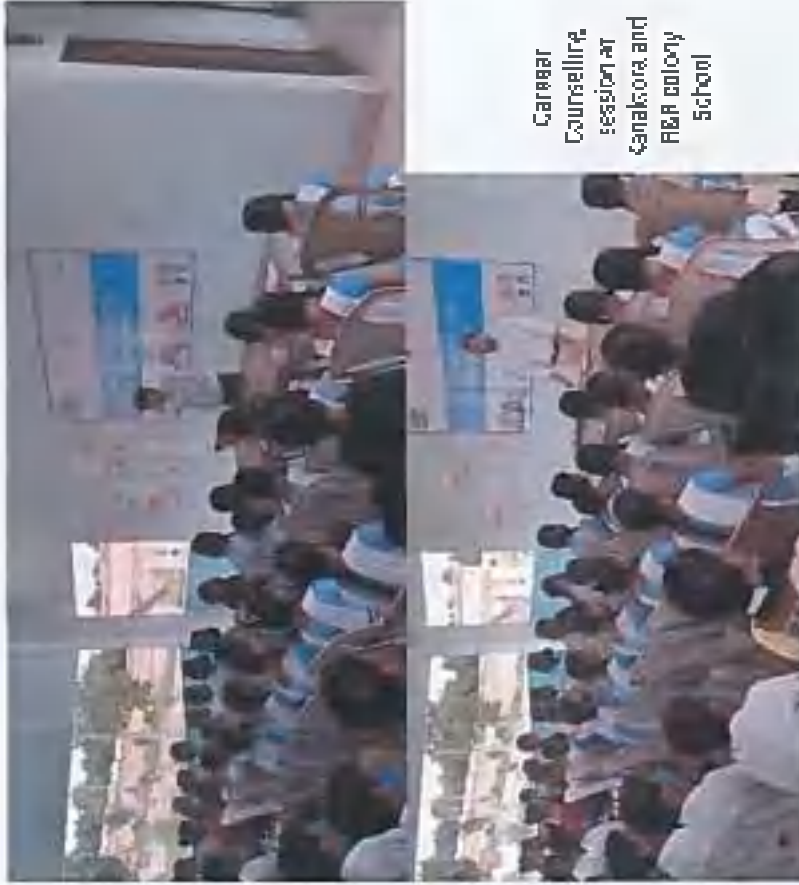


**Before Grassing Activities along the slope.**



**After Grazing Activities along slope of Top Soil.**

## Highlights of CSR activities



Career  
Counselling  
session at  
Sanskara and  
R&R colony  
School

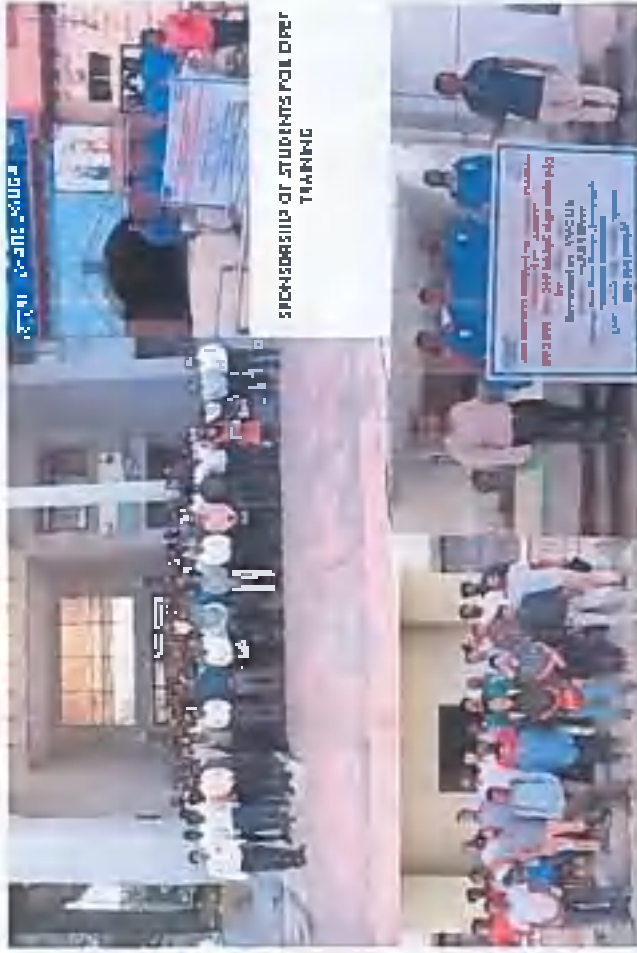


Tailoring batch starting at training center





**Cake &  
confectionary  
training program**



**Mobilisation Cum Counselling  
Programme**

**SPONSORSHIP OF STUDENTS FOR OVER  
TRAINING**



**HEALTH CAMP AND  
HYGIENE KIT DISTRIBUTION  
AT HEMGIR ORPHANAGE**



**Papad Making  
Training Program**



**PROJECT "DURGA" SPONSORSHIP WITH DISTRICT POLICE**



**Sponsorship of village sports meet**



**HSC test paper  
distribution at  
School**



**Ground Water Level  
Frequency of Monitoring - Quarterly**

Season : Pre Monsoon : April 2022  
Monsoon : August 2022

Sl. No	Monitoring Stations	Period of Measurement	Date of Measurement	Depth in meter from Surface Level
1	Open well in village Bendrichua	April 2022	10/04/2022	3.85
		August 2022	05/08/2022	3.30
2	Open well in village Dulanga	April 2022	10/04/2022	8.08
		August 2022	05/08/2022	2.52
3	Open well in village Khuntjharia	April 2022	10/04/2022	7.04
		August 2022	05/08/2022	4.47
4	Open well in village Beldihi	April 2022	10/04/2022	3.96
		August 2022	05/08/2022	2.01
5	Open well in village Kathfali	April 2022	10/04/2022	1.75
		August 2022	05/08/2022	1.50
6	Open well in village Kalamegha	April 2022	10/04/2022	4.17
		August 2022	05/08/2022	2.34
7	Bore well near Central Canteen (Inside the Lease Area)	April 2022	10/04/2022	4.12
		-	-	-
8	Bore well near Pit Office (Inside the Lease Area)	April 2022	10/04/2022	57.35
		-	-	-

**Ground Water Sampling and Analysis Report**  
**Frequency of Monitoring – Monthly Once**

**Ground Water Quality Analysis Report for the month of April 2022**  
**Date of Sampling: 09-10/04/2022**

Sl. No	Parameters Analyzed	Unit	Permissible Limit as per IS 10500:2012	Analysis Results		
				Village Bendrichua	Village Dulanga	Village Beldihi
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A
03	Taste	-	Agreeable (A)	A	A	A
04	pH value	-	6.5 to 8.5	7.02	7.21	6.89
05	Turbidity	NTU	1.0	0.51	.44	0.32
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	176.6	182.4	128.6
07	Total Iron	mg/L	0.3	0.07	0.06	0.06
08	Chloride	mg/L	250.0	65.04	67.01	30.55
09	Total Dissolved Solids	mg/L	500.0	363.1	520.0	311.0
10	Calcium as Ca	mg/L	75.0	50.79	51.56	35.40
11	Sulphate as SO <sub>4</sub>	mg/L	200.0	24.17	27.24	11.99
12	Fluoride	mg/L	1.0	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/L	200.0	130.0	112.0	128.0
14	Nitrate as NO <sub>3</sub>	mg/L	45.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/L	0.2 (min)	Nil	Nil	Nil
16	Copper	mg/L	0.05	ND	ND	ND
17	Manganese	mg/L	0.1	ND	ND	ND
18	Phenolic Compound	mg/L	0.001	ND	ND	ND
19	Mercury	mg/L	0.001	ND	ND	ND

20	Cadmium	mg/l.	0.003	ND	ND	ND
21	Selenium	mg/l.	0.01	ND	ND	ND
22	Total Arsenic	mg/l.	0.01	ND	ND	ND
23	Cyanide	mg/l.	0.05	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND
25	Zinc	mg/L	5.0	ND	ND	ND
26	Anionic detergents	mg/L	0.2	ND	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND
30	Pesticides	mg/l.	---	ND	ND	ND
31	Aluminaum	mg/l.	0.03	ND	ND	ND
32	Boron	mg/l.	0.5	ND	ND	ND
33	Nickel	mg/l.	0.02	ND	ND	ND

**Note: ND = Not Detected**

**Ground Water Quality Analysis Report for the month of April 2022**

**Date of Sampling: 09-10/04/2022**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500: 2012	Analysis Results			
				Village Kalamegha	Village Kathfali	Village Khuntjharis	Village Rengalnunr
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A	A
03	Taste	--	Agreeable (A)	A	A	A	A
04	pH value	-	6.5 to 8.5	7.03	6.11	6.23	7.14
05	Turbidity	NTU	1.0	0.57	0.45	0.34	0.51
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	274.6	67.2	86.4	301.4
07	Total Iron	mg/L	0.3	0.08	0.08	0.07	0.07
08	Chloride	mg/L	250.0	64.06	24.64	37.45	65.04
09	Total Dissolved Solids	mg/L	500.0	618.4	98.8	289.2	398.2
10	Calcium as Ca	mg/L	75.0	52.33	15.39	21.55	33.09
11	Sulphate as SO <sub>4</sub>	mg/L	200.0	25.96	5.71	15.45	25.28
12	Fluoride	mg/L	1.0	<0.1	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/L	200.0	306.0	34.0	56.0	422.0
14	Nitrate as NO <sub>3</sub>	mg/L	45.0	< 5.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/L	0.2 (min)	Nil	Nil	Nil	Nil
16	Copper	mg/L	0.05	ND	ND	ND	ND
17	Manganese	mg/L	0.1	ND	ND	ND	ND
18	Phenolic Compound	mg/L	0.001	ND	ND	ND	ND
19	Mercury	mg/L	0.001	ND	ND	ND	ND
20	Cadmium	mg/L	0.003	ND	ND	ND	ND

21	Selenium	mg/L	0.01	ND	ND	ND	ND
22	Total Arsenic	mg/L	0.01	ND	ND	ND	ND
23	Cyanide	mg/L	0.05	ND	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND	ND
25	Zinc	mg/L	5.0	ND	ND	ND	ND
26	Anionic detergents	mg/L	0.2	ND	ND	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND	ND
30	Pesticides	mg/L	---	ND	ND	ND	ND
31	Aluminium	mg/L	0.03	ND	ND	ND	ND
32	Boron	mg/L	0.5	ND	ND	ND	ND
33	Nickel	mg/L	0.02	ND	ND	ND	ND

**Note: ND = Not Detected**

**Ground Water Quality Analysis Report for the month of April 2022**

Date of Sampling: 09/04/2022

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500: 2012	Analysis Results		
				Bore well Near Office (inside the Lease Area)	Bore well Near Labour Barrack (Inside the Lease Area)	Tap water inside NTPC site office
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0
02	Odour	-	Agreeable (A)	A	A	A
03	Taste	-	Agreeable (A)	A	A	A
04	pH value	-	6.5 to 8.5	7.11	6.89	7.41
05	Turbidity	NTU	1.0	0.94	0.48	0.41
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	101.8	67.2	147.8
07	Total Iron	mg/L	0.3	0.08	0.07	0.08
08	Chloride	mg/L	250.0	58.15	22.67	37.45
09	Total Dissolved Solids	mg/L	500.0	393.2	105.2	251.8
10	Calcium as Ca	mg/L	75.0	36.17	18.47	36.17
11	Sulphate as SO <sub>4</sub>	mg/L	200.0	14.29	10.58	9.55
12	Fluoride	mg/L	1.0	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/L	200.0	206.0	60.0	140.0
14	Nitrate as NO <sub>3</sub>	mg/L	45.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/L	0.2 (min)	Nil	Nil	Nil
16	Copper	mg/L	0.05	ND	ND	ND
17	Manganese	mg/L	0.1	ND	ND	ND
18	Phenolic Compound	mg/L	0.001	ND	ND	ND
19	Mercury	mg/L	0.001	ND	ND	ND

20	Cadmium	mg/L	0.003	ND	ND	ND
21	Selenium	mg/L	0.01	ND	ND	ND
22	Total Arsenic	mg/L	0.01	ND	ND	ND
23	Cyanide	mg/l.	0.05	ND	ND	ND
24	Lead	mg/l.	0.01	ND	ND	ND
25	Zinc	mg/l.	5.0	ND	ND	ND
26	Anionic detergents	mg/L	0.2	ND	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND
30	Pesticides	mg/L	—	ND	ND	ND
31	Aluminum	mg/L	0.03	ND	ND	ND
32	Boron	mg/L	0.5	ND	ND	ND
33	Nickel	mg/L	0.02	ND	ND	ND

Note: ND = Not Detected

**Ground Water Quality Analysis Report for the month of May 2022**

**Date of Sampling: 07/05/2022**

Sl. No	Parameters Analyzed	Unit	Permissible Limit as per IS 10500:2012	Analysis Results			
				Village Bendrichua	Village Dulanga	Village Beldihi	Village Kalumgha
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0	<5.0
02	Odour	-	Agreeable (A)	A	A	A	A
03	Taste	--	Agreeable (A)	A	A	A	A
04	pH value	-	6.5 to 8.5	6.92	6.72	6.13	6.57
05	Turbidity	NTU	1.0	0.94	0.50	0.41	0.66
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	180.5	178.6	126.7	270.7
07	Total Iron	mg/L	0.3	0.08	0.09	0.07	0.08
08	Chloride	mg/L	250.0	63.7	64.06	32.52	66.03
09	Total Dissolved Solids	mg/L	500.0	364.5	473.9	265.4	603.9
10	Calcium as Ca	mg/L	75.0	53.10	52.33	36.17	51.56
11	Sulphate as SO <sub>4</sub>	mg/L	200.0	14.29	25.71	11.86	25.96
12	Fluoride	mg/L	1.0	<0.1	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/L	200.0	142.0	116.0	130.0	310.0
14	Nitrate as NO <sub>3</sub>	mg/L	45.0	< 5.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/L	0.2 (min)	Nil	Nil	Nil	Nil
16	Copper	mg/L	0.05	ND	ND	ND	ND
17	Manganese	mg/L	0.1	ND	ND	ND	ND
18	Phenolic Compound	mg/L	0.001	ND	ND	ND	ND
19	Mercury	mg/L	0.001	ND	ND	ND	ND
20	Cadmium	mg/L	0.003	ND	ND	ND	ND
21	Selenium	mg/L	0.01	ND	ND	ND	ND

22	Total Arsenic	mg/L	0.01	ND	ND	ND	ND
23	Cyanide	mg/L	0.05	ND	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND	ND
25	Zinc	mg/L	5.0	ND	ND	ND	ND
26	Anionic detergents	mg/L	0.2	ND	ND	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND	ND
30	Pesticides	mg/L	---	ND	ND	ND	ND
31	Aluminum	mg/L	0.03	ND	ND	ND	ND
32	Boron	mg/L	0.5	ND	ND	ND	ND
33	Nickel	mg/L	0.02	ND	ND	ND	ND

Note: ND = Not Detected

**Ground Water Quality Analysis Report for the month of May 2022**  
**Date of Sampling: 07/05/2022**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500:2012	Analysis Results		
				Village Kathfali	Village Khuntjhar	Village Rengalmunr
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0
02	Odour	—	Agreeable (A)	A	A	A
03	Taste	--	Agreeable (A)	A	A	A
04	pH value	-	6.5 to 8.5	5.97	5.80	6.82
05	Turbidity	NTU	1.0	0.51	0.49	0.66
06	Total Hardness as CaCO <sub>2</sub>	mg/L	200.0	71.0	90.2	303.4
07	Total Iron	mg/L	0.3	0.09	0.08	0.08
08	Chloride	mg/L	250.0	23.65	38.43	67.01
09	Total Dissolved Solids	mg/L	500.0	89.4	285.3	783.4
10	Calcium as Ca	mg/L	75.0	16.16	22.32	34.63
11	Sulphate as SO <sub>4</sub>	mg/L	200.0	15.32	21.35	28.53
12	Fluoride	mg/L	1.0	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/L	200.0	38.0	54.0	428.0
14	Nitrate as NO <sub>3</sub>	mg/l.	45.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/L	0.2 (min)	Nil	Nil	Nil
16	Copper	mg/l.	0.05	ND	ND	ND
17	Manganese	mg/L	0.1	ND	ND	ND
18	Phenolic Compound	mg/L	0.001	ND	ND	ND

19	Mercury	mg/L	0.001	ND	ND	ND
20	Cadmium	mg/L	0.003	ND	ND	ND
21	Selenium	mg/L	0.01	ND	ND	ND
22	Total Arsenic	mg/L	0.01	ND	ND	ND
23	Cyanide	mg/L	0.05	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND
25	Zinc	mg/L	5.0	ND	ND	ND
26	Anionic detergents	mg/L	0.2	ND	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND
30	Pesticides	mg/L	—	ND	ND	ND
31	Aluminum	mg/L	0.03	ND	ND	ND
32	Boron	mg/L	0.5	ND	ND	ND
33	Nickel	mg/L	0.02	ND	ND	ND

**Note: ND = Not Detected**

**Ground Water Quality Analysis Report for the month of May 2022**  
**Date of Sampling: 07/05/2022**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500: 2012	Analysis Results		
				Bore well Near Pit Office (Inside the Lease Area)	Bore well Near Labour Barrack (Inside the Lease Area)	Tap water inside NTPC site office
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A
03	Taste	--	Agreeable (A)	A	A	A
04	pH value	-	6.5 to 8.5	6.43	6.51	7.99
05	Turbidity	NTU	1.0	0.86	0.32	0.46
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	105.6	69.10	145.9
07	Total Iron	mg/L	0.3	0.06	0.07	0.07
08	Chloride	mg/L	250.0	59.13	23.65	25.62
09	Total Dissolved Solids	mg/L	500.0	411.5	129.6	254.5
10	Calcium as Ca	mg/L	75.0	36.94	20.01	31.55
11	Sulphate as SO <sub>4</sub>	mg/L	200.0	27.24	12.37	12.12
12	Fluoride	mg/L	1.0	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/L	200.0	202.0	64.0	182.0
14	Nitrate as NO <sub>3</sub>	mg/L	45.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/L	0.2 (min)	Nil	Nil	Nil
16	Copper	mg/L	0.05	ND	ND	ND
17	Manganese	mg/L	0.1	ND	ND	ND
18	Phenolic Compound	mg/L	0.001	ND	ND	ND
19	Mercury	mg/L	0.001	ND	ND	ND
20	Cadmium	mg/L	0.003	ND	ND	ND

21	Selenium	mg/L	0.01	ND	ND	ND
22	Total Arsenic	mg/L	0.01	ND	ND	ND
23	Cyanide	mg/l.	0.05	ND	ND	ND
24	Lead	mg/l.	0.01	ND	ND	ND
25	Zinc	mg/l.	5.0	ND	ND	ND
26	Anionic detergents	mg/L	0.2	ND	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND
30	Pesticides	mg/L	---	ND	ND	ND
31	Aluminium	mg/L	0.03	ND	ND	ND
32	Boron	mg/L	0.5	ND	ND	ND
33	Nickel	mg/L	0.02	ND	ND	ND

Note: ND = Not Detected

**Ground Water Quality Analysis Report for the month of June 2022**  
**Date of Sampling: 06/06/2022**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500:2012	Analysis Results			
				Village Bendrichua	Village Dulanga	Village Beldihi	Village Kalamegha
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A	A
03	Taste	-	Agreeable (A)	A	A	A	A
04	pH value	-	6.5 to 8.5	6.99	6.85	6.55	6.61
05	Turbidity	NTU	1.0	0.55	0.35	0.37	0.36
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	188.0	186.0	132.0	282.0
07	Total Iron	mg/L	0.3	0.09	0.06	0.07	0.09
08	Chloride	mg/L	250.0	66.0	66.03	36.46	64.06
09	Total Dissolved Solids	mg/L	500.0	337.4	488.5	247.0	613.5
10	Calcium as Ca	mg/L	75.0	55.31	54.51	37.68	53.71
11	Sulphate as SO <sub>4</sub>	mg/L	200.0	13.27	23.14	11.47	24.68
12	Fluoride	mg/L	1.0	<0.1	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/L	200.0	150.0	118.0	138.0	302.0
14	Nitrate as NO <sub>3</sub>	mg/L	45.0	< 5.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/L	0.2 (min)	Nil	Nil	Nil	Nil
16	Copper	mg/L	0.05	ND	ND	ND	ND
17	Manganese	mg/L	0.1	ND	ND	ND	ND
18	Phenolic Compound	mg/L	0.001	ND	ND	ND	ND
19	Mercury	mg/L	0.001	ND	ND	ND	ND
20	Cadmium	mg/L	0.003	ND	ND	ND	ND
21	Selenium	mg/L	0.01	ND	ND	ND	ND

22	Total Arsenic	mg/L	0.01	ND	ND	ND	ND
23	Cyanide	mg/l.	0.05	ND	ND	ND	ND
24	Lead	mg/l.	0.01	ND	ND	ND	ND
25	Zinc	mg/l.	5.0	ND	ND	ND	ND
26	Anionic detergents	mg/l.	0.2	ND	ND	ND	ND
27	Total Chromium	mg/l.	0.05	ND	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND	ND
29	Mineral Oil	mg/l.	0.5	ND	ND	ND	ND
30	Pesticides	mg/l.	--	ND	ND	ND	ND
31	Aluminum	mg/L	0.03	ND	ND	ND	ND
32	Baron	mg/L	0.5	ND	ND	ND	ND
33	Nickel	mg/L	0.02	ND	ND	ND	ND

Note: ND = Not Detected

**Ground Water Quality Analysis Report for the month of June 2022**

**Date of Sampling: 06/06/2022**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500:2012	Analysis Results		
				Village Kathfali	Village Khuntjharia	Village Rengalmunr
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A
03	Taste	--	Agreeable (A)	A	A	A
04	pH value	-	6.5 to 8.5	5.99	5.79	6.94
05	Turbidity	NTU	1.0	0.61	0.82	0.56
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	74.0	94.0	316.0
07	Total Iron	mg/L	0.3	0.05	0.06	.08
08	Chloride	mg/L	250.0	20.70	41.39	65.04
09	Total Dissolved Solids	mg/L	500.0	91.4	297.8	745.8
10	Calcium as Ca	mg/L	75.0	16.83	23.25	36.07
11	Sulphate as SO <sub>4</sub>	mg/L	200.0	14.04	18.78	24.68
12	Fluoride	mg/L	1.0	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/l.	200.0	44.0	62.0	416.0
14	Nitrate as NO <sub>3</sub>	mg/L	45.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/L	0.2 (min)	Nil	Nil	Nil
16	Copper	mg/L	0.05	ND	ND	ND
17	Manganese	mg/L	0.1	ND	ND	ND
18	Phenolic Compound	mg/L	0.001	ND	ND	ND

19	Mercury	mg/L	0.001	ND	ND	ND
20	Cadmium	mg/L	0.003	ND	ND	ND
21	Selenium	mg/L	0.01	ND	ND	ND
22	Total Arsenic	mg/L	0.01	ND	ND	ND
23	Cyanide	mg/L	0.05	ND	ND	ND
24	Lead	ug/L	0.01	ND	ND	ND
25	Zinc	mg/L	5.0	ND	ND	ND
26	Anionic detergents	ug/L	0.2	ND	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND
30	Pesticides	mg/L	---	ND	ND	ND
31	Aluminum	mg/L	0.03	ND	ND	ND
32	Boron	mg/L	0.5	ND	ND	ND
33	Nickel	mg/L	0.02	ND	ND	ND

**Note: ND = Not Detected**

**Ground Water Quality Analysis Report for the month of June 2022**  
**Date of Sampling: 06/06/2022**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500: 2012	Analysis Results		
				Bore well Near Pit Office (Inside the Lease Area)	Bore well Near Labour Barrack (Inside the Lease Area)	Tap water inside NTPC site office
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A
03	Taste	--	Agreeable (A)	A	A	A
04	pH value	-	6.5 to 8.5	6.81	6.99	7.66
05	Turbidity	NTU	1.0	0.56	0.47	0.33
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	110.0	72.0	152.0
07	Total Iron	mg/L	0.3	0.06	0.07	0.05
08	Chloride	mg/L	250.0	62.09	25.62	26.61
09	Total Dissolved Solids	mg/L	500.0	423.5	137.5	273.5
10	Calcium as Ca	mg/L	75.0	38.48	20.84	32.87
11	Sulphate as SO <sub>4</sub>	mg/L	200.0	24.68	13.14	13.40
12	Fluoride	mg/L	1.0	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/L	200.0	194.0	66.0	176.0
14	Nitrate as NO <sub>3</sub>	mg/L	45.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/L	0.2 (min)	Nil	Nil	Nil
16	Copper	mg/L	0.05	ND	ND	ND
17	Manganese	mg/L	0.1	ND	ND	ND
18	Phenolic Compound	mg/L	0.001	ND	ND	ND
19	Mercury	mg/L	0.001	ND	ND	ND

20	Cadmium	mg/l.	0.003	ND	ND	ND
21	Selenium	mg/l.	0.01	ND	ND	ND
22	Total Arsenic	mg/L	0.01	ND	ND	ND
23	Cyanide	mg/L	0.05	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND
25	Zinc	mg/L	5.0	ND	ND	ND
26	Anionic detergents	ug/L	0.2	ND	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.00011	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND
30	Pesticides	mg/L	---	ND	ND	ND
31	Aluminum	mg/L	0.03	ND	ND	ND
32	Boron	mg/L	0.5	ND	ND	ND
33	Nickel	mg/L	0.02	ND	ND	ND

Note: ND = Not Detected

**Ground Water Quality Analysis Report for the month of July 2022**  
**Date of Sampling 10/07/2022**

Sl. No	Parameters Analyzed	Unit	Permissible Limit as per IS 10500:2012	Analysis Results		
				Village Bendrichua	Village Dularua	Village Beldihi
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0
02	Odour	-	Agreeable (A)	A	A	A
03	Taste	-	Agreeable (A)	A	A	A
04	pH value	-	6.5 to 8.5	7.04	6.77	6.71
05	Turbidity	NTU	1.0	0.69	0.51	0.44
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	182.0	182.0	126.0
07	Total Iron	mg/L	0.3	0.07	0.07	0.08
08	Chloride	mg/L	250.0	64.06	64.06	34.49
09	Total Dissolved Solids	mg/L	500.0	302.0	461.2	232.1
10	Calcium as Ca	mg/L	75.0	54.51	23.71	36.87
11	Sulphate as SO <sub>4</sub>	mg/L	200.0	14.36	24.23	12.56
12	Fluoride	mg/l.	1.0	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/L	200.0	144.0	122.0	134.0
14	Nitrate as NO <sub>3</sub>	mg/L	45.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/L	0.2 (min)	Nil	Nil	Nil
16	Copper	mg/L	0.05	ND	ND	ND
17	Manganese	mg/L	0.1	ND	ND	ND
18	Phenolic Compound	mg/L	0.001	ND	ND	ND
19	Mercury	mg/L	0.001	ND	ND	ND
20	Cadmium	mg/L	0.003	ND	ND	ND
21	Selenium	mg/L	0.01	ND	ND	ND
22	Total Arsenic	mg/L	0.01	ND	ND	ND

23	Cyanide	mg/L	0.05	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND
25	Zinc	mg/L	5.0	ND	ND	ND
26	Anionic detergents	mg/L	0.2	ND	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND
30	Pesticides	mg/L	--	ND	ND	ND
31	Aluminum	mg/L	0.03	ND	ND	ND
32	Boron	mg/L	0.5	ND	ND	ND
33	Nickel	mg/L	0.02	ND	ND	ND

**Note: ND = Not Detected**

**Ground Water Quality Analysis Report for the month of July 2022**  
**Date of Sampling 10/07/2022**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500:2012	Analysis Results			
				Village Kalamegha	Village Kathfali	Village Khuntjaria	Village Rengalmunr
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A	A
03	Taste	--	Agreeable (A)	A	A	A	A
04	pH value	-	6.5 to 8.5	6.74	6.04	6.11	6.99
05	Turbidity	NTU	1.0	0.54	0.57	0.89	0.54
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	284.0	70.0	92.0	306.0
07	Total Iron	mg/L	0.3	0.05	0.06	0.08	0.07
08	Chloride	mg/L	250.0	63.07	22.67	44.35	68.0
09	Total Dissolved Solids	mg/L	500.0	611.0	87.4	267.4	687.4
10	Calcium as Ca	mg/L	75.0	51.30	18.44	24.85	37.68
11	Sulphate as SO <sub>4</sub>	mg/L	200.0	25.77	15.13	19.87	25.26
12	Fluoride	mg/L	1.0	<0.1	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/L	200.0	306.0	54.0	66.0	382.0
14	Nitrate as NO <sub>3</sub>	mg/L	45.0	< 5.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/L	0.2 (min)	Nil	Nil	Nil	Nil
16	Copper	mg/L	0.05	ND	ND	ND	ND
17	Manganese	mg/L	0.1	ND	ND	ND	ND
18	Phenolic Compound	mg/L	0.001	ND	ND	ND	ND
19	Mercury	mg/L	0.001	ND	ND	ND	ND
20	Cadmium	mg/L	0.003	ND	ND	ND	ND
21	Selenium	mg/L	0.01	ND	ND	ND	ND

22	Total Arsenic	mg/L	0.01	ND	ND	ND	ND
23	Cyanide	mg/L	0.05	ND	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND	ND
25	Zinc	mg/L	5.0	ND	ND	ND	ND
26	Anionic detergents	mg/L	0.2	ND	ND	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND	ND
30	Pesticides	mg/L	—	ND	ND	ND	ND
31	Aluminum	mg/L	0.03	ND	ND	ND	ND
32	Boron	mg/L	0.5	ND	ND	ND	ND
33	Nickel	mg/L	0.02	ND	ND	ND	ND

Note: ND = Not Detected

**Ground Water Quality Analysis Report for the month of July 2022**  
**Date of Sampling 10/07/2022**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500: 2012	Analysis Results		
				Bore well Near Office (Inside the Lease Area)	Bore well Near Labour Barrack (Inside the Lease Area)	Tap water inside NTPC site office
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A
03	Taste	--	Agreeable (A)	A	A	A
04	pH value	-	6.5 to 8.5	6.84	7.04	7.41
05	Turbidity	NTU	1.0	0.66	0.74	0.48
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	104.0	68.0	146.0
07	Total Iron	mg/l.	0.3	0.06	0.06	0.08
08	Chloride	mg/L	250.0	61.10	23.65	28.58
09	Total Dissolved Solids	mg/L	500.0	437.1	122.4	267.1
10	Calcium as Ca	mg/L	75.0	38.48	36.07	31.26
11	Sulphate as SO <sub>4</sub>	mg/L	200.0	25.77	14.23	14.49
12	Fluoride	mg/L	1.0	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/L	200.0	190.0	70.0	170.0
14	Nitrate as NO <sub>3</sub>	mg/L	45.0	<5.0	<5.0	<5.0
15	Residual Free Chlorine	mg/L	0.2 (min)	Nil	Nil	Nil
16	Copper	mg/l.	0.05	ND	ND	ND
17	Manganese	mg/l.	0.1	ND	ND	ND
18	Phenolic Compound	mg/L	0.001	ND	ND	ND

19	Mercury	mg/L	0.001	ND	ND	ND
20	Cadmium	mg/L	0.003	ND	ND	ND
21	Selenium	mg/L	0.01	ND	ND	ND
33	Total Arsenic	mg/L	0.01	ND	ND	ND
23	Cyanide	mg/L	0.05	ND	ND	ND
24	Lead	ug/L	0.01	ND	ND	ND
25	Zinc	mg/L	5.0	ND	ND	ND
26	Anionic detergents	mg/l	0.2	ND	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND
30	Pesticides	mg/l	---	ND	ND	ND
31	Aluminum	mg/L	0.03	ND	ND	ND
32	Boron	mg/L	0.5	ND	ND	ND
33	Nickel	mg/L	0.02	ND	ND	ND

**Note: ND = Not Detected**

**Ground Water Quality Analysis Report for the month of August 2022**

**Date of Sampling: 05/08/2022**

Sl. No	Parameters Analyzed	Unit	Permissible Limit as per IS 10500:2012	Analysis Results		
				Village Bendrichua	Village Dulanga	Village Reldihi
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A
03	Taste	--	Agreeable (A)	A	A	A
04	pH value	-	6.5 to 8.5	6.98	6.82	6.75
05	Turbidity	NTU	1.0	0.77	0.57	0.54
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	178.0	178.0	122.0
07	Total Iron	mg/l.	0.3	0.09	0.06	0.06
08	Chloride	mg/l.	250.0	63.07	63.07	31.54
09	Total Dissolved Solids	mg/l.	500.0	321.1	455.1	237.1
10	Calcium as Ca	mg/L	75.0	53.71	52.91	34.47
11	Sulphate as SO <sub>4</sub>	mg/L	200.0	14.23	21.67	13.85
12	Fluoride	mg/L	1.0	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/l.	200.0	140.0	120.0	132.0
14	Nitrate as NO <sub>3</sub>	mg/L	45.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/L	0.2 (min)	Nil	Nil	Nil
16	Copper	mg/L	0.05	ND	ND	ND
17	Manganese	mg/l.	0.1	ND	ND	ND
18	Phenolic Compound	mg/l.	0.001	ND	ND	ND
19	Mercury	mg/L	0.001	ND	ND	ND
20	Cadmium	mg/L	0.003	ND	ND	ND
21	Selenium	mg/L	0.01	ND	ND	ND
22	Total Arsenic	mg/L	0.01	ND	ND	ND

23	Cyanide	mg/L	0.05	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND
25	Zinc	mg/L	5.0	ND	ND	ND
26	Anionic detergents	mg/L	0.2	ND	ND	ND
27	Total Chromium	ug/L	0.05	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND
30	Pesticides	mg/L	---	ND	ND	ND
31	Aluminum	mg/L	0.03	ND	ND	ND
32	Boron	mg/L	0.5	ND	ND	ND
33	Nickel	mg/L	0.02	ND	ND	ND

**Note: ND = Not Detected**

**Ground Water Quality Analysis Report for the month of August 2022**

**Date of Sampling: 05/08/2022**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500:2012	Analysis Results			
				Village Kalamegha	Village Kathfall	Village Khuntjharia	Village Rengalpur
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A	A
03	Taste	--	Agreeable (A)	A	A	A	A
04	pH value	-	6.5 to 8.5	6.84	6.21	6.81	7.04
05	Turbidity	NTU	1.0	0.64	0.67	0.69	0.74
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	280.0	66.0	90.0	302.0
07	Total Iron	mg/L	0.3	0.06	0.08	0.07	0.09
08	Chloride	mg/L	250.0	60.12	20.70	41.39	67.01
09	Total Dissolved Solids	mg/L	500.0	601.4	92.4	258.4	647.4
10	Calcium as Ca	mg/L	75.0	49.70	16.83	23.25	36.87
11	Sulphate as SO <sub>4</sub>	mg/L	200.0	27.05	13.85	17.31	23.97
12	Fluoride	mg/L	1.0	<0.1	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/L	200.0	302.0	52.0	64.0	380.0
14	Nitrate as NO <sub>3</sub>	mg/l.	45.0	< 5.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/l.	0.2 (min)	Nil	Nil	Nil	Nil
16	Copper	mg/L	0.05	ND	ND	ND	ND
17	Manganese	mg/L	0.1	ND	ND	ND	ND
18	Phenolic Compound	mg/L	0.001	ND	ND	ND	ND
19	Mercury	mg/L	0.001	ND	ND	ND	ND
20	Cadmium	mg/L	0.003	ND	ND	ND	ND
21	Selenium	mg/l.	0.01	ND	ND	ND	ND

22	Total Arsenic	mg/L	0.01	ND	ND	ND	ND
23	Cyanide	mg/L	0.05	ND	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND	ND
25	Zinc	mg/L	5.0	ND	ND	ND	ND
26	Anionic detergents	mg/L	0.2	ND	ND	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND	ND
30	Pesticides	mg/L	...	ND	ND	ND	ND
31	Aluminium	mg/L	0.03	ND	ND	ND	ND
32	Boron	mg/L	0.5	ND	ND	ND	ND
33	Nickel	mg/L	0.02	ND	ND	ND	ND

Note: ND = Not Detected

**Ground Water Quality Analysis Report for the month of August 2022**

**Date of Sampling: 05/08/2022**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500: 2012	Analysis Results		
				Bore well Near Pit Office (Inside the Lease Area)	Bore well Near Labour Barrack (Inside the Lease Area)	Tap water inside NTPC site office
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0
02	Odour	—	Agreeable (A)	A	A	A
03	Taste	—	Agreeable (A)	A	A	A
04	pH value	-	6.5 to 8.5	6.74	7.11	7.21
05	Turbidity	NTU	1.0	0.61	0.77	0.52
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	102.0	62.0	142.0
07	Total Iron	mg/L	0.3	0.06	0.08	0.09
08	Chloride	mg/L	250.0	59.13	22.67	36.61
09	Total Dissolved Solids	mg/L	500.0	421.1	137.4	261.11
10	Calcium as Ca	mg/L	75.0	36.07	34.47	29.66
11	Sulphate as SO <sub>4</sub>	mg/L	200.0	24.49	15.51	13.21
12	Fluoride	mg/L	1.0	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/L	200.0	188.0	64.0	168.0
14	Nitrate as NO <sub>3</sub>	mg/L	45.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/L	0.2 (min)	Nil	Nil	Nil
16	Copper	mg/L	0.05	ND	ND	ND
17	Manganese	mg/L	0.1	ND	ND	ND
18	Phenolic Compound	mg/L	0.001	ND	ND	ND
19	Mercury	mg/L	0.001	ND	ND	ND

20	Cadmium	mg/L	0.013	ND	ND	ND
21	Selenium	mg/L	0.01	ND	ND	ND
22	Total Arsenic	mg/L	0.01	ND	ND	ND
23	Cyanide	mg/L	0.05	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND
25	Zinc	mg/L	5.0	ND	ND	ND
26	Anionic detergents	mg/L	0.2	ND	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND
30	Pesticides	mg/L	---	ND	ND	ND
31	Aluminum	mg/l.	0.03	ND	ND	ND
32	Boron	mg/L	0.5	ND	ND	ND
33	Nickel	mg/L	0.02	ND	ND	ND

**Note: ND = Not Detected**

**Ground Water Quality Analysis Report for the month of Sept 2022**

**Date of Sampling: 10/09/2022**

Sl No	Parameters Analyzed	Unit	Permissible Limit as per IS 10500:2012	Analysis Results		
				Village Bendrichuu	Face well inside SWSL Office premises	Bore well R&R colony, Kalumaj ba
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0
02	Odour	—	Agreeable (A)	A	A	A
03	Taste	—	Agreeable (A)	A	A	A
04	pH value	-	6.5 to 8.5	5.81	7.33	6.82
05	Turbidity	NTU	1.0	0.54	0.87	0.84
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	34.0	40.0	146.0
07	Total Iron	mg/L	0.3	0.07	0.07	0.08
08	Chloride	mg/L	250.0	19.71	15.77	24.64
09	Total Dissolved Solids	mg/L	500.0	42.0	97.6	287.0
10	Calcium as Ca	mg/L	75.0	5.61	8.82	33.67
11	Sulphate as SO <sub>4</sub>	mg/L	200.0	2.69	19.87	19.74
12	Fluoride	mg/L	1.0	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/L	200.0	36.0	100.0	188.0
14	Nitrate as NO <sub>3</sub>	mg/L	45.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/L	0.2 (min)	Nil	Nil	Nil
16	Copper	mg/L	0.05	ND	ND	ND
17	Manganese	mg/L	0.1	ND	ND	ND
18	Phenolic Compound	mg/L	0.001	ND	ND	ND
19	Mercury	mg/L	0.001	ND	ND	ND
20	Cadmium	mg/L	0.003	ND	ND	ND
21	Selenium	mg/L	0.01	ND	ND	ND

22	Total Arsenic	mg/L	0.01	ND	ND	ND
23	Cyanide	mg/L	0.05	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND
25	Zinc	mg/L	5.0	ND	ND	ND
26	Anionic detergents	mg/L	0.2	ND	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	3.0001	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND
30	Pesticides	mg/L	---	ND	ND	ND
31	Aluminum	mg/L	0.03	ND	ND	ND
32	Boron	mg/L	0.5	ND	ND	ND
33	Nickel	mg/L	0.02	ND	ND	ND

Note: ND = Not Detected

**Ground Water Quality Analysis Report for the month of Sept 2022**  
**Date of Sampling: 10/09/2022**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500:2012	Analysis Results			
				Village Kalamegha	Village Kathfali	Village Khuntjharla	Village Rengalmur
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0	<5.0
02	Odour	--	Agreeable (A)	A	A	A	A
03	Taste	-	Agreeable (A)	A	A	A	A
04	pH value	-	6.5 to 8.5	7.21	6.66	6.40	7.36
05	Turbidity	NTU	1.0	0.86	0.77	0.79	0.83
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	220.0	24.0	58.0	280.0
07	Total Iron	mg/L	0.3	0.06	0.08	0.05	0.07
08	Chloride	mg/L	250.0	54.20	14.78	34.49	83.77
09	Total Dissolved Solids	mg/L	500.0	593.0	48.6	231.0	781.0
10	Calcium as Ca	mg/L	75.0	36.37	6.41	21.64	28.06
11	Sulphate as SO <sub>4</sub>	mg/L	200.0	28.72	3.08	19.49	26.67
12	Fluoride	mg/L	1.0	<0.1	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/L	200.0	420.0	42.0	78.0	470.0
14	Nitrate as NO <sub>3</sub>	mg/L	45.0	< 5.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/L	0.2 (min)	Nil	Nil	Nil	Nil
16	Copper	mg/L	0.05	ND	ND	ND	ND
17	Manganese	mg/L	0.1	ND	ND	ND	ND
18	Phenolic Compound	mg/L	0.001	ND	ND	ND	ND
19	Mercury	mg/L	0.001	ND	ND	ND	ND
20	Cadmium	mg/L	0.003	ND	ND	ND	ND
21	Selenium	mg/L	0.01	ND	ND	ND	ND

22	Total Arsenic	mg/l.	0.01	ND	ND	ND	ND
23	Cyanide	mg/L	0.05	ND	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND	ND
25	Zinc	mg/L	5.0	ND	ND	ND	ND
26	Anionic detergents	mg/L	0.2	ND	ND	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND	ND
30	Pesticides	mg/L	--	ND	ND	ND	ND
31	Aluminum	mg/L	0.03	ND	ND	ND	ND
32	Boron	mg/L	0.5	ND	ND	ND	ND
33	Nickel	mg/L	0.02	ND	ND	ND	ND

**Note: ND = Not Detected**

**Ground Water Quality Analysis Report for the month of Sept 2022**  
**Date of Sampling: 10/09/2022**

Sl	Parameters Analyzed	Unit	Permissible Limit as per IS 10500: 2012	Analysis Results		
				Bore well Near Office (Inside the Lease Area)	Bore well Near Labour Barrack (Inside the Lease Area)	Tap water inside NTPC site office
01	Colour	Hazen	5.0	<5.0	<5.0	<5.0
02	Odour	-	Agreeable (A)	A	A	A
03	Taste	--	Agreeable (A)	A	A	A
04	pH value	-	6.5 to 8.5	7.23	7.20	7.31
05	Turbidity	NTU	1.0	0.71	0.79	0.91
06	Total Hardness as CaCO <sub>3</sub>	mg/L	200.0	180.0	48.0	150.0
07	Total Iron	mg/L	0.3	0.06	0.07	0.06
08	Chloride	mg/l.	250.0	51.25	17.78	32.52
09	Total Dissolved Solids	mg/L	500.0	369.0	103.0	272.0
10	Calcium as Ca	mg/l.	75.0	36.87	12.83	36.07
11	Sulphate as SO <sub>4</sub>	mg/l.	200.0	12.69	19.87	28.08
12	Fluoride	mg/L	1.0	<0.1	<0.1	<0.1
13	Total Alkalinity as CaCO <sub>3</sub>	mg/L.	200.0	192.0	102.0	198.0
14	Nitrate as NO <sub>3</sub>	mg/L.	45.0	< 5.0	< 5.0	< 5.0
15	Residual Free Chlorine	mg/L	0.2 (min)	Nil	Nil	Nil
16	Copper	mg/L	0.05	ND	ND	ND
17	Manganese	mg/L	0.1	ND	ND	ND
18	Phenolic Compound	mg/L	0.001	ND	ND	ND

19	Mercury	mg/L	0.001	ND	ND	ND
20	Cadmium	mg/L	0.003	ND	ND	ND
21	Selenium	mg/L	0.01	ND	ND	ND
22	Total Arsenic	mg/L	0.01	ND	ND	ND
23	Cyanide	mg/L	0.05	ND	ND	ND
24	Lead	mg/L	0.01	ND	ND	ND
25	Zinc	mg/L	5.0	ND	ND	ND
26	Anionic detergents	mg/L	0.2	ND	ND	ND
27	Total Chromium	mg/L	0.05	ND	ND	ND
28	Polynuclear aromatic hydrocarbons	mg/L	0.0001	ND	ND	ND
29	Mineral Oil	mg/L	0.5	ND	ND	ND
30	Pesticides	mg/L	—	ND	ND	ND
31	Aluminum	mg/L	0.03	ND	ND	ND
32	Boron	mg/L	0.5	ND	ND	ND
33	Nickel	mg/L	0.02	ND	ND	ND

**Note: ND = Not Detected**

**Effluent Water Sampling and Analysis Report**  
**Frequency of Monitoring – Monthly Once**

Month: April 2022, Date of Sampling: 09/04/2022

Sl. No	Parameters Analyzed	Unit	Permissible Limit as CTO issued by OSPCB	Analysis Result	
				ETP Inlet	ETP Outlet
1	pH value	-	6.5 – 8.5	6.82	6.77
2	Total Suspended Solids	mg/l.	50.0	29.3	1.37
3	Oil & Grease	mg/L	10.0	2.52	1.32
4	COD	mg/L	150.0	20.0	16.0

Month: May 2021, Date of Sampling: 07/05/2022

Sl. No	Parameters Analyzed	Unit	Permissible Limit as CTO issued by OSPCB	Analysis Result	
				ETP Inlet	ETP Outlet
1	pH value	-	6.5 – 8.5	6.86	6.97
2	Total Suspended Solids	mg/L	50.0	27.5	6.1
3	Oil & Grease	mg/L	10.0	2.66	1.56
4	COD	mg/L	150.0	24.0	12.0

Month: June 2021, Date of Sampling: 06/06/2022

Sl. No	Parameters Analyzed	Unit	Permissible Limit as CTO issued by OSPCB	Analysis Result	
				ETP Inlet	ETP Outlet
1	pH value	-	6.5 – 8.5	6.91	6.88
2	Total Suspended Solids	mg/L	50.0	21.5	3.1
3	Oil & Grease	mg/L	10.0	2.60	2.56
4	COD	mg/l.	150.0	20.0	12.0

Month: July 2022, Date of Sampling: 10/07/2022

Sl. No	Parameters Analyzed	Unit	Permissible Limit as CTO issued by OSPCB	Analysis Result	
				ETP Inlet	ETP Outlet
1	pH value	-	6.5 – 8.5	7.01	6.91
2	Total Suspended Solids	mg/L	50.0	25.5	3.7
3	Oil & Grease	mg/L	10.0	2.26	2.16
4	COD	mg/L	150.0	16.0	12.0

Month: August 2022, Date of Sampling: 05/08/2022

Sl. No	Parameters Analyzed	Unit	Permissible Limit as CTO Issued by OSPCB	Analysis Result	
				ETP Inlet	ETP Outlet
1	pH value	-	6.5 – 8.5	7.07	6.99
2	Total Suspended Solids	mg/l.	50.0	29.5	5.7
3	Oil & Grease	mg/L	10.0	4.06	3.16
4	COD	mg/L	150.0	20.0	16.0

Month: Sept 2022, Date of Sampling: 10/09/2022

Sl. No	Parameters Analyzed	Unit	Permissible Limit as CTO issued by OSPCB	Analysis Result	
				ETP Inlet	ETP Outlet
1	pH value	-	6.5 – 8.5	7.37	7.21
2	Total Suspended Solids	mg/L	50.0	2.06	1.76
3	Oil & Grease	mg/L	10.0	19.5	7.7
4	COD	mg/l.	150.0	16.0	12.0

**Ambient Air Quality Monitoring Report**  
**Frequency of Monitoring: Monthly Twice**  
**(April 2022 to September 2022)**

Sl. No	Monitoring Stations	Month	Dt. of Monitoring	Analysis Result in $\mu\text{g}/\text{m}^3$					CO In $\text{mg}/\text{m}^3$		
				SPM	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>			
1	Near Site Office, Khapurikachhar (Core Zone)	April 2022	10/04/2022	195.14	72.93	33.25	8.25	12.95	< 1.14		
			22/04/2022	203.74	71.31	30.81	7.87	10.60	< 1.14		
		May 2022	08/05/2022	183.90	68.73	30.48	8.03	12.74	< 1.14		
			17/05/2022	209.52	73.59	32.33	8.36	11.26	< 1.14		
		June 2022	06/06/2022	204.96	76.53	36.78	9.16	14.07	< 1.14		
			17/06/2022	203.94	71.74	31.55	8.16	13.36	< 1.14		
		July 2022	11/07/2022	187.20	71.05	31.15	6.72	10.65	< 1.14		
			22/07/2022	152.34	58.32	25.91	7.60	10.68	< 1.14		
		August 2022	06/08/2022	166.67	56.42	29.13	6.40	10.35	< 1.14		
			19/08/2022	150.31	64.84	27.00	6.71	11.64	< 1.14		
		Sept 2022	10/09/2022	133.45	56.89	29.15	7.70	10.41	< 1.14		
			21/09/2022	109.35	52.59	27.89	9.10	10.36	< 1.14		
		2	Near Coal Lab (Core Zone)	April 2022	10/04/2022	207.80	72.91	30.66	9.76	13.86	< 1.14
					22/04/2022	206.03	68.63	31.49	9.06	14.50	< 1.14
May 2022	08/05/2022			213.07	74.70	35.12	8.88	12.19	< 1.14		
	17/05/2022			205.30	77.73	32.94	9.23	14.94	< 1.14		
June 2022	06/06/2022			207.98	75.62	34.23	8.02	13.00	< 1.14		
	17/06/2022			212.95	68.67	35.79	9.58	13.99	< 1.14		
July 2022	11/07/2022			187.76	68.19	33.95	8.31	13.76	< 1.14		
	22/07/2022			157.50	54.93	26.17	7.67	10.96	< 1.14		
August 2022	06/08/2022			168.90	64.37	26.28	7.10	10.94	< 1.14		
	19/08/2022			159.22	67.49	27.29	7.55	11.64	< 1.14		
Sept 2022	10/09/2022			138.40	60.50	27.43	8.50	10.84	< 1.14		
	21/09/2022			113.02	47.91	28.38	8.09	11.92	< 1.14		
3	Near Work Shop (Core Zone)			April 2022	10/04/2022	203.30	73.48	31.31	8.01	13.03	< 1.14
					22/04/2022	194.02	73.22	31.11	7.74	10.76	< 1.14
		May 2022	08/05/2022	188.15	73.79	31.17	7.12	11.59	< 1.14		
			17/05/2022	209.40	76.51	33.45	9.40	13.04	< 1.14		
		June 2022	06/06/2022	196.2	71.79	29.88	7.47	10.64	< 1.14		
			17/06/2022	183.15	72.18	31.03	7.54	11.31	< 1.14		
		July 2022	11/07/2022	179.94	70.75	34.07	7.55	10.61	< 1.14		
			22/07/2022	163.33	60.05	25.25	6.30	11.15	< 1.14		
		August 2022	06/08/2022	165.48	63.67	27.44	6.64	11.25	< 1.14		
			19/08/2022	164.14	55.49	25.40	6.85	10.29	< 1.14		
		Sept 2022	10/09/2022	137.61	65.45	29.21	8.78	11.90	< 1.14		
			21/09/2022	111.90	52.16	28.76	8.13	11.05	< 1.14		
		<b>Permissible Limits as per NAAQS, 2009</b>				-	<b>100</b>	<b>60</b>	<b>80</b>	<b>80</b>	<b>2.0</b>

Sl. No	Monitoring Stations	Month		Analysis Result in $\mu\text{g}/\text{m}^3$					CO in $\text{mg}/\text{m}^3$		
				SPM	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>			
4	Near Village Dulanga (Core Zone)	April 2022	10/04/2022	205.26	70.95	32.11	8.20	11.75	< 1.14		
			22/04/2022	197.02	74.19	33.63	8.06	13.70	< 1.14		
		May 2022	08/05/2022	198.36	74.47	34.10	6.58	12.75	< 1.14		
			17/05/2022	204.54	70.07	30.91	8.28	12.18	< 1.14		
		June 2022	06/06/2022	206.15	77.42	32.76	8.20	13.74	< 1.14		
			17/06/2022	204.51	75.57	34.92	7.78	14.30	< 1.14		
		July 2022	11/07/2022	169.23	68.06	29.84	9.54	13.13	< 1.14		
			22/07/2022	163.10	61.30	23.96	7.33	10.74	< 1.14		
		August 2022	06/08/2022	153.88	61.88	23.89	6.77	11.37	< 1.14		
			19/08/2022	159.42	63.79	24.77	7.89	11.87	< 1.14		
		Sept 2022	10/09/2022	141.16	61.27	27.01	7.25	12.04	< 1.14		
			21/09/2022	110.12	49.64	31.13	7.23	12.89	< 1.14		
		5	Near Village Bendrichua (Buffer Zone)	April 2022	11/04/2022	205.12	74.21	30.08	7.83	10.58	< 1.14
					23/04/2022	174.62	68.42	26.68	6.61	11.43	< 1.14
May 2022	07/05/2022			191.73	69.37	32.50	8.40	11.48	< 1.14		
	18/05/2022			187.60	70.23	28.23	7.25	10.97	< 1.14		
June 2022	07/06/2022			194.07	70.21	29.98	7.71	10.61	< 1.14		
	18/06/2022			202.23	73.40	34.51	9.53	12.64	< 1.14		
July 2022	12/07/2022			185.22	63.32	28.46	8.11	13.64	< 1.14		
	23/07/2022			154.38	60.75	25.55	7.84	10.39	< 1.14		
August 2022	07/08/2022			152.29	63.77	25.19	7.85	12.49	< 1.14		
	20/08/2022			162.50	57.64	23.16	7.29	9.82	< 1.14		
Sept 2022	11/09/2022			142.96	62.45	32.07	9.98	12.04	< 1.14		
	22/09/2022			108.35	50.04	30.18	9.30	10.50	< 1.14		
6	Near Village Rengalmunt (Buffer Zone)			April 2022	11/04/2022	179.21	72.83	28.92	6.98	10.12	< 1.14
					23/04/2022	193.08	68.20	29.94	7.18	12.69	< 1.14
		May 2022	07/05/2022	203.01	78.03	27.45	9.12	13.69	< 1.14		
			18/05/2022	198.84	72.88	33.37	6.39	11.14	< 1.14		
		June 2022	07/06/2022	202.30	77.75	29.94	8.04	12.34	< 1.14		
			18/06/2022	202.59	14.26	32.90	8.57	11.94	< 1.14		
		July 2022	12/07/2022	164.28	70.82	34.68	7.09	12.77	< 1.14		
			23/07/2022	164.46	58.80	28.20	6.79	12.04	< 1.14		
		August 2022	07/08/2022	169.73	62.87	28.05	6.69	10.14	< 1.14		
			20/08/2022	155.39	58.88	24.99	6.52	10.06	< 1.14		
		Sept 2022	11/09/2022	138.75	56.58	29.90	8.11	11.02	< 1.14		
			22/09/2022	101.22	48.28	31.58	8.95	12.73	< 1.14		
		<b>Permissible Limits as per NAAQS, 2009</b>				-	100	60	80	80	2.0

Sl. No	Monitoring Stations	Month	Dt. of Monitoring	Analysis Result in $\mu\text{g}/\text{m}^3$					CO in $\text{mg}/\text{m}^3$		
				SPM	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>			
7	Near Village Khuntjaria (Buffer Zone)	April 2022	11/04/2022	191.52	68.36	27.25	8.19	13.93	< 1.14		
			23/04/2022	186.82	73.58	30.59	9.16	11.67	< 1.14		
		May 2022	07/05/2022	195.93	70.10	30.34	8.40	13.13	< 1.14		
			18/05/2022	195.48	69.50	32.85	9.44	12.09	< 1.14		
		June 2022	07/06/2022	193.93	75.66	34.51	7.67	13.03	< 1.14		
			18/06/2022	189.56	68.20	28.82	8.60	10.96	< 1.14		
		July 2022	12/07/2022	179.41	69.71	32.80	8.57	14.70	< 1.14		
			23/07/2022	161.63	59.16	26.40	7.01	11.45	< 1.14		
		August 2022	07/08/2022	157.95	61.37	29.84	7.45	10.01	< 1.14		
			20/08/2022	157.02	65.53	23.69	6.47	10.35	< 1.14		
		Sept 2022	11/09/2022	141.65	63.08	31.52	9.10	11.91	< 1.14		
			22/09/2022	103.30	47.31	32.01	8.06	13.17	< 1.14		
		8	Near Village Kathfali (Buffer Zone)	April 2022	11/04/2022	183.75	72.53	26.52	7.05	10.86	< 1.14
					23/04/2022	206.11	72.04	27.49	7.49	12.14	< 1.14
				May 2022	07/05/2022	184.56	68.82	31.57	7.63	11.09	< 1.14
					18/05/2022	177.18	66.61	34.48	8.17	13.48	< 1.14
June 2022	07/06/2022			196.51	70.59	33.64	7.36	13.50	< 1.14		
	18/06/2022			194.32	65.72	33.90	7.91	13.96	< 1.14		
July 2022	12/07/2022			161.10	66.42	30.18	7.93	11.69	< 1.14		
	23/07/2022			156.15	57.14	26.84	7.42	11.66	< 1.14		
August 2022	07/08/2022			152.56	57.38	26.20	6.44	10.73	< 1.14		
	20/08/2022			161.56	63.18	26.00	7.32	11.61	< 1.14		
Sept 2022	11/09/2022			129.45	63.67	30.75	7.88	13.43	< 1.14		
	22/09/2022			109.06	45.98	30.42	8.12	11.64	< 1.14		
Permissible Limits as per NAAQS, 2009				-	100	60	80	80	2.0		

**Reports on Heavy Metals in Ambient Air Quality  
Frequency of Monitoring - BI - Annual  
(September 2022)**

Sl. No	Monitoring Stations	Month	Date of Monitoring	Analysis Result				
				Hg in $\mu\text{g}/\text{m}^3$	Ni in $\text{ng}/\text{m}^3$	As in $\text{ng}/\text{m}^3$	Cr in $\mu\text{g}/\text{m}^3$	Cd in $\mu\text{g}/\text{m}^3$
1	Near Site Office, Khapurikachhar	September 2022	12/09/2022 & 22/09/2022	ND	ND	ND	ND	ND
2	Near Coal Lab (Core Zone)	September 2022	12/09/2022 & 22/09/2022	ND	ND	ND	ND	ND
3	Near Workshop (Core Zone)	September 2022	12/09/2022 & 22/09/2022	ND	ND	ND	ND	ND
4	Near Village Dulanga (Core Zone)	September 2022	12/09/2022 & 22/09/2022	ND	ND	ND	ND	ND
5	Near Village Bendrichua (Buffer Zone)	September 2022	12/09/2022 & 22/09/2022	ND	ND	ND	ND	ND
6	Near Village Rengalnunr (Buffer Zone)	September 2022	12/09/2022 & 22/09/2022	ND	ND	ND	ND	ND
7	Near Village Khunjharua (Buffer Zone)	September 2022	12/09/2022 & 22/09/2022	ND	ND	ND	ND	ND
8	Near Village Kathfali (Buffer Zone)	September 2022	12/09/2022 & 22/09/2022	ND	ND	ND	ND	ND
<b>Permissible Limits as per NAAQS, 2009</b>				-	20	06	-	-

**Note: ND: Not Detected**



**Annexure-XI**

**Monitoring data of the stipulated environmental quality parameters being displayed at the entrance of the mine office**

