

Ref. No. 1040/PBCMP/EMG/2024/F-47/196

Date: 31/12/2024

To,
The Deputy Director General of Forests (C),
MoEF&CC, Integrated Regional Office,
2nd Floor, Headquarter Jharkhand State Housing Board
Harmu Chowk, Ranchi (Jharkhand) – 834002.

Sub: Six monthly Progress Report on compliance of conditions stipulated in the Environmental Clearance by MoEF & CC and Monitoring report for the period April 2024 to September 2024 for NTPC Mining Limited– Pakri Barwadih Coal Mining Project (18MTPA): Reg.

Ref.: EC Ltr No. J-11015/692/2007-IA-II(M) Date 19th May 2009.
EC Amendment Ltr No. J-11015/692/2007-IA-II(M) Date 29.06.2016, 07.12.2017,
14.08.2018, 10.11.2020, 16.08.2023, 15.01.2024, 06.03.2024 (EC for 18 MTPA
PRC), 02.05.2024 (Transfer to NTPC Mining Limited) and 16.07.2024.

Dear Sir,

With reference to above subject please find enclosed herewith the six-monthly status report on compliance of various conditions in the Environmental Clearance and amendments accorded to NTPC Mining Limited – Pakri Barwadih Coal Mining Project (18 MTPA) for the period April 2024 to September 2024. The monitoring reports on fugitive dust emission, effluent quality, ambient air quality, ground and surface water quality, noise monitoring data etc. are also enclosed with the report.

This is for your kind consideration please.

Thanking you.

Yours Faithfully,

Navin Kumar

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कोयला खनन परियोजना / COAL MINING PROJECT
हजारीबाग / Hazaribag

Encl.: A/a
Copy to:

1. **Sc. E & Regional Director, Kolkata**, Central Pollution Control Board, Southern Conclave, Block 502, 5th & 6th Floors, Rajdhanga Main road, Kolkata-700107 (W.B), e-mail: mkbiswas.cpcb@nic.in.
2. **Regional Officer**, Jharkhand State Pollution Control Board, PTC Chowk, Hazaribagh, Jharkhand. Email-jspcb_hazaribagh@rediffmail.com
3. **Member Secretary**, Jharkhand State Pollution Control Board, Ranchi-834004 (Jharkhand), E-mail-ranchijspcb@gmail.com
4. **Director (HO)**, Office of the Coal Controller, Ministry of Coal, GOI, 1, Council House Street, Kolkata-700001, E-mail: coalcont-wb@nic.in

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NML Pakri Barwadih Coal Mining Project, Sikri Site Office, Barkagaon, Hazaribag - 825311

पंजीकृत कार्यालय : एनटीपीसी भवन, स्कोप कॉम्प्लेक्स, 7, इंस्टिट्यूशनल एरिया, लोधी रोड, नई दिल्ली – 110 0 03. टेलीफोन नं./Tel: 011-24387333, फैक्स नं./Fax: 01124361018
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Report Period:
April-2024
to
Sept.-2024



Six Monthly EC Compliance Report



In January 2020



In 2024

MIYAWAKI PLANTATION



- ❖ Total Area – 10000 sq. meter.
- ❖ 45 Trees per 10 Sq. meter.
- ❖ 25 different species.
- ❖ Multi layered green forest.
- ❖ 100% Organic Fertilizer.
- ❖ No. of Plants – 45000 Nos.



- 3X to 10X Growth
- 5X to 30X Dense
- 10X to 100X Biodiverse
- 100% Organic & Native
- 5X to 30X CO2 Absorption

NTPC Mining Ltd.
Pakri Barwadih Coal Mining Project.

COMPLIANCE STATUS OF ENVIRONMENTAL CLEARANCE CONDITIONS

Period: April–2024 to September–2024

EC Clearance Ltr. No.J-11015/692/2007-IA.II (M) Dated 19th May 2009
& Amendment Ltr. No J-11015/692/2007-IA-II (M) Dated 29.06.2016
Amendment Ltr. No J-11015/692/2007-IA-II (M) Dated 07.12.2017
Amendment Ltr. No J-11015/692/2007-IA-II (M) Dated 14.08.2018
Amendment Ltr. No J-11015/692/2007-IA-II (M) Dated 10.11.2020
Amendment Ltr. No J-11015/692/2007-IA-II (M) Dated 16.08.2023
Amendment Ltr. No J-11015/692/2007-IA-II (M) Dated 09.11.2023
Amendment Ltr. No J-11015/692/2007-IA-II (M) Dated 15.01.2024
EC Ltr. No J-11015/692/2007-IA-II (M) Dated 06.03.2024 (Expansion)
EC Transfer letter no. J-11015/692/2007-IA-II (M) Dated 02.05.2024
&
Amendment Ltr. No J-11015/692/2007-IA-II (M) Dated 16.07.2024



NTPC Mining Ltd. – PAKRI BARWADIH COAL MINING PROJECT
Sikri Site Office
PO: Barkagaon, Dist: Hazaribagh
Jharkhand – 825 311

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COMPLIANCE STATUS OF ENVIRONMENTAL CLEARANCE CONDITIONS

SL No	Conditions	Compliance/ Status report
SPECIFIC CONDITIONS (EC Clearance Ltr. No.J-11015/692/2007-IA.II (M) Dated 19th May 2009)		
I	The environmental clearance is restricted to Phase-1 of 39 years of opencast operations involving 3319.42 ha of ML area only for which exploration has been completed.	Noted. We shall always abide the said condition.
II	No mining operations shall be undertaken in the forest land within the ML until clearance has been obtained under the provisions of FC Act, 1980.	<p>All necessary clearances under the provisions of FC Act, 1980 has been obtained for the 1026.438 Ha of forestland involved vide:</p> <p>i. Stage I Clearance obtained vide letter no. "F. No 8-56/2009, dated 11th May2010",</p> <p>ii. Stage II Clearance obtained vide letter no. "F. No 8-56/2009, dated 17th Sept2010",</p> <p>iii. Final land release letter received from the State Govt. vide letter no. 3/Vanbhoomi-75/2009-1240 dated 31.03.2011.</p> <p>The Mining operation is restricted to the area only for which forest clearance has been accorded by MoEF&CC under the provisions of FC Act, 1980.</p>
III	The monolith found within the core zone shall not be disturbed by the mining operations and a minimum 500m distance along with thick green belt would be maintained between the eastern quarry and the monolith. A road would be created upto the monolith a park created around it so that the monolith could be visited.	To maintain thick green belt between Eastern quarry and Monolith, the existing green belt of 500m having large canopy trees, mainly of Mahua (Madhuca longifolia), Sisham (dalbergia sisoo) and other species between eastern quarry and Monolith has not been disturbed. Further, 13707 nos. of tree saplings have beenplanted around the eastern quarry to make the area green and fast-growing seedlings have been spread over the overburdens.

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	<p>Amendment vide letter number- J-11015/692/2007-IA-II(M) Date- 07.12.2017</p> <p>The user agency would provide necessary fund to the state Government for construction of road up to the monolith and a park around it so as that the Monolith could be visited as for tourism purpose.</p>	<p>NTPC is committed for development of the area in and around its projects; accordingly, NTPC had requested the District Administration for submission of the estimate for development of the Megalith. After various correspondence, made with the District Administration, they gave an estimate of Rs. 3,03,92,449/- on 16.10.2023 for development of Megalith Park with direction to submit Rs. 50 Lakhs as an advance.</p> <p>Based on demand raised by the District Administration, the amount of Rs. 50,00,000 (Rupees Fifty Lac) has been deposited with the District Administration for development of Megalith Park, vide Cheque no. 090436 attached with letter no. NTPC/PBCMP/R&R-CD/2023, dated 28.10.2023. Copy of the demand letter and payment receipt was submitted during previous compliance reporting vide letter ref. no. 1040/PBCMP/EMG/ F-47/108 Dated 01.06.2024.</p>
IV	<p>Mining shall be carried out as per statuette from the streams/nallahs flowing within the lease. Embankment to be constructed shall be based on peak flow data and shall be at least 3m above the HFL. The slope of the embankment shall at least 2:1 towards the ML and shall be stabilized with plantation. The CWPRS would be engaged for the design and study of realignment of the drains / nalas flowing across the ML and creation of embankment, and also obtain approval of the State Government for diversion of the nalas.</p>	<p>Complied.</p> <p>The CWPRS was engaged for the study and designing of the realignment/ diversion of Nalas flowing across the ML and creation of embankment.</p> <p>Based on the above study report of CWPRS, necessary permission/NOC for diversion of Dumuhani nalla has been obtained from State Water Resource Dept, GoJh vide their ltr. Ref. no. 2/PMC/ND- 171/2012/224 dated 19.03.2013 and accordingly Dumuhani Nalla has been diverted.</p>
V	<p>Topsoil should be stacked properly with proper slope at earmarked site(s) and should not be kept active and shall be used for reclamation and development of green belt.</p>	<p>Top soil is being stacked in available suitable site. Same is being used for spreading over the completed portion of OB Dump for development of the green belt.</p> <p>To prevent erosion from top soil dumps, coir mats have been laid on the slopes. Further, to avoid soil erosion mixed grass</p>

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		<p>seed spreading and root shoots of Vetiver grass and lemon grass has been sowed on top soil dump.</p> <p>Apart from this 450-meter-long toe wall along with garland drain and settling ponds have been constructed around the Top Soil dump near Itiz village. The garland drains are being repaired before monsoon every year.</p>
VI	<p>OB should be stacked at earmarked three external OB dump site within ML area of a maximum height of 90m.</p>	<p>As per approved revised Mine Plan, OB is being stacked at earmarked areas. Presently, maximum height of the dump is 89.62 m. It will be restricted to the maximum height of 90 meter.</p>
	<p>Amendment vide letter number- J-11015/692/2007-IA-II(M) Date- 07.12.2017</p> <p>A minimum of 500m shall be maintained and thick green belt developed between the habitation of Barkagaon and OB dumps.</p>	<p>At present the working of mine is more than 4 km from Barkagaon village, to maintain thick greenbelt existing greeneries between mine and habitation of the Barkagaon have not been disturbed.</p> <p>Further, about 2500 trees have been planted along road side between East quarry and Barkagaon village. Apart from above 6065 nos. of trees have been planted in Langatu and Arahara village falling between Mining and Barkagaon village.</p>
	<p>The option of raising the level of grazing land created after backfilling the quarry by 10m or so shall be examined so to reduce the overall OB dump height.</p>	<p>As per present approved mining plan and mine closure plan, 442 ha area have been envisaged for agricultural land and 223 ha area for grazing land, the same shall be modified to increase the final area under agriculture & grazing land and to reduce final void size in next amendment of the mining plan and mine closure plan.</p>
	<p>Slope stability tests may be undertaken and the feasibility of backfilling depending on the type of cost-effective technology available at that stage shall be re-examined.</p>	<p>Slope stability tests have been conducted through the Central Institute of Mining and Fuel Research (CIMFR) Dhanbad & BIT, Sindri – Dhanbad for Dump–A, Dump- C, backfill dump and pit slopes. Slope stability Study of Eastern Quarry & Eastern Quarry dump has been done by IIT-BHU.</p>
	<p>The ultimate slope of the dump shall not exceed 28°.</p>	<p>The ultimate slope of the dump is restricted to 28 degree.</p>

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	Monitoring and management of reclaimed dumpsite should continue until the vegetation becomes self-sustaining.	Monitoring & management of reclaimed dump site shall be carried out till the vegetation becomes self-sustaining
	Compliance status should be submitted to the Ministry of Environment & Forests and its Regional office located at Bhubaneswar on yearly basis.	The half yearly compliance report of EC is being submitted regularly to the MoEF & CC Regional office Ranchi. Last report submitted online on Parivesh Portal and also submitted to regional office vide letter no.-1040/PBCMP/EMG/2024/F-47/108 dated- 01/06/2024 through mail. Copy of the mail enclosed as Annexure – 1 .
VII	Catch drains and siltation ponds of appropriate size should be constructed to arrest silt and sediment flows from soil, OB and mineral dumps. The water so collected should be utilized for watering the mine area, roads, green belt development, etc. The drains should be regularly desilted and maintained properly. Garland drains (size, gradient and length) and sump capacity should be designed keeping 50% safety margin over and above the peak sudden rainfall and maximum discharge in the area adjoining the mine site. Sump capacity should also provide adequate retention period to allow proper settling of silt material.	<p>All the possible actions are being taken to arrest the silts from all the possible sources. The catch drains and the siltation ponds are designed to contain the maxrainfall and silt generation during the rain.</p> <p>The siltation ponds are being regularly de-silted and maintained properly and connected to garland drains. The water collected is utilized in green belt development, etc. After every monsoon cleaning of the catch drains and siltation ponds are being done.</p> <p>The maximum annual rainfall in last 10 years recorded at Barkagaon/Hazaribagh is 1750 mm (in 2021). The sump has been constructed keeping the safety margin more than 50% over and above the maximum rainfall in the area. Water so collected is being utilized for dust suppression in mining area, transportroads and also for green belt development etc. The catch drains are regularly being de-silted.</p> <p>The main sump is at deep most side so as to provide adequate retention period to allow settling of silt material.</p>
VIII	Dimension of the retaining wall at the toe of the dumps and OB benches within the mine to check run-off and siltation should be based on the rainfall data.	<p>OB dump is in active condition. All the protection measures for soil erosion from OB dump are being taken based on rainfall data.</p> <p>To prevent erosion from dumps, 2400-meter toe wall followed by garland drain along the embankment, 735-meter toe wall</p>

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		<p>followed by garland drain along the haul road facing Khora nala, 780-meter toe wall on the toe of the Dump 'C', 810- meter toe wall along the Dump 'A' and 560-meter toe wall followed by garland drain along the Top Soil dump have been constructed.</p> <p>The garland drains constructed all around the dumps are ultimately connected to the settling pits where the sediments are settled and allow the water to pass through it. Further, 4 nos. of rock fill Check dam are constructed to avoid any siltation in the nearby area.</p>
IX	<p>The main haul road of 6 Km within the core zone shall be metaled. A 3-tier avenue plantation shall be developed along the main approach road. Mineral Transportation from CHP to Railway Siding shall be by closed belt conveyor of a length of 7 Km. The railway siding shall be provided with Silo Rapid Loading System.</p> <p>Amendment : letter number- J-11015/692/ 2007-IA-II(M) Date 29.06.2016</p> <p>The coal shall be transported through closed belt conveyor system of a length of 13 km to Banadag railway station. The project proponent is permitted for (2) years to use State Highway/ public roads for transportation of coal (approx. 35 km) to Banadag Railway Siding by adopting all mitigative measures to control dust pollution. The project proponent shall put all the efforts to expedite completion of service road of belt conveyor so that the same can be utilized for coal transportation.</p>	<p>Transportation of coal is being done through 13 Km Belt Conveyor with Silo Rapid Loading system (completed on 15.12.2024) and also through state highway and service road adopting all mitigative measures to control dust pollution as permitted till 31.12.2024 by MOEF&CC vide EC Amendment letter no. J-11015/ 692/ 2007-IA-II(M) dated 30.10.2024. Copy of the EC attached as Annexure-2.</p>

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<p>Amendment: letter number- J-11015/692/ 2007-IA-II(M) Date 07.12.2017:</p> <p>The approach road of 6 km along northern boundary of mining lease shall be metaled. For development of 3-tier avenue plantation, northern sides of main approach road to be preferred in place of haul roads.</p>	<p>The approach road of 6 km along northern boundary of mining lease is metaled.</p> <p>The existing greenbelt along the Northern side of the main approach road has not been disturbed. Photographs attached as Annexure –3.</p> <p>Apart from the above till date total 7800 nos. of plants have been planted along the northern boundary as 3-tier avenue plantation. Photographs enclosed as Annexure-4.</p>
<p>Condition IX, Amendment vide letter number-J-11015/692/2007-IA-II(M) Date 29.06.2016, letter number-J-11015/692/2007-IA-II(M) Date 14.08.2018, letter number- J-11015/692/2007-IA-II(M) Date 10.11.2020</p> <p>Thereby extension in amendments in EC dated 19th July 2018 for a period of two years (i.e upto 28th June, 2022) by road as an interim arrangement by adopting all mitigation measures to control dust pollution, which would include regular maintenance of roads, water sprinkling, covering trucks with tarpaulin sheet etc.</p>	<p>Transportation of coal is being done through 13 Km Belt Conveyor with Silo Rapid Loading system (completed on 15.12.2024) and also through state highway and service road adopting all mitigative measures to control dust pollution as permitted till 31.12.2024 by MOEF&CC vide EC Amendment letter no. J-11015/ 692/ 2007-IA-II(M) dated 30.10.2024. Copy of the EC attached as Annexure-2.</p>
<p>Width of the road shall be at least 7 mts before the start of the transportation and necessary permission shall be taken from state PWD.</p>	<p>Road which is used for transportation of coal is wider than 7mtr. For granting of necessary permission from state PWD a letter vide letter no.1040/PBCMP /ENV/2021/F-47/44 Dt 28.06.2021 has been submitted. Copy of letter was submitted in compliance reporting for the period of Oct, 22 to March 2023.</p>
<p>The State Pollution Control Board, while considering consent to operate for the project, shall ensure that with the proposed coal transportation by road, air quality would remain within the national ambient air quality standards.</p>	<p>Agree to abide by the condition.</p> <p>The air quality monitoring is being done through NABL accredited Laboratory. The ambient air monitored data collected along the coal transport route indicates that all the parameters are within NAAQ limit. Monitoring report is attached as Annexure-5.</p>

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	<p>The mining lease holders shall, after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been distributed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc.”</p>	<p>The mining activities are being carried out as per the approved mine plan and mine closure plan and due care are being taken to minimize the adverse impact of the mining activity to surrounding areas. All the mitigation measures are being taken as per the approved EMP and Mine Closure Plan.</p>
<p>Condition IX, Amendment vide letter number-J-11015/692/2007-IA-II(M) Dated-16.08.2023.</p>		
<p>1.1</p>	<p>The PP needs to complete the construction of closed belt conveyor system of a length of 13 km to Banadag railway station. The project proponent is permitted till October, 2023 to use Service road/State Highways for transportation of coal to Banadag railway siding by adopting all mitigative measure to control dust pollution”.</p>	<p>Hon’ble Supreme Court has extended the timeline for construction of Belt Conveyor system till 31.12.2024 vide its order dated 29.01.2024. Copy of the order attached as Annexure-6.</p> <p>As permitted by MOEF&CC vide EC Amendment letter no. J-11015/692/2007-IA-II(M) dated 30.10.2024 part of coal is being transported through 13 Km Belt Conveyor with Silo Rapid Loading system (completed on 15.12.2024) and part of the coal is transported through state highway and service road adopting all mitigative measures to control dust pollution. Copy of the EC attached as Annexure-2.</p>
<p>1.2</p>	<p>Transportation of coal from service road instead of conveyor belt and silo loading system is subject to the outcome of Order of Hon’ble Supreme Court i.e. Civil Appeal No. 6249 of 2021 (in matter of National Thermal Power Corporation (NTPC) vs Tripurari Singh & Ors.)</p>	<p>Agreed to comply.</p> <p>In the matter of Miscellaneous Application MA-001824/2023 dated 18.08.2023 submitted before hon’ble Supreme Court in Civil Appeal No. 6249 of 2021 (NTPC vs Tripurari Singh & Ors.), Hon’ble Supreme Court extended the timeline for construction of Belt Conveyor till 31.12.2024 through its order dated 29.01.2024. Copy of the order attached as Annexure-6.</p>
<p>1.3</p>	<p>The PP shall submit the status of Dumhani nallah to IRO, MoEF&CC before October 2023 with photographs and drone video for diverted portion of Dumhani nallah. The project proponent shall also make all possible effort towards protecting catchment area of the streams flowing within the</p>	<p>The Status Report of Dumuhani Nallah has been submitted to RO, MoEF&CC vide letter no. 1040/PBCMP/EMG/2023/F- 47/199 Dated 19.10.2023. The copy of the same was submitted in compliance report submitted for the period of April 23 to Sept, 23.</p>

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	lease boundary as well as along the boundary of lease area.	The Work for preparation of Catchment Area Treatment Plan (CAT Plan) was awarded to IIT-ISM vide work order dated 18.07.2023. The CAT Plan has been approved by the state authority on 01.11.2024. Action towards protecting the catchment area of the streams flowing within the lease boundary as well as along the boundary of lease area shall be taken. Copy of CAT Plan approval is attached as Annexure-7 .
1.4	The PP shall deploy the covered truck with tarpaulin having size upto 50 tonnes for transportation of coal through Service road only. SPCB to ensure the strict compliance of condition.	Presently, part of the coal produced from PBCMP is being transported through road in tarpaulin covered trucks of size up to 50 tonnes and part of the coal is transported through conveyor belt. Photographs are enclosed as Annexure-8 .
1.5	The PP shall submit the status report of diverted Dumhani stream to IRO, MoEF&CC before October, 2023 ensuring that proper water management in catchment area has been made along with photographs and drone video for diverted portion. The project proponent shall also make all possible effort for protecting catchment area of other streams flowing within the lease boundary as well as along the boundary of lease area without their diversion.	As submitted at point no. 1.3.
1.6	The PP shall submit the complete compliance report of EC letter dated 19.05.2009 and subsequent amendment of ECs vide letter dated 29.06.2016, 07.12.2017, 14.08.2018 & 10.11.2020 respectively.	The half yearly compliance report of EC is being submitted regularly to the MoEF & CC Regional office Ranchi. Last report submitted online on PARIVESH Portal and also submitted to regional office vide letter no.- 1040/PBCMP/EMG/2024/F-47/108 dated- 01/06/2024 through mail. Copy of the mail enclosed as Annexure – 1 .
1.7	All the railway siding involved in loading and unloading of the materials which are prone to generate fugitive dust emissions, should install fixed type water sprinklers for effective dust suppression, should install settling pond of suitable capacity with chemical dosing system for treatment of the runoff water, should construct	At Banadag Railway Siding 10 nos. Permanent/fixed type high-capacity rain-guns have been installed on both side of railway siding to minimize the dust generation. Apart from the above fugitive emissions are being controlled by water sprinkling through 4 no. of 10 KL capacity water tankers. Photographs attached as Annexure-9 .

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	the wind breaking wall of 20 feet high to prevent the dusts to spread and should do tree plantation along the boundary wall.	<p>Garland drains have been constructed on both side of the Railway siding which ultimately connected with the settling ponds.</p> <p>Further, boundary wall has been constructed on both side of Banadag Railway Siding along with permanent wind breaking screen of height 20 ft. Photographs are attached as Annexure-10.</p> <p>Till date 1200 nos. of tree sapling have been planted along the periphery of the railway siding and in available vacant land. Photographs attached as Annexure-11.</p>
1.8	PP shall create a "Public Grievance Redressal and Monitoring System" for resolving any issues related to the pollution of mines and complaint has to resolve as soon as possible not beyond 30 days. In this regard, adequate awareness to be spread among the public to address their grievance to company with simple and easy manner and for which company needs to devise the mechanism. The same shall be reported to IRO within 3 months. A logbook to be maintained by PP on "Public Grievance Redressal and Monitoring System.	<p>Public Grievance Redressal and Monitoring System has been established at Pakri Barwadih Coal Mining Project for resolving any issues related to the pollution of mines. The same has been reported to RO, MoEF&CC vide letter Ref. no. 1040/PBCMP/EMG/2023/F-47/199 Dated 19.10.2023. The copy of the letter is attached as Annexure-12.</p> <p>An online system for "Public Grievance Redressal and Monitoring" has also been established the same can be accessed on https://www.ntpc.co.in/grievance/</p>
1.9	PP shall pay to farmers of agricultural land if there is any loss due to pollution found by concerned District Commissioner as per extent rules or norms.	Agreed to comply.
1.10	PP should establish in house (at project site) environment laboratory for measurement of environment parameter with respect to air quality and water (surface and ground. A dedicated team to oversee environment management shall be setup which should comprise of Environment Engineers, Laboratory	Presently, Monitoring and analysis is being done through MoEF&CC and NABL accredited lab in consultation with the State Pollution Control Board. An environmental laboratory with various water and air quality testing equipment has been setup at site. Photographs of laboratory is attached as Annexure- 13 . List of equipment is attached as Annexure-14 .

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	chemist and staff for monitoring of air, water quality parameters on routine basis. Any non-compliance or infringement should be reported to the concerned authority.	A dedicated team comprising of Environment Engineers, Laboratory chemist and supporting staff has been deployed in the lab for testing and monitoring work. Copy of the order and organization structure are attached as Annexure-15 .
1.11	PP to install solar lights along the road used for transportation of minerals to avoid accidents at night and also seek its maintenance. PP is asked to also identify the rural areas for installation of solar light with its maintenance within the study area of 10 km radius buffer zone within one year.	To avoid the accidents at night, street lamp posts have been installed through Department of Energy, Govt of Jharkhand along the transportation road. Also 550 nos. of solar lights have been installed in the rural areas. Apart from the above, the work of installation of 100 new solar lights/high mast along coal transportation road has been awarded to M/s Aasma Enterprises. Copy of the work order is attached as Annexure-16 . Photographs attached as Annexure-17 .
1.12	PP to provide bio toilets to the villages located within the study areas within 1 year from the grant of this EC.	The NTPC have already constructed 645 nos. of toilets in surrounding villages under Swachh Bharat Abhiyan. However, the work for installation of 6 nos. of Bio-Toilets has been awarded to M/s Cactus Profiles Pvt. Ltd. The work for installation of bio-toilets is under process. Copy of work order is attached as Annexure-18 . Photographs of bio-toilet is attached as Annexure-19 .
1.13	PP shall conduct feasibility studies for assessment of voids for backfilling of ash and mixing of ash with overburden, taking up backfilling ash and OB mixing activities during operations as well as post closure of mines in line with the Fly Ash Utilization Notification, 2021.	Similar study has been awarded to M/s CIMFER for another NTPC's project (Dulanga Coal Mine Project, Odisha). After completion of study and based on the recommendations same shall be implemented at Pakri Barwadih Coal Mining Project.
Condition IX, Amendment vide letter number-J-11015/692/2007-IA-II(M) Date-09.11.2023.		
1.1	PP needs to implement the conditions laid down in amended EC letter dated 16.08.2023 wherein additional safeguards with regard to road	Noted. We shall always abide the said condition.

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1.2	PP needs to submit the Certified Compliance Report (CCR) from IRO for the Amendment of Environmental Clearance (EC) letter dated 16.08.2023 and their respective Action taken report by 15 December 2023.	Certified Compliance Report (CCR) has been obtained from IRO-MoEF & CC, Ranchi, and same has been submitted to MoEF & CC, New Delhi Vide our letter no. 1040/PBCMP/EMG/2023/F-47/243 Dated 15.12.2023 through mail 15.12.2023. Copy of the mail is attached as Annexure-20 .
1.3	PP shall collect the One-month baseline data on environmental quality-air (PM10, PM2.5, Sox, Nox and heavy metals such as Hg, Pb, Cr, AS etc.), noise, water (surface and groundwater), soil at different location of the existing coal transportation route.	One-month baseline data on environmental quality-air (PM10, PM2.5, Sox, Nox and heavy metals such as Hg, Pb, Cr, AS etc.), noise, water (surface and groundwater), soil at different location of the existing coal transportation route has been submitted Vide our letter no. 1040/PBCMP/EMG/2023/F-47/243 Dated 15.12.2023 through mail 15.12.2023. Copy of the mail is attached as Annexure-20 .
1.4	PP needs to submit the Compliance of above condition no. (ii) in order to address the matter of court cases pending before the Hon'ble Supreme Court for National Thermal Power Corporation (NTPC) v. Tripurari Singh in Miscellaneous Application No. 1824/2023 in Civil Appeal No. 6249 of 2021.	As submitted at point 1.2.

Condition IX, Amendment: letter number-J-11015/ 692/ 2007-IA-II(M) Date 15.01.2024:

Specific Conditions:

1.1	PP needs to submit the monthly progress report of conveyor belt and silo loading system to IRO, MoEF&CC.	Monthly progress report of conveyor belt and silo loading system is regularly being submitted to RO-MoEF & CC, Ranchi. The last monthly report for the month of Nov 2024 has been submitted to RO office vide our letter no. 1040/PBCMP/EMG/2024/F-47/183 Dated 03.12.2024 through email dated 03.12.2024. Copy of mail is attached as Annexure-21 .
1.2	PP needs to implement the conditions laid down in amended EC letter dated 09.11.2023 wherein additional safeguards with regard to road transportation have been provided.	Agreed. All possible measures are being taken to safeguard the environment with regard to road transportation.
1.3	PP shall collect the One-month	The one-month baseline data on

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	baseline data on environmental quality – air (PM10, PM2.5, SOx, NOx and heavy metals such as Hg, Pb, Cr, AS, etc), noise, water (surface and groundwater), soil at different location of the existing coal transportation route.	environmental quality – air (PM10, PM2.5, SOx, NOx and heavy metals such as Hg, Pb, Cr, AS, etc), noise, water (surface and groundwater), soil at different location of the existing coal transportation route are attached as Annexure-5 .
1.4	The plantations done by the PP need to be adequately densified and audited by a third party preferably a forestry institution of MoEFCC (eg ICFRE) to assess their efficacy. Densification of existing plantations shall also be done during the monsoon of 2024.	Till date, Pakri Barwadih Coal Mining Project has planted more than 5.85 Lakhs of tree saplings within the lease as well as along the roads outside the lease area. Apart from the above, 10,172 nos. of tree saplings have been distributed to local villagers at and around the Pakri Barwadih Coal Mining Project. The densification and assessing efficiency of existing plantation has been carried out by ICFRE. As per the report the survival percentage of existing plantation is 85 % to 95 %. Copy of Report is attached as Annexure-22 .
1.5	PP needs to fully comply with EC conditions and submit the Certified Compliance Report (CCR) from IRO for the Amendment of Environmental Clearance (EC) and their respective Action taken report.	The Certified Compliance Report (CCR) has been issued by IRO Ranchi vide letter ref. no. 103-425/376 dated 19.06.2024. The ATR of the CCR has been submitted to MoEF & CC vide letter ref. no. 1040/PBCMP/EMG/2024/F-47/144 Dated 26.08.2024. Copy of the mail is attached as Annexure-23 .
1.6	The matter shall be reviewed again by EAC in June/July 2024 for compliance of above with updated status of construction of belt conveyor system.	Noted.
1.7	PP needs to submit the Compliance of above conditions in order to address the matter regarding court cases pending before the Hon'ble Supreme Court for National Thermal Power Corporation (NTPC) v. Tripurari Singh in Miscellaneous Application No. 1824/2023 in Civil Appeal No. 6249 of 2021.	Miscellaneous Application MA-001824/2023 dated 18.08.2023 submitted before hon'ble Supreme Court in Civil Appeal No. 6249 of 2021 (in matter of National Thermal Power Corporation(NTPC) vs Tripurari Singh & Ors.) has been disposed off by Hon'ble Supreme Court and extended the timeline for construction of Belt Conveyor till 31.12.2024 vide its order dated 29.01.2024. Copy of the order attached as Annexure-6 .

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Condition IX, Amendment: letter number-J-11015/ 692/ 2007-IA-II(M) Date 16.07.2024:

Specific Conditions:

1.1	PP needs to submit the monthly progress report of the conveyor belt and silo loading system to RO.	Monthly progress report of conveyor belt and silo loading system is regularly being submitted to RO-MoEF & CC, Ranchi. The last monthly report for the month of Nov 2024 has been submitted to RO office vide our letter no. 1040/PBCMP/EMG/2024/F-47/183 Dated 03.12.2024 through email dated 03.12.2024. Copy of mail is attached as Annexure-21.
1.2	PP shall expedite the compliance and submit an ATR with documentary proof and photographs to concerned RO within 2 months.	The Certified Compliance Report (CCR) has been issued by IRO Ranchi vide letter ref. no. 103-425/376 dated 19.06.2024. The ATR of the CCR has been submitted to MoEF & CC vide letter ref. no. 1040/PBCMP/EMG/2024/F-47/144 Dated 26.08.2024. Copy of the mail is attached as Annexure-23.
1.3	The plantations done by the PP need to be adequately densified and audited by a third party preferably a forestry institution of MoEFCC (e.g. ICFRE) to assess their efficacy. Densification of existing plantations shall also be done during the monsoon of 2024.	The densification and assessing efficiency of existing plantation has been carried out by ICFRE. As per the report the survival percentage of existing plantation is 85 % to 95 %. Report of the same is attached as Annexure-22.
X	Drills should be wet operated only.	Drilling machine with inbuilt waterinjecting system is being utilized for drilling purpose. Also, regular water spraying is being carried out in the drilling area for minimization of the fugitive dust emission.
XI	Controlled blasting should be practiced with use of delay detonators. The mitigative measures for control of ground vibrations and to arrest the fly rocks and boulders should be implemented.	Blasting patterns have been designed based on the study conducted by CIMFR Dhanbad. As suggested by CIMFR, Dhanbad, controlled blasting technique with use of non-electric detonators is being practiced to minimize ground vibration and to avoid fly rocks & boulders. Also blast vibration monitoring is being done regularly (<i>and also through third party</i>) to determine any adverse impact due to blasting. The test results are well within the norms prescribed by the DGMS. The latest

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		test report of the same is enclosed as Annexure – 24.
XII	No additional groundwater (bore well) shall be used for mining operations. Additional water if any required for the project shall be used from recycled water or mine discharge water or rainwater collected in rainwater harvesting pits within the CML.	The requirement of water for other activity viz.: dust suppression, gardening and vehicle washing etc. are being fulfilled through recycled water, mine seepage water and rain water. Ground water is being used mainly for domestic and drinking use.
XIII	Regular monitoring of groundwater level and quality should be carried out by establishing a network of existing wells and construction of new piezometers. The monitoring for quantity should 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 should be submitted to the Ministry of Environment & Forests and to the Central Pollution Control Board quarterly within one month of monitoring.	Automatic water level recorders (Piezometers) have been installed at Langatu site office, and Sikri site office. The real time data are being transmitted to the CGWA website. Also, manual monitoring are being carried out at 12 locations in and around the mining lease area. The data so generated is being submitted to Ministry of Environment & Forests and Climate Change & Central Pollution Control Board. Last six months water level data are enclosed as Annexure – 25. Water quality report of month May-2024 & August-2024 is attached as Annexure –26.
	Rainwater structures shall be erected in the core and buffer zone, in case monitoring indicates a decline in water table.	Approx. 23 lakh m³ of rainwater have been stored in the East quarry for use in dust suppression in CHP and roads, plantation activity and other miscellaneous activities. In addition to that, 12 Nos. of Check dams have been constructed in Pakwa and Khora Nala to meet water requirements and to augment the groundwater of the area around the project. The estimated cumulative storage capacity of the Check dams is 16.18 lakh cum. And estimated groundwater recharge potential of approx. 340.52 lakh m³/year through the Check Dams. Details and photographs of the Check Dams are attached as Annexure-27.
XIV	The project authorities should meet water requirement of nearby village(s) in case the village wells go dry due to dewatering of mine.	Monitoring of the ground water level is being carried out at 12 locations. Also, automatic water level recorders (Piezometers) have been installed at two locations viz.: Langatu site office, Sikri site office. Water level data

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		<p>for the period of April, 24 to Sept, 24 is attached as Annexure-25.</p> <p>Further, NTPC PBCMP under its social obligation, have installed 7 Nos. of hand pumps 31 nos. of borewells in nearby villages in FY 2024-25 and also, to meet the further water requirement of the nearby villagers 15 nos. mobile tankers are deployed during summer season. Further, 20 nos. of water filters have been installed in project affected villages.</p>
XV	<p>Sewage treatment plant of adequate capacity shall be installed in the colony.</p>	<p>Sewage Treatment Plant (STP) of 1.5 MLD capacities has been installed in R&R colony. STP of 25 KLD of MBBR technology is installed at Langatu site office for treatment of the sewage generated and 300 KLD capacity STP of MBBR technology is installed at MDO Colony, Sikri.</p> <p>The treated water are being used for horticulture purpose and no water is being discharged outside.</p> <p>Quality monitoring of the treated sewage water is being carried out at stipulated frequency. Latest monitoring report with photographs are attached as Annexure-28.</p>
	<p>ETP should also be provided for workshop and CHP wastewater.</p>	<p>For treatment of wastewater generated at HEMM Washing Centre, an Electromechanical ETP with capacity of 200 KLD has been installed at Mine workshop. During current FY 2024-25 (till sept 2024), approx. 13012 m³ of recycled water have been used for various mining activity. Test report with photographs of ETP treated water is attached as Annexure-29.</p> <p>Apart from the above for treatment of waste water generated in CHP area, settling pond has been constructed. After treatment of waste water same is being re-used in dust suppression. Photographs of settling tank is attached as Annexure-</p>

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		30.
	Treated wastewater meeting prescribed norms only shall be recycled for mining operations to the extent possible and permitted to be discharged in to the natural water courses only if it meets the prescribed standards.	Till date no discharge is being done into any natural water course. Treated waste water is being re-cycled and reused for various mining operations as reported.
XVI	The total area that shall be brought under afforestation at the time of mine closure shall not be less than 1199 ha which includes reclaimed topsoil soil dump area (25 ha), external OB dump (632 ha), backfilled area (524 ha), along ML boundary, embankment and undisturbed area, along roads and infrastructure, green belt (18 ha), and in township outside the lease by planting native species in consultation with the local DFO/Agriculture Department. The density of the trees should be around 2500 plants per ha.	<p>Shall always be complied with.</p> <p>Overburden dump "C", dump "A" and in-pit dump are in active condition. However, more than 1.9 lakhs of tree sapling have already been planted on closed and stabilized part of dump-C. More than 1.24 lakhs plant saplings have been planted along the slope of the Dump-A. Photographs are attached as Annexure- 31.</p> <p>Further, more than 20 thousand plant saplings have already been planted along the OB dump-D and vacant part of the eastern quarry. Photographs are attached as Annexure-32.</p> <p>It would very much relevant to mentioned here that more than 5.84 Lakhs of tree saplings have been planted and 10,172 nos. of tree saplings have been distributed to local villagers in and around the Pakri Barwadih Coal Mining Project. Details of year-wise plantation/distribution taken up by NTPC Limited till date is enclosed as Annexure-33.</p> <p>Also, for mass awareness, the NTPC Ltd – PBCMP is actively participating in "Van Mahotsav" "Tree Raksha Bandhan", "Paryavaran Mela" etc. being organized by State Forest Department.</p>
XVII	A Progressive Mine Closure Plan shall be implemented by reclamation of 524ha, of the total quarry area of 1785ha, which shall be backfilled and afforested by	<p>Shall always be complied with.</p> <p>Till Sept. 2024 total area of approx. 173.75 Ha was being backfilled. However internal dumping is in active stage and Mining /</p>

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	<p>planting native plantspecies in consultation with the local DFO/ Agriculture Department. The density of the trees should be around 2500 plants per ha. Of the total reclaimed backfilled area, 223 ha shall be grazing land and 442 ha shall be agricultural land for utilization of the villagers. Of the balance 1261 ha of quarry area, an area of 596 ha of de-coaled area/void being converted into a water reservoir shall be gently sloped and the upper benches of the reservoir shall be terraced and stabilized with plantation and the remaining 665 ha is for public use for Phase-2 of the Project.</p>	<p>reclamation shall be implemented at the cost of project.</p> <p>Escrow account has been opened and amount is being deposited annually. As per direction received from CCO an amount of Rs. 16.2607 Crores have been deposited in the FY 2023-24 {(Rs. 7.932 Crores as 8th (FY 2023-24) & Rs. 8.3287 Crores as 9th (FY 2024-25)} year Mine Closure cost.</p> <p>Till date Rs. 62.4507 Crore have been deposited in Escrow account as part of the Mine Closure cost. Detail of amounts deposited in ESCROW is enclosed as Annexure-34.</p>
XVIII	<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 agency such as NIOH, Ahmedabad within a period of one year and the results reported to this Ministry and to DGMS.</p>	<p>Regular periodic medical check-up of all mine workers as per DGMS guidelines is being carried out at project hospital.</p> <p><i>"Occupational health study in Pakri Barwadih Coal Project with special reference to respiratory health and hearing impairment assessment"</i> was conducted through Regional Occupational Health Centre (Eastern), Kolkata & National Institute of Occupational Health, Ahmedabad. Report of the same already submitted in last half yearly compliance report.</p> <p>As of now, no case of occupational disease and hearing impairment has been reported.</p>
XIX	<p>Condition XIX, Amendment vide letter number-J-11015/692/2007-IA-II(M) Date 07.12.2017</p> <p>A detailed R&R Plan for the life of the project comprising land losers, homestead losers and land and homestead losers, including tribals to be displaced from the project area shall be prepared and implemented in</p>	<p>R&R Plan has been approved vide Govt. of Jharkhand (GoJh) Gazette Notification and forwarded vide letter No. 116 /R dated 27.02.2013 which is in line with the Jharkhand R&R Policy.</p> <p>As per the approved Govt. of Jharkhand (GoJh) Sankalp No. 116 / R dated 27.02.2013, houses have been constructed in the R&R colony at Dhenga along with all</p>

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	<p>a stipulated time frame. Project proponent will implement the approved R&R plan as per phased requirement of displacement. The compensation shall be not less than that specified in the National R&R Policy.</p> <p>Provision shall also be made in the R&R Plan to take care of the land less labourers and the tribals. The total expenditure on R&R shall not be less than Rs. 2976 Cr, which includes private land acquisition (Rs. 982 Cr) and R&R (Rs.1492 Cr). Alternate livelihood and skill development programmes and schemes shall be implemented as part of R&R and CSR.</p>	<p>necessary infrastructure.</p> <p>Till Sep 2024, 90 families have been shifted to the R&R colony at Dhenga. Based on the demands of PAFs, a special package has been designed to compensate each self-relocating family. Till Sept. 2024, a total of 1973 PAPs have been self-resettled.</p> <p>As per the Socio-economic survey which has been mentioned in Sankalp document, SI No. 3, page no. 2, there are no ST PAF in the project area.</p> <p>Further, capacity building of youths of the project area is being carried out by PBCMP (Pakri Barwadih Coal Mining Project) through MAITI (Mining and Industrial Training Institute/ ITI Dhenga) {Being run through JGTR (Jharkhand Govt. Tool Room, Ranchi) from funds provided by NTPC},. Other training programs for Women Empowerment and providing skillsets for alternate livelihood options are also being organised at MAITI by PBCMP.</p> <p>Till 30.09.2024, 500 nos. of students got employed after passing from MAITI Dhenga.</p>
XX	<p>The project authorities shall carry out a pre-mining socio-economic survey based on the UNDP Human Development Report and monitor the socio-economic status once every three years and maintain records thereof and report in their Annual Report, the socio-economic impact of R&R and CSR activities.</p>	<p>Pre-mining Socio economic survey has been undertaken through IIT Kharagpur and Abhigyan Samiti.</p> <p>For monitoring socio economic status, a contract for conducting Social Impact Assessment in the project affected villages of PBCMP has been awarded to M/s. Deloitte Touche Tohmatsu India LLP, Gurgaon dated 16.09.2020. The study report has already been submitted in previous compliance report for the period of April 2023 to Sept, 2023.</p>
XXI	<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: 23 ha) of the core zone and buffer zone, from the</p>	<p>The LULC study is being carried out in every three years interval. The last study was conducted in the year 2019-22 and report of the same was submitted to the MoEF & CC with HYMR (Oct. 2022 to March 2023). The</p>

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	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 Regional office at Bhubaneswar.	next study shall be conducted in the year 2025 for the period 2022-2025. . Copy of the work order is attached as Annexure-35 .
XXII	A Final Mine Closure Plan along with details of Corpus Fund should be submitted to the Ministry of Environment & Forests 5 years in advance of final mine closure for approval.	A Final Mine Closure Plan shall be submitted to MoEF & CC for approval well in advance as per stipulation.

GENERAL CONDITIONS (EC Clearance Ltr. No. J-11015/692/2007-IA.II (M) Dated 19th May 2009)

I	No change in mining technology and scope of working shall be made without prior approval of the Ministry of Environment and Forests.	Agreed.
II	No change in the calendar plan including excavation, quantum of mineral coal and waste shall be made.	The OM from MoEF&CC vide F.No. 22-44/2018-IA.III dated 14.05.2020 regarding flexibility in coal or mineral production of capacity irrespective of calendar plansubject to maximum of capacity granted in the environmental clearance, is being followed.
III	Four ambient air quality monitoring stations shall be established in the core zone as well as in the buffer zone for monitoring SPM, RPM, SO ₂ , NO _x and heavy metals such as Hg, Pb, Cr, As, etc. Location of the stations shall be decided based on themeteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the State PollutionControl Board.	All the possible measures are being taken to improve the air quality through establishing 8 nos. AAQ monitoring stations in the core as well as buffer zone of the ML area in consultation with the Jharkhand State Pollution Control Board(JSPCB). Copy of the approval attached as Annexure-36 . There are 4 no. of monitoring station in core zone i.e. Urub Village, Nagari Village, Langatu Village, Pakri-Barwadih village and there are 4 nos. of monitoring stations in the buffer zone such as Kandaber village, Garikalan Village, Dhenga village and Kusumbha Village. Further to ensure the work zone air quality fugitive dust is being monitored in different locations of the working zone.The locations are Excavation area, Haul Road, Overburden

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		<p>Dump, Top-soil Dump, Workshop, Drilling and Crusher area. Monitoring data of the month of April, 24 to Sept. 2024 is attached as Annexure-37.</p> <p>Apart from the above One no. CAAQMS has been installed to monitor Ambient Air Quality at Langatu village in Mining lease area (Core zone) in consultation with JSPCB officials.</p>
IV	<p>Fugitive dust emissions (SPM and RSPM and heavy metals such as Hg, Pb, Cr., As, etc) from all the sources shall be controlled regularly monitored and data recorded properly.</p> <p>Water spraying arrangement on haul roads, wagon loading, and dump trucks (loading and unloading) points shall be provided and properly maintained.</p>	<p>All the possible measures are being taken to control the fugitive dust emission. Dust suppression at mines haul roads & other dust generating areas like truck loading & unloading points is being carried out by engaging 34 nos. mobile water tankers.</p> <p>Details are as under:</p> <p>12KL: 04 Nos. 14KL: 06 Nos. 16KL: 05 Nos. 20KL: 12 Nos. 25KL: 01 No. 28KL: 03 Nos. 70KL: 02 No. 80KL: 01 No.</p> <p>Apart from the above approx. 2 Km fixed water sprinklers are installed at main haul road.</p> <p>It would very much relevant to mentioned here that the 80 KL water tanker is being used in the Pakri Barwadih coal mining project which is unique in India.</p> <p>Further arrangement has been made to bring water from Eastern Quarry by pipeline to Western Quarry for adequate availability of water for dust suppression.</p> <p>Also, water accumulated in Eastern Quarry is being used for dust suppression in coal transport road through water tankers and in the coal stock yard of CHP area.</p>

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		<p>For controlling of the fugitive dust emissions wet drilling is used which have water injection system.</p> <p>Further to minimize the dust generation, part of the coal transportation is being done by trucks which is covered with the tarpaulin. Also, to prevent the dust generation due to plying of the trucks regular water sprinkling is being done along the transportation road.</p> <p>Also, the coal has been transported in wet condition from mine end to Banadag Railway Siding. For wetting the coal there are fog canon installed in the crusher haupers as well as coal stock yard of CHP. Photographs attached as Annexure-38.</p> <p>Further at Banadag Railway Siding, Fixed type 10 nos of water sprinkler with raingun has been installed on both side of the Railway Siding. Also, regular water sprinkling is being done through the water tanker. Apart from the above to minimize the dust propagation 2 Km long wind screen of 20 ft. height have been erected on both side of the Banadag Railway Siding.</p>
V	<p>Data on ambient air quality (SPM, RSPM, SO₂, NO_x and heavy metals such as Hg, Pb, Cr, As, etc)) shall be regularly submitted to the Ministry including its Regional Office at Bhubaneswar and to the State Pollution Control Board and the Central Pollution Control Board once in six months.</p>	<p>Environmental monitoring of ambient air quality is being done through MoEF&CC approved and NABL accredited Lab at CPCB prescribed intervals.</p> <p>Data for the Period April 2024 to Sept. 2024 is enclosed as Annexure-39.</p> <p>The Last report was submitted online on Parivesh Portal and to regional office vide letter no.- 1040/PBCMP/EMG/2024/F-47/108, dated- 01/06/2024 through mail dated 03.06.2024. Copy of the mail enclosed as Annexure – 1.</p>
VI	<p>Adequate measures shall be taken for control of noise levels below 85 dB (A) in the work environment.</p>	<p>Effective measures are being taken to minimize the noise level below 85 dB (A) in the work zone. All the equipments/ machines</p>

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	Workers engaged in blasting and drilling operations, operation of HEMM, etc shall be provided with ear plugs/muffs.	are provided with acoustic enclosure cabins. Workers engaged in blasting and drilling operations, operation of HEMM, are being provided with personal protective equipments (PPE) like ear plugs/muff in conformity with the prescribed norms and guidelines in this regard. Adequate awareness programme such as safety talk for the workers are being conducted regularly. Total 576 nos. of ear muffs/plugs have been distributed during April 2024 to Sept, 24. Noise monitored data is enclosed as Annexure-40.
VII	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 19 th May 1993 and 31 st December 1993 or as amended from time to time before discharge. Oil and grease trap shall be installed before discharge of workshop effluents.	No waste water from the mine is discharged outside. For treatment of waste water generated at HEMM Washing station, an Effluent treatment plant of 200 KLD Capacity have been provided at mine workshop. The treated effluent conforms to the standards and all the parameters are well within the limits. No mine waste water, workshop effluent is being discharged outside from mine. All the effluent generated are treated and reused in various mining activity such as Water sprinkling, Vehicle Washing etc. During current FY 13012 m3 (till sept 2024) of recycled water have been used for various mining activity. Photographs and Effluent quality data of ETP are attached as Annexure- 29.
VIII	Vehicular emissions shall be kept under control and regularly monitored.	Being Complied. Planned preventive maintenance of all vehicles plying for mining and allied activities are being done periodically. All the vehicles deployed at PBCMP are PUC compliant. PUC certificate of some of the vehicle is enclosed as Annexure – 41.
IX	Environmental laboratory shall be established with adequate number and type of pollution monitoring and analysis equipment in consultation	Presently, Monitoring and analysis is being done through MoEF&CC and NABL accredited lab in consultation with the State Pollution Control Board. However, Environmental

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	withthe State Pollution Control Board. Amendments dt 07.12.2017: The monitoring shall be done by NABL/MoEF&CC accredited Laboratory.	laboratory has been setup at site with various water and air quality testing equipment. Photographs of laboratory is attached as Annexure- 13 . List of equipment is attached as Annexure-14 .
X	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. 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.	All the possible measures are being taken to control the fugitive dust emission. Apartfrom controlling fugitive dust emission, Personal protective respiratory devices are provided to personnel working in dustyareas & adequate training on safety & health are also being imparted. "Occupational health study in Pakri Barwadih Coal Project with special reference to respiratory health and hearing impairment assessment" was conducted through Regional Occupational Health Centre (Eastern), Kolkata & National Institute Of Occupational Health, Ahmedabad. Report of the same has been submitted in last submitted half yearly compliance report. As of now no case of occupational disease and hearing impairment has been reported.
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.	At the corporate office, a separate Environmental Management Cell is functioning under senior executive who is reporting to Head of the Company to look after the implementation of the various pollution control measures and other Environment Management System requirements. At local level, dedicated department for Environment Management is also functional with qualified EnvironmentalEngineer. Head of the Department directly reports to Head of the Project. The working level staffs Environment Mgmt. have been deployed through MDO. Theorganization chart of the same is enclosed as Annexure – 42 .
XII	The funds earmarked for	The requisite funds for environmental

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	<p>environmental protection measures shall be kept in separate account and shall not be diverted for other purpose.</p>	<p>mitigation measures have been included in the project cost.</p> <p>An amount of Rs. 9.253 Crores has been spent during April-2024 to Sept.-2024 for the Environment Management.</p> <p>Till Sept. 2024 we have spent an amount Rs. 92.648 Crores (Rs. 71.778 Crores – Audited and Rs. 20.87 Crores - Unaudited)for the Environment Management. Details attached as Annexure-43.</p> <p>Escrow account has been opened and amount is being deposited annually. Asper direction received from CCO an amount of Rs. 16.2607 Crores have been deposited in the FY 2023-24 {(Rs. 7.932 Crores as 8th (FY 2023-24) & Rs. 8.3287 Crores as 9th (FY 2024-25)} year Mine Closure cost.</p> <p>Till date Rs. 62.4507 Crore have been deposited in Escrow account as part of the Mine Closure cost. Detail of amounts deposited in ESCROW is enclosed as Annexure-34.</p>
<p>XIII</p>	<p>The Regional Office of this Ministry located at Ranchi 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>	<p>Full co-operation is being extended by the project authorities to the officers of MoEF/ RO during their inspection / site visit.</p>
<p>XIV</p>	<p>A copy of the EC will be marked to concerned Panchayat/ local NGO, if any, from whom any suggestion/representation has been received while processing the proposal.</p>	<p>No suggestion / representation have been received while processing the proposal. Copy of the EC letter has been sent to the local administrative offices and the EC letter has been also uploaded on the company's website www.ntpc.co.in.</p> <p>The copy of EC dated 06.03.2024 has also been submitted to concerned panchayat/ Mukhiya. Copies of the letters was submitted during last compliance reporting submitted for the period of Oct, 23 to March</p>

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		24.
XV	State Pollution Control Board shall display a copy of the clearance letter at the Regional Office, District Industry Centre and Collector's Office/ Tehsildar's Office for 30 days.	<p>Copy of the EC letter was sent to office of District Industry centre, District Collector office for display.</p> <p>A copy of the EC has been also marked to JSPCB for display at their Regional office.</p> <p>After EC amendment dated 06.03.2024 the EC letter has also been submitted to District collector, Hazaribagh, JSPCB Regional office Hazaribagh, JSPCB Ranchi, District Industry Center, Hazaribagh, Municipal Office, Hazaribagh, ConcernedCOs. Copies of the letters was submitted during last compliance reporting submitted for the period of Oct, 23 to March 24.</p>
XVI	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 http://envfor.nic.in/ . The compliance status shall also be uploaded by the project authorities in their website and regularly updated at least once in six months so as to bring the same in the public domain. The data shall also be displayed at the entrance of the project premises and mines office and in corporate office.	<p>EC was granted on 19.05.2009 which was received at our end on 25.05.2009 and the same was published in English Daily "The Times of India" as well as in vernacular language (Hindi) daily "<u>PRABHAT KHABAR</u>" on 30.05.2009 which is within 7 days of receiving the granted EC.</p> <p>After EC dated 06.03.2024 has been published in two newspaper Dainik Bhaskar and Dainik Jagran. Copies of the letters was submitted during last compliance reporting submitted for the period of Oct, 23 to March 24.</p> <p>The half yearly Compliance status is being updated on Company's website (NTPC). https://www.ntpc.co.in/about-us/corporate-functions/environment/status-hyc-reports The data is also being displayed at entrance of the office.</p> <p>However, the website of NML is under construction. After launching of website same will be uploaded on NML company site.</p>
3	The Ministry or any other competent authority may stipulate any further	Noted

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	condition for environmental protection.	
4	Failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract the provisions of the Environment (Protection) Act, 1986.	Noted and will be complied.
5	The above conditions will be enforced <i>inter-alia</i> , 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 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.	Noted and will be complied under the provision of these acts and rules.

Compliance of conditions Stipulated in EC letter J-11015/692/2007-IA-II(M) Dated 06.03.2024 (PRC-18 MTPA)

Specific Conditions

1.1	PP to obtain the CTO for Opencast coalmine capacity of 18 MTPA after grant of EC	CTO for PBCMP for capacity of 18 MTPA has been obtained vide CTO Ref. No. JSPCB/HO/RNC/CTO-18605537/2024/379, Dated-10.03.2024. The CTO is valid till 28.02.2025. Copy of the CTO is attached as Annexure-44.
1.2	No mining activities shall be carried out within an area of 193.85 Ha till the time PP obtains all the valid permission and mining lease from the concerned authorities as per law.	Agreed to comply. Presently no mining activity is being carried out within area of 193.85 Ha. Necessary action for obtaining the mining lease from have been initiated. Any mining activity shall be carried out in the said area only after obtaining valid permission and mining lease from concerned authorities as per law.
1.3	PP shall ensure for control of polluting during the transportation of	All the possible measures are being taken to control the fugitive dust emission due to

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	<p>mineral/waste/OB and implement all the mitigative measures as mentioned in EMP. The budget earmarked for the same shall be kept in a separate account and audited annually. The expenditure incurred shall be reported to RO along with proof of activities carried out.</p>	<p>transportation of the mineral/waste/OB etc. Total 34 nos. of mobile water tankers are deployed for dust suppression at mines haul roads & other dust generating areas like truck loading & unloading points etc. Details are as under: 12KL: 04 Nos., 14KL: 06 Nos., 16KL: 05 Nos., 20KL: 12 Nos., 25KL: 01 No., 28KL: 03 Nos., 70KL: 02 No., 80KL: 01 No. It would very much relevant to mentioned here that the 80 KL water tanker is being used in the Pakri Barwadih coal mining project which is unique in India.</p> <p>Apart from deployment of mobile water sprinklers, approx. 2 Km fixed water sprinklers are installed along the main haul road. Arrangement has been made to bring water from Eastern Quarry by pipeline to Western Quarry for adequate availability of water for dust suppression. Also, Eastern Quarry water is being used for dust suppression in coal transport road through water tankers and in the coal stock yard of CHP area.</p> <p>For controlling of the fugitive dust emission wet drilling with water injection system is being in practice during drilling operations.</p> <p>Further to minimize the dust generation, part of the coal transportation is being done by trucks which is covered with the tarpaulin. Also, to prevent the dust generation due to plying of the trucks regular water sprinkling is being done along the transportation road.</p> <p>Also, the coal has been transported in wet condition from mine end to Banadag Railway Siding. For wetting the coal there are fog canon installed in the crusher hoppers as well as coal stock yard of CHP. Photographs attached as Annexure-38.</p> <p>Apart from the above the coal which is transported through closed belt conveyor</p>
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		<p>passing through 10 nos. of TPs (Transfer Points) which have water injection system which regularly injects the water in the coal.</p> <p>Further at Banadag Railway Siding, Fixed type 10 nos of water sprinkler with raingun has been installed on both side of the Railway Siding. Also, regular water sprinkling is being done through the water tanker. Apart from the above to minimize the dust propagation 2 Km long wind screen of 20 ft. height have been installed on both side of the Banadag Railway Siding.</p> <p>As per the EIA/EMP-2023 102.88 Crores Capital cost and Rs. 8.45 Crores Recurring cost are earmarked as cost of environmental control measures.</p> <p>The expenditure incurred during April, 2024 to Sept. 2024 is attached as Annexure - 43.</p> <p>It is to submit that; third party audit is being done for the expenditure incurred towards Environment Management Plan. report of the expenditure incurred is being submitted to MoEF&CC on six monthly basis along with the HYMR with copy to RO, MoEF&CC, Ranchi. The report was submitted on 01.06.2024 vide our office ltr no. 1040/PBCMP/EMG/2024/F-47/108.</p>
1.4	PP shall install CCTV camera at all entry and exit point.	<p>Complied.</p> <p>There are 4 nos. of entry and exit gated for mining areas and 5 nos. of CCTV camera has been installed at all entry and exit point of mines. Photographs attached as Annexure-45.</p> <p>Apart from installation of cameras on entry and exit points, 9 nos. of CCTV cameras with latest technology have been installed all along the mining areas.</p>

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1.5	PP shall use mine water for all purpose except for drinking and install dual pumping system. PP shall reduce the water requirement from bore well to 30% within a period of two years.	<p>Ground water abstracted through bore wells are being used for domestic purpose only. For use of water in dust suppression, vehicle washing, etc. mine water or recycled water is being used. To meet the purpose for treatment of wastewater generated at HEMM Washing Centre, an Electromechanical ETP with capacity of 200 KLD has been installed at Mine workshop. During current FY 13012 m3 of recycled water have been used for various mining activity. Photographs of ETP is attached as Annexure-29.</p> <p>Apart from the above for treatment of waste water generated in CHP area settling pond has been constructed. After treatment of waste water same is being re-used in dust suppression. Photographs of settling tank is attached as Annexure-30.</p> <p>It is father to mention that, various water recharge and conservation measures have been taken at PBCMP. The comparative statement of water consumption vis-a-vis ground water recharge potential created is attached as Annexure-46.</p>
1.6	PP shall increase the area under agriculture & grazing land and area of void to be reduced suitability as committed during the meeting. PP shall get the mining plan modified accordingly.	<p>Agreed to Comply.</p> <p>As per present approved mining plan and mine closure plan, 442 ha area have been envisaged for agricultural land and 223 ha area for grazing land, the same shall be modified to increase the final area under agriculture & grazing land and to reduce final void size in next amendment of the mining plan and mine closure plan.</p>
1.7	PP shall not dump any waste/OB outside the mine lease area.	<p>Being Complied.</p> <p>No dumping of waste / OB is being done outside the mining lease area.</p>
1.8	PP shall prepare the scientific reclamation plan in order to reduce the void area post mining.	<p>Agreed to Comply.</p> <p>The mining plan and mine closure plan shall be modified to increase the final area under agriculture & grazing land and to reduce final void size.</p>

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1.9	PP should conduct the monthly review meeting with the environment management committee of the company.	Being Complied. A monthly review meeting is being conducted with the environment management committee of the company. Copy of the MOM is attached as Annexure-47.
1.10	PP shall ensure that all type of plastic waste generated from the mines shall bestored separately in isolated area and disposed of strictly adhering to the Plastic Waste Management Rules 2016. In pursuant to Ministry's OM dated 18/07/2022 PP shall also create awareness among the people working in the project area as well as in its surrounding area on the ban on Single Use Plastic (SUP) in order to ensure compliance of Ministry's Notification published by the Ministry on 12/08/2021. A report along with photograph on the measures taken shall also be included in the six-monthly compliance report being submitted by PP.	Being a coal mining project the plastic waste is generated in the form of oil/lubricant drums only, same are being managed under the provision of the HW (MH & TBM) Rule and being handed over to authorized recyclers. Also, it is ensured to purchase the materials with recyclable/reusable and bio-degradable packaging from the authorized vendor. The PBCMP Mine have been declared as "No Plastic Zone" and all sigle use plastics have been banned at PBCMP. Various awareness programs such as Nukkad natak, Pamphlet distribution, Essay/slogan competition & others have been conducted during FY 2024-25 for ban on Single Use Plastic. Photograph enclosed as Annexure-48.
1.11	All the mitigation measures committed / envisaged in the EIA/EMP report and subsequent submission shall be implemented. PP should annually submit the audited statement along with proof of activities carried to the Regional Office of MoEF&CC and PARIVESH Portal as the case may be for the activities carried out during previous year.	All the mitigation measures committed / envisaged in the EIA/EMP report and subsequent submission is being implemented at site and audited statement is being submitted annually. It is to submit that; third party audit is being done for the expenditure incurred towards Environment Management Plan. report of the expenditure incurred is being submitted to MoEF&CC on six monthly basis along with the HYMR with copy to RO, MoEF&CC, Ranchi. The report was submitted on 01.06.2024 vide our office ltr. no. 1040/PBCMP/EMG/2024/F-47/108.
1.12	PP shall conduct feasibility studies for assessment of voids for backfilling of ashand mixing of ash with overburden, taking up backfilling ash and OB mixing	Similar study has been awarded to M/s CIMFER for another NTPC's project (Dulanga Coal Mine Project, Odisa). After completion of study and based on the

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	activities during operations as well as post closure of mines in line with the Fly Ash Utilization Notification, 2021	recommendations same shall be implemented at Pakri Barwadih Coal Mining Project.
1.13	Hon'ble Supreme Court in an Writ Petition(s) Civil No. 114/2014, Common Cause vs Union of India & Ors vide its judgment dated 8th January, 2020 has directed the Union of India to impose a condition in the mining lease and a similar condition in the environmental clearance and the mining plan to the effect that the mining lease holders shall, after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc. Compliance of this condition after the mining activity is over at the cost of the mining lease holders/Project Proponent". The implementation report of the above said condition shall be sent to the Regional Office of the MoEF&CC.	<p>Being Complied.</p> <p>In line with the Hon'ble Supreme court direction, the mining plan have been prepared with integrated mine closure plan and duly approved by the Ministry of Coal. Back filling of voids, Re-grassing of OB Dumps, green belt development, etc. are the integral part of the mine closure plan. Also, to ensure the proper mine closure, an ESCROW Account have been opened and the cost to be incurred in mine closure is being deposited. As per guidelines of MoC, progressive mine closure activity is being audited/monitored through third party. The last third-party audit for PBCMP was done by NEERI, Nagpur in the year 2023.</p> <p>The report of the progressive mine closure activity for the period of April to Sept 2024 is submitted to Coal Controller Office vide letter ref. no. 1040/PBCMP/EMG/2024/F-05/173 dated 17.10.2024. Copy of the same is attached as Annexure-49.</p>

Standard EC conditions Stipulated in EC letter dated 06.03.2024

1. Statutory Compliance

SL No.	Conditions	Compliance/ Status
1.1	The project proponent shall obtain forest clearance under the provisions of Forest (Conservation) Act, 1986, in case of the diversion of forest land for non-forest purpose involved in the project.	All necessary clearances under the provisions of FC Act, 1980 has been obtained for the 1026.438 Ha of forestland involved vide: Stage I Clearance obtained vide letter no. "F. No 8-56/2009, dated 11 th May 2010", Stage II Clearance obtained vide letter no. "F. No 8-56/2009, dated 17 th Sept 2010", Final land release letter received from the State Govt. vide letter no. 3/Vanbhoomi-75/2009-1240 dated 31.03.2011.
1.2	The project proponent shall obtain clearance from the National	Not Applicable.

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	Board for Wildlife, if applicable	
1.3	The project proponent shall prepare a Site-Specific Conservation Plan & Wildlife Management Plan and approved by the Chief Wildlife Warden. Therecommendations of the approved Site- Specific Conservation Plan / Wildlife Management Plan shall be implemented in consultation with the State Forest Department. The implementation report shall be furnished along with the six- monthly compliance report (in case of the presence of schedule-I species in the study area).	Site specific Wild Life Management Planhas been prepared in line with the Integrated Wildlife Management Plan of North Karanpura Coal block, the site Specific Wild Life Management Plan hasbeen approved by Chief Wildlife Warden ofJharkhand vide letter Ref. no. 33 dated03.08.2023. Copy of the letter is attached as Annexure-72 . The same shall be implemented by Forest Dept., requisite fund of Rs. 125.6732 Crore has been deposited in Ad-Hoc CAMPA fund. Copy of the letter is attached as Annexure-73 .
1.4	The project proponent shall obtain Consent to Establish / Operate under the provisions of Air (Prevention & Control of Pollution) Act, 1981 and the Water (Prevention & Control of Pollution) Act, 1974 from the concerned State pollution Control Board/Committee prior to start/commencement of mining operations/production	Complied. Consent to Operate under the provisions of Air (Prevention & Control of Pollution) Act, 1981 and the Water (Prevention & Control of Pollution) Act, 1974 from Jharkhand State Pollution Control Board (JSPCB) for Pakri Barwadih Coal Mine Project (PBCMP) for capacity of 18 MTPA has been obtainedvide letter Ref No. JSPCB/ HO/ RNC/CTO-18605537/2024/379, Dated- 10.03.2024. Copy of the CTO is attached as Annexure-44 .
1.5	The project proponent shall obtain the necessary permission from the Central Ground Water Authority	Complied. Necessary approval for abstraction ofground water has been obtained from Central Ground Water Authority vide NOC Ref. no. CGWA/NOC/MIN/ORIG/2023 /17449 Dated 03.01.2023. Copy of NOC attached as Annexure-50 .
1.6	Solid/hazardous waste generated in the mines needs to addressed in accordance to the Solid Waste Management Rules, 2016/Hazardous & Other Waste Management Rules, 2016.	All the hazardous waste generated at NTPC Ltd – PBCMP is being disposed off as per the provisions of HW (MH&TBM) Rule 2016. Authorization under HW (MH&TBM) Rule 2016 has been obtained from Jharkhand State Pollution Control Board (JSPCB) vide letter ref. no. JSPCB/HO/RNC/HWM-15671118/2023/77 Dated 02.12.2023.

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		Copy of the authorization is attached as Annexure-51.
1.7	Permission of power supply to be taken from the concerned authority for meeting power demand of the project site.	Permission has been obtained from Central Electricity Authority vide letter ref. no. RIO/ER/ Approval/NTPC/Pakri Barwadih/ 2023-24/320 Dated 04.09.2023. Copy of the approval attached as Annexure-52.
1.8	The maximum production or peak production at any given time shall not exceed the limit as prescribed in the EC.	Being Complied. As per the EC dated 06.03.2024 the peak rated capacity of Pakri Barwadih Coal Mining Project is 18 MTPA. The production or peak production at Pakri Barwadih Coal Mining Project is limited to peak rated capacity.
1.9	Validity of Environment Clearance is as per life of the mine mentioned in EC letter or 30 years as per EIA Notification, 2006 and its amendments therein	Agreed to Comply.
1.10	All the conditions stipulated in previous Environment Clearance conditions should be strictly complied within certain timeline.	Agreed to Comply. All the conditions mentioned in previous Environmental Clearance is being complied.
2. Air Quality Monitoring and Mitigation Measure		
2.1	Continuous ambient air quality monitoring stations as prescribed in the statue be established in the core zone as well as in the buffer zone for monitoring of pollutants, namely PM10, PM2.5, SO2 and NOx. 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. Online ambient air quality monitoring stations may also be installed in addition to the regular monitoring stations as per the requirement and/or in consultation with the SPCB. The new CAAQMS should be installed with expansion.	One no. CAAQMS has been installed in core zone to monitor Ambient Air Quality at Langatu village in Mining lease area in consultation with JSPCB officials. Further, procurement of two nos. of CAAQMS for installation in buffer zone is under process. The bid has been floated on GeM on 18.11.2024 and the bid opening dated is 17.12.2024. The installation and commissioning of two nos. of CAAQMS is to be completed by 30.04.2025. GeM published bid is attached as Annexure-53.
2.2	The Ambient Air Quality monitoring in the core zone shall be carried out to ensure the Coal Industry Standards	The Ambient Air Quality Monitoring is being done through MoEF&CC approved and NABL accredited Lab at CPCB/JSPCB

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	<p>notified vide GSR 742 (E) dated 25th September, 2000 and as amended from time to time by the Central Pollution Control Board. Data on ambient air quality and heavy metals such as Hg, As, Ni, Cd, Cr and other monitoring data shall be regularly reported to the Ministry/Regional Office and to the CPCB/SPCB.</p>	<p>prescribed intervals and submitted to Regional office and Jharkhand State Pollution Control Board (JSPCB) along with Half yearly Compliance report. The monitored data are well within the prescribed limit.</p> <p>The monitored data for the period of April, 24 to Sept. 24 is attached as Annexure-39.</p>
<p>2.3</p>	<p>Transportation of coal, to the extent, if permitted by road, shall be carried out by covered trucks/conveyors. Effective control measures such as regular water/mist sprinkling/rain gun/ Fog cannon etc shall be carried out in critical areas prone to air pollution (with higher values of PM10/PM2.5) such as haul road, loading/unloading and transfer points. Fugitive dust emissions from all sources shall be controlled regularly. It shall be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central/State Pollution Control Board.</p>	<p>To minimize the dust generation, coal transportation is being done by trucks covered with the tarpaulin. Also, to prevent the dust generation due to plying of the trucks regular water sprinkling is being done along the transportation road. Fixed type of rain guns have been installed in the coal stock yard of CHP and mist sprinkler have been installed at each transfer points.</p> <p>At Banadag Railway Siding, Fixed type 10 nos. of water sprinkler with rain gun has been installed on both side of the Railway Siding. Also, regular water sprinkling is being done through the water tanker. Apart from the above to minimize the dust propagation 2 Km long wind screen of 20 ft. height have been installed on both side of the Banadag Railway Siding.</p> <p>The ambient air monitored data of the months April'24, Oct'24 & Nov'24 indicates that all the parameters are within prescribed limit. Monitoring report is attached as Annexure-05.</p>
<p>2.4</p>	<p>The transportation of coal shall be carried out as per the provisions and route envisaged in the approved Mining Plan or environment monitoring plan. Transportation of the coal through the existing road passing through any village shall be avoided. In case, it is proposed to construct a 'bypass' road, it should be so constructed so that the impact of sound, dust and accidents could be appropriately mitigated.</p>	<p>Being Complied.</p> <p>The transportation is being done as per EC amendment condition. Proper mitigative measures is being taken for control the dust by deploying water tanker and plantation along the dispatch road. To curb the noise and accidents, honking in night and over speeding of the vehicle are strictly avoided. Various sign boards and speed regulators have also been provided along</p>

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		the coal transport route.
2.5	PP to install solar lights along the road used for transportation of coal to avoid the accidents at night and also seek its maintenance.	<p>Being Complied.</p> <p>To avoid the accidents at night Street lamp posts have been installed through Department of Energy, Govt of Jharkhand along the transportation road. Also, 550 nos. of solar lights have been installed along the streets of nearby villages.</p> <p>Apart from the above, the work of installation of 100 new solar lights/high mast along coal transportation road has been awarded to M/s Aasma Enterprises. Till date 69 nos. of solar lights have been installed along the coal transportation road. Copy of the work order is attached as Annexure-16. Photographs attached as Annexure-17.</p>
2.6	Vehicular emissions shall be kept under control and regularly monitored. All the vehicles engaged in mining and allied activities shall operate only after obtaining 'PUC' certificate from the authorized pollution testing centers.	<p>Being Complied.</p> <p>Planned preventive maintenance of all vehicles plying for project is being done periodically. All the vehicles deployed at PBCMP are PUC compliant.</p> <p>PUC certificate of some of the vehicle is enclosed as Annexure – 41.</p>
2.7	Coal stock pile/ crusher /feeder and breaker material transfer points shall invariably be provided with dust suppression system. Belt-conveyors shall be fully covered to avoid air borne dust. Side cladding all along the conveyor gantry should be made to avoid air borne dust. Drills shall be wet operated or fitted with dust extractors.	<p>The each of the crushers are fitted with two nos. of mist fog canon and mist nozzles for water sprinkling during feeding of coal. fixed rain guns have been provided at the stock pile area of the CHP. Part of the coal is being transported up to RLS (Rapid Loading System) through closed belt conveyor system having the inbuilt dust suppression system throughout the conveyor. All the TP's (Transfer points) are provided with water injection system.</p> <p>Drilling machines are fitted with inbuilt water injecting system. Also, water spraying is being carried out in the drilling area to minimize the fugitive dust emission during drilling. Photographs attached as</p>

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		Annexure-54.
2.8	Coal handling plant shall be operated with effective control measures w.r.t. various environmental parameters. Environmental friendly sustainable technology should be implemented for mitigating such parameters.	<p>Being Complied.</p> <p>Coal handling plant is being operated with effective control measures. The each of the crushers are fitted with two nos. of mist fog canon and mist nozzles for water sprinkling during feeding of coal. Part of the coal is being transported up to RLS (Rapid Loading System) in closed belt conveyor system having the inbuilt dust suppression system throughout the conveyor. All the TP's (Transfer points) are provided with mist sprayer with water injection system. To minimize the dust generation in the stock yard area of CHP and siding fixed type of rain guns have been installed. Photographs attached as Annexure-55.</p>
2.9	Adequate measures on EMP should be analyzed on annual basis to assess the trend of air pollution data from continuous monitoring station and quarterly report shall be generated and submitted with 6 monthly compliance reports to RO, MoEF&CC.	<p>Being Complied.</p> <p>All the measures taken under approved EMP is being audited internally and also through external agency (NEERI).</p> <p>Continuous Ambient Air Quality Monitoring Station CAAQMS has been installed at PBCMP site office at Langatu. Real time data transmission is linked to JSPCB Server. Also, regular ambient air quality monitoring is being done through the NABL & MoEF &CC approved laboratory. All the parameters are within the CBCB/JSPCB prescribed standard. The report is being submitted to RO MoEF & CC on six monthly basis with HYMR.</p> <p>Photograph of the CAAQMS (Continuous Ambient Air Quality Monitoring Station) and report for the period of April-24 to Sept. is attached as Annexure-56.</p>
2.10	Effective safeguard measures for prevention of dust generation and subsequent suppression like regular water sprinkling shall be carried out in areas prone to air pollution. The Fugitive	<p>Being Complied.</p> <p>All the possible measures are being taken to control the fugitive dust emission due to transportation of the mineral/waste/OB etc.</p>

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	<p>dust emission from all sources shall be regularly controlled by installation of required equipment's. It should be ensured that air pollution level confirm to the standards prescribed by the MOEFCC/CPCB.</p>	<p>Total 34 nos. of mobile water tankers are deployed for dust suppression at mines haul roads & other dust generating areas like truck loading & unloading points etc. Details are as under: 12KL: 04 Nos., 14KL: 06 Nos., 16KL: 05 Nos., 20KL: 12 Nos., 25KL: 01 No., 28KL: 03 Nos., 70KL: 02 No., 80KL: 01 No. It would very much relevant to mentioned here that the 80 KL water tanker is being used in the Pakri Barwadih coal mining project which is unique in India.</p> <p>Apart from deployment of mobile water sprinklers, approx. 2 Km fixed water sprinklers are installed along the main haul road. Arrangement has been made to bring water from Eastern Quarry by pipeline to Western Quarry for adequate availability of water for dust suppression. Also Eastern Quarry water is being used for dust suppression in coal transport road through water tankers and in the coal stock yard of CHP area. Photographs attached as Annexure-38.</p> <p>Further to minimize the dust generation due to mineral transportation, closed belt conveyor system have been installed wherein, mist spraying system have been provided at each transfer points in the coal handling plant. Due to non-completion of part of Rappid Loading System, part of the coal is being transported by trucks covered with the tarpaulin. Photographs are attached as Annexure-57.</p> <p>At Banadag Railway Siding, 10 nos. of Fixed type water sprinkler with rain gun has been installed on both side of the Railway Siding. Also, regular water sprinkling is being done by mobile water tanker. Also to minimize the dust propagation, 20 ft. high wind screen have been provided on both side of the Banadag Railway Siding.</p> <p>Air quality monitoring is being done</p>
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		through NABL & MoEF&CC accredited laboratory. The monitoring data are within the CPCB & MoEF & CC prescribed limit. Monitoring report for the period of April 24 to Sept, 24 is attached as Annexure-58 .
2.11	Adequate number of Fog canon (mist sprayer) shall be installed to reduce the impact of air pollution at dust generating sources with time bound action plan.	To minimize the dust generation in the crusher area as well as coal stock yard of CHP, two nos. of fog canons with mist water sprinklers have been installed. Also 10 nos fixed type of water sprinkler has been installed on both side of Banadag Railway siding i.e, along Northern and Southern side of railway siding. Total 34 nos. of mobile water tankers are deployed for dust suppression at mines haul roads & other dust generating areas like truck loading & unloading points etc. Apart from deployment of mobile water sprinklers, approx. 2 Km fixed water sprinklers are installed along the main haul road.
2.12	PP should Install Wind breaker/shield arrangement along the railway siding for reducing the dust propagation in upwinddirection.	20 feet high wind breaking wall/ green net has been constructed on both side of Banadag Railway Siding. Also, 10 nos. of high capacity, rain guns are installed on both side of the railway siding. Photographs attached as Annexure-11 .
2.13	Post environmental closure third party monitoring by reputed instituted in air quality, water, land & soil etc shall be carried out and analyzed with EMP measures at regular interval. A suitable recommendation in this regard, shall be furnished to IRO, MoEF&CC for compliance. The data used for analysis shall be obtained from continuous AQMS, site specific water regime. Also, third party shall analyses the implementation of river diversion, meeting to the requirement of project report.	Being Complied For auditing the progressive mine closure activity, the third-party agency CSIR-NEERI, Nagpur were engaged to analyzed the EMP measures. The conclusion and recommendation of the agency is attached as Annexure-59 .
2.14	Comparison of average monthly temperature of pre and post mine operation after obtaining EC shall be	Agreed. Meteorological station has been installed at

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	<p>elaborated for post three years and a record to be maintain at regular interval.</p>	<p>project site for monitoring the temperature, rainfall, wind speed and direction. The data is being recorded on daily, monthly, and yearly basis. Photographs is attached as Annexure-60.</p>
<p>3. Water Quality Monitoring And Mitigation Measures</p>		
<p>3.1</p>	<p>The effluent discharge (mine waste water, workshop effluent) shall be monitored in terms of the parameters notified under the Water Act, 1974 Coal Industry Standards vide GSR 742 (E) dated 25th September, 2000 and as amended from time to time by the Central Pollution Control Board.</p>	<p>An Effluent treatment plant of 200 KLD Capoacity have been provided at mine workshop. The treated effluent conforms to the standards and all the parameters are well within the limits. No mine waste water, workshop effluent is being discharged outside from mine. All the effluent generated are treated and reused in various mining activity such as Water sprinkling, Vehicle Washing etc.</p> <p>During current FY 13012 m3 (till sept 2024) of recycled water have been used for various mining activity. Photographs and effluent quality of ETP is attached as Annexure-29.</p>
<p>3.2</p>	<p>The monitoring data shall be uploaded on the company's website and displayed at the project site at a suitable location. The circular No.J-20012/1/2006-IA.11 (M) dated 27th May, 2009 issued by Ministry of Environment, Forest and Climate Change shall also be referred in this regard for its compliance.</p>	<p>The website of NTPC Mining Limited (NML) is under construction. After launching of website same will be uploaded on NML website. Presently all the monitoring data is being uploaded on NTPC Ltd company site link of the same is as under;</p> <p>https://ntpc.co.in/about-us/corporate-functions/environment/status-hyc-reports</p> <p>The CAAQMS data is being uploaded on real time basis on State Pollution control Board. Also data is being displayed at Pit Office and Banadag Railway Siding. Photographs attached as Annexure-56.</p>
<p>3.3</p>	<p>Regular monitoring of ground water level and quality shall be carried out in and around the mine lease area by establishing a network of existing wells and constructing new piezometers during the mining operations. The monitoring of ground water levels shall be carried out four times a year i.e. pre-</p>	<p>Automatic water level recorders (Piezometers) have been installed at two locations viz.: Langatu site office, Sikri site office. The real time data are being transmitted to the CGWA website. Also, as stipulated, mannual monitoring are being carried out at 12 locations in and around the mining lease area.</p>

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	<p>monsoon, monsoon, post-monsoon and winter. The ground water quality shall be monitored once a year, and the data thus collected shall be sent regularly to MOEFCC/RO.</p>	<p>The data so generated is being submitted to Ministry of Environment & Forests and Climate Change & Central Pollution Control Board. Last six months water level data are enclosed as Annexure – 25. Water quality report of month May-2024 & August-2024 is attached as Annexure –26.</p>
<p>3.4</p>	<p>Monitoring of water quality upstream and downstream of river including ponds, lakes, tanks shall be carried out once in six months and record of monitoring data shall be maintained and submitted to the Ministry of Environment, Forest and Climate Change/Regional Office.</p>	<p>Surface water quality monitoring and analysis is being done through NABL and MoEF&CC accredited Laboratory and the monitored data is being submitted to RO, MoEF & CC on six monthly basis with HYMR report. Monitoring report for the month of May 2024 and August 2024 is attached as Annexure-61.</p>
<p>3.5</p>	<p>Ground water, excluding mine water, shall not be used for mining operations. Rainwater harvesting shall be implemented for conservation and augmentation of ground water resources.</p>	<p>To meet the water requirement for mining activity, the rainwater is collected in the sump of the mine. Also, mine seepage water, if any, is collected in the sump and same is being used for mining activity. Ground Water is only being used to fulfil the domestic requirements of the project.</p> <p>Adequate conservation measures are being taken in Pakri Barwadih Coal Mining Project for rainwater harvesting. The Roof top rainwater structure has been constructed and also the existing ponds have been rejuvenated in nearby villages for improving the ground water of the area. Approximately 1.55 lakh m³/year of ground water is being recharged at Pakri Barwadih Coal Mining Project.</p> <p>Apart from the above Approx. 23 lakh m³ of rainwater have been stored in the East quarry for use in dust suppression, plantation activity, etc. In addition to that, 12 Nos. of Check dams have been constructed in Pakwa and Khora Nala to meet water requirements and to augment the groundwater of the area around PBCMP. The estimated cumulative storage capacity of the Check dams is 16.18 lakh cum. And estimated</p>

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		<p>groundwater recharge potential of approx. 340.52 lakh m³/year through the Check Dams. Details and photographs are attached Annexure-27.</p>
<p>3.6</p>	<p>Catch and/or garland drains and siltation ponds in adequate numbers and appropriate size shall be constructed around the mine working, coal heaps & OB dumps to prevent run off of water and flow of sediments directly into the river and water bodies. Further, dump material shall be properly consolidated/compacted and accumulation of water over dumps shall be avoided by providing adequate channels for flow of silt into the drains. The drain/ ponds so constructed shall be regularly de-silted particularly before onset of monsoon and maintained properly. Sump capacity should provide adequate retention period to allow proper settling of silt material. The water so collected in the sump shall be utilised for dust suppression and green belt development and other industrial use. Dimension of the retaining wall constructed, if any, at the toe of the OB dumps within themine to check run-off and siltation should be based on the rainfall data. The plantation of native species to be made between toe of the dump and adjacent field/habitation/water bodies.</p>	<p>Presently, Dump-C is active from three sides. Inactive portion of the dump have been reclaimed with top soil and tree plantation. All the protection measures, viz garland drain, rock filled check dams, rock filled toe walls are provided to avoid the soil erosion from OB dump.</p> <p>For compaction of the OB, dumping is being carried out in 15 meter benches. Toe of each benches are provided with Garland drain so that no water is being accumulated over OB Dumps.</p> <p>To prevent flow of sediments directly into the river and water bodies from dumps, the toe of the OB dumps are provided with toe wall and garland drain. Approx, 5285 meters of garland drain followed by toe wall have been constructed around the OB dumps & embankment (2400- meter toe wall followed by garland drain along the embankment at Western part of the mine, 735-meter toe wall followed by garland drain along the haul road facing Khora nala, 780-meter toe wall on the toe of the OB Dump 'C', 810-meter toe wall along the OB Dump 'A' and 560-meter toe wall followed by garland drain along the Top Soil dump have been constructed).</p> <p>The garland drains constructed all around the dumps are ultimately connected to the settling pit where the sediments are settled and allow the water to pass through it. Further, 4 Nos. of rock fill Check dam are also constructed to avoid any siltation in the nearby area.</p> <p>Apart from the above, catch drains have also been constructed at workshop, offices etc. to direct the rain water to siltation pond</p>

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		<p>at sump area to arrest silts and further to direct water to main sump.</p> <p>The water accumulated at sump area is being used for dust suppression and development of green belt.</p>
3.7	<p>Adequate groundwater recharge measures shall be taken up for augmentation of ground water. The project authorities shall meet water requirement of nearby village(s) after due treatment conforming to the specific requirement (standards).</p>	<p>Adequate conservation measures are being taken in Pakri Barwadih Coal Mining Project for rainwater harvesting. The Roof top rainwater structure has been constructed and also rejuvenated the existing ponds in nearby villages for improving the ground water of the area. Approximately 1.55 lakh m³/year of ground water is being recharged at Pakri Barwadih Coal Mining Project.</p> <p>Approx. 23 lakh m³ of rainwater have been stored in the East quarry for use in dust suppression, plantation activity and the same water is used for other miscellaneous use also. In addition to that, 12 Nos. of Check dams have been constructed in Pakwa and Khora Nala to meet water requirements and to augment the groundwater of the area around PBCMP. The estimated cumulative storage capacity of the Check dams is 16.18 lakh cum. And estimated groundwater recharge potential of approx. 340.52 lakh m³/year through the Check Dams. Details and photographs are attached Annexure-27.</p> <p>Apart from the above, in summer season drinking water have been provided to project affected villages through 15 nos. of water tanker. Photographs are attached as Annexure-62.</p>
3.8	<p>Industrial waste water generated from CHP, workshop and other waste water, shall be properly collected and treated so as to conform to the standards prescribed under the standards prescribed under Water Act 1974 and Environment (Protection) Act, 1986 and the Rules made there under, and as</p>	<p>Being Complied.</p> <p>An Effluent treatment plant of 200 KLD Capacity have been provided at mine workshop. The treated effluent conforms to the standards and all the parameters are well within the limits. All the effluent generated are treated and reused in</p>

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	<p>amended from time to time. Adequate ETP /STP needs to be provided.</p>	<p>various mining activity such as Water sprinkling, Vehicle Washing etc.</p> <p>During current FY 13012 m3 (till sept 2024) of recycled water have been used for various mining activity. Photographs and test report of ETP is attached as Annexure-29.</p> <p>Apart from the ETP, 3 nos. of Sewage Treatment Plant (STP) on latest MBBR technology have been installed at R&R Colony (1.5 MLD capacity), Langatu Site Office (25 KLD capacity) and MDO Colony, Sikiri (300 KLD capacity). Photographs and test report of STP is attached as Annexure-28.</p> <p>The quality of ETP & STP treated water are within the prescribed limit.</p>
3.9	<p>The water pumped out from the mine, after siltation, shall be utilized for industrial purpose viz. watering the mine area, roads, green belt development etc. The drains shall be regularly desilted particularly after monsoon and maintained properly.</p>	<p>Being Complied.</p> <p>No mine waste water, workshop effluent is being discharged outside from mine. All the effluent generated are treated and reused in various mining activity such as Water sprinkling, Vehicle Washing etc.</p>
3.10	<p>The surface drainage plan including surface water conservation plan for the area of influence affected by the said mining operations, considering the presence of river/rivulet/pond/lake etc, shall be prepared and implemented by the project proponent. The surface drainage plan and/or any diversion of natural water courses shall be as per the approved Mining Plan/EIA/EMP report and with due approval of the concerned State/GoI Authority. The construction of embankment to prevent any danger against inrush of surface water into the mine should be as per the approved Mining Plan and as per the permission of DGMS or any other authority as prescribed by the law.</p>	<p>There are three nos. of nallas namely Pakwa, Khorra and Dumuhani Nala falling the mine lease area. As the Dumuhani nala was flowing across the middle of the mine lease area, as per the Mine Plan the this was to be realigned/ diverted. For realignment of Dumuhani nala CWPRS was engaged for study and design.</p> <p>Based on the study of the CWPRS, necessary permission/NOC has been obtained from State Water Resource Dept, GoJh vide their ltr. Ref. no. 2/PMC/ND-171/2012/224 dated 19.03.2013 for realignment of Dumuhani Nala and Dumuhani Nala has been diverted.</p> <p>Also, part of the Pakwa and Khorra Nalla</p>

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		<p>shall be diverted as per approved Mining Plan in 25th and 40th year of mine life after obtaining NOC from the State.</p> <p>Drainage map showing all the surface water bodies are attached as Annexure-63.</p>
3.11	<p>The project proponent shall take all precautionary measures to ensure riverine/riparian ecosystem in and around the coal mine up to a distance of 5 km. A rivarine/riparian ecosystem conservation and management plan should be prepared and implemented in consultation with the irrigation / water resource department in the state government.</p>	<p>Agreed.</p> <p>There are three nos. of nallas namely Pakwa, Khorra and Dumuhani Nala have been flows across the mine lease area. The mine boundary has been so decided that there is minimum impact have been done on the natural water courses. Accordingly, the Pakwa nala flows through the eastern Boundary and Khorra Nala flows at the Western boundary of the project. The Dumuhani nala which flows accros the middle of the mine lease area, accordingly, as per the Mine Plan the dumuhani nala was to be realigned. For realignment of the nala CWPRS was involved in study and design for realignment of the nallas.</p> <p>Based on the study of the CWPRS, and due approval of State Water Resource Dept, GoJh vide their ltr. Ref. no. 2/PMC/ND-171/2012/224 dated 19.03.2013 the Dumuhani Nala and Dumuhani Nala has been diverted.</p>
3.12	<p>Quality of polluted water generated from the operations which include COD and acid mine drainage and metal contamination shall be monitored along with TDS, DO, TSS. The monitored data shall be uploaded on the website of the company as well as displayed at the site in public domain.</p>	<p>An Effluent treatment plant of 200 KLD Capacity have been provided at mine workshop. The treated effluent confirms to the standards and all the parameters are well within the limits. Monitoring is being done through MoEF&CC and NABL accredited Lab. Data of the same is being submitted to RO MoEF & CC, JSPCB on six monthly basis through HYMR report. The monitored data is also uploaded on the NTPC website https://ntpc.co.in/about-us/corporate-functions/environment/status-hyc-reports</p> <p>The website of NTPC Mining Limited (NML)</p>

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		is under construction. After launching of website same will be uploaded on NML website. The quality of ETP & STP treated water are within the prescribed limit. The monitoring quality report of ETP & STP for the period of April 2024 to Sept 24 are attached as Annexure-28 & 29 .
3.13	Domestic water shall be providing to the residents/villages which are coming under the zone of influence of the project due to ground water extraction and mining operation by installing adequate number of RO plants with proper supply line and Taps within 2 years	<p>To determine the impact on ground water regime in the surrounding villages, regular monitoring of the ground water level is being carried out at 12 locations. Also, automatic water level recorders (Piezometers) have been installed at two locations viz.: Langatu site office and Sikri site office. Water level data for the period of April, 24 to Sept, 24 is attached as Annexure-25.</p> <p>Further, NTPC PBCMP under its social obligation, have installed 7 Nos. of hand pumps 31 nos. of borewells in nearby villages in FY 2024-25 and also, to meet the further water requirement of the nearby villagers adequate nos. of mobile tankers are deployed during summer season. Further. 20 nos. of water fillters have been installed in project affected villages.</p> <p>Moreover, fund has been deposited to District Administration for construction of 27 Hand pumps & 50 Bore wells.</p>
3.14	No obsolete technologies for sewage treatment shall be implemented. Construction of Sewage Treatment Plant with latest technology should be completed within 2 years and treated water shall be reused for plantation. CTE and CTO of STP shall be obtained as per the norms.	Three nos. of Sewage Treatment Plant (STP) with latest MBBR technology have been installed at R&R Colony (1.5 MLD capacity), Langatu Site Office (25 KLD capacity) and MDO Colony, Sikiri (300 KLD capacity). Photographs of STP is attached as Annexure-28
4. Noise And Vibration Monitoring And Prevention		
4.1	Adequate measures shall be taken for control of noise levels as per Noise Pollution Rules, 2016 in the work environment. Workers engaged in blasting and drilling operations,	<p>Effective measures are being taken to minimize the noise level below 85 dB (A) in the work zone.</p> <p>All the equipments/machines are provided</p>

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	operation of HEMM, etc shall be provided with personal protective equipments (PPE) like ear plugs/muffs in conformity with the prescribed norms and guidelines in this regard. Adequate awareness programme for users to be conducted. Programme for users to be conducted. Progress in usages of such accessories to be monitored.	with acoustic enclosure cabins. Workers engaged in blasting and drilling operations, operation of HEMM, are being provided with personal protective equipments (PPE) like ear plugs/muff in conformity with the prescribed norms and guidelines in this regard. Adequate awareness programme such as safety talk for the workers are being conducted regularly. Total 586 nos. of ear muffs/plugs have been distributed during April 2024 to Sept, 24.
4.2	Controlled blasting techniques shall be practiced in order to mitigate ground vibrations, fly rocks, noise and air blast etc., as per the guidelines prescribed by the DGMS.	Blasting patterns have been designed based on the study conducted by CIMFR Dhanbad. As suggested by CIMFR, Dhanbad, controlled blasting technique with non-electric delay detonators is being practiced to minimize ground vibration and to avoid fly rocks & boulders.
4.3	The noise level survey shall be carried out as per the prescribed guidelines to assess noise exposure of the workmen at vulnerable points in the mine premises, and report in this regard shall be submitted to the Ministry/RO on six-monthly basis.	Noise level survey has been carried out as per the CMR 2017 and prescribed guidelines to assess noise exposure of the workmen at different places of mine on monthly basis. Noise monitoring report is enclosed as Annexure-64 .
5. Mining Plan		
5.1	5-Star Rating is mandatory to obtained certification as per guidelines of Ministry of Coal.	Noted.
5.2	Mining shall be carried out under strict adherence to provisions of the Mines Act 1952 and subordinate legislations made there-under as applicable.	Mining is being carried out under strict adherence to provisions of the Mines Act 1952 and subordinate legislations made there-under.
5.3	Mining shall be carried out as per the approved mining plan (including Mine Closure Plan) abiding by mining laws related to coal mining and the relevant circulars issued by Directorate General Mines Safety (DGMS).	Mining is being carried out as per the approved mining plan (including Mine Closure Plan) abiding by mining laws related to coal mining and the relevant circulars issued by Directorate General Mines Safety (DGMS).
5.4	No mining shall be carried out in forest land without obtaining Forestry Clearance as per Forest (Conservation) Act, 1980.	Mining is being carried out in forest area after obtaining following clearance under the provisions of FC Act, 1980:

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		<p>.Stage I Clearance obtained vide letter no. "F. No 8-56/2009, dated 11th May 2010",</p> <p>.Stage II Clearance obtained vide letter no. "F. No 8-56/2009, dated 17th Sept 2010",</p> <p>Final land release letter received from the State Govt. vide letter no. 3/Vanbhoomi-75/2009-1240 dated 31.03.2011.</p>
5.5	Efforts should be made to reduce energy and fuel consumption by conservation, efficiency improvements and use of renewable energy.	<p>01 electric drill machine and 06 electrical excavators are being used in mines to reduce fuel consumption. Photographs are attached as Annexure-65.</p> <p>Effort are also being made to reduce the energy and fuel consumption by installing two nos. of Solar tree of 3 KW Capacity, by installing Bio-methanation plant of 100 Kg/day capacity and Bio Composter of 500 Kg/day capacity. Photographs are attached as Annexure-66.</p> <p>Apart from the above to reduce the fuel consumption, electric vehicle is being deployed in the mine area as well as in office area. Photographs are attached as Annexure-67.</p> <p>The work of "feasibility study for installation of solar plant on OB Dump" has been awarded to M/s CIMFER vide PO No. 5500041554-131-1040 Dated 27.10.2022.</p> <p>The Study is under process. Copy of work order is attached as Annexure-68.</p>
5.6	PP shall adopt mining method by preferably using surface miners for the project and silo loading through in-pit conveyor should be adopted	<p>The mining is being done as per approved mine plan and mine Closure plan. The surface miner trial is going on. Photographs are attached as Annexure-69.</p> <p>Silo Rapid Loading System is being installed at Bandag. Photographs are attached as Annexure-70.</p>
5.7	Transportation of coal till Railway Siding shall be developed to avoid	Transportation of coal is being done through 22.2 Km Belt Conveyor with Silo

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	<p>transportation through Road.</p>	<p>Rapid Loading system (completed on 15.12.2024) and through road as permitted by MOEF&CC.</p> <p>The construction of siding being done by railways, consists of seven nos. of rail tracks out of which 3 are ready, also, the electrification and signaling work is under progress. It is likely that yard augmentation work by railways shall be completed by 31.01.2025. After yard augmentation and RLS completion, it shall require three months of time (till 31.03.2025) to synchronize the system with railways which is known as "Integrated commissioning". In other words, it may take three months for both RLS streams to reach its rated capacity of 15 MTPA. However, actions have been initiated to enhance the conveying capacity of the existing system to 18 MTPA and shall be completed by 31.03.2026. After that no coal shall be transported through road.</p>
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6. Land Recalvation

<p>6.1</p>	<p>Digital Survey of entire lease hold area/core zone using Satellite Remote Sensing survey shall be carried out at least once in three years for monitoring land use pattern and report in 1:50,000 scale or as notified by Ministry of Environment, Forest and Climate Change(MOEFCC) from time to time shall be submitted to MOEFCC/Regional Office (RO).</p>	<p>The LULC study is being carried out at every three years interval. The last study was conducted in the year 2019-22 and report of the same was submitted to the MoEF & CC with HYMR (Oct. 2022 to March 2023). The next study shall be conducted for the period 2022-25 and shall be completed by June 2025. Copy of work order is attached as Annexure-35.</p>
<p>6.2</p>	<p>The final mine void depth should preferably be as per the approved Mine Closure Plan, and in case it exceeds 40 m, adequate engineering interventions shall be provided for sustenance of aquatic life therein. The remaining area shall be backfilled and covered with thick and alive top soil. Postmining land be rendered usable for agricultural/ forestry purposes and shall be diverted. Further action will be treated as specified in the guidelines for</p>	<p>Agreed.</p>

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	Preparation of Mine Closure Plan issued by the Ministry of Coal dated 27th August, 2009 and subsequent amendments.	
6.3	The entire excavated area, backfilling, external OB dumping (including top soil) and afforestation plan shall be in conformity with the "during mining"/"post mining" land-use pattern, which is an integral part of the approved Mining Plan and the EIA/EMP submitted to this Ministry. Progressive compliance status vis-a-vis the post mining land use pattern shall be submitted to the MOEFCC/RO.	<p>Agreed.</p> <p>The mining is being carried out as per approved Mine Plan and Mine Closure Plan.</p> <p>Progressive compliance status of mine closure activity for the period of April 24 to Sept. 24 is attached as Annexure-49.</p>
6.4	Fly ash shall be used for external dump of overburden, backfilling or stowing of mine as per provisions contained in clause (i) and (ii) of subparagraph (8) of fly ash notification issued vide SO 2804 (E) dated 3rd November, 2009 as amended from time to time. Efforts shall be made to utilize gypsum generated from Flue Gas Desulfurization (FGD), if any, along with fly ash for external dump of overburden, backfilling of mines. Compliance report shall be submitted to Regional Office of MoEF&CC, CPCB and SPCB.	<p>A study for use of fly ash for external OB has been awarded to M/s CIMFER for another NTPC's project (Dulanga Coal Mine Project, Odisha). After completion of study and based on the recommendations same shall be implemented at Pakri Barwadih Coal Mining Project. Copy of the work order is attached as Annexure-71.</p> <p>However, Gypsum is not available nearby which is required for mixing of fly ash with OB material.</p>
6.5	Further, it may be ensured that as per the time schedule specified in mine closure plan it should remain live till the point of utilization. The topsoil shall temporarily be stored at earmarked site(s) only and shall not be kept unutilized. The top soil shall be used for land reclamation and plantation purposes. Active OB dumps shall be stabilized with native grass species to prevent erosion and surface run off. The other overburden dumps shall be vegetated with native flora species. The excavated area shall be backfilled and afforested in line with the approved Mine Closure Plan. Monitoring and	<p>Top soil is being stacked in available suitable site. Same is being used for spreading over completed portion of OB Dump for development of the green belt.</p> <p>To prevent erosion from top soil dumps, coir mats have been laid on the slopes. Further, to avoid soil erosion mixed grass seed, root shoots of Vertiver grass and lemon grass have been sowed on topsoil dump.</p> <p>Apart from this 450-meter toe wall along with garland drain and settling ponds have been constructed along the toe of Topsoil dump. The garland drains are being repaired regularly before monsoon every</p>

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	<p>management of rehabilitated areas shall continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment, Forest and Climate Change/ Regional Office.</p>	<p>year.</p> <p>Active OB dumps are being stabilised with native grass species to prevent erosion. The other overburden dumps are being vegetated with native flora species.</p> <p>The excavated area shall be backfilled and afforested in line with the approved Mine Closure Plan.</p> <p>Monitoring and management of rehabilitated areas shall continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment, Forest and Climate Change/ Regional Office.</p>
<p>6.6</p>	<p>The project proponent shall make necessary alternative arrangements, if grazing land is involved in core zone, in consultation with the State government to provide alternate areas for livestock grazing, if any. In this context, the project proponent shall implement the directions of Hon'ble Supreme Court with regard to acquiring grazing land.</p>	<p>As per present approved mining plan and mine closure plan, 223 ha area have been envisaged for grazing land, the same shall be modified to increase the final area under grazing land and to reduce final void size in next amendment of the mining plan and mine closure plan. Grazing land shall be developed as per approved mining and mining closure plan and its revision.</p>
<p>6.7</p>	<p>Top soil should be stored separately at marked area and necessary vegetation shall be maintained to avoid any entrainment of dust.</p>	<p>Top soil is being stacked in available suitable site. Same is being used for spreading over completed portion of OB Dump for development of the green belt.</p> <p>To prevent erosion from top soil dumps, coir mats have been laid on the slopes. Further, to avoid soil erosion mixed grass seed, root shoots of Vertiver grass and lemon grass have been sowed on topsoil dump.</p> <p>Apart from this 450-meter toe wall along with garland drain and settling ponds have been constructed along the toe of Topsoil dump. The garland drains are being repaired regularly before monsoon every year.</p> <p>Active OB dumps are being stabilized with native grass species to prevent erosion. The</p>

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		other overburden dumps are being vegetated with native flora species.
6.8	Progressive backfilling of mine and progressive reclamation of OB dump shall be done.	<p>Agreed.</p> <p>Till Sept. 2024 total area of approx. 173.75 Ha was being backfilled. However internal dumping is in active stage and Mining / reclamation shall be implemented at the cost of project.</p> <p>More than 1.9 lakhs of tree sapling have been planted in all closed part of the OB Dump-C as well as more than 1.24 thousand plant saplings have been planted along the slope of the Dump-A.</p> <p>Further, more than 20 thousand plant saplings have been planted on OB dump-D and vacant part of the eastern quarry.</p> <p>Progressive compliance status of mine closure activity for the period of April 24 to Sept. 24 is attached as Annexure-49.</p>
6.9	Active OB Dump should not be kept barren/open and should be covered by temporary grass to avoid air born of particles.	During April 2024 to Sept, 2024, 11,000 Kg of mixed grass seed have been sowed over the temporary in-active OB Dumps areas.
6.10	PP shall explore the possibilities of utilization of OB material for different purposes (in construction of roads/ manufacture of artificial sand, aggregates/ use for farmers etc.)	<p>Agreed.</p> <p>OB material are being utilized for filling and construction of mine approach roads, embankments, etc.</p>
6.11	All approach roads to mine and all other roads which are in regular use should be black topped. The maintenance of road shall be done by PP in collaboration with state government	The approach roads to mine have been black topped and maintenance of the same are being done by NTPC Mining Ltd.
6.12	Hon'ble Supreme Court in an Writ Petition(s) Civil No. 114/2014, Common Cause vs Union of India & Ors vide its judgement dated 8th January, 2020 has directed the Union of India to impose a condition in the mining lease and a similar condition in the environmental clearance and the mining plan to the effect that the mining lease holders	<p>Agreed.</p> <p>The mining is being carried out as per approved Mine Plan and Mine Closure Plan. As per present approved mining plan and mine closure plan, 442 ha area have been envisaged for agricultural land, 1199 Ha of area shall be created into green belt/Plantation and 223 ha area for grazing</p>

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	<p>shall, after ceasing mining operations, undertake regrassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc. Compliance of this condition after the mining activity is over at the cost of the mining lease holders/Project Proponent". The implementation report of the above said condition shall be sent to the Regional Office of the MoEF&CC</p>	<p>land, the same shall be modified to increase the final area under agriculture & grazing land and to reduce final void size in next amendment of the mining plan and mine closure plan.</p>
<p>7. Green Belt</p>		
<p>7.1</p>	<p>The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered/endemic flora/fauna, if any, spotted/reported in the study area. The Action plan in this regard, if any, shall be prepared and implemented in consultation with the State Forest and Wildlife Department.</p>	<p>Site specific Wild Life Management Plan has been prepared in line with the Integrated Wildlife Management Plan of North Karanpura Coal block and the same has been approved by Chief Wildlife Warden of Jharkhand vide letter Ref. no. 33 dated 03.08.2023. Copy of the letter is attached as Annexure-72.</p> <p>The same shall be implemented by Forest Dept., requisite fund of Rs. 125.6732 Crore has been submitted to Ad-Hoc CAMPA fund. Letter of deposition is attached as Annexure-73.</p>
<p>7.2</p>	<p>Greenbelt consisting of 3-tier plantation of width not less than 7.5 m shall be developed all along the mine lease area as soon as possible. The green belt comprising a mix of native species (endemic species should be given priority) shall be developed all along the major approach/ coal transportation roads. And Plantation should also be carried out in nearby area with consent of forest department and gram panchayat within 10 km radius with its proper maintenance</p>	<p>6 Km all along within the mining lease 7.5 m wide safety zone has been developed with plantation of approx. 75000 nos. of mix of native plant species.</p> <p>The 3-tier plantation green belt comprising a mix of native species (5930 nos.) is being developed along the 7 Km coal transportation roads along the northern boundary of the mining lease.</p> <p>NTPC PBCMP has also distributed 10172 plants in nearby villages and agreed for further plantation with consent of Forest Dept. and Gram Panchayat.</p>
<p>8. Public Hearing And Human Health Issues</p>		

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8.1	Adequate illumination shall be ensured in all mine locations (as per DGMS standards) and monitored weekly. The report on the same shall be submitted to this ministry & it's RO on six monthly basis.	Adequate illumination is being ensured in all mine locations and monitored monthly as per DGMS norms. Monitoring report is attached as Annexure-74 .
8.2	The project proponent shall undertake occupational health survey for initial and periodical medical examination of the personnel engaged in the project and maintain records accordingly as per the provisions of the Mines Rules, 1955 and DGMS circulars. Besides regular periodic health check-up, 20% of the personnel identified from workforce engaged in active mining operations shall be subjected to health check-up for occupational diseases and hearing impairment, if any, as amended time to time.	Regular periodic medical check-up of all mine workers as per DGMS guidelines is being carried out at project hospital as reported. "Occupational health study in Pakri Barwadih Coal Project with special reference to respiratory health and hearing impairment assessment" was conducted through Regional Occupational Health Centre (Eastern), Kolkata & National Institute Of Occupational Health, Ahmedabad. Report of the same already submitted in last compliance reporting. During April 24 to Sept-24, IME & PME of 147 nos. persons have been done. As of now no case of occupational disease and hearing impairment has been reported.
8.3	Personnel (including outsourced employees) working in core zone shall wear protective respiratory devices and shall also be provided with adequate training and information on safety and health aspects.	Personnel (including outsourced employees) working in core zone are wearing protective respiratory devices and are being provided with adequate training and information on safety and health aspects. From April 2024 to Sep 2024 6027 nos. nose mask have been provided to personnel working in core zone.
8.4	Implementation of the time bound action plan on the issues raised during the public hearing shall be ensured. The project proponent shall undertake all the tasks/measures as per the time bound action plan submitted with budgetary provisions during the public hearing. Land Oustees shall be compensated as per the norms laid down in the R&R policy of the company/State Government/Central Government, as applicable.	Commitment made during Public Hearing is being ensured in time bound manner. Rehabilitation Action Plan has been approved vide Govt. of Jharkhand (GoJh) Gazette Notification vide letter No. 116 /R dated 27.02.2013 which is in line with the Jharkhand R&R policy. Commitment made during PH was mostly related to R&R benefits for which the Sankalp is prepared and those are being met.

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<p>8.5</p>	<p>The project proponent shall follow the mitigation measures provided in this Ministry's OM No. Z11013/5712014-IA.II (M) dated 29th October, 2014, titled 'Impact of mining activities on habitations-issues related to the mining projects wherein habitations and villages are the part of mine lease areas or habitations and villages are surrounded by the mine lease area'.</p>	<p>Agreed.</p> <p>All habitation falling within the mining lease area shall be resettled gradually. However following mitigation measures are being taken as per the OM.</p> <p>To suppress the dust, fixed water sprinkler of 2 Km has been installed in permanent type haul road and 34 nos mobile tankers of various sizes have been deployed in the mines. Green Agro-net has been installed between active mining area and nearby habitation.</p> <p>Adequate conservation measures are being taken in Pakri Barwadih Coal Mining Project for rainwater harvesting. The Roof top rainwater structure has been constructed and also the existing ponds have been rejuvenated in nearby villages for improving the ground water of the area. Approximately 1.55 lakh m³/year of ground water is being recharged.</p> <p>Apart from the above Approx. 23 lakh m³ of rainwater have been stored in the East quarry for use in dust suppression, plantation activity, etc. In addition to that, 12 Nos. of Check dams have been constructed in Pakwa and Khora Nala to meet water requirements and to augment the groundwater of the area around PBCMP. The estimated cumulative storage capacity of the Check dams is 16.18 lakh cum. And estimated groundwater recharge potential of approx. 340.52 lakh m³/year through the Check Dams.</p> <p>Noise levels have been kept under prescribed limits for day/night. Also, orientation of lights have been kept away from habitation.</p> <p>Adequate size and nos. of toe wall, garland</p>
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		<p>drains, settling ponds have been constructed to avoid wash-off with the rain water.</p> <p>Blasting is done 100 m away from the public structure and monitoring of each blast is done to ascertain the impact of blasting on nearby habitation and dwelling units.</p> <p>The project has bear the cost towards the widening and strengthening of existing public road being used for road transport.</p> <p>R&R of the affected person are being done as per Sankalp issued vide letter No. 116 /R dated 27.02.2013 by the State Govt.</p>
8.6	PP to conduct need-based assessment survey of the area to for in order to decide the activities to be carried under the CSR and to provide detail of the activity carried out with adequate budgetary provision and time bound action plan.	<p>Pre-mining Socio economic survey has been undertaken through IIT Kharagpur and Abhigyan Samiti.</p> <p>For monitoring, socio economic status a contract for conducting Social Impact Assessment in the project affected villages of PBCMP has been awarded to M/s. Deloitte Touche Tohmatsu India LLP, Gurgaon dated 16.09.2020. The study report has been submitted in previous compliance report.</p> <p>Year wise CSR activity with expenditure is attached as Annexure-75.</p>
8.7	PP should conduct epidemiology study to (analysis of the distribution, patterns and determinants of health and disease conditions in defined populations).	Agreed.
8.8	Permanent Health care facilities of Hospital should be established within 5 km of project boundary for the local people	Medical dispensary has been established at Langatu site office equipped with latest medical equipment and technologies. Full time medical teams consisting of MBBS Medical Officers, Pharmacists, Compounder cum Dressers, Lab Technicians, Female Nurses and EDP operators are serving the villagers dedicatedly. The dispensary is providing services like general checkup,

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		distribution of medicine, all for free to the villagers and employees.
8.9	PP must ensure an emergency action plan during pandemic in order to provide assistance to the nearby villages located within the 10 km radius buffer zone (If required)	We shall always abide the said condition. During COVID pandemic various advisory and SoPs have been issued. Some of the advisory/SoP is attached as Annexure-76 .
8.10	PP is asked to also identify the rural areas for installation of solar light with its maintenance within the study area of 10 km radius buffer zone within one year	550 nos. of solar lights have been installed in the rural areas. Apart from the above, the work of installation of 100 new solar lights/high mast along coal transportation road has been awarded to M/s Aasma Enterprises. Copy of the work order is attached as Annexure-16 . Photographs attached as Annexure-17 .
8.11	PP to take measure for installation of Renewable Energy sources in nearby area falling within 10 km radius	As submitted at point no. 8.10.
8.12	The illumination and sound at night at project sites disturb the villages in respect of both human and animal population. Consequent sleeping disorders and stress may affect the health in the villages located close to mining operations. Habitations have a right for darkness and minimal noise levels at night. PPs must ensure that the biological clock of the villages is not disturbed; by orienting the floodlights/masks away from the villagers and keeping the noise levels well within the prescribed limits for day light/night hours	Being complied. All possible measure are being carried out to make the illumination and noise level within prescribed limit. The Noise level monitoring data for the period of April 24 to Sept. 24 confirms that the noise levels are within prescribed limit. Noise level data within mining area as well as coal transport route for the period of April 24 to Sept 24 is attached as Annexure-40 .
8.13	Adequate facility of drinking water, plantation and other social amenities should be provided to established R&R villages.	The requirement of water at R&R Colony has been fulfilled through overhead tanks constructed for the purpose which is filled with ground water. Further, more than 4000 nos. of fruit bearing plants (such as mango, Guava, Mulberry, Lychee, Jackfruit etc.) have been planted in R&R colony which is being maintained by NTPC Ltd. Copy of the work

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		order awarded for plantation and maintenance of plants in R&R colony is attached as Annexure-77 . Apart from the above other social amenities such as School, Mandirs, Health centers, etc. have also been provided at established R&R colony, Dhenga, Barkagaon.
8.14	Persons of nearby villages shall be given training on livelihood and skill development to make them employable with its proper records.	Through ITI Dhenga (Being run by NTPC) capacity building of youths of the project area is being carried out by the project. Other training programs for women empowerment and providing livelihood options is also being organised by PBCMP. Details of training is attached as Annexure-78 . Till date 500 nos. of student got employment after passing from ITI Dhenga.
8.15	Compensation of the land acquired for the project shall be settled as per the R&R Policy within fixed timeline	Compensation of the land acquired for the project is being settled as per R&R package approved vide letter No. 116 /R dated 27.02.2013 by State Govt.

9. Corporate Environment Responsibility

9.1	The company shall have a well laid down environmental policy duly approved by the Board of Directors. The environmental policy should prescribe for standard operating procedures to have proper checks and balances and to bring into focus any infringements/ deviation/ violation of the environmental/ forest/ wildlife norms/ conditions. The company shall have defined system of reporting infringements/ deviation/ violation of the environmental/ forest/ wildlife norms/ conditions and/or shareholders/ stake holders.	The Environment policy has been approved by the Board of Directors and is being implemented at site. Approved environment policy is attached as Annexure-79 .
9.2	A separate Environmental Cell both at the project and company head quarter level, with qualified personnel shall be set up under the control of senior Executive, who will directly to the head	At the corporate office, a separate Environmental Management Cell is already functioning under supervision of senior executive who is reporting to Head of the Company to look after the implementation

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	of the organization.	of the various pollution control measures and other Environment Management System requirements. At local level, dedicated department for Environment Management is also functional with qualified Environmental Engineer. Head of the Department directly reports to Head of the Project. The working level staffs in Environment Cell have been deployed through MDO. The organization chart of the same is enclosed as Annexure – 42.
9.3	Action plan for implementing EMP and environmental conditions along with responsibility matrix of the company shall be prepared and shall be duly approved by competent authority. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to be diverted for any other purpose. Year wise progress of implementation of action plan shall be reported to the Ministry/Regional Office along with the Six Monthly Compliance Report.	The requisite funds for environmental mitigation measures have been included in the project cost. An amount of Rs. 9.253 Crores have been spent during April-2024 to Sept, 2024 for the Environment Management Cost. Till Sept, 2024 we have spent an amount Rs. 92.648 Crores (Rs. 71.778 Crores – Audited and Rs. 20.87 Crores - Unaudited) for the Environment Management Cost. Escrow account has been opened and amount is being deposited annually. As per direction received from CCO an amount of Rs. 16.2607 Crores have been deposited in the FY 2023-24 as 8 th (FY 2023-24) & 9 th (FY 2024-25) year Mine Closure cost. Till date Rs. 62.45 Crore have been deposited in Escrow account as part of the Mine Closure cost. Detail of amounts deposited in ESCROW is enclosed as Annexure- 34.
9.4	Self-environmental audit shall be conducted annually. Every three years third party environmental audit shall be carried out.	Self-environmental audit (internal audit) and third-party environmental audit (ISO) is being carried out annually and in three years respectively.
9.5	PP should establish in house (at project site) environment laboratory for measurement of environment parameter with respect to air quality and	Presently, Monitoring and analysis is being done through MoEF&CC and NABL accredited lab in consultation with the State Pollution Control Board.

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	water(surface and ground. A dedicated team to oversee environment management shall be setup which should comprise of Environment Engineers, Laboratory chemist and staff for monitoring of air, water quality parameters on routine basis. Any non-compliance or infringement should be reported to the concerned authority	<p>However, Environmental laboratory has already been setup at site with various equipments. The dedicated team has looking after the monitoring work.</p> <p>Various equipments is being purchud for testing of air and water quality paramenters. Details and GeM bidders are attached as Annexure-80.</p>
10. Miscellaneous		
10.1	The project proponent shall make public the environmental clearance granted for their project along with the environmental conditions and safeguards at their cost by prominently advertising it at least in two local newspapers of the District or State, of which one shall be in the vernacular language within seven days and in addition this shall also be displayed in the project proponent's website permanently.	<p>EC (18 MTPA) was was published in "Danik Jagran and Danik Bhaskar" in hindi and english.</p> <p>Copies of the news clippings published in Papers are enclosed herewith and marked as Annexure- 81.</p> <p>Copy of the EC letter has been sent to the local administrative offices and uploaded on the company's website www.ntpc.co.in.</p>
10.2	The copies of the environmental clearance shall be submitted by the project proponents to the Heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn has to display the same for 30 days from the date of receipt.	<p>Copy of the EC letter was sent to office of District collector, Hazaribagh, JSPCB Regional office Hazaribagh, JSPCB Ranchi, District Industry Center, Hazaribagh, Municipal Office, Hazaribagh, Concerned COs.</p> <p>Copy of the receipt of EC from different Panchayats is attached as Annexure-82.</p>
10.3	The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.	<p>The half yearly Compliance status is being updated on Company's website. https://www.ntpc.co.in/about-us/corporate-functions/environment/status-hyc-reports</p> <p>The data is also being displayed at entrance of the office.</p> <p>However, the website of NML is under construction. After launching of website same will be uploaded on NML company site.</p>
10.4	The project proponent shall monitor the criteria pollutants level namely; PM10,	The pollutants level is being monitored and displayed at Mine area Office area and

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	SO ₂ , NO _x (ambient levels) or critical sectoral parameters, indicated for the projects and display the same at a convenient location for disclosure to the public and put on the website of the company.	Banadag Railway Siding. Photographs attached as Annexure-83 .
10.5	The project proponent shall submit six-monthly reports on the status of the compliance of the stipulated environmental conditions on the website.	The six-monthly Compliance status is being updated on Company's website. https://www.ntpc.co.in/about-us/corporate-functions/environment/status-hyc-reports However, the website of NML is under construction. After launching of website same will be uploaded on NML company site.
10.6	The project proponent shall submit the environmental statement for each financial year Form-V to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently and put on the website of the company.	Agreed. The last environmental statement had been submitted to Jharkhand State Pollution Control Board vide our ltr. Ref. 1040/PBCMP/EMG/2024/F-38/159, dated 21.09.2024 through mail dated 23.09.2023. Copy of the mail attached as Annexure – 84 .
10.7	The project authorities shall inform to the Regional Office of the MOEFCC regarding commencement of mining operations.	Agreed.
10.8	The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.	Agreed.
10.9	The project proponent shall abide by all the commitments and recommendations made in the EIA/EMP report, commitment made during Public Hearing and also that during their presentation to the Expert Appraisal Committee.	Agreed.
10.10	No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment, Forests and Climate Change.	Noted. Before any expansion or modification prior approval of the Ministry of Environment, Forests and Climate Change will be

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		obtained.
10.11	Concealing factual data or submission of false/fabricated data may result in revocation of this environmental clearance and attract action under the provisions of Environment (Protection) Act, 1986.	Noted and Agreed.
10.12	The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.	Noted and Agreed.
10.13	The Ministry reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.	Noted and Agreed.
10.14	The Regional Office of this Ministry shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information/ monitoring reports.	Noted and Agreed.
10.15	The above conditions shall 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, Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 along with their amendments and Rules and any other orders passed by the Hon'ble Supreme Court of India / High Courts and any other Court of Law relating to the subject matter.	Noted and Agreed.

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Six Monthly Progress Report on compliance of conditions stipulated in the Environmental Clearance by MoEF & CC and Monitoring report for the period October 2023 to March 2024 for Pakri Barwadih Coal Mining Project (18 MTPA) of NTPC Mining Ltd.: Reg.

From EMG_PBCMP <emg_pbcmp@ntpc.co.in>

Date Mon 03/06/2024 12:40

To ROR MoEFCC <ro.ranchi-mef@gov.in>

Cc TSPAKRI <tspakri@ntpc.co.in>; Upendra Kumar Pandit <UPENDRAKUMARPANDIT@NTPC.CO.IN>; NAVIN <NAVINKUMAR03@NTPC.CO.IN>; Birendra Kumar <BIRENDRAKUMAR01@NTPC.CO.IN>; jspcb_hazaribagh@rediffmail.com <jspcb_hazaribagh@rediffmail.com>; ranchijspcb@gmail.com <ranchijspcb@gmail.com>; mkbiswas.cpcb@nic.in <mkbiswas.cpcb@nic.in>

Bcc nk@thrivenisainik.com <nk@thrivenisainik.com>; hkr@thrivenisainik.com <hkr@thrivenisainik.com>

 [D.No.-108, Date01.06.2024 EC Compliance\) 1.pdf](#)

Dear Sir,

With reference to above subject please find enclosed herewith the six-monthly status report on compliance of various conditions in the Environmental Clearance accorded to **Pakri Barwadih Coal Mining Project (18 MTPA) of NTPC Mining Limited** for the period **October 2023 to March 2024**.

This is for your kind information please.

Thanking you.

सादर / Warm regards,

नवीन कुमार/ Navin Kumar
DGM (Mining), Environment Mgmt.
एनटीपीसी लिमिटेड / NTPC Ltd.
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कोयला खनन परियोजना / COAL MINING PROJECT
हजारिबाग / Hazaribag

Your (**Environment Clearance**) application has been **Submitted** with following details

Proposal No	IA/JH/CMIN/462601/2024
Compliance ID	70417150
Compliance Number(For Tracking)	EC/COMPLIANCE/70417150/2024
Reporting Year	2023
Reporting Period	01 Jun(01 Oct - 31 Mar)
Submission Date	01-06-2024
IRO Name	ARTATRANA MISHRA
IRO Email	jhk109@ifs.nic.in
State	JHARKHAND
IRO Office Address	Integrated Regional Offices, Ranchi

Note:- SMS and E-Mail has been sent to ARTATRANA MISHRA, JHARKHAND with Notification to Project Proponent.

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Six Monthly Progress Report on compliance of conditions stipulated in the Environmental Clearance by MoEF & CC and Monitoring report for the period October 2023 to March 2024 for Pakri Barwadih Coal Mining Project (18 MTPA) of NTPC Mining Ltd.: Reg.

1 message

EMG_PBCMP <emg_pbcmp@ntpc.co.in>

Mon, Jun 3, 2024 at 6:10 PM

To: ROR MoEFCC <ro.ranchi-mef@gov.in>

Cc: TSPAKRI <tspakri@ntpc.co.in>, Upendra Kumar Pandit <UPENDRAKUMARPANDIT@ntpc.co.in>, NAVIN

<NAVINKUMAR03@ntpc.co.in>, Birendra Kumar <BIRENDRAKUMAR01@ntpc.co.in>,

"jspcb_hazaribagh@rediffmail.com" <jspcb_hazaribagh@rediffmail.com>, "ranchijspcb@gmail.com"

<ranchijspcb@gmail.com>, "mkbiswas.cpcb@nic.in" <mkbiswas.cpcb@nic.in>

 [D.No.-108, Date01.06.2024 EC Compliance\) 1.pdf](#)

Dear Sir,

With reference to above subject please find enclosed herewith the six-monthly status report on compliance of various conditions in the Environmental Clearance accorded to **Pakri Barwadih Coal Mining Project (18 MTPA) of NTPC Mining Limited** for the period **October 2023 to March 2024**.

This is for your kind information please.

Thanking you.

सादर / Warm regards,

नवीन कुमार/ Navin Kumar

DGM (Mining), Environment Mgmt.

एनटीपीसी लिमिटेड / NTPC Ltd.

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शोबना खान परिवेक्षण / COAL MINING PROJECT
हजारिबाग / Hazaribag



सत्यमेव जयते

File No.:
Government of India
Ministry of Environment, Forest and Climate Change
IA Division



Dated 30/10/2024



To,

Sh. NAVIN KUMAR
M/s NTPC MINING LIMITED
NTPC MINING LIMITED, NTPC BHAWAN, CORE-7, 7 INSTITUTIONAL AREA, LODHI ROAD,
SOUTH EAST DELHI, NEW DELHI - 110003, NORTH EAST, DELHI, 110003
Email: env-mines@ntpcmining.co.in

Subject: **Pakri Barwadih Coal Mining Project (area 3319.42 Ha having capacity 18 MTPA) by M/s NTPC Mining Limited located at Villages: Barkagaon, Itij, Chiruadih, Urub, Chepa, Kalan, Nagri, Jugra, Sinduari, Churchu, Carahara, Sonbarsa, Pakri – Barwadih; District: Hazaribagh; State: Jharkhand – Grant of Amendment in Environmental Clearance – regarding.**

Sir/Madam,

This is with reference to your online application vide proposal No. IA/JH/CMIN/475123/2024 dated 03/09/2024 along with CAF (Part A, B and C) seeking amendment in Environment Clearance accorded by the Ministry vide letter no. J-11015/692/2007-IA-II(M) dated 19.05.2009, under the provisions of the EIA Notification, 2006 for the project mentioned above.

2. The particulars of the proposal are as below :

(i) EC Identification No.	EC24A0101JH5485797A
(ii) File No.	
(iii) Clearance Type	Amendment in EC
(iv) Category	A
(v) Schedule No./ Project Activity	1(a) Mining of minerals
(vi) Sector	Coal Mining
(vii) Name of Project	Amendment in Environment Clearance (EC) of Pakri Barwadih Coal Mining Project, NTPC Mining Limited
(viii) Location of Project (District, State)	HAZARIBAGH, JHARKHAND
(ix) Issuing Authority	MoEF&CC
(x) EC Date	03/09/2024
(xii) Applicability of General Conditions	NO

(xiii) Status of implementation of the project

3. The proposal was considered by EAC (Coal) in its 15th meeting held during September 18-19th, 2024. The project activity is listed at schedule no. 1(a) - Mining of minerals under Category "A" of the schedule of the EIA Notification, 2006. The minutes of the meeting and all the project documents are available on PARIVESH portal which can be accessed at <https://parivesh.nic.in>.

4. The instant proposal is for amendment in Environment Clearance granted to M/s NTPC Limited vide letter no. J-11015/692/2007-IA-II(M) dated 19.05.2009, later transferred to M/s NTPC Mining Limited vide letter no. J-11015/692/2007-IA-II(M) dated 02.05.2024 for Pakri Barwadih Coal Mining Project (area 3319.42 Ha having capacity 18 MTPA) located at Villages: Barkagaon, Itij, Chiruadih, Urub, Chepa, Kalan, Nagri, Jugra, Sinduari, Churchu, Carahara, Sonbarsa, Pakri – Barwadih; District: Hazaribagh; State: Jharkhand.

5. Details of all the prior ECs including the EC for which amendment is sought are summarized as below:

S. No.	Details of Letter No.	Details of EC/Expansion EC/ Amendment in EC/ Validity extension/ Transfer of EC	Capacity (MTPA)	Area (Ha)	Date of issuance	Status of implementation
1	J-11015/692/2007-IA-II(M)	Fresh EC	15	3319.42	19.05.2009	Production of 15 MTPA achieved during the year 2023-2024
2	-do-	Amendment in EC [Road transportation granted till 28.06.2018]	15	3319.42	29.06.2016	Implemented
3	-do-	Amendment in EC [Specific Condition nos (iii), (vi) & (ix) And General Condition nos (ix) & (xiii)]	15	3319.42	07.12.2017	Being implemented
4	-do-	Amendment in EC [Road transportation granted till 28.06.2020]	15	3319.42 Ha	14.08.2018	Implemented
5	-do-	Amendment in EC [Road transport granted till 28.06.2022 and auto extended to 28.06.2023 in line with Covid notification of MOEF&CC]	15 MTPA	3319.42 Ha	10.11.2020	Road transport granted till 28.06.2022 and auto extended to 28.06.2023 in line with Covid notification of MOEF&CC - Implemented
6	-do-	Amendment in EC [Road transport granted till 31.10.2023]	15 MTPA	3319.42 Ha	16.08.2023	Implemented
7	-do-	Amendment in EC [Road transport granted till 31.01.2024]	15 MTPA	3319.42 Ha	09.11.2023	Implemented
8	-do-	Amendment in EC [Road transport granted till 31.07.2024]	15 MTPA	3319.42 Ha	15.01.2024	Implemented

9	-do-	PRC Enhancement (1st phase 20%) as per MoEF&CC guidelines dated 11/04/2022	18 MTPA	3319.42 Ha	06.03.2024	Being implemented
10	-do-	Transfer of EC [Transfer from NTPC Ltd to NTPC Mining Ltd]	18 MTPA	3319.42 Ha	02.05.2024	Transfer from NTPC Ltd to NTPC Mining Ltd
11	-do-	Amendment in EC [Road transport granted till 31.10.2024]	18 MTPA	3319.42 Ha	16.07.2024	Being Implemented

6. The PP has made an online application vide proposal no. IA/JH/CMIN/475123/2024 dated 03.09.2024 for amendment in EC Specific Condition no. 2A(ix) accorded vide letter no. J-11015/692/2007-IA-II(M) dated 19.05.2009, seeking further amendment for extension of timeline regarding transportation of coal by road using State Highway/ Service Road till 31.12.2024 and after that 13 MTPA by belt conveyor and 5 MTPA by State Highway/ Service Road till 31.03.2026. PP submitted the following details for the amendment sought along with the justification:

Specific/ General Condition No.	Details of Conditions as per EC	Amendment Sought	Justification
Specific Condition No. 2A (ix)	The PP needs to complete the construction of closed belt conveyor system of a length of 13 km to Banadag railway station. The pp is permitted till 31.10.2024 to use Service road/State Highways for transportation of coal to Banadag railway siding.	The PP is permitted to use Service Road/State Highways for transportation of 18 MTPA of coal to Banadag railway siding till 31.12.2024 and after that 13 MTPA by Belt conveyor and 5 MTPA by Service Road/State Highways till 31.03.2026 adopting all mitigative measure to control dust pollution.	Silo Rapid Loading System is still under construction and was getting delayed due to various land acquisition and local law and order issues. The delay in construction was mainly due to the unavailability of land. It is pertinent to submit that due to the continuous agitations of locals for fulfilment of demands beyond the acquisition policy etc., NTPC had to repeatedly write to the Deputy Commissioner, Hazaribagh, Jharkhand requesting for deployment of police personnel for taking possession of the notified land (for which the payment was already disbursed/ compensation was already deposited). Due to such protest and agitations, the required extent of land could be taken in possession only on 28.04.2023. After 28.04.2023, construction of Silo Rapid Loading System is in full swing and complete conveyor belt system is expected to be completed by 31.12.2024. Hon'ble Supreme Court has extended the timeline for completion of belt conveyor system till 31.12.2024 vide its order dated 29.01.2024 in the matter of Misc. Appeal No. 1824 of 2023 in Civil Appeal No. 6249 of 2021 (NTPC Ltd v. Tripurari Singh and Others). Presently, Pakri Barwadih Coal Mining Project (PBCMP) dispatches coal from mine at Pakri Barwadih to railway siding at Banadag in following modes/ways: Part I: From mine pit to crusher installed at mine pithead by mine trucks for the entire quantity proposed throughout the mine life. Part II: For connecting TP 10 to siding by conveyor, Silo Rapid Loading System is still under construction and likely to be complete by 31.12.2024. The completion status of the RLS work, as on 31.08.2024, is as follows:

Specific/ General Condition No.	Details of Conditions as per EC	Amendment Sought	Justification		
			Sl. No.	Description	Completion %
			i	Civil works	99.39
			ii	Structural Supply	100
			iii	Electrical and Mechanical Supply	100
			iv	Structural Erection	87
			The Expected Completion Schedule is as follows:		
			i	Civil works	30.09.2024
			ii	Structural work	10.10.2024
			iii	Mechanical works	20.10.2024
			iv	Electrical works	31.10.2024
			v	Final Commissioning	31.12.2024
			<p>As submitted, the initial EC accorded in 2009 was for 15 MTPA of Peak rated capacity (PRC), accordingly, Coal Handling Plant (CHP) & Rapid Loading Systems (RLS) of PBCMP was designed to transport coal up to 15 MTPA. Subsequent upon the revision of PRC, vide File no. J-11015/692/2007-IA-II(M) dated 16.07.2024, EC was granted to transport coal up to 18 MMT per annum till 31.10.2024.</p> <p>Due to design capability of present CHP & RLS System, which is of 15 MTPA, balance 3 MTPA shall be required to be transported through road after 31.12.2024, till the completion of capacity enhancement of existing coal conveying system, which may require approximately 24-month time.</p> <p>It is also pertinent to mention that, from commissioning till the achievement of its peak rated capacity, the present RLS system will approximately require three to four months of stabilisation period after 31.12.2024. Assuming the comprehensive coal conveying system operates at 90% of its rated capacity after the stabilisation period, there may be additional requirement of 2 MTPA required to be transported through road. Therefore, after 31.12.2024, approx. 5 MTPA out of 18 MTPA shall be required to be transported through road.</p>		

7. Certified Compliance Report and Action Taken thereof: The PP submitted that CCR from Regional office (RO), Ranchi was received on 19.06.2024 vide letter no. 103-425/376 and PP submitted ATR on the same on 26.08.2024. With respect to the Condition for which amendment is sought, RO has given its observations and has mentioned that, “during inspection on 30.05.2024 it was observed that coal transportation is still being done by road from Pakri Barwadih coal mine project to Banadag railway siding. It is observed that rapid loading system of the conveyor system is under construction near Banadag railway siding. PP informed that now full efforts are being made to complete the same before 31.12.2024.”

8. Details of the court cases:

Case No.	Court	Brief	Next date of hearing	Decision of court and its compliance
WP (C) 5732/2016	HC	of Writ Petition filed by Bhartiya	Next hearing	

Case No.	Court	Brief	Next date of hearing	Decision of court and its compliance
	Jharkhand	Suraj Dal against State of Jharkhand and others regarding pollution and diversion of forest land without obtaining the consent of Gram Sabhas under the FRA Act 2006.	scheduled on 20.09.2024.	
WP (C) 4036/2021	HC of Jharkhand	Writ Petition has been filed by NTPC against the State of Jharkhand and others against demand of transit fee on 100 % coal production under Jharkhand Forest Produce Transit (Regulation of Transport) Rules 2020 issued by State of Jharkhand.	Listed for hearing in first week of February 2024. No date showing for now. Next date is not given.	
WP (C) 1759/2023	HC of Jharkhand	Writ Petition filed by NTPC against the State of Jharkhand and others to stay the operation, implementation and execution of the letter No. 43, dated 03.01.2023 of Divisional Forest Officer (West), Hazaribagh by which the State of Jharkhand has demanded the payment of Transit Fee for the second time on the same load by stating that NTPC is liable to generate the challan for the second time when there is a change of mode of transportation.	Next hearing date is not given	Hon'ble court vide order dated 06.09.2024 directed NTPC not to be charged twice for the same forest produce on the change of mode of transportation for transportation of any forest produce as transit fee. Hon'ble Court has stayed the order till next date of hearing held on 21/02/24.
WP (C) 3256/2023	HC of Jharkhand	Writ Petition filed by NTPC against the State of Jharkhand and others regarding quashing the letter No. 3426, dated 23.06.2023 of Divisional Forest Officer (West), Hazaribagh by which Forest Deptt. has denied Coal Transportation by Road.		The Hon'ble High Court granted stay on the letter vide order dated 30.06.2024.
WP (C) 3614/2023	HC of Jharkhand	PIL filed by Shri Mantu Soni against State of Jharkhand and Others regarding FC granted to Pakri Barwadih Coal Mining Project on forged document (Consent letter of Van Prabandhan Samittee).	Next hearing is scheduled on 20.09.2024	Ø CA filled by NTPC on 18.06.2024. Ø Rejoinder filled by applicant on 27.06.2024. Ø Supplementary Counter Affidavit filed by NTPC on 07.08.2024. Ø Reply of affidavit filed by applicant on 20.08.2024.
OA no 63/2023/EZ (158/2023/PB)	NGT, Kolkata	Filed by Shri Anup Kumar against State of Jharkhand and Others regarding illegal mining in Pakri Barwadih Coal Mining Project. Vide order dated	Next hearing is scheduled on 12.11.2024.	Ø Due to similar nature hearings are being held with Appeal No 20/2023 Ø Last hearing conducted on 22.08.2024. Case o be further

Case No.	Court	Brief	Next date of hearing	Decision of court and its compliance
		11.08.2023, NTPC and its MDO(TSMPL) has been made party by the Hon'ble court.		heard on 12.11.2024.
Appeal No 20/2023	NGT, Kolkata	Appeal filed by NTPC against State of Jharkhand & Others to stay on DFO's demand letter for payment of Penal NPV with interest in line with MOEF&CC amendment letter dated 25.05.2023 for amendment of condition no-8 of FC.	Next hearing is scheduled on 12.11.2024.	Ø 1st hearing done on 01.08.2023. Hon'ble NGT stayed on DFO's Demand letter. Ø Last hearing conducted on 22.08.2024, stay continued till further order.
W.P.(PIL) 4358/2024	HC of Jharkhand	PIL filed by Shri Ravikant Singh Vs Union of India and others regarding Mining beyond lease and regarding FC granted to Pakri Barwadih Coal Mining Project on forged document (Consent letter of Van Prabandhan Samittee).	Next hearing is scheduled on 20.09.2024	Ø First Hearing held on 28.08.2024. Ø CA filled by NTPC on 02.09.2024.

9. Traffic assessment study

Traffic study report had been carried for assessment of impacts due to transportation of coal by road from Pakri Barwadih coal mining project to Banadag railway siding. The traffic study has conducted traffic and road surveys for assessment of carrying capacity on route, monitoring of air quality and noise levels along the route, air quality modelling for impact assessment of incremental ground level concentration of air pollutants, data collection regarding flora and opinion survey along the road and identification of villages, forests within 100 m along the route. Based on the existing traffic volume monitored, existing width of roads, traffic projections upto December 2024 and additional trucks from Pakri Barwadih coal mine, the carrying capacity has been calculated for December 2024. The resultant future traffic load will vary between 8.4% to 63.8% of the maximum capacity of the road. To minimise air pollution at the mine and railway sidings, the PP has installed Wind breaker (20' high, 2 km length) along with 10 nos. fixed water sprinklers at Banadag Railway Siding. A mobile water sprinkler has been deployed for the roads. Currently all the trucks / tippers involved in transportation of coal are covered with tarpaulin & stamped. Only Trucks/Tipper with valid PUC certification & fitness certificate and using unadulterated diesel are allowed to ply. Safety measures include installation of speed bumps near settlements, awareness to drivers and local people, deployment of traffic marshals from villages and following a "no horn, low speed" protocol while passing through inhabited stretches and 24 x 7 Ambulance & Crane facility.

Observations and deliberation of the Committee

10. The Committee deliberated on various aspects of the proposal submitted and the presentation made by PP. After detailed deliberation, the Committee noted the following:

- i. MoEF&CC has granted EC for the Pakri Barwadih Coal Mining Project of M/s NTPC Limited vide letter no. J-11015/692/2007-IA.II(M) dated 19.05.2009 for capacity of 15 MTPA in an area of 3319.42 Ha. Subsequently, various amendments for the same were issued vide letters dated 29.06.2016, 07.12.2017, 14.08.2018, 10.11.2020, 16.08.2023, 09.11.2023 and 15.01.2024.
- ii. Further the PRC enhancement for the project was issued vide letter dated 06.03.2024 for the capacity of 18 MTPA from 15 MTPA in the existing area of 3319.42 Ha and the same was transferred to M/s NTPC Mining Limited vide letter dated 02.05.2024. Subsequently, an amendment in condition pertaining to transportation of coal was again issued vide letter dated 16.07.2024.
- iii. It is observed by the EAC that the project involves total 643.9 Ha of forestland. Stage – II FC has been obtained by the proponent.
- iv. The above projects have been implemented and are already under operation.

v. Specific Condition no. – 2A (ix) of EC stipulated that the coal was to be transported from Coal Handling Plant (CHP) to railway siding by closed conveyor belt. The railway siding shall be provided with Silo Rapid Loading System. The timeline for this condition was extended till 31.10.2024, vide various amendments as stated above, subject to the order of Hon'ble Supreme Court w.r.t. Misc. Appeal (MA-001824 dated 18.08.2023) in the matter of Civil Appeal no 6249/2022 (NTPC vs Tripuri Singh Ors) filed by the Project Proponent.

Now, the PP has submitted the proposal for amendment in Specific Condition no. 2A(ix) of EC dated 19.05.2009 (last amended vide EC dated 16.07.2024), regarding the construction of belt conveyor system of a length of 13 km to Banadag railway station and use of Service road/ State highways for transportation of 18 MTPA of coal to Banadag railway siding till 31.12.2024 in place of 31.10.2024 & after that 13 MTPA of coal by belt conveyor and 5 MTPA by Service road/ State highways till 31.03.2026 adopting all mitigative measures to control dust pollution.

A drone video of the developments made in the construction of Coal Handling Plant (CHP) since last amendment granted was presented to the Committee. PP submitted that the construction of Silo Rapid Loading System is in full swing and the complete belt conveyor system is expected to be completed by 31.12.2024. PP mentioned that 99.39% of the civil works have been completed and 100% of structural and electrical and mechanical supply works have been completed. Further, 87% of the structural erection work is completed. It is observed that momentum of the work has taken place and PP is committed to implement the entire works of belt conveyor system and silo loading by December 2024.

The Committee observed that there is good progress in the construction of the Coal Handling Plant (CHP) and the work is almost on the stage of completion. However, in order to make it operational after completion, it will take some time. In view of this, the Committee opined that PP may be allowed to transport coal through road till 31.12.2024 with all mitigative measures, restricted to the capacity of 15 MTPA only.

vi. The PP submitted that the conveyor belt being constructed is only for the capacity of 15 MTPA and for another 3 MTPA (i.e., 18 MTPA), engineering designing is under process to make the changes in the conveyor and siding capacity for 18 MTPA. The Committee is of the opinion that a time bound action plan for transportation of additional 3 MTPA coal approved as part of expansion EC of 18 MTPA should be submitted by the PP.

vii. The Committee deliberated on the air quality data of the concerned area and measures being taken for the same and observed that coal is being transported through covered trucks and trucks being used are with valid PUC and fitness certificate, continuous water sprinkling is being done on the coal transport roads, high throw water sprinklers are installed on both side of siding and 20 ft high wind breaker of 2 km length is erected along the Banadag Railway Siding. In view of this, the Committee opined that all the recommendations made in the Traffic Assessment Study Report shall be complied with inter alia, installation of CAAQMS in the villahges nearby coal transportation road; air pollution mitigation measures also roads being used for transport and shift to e-/CNG/PNG modes of transport.

viii. The Committee also deliberated on the certified compliance report from RO and action taken report by the PP of the same and found that the CCR from RO Ranchi was received on 19.06.2024 vide letter no. 103-425/376 and PP submitted ATR on the same on 26.08.2024. There were few partially complied and non-complied conditions observed in the CCR from RO for which PP has submitted the action taken report. However, the Committee is of the opinion that a fresh CCR report for compliance of all the condition of EC must be submitted by the PP by 31.10.2024.

ix. The Committee also enquired about the status of court cases pending on the project. The PP submitted that there are total 6 nos. of cases pending at Hon'ble High Court of Jharkhand and total 2 nos. of cases pending at Hon'ble NGT (EZ), Kolkata. PP also displayed a copy of the Court Order during the presentation of the Court case in the matter of Misc. Appeal No. 1824 of 2023 in Civil Appeal No. 6249 of 2021 (NTPC Ltd v. Tripurari Singh and Others) regarding the extension of the timeline for completion of the closed conveyor belt system. PP submitted that the Hon'ble Supreme Court has extended the timeline for completion of the belt conveyor system till 31.12.2024, vide its order dated 29.01.2024 and the matter was disposed of.

x. The Committee also deliberated on the compliance of the conditions stipulated in amendment EC dated 16.07.2024. The PP submitted that monthly progress report of the construction of Coal Handling Plant (CHP) is being submitted to the Regional Office and the ICFRE report is in the stage of finalization. The Committee asked the PP to submit the same by 31.10.2024.

xi. The Committee also noted that the instant amendment proposal was earlier considered by the EAC in its meeting held on 5-7th July, 2024 and EAC has recommended for timeframe till 31/10/2024 in place of 31/12/2024 as sought by the PP.

Now PP has again approached for the same amendment.

xii. The committee noted that Pakri Barwadih Coal Mining Project does not fall under critically polluted area and severely polluted area as per CEPI assessment 2018.

Recommendations of the Committee

11. After deliberations, the Committee **recommended** the proposal for amendment in EC granted vide file no. J-11015/692/2007-IA.II(M) dated 19.05.2009, as detailed below subject to stipulation of additional specific conditions (**Annexure-I**). Other terms and conditions prescribed in EC dated 19.05.2009 and its subsequent amendment shall remain unchanged.:

Reference in EC letter dated 19.05.2009	Description as per approved EC	Amendment sought in EC	Justification/ Remarks
Specific Condition No.- 2A (ix)	The PP needs to complete the construction of closed belt conveyor system of a length of 13 km to Banadag railway station. The PP is permitted till 31.10.2024 to use Service road/State Highways for transportation of coal to Banadag railway siding.	The PP is permitted to use Service Road/ State Highways for transportation of 18 MTPA of coal to Banadag railway siding till 31.12.2024 and after that 13 MTPA by Belt conveyor and 5 MTPA by Service Road/State Highways till 31.03.2026 adopting all mitigative measure to control dust pollution.	With regard to the changes in specific condition 2A(ix), Committee is of the opinion to amend specific condition 2A(ix) as follows: "The PP is permitted to use Service Road/ State Highway for transportation of 15 MTPA of Coal to Banadag railway siding till 31.12.2024 adopting all the mitigative measure to control dust pollution."

Decision of MoEF&CC

12. The undersigned is directed to inform that Ministry of Environment, Forest and Climate Change has examined the proposal in accordance with the Environment Impact Assessment (EIA) Notification, 2006 & further amendments thereto and after accepting the recommendations of the Expert Appraisal Committee (Coal) hereby decided for grant of amendment in the EC dated 19.05.2009; as detailed in **para 11** above subject to the compliance of the additional terms & conditions / specific conditions at **Annexure-I**.

13. All other terms and conditions mentioned in the Environment Clearance letter no. J-11015/692/2007-IA.II(M) dated 19.05.2009 and its subsequent amendment shall remain unchanged.

14. The project proponent shall obtain fresh Environment Clearance in case of change in scope of the project, if any.

15. This issues with the approval of the Competent Authority.

Yours faithfully,

(Sundar Ramanathan)
Scientist 'E'/Additonal Director
Tel: 011- 20819378
Email- r.sundar@nic.in

Copy To

1. The Secretary, Ministry of Coal, Shastri Bhawan, New Delhi.
2. The Secretary, Department of Environment & Forests, Government of Jharkhand, Secretariat, Ranchi.
3. Deputy Director General of Forests (C), Ministry of Environment, Forest and Climate Change, Regional Office, 2nd Floor, Headquarter- Jharkhand State Housing Board, Harmu Chowk, Ranchi, Jharkhand – 834 002.
4. The Chairman, Jharkhand State Pollution Control Board, TA building, HEC complex, PO Dhurwa, Ranchi.

5. The Member Secretary, Central Pollution Control Board, CBD-cum-Office Complex, East Arjun Nagar, Delhi – 32.
6. The Chairman, Central Ground Water Authority, Ministry of Water Resources, Curzon Road Barracks, A-2, W-3 Kasturba Gandhi Marg, New Delhi
7. The Regional Director, Central Ground Water Board, Mid-Eastern Region, 6th& 7th Floor, Lok Nayak Jai Prakash Bhawan, Frazer Road, Dak Banglow, Patna- 800011, Bihar.
8. The District Collector, Hazaribagh, Government of Jharkhand.
9. PARIVESH Portal.

Annexure 1

Specific EC Conditions for (Mining Of Minerals)

1. Additional Specific Conditions

S. No	EC Conditions
1.1	A time bound action plan for transportation of additional 3 MTPA coal as part of expansion of EC dated 06.03.2024 from the Coal Handling Plant (CHP) shall be submitted by 31.10.2024.
1.2	Project proponent shall submit a fresh certified compliance report from the concerned Regional Office of the Ministry regarding the compliance of all the stipulated conditions in the existing ECs and its subsequent amendments to the Ministry by 31.10.2024.
1.3	Audit report of ICFRE regarding the assessment of efficacy of plantations done by the PP shall be submitted by 31.10.2024.
1.4	Ambient Air Quality (AAQ) and Noise quality data along the entire coal transportation route shall be monitored and the data shall be submitted along with the six monthly compliance to the concerned Regional Office and also kept on the web portal of the company.
1.5	All the recommendations made in the Traffic Assessment Study Report regarding coal transportation by road shall be strictly adhered with. PP shall install CAAQMS in the villages nearby the coal transportation road in consultation with the JSPCB. Compliance in this regard shall be submitted along with the six monthly compliance to the concerned Regional Office and also kept on the web portal of the company.
1.6	Additional air pollution control measures should be taken along roads being used for transport of coal including e-/CNG/PNG vehicles.

Existing plantation photographs along the Northern part of the Mine Lease



Navin Kumar
नवीन कुमार / NAVIN KUMAR
उप महाप्रबन्धक / DY. GENERAL MANAGER
(पर्यावरण प्रबंधन) / (ENVIRONMENT MANAGEMENT)
एनटीपीसी लिमिटेड / NTPC Mining Limited (NML)
कोयला खनन परियोजना / COAL MINING PROJECT
हजारीबाग / Hazaribag



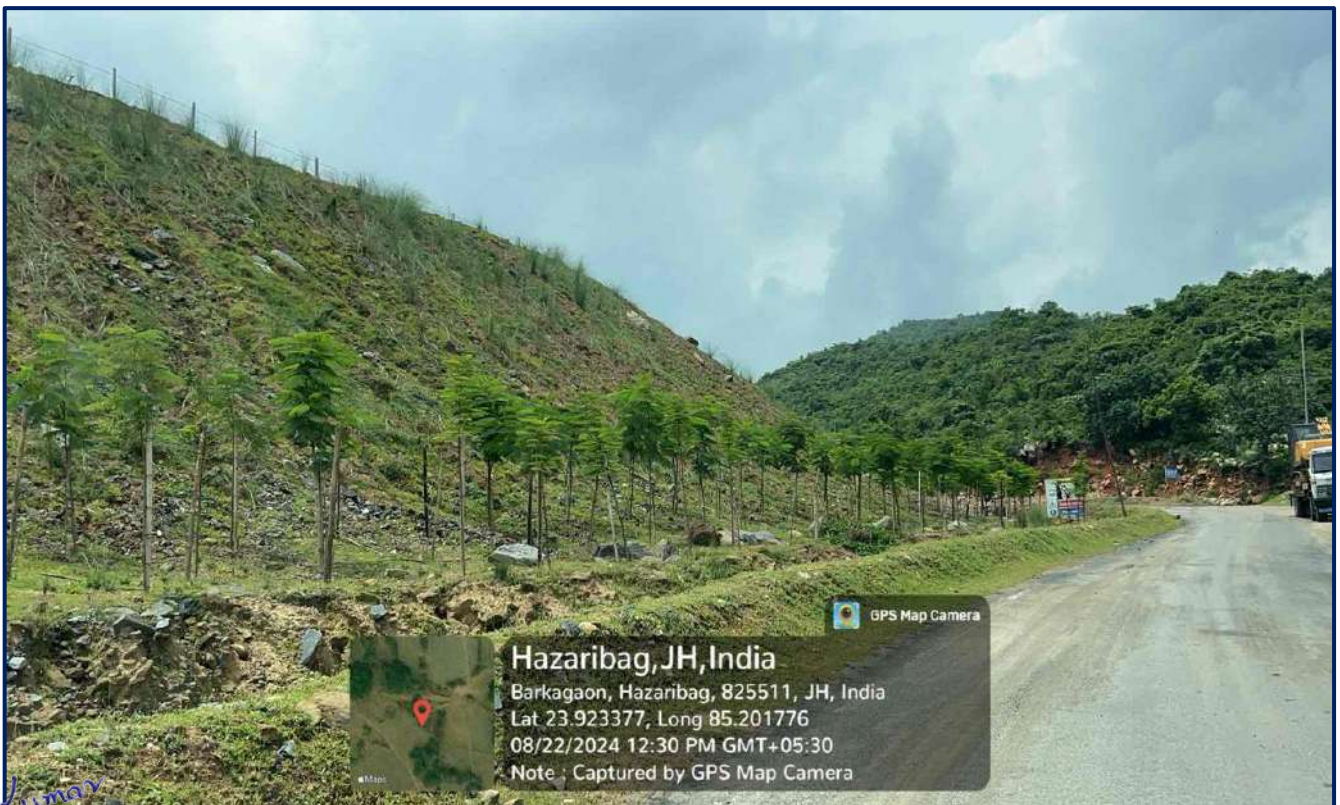
Navin Kumar

नवीन कुमार / NAVIN KUMAR
ज्य. महाप्रबन्धक / DY. GENERAL MANAGER
(पर्यावरण प्रबंधन) / (ENVIRONMENT MANAGEMENT)
एनटीपीसी खनिज लिमिटेड / NTPC Mining Limited (NML)
शोधना खनन परियोजना / COAL MINING PROJECT
हजारीबाग / Hazaribag

Photographs showing # plants have been planted along the northern boundary.



Navin Kumar
नवीन कुमार / NAVIN KUMAR
ज्य. महाप्रबन्धक / DY. GENERAL MANAGER
(पर्यावरण प्रबंधन) / (ENVIRONMENT MANAGEMENT)
एनटीपीसी लिमिटेड / NTPC Mining Limited (NML)
कोयला खनन परियोजना / COAL MINING PROJECT
हजारीबाग / Hazaribag



Navin Kumar
नवीन कुमार / NAVIN KUMAR
 उप महाप्रबंधक / DY. GENERAL MANAGER
 (पर्यावरण प्रबंधन) / (ENVIRONMENT MANAGEMENT)
 इन्टीग्रेटेड कॉलिंग लिमिटेड / NTPC Mining Limited (NML)
 कोयला खनन परियोजना / COAL MINING PROJECT
 हजारीबाग / Hazaribagh



Min Mec R&D Laboratory

(A DIVISION OF MIN MEC CONSULTANCY PVT. LTD.)

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Recognised by MOEF&CC (Sl.No.97 of S.O.3744(E) dated 17/10/2019)

TEST REPORT

Customer's Name & Address	
NTPC Limited SSC - Coal Mining (Ranchi) Sikri Site Office, P.O. Barkagaon, Hazaribagh, Jharkhand- 825301, India Contact Person: Mr. Navin Kumar Phone: 9470197223 / 7004012892	
Sample Particulars	
Type of Sample	: Ambient Air
Work Order No.	: 4000331821-108-1040
Sampling Location	: NTPC Pakri Barwadih Coal Mining Project, Jharkhand
Sampling Procedure	: Section 3.0, Primary data collection of FWIM, Issue 3, Rev 02, dated 15.04.2024
Sample Duration	: 24 hours
Sampling Team	: MMRDL (Manoj)
Sample Reg. No	: MMA/04-24/6.1-6.9
Date(s) of Sampling	: 16/04/2024 to 26/04/2024
Date(s) of Receipt	: 27/04/2024
Date(s) of Testing	: 27/04/2024 to 28/04/2024
Date of Report	: 02/05/2024
Test Report No.	: MMA/05-24/01
Page	: 1 of 1

AMBIENT AIR QUALITY TEST RESULTS

Sl. No	Date of Sampling	Location	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO ₂ (µg/m ³)	CO (mg/m ³)
1	16-17/04/2024	13 mile Chowk	120.6	65.2	21.6	36.2	0.702
2	17-18/04/2024	Gate No.4, PBCMP	175.3	91.1	19.3	30.4	0.609
3	18-19/04/2024	Transfer Point 5, Conveyor, PBCMP to Banadag R.S.	83.5	50.6	17.4	32.6	0.623
4	19-20/04/2024	Transfer Point 6, Conveyor, PBCMP to Banadag R.S.	86.2	47.8	15.3	30.6	0.667
5	20-21/04/2024	Odama Village	85.4	44.8	18.6	28.4	0.717
6	21-22/04/2024	Phatha Chowk	81.2	42.3	17.3	26.2	0.666
7	22-23/04/2024	Sirka Village	97.1	50.4	20.6	35.6	0.802
8	24-25/04/2024	Transfer Point 8, Conveyor, PBCMP to Banadag R.S.	84.6	47.4	16.4	32.4	0.712
9	25-26/04/2024	Kusumbha Village	88.3	45.3	18.4	34.3	0.618
Protocol of Analysis			IS:5182 (Part 23) : 2006, RA 2017	Lab SOP/09/6 Issue 03 : 2017	IS:5182 (Part 2) : 2001, RA 2017	IS:5182 (Part 6) : 2006, RA 2017	Electro-chemical Detection
National Ambient Air Quality Standards (2009) for Concentration in Ambient Air for Industrial, Residential, Rural & Other areas.			100 (24 hours)	60 (24 hours)	80 (24 hours)	80 (24 hours)	2 (8 Hourly)

Abbreviation: FWIM- Field Work Instruction Manual.
PBCMP-Pakri Barwadih Coal Mining Project

Prepared by

Rashmi

Rashmi Gupta
Administrative Manager

Navin Kumar

नवीन कुमार / NAVIN KUMAR
उप महाप्रबन्धक / DY. GENERAL MANAGER
(पर्यावरण प्रबंधन) / (ENVIRONMENT MANAGEMENT)
एनटीपीसी लिमिटेड / NTPC Mining Limited (NML)
कोयला खनन परियोजना / COAL MINING PROJECT
हजारीबाग / Hazaribag

Checked by

Marisha

Dr. Marisha Sharma
Authorised Signatory

- end of report -

NOTES:

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TEST REPORT

Customer's Name & Address

NTPC Limited
SSC - Coal Mining (Ranchi) Sikri Site Office,
P.O. Barkagaon, Hazaribagh,
Jharkhand- 825301, India

Contact Person: Mr. Navin Kumar Phone: 9470197223 / 7004012892

Sample Particulars

Type of Sample	: Noise
Work Order No.	: 4000331821-108-1040
Sampling Location	: NTPC Pakri Barwadih Coal Mining Project, Jharkhand
Sampling Procedure	: Section 3.0, Primary data collection of FVIM, Issue 3, Rev 00, dated 15.12.2020
Sample Duration	: 24 hours
Sampling Team	: MMRDL (Manoj)
Sample Reg. No.	: MMN/04-24/3.1-3.10
Date(s) of Monitoring	: 15/04/2024 to 26/04/2024
Date(s) of Receipt	: 27/04/2024
Date of Report	: 02/05/2024
Test Report No.	: MMN/05-24/02
Page	: 1 of 3

Hours ↓	Coal Handling Plant Area	13 mile Chowk	Gate No.4, PBCMP	Transfer Point 5, Conveyor, PBCMP to Banadag R.S.
Date of Monitoring →	15-16/04/2024	16-17/04/2024	17-18/04/2024	18-19/04/2024
Day Time : 6 am to 10 pm	dB (A)	dB (A)	dB (A)	dB (A)
6-7 am	70.8	60.4	53.6	65.3
7-8 am	69.0	56.6	51.7	64.8
8-9 am	70.1	63.0	53.9	67.6
9-10 am	74.4	59.8	56.6	62.8
10-11 am	70.9	59.6	54.7	68.8
11-12 am	70.7	61.4	53.9	68.3
12-1 pm	71.0	63.2	53.8	69.2
1-2 pm	69.9	61.4	54.2	63.3
2-3 pm	70.8	60.5	55.9	67.4
3-4 pm	71.5	60.2	54.1	69.1
4-5 pm	69.5	58.7	56.4	66.8
5-6 pm	74.9	58.9	57.8	64.7
6-7 pm	75.3	57.4	51.4	63.0
7-8 pm	65.6	57.6	49.1	61.2
8-9 pm	65.9	57.9	47.7	62.0
9-10 pm	69.8	58.3	51.0	62.0
Night Time : 10 pm to 6 am				
10-11 pm	69.6	57.9	45.9	63.5
11-12 pm	68.9	57.7	41.6	64.1
12-1 am	69.0	56.3	41.8	63.8
1-2 am	65.8	58.1	42.6	63.5
2-3 am	68.5	56.3	42.5	64.7
3-4 am	67.9	55.4	42.1	61.1
4-5 am	67.6	56.9	43.2	62.5
5-6 am	66.0	54.6	44.7	62.1
Day time Leq.	71.4	60.1	54.2	66.2
Night time Leq.	68.1	56.8	43.3	63.3

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झारखंड खनन परियोजना / COAL MINING PROJECT
हजारबाग / Hazaribag



Test Report No. : MMN/05-24/02
 Page : 2 of 3

Hours↓	Transfer Point 6, Conveyor, PBCMP to Banadag R.S.	Odarna Village	Phatha Chowk	Sirka Village
Date of Monitoring→	19-20/04/2024	20-21/04/2024	21-22/04/2024	22-23/04/2024
Day Time : 6 am to 10 pm	dB (A)	dB (A)	dB (A)	dB (A)
6-7 am	64.8	48.8	51.4	50.5
7-8 am	62.6	50.9	52.9	51.1
8-9 am	63.2	51.6	49.5	53.5
9-10 am	65.3	54.3	51.4	53.9
10-11 am	67.2	52.7	52.5	55.1
11-12 am	67.5	48.5	56.2	55.5
12-1 pm	65.2	52.9	54.7	52.7
1-2 pm	66.2	53.5	53.6	52.8
2-3 pm	62.7	53.4	52.9	53.3
3-4 pm	66.2	50.0	55.4	52.1
4-5 pm	68.7	51.0	52.9	52.3
5-6 pm	61.1	53.3	52.3	50.2
6-7 pm	63.3	51.9	55.9	48.6
7-8 pm	61.3	44.8	50.3	47.6
8-9 pm	64.2	45.4	49.3	51.5
9-10 pm	63.5	46.0	49.9	49.8
Night Time : 10 pm to 6 am				
10-11 pm	62.5	42.9	42.3	42.8
11-12 pm	60.5	42.0	44.5	41.4
12-1 am	59.3	41.6	42.2	43.7
1-2 am	59.6	41.9	43.6	42.9
2-3 am	59.6	40.7	42.5	43.3
3-4 am	63.1	40.2	41.7	42.1
4-5 am	63.5	40.8	42.2	40.2
5-6 am	60.7	41.3	42.7	44.0
Day time Leq.	65.1	51.4	53.1	52.4
Night time Leq.	61.4	41.5	42.8	42.7

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Test Report No. : MMN/05-24/02
Page : 3 of 3

Hours	Transfer Point 8, Conveyor, PBCMP to Banadag R.S.	Kusumbha Village
Date of Monitoring→	23-24/04/2024	25-26/04/2024
Day Time : 6 am to 10 pm	dB (A)	dB (A)
6-7 am	60.5	60.5
7-8 am	62.3	58.7
8-9 am	62.8	61.3
9-10 am	63.6	57.8
10-11 am	63.6	63.0
11-12 am	62.2	60.2
12-1 pm	63.8	60.4
1-2 pm	65.7	62.3
2-3 pm	62.5	59.2
3-4 pm	64.9	57.8
4-5 pm	63.3	56.7
5-6 pm	62.0	56.0
6-7 pm	65.1	55.5
7-8 pm	62.0	58.9
8-9 pm	61.6	60.5
9-10 pm	58.7	58.7
Night Time : 10 pm to 6 am		
10-11 pm	60.0	57.4
11-12 pm	60.9	54.2
12-1 am	59.4	52.0
1-2 am	61.9	52.4
2-3 am	59.0	53.1
3-4 am	58.2	53.4
4-5 am	61.8	54.9
5-6 am	60.6	55.8
Day time Leq.	63.1	59.5
Night time Leq.	60.4	54.5

Abbreviation: FWIM- Field Work Instruction Manual.

Category of area	Ambient Air Quality Standards in Respect of Noise in db (A) Leq as per Noise Pollution (Regulation and Control) Rules 2000	
	Day time	Night time
Industrial area	75	70
Commercial area	65	55
Residential area	55	45
Silence zone	50	40

Source: Pollution Control Acts, Rules and Notifications Issued Thereunder, Pollution Control Law Series: PCLS/02/2010 (Sixth edition) of Central Pollution Control Board, June -2010, Page 1117

Prepared by

Rashmi

Rashmi Gupta
Administrative Manager

Checked by

Marisha

Dr. Marisha Sharma
Authorised Signatory

- end of report -

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Page 1 of 4
Test Report No. : MMW/05-24/3
ULR Number : -

TEST REPORT

Customer's Name & Address						
NTPC Limited SSC - Coal Mining (Ranchi) Sikri Site Office, P.O. Barkagaon, Hazaribagh, Jharkhand- 825301, India Contact Person: Mr. Navin Kumar Phone: 9470197223						
Sample Particulars						
Type of Sample : Ground water						
Work Order No. : 4000331821-108-1040						
Sampling location : NTPC Pakri Barwadih Coal Mining Project, Jharkhand						
Sampling Procedure : Section 3.0, Primary data collection of FWIM, Issue 3, Rev 00, Dated 15.12.2020						
Sample Vol./Qty. : 1 lit.						
Sampling Team : MRDL (Manoj)						
Sample Reg. No. : MMW/04-24/10.1-10.6						
Date(s) of Sampling : 25-04-2024						
Date(s) of Receipt : 27-04-2024						
Date(s) of Testing : 27/04/2024 to 02/05/2024						
Date of Report : 02-05-2024						
Test Report No. : MMW/05-24/3						
Parameters	Drinking water limits (IS: 10500:2012, Amendment 3, 2021)		Protocol	TEST RESULTS		
	Acceptable	Permissible		Arahara Village (Bore Well)	Transfer Point-5 (Bore Well)	Transfer Point-7 (Bore Well)
Turbidity, NTU	1	5	IS 3025 (Part 10): 1984, RA 2017	0.08	BDL	BDL
pH value	6.5 - 8.5	No relaxation	IS 3025 (Part 11): 1983, RA 2017	7.6	7.5	7.4
Specific Conductance, μ S/cm	-	-	IS 3025 (Part 14): 2013, RA 2019	541	537	536
Total Dissolved Solids, mg/l	500	2000	IS 3025 (Part 16): 1984, RA 2017	346	322	320
Total Suspended Solids, mg/l	-	-	IS 3025 (Part 17): 1984, RA 2017	BDL	BDL	BDL
Total Hardness as CaCO ₃ , mg/l	200	600	IS 3025 (Part 21): 2009, RA 2019	156	200	204
Alkalinity, mg/l	200	600	APHA 23rd Ed. 2320 B: 2017	275	285	260
Sulphate as SO ₄ mg/l	200	400	IS 3025 (Part 24): 1986, RA 2019	2	1	3
Chloride as Cl, mg/l	250	1000	IS 3025 (Part 32): 1988, RA 2019	22	20	26
Calcium as Ca, mg/l	75	200	IS 3025 (Part 40): 1991, RA 2019	51	56	58
Sodium as Na, mg/l	-	-	IS 3025 (Part 45): 1993, RA 2019	58.78	40.23	38.56
Potassium as K, mg/l	-	-	IS 3025 (Part 45): 1993, RA 2019	5.22	1.73	1.86
Magnesium as Mg, mg/l	30	100	IS 3025 (Part 46): 1994, RA 2019	7	14	14
Iron as Fe, mg/l	1.0	No relaxation	IS 3025 (Part 53): 2003, RA 2019	BDL	BDL	BDL
Fluoride as F, mg/l	1.0	1.5	APHA 23rd Ed. 4500-F- D: 2017	0.85	0.78	0.66
Silver as Ag, mg/l	0.1	No relaxation	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL
Barium as Ba, mg/l	0.7	No relaxation	IS 3025 (Part 2): 2004, RA 2019	0.118	0.017	BDL
Boron as B, mg/l	0.5	2.4	IS 3025 (Part 2): 2004, RA 2019	0.052	0.016	0.027
Bismuth as Bi, mg/l	-	-	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL
Cadmium as Cd, mg/l	0.003	No relaxation	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL

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TEST REPORT

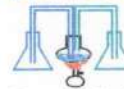
Customer's Name & Address						
NTPC Limited SSC - Coal Mining (Ranchi) Sikri Site Office, P.O. Barkagaon, Hazaribagh, Jharkhand- 825301, India Contact Person: Mr. Navin Kumar Phone: 9470197223						
Sample Particulars						
Type of Sample : Ground water						
Work Order No. : 4000331821-108-1040						
Sampling location : NTPC Pakri Barwadih Coal Mining Project, Jharkhand						
Sampling Procedure : Section 3.0, Primary data collection of FWIM, Issue 3, Rev 00, Dated 15.12.2020						
Sample Vol./Qty. : 1 lit.						
Sampling Team : MRDL (Manoj)						
Sample Reg. No. : MMW/04-24/10.1-10.6						
Date(s) of Sampling : 25-04-2024						
Date(s) of Receipt : 27-04-2024						
Date(s) of Testing : 27/04/2024 to 02/05/2024						
Date of Report : 02-05-2024						
Test Report No. : MMW/05-24/3						
Parameters	Drinking water limits (IS: 10500:2012, Amendment 3, 2021)		Protocol	TEST RESULTS		
	Acceptable	Permissible		Arahara Village (Bore Well)	Transfer Point-5 (Bore Well)	Transfer Point-7 (Bore Well)
Turbidity, NTU	1	5	IS 3025 (Part 10): 1984, RA 2017	0.08	BDL	BDL
pH value	6.5 - 8.5	No relaxation	IS 3025 (Part 11): 1983, RA 2017	7.6	7.5	7.4
Specific Conductance, μ S/cm	-	-	IS 3025 (Part 14): 2013, RA 2019	541	537	536
Total Dissolved Solids, mg/l	500	2000	IS 3025 (Part 16): 1984, RA 2017	346	322	320
Total Suspended Solids, mg/l	-	-	IS 3025 (Part 17): 1984, RA 2017	BDL	BDL	BDL
Total Hardness as CaCO ₃ , mg/l	200	600	IS 3025 (Part 21): 2009, RA 2019	156	200	204
Alkalinity, mg/l	200	600	APHA 23rd Ed. 2320 B: 2017	275	285	260
Sulphate as SO ₄ mg/l	200	400	IS 3025 (Part 24): 1986, RA 2019	2	1	3
Chloride as Cl, mg/l	250	1000	IS 3025 (Part 32): 1988, RA 2019	22	20	26
Calcium as Ca, mg/l	75	200	IS 3025 (Part 40): 1991, RA 2019	51	56	58
Sodium as Na, mg/l	-	-	IS 3025 (Part 45): 1993, RA 2019	58.78	40.23	38.56
Potassium as K, mg/l	-	-	IS 3025 (Part 45): 1993, RA 2019	5.22	1.73	1.86
Magnesium as Mg, mg/l	30	100	IS 3025 (Part 46): 1994, RA 2019	7	14	14
Iron as Fe, mg/l	1.0	No relaxation	IS 3025 (Part 53): 2003, RA 2019	BDL	BDL	BDL
Fluoride as F, mg/l	1.0	1.5	APHA 23rd Ed. 4500-F- D: 2017	0.85	0.78	0.66
Silver as Ag, mg/l	0.1	No relaxation	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL
Barium as Ba, mg/l	0.7	No relaxation	IS 3025 (Part 2): 2004, RA 2019	0.118	0.017	BDL
Boron as B, mg/l	0.5	2.4	IS 3025 (Part 2): 2004, RA 2019	0.052	0.016	0.027
Bismuth as Bi, mg/l	-	-	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL
Cadmium as Cd, mg/l	0.003	No relaxation	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL

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Page 2 of 4

Test Report No. : MMW/05-24/3

ULR Number : -

Parameters	Drinking water limits (IS: 10500:2012, Amendment 3, 2021)		Protocol	TEST RESULTS		
	Acceptable	Permissible		Arahara Village (Bore Well)	Transfer Point-5 (Bore Well)	Transfer Point-7 (Bore Well)
Chromium as Cr, mg/l	0.05	No relaxation	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL
Cobalt as Co, mg/l	-	-	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL
Copper as Cu, mg/l	0.05	1.5	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL
Lead as Pb, mg/l	0.01	No relaxation	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL
Manganese as Mn, mg/l	0.1	0.3	IS 3025 (Part 2): 2004, RA 2019	0.029	0.097	0.131
Nickel as Ni, mg/l	0.02	No relaxation	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL
Selenium as Se, mg/l	0.01	No relaxation	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL
Arsenic as As, mg/l	0.01	No relaxation	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL
Zinc as Zn, mg/l	5	15	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	0.418
Acidity mg/l CaCO ₃	-	-	IS 3025 (Part 22): 1986, RA 2019	15 at pH 8.3	20 at pH 8.3	20 at pH 8.3
Nitrate as NO ₃ , mg/l	45	No relaxation	APHA 23rd Ed. (4500-NO ₃ -B): 2017	BDL	0.61	BDL
Hexavalent Chromium, mg/l	-	-	APHA 23rd Ed. 3500-Cr B: 2017	BDL	BDL	BDL

NOTE : BDL(Below Detection Limit) of Turbidity (NTU)<0.001, TSS<2, SO₄<1, K<1, Fe<0.1, Ag<0.01, Ba<0.01, B<0.01, Bl<0.02, Cd<0.002, Cr<0.01, Co<0.01, Cu<0.01, Pb<0.01, Mn<0.01, Ni<0.01, Se<0.01, As<0.01, Zn<0.01, NO₃<0.5, Cr6+<0.1 mg/l

Abbreviation: FWIM- Field Work Instruction Manual

Navin Kumar
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 (पर्यावरण प्रबंधन) / (ENVIRONMENT MANAGEMENT)
 एनटीपीसी मॉनिंग लिमिटेड / NTPC Mining Limited (NML)
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Page 3 of 4
 Test Report No. : MMW/05-24/3
 ULR Number : -

TEST REPORT

Customer's Name & Address						
NTPC Limited SSC - Coal Mining (Ranchi) Sikri Site Office, P.O. Barkagaon, Hazaribagh, Jharkhand- 825301, India Contact Person: Mr. Navin Kumar Phone: 9470197223						
Sample Particulars						
Type of Sample : Ground water						
Work Order No. : 4000331821-108-1040						
Sampling location : NTPC Pakri Barwadih Coal Mining Project, Jharkhand						
Sampling Procedure : Section 3.0, Primary data collection of FWIM, Issue 3, Rev 00, Dated 15.12.:						
Sample Vol./Qty. : 1 lit.						
Sampling Team : MRDL (Manoj)						
Sample Reg. No. : MMW/04-24/10.1-10.6						
Date(s) of Sampling : 25-04-2024						
Date(s) of Receipt : 27-04-2024						
Date(s) of Testing : 27/04/2024 to 02/05/2024						
Date of Report : 02-05-2024						
Test Report No. : MMW/05-24/3						
Parameters	Drinking water limits (IS: 10500:2012, Amendment 3, 2021)		Protocol	TEST RESULTS		
	Acceptable	Permissible		Odama Village (Hand Pump)	Sirka Village (Hand Pump)	Kusumbha Village (Well)
Turbidity, NTU	1	5	IS 3025 (Part 10): 1984, RA 2017	0.902	BDL	0.24
pH value	6.5 - 8.5	No relaxation	IS 3025 (Part 11): 1983, RA 2017	6.7	6.7	6.7
Specific Conductance, μ S/cm	-	-	IS 3025 (Part 14): 2013, RA 2019	258	557	282
Total Dissolved Solids, mg/l	500	2000	IS 3025 (Part 16): 1984, RA 2017	180	346	182
Total Suspended Solids, mg/l	-	-	IS 3025 (Part 17): 1984, RA 2017	BDL	BDL	20
Total Hardness as CaCO ₃ , mg/l	200	600	IS 3025 (Part 21): 2009, RA 2019	68	240	96
Alkalinity, mg/l	200	600	APHA 23rd Ed. 2320 B: 2017	130	160	65
Sulphate as SO ₄ mg/l	200	400	IS 3025 (Part 24): 1986, RA 2019	BDL	4	BDL
Chloride as Cl, mg/l	250	1000	IS 3025 (Part 32): 1988, RA 2019	20	75	46
Calcium as Ca, mg/l	75	200	IS 3025 (Part 40): 1991, RA 2019	21	74	22
Sodium as Na, mg/l	-	-	IS 3025 (Part 45): 1993, RA 2019	25.25	19.86	18.01
Potassium as K, mg/l	-	-	IS 3025 (Part 45): 1993, RA 2019	BDL	4.09	1.83
Magnesium as Mg, mg/l	30	100	IS 3025 (Part 46): 1994, RA 2019	4	13	10
Iron as Fe, mg/l	1.0	No relaxation	IS 3025 (Part 53): 2003, RA 2019	BDL	BDL	BDL
Fluoride as F, mg/l	1.0	1.5	APHA 23rd Ed. 4500-F- D: 2017	0.69	0.20	0.50
Silver as Ag, mg/l	0.1	No relaxation	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL
Barium as Ba, mg/l	0.7	No relaxation	IS 3025 (Part 2): 2004, RA 2019	BDL	0.019	0.085
Boron as B, mg/l	0.5	2.4	IS 3025 (Part 2): 2004, RA 2019	BDL	0.013	BDL
Bismuth as Bi, mg/l	-	-	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL
Cadmium as Cd, mg/l	0.003	No relaxation	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL

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Page 4 of 4
 Test Report No. : MMW/05-24/3
 ULR Number : -

Parameters	Drinking water limits (IS: 10500:2012, Amendment 3, 2021)		Protocol	TEST RESULTS		
	Acceptable	Permissible		Odarna Village (Hand Pump)	Sirka Village (Hand Pump)	Kusumbha Village (Well)
Chromium as Cr, mg/l	0.05	No relaxation	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL
Cobalt as Co, mg/l	-	-	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL
Copper as Cu, mg/l	0.05	1.5	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL
Lead as Pb, mg/l	0.01	No relaxation	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL
Manganese as Mn, mg/l	0.1	0.3	IS 3025 (Part 2): 2004, RA 2019	0.135	BDL	0.090
Nickel as Ni, mg/l	0.02	No relaxation	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL
Selenium as Se, mg/l	0.01	No relaxation	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL
Arsenic as As, mg/l	0.01	No relaxation	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL
Zinc as Zn, mg/l	5	15	IS 3025 (Part 2): 2004, RA 2019	BDL	0.039	0.029
Acidity mg/l CaCO ₃	-	-	IS 3025 (Part 22): 1986, RA 2019	37.5 at pH 8.3	30 at pH 8.3	20 at pH 8.3
Nitrate as NO ₃ , mg/l	45	No relaxation	APHA 23rd Ed. (4500-NO ₃ -B): 2017	7.01	26.00	18.79
Hexavalent Chromium, mg/l	-	-	APHA 23rd Ed. 3500-Cr B: 2017	BDL	BDL	BDL

NOTE : BDL(Below Detection Limit) of Turbidity (NTU)<0.001, TSS<2, SO₄<1, K<1, Fe<0.1, Ag<0.01, Ba<0.01, B<0.01, Bi<0.02, Cd<0.002, Cr<0.01, Co<0.01, Cu<0.01, Pb<0.01, Mn<0.01, Ni<0.01, Se<0.01, As<0.01, Zn<0.01, NO₃<0.5, Cr₆₊<0.1 mg/l

Abbreviation: FWM- Field Work Instruction Manual

Prepared by

Rashmi

Rashmi Gupta
 Administrative Manager

Checked by

Marisha

Dr. Marisha Sharma
 Authorised Signatory

-end of report-

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Parameters	Drinking water limits (IS: 10500:2012, Amendment 3, 2021)		Protocol	TEST RESULTS		
	Acceptable	Permissible		Odarna Village (Hand Pump)	Sirka Village (Hand Pump)	Kusumbha Village (Well)
Chromium as Cr, mg/l	0.05	No relaxation	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL
Cobalt as Co, mg/l	-	-	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL
Copper as Cu, mg/l	0.05	1.5	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL
Lead as Pb, mg/l	0.01	No relaxation	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL
Manganese as Mn, mg/l	0.1	0.3	IS 3025 (Part 2): 2004, RA 2019	0.135	BDL	0.090
Nickel as Ni, mg/l	0.02	No relaxation	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL
Selenium as Se, mg/l	0.01	No relaxation	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL
Arsenic as As, mg/l	0.01	No relaxation	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL
Zinc as Zn, mg/l	5	15	IS 3025 (Part 2): 2004, RA 2019	BDL	0.039	0.029
Acidity mg/l CaCO ₃	-	-	IS 3025 (Part 22): 1986, RA 2019	37.5 at pH 8.3	30 at pH 8.3	20 at pH 8.3
Nitrate as NO ₃ , mg/l	45	No relaxation	APHA 23rd Ed. (4500-NO ₃ -B): 2017	7.01	26.00	18.79
Hexavalent Chromium, mg/l	-	-	APHA 23rd Ed. 3500-Cr B: 2017	BDL	BDL	BDL

NOTE : BDL(Below Detection Limit) of Turbidity (NTU)<0.001, TSS<2, SO₄<1, K<1, Fe<0.1, Ag<0.01, Ba<0.01, B<0.01, Bi<0.02, Cd<0.002, Cr<0.01, Co<0.01, Cu<0.01, Pb<0.01, Mn<0.01, Ni<0.01, Se<0.01, As<0.01, Zn<0.01, NO₃<0.5, Cr₆₊<0.1 mg/l

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TEST REPORT

Customer's Name & Address							
NTPC Limited SSC - Coal Mining (Ranchi) Sikri Site Office, P.O. Barkagaon, Hazaribagh, Jharkhand- 825301, India Contact Person: Mr. Navin Kumar Phone: 9470197223							
Sample Particulars							
Type of Sample : Surface water							
Work Order No. : 4000331821-108-1040							
Sampling location : NTPC Pakri Barwadih Coal Mining Project, Jharkhand							
Sampling Procedure : Section 3.0, Primary data collection of FWIM, Issue 3, Rev 00, Dated 15.12.2020							
Sample Vol./Qty. : 2 lit.							
Sampling Team : MRDL (Manoj)							
Sample Reg. No. : MMW/04-24/11.1-11.4							
Date(s) of Sampling : 25-04-2024							
Date(s) of Receipt : 27-04-2024							
Date(s) of Testing : 27/04/2024 to 02/05/2024							
Date of Report : 02-05-2024							
Test Report No. : MMW/05-24/4							
Parameters	Drinking water limits (IS: 10500:2012, Amendment 3, 2021)		Protocol	TEST RESULTS			
	Acceptable	Permissible		Pakwa Nala in Arahara Village	Pond in Odarna Village	Pond in Sirka Village	Nala in Between Transfer Point-9 and 10
Turbidity, NTU	1	5	IS 3025 (Part 10): 1984, RA 2017	BDL	0.802	4.112	1.142
pH value	6.5 - 8.5	No relaxation	IS 3025 (Part 11): 1983, RA 2017	7.4	7.5	7.3	7.6
Specific Conductance, μ S/cm	-	-	IS 3025 (Part 14): 2013, RA 2019	278	258	581	404
Total Dissolved Solids, mg/l	500	2000	IS 3025 (Part 16): 1984, RA 2017	172	158	354	250
Total Suspended Solids, mg/l	-	-	IS 3025 (Part 17): 1984, RA 2017	4	22	82	50
Total Hardness as CaCO ₃ , mg/l	200	600	IS 3025 (Part 21): 2009, RA 2019	.104	76	104	168
Alkalinity, mg/l	200	600	APHA 23rd Ed. 2320 B: 2017	130	115	175	220
Sulphate as SO ₄ mg/l	200	400	IS 3025 (Part 24): 1986, RA 2019	1	1	5	BDL
Phosphorous as P, mg/l	-	-	IS 3025 (Part 31): 1988, RA 2019	6.8	6.6	3.6	7.4
Chloride as Cl, mg/l	250	1000	IS 3025 (Part 32): 1988, RA 2019	28	22	79	18
Calcium as Ca, mg/l	75	200	IS 3025 (Part 40): 1991, RA 2019	24	14	24	37
Dissolved Oxygen, mg/l	-	-	IS 3025 (Part 38): 1989, RA 2019	6.8	6.6	3.6	7.4
Biochemical Oxygen Demand (BOD), mg/l	-	-	IS 3025 (Part 44): 1993, RA 2019	1	1	23	1
Chemical Oxygen Demand (COD), mg/l	-	-	APHA 23rd Ed. 5220 D: 2017	BDL	BDL	76	BDL
Sodium as Na, mg/l	-	-	IS 3025 (Part 45): 1993, RA 2019	17.19	21.13	37.7	14.83
Potassium as K, mg/l	-	-	IS 3025 (Part 45): 1993, RA 2019	1.72	3.45	58.25	5.32
Magnesium as Mg, mg/l	30	100	IS 3025 (Part 46): 1994, RA 2019	11	10	11	18

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 Test Report No. : MMW/05-24/4
 ULR Number : -

Parameters	Drinking water limits (IS: 10500:2012, Amendment 3, 2021)		Protocol	TEST RESULTS			
	Acceptable	Permissible		Pakwa Nala in Arahara Village	Pond in Odarna Village	Pond in Sirka Village	Nala in Between Transfer Point-9 and 10
Iron as Fe, mg/l	1.0	No relaxation	IS 3025 (Part 53): 2003, RA 2019	BDL	BDL	0.3	BDL
Fluoride as F, mg/l	1.0	1.5	APHA 23rd Ed. 4500-F-D: 2017	0.60	0.48	0.84	0.55
Oil & Grease, mg/l	-	-	IS 3025 (Part 39): 2021	BDL	BDL	BDL	BDL
Silver as Ag, mg/l	0.1	No relaxation	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL	BDL
Barium as Ba, mg/l	0.7	No relaxation	IS 3025 (Part 2): 2004, RA 2019	0.035	0.026	0.101	0.076
Boron as B, mg/l	0.5	2.4	IS 3025 (Part 2): 2004, RA 2019	0.010	0.023	0.048	0.014
Bismuth as Bi, mg/l	-	-	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL	BDL
Cadmium as Cd, mg/l	0.003	No relaxation	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL	BDL
Chromium as Cr, mg/l	0.05	No relaxation	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL	BDL
Cobalt as Co, mg/l	-	-	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL	BDL
Copper as Cu, mg/l	0.05	1.5	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL	BDL
Lead as Pb, mg/l	0.01	No relaxation	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL	BDL
Manganese as Mn, mg/l	0.1	0.3	IS 3025 (Part 2): 2004, RA 2019	0.031	0.040	0.392	0.263
Nickel as Ni, mg/l	0.02	No relaxation	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL	BDL
Selenium as Se, mg/l	0.01	No relaxation	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL	BDL
Arsenic as As, mg/l	0.01	No relaxation	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL	BDL
Zinc as Zn, mg/l	5	15	IS 3025 (Part 2): 2004, RA 2019	BDL	BDL	BDL	0.011
Acidity mg/l CaCO ₃	-	-	IS 3025 (Part 22): 1986, RA 2019	12.5 at pH 8.3	10 at pH 8.3	17.5 at pH 8.3	10 at pH 8.3
Nitrate as NO ₃ , mg/l	45	No relaxation	APHA 23rd Ed. (4500-NO ₃ -B): 2017	BDL	1.17	5.42	1.63
Hexavalent Chromium, mg/l	-	-	APHA 23rd Ed. 3500-Cr B: 2017	BDL	BDL	BDL	BDL
Total Coliform (MPN/100ml)	-	-	APHA 23rd Ed. 9221 B: 2017	<1.8	<1.8	<1.8	<1.8
E. Coli	-	-	APHA 23rd Ed. 9221 F: 2017	Absent	Absent	Absent	Absent

NOTE : BDL(Below Detection Limit) of Turbidity (NTU)<0.001, SO₄<1, COD<5, Fe<0.1, O&G<2, Ag<0.01, Bi<0.02, Cd<0.002, Cr<0.01, Co<0.01, Cu<0.01, Pb<0.01, Ni<0.01, Se<0.01, As<0.01, Zn<0.01, NO₃<0.5, Cr₆+<0.1 mg/l

Abbreviation: FWM- Field Work Instruction Manual

Prepared by

Rashmi

Rashmi Gupta
 Administrative Manager

Checked by

Marisha

Dr. Marisha Sharma
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 कोयला खनन परियोजना / COAL MINING PROJECT
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TEST REPORT

Customer's Name & Address	
NTPC Limited SSC - Coal Mining (Ranchi) Sikri Site Office, P.O. Barkagaon, Hazaribagh, Jharkhand- 825301, India	
Contact Person: Mr. Navin Kumar Phone: 9470197223 / 7004012892	
Customer Particulars	
Type of Sample	: Soil
Work Order No.	: 4000331821-108-1040
Sampling Location	: NTPC Pakri Barwadih Coal Mining Project, Jharkhand
Sampling Procedure	: Section 3.0, Primary data collection of FWM, Issue 3, Rev 00, dated 15.12.2020
Sample Volume/ Quantity	: 1.9 Kg
Sampling Team	: MMRDL (Manoj)
Sample Reg. No.	: MMS/04-24/2.1-2.10
Date(s) of Sampling	: 23/04/2024
Date(s) of Receipt	: 27/04/2024
Date(s) of Testing	: 27/04/2024 to 02/05/2024
Date of Report	: 02/05/2024
Test Report No.	: MMS/05-24/05
Page	: 1 of 3

Parameters	Protocol	Near Gate No.4, PBCMP		Near Coal Handling Plant area		13 mile Chowk		Transfer Point 5	
		% retain	% finer	% retain	% finer	% retain	% finer	% retain	% finer
Textural Classification	IS 1498:1970, RA 2007	Medium grained sand		Medium grained sand		Medium grained sand		Medium grained sand	
Grain size analysis	IS 2720 (P 4): 1985, RA 2020	% retain	% finer	% retain	% finer	% retain	% finer	% retain	% finer
2.0 mm		10.15	89.85	13.28	86.72	3.46	96.54	4.1	95.9
425 µm		61.8	28.05	54.92	31.8	61.15	35.39	46.54	49.36
75 µm		19.77	8.28	19.89	11.91	26.18	9.21	38.17	11.19
<75 µm		8.28	-	11.91	-	9.21	-	11.19	-
pH	IS 2720 (P26): 1987, RA 2016	4.2		4.6		5.1		4.4	
E.C. (mS/cm)	IS 14767:2000, RA 2021	0.0462		0.0675		0.0216		0.0470	
CaCO ₃ (%by mass)	IS 2720 (P23): 1976, RA 2020	1.0		1.5		5.0		1.5	
Specific Gravity	IS : 2720 (P 3/Sec 2):1980, RA 2016	2.49		2.35		2.56		2.44	
Moisture (%by mass)	IS 2720 (P 2): 1973, RA 2020	0.834		3.764		1.256		5.156	
Sodium (Kg/ha)	Lab SOP/12/7: 2017	34.048		95.536		51.520		40.544	
Potassium (Kg/ha)	Lab SOP/12/7: 2017	45.2		79.8		82.7		192.1	
Colour	-	Medium Brown		Medium Brown		Light Yellow		Reddish	
Organic Carbon (% by mass)	Method no. 9*	0.18		0.79		0.25		0.61	
Organic Matter (% by mass)	Method no. 9*	0.31		1.37		0.44		1.06	
Phosphorous (mg/kg)	Method no. 13*	0.97		0.41		0.81		0.08	
Nitrate-Nitrogen (mg/kg)	Method no. 12*	1.66		2.02		0.24		0.24	
Calcium ²⁺ me/100 gram Soil	Method no. 16.a*	2.1		3.5		7.4		4.2	
Magnesium ²⁺ me/100 gram Soil	Method no. 16.b*	0.4		1.5		6.7		2.0	
Water Holding Capacity, %	IS 14765 : 2000	27.59		35.88		35.55		33.54	
Porosity, %	SMF#	28.0		36.0		22.0		40.0	

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Test Report No. : MMS/05-24/05

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Parameters	Protocol	Transfer Point 6		Odarna Village		Phatha Village		Sirka Village	
Textural Classification	IS 1498:1970, RA 2007	Medium grained sand		Medium grained sand		Fine grained sand		Fine grained sand	
Grain size analysis	IS 2720 (P 4): 1985, RA 2020	% retain	% finer	% retain	% finer	% retain	% finer	% retain	% finer
2.0 mm		5.78	94.22	3.59	96.41	2.34	97.66	1.86	98.14
425 µm		44.01	50.21	40.58	55.83	22.67	74.99	8.54	89.6
75 µm		39.71	10.5	30.83	25.0	49.07	25.92	50.93	38.67
<75 µm		10.5	-	25.0	-	25.92	-	38.67	-
pH	IS 2720 (P26): 1987, RA 2016	4.5		4.3		4.8		4.6	
E.C. (mS/cm)	IS 14767:2000, RA 2021	0.0483		0.0976		0.0598		0.0514	
CaCO ₃ (%by mass)	IS 2720 (P23): 1976, RA 2020	3.0		2.5		1.5		2.0	
Specific Gravity	IS : 2720 (P 3/Sec 2):1980, RA 2016	2.50		2.53		2.30		2.68	
Moisture (%by mass)	IS 2720 (P 2): 1973, RA 2020	5.171		3.826		3.605		1.24	
Sodium (Kg/ha)	Lab SOP/12/7: 2017	38.976		63.056		34.384		28.672	
Potassium (Kg/ha)	Lab SOP/12/7: 2017	261.1		93.0		262.0		154.6	
Colour	-	Reddish		Medium Brown		Medium Brown		Medium Brown	
Organic Carbon (% by mass)	Method no. 9*	0.51		1.66		0.25		0.33	
Organic Matter (% by mass)	Method no. 9*	0.87		2.86		0.44		0.56	
Phosphorous (mg/kg)	Method no. 13*	0.08		2.59		1.7		5.51	
Nitrate-Nitrogen (mg/kg)	Method no. 12*	0.30		0.71		1.01		0.36	
Calcium ²⁺ me/100 gram Soil	Method no. 16.a*	2.8		2.6		3.4		1.9	
Magnesium ²⁺ me/100 gram Soil	Method no. 16.b*	2.6		0.5		0.4		0.9	
Water Holding Capacity, %	IS 14765 : 2000	31.68		35.42		30.65		27.38	
Porosity, %	SMF#	38.0		38.0		40.0		34.0	

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Test Report No. : MMS/05-24/05
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Parameters	Protocol	Transfer Point 8		Kusumbha Village	
Textural Classification	IS 1498:1970, RA 2007	Medium grained sand		Silt	
Grain size analysis	IS 2720 (P 4): 1985, RA 2020	% retain	% finer	% retain	% finer
2.0 mm		6.53	93.47	2.77	97.23
425 µm		36.58	56.89	33.7	63.53
75 µm		29.65	27.24	23.05	40.48
<75 µm		27.24	-	40.48	-
pH	IS 2720 (P26): 1987, RA 2016	4.4		5.0	
E.C. (mS/cm)	IS 14767:2000, RA 2021	0.0412		0.0680	
CaCO ₃ (%by mass)	IS 2720 (P23): 1976, RA 2020	1.5		3.0	
Specific Gravity	IS : 2720 (P 3/Sec 2):1980, RA 2016	2.55		2.62	
Moisture (%by mass)	IS 2720 (P 2): 1973, RA 2020	4.165		4.505	
Sodium (Kg/ha)	Lab SOP/12/7: 2017	48.496		56.896	
Potassium (Kg/ha)	Lab SOP/12/7: 2017	122.5		98.8	
Colour	-	Medium Brown		Medium Brown	
Organic Carbon (% by mass)	Method no. 9*	0.36		0.43	
Organic Matter (% by mass)	Method no. 9*	0.62		0.75	
Phosphorous (mg/kg)	Method no. 13*	0.24		1.94	
Nitrate-Nitrogen (mg/kg)	Method no. 12*	0.18		0.65	
Calcium ²⁺ me/100 gram Soil	Method no. 16.a*	3.8		3.3	
Magnesium ²⁺ me/100 gram Soil	Method no. 16.b*	1.4		0.8	
Water Holding Capacity, %	IS 14765 : 2000	30.52		36.51	
Porosity, %	SMF#	36.0		45.1	

Note: – *Methods Manual, Soil Testing in India, Department of Agriculture & Cooperation, Ministry of Agriculture (MOA), Government of India 2011.

*Section 2.4, Soil Mechanics and foundations by B. C. Punmia

Abbreviation: FWIM- Field Work Instruction Manual

Prepared by

Rashmi

Rashmi Gupta
 Administrative Manager

Navin Kumar

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Checked by

Marisha

Dr. Marisha Sharma
 Authorised Signatory

-end of report-

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Customer's Name & Address

NTPC Limited
SSC - Coal Mining (Ranchi) Sikri Site Office,
P.O. Barkagaon, Hazaribagh,
Jharkhand- 825301, India

Contact Person: Mr. Navin Kumar Phone: 9470197223 / 7004012892

Sample Particulars

Type of Sample	: Ambient Air
Work Order No.	: 4000331821-108-1040
Sampling Location	: NTPC Pakri Barwadih Coal Mining Project, Jharkhand
Sampling Procedure	: Section 3.0, Primary data collection of FWM, Issue 3, Rev 02, dated 15.04.2024
Sample Duration	: 24 hours
Sampling Team	: MMRDL (Manoj)
Sample Reg. No	: MMA/24/S2L1, L2, L3, L4, L5, L6, L7, L8, L9, L10/01-08
Date(s) of Sampling	: 01/04/2024 to 30/04/2024
Date(s) of Receipt	: 27/04/2024 to 03/05/2024
Date(s) of Testing	: 27/04/2024 to 06/05/2024
Date of Report	: 10/05/2024
Test Report No.	: MMA/05-24/10
Page	: 1 of 3

TEST REPORT

Sl. No.	Location →		Gate No.4, PBCMP					Location →		Coal Handling Plant Area				
	Date of sampling ↓		PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³	Date of sampling ↓		PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³
1	1	- 02-04-2024	178.7	91.4	14.5	28.1	0.644	1	- 02-04-2024	184.9	91.2	23.7	42.4	0.755
2	5	- 06-04-2024	171.6	87.8	19.5	25.8	0.624	5	- 06-04-2024	190.7	92.0	21.6	34.1	0.715
3	9	- 10-04-2024	178.1	93.3	19.6	29.2	0.712	9	- 10-04-2024	196.3	88.8	24.6	38.0	0.796
4	12	- 13-04-2024	167.2	86.5	20.5	30.8	0.796	12	- 13-04-2024	193.5	89.4	21.6	41.8	0.652
5	17	- 18-04-2024	175.3	91.1	19.3	30.4	0.609	16	- 17-04-2024	183.5	90.0	18.7	41.1	0.688
6	19	- 20-04-2024	181.4	88.4	17.5	28.9	0.653	20	- 21-04-2024	186.6	93.1	19.6	39.2	0.615
7	26	- 27-04-2024	177.8	80.5	19.6	33.3	0.684	26	- 27-04-2024	189.7	97.4	19.6	35.2	0.621
8	29	- 30-04-2024	169.2	88.7	16.5	33.2	0.612	29	- 30-04-2024	186.2	96.1	23.7	41.0	0.721
	Minimum		167.2	80.5	14.5	25.8	0.609	Minimum	183.5	88.8	18.7	34.1	0.615	
	Maximum		181.4	93.3	20.5	33.3	0.796	Maximum	196.3	97.4	24.6	42.4	0.796	
	Average		174.9	88.5	18.4	30.0	0.667	Average	188.9	92.3	21.6	39.1	0.695	
	98 percentile		181.0	93.0	20.4	33.3	0.784	98 percentile	195.9	97.2	24.5	42.3	0.790	

Sl. No.	Location →		13 mile Chowk					Location →		Transfer Point 5, Conveyor, PBCMP to Banadag R.S.				
	Date of sampling ↓		PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³	Date of sampling ↓		PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³
1	1	- 02-04-2024	122.0	63.7	20.6	33.6	0.685	1	- 02-04-2024	74.3	48.1	13.7	27.3	0.612
2	5	- 06-04-2024	123.3	57.8	20.6	34.4	0.702	5	- 06-04-2024	77.2	48.1	17.5	29.3	0.715
3	9	- 10-04-2024	111.0	60.4	23.4	30.8	0.802	9	- 10-04-2024	83.0	46.8	15.5	30.0	0.641
4	12	- 13-04-2024	109.4	63.3	17.5	31.7	0.614	12	- 13-04-2024	83.5	49.6	16.5	30.4	0.614
5	16	- 17-04-2024	120.6	65.2	21.6	36.2	0.702	18	- 19-04-2024	83.5	50.6	17.4	32.6	0.623
6	19	- 20-04-2024	115.6	64.8	20.6	37.2	0.742	19	- 20-04-2024	84.0	47.5	14.4	21.4	0.653
7	26	- 27-04-2024	126.5	65.4	22.7	29.4	0.721	26	- 27-04-2024	86.3	52.4	19.5	21.7	0.785
8	29	- 30-04-2024	122.4	68.4	16.4	36.0	0.624	29	- 30-04-2024	79.6	46.5	17.5	25.3	0.632
	Minimum		109.4	57.8	16.4	29.4	0.614	Minimum	74.3	46.5	13.7	21.4	0.612	
	Maximum		126.5	68.4	23.4	37.2	0.802	Maximum	86.3	52.4	19.5	32.6	0.785	
	Average		118.9	63.6	20.4	33.7	0.699	Average	81.4	48.7	16.5	27.2	0.659	
	98 percentile		126.1	68.0	23.3	37.0	0.794	98 percentile	86.0	52.1	19.2	32.3	0.775	

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Type text here

Sl. No.	Location →		Transfer Point 6, Conveyor, PBCMP to Banadag R.S					Location →		Odarna Village				
	Date of sampling ↓		PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³	Date of sampling ↓		PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³
1	2	- 03-04-2024	76.9	46.2	12.4	32.0	0.614	2	- 03-04-2024	89.2	43.4	14.2	18.7	0.684
2	6	- 07-04-2024	78.4	39.4	13.4	29.6	0.712	6	- 07-04-2024	76.8	38.4	17.5	26.1	0.746
3	10	- 11-04-2024	79.0	44.2	15.5	28.1	0.746	10	- 11-04-2024	86.9	45.7	16.5	22.1	0.742
4	13	- 14-04-2024	71.8	42.1	14.4	32.2	0.684	13	- 14-04-2024	76.7	46.7	19.1	26.1	0.788
5	16	- 17-04-2024	83.1	39.4	13.4	27.3	0.652	17	- 18-04-2024	79.6	39.3	15.4	25.3	0.654
6	19	- 20-04-2024	86.2	47.8	15.3	30.6	0.667	20	- 21-04-2024	85.4	44.8	18.6	28.4	0.717
7	25	- 26-04-2024	72.4	42.0	16.8	24.6	0.763	25	- 26-04-2024	88.7	39.1	18.5	21.7	0.734
8	28	- 29-04-2024	75.7	46.7	13.4	26.5	0.716	28	- 29-04-2024	77.7	43.2	17.5	19.0	0.684
	Minimum		71.8	39.4	12.4	24.6	0.614	Minimum	76.7	38.4	14.2	18.7	0.654	
	Maximum		86.2	47.8	16.8	32.2	0.763	Maximum	89.2	46.7	19.1	28.4	0.788	
	Average		77.9	43.5	14.3	28.9	0.694	Average	82.6	42.6	17.2	23.4	0.719	
	98 percentile		85.8	47.6	16.6	32.2	0.761	98 percentile	89.1	46.6	19.0	28.1	0.782	

Sl. No.	Location →		Phatha Chowk					Location →		Sirka Village				
	Date of sampling ↓		PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³	Date of sampling ↓		PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³	CO (mg/m ³)
1	2	- 03-04-2024	77.5	45.6	13.4	19.6	0.615	3	- 04-04-2024	82.7	50.6	18.6	30.8	0.784
2	6	- 07-04-2024	75.1	41.6	18.5	28.0	0.714	7	- 08-04-2024	94.3	45.9	15.2	23.6	0.654
3	10	- 11-04-2024	73.1	39.8	15.5	25.3	0.624	11	- 12-04-2024	81.4	50.4	17.5	26.1	0.682
4	13	- 14-04-2024	79.8	44.3	12.1	26.5	0.612	14	- 15-04-2024	86.4	50.3	20.6	31.3	0.744
5	16	- 17-04-2024	75.2	43.9	15.4	20.9	0.716	18	- 19-04-2024	88.7	43.5	22.3	25.2	0.788
6	21	- 22-04-2024	81.2	42.3	17.3	26.2	0.666	22	- 23-04-2024	97.1	50.4	20.6	35.6	0.802
7	24	- 25-04-2024	72.5	45.7	15.4	28.8	0.746	24	- 25-04-2024	90.8	47.0	19.5	32.4	0.694
8	27	- 28-04-2024	76.7	43.3	17.5	20.6	0.686	27	- 28-04-2024	91.8	52.0	16.5	29.3	0.624
	Minimum		72.5	39.8	12.1	19.6	0.612	Minimum	81.4	43.5	15.2	23.6	0.624	
	Maximum		81.2	45.7	18.5	28.8	0.746	Maximum	97.1	52.0	22.3	35.6	0.802	
	Average		76.4	43.3	15.7	24.5	0.672	Average	89.2	48.8	18.9	29.3	0.722	
	98 percentile		81.0	45.7	18.4	28.7	0.742	98 percentile	96.7	51.8	22.1	35.2	0.800	

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Sl. No.	Location →		Transfer Point 8, Conveyor, PBCMP to Banadag R.S.					Location →		Kusumbha Village				
	Date of sampling ↓		PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³	Date of sampling ↓		PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³	CO mg/m ³
1	3	04-04-2024	79.0	44.7	13.4	30.1	0.614	3	04-04-2024	84.3	42.0	15.4	26.4	0.717
2	7	08-04-2024	84.9	45.2	15.5	30.8	0.712	7	08-04-2024	72.4	42.9	14.6	32.4	0.644
3	11	12-04-2024	75.0	46.0	16.5	24.6	0.756	11	12-04-2024	78.6	43.5	16.5	27.7	0.612
4	14	15-04-2024	78.1	49.4	15.5	31.3	0.742	14	15-04-2024	73.3	36.8	17.5	32.0	0.746
5	17	18-04-2024	78.2	48.3	18.2	28.4	0.687	18	19-04-2024	83.3	40.5	15.5	23.2	0.688
6	21	22-04-2024	80.7	50.1	17.5	31.2	0.716	20	21-04-2024	81.1	45.0	19.5	24.5	0.748
7	24	25-04-2024	84.6	47.4	16.4	32.4	0.712	25	26-04-2024	88.3	45.3	18.4	34.3	0.618
8	27	28-04-2024	88.7	52.8	12.2	27.3	0.632	28	29-04-2024	72.5	37.7	16.5	26.1	0.716
	Minimum		75.0	44.7	12.2	24.6	0.614	Minimum		72.4	36.8	14.6	23.2	0.612
	Maximum		88.7	52.8	18.2	32.4	0.756	Maximum		88.3	45.3	19.5	34.3	0.748
	Average		81.2	48.0	15.6	29.5	0.696	Average		79.2	41.7	16.7	28.3	0.686
	98 percentile		88.2	52.4	18.1	32.3	0.754	98 percentile		87.7	45.3	19.3	34.1	0.748

Parameter	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO ₂ (µg/m ³)	CO (mg/m ³)
Protocol of Measurement	IS:5182 (Part 23) : 2006, RA 2017	Lab SOP/09/6 Issue 03 : 2017	IS:5182 (Part 2) : 2001, RA 2017	IS:5182 (Part 6) : 2006, RA 2017	Electro-chemical Detection
National Ambient Air Quality Standards (2009) for Concentration in Ambient Air for Industrial, Residential, Rural & Other areas.	100 (24 hours)	60 (24 hours)	80 (24 hours)	80 (24 hours)	2 (8 Hourly)

Abbreviation: FWIM- Field Work Instruction Manual
 PBCMP-Pakri Barwadih Coal Mining Project

Prepared by

 Rashmi Gupta
 Administrative Manager

Checked by

 Dr. Marisha Sharma
 Authorised Signatory

- end of report -

NOTES:

- ♦ The results indicated only refer to the tested samples and listed parameters and do not endorse any product
- ♦ Total liability of the laboratory is limited to the invoice amount
- ♦ This certificate shall not be reproduced wholly or in part without prior written consent of the laboratory
- ♦ Unused balance of samples received shall be destroyed after one month from the date of issue of test report, unless other wise specified
- ♦ This report shall not be used in any advertising media or as evidence in the court of law without prior written consent of the laboratory
- ♦ Complaint register is available with the laboratory, in case required

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 कोयला खनन परियोजना / COAL MINING PROJECT
 हजारीबाग / Hazaribag

AMBIENT AIR QUALITY MONITORING AND ANALYSIS SUMMARY REPORT FOR THE MONTH OF OCTOBER 2024

Name and Address of Customer: M/S PAKRI BARWADIH COAL MINING NTPC LTD.
LANGATU, BARKAGAON, HAZARIBAGH, JHARKHAND. (INDIA)

PAKRI BARWADIH COL MINES, NTPC LTD.					
AMBIENT AIR QUALITY MONIOTRING REPORT, OCTOBER 2024					
VILLAGE PAKRIBARWADIH					
Date	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	CO
01.10.2024	62.1	32.9	15.1	28.7	0.81
06.10.2024	63.4	33.6	14.3	27.1	0.83
08.10.2024	64.1	33.9	14.6	26.8	0.84
13.10.2024	63.6	33.7	13.9	26.2	0.79
16.10.2024	62.7	33.2	15.0	28.3	0.78
19.10.2024	63.0	32.6	14.4	27.1	0.86
22.10.2024	64.5	34.1	14.2	26.7	0.85
26.10.2024	62.5	32.4	15.5	29.3	0.80
Maximum	64.5	34.1	15.5	29.3	0.86
Minimum	62.1	32.4	13.9	26.2	0.78
Average	63.2	33.2	14.6	27.5	0.82
VILLAGE KUSUMBHA					
Date	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	CO
01.10.2024	59.2	31.5	12.0	22.5	0.70
06.10.2024	58.4	31.1	11.5	21.5	0.67
08.10.2024	60.2	32.0	13.1	24.5	0.63
13.10.2024	59.6	31.2	11.6	21.9	0.65
16.10.2024	58.3	30.8	12.1	22.9	0.64
19.10.2024	57.4	30.6	12.9	23.9	0.59
22.10.2024	60.4	32.1	11.8	22.3	0.74
26.10.2024	59.8	31.8	12.6	23.5	0.62
Maximum	60.4	32.1	13.1	24.5	0.74
Minimum	57.4	30.6	11.5	21.5	0.59
Average	59.1	31.3	12.2	22.9	0.65

PAKRI BARWADIH COL MINES, NTPC LTD.					
AMBIENT AIR QUALITY MONIOTRING REPORT, OCTOBER 2024					
VILLAGE ARAHARA					
Date	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	CO
01.10.2024	63.3	33.5	13.0	24.5	0.77
06.10.2024	60.9	32.3	13.6	25.7	0.71
08.10.2024	61.4	32.3	14.8	27.9	0.73
13.10.2024	62.2	33.0	15.2	28.7	0.75
16.10.2024	61.7	32.8	12.9	24.1	0.69
19.10.2024	62.4	32.1	14.1	27.0	0.72
22.10.2024	62.8	33.3	12.8	23.9	0.68
26.10.2024	63.0	33.4	13.2	24.7	0.76
Maximum	63.3	33.5	15.2	28.7	0.77
Minimum	60.9	32.1	12.8	23.9	0.68
Average	62.1	32.8	13.7	25.9	0.72
GATE NO. 4					
Date	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	CO
01.10.2024	59.9	31.8	10.0	18.5	0.60
06.10.2024	57.7	30.7	11.9	22.3	0.61
08.10.2024	58.1	30.2	10.6	19.5	0.47
13.10.2024	56.2	30.0	9.9	18.4	0.56
16.10.2024	58.8	31.3	11.4	21.1	0.57
19.10.2024	57.9	30.1	9.8	17.9	0.48
22.10.2024	56.4	29.3	10.7	19.7	0.59
26.10.2024	59.0	30.9	11.7	21.7	0.49
Maximum	59.9	31.8	11.9	22.3	0.61
Minimum	56.2	29.3	9.8	17.9	0.47
Average	58.0	30.5	10.7	19.9	0.54

PM10 (100µg/m3) for 24 hrs, PM 2.5 (60 µg/m3) for 24 hrs, SO2 (80 µg/m3) for 24 hrs, NO2 (80 µg/m3) for 24 hrs, CO (4.0 mg/m3),) for 1 hrs

***END OF TEST REPORT ***

Page No. 1 of 2

FOR GLOBAL ENVIRO LABORATORIES

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AMBIENT AIR QUALITY MONITORING AND ANALYSIS SUMMARY REPORT FOR THE MONTH OF OCTOBER 2024

Name and Address of Customer: M/S PAKRI BARWADIH COAL MINING NTPC LTD.
LANGATU, BARKAGAON, HAZARIBAGH, JHARKHAND. (INDIA)

PAKRI BARWADIH COL MINES, NTPC Ltd.					
AMBIENT AIR QUALITY MONIOTRING REPORT,OCTOBER 2024					
TP-3					
Date	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	CO
01.10.2024	56.4	30.3	9.7	17.9	0.58
06.10.2024	55.3	29.5	10.1	18.7	0.46
08.10.2024	54.2	29.0	8.7	15.7	0.45
13.10.2024	55.9	29.8	10.9	20.1	0.55
16.10.2024	56.1	29.9	8.9	16.1	0.53
19.10.2024	55.1	29.2	8.0	14.3	0.41
22.10.2024	53.3	28.5	9.6	17.5	0.54
26.10.2024	52.8	27.2	10.8	19.9	0.44
Maximum	56.4	30.3	10.9	20.1	0.58
Minimum	52.8	27.2	8.0	14.3	0.41
Average	54.8	29.0	9.5	17.4	0.49

PAKRI BARWADIH COL MINES, NTPC Ltd.					
AMBIENT AIR QUALITY MONIOTRING REPORT,OCTOBER 2024					
TP-7					
Date	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	CO
01.10.2024	53.4	28.6	8.8	16.1	0.52
06.10.2024	52.9	28.3	9.1	16.7	0.43
08.10.2024	53.9	28.2	9.5	17.3	0.39
13.10.2024	55.9	29.8	8.1	14.5	0.50
16.10.2024	53.7	28.7	9.0	16.3	0.37
19.10.2024	52.6	27.9	9.4	16.1	0.38
22.10.2024	54.8	29.3	7.9	14.1	0.42
26.10.2024	51.9	27.8	8.2	15.2	0.51
Maximum	55.9	29.8	9.5	17.3	0.52
Minimum	51.9	27.8	7.9	14.1	0.37
Average	53.6	28.6	8.7	15.7	0.44

PM10 (100µg/m³) for 24 hrs, PM 2.5 (60 µg/m³) for 24 hrs, SO2 (80 µg/m³) for 24 hrs, NO2 (80 µg/m³) for 24 hrs, CO (4.0 mg/m³), for 1 hrs

***END OF TEST REPORT ***

Page No. 2 of 2

FOR GLOBAL ENVIRO LABORATORIES

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AMBIENT AIR QUALITY MONITORING AND ANALYSIS (HEAVY METALS) SUMMARY REPORT FOR THE MONTH OF OCTOBER 2024

Name and Address of Customer: M/S PAKRI BARWADIH COAL MINING NTPC LTD.
LANGATU, BARKAGAON, HAZARIBAGH, JHARKHAND. (INDIA)

PAKRI BARWADIH COAL MINING PROJECT, VILLAGE WISE HEAVY METALS ANALYSIS DATA MONTH OF OCTOBER 2024

S.No	PARAMETERS	NORMS	VILLAGE PAKRIBARWADIH		VILLAGE ARAHARA		VILLAGE KUSUMBHA		GATE NO. 4		TP-3		TP-7	
			06.10.2024	22.10.2024	06.10.2024	22.10.2024	06.10.2024	22.10.2024	13.10.2024	23.10.2024	13.10.2024	23.10.2024	13.10.2024	23.10.2024
1	PM ₁₀ *	100 µg/m ³	60.2	61.7	59.8	60.1	56.6	58.7	62.2	61.1	60.3	59.4	60.8	58.6
2	PM _{2.5} *	60 µg/m ³	30.1	32.7	28.4	31.5	27.2	30.8	33.0	32.0	32.0	31.1	32.3	30.7
3	SO ₂ *	80 µg/m ³	15.3	13.8	12.3	14.9	10.4	11.5	13.6	12.2	10.8	10.1	12.3	11.8
4	NO ₂ *	80 µg/m ³	29.8	26.1	23.2	28.3	21.3	21.5	25.5	22.9	19.9	18.7	22.9	22.1
5	CO**	4.0 mg/m ³	0.68	0.63	0.56	0.50	0.57	0.55	0.65	0.62	0.59	0.54	0.60	0.55
6	O ₃ **	180 µg/m ³	21.9	22.8	22.3	23.1	23.6	24.7	24.8	24.9	22.1	23.9	23.7	24.1
7	NH ₃ *	400 µg/m ³	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
8	Benzo (A) Pyrene***	1.0 ng/m ³	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
9	Benzenes***	5.0 µg/m ³	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
10	Arsenic***	6.0 ng/m ³	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11	Nickel***	20.0 ng/m ³	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12	Mercury	NOT SPECIFIED µg/m ³	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
13	Chromium	NOT SPECIFIED µg/m ³	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
14	Lead*	1 µg/m ³	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

* CPCB Specification for Ambient Air Quality for 24 hrs.

***END OF TEST REPORT ***

** CPCB Specification for Ambient Air Quality for 1 hr.

Page No. 1 of 1

*** CPCB Specification for Ambient Air Quality for Annual

FOR GLOBAL ENVIRO LABORATORIES

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NOISE LEVEL MONITORING SUMMARY REPORT FOR THE MONTH OF OCTOBER 2024

Name & Address of Customer: M/S. PAKRI BARWADIH COAL MINING, NTPC LTD.
LANGTU, BARKAGAON, HAZARIBAGH, JHARKHAND (INDIA)

PAKRI BARWADIH COAL MINING PROJECT							PAKRI BARWADIH COAL MINING PROJECT								
MONITORING LOCATION :- VILLAGE PAKRIBARWADIH							MONITORING LOCATION: - VILLAGE ARAHARA								
NOISE MONITORING DATA MONTH OF OCTOBER 2024							NOISE MONITORING DATA MONTH OF OCTOBER 2024								
Sl. No	Date	Monitoring Code	Description noise level db(A)	Result		Standards (CPCB/FACTORIES ACT)		Sl. No	Date	Monitoring Code	Description noise level db(A)	Result		Standards (CPCB/FACTORIES ACT)	
				Day	Night	Day	Night					Day	Night	Day	Night
1	06.10.2024	ANL-1	Average	70.4	65.5	75/90	70	1	06.10.2024	ANL-2	Average	68.8	66.8	75/90	70
			Maximum	72.5	67.5						70.4	68.7			
			Minimum	68.2	63.4						67.1	64.9			
			Leqdb(A)	69.1	64.8						69.3	65.7			
2	16.10.2024	ANL-1	Average	69.3	63.9	75/90	70	2	17.10.2024	ANL-2	Average	68.1	66.4	75/90	70
			Maximum	72.2	66.1						70.6	68.8			
			Minimum	66.4	61.7						65.6	63.9			
			Leqdb(A)	68.1	62.7						67.5	65.7			
MONITORING LOCATION: - VILLAGE KUSUMBHA							MONITORING LOCATION: - GATE NO. 4								
Sl. No	Date	Monitoring Code	Description noise level db(A)	Result		Standards (CPCB/FACTORIES ACT)		Sl. No	Date	Monitoring Code	Description noise level db(A)	Result		Standards (CPCB/FACTORIES ACT)	
				Day	Night	Day	Night					Day	Night	Day	Night
1	06.10.2024	ANL-3	Average	69.5	66.0	75/90	70	1	13.10.2024	ANL-4	Average	71.7	66.7	75/90	70
			Maximum	72.8	69.2						73.6	68.8			
			Minimum	66.1	62.7						69.7	64.6			
			Leqdb(A)	68.7	65.3						70.5	65.6			
2	18.10.2024	ANL-3	Average	69.1	64.3	75/90	70	2	19.10.2024	ANL-4	Average	68.2	63.3	75/90	70
			Maximum	71.1	66.7						72.8	65.9			
			Minimum	67.0	61.9						63.6	60.7			
			Leqdb(A)	68.0	63.8						67.8	62.6			

FOR GLOBAL ENVIRO LABORATORIES

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हजारीबाग / Hazaribag



NOISE LEVEL MONITORING SUMMARY REPORT FOR THE MONTH OF OCTOBER 2024

Name & Address of Customer: M/S. PAKRI BARWADIH COAL MINING, NTPC LTD.
LANGTU, BARKAGAON, HAZARIBAGH, JHARKHAND (INDIA)

MONITORING LOCATION: - TP-3							MONITORING LOCATION: - TP-7								
NOISE MONITORING DATA MONTH OF OCTOBER 2024							NOISE MONITORING DATA MONTH OF OCTOBER 2024								
Sl. No	Date	Monitoring Code	Description noise level db(A)	Result		Standards (CPCB/FACTORIES ACT)		Sl. No.	Date	Monitoring Code	Description noise level db(A)	Result		Standards (CPCB/FACTORIES ACT)	
				Day	Night	Day	Night					Day	Night	Day	Night
1	13.10.2024	ANL-5	Average	69.7	65.0	75/90	70	1	13.10.2024	ANL-6	Average	69.8	66.6	75/90	70
			Maximum	72.1	67.7						Maximum	72.1	69.9		
			Minimum	67.3	62.2						Minimum	67.3	63.3		
			Leqdb(A)	68.1	64.9						Leqdb(A)	68.1	65.5		
2	20.10.2024	ANL-5	Average	68.9	66.1	75/90	70	2	21.10.2024	ANL-6	Average	68.6	64.1	75/90	70
			Maximum	73.3	68.5						Maximum	70.9	65.4		
			Minimum	64.4	63.6						Minimum	66.3	62.7		
			Leqdb(A)	67.7	65.4						Leqdb(A)	67.6	63.6		

***END OF TEST REPORT ***

FOR GLOBAL ENVIRO LABORATORIES

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**AMBIENT AIR QUALITY MONITORING AND ANALYSIS SUMMARY REPORT
 FOR THE MONTH OF NOVEMBER 2024**

Name and Address of Customer: **M/S PAKRI BARWADIH COAL MINING NTPC LTD.
 LANGATU, BARKAGAON, HAZARIBAGH, JHARKHAND. (INDIA)**

PAKRI BARWADIH COL MINES, NTPC LTD.					
AMBIENT AIR QUALITY MONITRING REPORT, NOVEMBER 2024					
TP-5					
Date	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	CO
01.11.2024	72.4	38.1	18.9	36.3	0.89
06.11.2024	70.8	37.3	17.4	33.3	0.96
08.11.2024	64.4	34.1	19.8	37.2	0.91
12.11.2024	66.8	35.3	16.4	31.2	0.75
14.11.2024	67.4	35.6	14.7	27.7	0.83
Maximum	72.4	38.1	19.8	37.2	0.96
Minimum	64.4	34.1	14.7	27.7	0.75
Average	68.3	36.0	17.3	32.9	0.86
TP-7					
Date	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	CO
02.11.2024	71.4	37.6	12.1	22.7	0.76
04.11.2024	68.3	36.0	11.8	22.1	0.69
07.11.2024	70.6	37.2	14.8	27.9	0.80
11.11.2024	63.3	33.0	16.2	31.1	0.92
13.11.2024	61.4	32.4	17.7	34.1	0.67
Maximum	71.4	37.6	17.7	34.1	0.92
Minimum	61.4	32.4	11.8	22.1	0.67
Average	66.8	35.1	14.5	27.7	0.77

PAKRI BARWADIH COL MINES, NTPC LTD.					
AMBIENT AIR QUALITY MONITRING REPORT, NOVEMBER 2024					
TP-6					
Date	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	CO
02.11.2024	69.8	36.8	14.1	26.7	0.84
04.11.2024	60.4	32.1	13.3	25.1	0.73
07.11.2024	65.2	34.2	18.1	34.5	0.76
11.11.2024	62.8	33.3	15.3	28.9	0.93
13.11.2024	59.4	31.7	16.1	30.5	0.78
Maximum	69.8	36.8	18.1	34.5	0.93
Minimum	59.4	31.7	13.3	25.1	0.73
Average	63.8	33.8	15.4	29.3	0.81
TP-8					
Date	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	CO
01.11.2024	65.3	34.5	15.5	29.5	0.74
06.11.2024	64.8	34.3	16.9	32.3	0.88
08.11.2024	71.8	37.1	15.1	28.5	0.61
12.11.2024	59.1	31.4	19.3	37.3	0.68
14.11.2024	61.3	32.5	17.1	32.5	0.56
Maximum	71.8	37.1	19.3	37.3	0.88
Minimum	59.1	31.4	15.1	28.5	0.56
Average	64.7	34.0	16.9	32.2	0.70

PM10 (100µg/m3) for 24 hrs, PM 2.5 (60 µg/m3) for 24 hrs, SO2 (80 µg/m3) for 24 hrs, NO2 (80 µg/m3) for 24 hrs, CO (4.0 mg/m3), for 1 hrs

FOR GLOBAL ENVIRO LABORATORIES

Page No. 1 of 3

Sujata

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 SUJATA KAUSHIK (Sr. Chemist)

Navin Kumar

नवीन कुमार / NAVIN KUMAR
 जन महासंचालक / DY. GENERAL MANAGER
 (पर्यावरण प्रबंधन) / (ENVIRONMENT MANAGEMENT)
 एनटीपीसी खनिज लिमिटेड / NTPC Mining Limited (NML)
 कोयला खनन परियोजना / COAL MINING PROJECT
 हजारीबाग / Hazaribag

Shikha Bhatiya
 AUTHORIZED SIGNATORY
 (SHIKHA BHATIYA)
 Global Enviro Laboratories



AMBIENT AIR QUALITY MONITORING AND ANALYSIS SUMMARY REPORT FOR THE MONTH OF NOVEMBER 2024

Name and Address of Customer: M/S PAKRI BARWADIH COAL MINING NTPC LTD.
LANGATU, BARKAGAON, HAZARIBAGH, JHARKHAND. (INDIA)

PAKRI BARWADIH COL MINES, NTPC LTD.					
AMBIENT AIR QUALITY MONIOTRING REPORT, NOVEMBER 2024					
TP-9					
Date	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	CO
02.11.2024	66.3	35.0	11.4	21.3	0.71
04.11.2024	64.9	34.6	13.8	26.1	0.64
07.11.2024	63.4	33.6	14.2	26.7	0.62
11.11.2024	60.1	31.9	16.5	31.3	0.60
13.11.2024	58.8	31.3	18.2	34.7	0.55
Maximum	66.3	35.0	18.2	34.7	0.71
Minimum	58.8	31.3	11.4	21.3	0.55
Average	62.6	33.2	14.8	28.0	0.62
SIRKA					
Date	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	CO
01.11.2024	62.4	33.1	16.3	31.1	0.82
06.11.2024	59.8	31.8	14.4	27.3	0.54
08.11.2024	71.1	37.4	16.6	31.7	0.57
12.11.2024	63.2	33.5	18.3	35.1	0.90
14.11.2024	59.3	31.5	13.9	26.3	0.84
Maximum	71.1	37.4	18.3	35.1	0.9
Minimum	59.3	31.5	13.9	26.3	0.54
Average	63.7	33.7	15.9	30.4	0.73

PAKRI BARWADIH COL MINES, NTPC LTD.					
AMBIENT AIR QUALITY MONIOTRING REPORT, NOVEMBER 2024					
TP-10					
Date	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	CO
01.11.2024	63.6	33.7	12.2	22.9	0.81
06.11.2024	60.7	32.3	10.3	19.1	0.66
08.11.2024	61.8	32.2	15.2	28.7	0.63
12.11.2024	73.2	38.5	17.3	32.9	0.85
14.11.2024	59.0	31.4	11.3	20.9	0.51
Maximum	73.2	38.5	17.3	32.9	0.85
Minimum	59.0	31.4	10.3	19.1	0.51
Average	64.3	34.0	13.4	25.2	0.68
ODERNA					
Date	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	CO
02.11.2024	58.3	31.0	15.6	29.7	0.59
04.11.2024	60.4	32.1	12.3	22.5	0.70
07.11.2024	70.4	36.4	14.3	27.1	0.52
11.11.2024	61.9	32.8	12.3	23.1	0.49
13.11.2024	65.4	35.6	15.9	36.3	0.47
Maximum	70.4	36.4	15.9	36.3	0.70
Minimum	58.3	31	12.3	22.5	0.47
Average	63.5	33.6	14.0	28.2	0.56

PM10 (100µg/m³) for 24 hrs, PM 2.5 (60 µg/m³) for 24 hrs, SO2 (80 µg/m³) for 24 hrs, NO2 (80 µg/m³) for 24 hrs, CO (4.0 mg/m³), for 1 hrs

FOR GLOBAL ENVIRO LABORATORIES

Page No. 2 of 3

Sujata

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झोयला खनन परियोजना / COAL MINING PROJECT
हजारिबाग / Hazaribag



AMBIENT AIR QUALITY MONITORING AND ANALYSIS SUMMARY REPORT FOR THE MONTH OF NOVEMBER 2024

Name and Address of Customer: M/S PAKRI BARWADIH COAL MINING NTPC LTD.
LANGATU, BARKAGAON, HAZARIBAGH, JHARKHAND. (INDIA)

PAKRI BARWADIH COL MINES, NTPC Ltd.					
AMBIENT AIR QUALITY MONIOTRING REPORT,NOVEMBER 2024					
NAGRI					
Date	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	CO
01.11.2024	64.7	34.2	14.9	28.3	0.77
06.11.2024	59.2	31.5	10.8	20.1	0.65
08.11.2024	63.0	33.4	16.7	31.9	0.58
12.11.2024	60.8	32.3	18.8	36.1	0.54
14.11.2024	69.9	37.8	19.9	38.3	0.86
Maximum	69.9	37.8	19.9	38.3	0.86
Minimum	59.2	31.5	10.8	20.1	0.54
Average	63.8	34.0	15.9	30.4	0.68

PAKRI BARWADIH COL MINES, NTPC Ltd.					
AMBIENT AIR QUALITY MONIOTRING REPORT,NOVEMBER 2024					
CHP AREA					
Date	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	CO
02.11.2024	66.4	35.1	17.6	33.7	0.79
04.11.2024	65.4	34.7	15.4	29.3	0.72
07.11.2024	70.9	37.3	12.4	23.3	0.87
11.11.2024	61.7	32.7	14.5	27.5	0.50
13.11.2024	66.1	35.9	16.9	32.3	0.48
Maximum	70.9	37.3	17.6	33.7	0.87
Minimum	61.7	32.7	12.4	23.3	0.48
Average	66.1	35.1	15.2	29.0	0.67

PM10 (100µg/m³) for 24 hrs, PM 2.5 (60 µg/m³) for 24 hrs, SO2 (80 µg/m³) for 24 hrs, NO2 (80 µg/m³) for 24 hrs, CO (4.0 mg/m³), for 1 hrs

***END OF TEST REPORT ***

FOR GLOBAL ENVIRO LABORATORIES

Page No. 3 of 3

Sujata

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(SHIKHA KAUSHIK)

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कोयला खनन परियोजना / COAL MINING PROJECT
हजारीबाग / Hazaribag



NOISE LEVEL MONITORING SUMMARY REPORT FOR THE MONTH OF NOVEMBER 2024

Name & Address of Customer: **M/S. PAKRI BARWADIH COAL MINING, NTPC LTD.
LANGTU, BARKAGAON, HAZARIBAGH, JHARKHAND (INDIA)**

PAKRI BARWADIH COAL MINING PROJECT							PAKRI BARWADIH COAL MINING PROJECT								
MONITORING LOCATION :- TP-5							MONITORING LOCATION :- TP-6								
NOISE MONITORING DATA MONTH OF NOVEMBER 2024							NOISE MONITORING DATA MONTH OF NOVEMBER 2024								
Sl. No	Date	Monitoring Code	Description noise level db(A)	Result		Standards (CPCB/FACTORIES ACT)		Sl. No	Date	Monitoring Code	Description noise level db(A)	Result		Standards (CPCB/FACTORIES ACT)	
				Day	Night	Day	Night					Day	Night	Day	Night
1	01.11.2024	ANL-1	Average	70.2	67.2	75/90	70	1	02.11.2024	ANL-2	Average	70.4	65.5	75/90	70
			Maximum	71.8	69.6						73.8	67.2			
			Minimum	68.5	64.7						66.9	63.8			
			Leqdb(A)	69.4	66.3						69.1	64.4			
MONITORING LOCATION :- TP-7							MONITORING LOCATION :- TP-8								
Sl. No	Date	Monitoring Code	Description noise level db(A)	Result		Standards (CPCB/FACTORIES ACT)		Sl. No	Date	Monitoring Code	Description noise level db(A)	Result		Standards (CPCB/FACTORIES ACT)	
				Day	Night	Day	Night					Day	Night	Day	Night
1	02.11.2024	ANL-3	Average	69.4	66.4	75/90	70	1	03.11.2024	ANL-4	Average	68.2	65.7	75/90	70
			Maximum	72.2	69.3						71.9	69.6			
			Minimum	66.6	63.4						64.4	61.8			
			Leqdb(A)	68.1	65.5						67.5	64.3			

FOR GLOBAL ENVIRO LABORATORIES

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हजारीबाग / Hazaribag

Shikha Bhatiya
GLOBAL ENVIRO LABORATORIES LLP
AUTHORISED SIGNATORY
(SHIKHA BHATIYA)
Ghaziabad



**NOISE LEVEL MONITORING SUMMARY REPORT
 FOR THE MONTH OF NOVEMBER 2024**

Name & Address of Customer: **M/S. PAKRI BARWADIH COAL MINING, NTPC LTD.
 LANGTU, BARKAGAON, HAZARIBAGH, JHARKHAND (INDIA)**

PAKRI BARWADIH COAL MINING PROJECT							PAKRI BARWADIH COAL MINING PROJECT								
MONITORING LOCATION :- TP-9							MONITORING LOCATION :- TP-10								
NOISE MONITORING DATA MONTH OF NOVEMBER 2024							NOISE MONITORING DATA MONTH OF NOVEMBER 2024								
Sl. No	Date	Monitoring Code	Description noise level db(A)	Result		Standards (CPCB/FACTORIES ACT)		Sl. No	Date	Monitoring Code	Description noise level db(A)	Result		Standards (CPCB/FACTORIES ACT)	
				Day	Night	Day	Night					Day	Night	Day	Night
1	03.11.2024	ANL-3	Average	67.2	65.4	75/90	70	1	04.11.2024	ANL-4	Average	71.1	64.0	75/90	70
			Maximum	70.7	67.8						Maximum	73.3	66.5		
			Minimum	63.6	62.9						Minimum	68.8	61.4		
			Leqdb(A)	66.2	64.6						Leqdb(A)	70.7	63.1		
MONITORING LOCATION :- SIRKA							MONITORING LOCATION :- ODERNA								
Sl. No	Date	Monitoring Code	Description noise level db(A)	Result		Standards (CPCB/FACTORIES ACT)		Sl. No	Date	Monitoring Code	Description noise level db(A)	Result		Standards (CPCB/FACTORIES ACT)	
				Day	Night	Day	Night					Day	Night	Day	Night
1	04.11.2024	ANL-3	Average	70.2	65.3	75/90	70	1	05.11.2024	ANL-4	Average	68.3	64.5	75/90	70
			Maximum	72.9	68.1						Maximum	70.0	67.6		
			Minimum	67.4	62.5						Minimum	66.5	61.4		
			Leqdb(A)	69.3	64.2						Leqdb(A)	67.2	63.8		

FOR GLOBAL ENVIRO LABORATORIES

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 AUTHORIZED SIGNATORY
 (SHIKHA BHATIYA)

Navin Kumar
नवीन कुमार / NAVIN KUMAR
 उपाध्यक्ष / DY. GENERAL MANAGER
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 कोयला खनन परियोजना / COAL MINING PROJECT
 हजारीबाग / Hazaribag

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NOISE LEVEL MONITORING SUMMARY REPORT FOR THE MONTH OF NOVEMBER 2024

Name & Address of Customer: M/S. PAKRI BARWADIH COAL MINING, NTPC LTD.
LANGTU, BARKAGAON, HAZARIBAGH, JHARKHAND (INDIA)

PAKRI BARWADIH COAL MINING PROJECT						PAKRI BARWADIH COAL MINING PROJECT									
MONITORING LOCATION :- NAGRI						MONITORING LOCATION: - CHP AREA									
NOISE MONITORING DATA MONTH OF NOVEMBER 2024						NOISE MONITORING DATA MONTH OF NOVEMBER 2024									
Sl. No	Date	Monitoring Code	Description noise level db(A)	Result		Standards (CPCB/FACTORIES ACT)		Sl. No	Date	Monitoring Code	Description noise level db(A)	Result		Standards (CPCB/FACTORIES ACT)	
				Day	Night	Day	Night					Day	Night	Day	Night
1	05.11.2024	ANL-1	Average	68.8	66.0	75/90	70	1	06.11.2024	ANL-2	Average	67.6	63.3	75/90	70
			Maximum	71.1	68.2						70.5	66.1			
			Minimum	66.4	63.8						64.7	60.5			
			Leqdb(A)	67.3	65.5						66.8	62.8			

END OF TEST REPORT

Page 3 of 3

FOR GLOBAL ENVIRO LABORATORIES

Sujata

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एनटीपीसी खनिज लिमिटेड / NTPC Mining Limited (NML)
कोयला खनन परियोजना / COAL MINING PROJECT
हजारिबाग / Hazaribag



ITEM NO.39

COURT NO.9

SECTION XVII

S U P R E M E C O U R T O F I N D I A
R E C O R D O F P R O C E E D I N G S

Miscellaneous Application No. 1824/2023 in C.A. No. 6249/2021

NATIONAL THERMAL POWER CORPORATION LIMITED (NTPC) Petitioner(s)

VERSUS

TRIPURARI SINGH & ORS.

Respondent(s)

IA No. 155852/2023 - EXTENSION OF TIME

IA No. 192404/2023 - GRANT OF INTERIM RELIEF

Date : 29-01-2024 This matter was called on for hearing today.

CORAM : HON'BLE MR. JUSTICE J.K. MAHESHWARI
HON'BLE MR. JUSTICE SANJAY KAROL

For Petitioner(s) Mr. Tushar Mehta, Solicitor General
Ms. Aishwarya Bhati, A.S.G.
Mr. Adarsh Tripathi, AOR
Mr. Vikram Singh Baid, Adv.
Mr. Ajitesh Garg, Adv.

For Respondent(s) Mr. Anand Varma, AOR
Ms. Adyasha Nanda, Adv.

Mr. Shivam Kumar, Adv.
Mr. Vaibhav Prasad Deo, Adv.
Ms. Mudita Arora, Adv.
M/S. Qua Legal, AOR

Mr. Piyush Beriwal, Adv.
Mr. S K Gupta, Adv.
Ms. Nidhi Khanna, Adv.
Ms. Chinmaee Chandra, Adv.
Mr. Rajesh Kumar Singh, Adv.
Mr. Ishaan Sharma, Adv.
Ms. Muskan Gupta, Adv.
Mr. Gurmeet Singh Makker, AOR

UPON hearing the counsel the Court made the following
O R D E R

Signature Not Verified
Digitally signed by
Jayant Kumar Arora
Date: 2024.01.30
11:34:05 IST
Reason: 

No. 155852 of 2023

Having heard learned Solicitor General appearing for the petitioner – NTPC and learned counsel appearing for the respondents,

we are of the considered view that in view of the averments made in the application for extension of time i.e. I.A. No. 155852 of 2023, the time as fixed vide our order dated 20.10.2023 is required to be extended till 31.12.2024. Ordered accordingly.

In view of the above, Misc. Application No. 1824 of 2023, along with I.A. No. 155852 of 2023, is, accordingly, disposed of.

(JAYANT KUMAR ARORA)
ASTT. REGISTRAR-cum-PS

(VIRENDER SINGH)
BRANCH OFFICER



Office of the Principal Chief Conservator of Forests

Van Bhawan, Doranda, Ranchi - 834 002
Email: pccf-jhk@gov.in, Phone No. 0651-2481909

Office order No. 156

dated 01/11/2024

Site-Specific Catchment Area Treatment Plan with reference to non-forestry use of 331.198 ha of forest land for Pakri Barwadih North West (PBNW) coal mining project in favour of M/s NTPC Ltd.


The Site-Specific Catchment Area Treatment Plan has been submitted by M/s. NTPC (referred to as "the User Agency or M/s NTPC") in pursuance of the following condition laid by MoEF&CC under condition no. VI of Stage-1 approval vide letter no. 8-56/2009-FC dated 26.05.2023 for non-forestry use of 331.198 ha of forest land for Pakri Barwadih North West (PBNW) coal mining project in favour of M/s NTPC Ltd.

The aforesaid Term of Reference laid by the Central Government reads as follows:

Condition No. vi:

A Catchment Area Treatment Plan which is to be implemented at the cost of the user agency for the treatment of all Nallahs/Streams pertaining to instant mining lease/project area.

2. It was informed by the User Agency that in compliance of the above mentioned condition, the instant Catchment Area Treatment Plan has been prepared in consultation with the forest officials.
3. In the above stated background, the Regional Chief Conservator of Forests, Ranchi (RCCF, Hazaribagh) vide his letter no. 1081 dated 19.06.2024 submitted the Plan to the office of the undersigned for its consideration for sanction.
4. In order to examine the plan prescriptions a communication was issued to the Regional Chief Conservator of Forests, Ranchi, vide this office letter no. 1709 dated 04.07.2024 to arrange a Power-Point Presentation of the plan on 19.07.2024 in the


01.11.2024

conference hall of the undersigned. The presentation was made by the Project proponent in the presence of Regional Chief Conservator of Forests, Hazaribagh and DFO Hazaribagh West Forest Division. Additional GM (Projects), NTPC, Shri Navin Kumar, DGM (Env. Mgmt.), NTPC, Shri Sachin Kumar Yadav, Sr. Manager (Mining), NTPC, Shri S. Gunesan, NTPC, Shri Ravish Kumar, NTPC, Shri Shresh Kumar, NTPC, and Shri Biswajit Paul, Professor & Head, CME, IIT (ISM), Dhanbad were also present during the presentation.

5. After deliberation on various provisions of the proposed Plan and the presentation, it was observed:


- (i) That the villages falling under the impact area need to be included so as to cover the total impact area.
- (ii) That adequate measures regarding Capacity Building of Frontline Forest Staff as well as Awareness Development Programme need to be further elaborated and duly modified.
- (iii) That the Joint Forest Management Committees falling within the impact area need to be included and their training estimates need to be suitably enhanced so as to have a meaningful capacity building of the stakeholders.

6. The aforementioned observations were communicated to all concerned vide this office order no. 106 dated 24.07.2024 through office memo no. 1970 dated 24.07.2024.

7. A revised Plan was submitted by RCCF, Hazaribagh vide letter no. 1879 dated 23.10.2024 which was reviewed by the undersigned and it was found that the observations have been duly incorporated in this revised Plan.

8. The cost of the proposed 10-year Site-Specific Catchment Area Treatment Plan with respect to the activities to be carried out by DFO, Hazaribagh West Forest Division and DFO, Chatra South Forest Division has been estimated to be Rs. 3878.86 lakh. The summary of the proposed interventions (component wise) under the Plan is as follows:


01.11.2024


नवीन कुमार / NAVIN KUMAR
उप महाप्रबंधक / DY. GENERAL MANAGER
(पर्यावरण प्रबंधन) / (ENVIRONMENT MANAGEMENT)
एनटीपीसी मॉनिंग लिमिटेड / NTPC Mining Limited (NML)
कोयला खनन परियोजना / COAL MINING PROJECT
हजारिबाग / Hazaribag


**Summary of the Site Specific Catchment Area Treatment Plan for Pakri
Barwadih North West (PBNW) coal mining project**

Sl. No.	Activity Head	Hazaribagh West Forest Division (Rs. in Lakh)	Chatra South Forest Division (Rs. in Lakh)	Total (Rs. in Lakh)
1.	Bio-Engineering measures	42.00	-	42.00
2.	Engineering measures	927.40	128.00	1055.40
3.	Water Storage Structures	76.15	63.10	139.25
4.	Livelihood	681.25	107.50	788.75
5.	Monitoring and study for implementation	145.00	75.00	220.00
6.	Energy saving interventions	250.00	-	250.00
7.	Capacity building	357.34	131.00	488.34
	Sub-total	2479.14	504.60	2983.74
	Administrative cost @ 10%	247.91	50.46	298.38
	Escalation cost @ 20%	495.83	100.92	596.75
	Total Cost	3222.88	655.98	3878.86

9. The Plan with a total financial outlay of **Rs. 3878.86 Lakh** extends over a period of 10 years and shall be utilized by the Forest Department through the DFO, Hazaribagh West Forest Division and DFO, Chatra South Forest Division in accordance with the Plan prescriptions.


10. Considering the proposals under the plan submitted by the User Agency and recommendation of the concerned forest officers, sanction is hereby accorded to the instant Plan subject to the following conditions:

- (i) That the User Agency shall ensure that its officials/contractors and the work force engaged into mining and allied operations under the Project shall not commit or abet any forest/wildlife offence in their area of


07.11.2024

operation. They will also promptly report any forest/wildlife offence in the area to the nearest forest office/official. Further, they will extend their full cooperation to the forest officials in control/mitigation of any incident, natural or man-made, detrimental to forest and wildlife in their area of operation.

- (ii) That the total amount of **Rs. 3878.86 Lakh (Rupees thirty eight crore seventy eight lakh and eighty six thousand only)** shall be deposited by the User Agency into CAMPA account under the relevant head/sub-head and shall be utilized by the State Forest Department through the DFO, Hazaribagh West Forest Division and DFO, Chatra South Forest Division as delineated under the Plan, strictly in accordance with the prevailing norms under the Jharkhand Forest Department.
- (iii) That as regards the funds earmarked against activities to be undertaken by the State Forest Department, the DFO, Hazaribagh West Forest Division and DFO, Chatra South Forest Division shall prepare a detailed Annual Plan of Operations (APO) in the beginning of every financial year in respect of the instant Plan following all the rules, regulations, Schedule of Rates etc. issued from time to time by the State Government/ Forest Department. Regional Chief Conservator of Forests, Hazaribagh shall supervise & closely monitor the progress of the activities undertaken by DFO, Hazaribagh West Forest Division and DFO, Chatra South Forest Division as per the approved APO & funds released under CAMPA.
- (iv) That the Conservator of Forests, Hazaribagh Circle shall supervise all the activities as per directions issued by the Forest Department from time to time.
- (v) That the DFO, Hazaribagh West Forest Division and DFO, Chatra South Forest Division shall carry out the activities under the Plan strictly as per the duly sanctioned APO.
- (vi) That both the DFOs shall ensure that no violation of duly sanctioned Working Plan of their Forest Divisions takes place during implementation of any of the activities involved in this plan over notified and demarcated forest land.


01.11.2024

(vii) That the instant Plan is dynamic and be revisited after 5 years to assess its compatibility with mining and its concurrent reclamation activities and a revised Plan be formulated as per requirement.

(viii) That though adequate provisions have been made towards cost escalation in the plan viz. increase in wage rate/ material cost etc., yet the User Agency shall submit an undertaking to the Divisional Forest Officer, Ranchi Forest Division to the effect that they will deposit extra cost of the plan beyond the cost escalation provision owing to increase in wage rate etc. in due course of time as well as consequent upon revision in the plan, if any, as and when given effect to by the competent authority.

Sd/-

Principal Chief Conservator of Forests,
Jharkhand, Ranchi

Memo No. dated

Copy forwarded to Deputy Director General of Forests (Central), Ministry of Environment, Forest & Climate Change, Integrated Regional Office, Ranchi, Harmu Housing Colony, Ranchi [email: ro.ranchi-mef@gov.in] / Principal Chief Conservator of Forest-cum-Executive Director, Waste Land Development Board, Jharkhand, Ranchi / Additional PCCF, CAMPA along with a copy of the Plan, for information and necessary action.

Sd/-

Principal Chief Conservator of Forests,
Jharkhand, Ranchi

Memo No. dated

Copy forwarded to Regional Chief Conservator of Forest, Hazaribagh / Conservator of Forest, Territorial Circle, Hazaribagh / Conservator of Forest, Territorial Circle, Chatra / DFO, Hazaribagh West Forest Division / DFO, Chatra South Forest Division for information and necessary action.

Sd/-

Principal Chief Conservator of Forests,
Jharkhand, Ranchi

Memo No. 2786 dated 01.11.2024

Copy forwarded to M/s NTPC Ltd. for information and necessary action.

Principal Chief Conservator of Forests,
Jharkhand, Ranchi

Navin Kumar
नवीन कुमार / NAVIN KUMAR
उप महाप्रबन्धक / DY. GENERAL MANAGER
(पर्यावरण प्रबंधन) / (ENVIRONMENT MANAGEMENT)
एनटीपीसी लिमिटेड / NTPC Mining Limited (NML)
कोयला खनन परियोजना / COAL MINING PROJECT
हजारीबाग / Hazaribag

Photographs of Tarpaulin Cover Trucks



Navin Kumar
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(पर्यावरण प्रबंधन) / (ENVIRONMENT MANAGEMENT)
एनटीपीसी मॉनिंग लिमिटेड / NTPC Mining Limited (NML)
कोयला खनन परियोजना / COAL MINING PROJECT
हजारीबाग / Hazaribag



Navin Kumar

नवीन कुमार / NAVIN KUMAR
ज्य. महासंचालक / DY. GENERAL MANAGER
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कोयला खनन परियोजना / COAL MINING PROJECT
हजारीबाग / Hazaribag

Water Sprinkling on Coal Transportation Road and Railway Siding



Navin Kumar
नवीन कुमार / NAVIN KUMAR
उप महाप्रबंधक / DY. GENERAL MANAGER
(पर्यावरण प्रबंधन) / (ENVIRONMENT MANAGEMENT)
एनटीपीसी खनिज लिमिटेड / NTPC Mining Limited (NML)
कोयला खनन परियोजना / COAL MINING PROJECT
हजारीबाग / Hazaribag



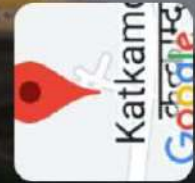
Navin Kumar

नवीन कुमार / NAVIN KUMAR
उप महाप्रबंधक / DY. GENERAL MANAGER
(पर्यावरण प्रबंधन) / (ENVIRONMENT MANAGEMENT)
एनटीपीसी मॉनिंग लिमिटेड / NTPC Mining Limited (NML)
कोयला खनन परियोजना / COAL MINING PROJECT
हजारीबाग / Hazaribag

Water Sprinkling at Banadag Railway Siding



X7JR+P9H, NH-100, Katkandag,
Jharkhand 825302, India
23.98198198198 85.29079943864
06:27 PM 02/05/2024



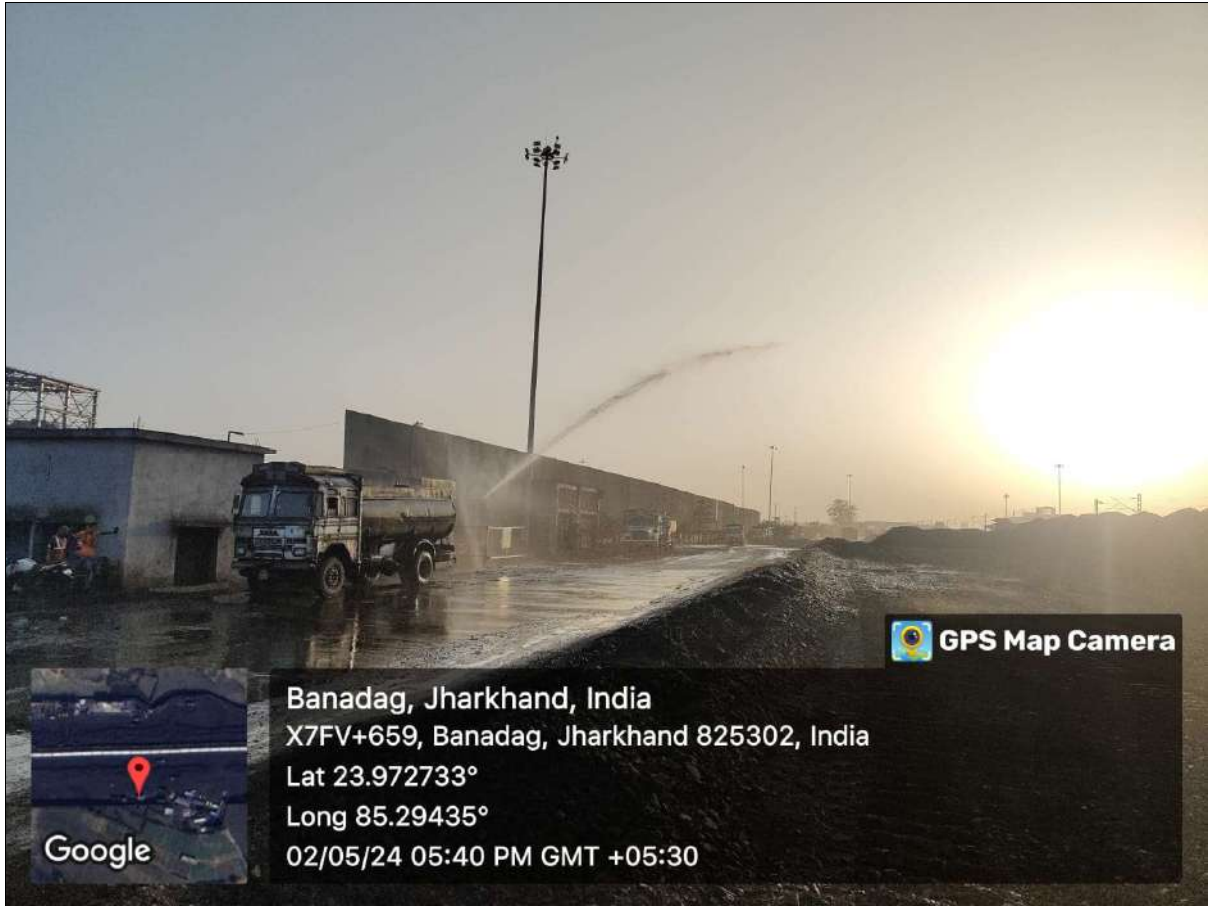
GPS Map Camera



Banadag, Jharkhand, India
X7FV+659, Banadag, Jharkhand 825302, India
Lat 23.972733°
Long 85.29435°
02/05/24 05:40 PM GMT +05:30

Navin Kumar

नवीन कुमार / NAVIN KUMAR
उप महाप्रबंधक / DY. GENERAL MANAGER
(पर्यावरण प्रबंधन) / (ENVIRONMENT MANAGEMENT)
एनटीपीसी लिमिटेड / NTPC Mining Limited (NML)
कोयला खनन परियोजना / COAL MINING PROJECT
हजारीबाग / Hazaribag



 GPS Map Camera

Banadag, Jharkhand, India
X7FV+659, Banadag, Jharkhand 825302, India
Lat 23.972733°
Long 85.29435°
02/05/24 05:40 PM GMT +05:30



Navin Kumar

नवीन कुमार / NAVIN KUMAR
उप महाप्रबंधक / DY. GENERAL MANAGER
(पर्यावरण प्रबंधन) / (ENVIRONMENT MANAGEMENT)
एनटीपीसी लिमिटेड / NTPC Mining Limited (NML)
कोयला खनन परियोजना / COAL MINING PROJECT
हजारीबाग / Hazaribag

Photographs of Boundary wall with 20 ft. windscreen



Navin Kumar
नवीन कुमार / NAVIN KUMAR
उप महाप्रबन्धक / DY. GENERAL MANAGER
(पर्यावरण प्रबन्धन) / (ENVIRONMENT MANAGEMENT)
एन्टीकोरपोरेट मॉनिंग लिमिटेड / NTPC Mining Limited (NML)
खोयला खनन परियोजना / COAL MINING PROJECT
हजारीबाग / Hazaribag

Plantation photographs at Banadag Railway Siding



Navin Kumar
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कोयला खनन परियोजना / COAL MINING PROJECT
हजारीबाग / Hazaribag



एनटीपीसी लिमिटेड
(भारत सरकार का उद्यम)

NTPC Limited
(A Govt. of India Enterprise)

कोयला खनन परियोजनाएँ, हजारीबाग
Coal Mining Projects, Hazaribag

Ref: 1040/PBCMP/EMG/2023/F-47/199

Date: 19.10.2023

To,

**The Deputy Director General of Forests (C),
MoEF & CC, Regional Office,
2nd Floor, Headquarter, Jharkhand State Housing Board,
Harmu Chowk, Ranchi (Jharkhand) - 834 002.**

Sub: Submission of status of Dumuhani Nallah as per specific condition no. 1.3, 1.5 and 1.8 of the Environmental Clearance amendment dated 16.08.2023 accorded by MoEF & CC for NTPC Ltd - Pakri Barwadih Coal Mining Project (15MTPA): Reg.

Ref: 1. EC Ref. no. J-11015/692/2007-IA-II(M) Dated 19.05.2009.
2. Letter No. 2/PMC/ND-171/2012/224 Dated 19.03.2013.
3. EC Amendment dated 16.08.2023.

Respected Sir,

With reference to specific condition no. 1.3, 1.5 and 1.8 of the Environmental Clearance amendments dated 16.08.2023, **I hereby submit the Following:**

Condition no-1.3 & 1.5 -It is kindly submitted that in compliance of the specific condition no. iv of EC dated 19.05.2009, the CWPRS was awarded the study and designing of the Nallah diversion. Based on the above study report of CWPRS, NOC/permission has been accorded by Water Resource Dept, GoJH for realignment of Dumuhani nallah vide letter mentioned under reference 2 (**attached as Annexure-1**). In line with this, to continue the mining operation 3.1 Km length of Dumuhani nallah has been re-aligned. Rest of the part of Dumuhani Nalla is intact. Photographs (**attached as Annexure-2**) and Drone Video of Dumuhani Nalla (**attached as Annexure-3**) is being submitted to your kind office. It is further submitted that NTPC Ltd PBCMP shall make all possible efforts towards protecting catchment area of the streams flowing within the lease boundary as well as along the boundary of lease area until mining operation reaches its vicinity.

Navin Kumar
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कोयला खनन परियोजना / COAL MINING PROJECT
हजारीबाग / Hazaribag

Navin Kumar

कोयला खनन परियोजनाएँ, सिकरी साईट कार्यालय, बड़कागाँव, हजारीबाग – 825311
Coal Mining Projects, Sikri Site Office, Barkagaon, Hazaribag - 825311

Condition No-1.8- It is kindly submitted that required "Public Grievance Redressal and Monitoring System" has been established at Pakri Barwadih Coal Mining Project for resolving any issues related to the pollution of mines. Adequate awareness is being spread among the public / local villagers to address their grievance. A logbook is being maintained by NTPC on "Public Grievance Redressal and Monitoring System". The same is being monitored weekly by Head of Department (Envt Mgmt.) and monthly by Head of Project (PBCMP).

Thanking you.

Yours Faithfully,

Navin Kumar

[NAVIN KUMAR]

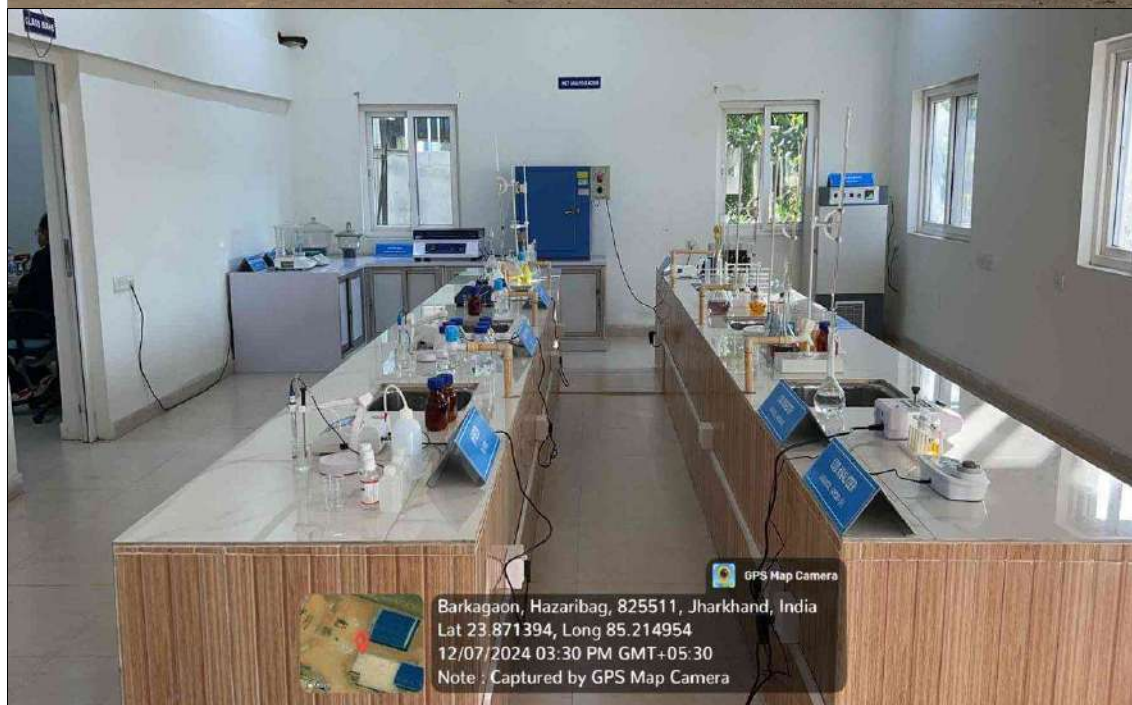
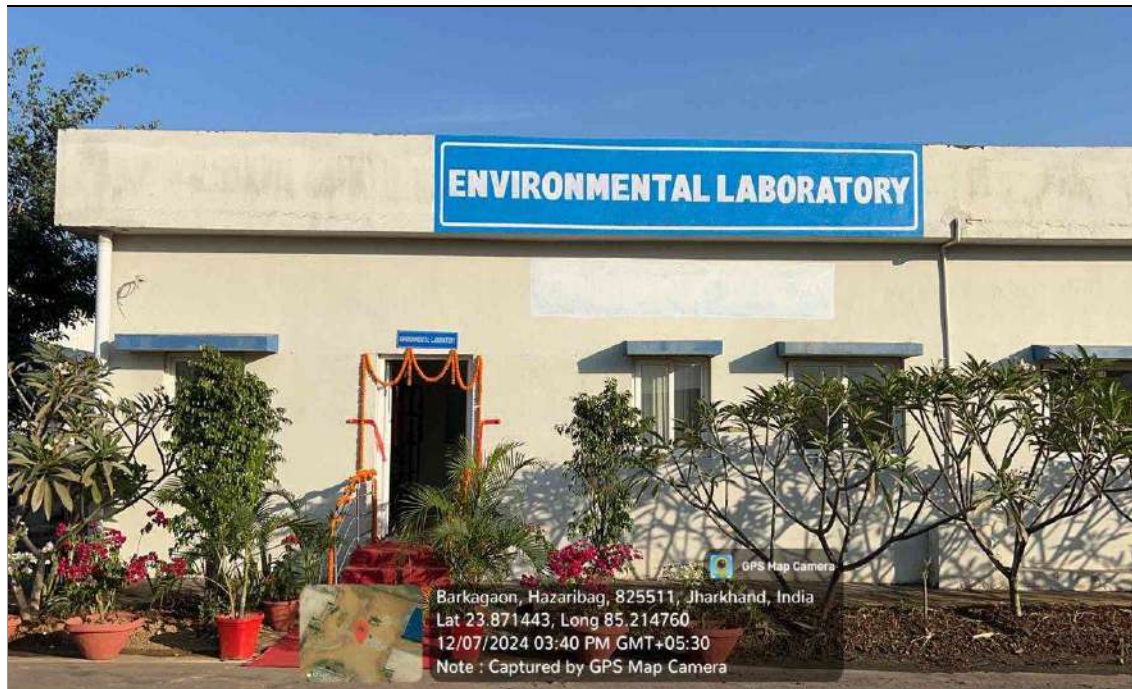
नवीन कुमार / NAVIN KUMAR
उप महाप्रबंधक (पर्यावरण प्रबंधन) / DGM (ENVT. MGMT.)
एन.टी.पी.सी. लिमिटेड / NTPC Limited
पर्यावरण प्रबंधन विभाग / ENVIRONMENTAL MANAGEMENT
COAL MINING PROJECTS

Encl.: A/a

Navin Kumar

नवीन कुमार / NAVIN KUMAR
उप महाप्रबंधक / DY. GENERAL MANAGER
(पर्यावरण प्रबंधन) / (ENVIRONMENT MANAGEMENT)
एन.टी.पी.सी. लिमिटेड / NTPC Mining Limited (NML)
कोयला खनन परियोजना / COAL MINING PROJECT
हजारीबाग / Hazaribag

Photographs of Laboratory



Navin Kumar
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हजारीबाग / Hazaribag



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Navin Kumar
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एनटीपीसी खानिया लिमिटेड / NTPC Mining Limited (NML)
कोयला खनन परियोजना / COAL MINING PROJECT
हजारीबाग / Hazaribag



Navin Kumar
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 एनटीपीसी लिमिटेड / NTPC Mining Limited (NML)
 कोयला खनन परियोजना / COAL MINING PROJECT
 हजारीबाग / Hazaribag

LIST OF INSTRUMENTS FOR LABORATORY

Sl. No.	Name	Qty
1	Analytical Balance (3 Digit)	1
2	BOD Incubator	1
3	Muffle Furnace	1
4	Hot Air Oven	1
5	Test Sieves	2
6	Flame Photometer	1
7	Visible Spectro-photometer	1
8	pH Meter	1
9	Water Quality Analyser	1
10	Desiccators	2
11	Centrifuge	1
12	Fume Hood Auto pass	1
13	Hot Plate	2
14	Heating Mantle for COD	3
15	Stirrer (Magnetic)	1
16	Vacuume Pump	1
17	Water Bath	1
18	Digital Thermometer	1
19	Water Distillation Unit	1
20	Jaw Crusher	1
21	Pulveriser	1
22	Beaker (500 ml)	4
23	Beaker (400 ml)	12
24	Beaker (250 ml)	34
25	Beaker (100 ml)	4
26	Beker (50 ml)	8
27	Beker (80ml & 20 ml)	18
28	Beaker (25 ml)	6
29	Burette	6
30	Burette Stand	4
31	Pipette (5 ml, 10 ml, 15 ml, 20 ml)	19
32	Glass rod	10
33	Measuring Cylinder of Different Size	22
34	Reagent Bottle	26
35	Volumetric Flask (1000 ml)	5
36	Volumetric Flask (500 ml)	10
37	Volumetric Flask (250 ml)	19
38	Volumetric Flask (100 ml)	13
39	Volumetric Flask (50 ml)	21
40	Volumetric Flask (25 ml)	7
41	Pippete Stand	3
42	Spatula	1
43	Watch Glass	25
44	Distillation Bottle	3

45	Beaker Tray	3
46	Funnel	20
47	Autoclave	1
48	COD Digester	1
49	Colony Counter	1
50	Measuring Cylinder (1 Ltr)	2
51	Measuring Cylinder (250 ml)	12
52	Measuring Cylinder (100 ml)	3
53	Measuring Cylinder (50 ml)	2
54	Measuring Cylinder (25 ml)	8
55	Measuring Cylinder of Different Size (NEW)	151
56	Conical Flask (1 Ltr)	8
57	Conical Flask (500 ml)	15
58	Conical Flask (250 ml)	8
59	Conical Flask (100 ml)	9
60	COD/BOD bottle	26
61	Reagent Bottle (1 Ltr)	12
62	Reagent Bottle (500 ml)	17
63	Petri dish	18
64	Test Tube (50 ml)	51
65	Test Tube (20 ml)	100
66	Fiblex Ass (500ml)	1
67	Crucible	15
68	Glass Bowl	12
69	Nickel Crucible	12
70	AQ Bottle	50
71	Water Sample Bottle	40
72	Stirrer	2
73	Refrigerator	1
74	FPM Compressor filter	1
75	Colorimeter	1
76	Rack	3
77	Analysis Table	1
78	Office Table	1
79	Office Chair	3
80	Aluminium door	6
81	Name Plate	1
82	Agnet Mixture	1
83	Filter paper	3 Pkt

Navin Kumar
नवीन कुमार / NAVIN KUMAR
 उपायुक्त / DY. GENERAL MANAGER
 (पर्यावरण प्रबंधन) / (ENVIRONMENT MANAGEMENT)
 एनटीपीसी खनिज लिमिटेड / NTPC Mining Limited (NML)
 कोयला खनन परियोजना / COAL MINING PROJECT
 हजारीबाग / Hazaribag



NTPC Limited
P&S Deptt- PB, PB-NW COAL MINING PROJECTS

OFFICE ORDER

Ref. No.1040/2023/P&S/030224

Date: 03.02.2024

The Water and Air Quality Monitoring and Testing for NTPC PBCMP shall be taken up by Chemistry Department wef 03.02.2024. In this regard, a suitable environment laboratory for measurement of environment parameters regarding air and water (surface and ground) quality may be established.

This is being issued on approval by CA.

S. Kar

03.02.2024

(Sanchita Kar)
Sr. Manager (P&S)

E- Distribution:-

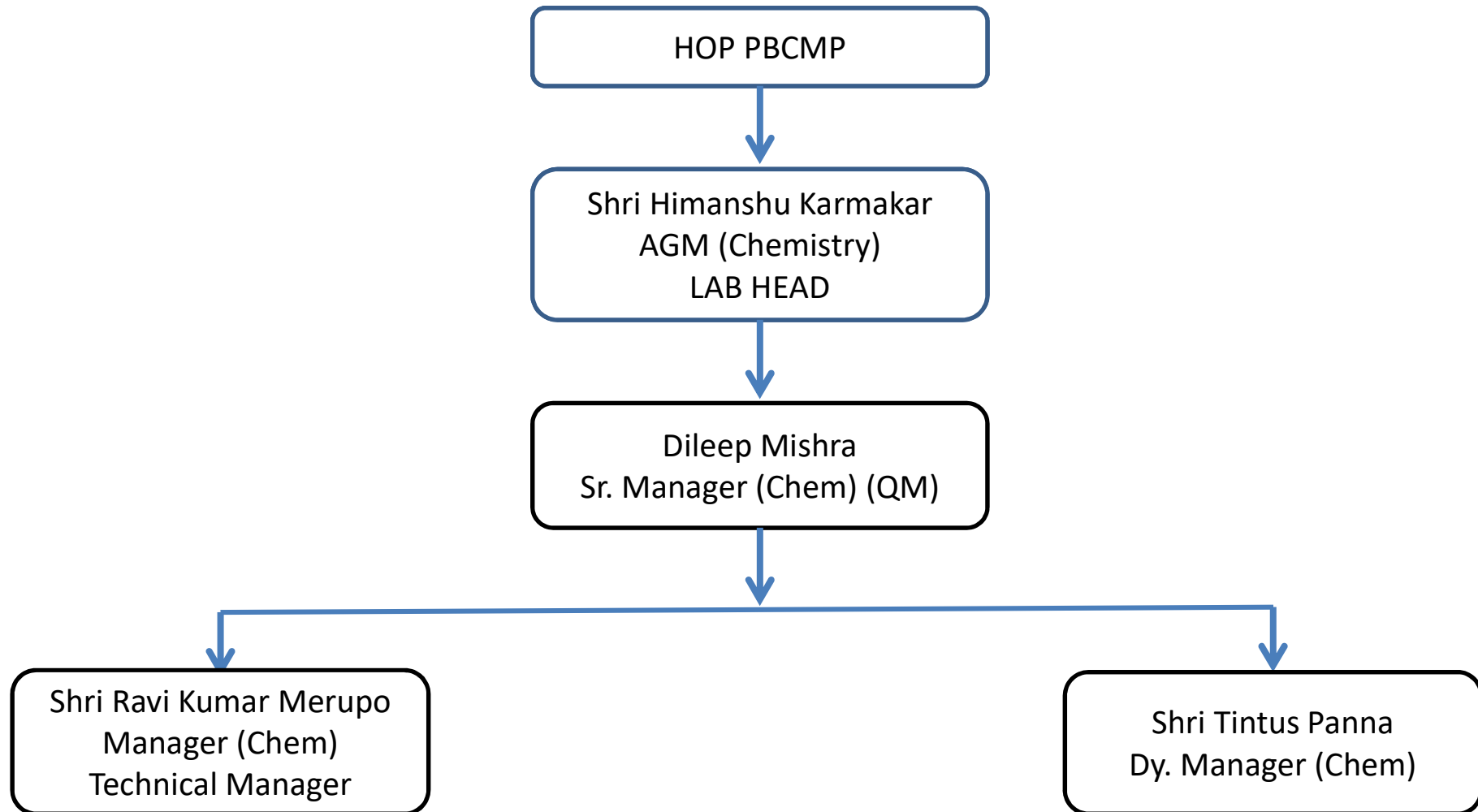
- ES to CGM (PB & PB-NW CMPs) – For kind information pl.
- GM(Infra)
- GM(LA /R&R)
- HoD EMG and HoD Chemistry- For necessary action pl.
- All HODs

Navin Kumar
नवीन कुमार / NAVIN KUMAR
उप महाप्रबंधक / DY. GENERAL MANAGER
(पर्यावरण प्रबंधन) / (ENVIRONMENT MANAGEMENT)
एनटीपीसी मॉनिंग लिमिटेड / NTPC Mining Limited (NML)
कोयला खनन परियोजना / COAL MINING PROJECT
हजारीबाग / Hazaribag

ORGANISATION CHART

Chemistry Department

Pakri Barwadih & Pakri Barwadih-North West Coal Mining project



Navin Kumar
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श्रीवसा खनन परियोजना / COAL MINING PROJECT
हजारीबाग / Hazaribag



NTPC Limited
(A Government of India Enterprise)
SSC - Coal Mining(Ranchi)
Sikri Site Office, P.O. Barkaga
Hazaribag - JHARKHAND
Jharkhand- 825311, India
Telephone No. : 06546-270808/267808 Fax No. : 06546270808

PURCHASE ORDER

To:
AASMA ENTERPRISES SH. ASHISH BHARGAVA
E116, NIRMAN NAGAR VISHWAS PATH,
AJMER ROAD BEHIND APPLE INN HOTEL,
JAIPUR JAIPUR
Rajasthan -302019
India
Tel: 8766616660 E-Mail : aasmaenterprises50@gmail.com

PAN No. : AAACN0255D
CIN No. : L40101DL1975GOI007966
Vendor Code : 1198844 (SME Vendor)
PAN No : AAQFA5328K

Purchase Order No. : 4600080863-M29-1040 Date: 25.09.2024 (version : 0)

GEM Order ID : GEMC-511687703312200

Reference : Supply, installation and commissioning of Solar Streetlight for Affected villages of PBCMP.

Our Enquiry No. : 9900287812 **Date** : 04.09.2024

Offer : GeM bid no. GEM/2024/B/5303978

Your Reference : GeM bid no. GEM/2024/B/5303978

Dear Sir,

We are pleased to accept your above cited offer along with correspondences thereof and place our Purchase Order No. 4600080863-M29-1040 dated 25.09.2024 for total order value of INR 1,129,464.00 (INR ELEVEN LAKH TWENTY-NINE THOUSAND FOUR HUNDRED SIXTY-FOUR ONLY). Please arrange to deliver the materials as detailed in Annexure-1 & 2 subject to terms and conditions specified in Annexure-3 and in our General Purchase Conditions, other specifications and requirement. Duplicate copy of the Purchase Order may please be signed and returned back to us within 15 days of its receipt in token of acceptance of the same. If no communication is received within 15 days of receipt of Purchase Order, it will be treated that order has been accepted in entirety.

Our general purchase conditions shall form part of Purchase Order for all other clauses.

For and on Behalf of NTPC Limited

For and on Behalf of NTPC Limited
Kumar Sudhakar
ADDL. GENERAL MANAGER
9650992016
KSUDHAKAR@NTPC.CO.IN

Enclosures

Navin Kumar
नवीन कुमार / NAVIN KUMAR
उप महाप्रबंधक / DY. GENERAL MANAGER
(पर्यावरण प्रबंधन) / (ENVIRONMENT MANAGEMENT)
एनटीपीसी लिमिटेड / NTPC Mining Limited (NML)
कोयला खनन परियोजना / COAL MINING PROJECT
हज़ारीबाग / Hazaribag

ANNEXURE - 1

Consignee - Str(l/c)/M/SM/DG/AG, Name: , Contact No.: ,
Email:

Indentor - Name: SANJIT KUMAR SENAPATI, **Contact No:** 9437147029, **Email:**
 SKSENAPATI@NTPC.CO.IN

Delivery/Invoicing Address:

1040 Pakri Barwadih CMP

Sikri Site Office, P.O. Barkaga Hazaribag - JHARKHAND

Jharkhand- 825311, India

Telephone No. : 06546-270808/267808 Fax No. : 06546270808

Invoicing to be done on

GST No. : 20AAACN0255D1ZC

Purchase Order Currency: Indian Rupee

Additional Information:

Our Transporter: M/S EAST INDIA TRANSPORT AGENCY-FOR SMALL&FULL
 TRUCK/TRAILER

M/S SURAT GOODS TRANSPORT PVT LTD-FOR FULL

TRUCK/TRAILER LOD

M/S ASSOCIATED ROAD CARRIERS LTD

w.e.f

S.No.	Material Code	Description	Qty.	UM	Unit Rate	Discount	Lumpsum Discount	Net Price	Total Amount
10		Solar street light supply & Installation	100.000	SET	11,294.6400	0%	0.00	11,294.6400	1,129,464.00

Tax: IN:Integrated GST-ND @ 12.00 % Extra

Total Amount	INR	1,129,464.00
Discount Value(Lumpsum)		0.00
Net Amount	INR	1,129,464.00

Navin Kumar
नवीन कुमार / NAVIN KUMAR
 ज्य. महाप्रबन्धक / DY. GENERAL MANAGER
 (पर्यावरण प्रबंधन) / (ENVIRONMENT MANAGEMENT)
 एनटीपीसी खनिज लिमिटेड / NTPC Mining Limited (NML)
 कोयला खनन परियोजना / COAL MINING PROJECT
 हजारीबाग / Hazaribag

For and on Behalf of NTPC Limited
 Kumar Sudhakar
 ADDL. GENERAL MANAGER
 9650992016
 KSUDHAKAR@NTPC.CO.IN

ANNEXURE - 2

NTPC Limited

(A Government of India Enterprise)

TECHNICAL DATA SHEET

S.No.	Material Code	Specification
10	Solar street light supply & Installation	<p>Supply, installation and commissioning of Solar Street light</p> <p>Make:- TAKEWAY</p> <p>MODEL: AASMA-SSLOR/NT20R5</p> <p>Technical specification:-</p> <p>Description : Solar Street Light (LED based) consist of white LED luminaire (LED + Driver) rating as per configuration along with Solar PV modules and LiFePo4 battery of given capacity, necessary control electronics, interconnecting wires / cables, module mounting structures, etc. to operate from dusk to dawn.</p> <ol style="list-style-type: none"> 1. Type of PV Module: Only indigenous modules of IEC Tested used. Crystalline high power/efficiency cells used in the solar photovoltaic module. 2. Power Output Of PV Module : # 75 Wp at 16.4 ±0.2 Volt at STC 3. PV Module Efficiency # 14%. 4. The open circuit voltage of the PV modules under STC (in volts): 21 5. Type of Battery: Lithium Ferro Phosphate battery (LiFePo4). Operating from dusk to dawn first four hour full brightness, rest of the time at lower level, with motion sensor 6. Battery capacity # 12.8 V (nominal), 30 Ah at STC (1 day autonomy) 7. Type Of LED (Light Source) : 20 Watt White LED type 8. LED chip Efficacy (Lumen/watt): #135 9. Luminaire System Efficacy - Lumen output - (Lumen/watt) #120 10. CRI > 70 % 11. Lighting quality Free from glare, flickering and UV 12. Wattage Power consumption of the LED Luminaire / Lighting unit # 30W (including LED and Driver power loss) 13. Ingress protection IP65 or better 14. Certification/ Test report: Yes, test certificate from MNRE/ NABL accredited labs 15. Provision of Fuses: Fuses provided to protect against short circuit conditions Protection Full protection against open circuit, accidental short circuit and for reverse polarity provided. 16. Total electronics efficiency # 90 % 17. Indicators On The System: Provided with 2 LED indicators: a green light to indicate charging in progress and a red LED to indicate deep discharge condition of the battery. The green LED glow only when the battery is actually being charged. 18. Nominal Bore Size Of Tube :: Thickness Of Tube : 65 mm / 4.5 mm 19. Height Of Pole (In M) : 7 20. Battery Box : Battery included in the luminaire enclosure, with water proof (IP65 or better) and corrosion resistant 21. Installation, Testing And Demonstration (Including Civil Work At Sites) (At Multiple Locations Shall Follow As Per The Regulations As Applicable) : Yes 22. The grouting should be such that it should withstand the maximum wind speed /storm of 180 kmph. The pole should be rest on a suitable foundation. (RCC Foundation size 600 mm x600 mm x 1250 mm deep and 500 mm above the ground level. must have 4/6/8 nos. foundation bolts of 1200 mm & 20mm dia. Bolts for fixing of light fittings and solar panels should be anti-theft SS Bolts. 23. Certifications: a. Certified by MNRE/NABL authorized test center as per latest edition of IEC 61215 edition II / IS 14286.

For and on Behalf of NTPC Limited
Kumar Sudhakar
ADDL. GENERAL MANAGER
9650992016
KSUDHAKAR@NTPC.CO.IN

Navin Kumar
नवीन कुमार / NAVIN KUMAR
ज्म महाप्रबन्धक / DY. GENERAL MANAGER
(पर्यावरण प्रबंधन) / (ENVIRONMENT MANAGEMENT)
एनटीपीसी मॉनिंग लिमिटेड / NTPC Mining Limited (NML)
होबसा खनन परियोजना / COAL MINING PROJECT
हजारीबाग / Hazaribag

NTPC Limited
(A Government of India Enterprise)

TECHNICAL DATA SHEET

S.No.	Material Code	Specification
		b. BIS CRS compliance for PV Module as per IEC 61215 Edition II / BIS 14286 from NABL or IECQ accredited Laboratory c. Hot dip galvanized condition the zinc coating on the tubes as per IS:4736 latest.

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कोयला खनन परियोजना / COAL MINING PROJECT
हजारीबाग / Hazaribag

ANNEXURE - 3Terms and Conditions

1.	Order Value	INR 1,129,464.00 (ELEVEN LAKH TWENTY-NINE THOUSAND FOUR HUNDRED SIXTY-FOUR ONLY)
2.	Price Basis	Free on Road/Rail NTPC PBCMP
3.	Freight Charges	Vendor's account
4.	Inspection	Material shall be inspected at Site Store
5.	Price Variation	Fixed Price Basis
6.	Place of Despatch	Jaipur (Rajsthan)
7.	Mode of transport	By road/courier
8.	P & F Charges	Inclusive
9.	Payment Terms	95% Payment shall be released upon supply, Installation of Solar Street light as per scope of work and as per instruction of EIC and submission for relevant documents for payment and CRAC generation by consignee. Balance 5% shall be withheld and will be released after completion of warranty period or on submission, acceptance and verification of PBG for an equivalent amount.
10.	Mode of payment	Through EFT Invoice to be raised on delivery/invoice address against the given PO line items.
11.	Delivery Period	Within 60 days from the date of issue of GEM PO.
12.	Insurance	By Vendor
13.	Bank Charges	Borne by VENDOR
14.	Warrantee / Guarantee	As per Special instructions
15.	PBG Amount	Not Applicable
16.	SD Amount	Not Applicable
17.	LD Rate	0.50 % per week or part thereof for the portion executed / supplied beyond agreed delivery schedule
18.	LD Ceiling	5.00 % of PO Value
19.	Special Instruction	1. GST extra@12%. 2. Quality and Warranty: - (a) The street lighting system (including the battery) will be warranted for a period of 3 years from the date of supply. (b) The PV module(s) will be warranted for a minimum period of 3 years from the date of supply. The PV modules must be warranted for their output peak watt capacity, which should not be less than 90% at the end of Ten (10) years and 80% at the end of Twenty five (25) years. (c) The Warranty Card to be supplied with the system must contain the details of the system. 3. Installation and commissioning of materials under vendor's scope without any extra charge. 4. The Solar Street Lights will be installed in nearby surrounding villages within 3KM to 18 KM radius (Maximum) from Sikri Site Office. 5. All other terms and conditions shall be as per GEM General terms & conditions (attached) and tender GTC.

Prepared By:
Arbind Kumar

For and on Behalf of NTPC Limited
Kumar Sudhakar
ADDL. GENERAL MANAGER
9650992016
KSUDHAKAR@NTPC.CO.IN

Navin Kumar
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हजारीबाग / Hazaribag

List of Documents

Please note that below documents are needed to be provided along with Invoice.

S.No.	Document Description
1	Invoice

For and on Behalf of NTPC Limited
Kumar Sudhakar
ADDL. GENERAL MANAGER
9650992016
KSUDHAKAR@NTPC.CO.IN

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NTPC VENDOR PAYMENT PORTAL & PAYMENT PROCEDURE

1.For all the cases where payment documents are to be directly submitted to NTPC (excluding Payment through Bank cases), the Invoice and supporting document(s) as required in the Purchase Order have to be Digitally Signed with class II or III digital signature and uploaded in the NTPC Vendor Payment Portal <https://pradip.ntpc.co.in/VendorFinal/Login.jsp>.

In such cases, there will be no requirement of physical copy of invoice & documents except for Lorry Receipts (LRs)/ Delivery Challan, which are normally sent along with the material/ transporter. Bank Guarantees to be sent in original wherever applicable.

2.From 01.01.2020, NTPC will accept only digitally signed Invoice & supporting documents from Vendors for direct payment cases. Submission of documents in physical form shall not be accepted by NTPC unless otherwise asked for in the PO.

For such cases of physical submission, Vendors are required to send complete set of documents including invoice etc. addressed to the "Invoice Receipt Center" of the Delivery/ Invoicing Address as mentioned in the Purchase Order Annexure 1/ BOQ Sheet.

While submitting the Invoice/ Bills & related documents in physical form, Vendors are required to mention the following details on the top of the envelope:

- a. Invoice/Bill reference No.
- b. NTPC PO No./ Package no.
- c. NTPC Vendor Code as per PO

In addition to above, vendors are requested to mention their correspondence E-mail & Mobile No.in the Covering Letter, through which invoice processing related information/clarification request may be sent.

3.Vendors can track / monitor the status of payments from the Vendor payment portal. Help documents are available in the portal. Vendors are requested to make full use of the Vendor Payment Portal.

4. For payment cases through bank, all original documents are to be submitted in bank as per terms of PO.

Alternate Mode of Payment for Micro Small & Medium Enterprises (MSMEs):

Trade Receivables Discounting System (TReDS) is a regulatory framework put in place by the Reserve Bank of India under the Payment and Settlement Systems Act 2007 (PSS Act) to facilitate the financing of trade receivables (invoices) of MSMEs through invoice financing by multiple financiers.

The Reserve Bank of India has granted approval to Mynd Solutions Pvt Limited, A.TREDS Ltd and Receivables Exchange of India Ltd (RXIL) to set up and operate TReDS platforms. The Respective TReDS platforms names of the above-mentioned entities are M1xchange, Invoicemart and TREDS.

Currently NTPC Limited is transacting with M1xchange and RXIL TReDS platforms. MSME Vendors may choose the TReDS platforms as an alternate payment mechanism.

For queries/ details, the vendor may directly contact M1xchange or RXIL at:-

M1XCHANGE:-

URL: <https://m1xchange.com>
Toll free No.: 1800-103-7261

RXIL:-

URL: <https://www.rxil.in/Home/Index>
Phone: 022-40771424, 40771426
Toll free No.: 1800 1038 311

Vendor must ensure the delivery of material and service before uploading invoices at TReDS portal for discounting. After uploading invoices on TReDS portal, vendor has to upload invoices on NTPC payment portal in case of Non-GeM contract and in case of GeM Contract invoices shall be uploaded on GeM portal, immediately . All relevant documents required for processing of payments as per P.O/Contract terms and conditions shall be made available by the Vendor along with the invoice.

Navin Kumar
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ज्य. महाप्रबन्धक / DY. GENERAL MANAGER
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कोयला खनन परियोजना / COAL MINING PROJECT
हजारीबाग / Hazaribag

Photographs of solar street light installed along the coal transport route



GPS Map Camera
 Darha, Sirka, Jharkhand, India
 Hazaribagh Tandwa Tangar Rd, Odarna, Jamuari,
 Jharkhand 825302, India
 Lat 23.919819° Long 85.289544°
 14/11/24 03:36 PM GMT +05:30
 Google



GPS Map Camera
 Darha, Sirka, Jharkhand, India
 Hazaribagh Tandwa Tangar Rd, Odarna, Jamuari,
 Jharkhand 825302, India
 Lat 23.919819° Long 85.289644°
 14/11/24 03:42 PM GMT +05:30
 Google



GPS Map Camera
 Siso, Fatha, Jharkhand, India
 Hazaribagh Tandwa Tangar Rd, Odarna, Jamuari,
 Jharkhand 825302, India
 Lat 23.919819° Long 85.289544°
 14/11/24 04:08 PM GMT +05:30
 Google



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 Jharkhand 825302, India
 Lat 23.919819° Long 85.289544°
 14/11/24 03:29 PM GMT +05:30
 Google

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 हजारीबाग / Hazaribag



NTPC Limited

(A Government of India Enterprise)

SSC - Coal Mining(Ranchi)

Sikri Site Office, P.O. Barkaga

Hazaribag - JHARKHAND

Jharkhand- 825311, India

Telephone No. : 06546-270808/267808 Fax No. : 06546270808

Service Purchase Order

PAN No. : AAACN0255D

CIN No. : L40101DL1975GOI007966

Purchase Order No. : 4600080151-187-1040 **Date :** 24.07.2024 **(version : 0)**

To

CACTUS PROFILES PVT LTD
B-12, SECTOR-81
DISTT-GAUTAM BUDH NAGAR
NOIDA
Uttar Pradesh
India - 201301
Tel: 01204251012-14
Fax: 01204251011
E-Mail : INFO@CACTUSPROFILES.COM

Vendor Code : 1143679

GEM Order ID : GEMC-511687756451556
Subject: : Supply and Installation of Bio Toilet Portable Cabin Size 6X4ft.
NIT NO. : 9900281223 Dated
Your Offer No. :
Your Reference :
Our Reference : GEM Contract No: GEMC-511687756451556 Dated: 18-Jul-2024
Bid/RA/PBP No.: GEM/2024/B/4978469

Dear Sir,

This has reference to our above mentioned NIT, Your offer and subsequent discussions. We are pleased to accept your offer opened on and confirm having awarded on you the work of Supply and Installation of Bio Toilet Portable Cabin Size 6X4ft. of total value INR 1,008,813.54 (Rupee TEN LAKH EIGHT THOUSAND EIGHT HUNDRED THIRTEEN POINT FIFTY-FOUR ONLY) mentioned in the scope of works, special terms & conditions, Bill of quantities etc.

The duration of the service period shall be from 18.07.2024 to 16.09.2024. Though the duration of contract shall remain same, the actual date of commencement of the contract shall be as per the direction of EIC. AGM/DGM Concern. Dept. shall be EIC for this work.

This service purchase order along with its annexure is being issued to you in duplicate .We request you to return the duplicate copy of this service purchase order, duly signed on each page by your authorised signatory in token of your unequivocal acknowledgment of the same within 15 days from the date of this service purchase order. If no communication is received within 15 days of receipt of Purchase Order, it will be treated that order has been accepted in entirety.

We thank you for the interest shown by you in our project and the cooperation extended to us. We expect to receive your continued cooperation in future also.

Thanking You,
For & on behalf of NTPC Limited.

Sr. Manager (C&M)

Enclosures :

GEM Contract No: GEMC-511687756451556 Dated: 18-Jul-2024

Navin Kumar
नवीन कुमार / NAVIN KUMAR
ज्य. महासंचालक / DY. GENERAL MANAGER
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कोयला खनन परियोजना / COAL MINING PROJECT
हजारीबाग / Hazaribag

(Bill of Quantity)**Name of Work:**

Supply and Installation of Bio Toilet Portable Cabin Size 6X4ft.

SI No.	Code	Description	Unit	Quantity	Net Price	Amount	Long Text
--------	------	-------------	------	----------	-----------	--------	-----------

Delivery/Invoicing Address:

1040 Pakri Barwadiah CMP
 Sikri Site Office, P.O. Barkaga Hazaribag - JHARKHAND
 Jharkhand
 825311
 India
 06546-270808/267808
 06546270808
 Invoicing to be done on
GST No. : 20AAACN0255D1ZC

10		Bio Toilet	AU	1.000	1,008,813.54	1,008,813.54	
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Tax: IN:Integrated GST-ND @ 18.00 % **Extra**

10 .10		STRUCTURE	NO	6	67,796.6100	406,779.66	
10 .20		FURNISHING & INSULATION	NO	6	21,186.4400	127,118.64	
10 .30		ELECTRICAL(Wiring & Fitting)	NO	6	21,186.4400	127,118.64	
10 .40		PAINTING	NO	6	8,474.5800	50,847.48	
10 .50		SANITARY & PLUMBING	NO	6	12,711.8600	76,271.16	
10 .60		WASTE MANEGMENT	NO	6	36,779.6600	220,677.96	

TOTAL OF BOQ PART : 00010 INR 1008813.54

Amount**1008813.54**

Other Charges

0.00

Net Amount on BOQ PART : 00010

INR 1008813.54

Net Total Amount

INR 1,008,813.54

Less Rebate/Amount

INR 0.00

Grand Total

INR 1,008,813.54

INR TEN LAKH EIGHT THOUSAND EIGHT HUNDRED THIRTEEN AND FIFTY-FOUR PAISA ONLY

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Terms & Conditions

Payment Terms

- i. 60% of the payments may be released to the agency after cabin/bio toilet reached at site.
- ii. 35% of the payments may be released after installing and handing over of Toilets.
- iii. Balance 5% after Completion of Warranty period or on submission of PBG of equivalent amount having validity of 15 months from the date of completion of installation and commissioning.

Payment Mode

EFT

Invoice to be raised on delivery/invoice address against the given PO line items.

Liquidated Damages

@ 0.50 % per week or part there of for the portion of works executed beyond the agreed completion date subject to a maximum of 10.00 % PO value.

Special Instruction

1. Name of Agency: M/s CACTUS PROFILES PRIVATE LIMITED.
2. Award Price: Rs.11,90,400/- (Incl GST).
3. GST: Included
4. Scope of Work: As per Technical Specifications.
5. Delivery Period: Supply & Installation of Boi- Toilets within 2 Months from the date of issue of GeM contract.
6. Performance Bank Guarantee: Vendor to submit PBG of 5% of total contract value.
7. Price Basis: FIRM and FOR destination
8. F&I: Freight Charges, loading, material transit insurance is in agency's scope.
9. Guarantee / Warrantee: 12 Month Warranty (only in MS Structure) after installation of Toilet Portable Cabin.
10. Mode of payment: Through EFT
11. Bank charge: Vendor's account
12. Price: Firm
13. LD: @ 0.5% of the contract value of delayed quantity per week or part of the week of delayed period as pre-estimated damages not exceeding 10% of the contract value of delayed quantity.
14. Material Inspection : At Site.
15. All Other Terms and Conditions as per provision of Bidding Documents.

Sr. Manager (C&M)

Sr. Manager (C&M)

Navin Kumar

नवीन कुमार / NAVIN KUMAR
 जन महामबन्धक / DY. GENERAL MANAGER
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 इन्टीग्रेटेड कोयला खनिज लिमिटेड / NTPC Mining Limited (NML)
 कोयला खनन परियोजना / COAL MINING PROJECT
 हजारीबाग / Hazaribag

Break up of Price (For Service Related Lines Only)

SI No.	Service Code	Description	Qty.	UOM	Rate	Premium	Discount	Addl Discount	Net Rate	Value
10.10		STRUCTURE	6	NO	67,796.61	0.00	0.00	0.00	67,796.61 00	406,779.66
10.20		FURNISHING & INSULATION	6	NO	21,186.44	0.00	0.00	0.00	21,186.44 00	127,118.64
10.30		ELECTRICAL(Wiring & Fitting)	6	NO	21,186.44	0.00	0.00	0.00	21,186.44 00	127,118.64
10.40		PAINTING	6	NO	8,474.58	0.00	0.00	0.00	8,474.580 0	50,847.48
10.50		SANITARY & PLUMBING	6	NO	12,711.86	0.00	0.00	0.00	12,711.86 00	76,271.16
10.60		WASTE MANEGMENT	6	NO	36,779.66	0.00	0.00	0.00	36,779.66 00	220,677.96

Prepared By:
NAYAN KUMAR DALEI

Sr. Manager (C&M)

Navin Kumar

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 उपायुक्त / DY. GENERAL MANAGER
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 हजारीबाग / Hazaribag

List of Documents

Please note that below documents are needed to be provided along with Invoice.

S.No.	Document Description
1	Invoice
2	CCP-10/11 For Services

Sr. Manager (C&M)

Navin Kumar
नवीन कुमार / NAVIN KUMAR
ज्येष्ठ महाप्रबंधक / DY. GENERAL MANAGER
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NTPC VENDOR PAYMENT PORTAL & PAYMENT PROCEDURE

1. For all the cases where payment documents are to be directly submitted to NTPC (excluding Payment through Bank cases), the Invoice and supporting document(s) as required in the Purchase Order have to be Digitally Signed with class II or III digital signature and uploaded in the **&gv_cocd&** Vendor Payment Portal <https://pradip.ntpc.co.in/VendorFinal/Login.jsp>.

In such cases, there will be no requirement of physical copy of invoice & documents except for Lorry Receipts (LRs)/ Delivery Challan, which are normally sent along with the material/ transporter. Bank Guarantees to be sent in original wherever applicable.

2. From 01.01.2020, NTPC will accept only digitally signed Invoice & supporting documents from Vendors for direct payment cases. Submission of documents in physical form shall not be accepted by NTPC unless otherwise asked for in the PO.

For such cases of physical submission, Vendors are required to send complete set of documents including invoice etc. addressed to the "Invoice Receipt Center" of the Delivery/ Invoicing Address as mentioned in the Purchase Order Annexure 1/ BOQ Sheet.

While submitting the Invoice/ Bills & related documents in physical form, Vendors are required to mention the following details on the top of the envelope:

- a. Invoice/Bill reference No.
- b. **NTPC PO No./ Package no.**
- c. **NTPC Vendor Code as per PO**

In addition to above, vendors are requested to mention their correspondence E-mail & Mobile No. in the Covering Letter, through which invoice processing related information/clarification request may be sent.

3. Vendors can track / monitor the status of payments from the Vendor payment portal. Help documents are available in the portal. Vendors are requested to make full use of the Vendor Payment Portal.

4. For payment cases through bank, all original documents are to be submitted in bank as per terms of PO.

Alternate Mode of Payment for Micro Small & Medium Enterprises (MSMEs):

Trade Receivables Discounting System (TReDS) is a regulatory framework put in place by the Reserve Bank of India under the Payment and Settlement Systems Act 2007 (PSS Act) to facilitate the financing of trade receivables (invoices) of MSMEs through invoice financing by multiple financiers.

The Reserve Bank of India has granted approval to Mynd Solutions Pvt Limited, A.TREDS Ltd and Receivables Exchange of India Ltd (RXIL) to set up and operate TReDS platforms. The Respective TReDS platforms names of the above-mentioned entities are M1xchange, Invoicemart and TREDS.

Currently NTPC Limited is transacting with M1xchange and RXIL TReDS platforms. MSME Vendors may choose the TReDS platforms as an alternate payment mechanism.

For queries/ details, the vendor may directly contact M1xchange or RXIL at:-

M1XCHANGE:-

URL: <https://m1xchange.com>
Toll free No.: 1800-103-7261

RXIL:-

URL: <https://www.rxil.in/Home/Index>
Phone: 022-40771424, 40771426
Toll free No.: 1800 1038 311

Vendor must ensure the delivery of material and service before uploading invoices at TReDS portal for discounting. After uploading invoices on TReDS portal, vendor has to upload invoices on NTPC payment portal in case of Non-GeM contract and in case of GeM Contract invoices shall be uploaded on GeM portal, immediately. All relevant documents required for processing of payments as per P.O/Contract terms and conditions shall be made available by the Vendor along with the invoice.

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Photographs of bio-toilet



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नवीन कुमार / NAVIN KUMAR
उप महाप्रबन्धक / DY. GENERAL MANAGER
(पर्यावरण प्रबंधन) / (ENVIRONMENT MANAGEMENT)
एनटीपीसी मॉनिंग लिमिटेड / NTPC Mining Limited (NML)
कोयला खनन परियोजना / COAL MINING PROJECT
हजारीबाग / Hazaribag

Submission of Certified Compliance Report (CCR) and one-month baseline data on environment quality along the Coal Transportation route of PBCMP, NTPC Limited: Reg.

From NAVIN <NAVINKUMAR03@NTPC.CO.IN>


Date Fri 15/12/2023 21:54

To lk.bokolia@nic.in <lk.bokolia@nic.in>

Cc munna.shah@gov.in <munna.shah@gov.in>; TSPAKRI <tspakri@ntpc.co.in>; Sumeet Kumar <SUMEETKUMAR@NTPC.CO.IN>; Birendra Kumar <BIRENDRAKUMAR01@NTPC.CO.IN>; Ketan Kumar <MEWARKETAN@NTPC.CO.IN>; D Shrikhande <DSHRIKHANDE@NTPC.CO.IN>; NeerajJalota <NEERAJJALOTA@NTPC.CO.IN>; VijayPrakash <VIJAYPRAKASH@NTPC.CO.IN>

 2 attachments (22 MB)

Cover letter for Submission of CCR & Monitoring Report.pdf; Annexure-1 CCR dated 15.12.2023.pdf;

 [Annexure-2 Environment Base line data PBCMP compressed.pdf](#)

Respected Sir,

While expressing sincere gratitude for granting amendment of EC for coal transportation by road till 31.01.2024 vide amendment letter J-11015/692/2007-IA-II(M) dated 09.11.2023, we hereby submit the following wrt specific conditions mentioned therein:

Specific condition SI No- 1.1: Conditions laid down in amended EC letter dated 16.08.2023 are being implemented and status of the same is mentioned in the Certified Compliance Report of RO, MOEF&CC Ranchi letter no 103-425/pt/1680 dated 15.12.2023 (attached as Annexure-1).

Specific Condition No- 1.2: Certified Compliance Report (CCR) from IRO for the Amendment of Environmental Clearance (EC) dated 16.08.2023 is attached as Annexure-1.

Specific Condition No- 1.3: One-month baseline data on environmental quality – air (PM10, PM2.5, SOx, NOx and heavy metals such as Hg, Pb, Cr, AS, etc), noise, water (surface and groundwater), soil at different location of the existing coal transportation route is attached as Annexure-2.


We humbly wish to submit that NTPC is committed to comply with the statutory conditions/directions issued from your good office time to time and request to kindly consider our submission for extension of timeline for coal transportation by road till 31.12.2024.

Submitted for your kind consideration and favorable order please.

Thanking you.

सादर / Warm regards,

नवीन कुमार/ Navin Kumar
DGM (Mining), Environment Mgmt.
एनटीपीसी लिमिटेड / NTPC Ltd.


नवीन कुमार / NAVIN KUMAR
ज्य. महाप्रबन्धक / DY. GENERAL MANAGER
(पर्यावरण प्रबंधन) / (ENVIRONMENT MANAGEMENT)
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कोयला खनन परियोजना / COAL MINING PROJECT
हजारीबाग / Hazaribag

Pakri Barwadih Coal Mining Project,
Sikri Site Office, Barkagaon,
Hazaribagh 825301 (Jharkhand)
मोबाइल / Mobile 9470197223 / 7004012892



Navin Kumar
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उप महाप्रबंधक / DY. GENERAL MANAGER
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कोयला खनन परियोजना / COAL MINING PROJECT
हजारीबाग / Hazaribag


MOEFCC File No. J-11015/692/2007-IA-11(M) dated 15.01.2024: Submission of monthly progress report of conveyor belt and silo loading system at Pakri Barwadih Coal Mines Project (PBCMP) of NTPC Mining Limited.

From NAVIN KUMAR <env-pb@nml.co.in>

Date Tue 03/12/2024 17:34

To ROR MoEFCC <ro.ranchi-mef@gov.in>

Cc TSPAKRI <tspakri@ntpc.co.in>; Upendra Kumar Pandit <UPENDRAKUMARPANDIT@NTPC.CO.IN>; NAVIN <NAVINKUMAR03@NTPC.CO.IN>; Birendra Kumar <BIRENDRAKUMAR01@NTPC.CO.IN>; Sanjay Kumar Dubey <SKDUBEY02@NTPC.CO.IN>; Faiz Taiyab <FAIZTAIYAB@NTPC.CO.IN>

 1 attachment (2 MB)

D. No. 184 Date 03.12.2024 (Monthly Progress Report RLS).pdf;

CAUTION: This Email has been sent from outside the Organization. Unless you trust the sender, Don't click links or open attachments as it may be a Phishing email, which can steal your Information and compromise your Computer.


Respected Sir,

With reference to the specific condition no. 1.1 of the EC Amendment letter dated 15.01.2024, we hereby submit the monthly progress report of conveyor belt and silo loading system (Silo Rapid Loading System) as on 30.11.2024 at Pakri Barwadih Coal Mines Project (PBCMP) of NTPC Mining Limited.

This is for your kind consideration please.

सादर / Warm regards,

नवीन कुमार/ Navin Kumar
DGM (Envt. Mgmt.)
एनटीपीसी माइनिंग लिमिटेड / NTPC Mining Ltd.
Pakri Barwadih Coal Mining Project,
Sikri Site Office, Barkagaon,
Hazaribagh 825301 (Jharkhand)
मोबाइल / Mobile 9470197223


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कोयला खनन परियोजना / COAL MINING PROJECT
हजारीबाग / Hazaribag

ICFRE – Institute of Forest Productivity

(Indian Council of Forestry Research and Education)

Gumla Road, National Highway - 23, Lalgutwa, Ranchi – 835303,
Jharkhand



Final Report on

Audit of Densification and Assessing Efficiency of Existing Plantation

of

M/s NTPC Mining Limited

at

**Pakri Barwadih Coal Mining Project NTPC (PBCMP),
Barkagaon, Hazaribagh, Jharkhand**



October 2024

Navin Kumar
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हजारीबाग / Hazaribag

ICFRE-IFP, Ranchi, Jharkhand, 835303

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Gumla Road, National Highway - 23, Lalgutwa, Ranchi – 835303,
Jharkhand



Final Report on

Audit of densification and assessing efficiency of existing plantation

of M/s NTPC Mining Limited at Pakri Barwadih Coal Mining Project
NTPC (PBCMP), Barkagaon, Hazaribagh, Jharkhand

REPORT COMPILED BY:

- **Dr. Yogeshwar Mishra**, Scientist-G and Group Coordinator (Research),
Project Leader
- **Shri Ravi Sankar Prasad**, Chief Technical Officer
- **Shri Sanjoy Garai**, Research Associate
- **Shri Ayushman Malakar**, Senior Research Fellow



डॉ योगेश्वर मिश्रा, जी सी (आर)
Dr. Yogeshwar Mishra
Group Coordinator
(Research)

भा वा अ शि प - वन उत्पादकता संस्थान

(भारतीय वानिकी अनुसंधान एवं शिक्षा परिषद)

(वन, पर्यावरण, एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार की एक स्वायत्त निकाय)
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ICFRE - INSTITUTE OF FOREST PRODUCTIVITY

(Indian Council of Forestry Research & Education)

(An Autonomous Body of the Ministry of Environment, Forest and Climate Change, Govt of India)

Lalgutwa, Gumla Road, N.H.-23, Ranchi-835303 (Jharkhand)

Email: dir_ifp@icfre.org, ifpranchi2018@gmail.com

Website:-www.ifp.icfre.gov.in

Phone: 0651- 2526140
2526150

Final Report on

Audit of densification and assessing efficiency of existing plantation

of M/s NTPC Limited at Pakri Barwadih Coal Mining Project NTPC
(PBCMP), Barkagaon, Hazaribagh, Jharkhand

This report is meant for internal use of your organization only and it should not be published in full or part by your organization. It should not be communicated or circulated to outside parties except concerned departments. However, ICFRE-IFP reserves the right to publish the results of the investigations for the benefit of the industry. The conclusions and recommendations are based on the results of investigations. It is hoped that the recommendations will be helpful to get the optimum results without hampering production, productivity and safety. The recommendations are the guidelines, which should be implemented in later and spirit.

Signature of the Project Head

(Dr. Yogeshwar Mishra)

Scientist-G and Group Coordinator (Research)

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हजारीबाग / Hazaribag



डॉ योगेश्वर मिश्रा, जी सी (आर)
Dr. Yogeshwar Mishra
Group Coordinator
(Research)

भा वा अ शि प - वन उत्पादकता संस्थान
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लागतवा, गुमला रोड, रांची ८३५ ३०३ (झारखण्ड)

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FORWARD

NTPC, India's largest energy conglomerate, has been at the forefront of power development since 1975. NTPC engaged M/S Thriveni Sainik Mining Private Limited as the Mine Developer Cum Operator (MDO) for the Pakri-Barwadih Coal Mining Project (PBCMP) at Barkagaon, Hazaribagh, Jharkhand.

ICFRE - Institute of Forest Productivity, Ranchi, was entrusted with auditing the densification and assessing the efficiency of existing plantations at PBCMP. The audit covered 13.5 ha out of a total of 135 ha of plantations, providing a representative sample of the overall plantation efforts.

The audit revealed encouraging results, with survival rates consistently between 85% to 95% across various plantation sites. The plantations demonstrated a diverse range of species, including native varieties well-suited to local conditions. Growth metrics were promising, with tree heights ranging from 3 to 12 feet and girth sizes spanning 15 to 50 cm.

Despite challenges such as water logging in some areas and occasional human interference, the overall trend indicates a positive trajectory in plantation efforts. The audit highlighted the strategic use of resilient species and the conscious effort to enhance biodiversity, including the introduction of fruit-bearing and ornamental trees.

This report underscores NTPC and its MDO's commitment to effective environmental restoration and sustainable practices in mining operations. It provides valuable insights for future plantation strategies, emphasizing the need for site-specific adjustments and continuous monitoring. The success of these plantations not only contributes to ecological balance but also aligns with NTPC's broader goals of responsible resource management and community engagement.

Y.M.
21/10/2021

(Dr. Yogeshwar Mishra)

Scientist-G and Group Coordinator (Research)

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1. INTRODUCTION:

NTPC Limited is India's largest energy conglomerate with roots planted way back in 1975 to accelerate power development in India. Since then, it has established itself as the dominant power major with presence in the entire value chain of the power generation business with a capacity of approximately 68 GW. From fossil fuels it has forayed into generating electricity via hydro, nuclear and renewable energy sources.

To strengthen its core business and a step towards reliable fuel security, NTPC Limited entered in the fields of Coal mining as well. NTPC incorporated a wholly-owned subsidiary company named as "NTPC Mining Limited" (NML) on 29th Aug'19 for carrying out its mining business by creating a dedicated workforce with focused approach. NTPC Mining Limited is developing 7 coal blocks allocated directly to it and one coal block of PVUNL, a JV of NTPC Limited with Govt. of Jharkhand, for captive consumption of the coal. The total peak rated annual production capacity of these coal blocks estimated to be 86 MMT to fuel approximately 15 GW of NTPC Mining Limited."

NTPC Mining Limited is allocated 8 coal blocks having peak rated capacity of 86 MMTPA. It has started coal production from its 5 coal blocks i.e Pakri Barwadih, Chattibariatu and Keredari in Jharkhand, Dulanga in Odisha and Talaipalli in Chhattisgarh. During FY 2023-24, NTPC Mining Limited achieved 34.39 MMT coal production from its all operating mines. Other mines are in various stages of development and expected to start coal production in near future. Leading from the front, in FY 2023-24, Pakri Barwadih coal mine has also achieved the highest ever coal production of 16.31 Million tons since start.

In efforts to eliminate environmental injustices, the working areas have been installed with dust suppression and water-sprinkling systems. The monitoring of emissions, SOx, NOx, particulate matter, etc. are being done continuously, and tree plantation is being done at all available opportunities. Transformation from diesel operated HEMMs to electrically operated HEMMs has started in these mines.

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Heeding to the words of Benjamin Franklin - An investment in knowledge pays the best interest, NTPC Mining Limited is imparting skill development training to the coal mining project affected persons to make them employable. NTPC Pakri-Barwadih has tied up with Government of Jharkhand to run the NTPC Mining Industrial Training Institute (MAITI), established in Pakri- Barwadih mine area, through Jharkhand Government Mini Tool Room and Training Center (JGMTRTC).

As a part of backward integration, NTPC Limited forayed into the coal mining sector, and so far, its operational mines have delivered more than 48 million MT of coal to more than 22 thermal plants of NTPC Limited. The coal, from captive coal mines, is much sought after in NTPC Mining Limited power stations because of its consistent quality, size and absence of any shale/boulder etc. So far, NTPC Coal Mining has delivered against all odds and shall continue to ensure sustainable coal supply to its power plants for delivery of cheap and uninterrupted power to the stakeholders.

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2. COMPLAINTS:

NTPC Limited has been allotted Pakri Barwadih coal mining block by the Ministry of Coal, Government of India vide its allotment letter no. 13016/29/2003-CA dated 11.10.2004. The mining plan was approved by the Ministry of Coal vide its letter ref. no. 13016/29/2003- CA (Part) dated 25.08.2006 and the revised Mining Plan and Mine Closure Plan was approved on 07.03.2016. NTPC Limited started mining operations in the month of December 2016 after obtaining all the statutory permissions related to coal mining. Further, in line with the Ministry of Coal, GoI OM no. F.No. 34011/28/2019-CPAM dated 29.05.2020 the Mining Plan and Mine Closure Plan has been revised in year 2023 by competent authority of NTPC Limited. Further, the coal is now being operated by NTPC Mining Limited wholly owned subsidiary of NTPC limited.

Environment clearance has been accorded by Ministry of Environment, Forest and Climate Change (MoEFCC) vide letter ref. no. J-11015/692/2007-IA.II(M) Dated 19.05.2009 with amendment dated 29.06.2016, dated 07.12.2017, 14.08.2018, 10.11.2020, 16.08.2023, 09.11.2023, 15.01.2024, 06.03.2024, 02.05.2024 (transferred to NTPC Mining Limited) and 16.07.2024.

Stage-I Forest Clearance have been accorded vide letter ref. no. 8-56/2009-FC dated 11.05.2010 and Stage-II forest clearance vide 8-56/2009-FC dated 17.09.2010 with amendment dated 25.05.2023.

CTO has been accorded by Jharkhand State Pollution Control Board (JSPCB) vide letter ref. no. JSPCB/HO/RNC/CTO-18605537/2024/379 Dated 10.03.2024 with validity up to 28.02.2025.

NOC from Central Ground Water Authority for abstraction of ground water has been accorded vide NOC. No. CGWA/NOC/MIN/ORIG/2023/17449 dated 03rd January 2023 and valid up to 02nd January 2025.

NTPC incorporated a wholly-owned subsidiary company named as “NTPC Mining Limited” (NML) on 29th Aug’19 for carrying out its mining business by creating a dedicated workforce with focused approach.

M/s NTPC Mining Ltd. Engaged M/s Thriveni Sainik Mining Private Limited as Mine Developer Cum Operator (MDO) at Pakri-Barwadih Coal Mining Project. M/s Thriveni Sainik ICFRE-IFP, Ranchi, Jharkhand, 835303

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कोयला खनन परियोजना / COAL MINING PROJECT
हजारीबाग / Hazaribag

Private Limited endowed their trust on ICFRE-Institute of Forest Productivity, Ranchi, Jharkhand for audit of densification and assess efficiency of existing plantation at Pakri Barwadih Coal Mining Project NTPC (PBCMP) through work order of vide no. TSMPL/SC/WO/ENV/ICFRE/23-24/04 dated 01/04/2024.

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कोयला खनन परियोजना / COAL MINING PROJECT
हजारीबाग / Hazaribag

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3. OBJECTIVES:

A detailed sampling methodology was designed to visit 10% plantation area for conducting a detailed survey, monitoring and evaluation exercise such that it represents all the plantation done by Pakri Barwadih Coal Mining Project, NTPC Mining Limited. In total, ICFRE-IFP proposed to monitor and evaluate plantation covering an area of ~13.5 ha from of a total of 135 ha area brought under plantation by Pakri Barwadih Coal Mining Project and adjacent areas.

A research team from ICFRE-IFP was deployed from 19.09.2024 to 22.09.2024 for the task to complete the audit, survey and monitoring of the selected plantation plots in PBCMP, Barkagaon, Hazaribagh, Jharkhand.

This report is the Final Report of observations and findings of the auditing, monitoring and evaluation work carried out by ICFRE-IFP for the plantations done by Pakri Barwadih Coal Mining Project, NTPC Mining Limited, Barkagaon, Hazaribagh, Jharkhand.

The auditing of the plantation was carried out with the following objective –

- 3.1. To verify area/length/boundary of plantation area
- 3.2. To count the number of planted seedlings/trees
- 3.3. To verify the plantation area through GPS coordinates
- 3.4. To audit the plantation species wise through random sampling (10%) of each site
- 3.5. To estimate the survival percentage of the plantation sites
- 3.6. To study the height and health of the plants/trees in the plantation sites
- 3.7. To study the gabion/protection of plantations
- 3.8. To evaluate the pressures and effects of human/cattle interference in the plantation area.
- 3.9. To find reasons and remedies in case of plantation failure
- 3.10. To recommend for success/betterment of the plantation schemes and its future plans

4. STUDY LOCATION:

Pakri Barwadih coal mining block is located in North Central part of North Karanpura coal fields in Hazaribagh district of Jharkhand State. The Hazaribagh – Khelari – Ranchi State highway passes through the eastern and southern parts of the block touching Barkagaon and Tandwa villages. The nearest township is Hazaribagh located at a distance of 25 km from Barkagaon village on southern part of the coal block. State capital Ranchi is located at 120 km distance. The nearest Railway station is Ranchi Road (on Gomoh – Barkakana – Dehri -on-sone loop lines of Eastern Railway) at a distance of 70 km from the block. The coal deposit is covered under Survey of India toposheet no. 73 E/1 and bounded by latitudes of 23.85833°N to 23.92777°N and longitude of 85.15527°E to 85.25527°E. The location map of study area is given in **Figure 1**.

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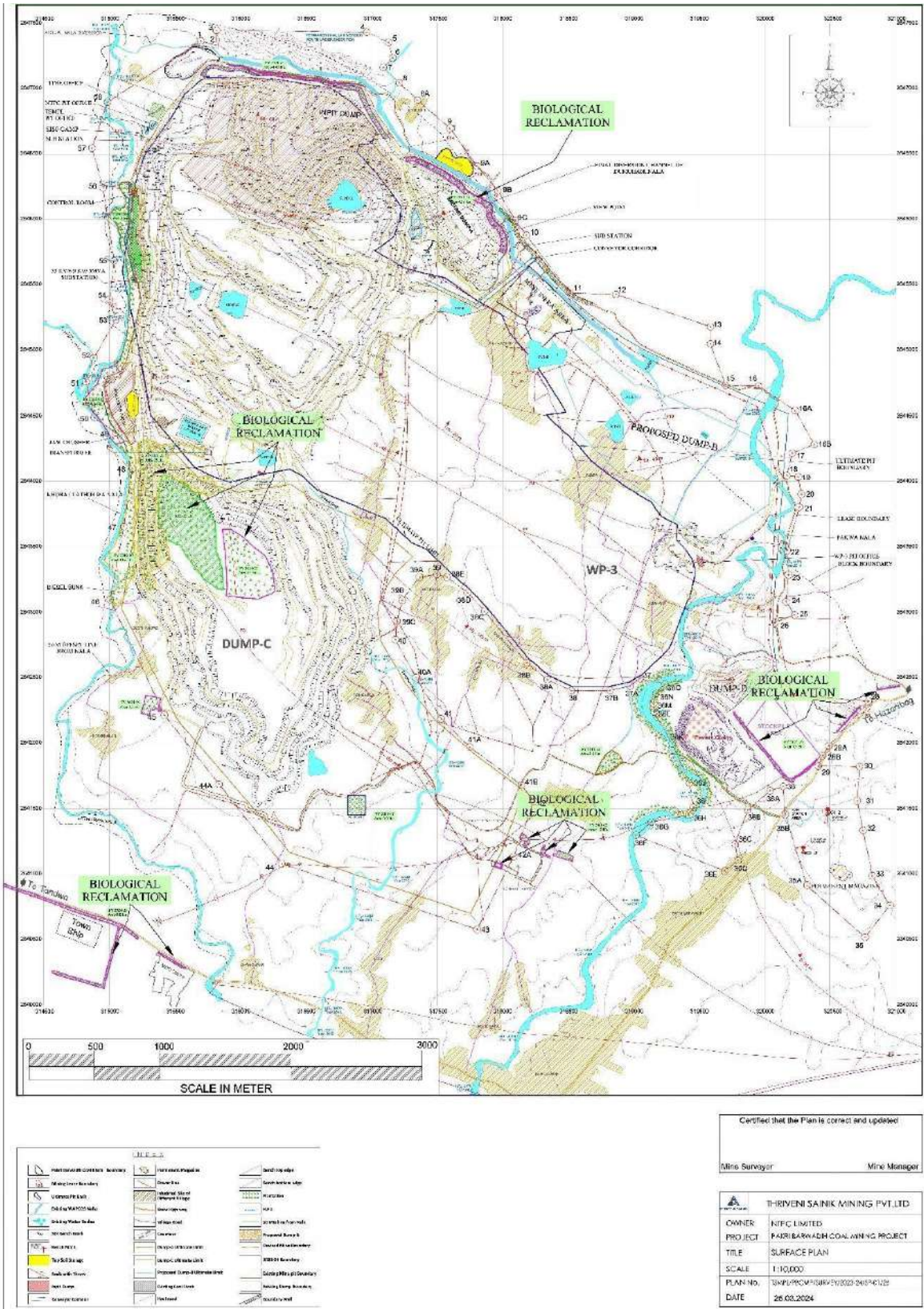


Figure 1: Study Location of the Plantation audit carried out by ICFRE-IFP
(Map Courtesy: M/s Thriveni Sainik Mining Private Limited)

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5. STUDY DESIGN AND METHODOLOGY:

5.1. Sampling Methodology –

For physical verification and qualitative assessment of the conditions of the plantation following approaches were carried out:

10% of the total plantations was visited by ICFRE-IFP to undertake the evaluation which corresponds to block plantation area in Ha and roadside gabion plantation in running kms, respectively.

5.1.1. For Field Plantations (Figure 2)

- Method: Quadrat sampling
- Quadrat size: 15m x 15m
- Sampling density: 5 quadrats per hectare
- Data collected: Information on planted seedlings, their height, and health



Figure 2: Random quadrat sampling of 15m X 15m per 1 ha

ICFRE-IFP, Ranchi, Jharkhand, 835303

5.1.2. Line Plantations (along roads, canals, Nalas etc.) (Figure 3)

- Method: Line transect sampling
- Transect length: 100m
- Sampling density: 3 transects per km

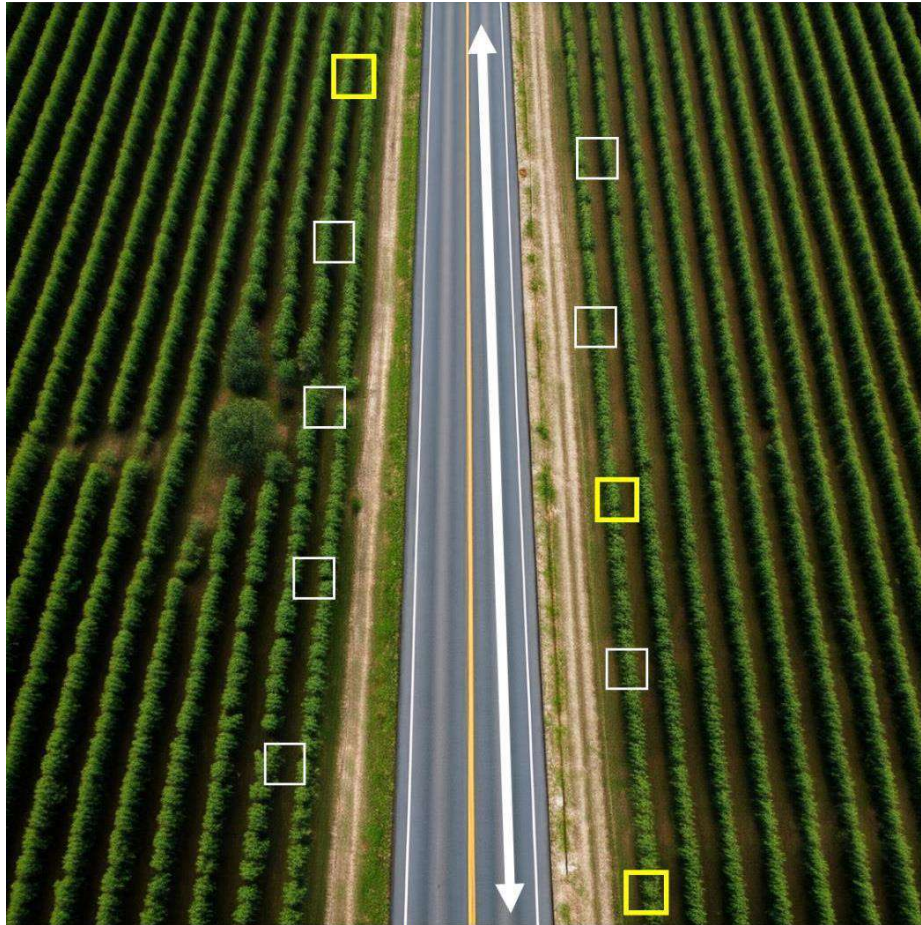


Figure 3: Random evaluation of selected 3 transects (in yellow) among 10 transects per 1 km

Verification of various documents were also physically carried out by ICFRE-IFP on-site.

Based on this sampling methodology ICFRE-IFP physically audited a total of 43 quadrats laid randomly in the total block plantation sites along with 34 transects selected randomly per km of line/roadside/gabion plantation in the study area.

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हजारीबाग / Hazaribag

ICFRE-IFP, Ranchi, Jharkhand, 835303

5.2. Monitoring Methodology –

Each of the selected quadrats/transects was visited by the monitoring team. Following details were documented on field:

- ✓ Plantation Plot location (Geo coordinates) and area planted (cumulative)
- ✓ Plantation model type and design (if any)
- ✓ Age of the plantation
- ✓ Number of saplings/trees planted (cumulative)
- ✓ Average height of the saplings/trees (species wise)
- ✓ Average girth at breast height (GBH) of the saplings/trees (Species wise)
- ✓ Number of plants surviving at the time of monitoring
- ✓ Species composition and distribution
- ✓ Protection system and maintenance
- ✓ Anthropogenic pressures (Grazing Pressure or illicit cutting)

During the visits at the selected plots for physical verification, the team of ICFRE-IFP got the wholehearted assistance and support of the officials and field staffs of Pakri Barwadih Coal Mining Project, M/s NTPC Mining Limited and its MDO M/s Thriveni Sainik Mining Private Limited in terms of::

- ✓ Area/plot identification
- ✓ Showing boundary of the plot
- ✓ Supports during field auditing
- ✓ Providing updated copies of Plantation Register (along with details of casualty replacement) and Plantation Maps
- ✓ Acquaintance to the plantation site, implementation of plantation model undertaken at the plot, details regarding plantation works and future plans for plantations.
- ✓ Logistic and Accommodation supports etc.

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5.3. Parameters of the Audit –

Using a diversified strategy including several ecological and silvicultural criteria, the thorough auditing and monitoring of the plantations was carried out. These protocols detailed an organized approach to gathering and analysing data, based on tried-and-true methods in the field of forest ecology and management.

Plot location and area measurement formed the foundation of the monitoring process. Precise geospatial coordinates were recorded using handheld Global Positioning System (GPS) devices while area measurement employed a combination of GPS tracking and remote sensing techniques. The evaluated total plantation area by ground truthing was cross-checked with the plantation area data provided by M/s NTPC Mining Limited and its MDO M/s Thriveni Sainik Mining Private Limited.

The plantation model type and design were assessed through visual inspection and documentation of spatial tree arrangements. This included identification of specific planting patterns such as row planting or mixed species blocks.

Determining the age of the plantation relied on consultation of plantation records available with M/s NTPC Mining Limited. Additionally, age estimation was based on tree size and known growth rates for the species in question on field.

Quantification of planted saplings or trees involved direct counting within each quadrat. For larger plantation blocks, sampling techniques such as plot sampling were employed, followed by extrapolation to the entire area. Some data were also provided by M/s NTPC Mining Limited which were cross-checked in field.

Average height measurement utilized various tools depending on tree size. For smaller trees, height poles or measuring tapes sufficed, while taller specimens required digital Haga-altimeter. For denser plantations, ocular estimation was also sufficed in field. Species wise average height was calculated as per the formula - $\Sigma(f * x)/N$

Where, f is frequency i.e. no. of plants of the given spp. in a particular class interval, (e.g. 456 in 10-20cm class interval); x is Middle value of the class interval, (e.g. 15 for 10-20 cm class interval); and N is total number of the plants of the particular spp.

Girth at Breast Height (GBH) was measured using diameter tapes at a standard height of 1.37 meters above ground level. For trees on slopes or with irregularities, GBH was converted to Diameter at Breast Height (DBH) using the formula: $DBH = GBH / \pi$

Survival rate assessment involved counting living trees and comparing this figure with planting records. The survival percentage (S) was calculated as: $S = (N_s / N_p) * 100$

Where, N_s was the number of surviving trees and N_p was the number of planted trees.

Species composition and distribution analysis required identification of all present species. The research team of ICFRE-IFP identified the available species of trees/plants in each plantation site using expert knowledge. The spatial distribution of different species within the quadrat or transect was documented, contributing to biodiversity assessments through calculation of Important Value Index (IVI) for each species. The minimum number and size of quadrates to be laid determined by species area curve method (Mishra, 1968) were in alignment of our predetermined methodology.

The recorded data from the quadrats and transects laid were analyzed quantitatively for calculating frequency, density, dominance and the relative values of these parameters. Estimation of Importance Value Index (IVI) of the available tree species was carried out based on species dominance as it is proved to be more justified while calculating IVI for tree community with higher girth. Shannon-Wiener index, and Pielou's Evenness index were calculated thereafter. Following mathematical expressions were used in the study to estimate IVI, Shannon-Wiener and Simpson's index.

$$\text{❖ Frequency (\%)} = \frac{\text{Number of quadrates of species occurrence}}{\text{Total number of quadrates sampled}} \times 100$$

$$\text{❖ Density} = \frac{\text{Total number of individuals of a species present in all quadrates}}{\text{Total number of quadrates sampled}}$$

$$\text{❖ Dominance} = \text{Total basal area covered by stems of all individuals of a species in all of the quadrates under study. The basal area of individual tree is calculated by } \frac{GBH^2}{4\pi} \text{, where GBH stands for Girth at Breast Height of that individual tree taken at 1.37 m above from the ground.}$$

$$\text{❖ Relative frequency} = \frac{\text{Frequency of one species}}{\text{Frequency of all species}} \times 100$$

- ❖ Relative density = $\frac{\text{Density of one species}}{\text{Density of all species}} \times 100$
- ❖ Relative dominance = $\frac{\text{Dominance of one species}}{\text{Dominance of all species}} \times 100$
- ❖ Importance Value Index (IVI) = Relative Frequency + Relative Density + Relative Dominance
- ❖ Shannon-Wiener Index (H') = $-\sum P_i \log P_i$
- ❖ Pielou's Evenness index (J') = $\frac{H'}{\ln S}$, where H' corresponds to Shannon-Wiener Index and S stands for the total number of species occurred in the study area.

Assessment of protection systems and maintenance involved observing and documenting protective measures such as fencing, gabions or signage, as well as evidence of maintenance activities like pruning or weeding. Finally, evaluation of anthropogenic pressures focused on identifying signs of grazing (e.g., browsed vegetation, hoof prints) and illegal cutting or harvesting. Standardized scales were used to quantify pressure levels, allowing for comparison across different plantation sites.

This extensive monitoring and audit program gave a strong structure for evaluating the state of development of the compensatory plantation carried out by M/s NTPC Mining Limited at Pakri Barwadih Coal Mining Project (PBCMP), Barkagaon, Hazaribagh, Jharkhand.

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6. RESULTS AND DISCUSSIONS:

For plantation works, it was observed that seedlings and saplings are being provided from the nursery of M/s PBCMP as well as brought from other sources also. Visit to the nursery (23.87505°N, 85.20171°E) was done and the following species were observed in the nursery which are enumerated in Table 1:

Common Name	Scientific Name
Sal	<i>Shorea robusta</i>
Almond	<i>Prunus dulcis</i>
Camphor	<i>Cinnamomum camphora</i>
Guava	<i>Psidium guajava</i>
Tejpatta	<i>Cinnamomum tamala</i>
Neem	<i>Azadirachta indica</i>
Naspati	<i>Pyrus communis</i>
Sarifa	<i>Annona squamosa</i>
Gullar	<i>Ficus glomerata</i>
Chakundi	<i>Cassia siamiae</i>
Mulberry	<i>Morus alba</i>
Chinese Guava	<i>Psidium cattleianum</i>
Mahaneem	<i>Ailanthus excelsa</i>
Eucalyptus	<i>Eucalyptus spp.</i>
Jackfruit	<i>Artocarpus heterophyllus</i>
Coral Tree	<i>Erythrina indica</i>
Sahejan	<i>Moringa oleifera</i>
Sthal Kamal	<i>Nelumbo nucifera</i>
Pakar	<i>Ficus virens</i>
Mahogany	<i>Swietenia mahagoni</i>
Baken	<i>Melia azedarach</i>
Grapes	<i>Vitis vinifera</i>
Gamhar	<i>Gmelina arborea</i>
Drooping Ashoka	<i>Polyalthia longifolia var. pendula</i>
Spreading Ashok	<i>Polyalthia longifolia</i>

Bahera	<i>Terminalia bellirica</i>
Pigeon Wood	<i>Tream orientale</i>
Bakul	<i>Mimusops elengi</i>
Subabul	<i>Leucaena leucocephala</i>
Mango	<i>Mangifera indica</i>
Lemongrass	<i>Cymbopogon citratus</i>
Peepal	<i>Ficus religiosa</i>
Harsingar	<i>Nyctanthes arbor-tristis</i>
Amaltash	<i>Cassia fistula</i>
Curry leaves	<i>Murraya koenigii</i>
Shisham	<i>Dalbergia sissoo</i>
Khirni	<i>Manilkara hexandra</i>
Nimbu	<i>Citrus limon</i>
Bamboo	<i>Bambusa spp.</i>
Anar	<i>Punica granatum</i>

Maintenance of the nursery was found suitable and scientific. The nursery is capable of supplying the required seedlings/saplings in large quantity for the plantation works. Majority of the seedlings and saplings of all species were found healthy and free from any kind of pest or disease attacks.

The plantation sites were visited individually to take observations on the study parameters of the trees planted. Table 2 enumerates year-wise number of cumulative plants which have been planted in the study area at Pakri Barwadih Coal Mining Project (PBCMP) of M/s NTPC Mining Limited.

Year	Number of plants
2016	4500
2017	15195
2018	20250
2019	49120
2020	42036
2021	79994
2022	22670
2023	78977
2024	211767
Total	524509

Several Plantation sites at Pakri Barwadih Coal Mining Project (PBCMP) of M/s NTPC Mining Limited were visited and phytosociological analysis of the planted seedlings and saplings were recorded. Table 3 shows the geo-coordinates of several plantation blocks/sites where audit for densification and assessment of existing plantation was performed..

Table 3: Geo-coordinates of several Blocks/Roadside plantations audited

Area	Latitude (°N)	Longitude (°E)
Dump 90 Meter	23.89140	85.18716
	23.89294	85.18645
	23.89550	85.18633
	23.89835	85.18643
	23.89786	85.18839
	23.89756	85.18990
	23.89739	85.19062
	23.89661	85.19108
Old Work Shop Deworia along with Latorwa Nala	23.89031	85.18470
	23.89108	85.18482
	23.89256	85.18470
	23.89469	85.18475
	23.89663	85.18467
	23.89847	85.18463
	23.90012	85.18437
	23.90166	85.18350
Urub Nala	23.90327	85.18329
	23.90541	85.18404
Top Soil Inter	23.90952	85.18505
Logistic Office	23.91368	85.18469
	23.91710	85.18475
Arahara dispatch road	23.87852	85.22624
	23.87800	85.22681
	23.87690	85.22843
	23.87608	85.22980
	23.87463	85.23298

Arahara Plantation	23.87829	85.22006
	23.87764	85.22019
	23.87728	85.21983
Langathu Primary School	23.87164	85.21675
	23.87128	85.21786
	23.87167	85.21728
	23.87131	85.21714
Langathu Village Plot-1	23.87140	85.21609
	23.87158	85.21569
	23.87153	85.21547
	23.87192	85.21569
Langathu Village Plot-2	23.87214	85.21416
	23.87264	85.21456
	23.87267	85.21386
	23.87300	85.21406
Deworia Plantation	23.89002	85.18510
	23.89282	85.18483
OB Dump Plantation	23.89449	85.18488
Khora Nala Side Plantation	23.90407	85.18335
	23.90547	85.18410
	23.90898	85.18487
Embankment	23.91056	85.18523
	23.91313	85.18433
NTPC Office, Sikri	23.86741	85.18046
	23.86818	85.17817
R&R Colony, Dhenga	23.84663	85.18046
	23.86818	85.17817
Miyawaki Plantation Plot (2024)	23.88157	85.18614
Miyawaki Plantation Plot (2023)	23.91273	85.18433

A Detailed analysis of the audit performed in field in enumerated in Table 4.

Table 4: Performance of Plantation works at Pakri Barwadih Coal Mining Project NTPC (PBCMP)								
Location	Geo-coordinates		Species		Survival %	Average height (ft)	Average GBH/CD (cm)	Special Remarks (if any)
	Latitude (°N)	Longitude (°E)	Common Name	Scientific Name				
Miyayaki Plantation	23.881552	85.18673	Teak	<i>Tectona grandis</i>	The trees in this plantation plot are observed to have >90% of survivability	1.5-3	15-35	Proper species selection is recommended for canopy height optimisation
			Kadam	<i>Anthocephalus cadamba</i>				
			Arjun	<i>Terminalia arjuna</i>				
			Aonla	<i>Emblica officinalis</i>				
			Mahogany	<i>Swietenia mahagoni</i>				
			Jamun	<i>Syzygium cumini</i>				
			Karanj	<i>Pongamia pinnata</i>				
			Kachnar	<i>Bauhinia purpurea</i>				
			Peepal	<i>Ficus religiosa</i>				
			Bakain	<i>Melia azadirach</i>				
			Kanail	<i>Cascabela thevetia</i>				
			Mahua	<i>Madhuca indica</i>				
			Urhul	<i>Hibiscus rosa chinensis</i>				
			Sarifa	<i>Annona squamosa</i>				
			Sisham	<i>Dalbergia sissoo</i>				
			Curry Leaves	<i>Murraya koenigii</i>				
Bakul	<i>Mimusops elengi</i>							
Simal	<i>Bombax ceiba</i>							

Along Khora Nala Embankment	23.89574	85.184799	Chakundi	<i>Cassia siamea</i>	The trees in this plantation plot are observed to have >85% of survivability	4-7	20-45	Chakundi is the predominant species
			Palash	<i>Butea monosperma</i>				
			Babul	<i>Acacia nilotica</i>				
			Bakain	<i>Melia azadirach</i>				
			Mahogany	<i>Swietenia mahagoni</i>				
			Tal	<i>Borassus flabellifer</i>				
			Teak	<i>Tectona grandis</i>				
			Siris	<i>Albizia lebbeck</i>				
			Neem	<i>Azadirachta indica</i>				
			Sisham	<i>Dalbergia sissoo</i>				
			Bargad	<i>Ficus benghalensis</i>				
Sinduri	<i>Bixa orellana</i>							
Dump C	23.89418	85.1848	Chakundi	<i>Cassia siamea</i>	The trees in this plantation plot are observed to have >85% of survivability	5-8	25-50	Chakundi, Babul and Subabul are found to be the predominant species.
			Babul	<i>Acacia nilotica</i>				
			Jamun	<i>Syzygium cumini</i>				
			Siris	<i>Albizia lebbeck</i>				
			Bakain	<i>Melia azadirach</i>				
			White siris	<i>Albizia procera</i>				
			Kaash Gras	<i>Saccharum spontaneum</i>				
			Kanail	<i>Cascabela thevetia</i>				
			Karanj	<i>Pongamia pinnata</i>				
			Subabul	<i>Leucaena leucocephala</i>				
			Radhachura	<i>Peltophorm ferrugineum</i>				
			Shisham	<i>Dalbergia sissoo</i>				
			Bamboo	<i>Bambusa spp.</i>				
Ber	<i>Ziziphus mauritiana</i>							

90 meter	23.89527	85.18927	Shisham	<i>Dalbergia sissoo</i>	The trees in this plantation plot are observed to have ~90% of survivability	5-10	15-35	Plantation is being expanded this year with seedlings of Karanj, Gulmohar, Arjun etc. A good variety of Grass species was observed in this plantation which refers to good biodiversity.
			Gulmohar	<i>Delonix regia</i>				
			Radhachura	<i>Peltophorm ferrugineum</i>				
			Kachnar	<i>Bauhinia purpurea</i>				
			Siris	<i>Albizia lebbek</i>				
			Amaltas	<i>Cassia fistula</i>				
			Khair	<i>Acacia catechu</i>				
			Raintree	<i>Samanea saman</i>				
			Pigeon Wood	<i>Trema orientale</i>				
			Jamun	<i>Syzygium cumini</i>				
			Eucalyptus	<i>Eucalyptus spp.</i>				
			Kadam	<i>Anthocephalus cadamba</i>				
			Bamboo	<i>Bambusa spp.</i>				
			Aonla	<i>Emblica officinalis</i>				
			Akashmani	<i>Acacia auriculiformis</i>				
			Arjun	<i>Terminalia arjuna</i>				
			Amrudh	<i>Psidium guajava</i>				
			Mango	<i>Mangifera indica</i>				
			Karanj	<i>Pongamia pinnata</i>				
			Kadam	<i>Anthocephalus cadamba</i>				
Gulmohar	<i>Delonix regia</i>							
Mulberry	<i>Morus alba</i>							
Arjun	<i>Terminalia arjuna</i>							
Amaranthas	<i>Amaranthus viridis</i>							
Hara Simal	<i>Ceiba pentandra</i>							

Miyayaki Sample Plot	23.91273	85.18433	Bakain	<i>Melia azadirach</i>	The trees in this plantation plot are observed to have ~90% of survivability	3-8	20-45	Well established Miyayaki plot with optimum species selection.
			Neem	<i>Azadirachta indica</i>				
			Karanj	<i>Pongamia pinnata</i>				
			Kachnar	<i>Bauhinia purpurea</i>				
			Kadam	<i>Anthocephalus cadamba</i>				
			Raintree	<i>Samanea saman</i>				
			Hara Simal	<i>Ceiba pentandra</i>				
			Gullar	<i>Ficus racemosa</i>				
			Chakundi	<i>Cassia siamea</i>				
			Chatim	<i>Alstonia scholaris</i>				
			Jamun	<i>Syzygium cumini</i>				
			Amaltas	<i>Cassia fistula</i>				
Ber	<i>Ziziphus mauritiana</i>							
Roadside Linear Plantation near Gate 3	23.92527	85.19445	Gulmohar	<i>Delonix regia</i>	The trees in this plantation plot are observed to have ~85% of survivability	3-6	15-25	Some mortality is observed mainly due to the problem of waterlogging, proper drainage system is recommended
Roadside Linear Plantation	23.91392	85.21358	Peepal	<i>Ficus religiosa</i>	The trees in this plantation plot are	2-4	15-25	Plantation is carried out this year also
			Bakain	<i>Melia azadirach</i>				
			Gulmohor	<i>Delonix regia</i>				

along Dispatch Road at Gate 4			Bargad	<i>Ficus benghalensis</i>	observed to have ~90% of survivability			along with previous year seedlings
			Kanail	<i>Cascabela thevetia</i>				
			Gullar	<i>Ficus racemosa</i>				
			Arjun	<i>Terminalia arjuna</i>				
			Neem	<i>Azadirachta indica</i>				
Roadside Linear Plantation at CHP along Conveyer belt	23.88132	85.29935	Gulmohar	<i>Delonix regia</i>	The trees in this plantation plot are observed to have ~85% of survivability	3-5	15-20	Protected by barbed wire.
			Peepal	<i>Ficus religiosa</i>				
Roadside Linear Plantation at Langathu Office Road (14 Mile)	23.87458	85.23302	Kadam	<i>Anthocephalus cadamba</i>	The trees in this plantation plot are observed to have >90% of survivability	3-7	15-30	Linear plantation on both side of the road. East query boundary by barbed wire.
			Lambu	<i>Khaya anthotheca</i>				
			Hara Simal	<i>Ceiba pentandra</i>				
			Subabul	<i>Leucaena leucocephala</i>				
			Mahogny	<i>Swietenia mahagoni</i>				
			Shisham	<i>Dalbergia sissoo</i>				
			Gulmohar	<i>Delonix regia</i>				
			Kadam	<i>Anthocephalus cadamba</i>				
			Bakain	<i>Melia azadirach</i>				
			Peepal	<i>Ficus religiosa</i>				
			Chatim	<i>Alstonia scholaris</i>				
			Chakundi	<i>Cassia siamea</i>				
Roadside Linear	23.87701	85.2141	Kadam	<i>Anthocephalus cadamba</i>	The trees in this plantation plot are	3-6	15-30	Some cattles were seen to graze along
			Chatim	<i>Alstonia scholaris</i>				

Plantation at Office Road			Jacaranda	<i>Jacaranda mimosifolia</i>	observed to have ~90% of survivability			the linear plantation
			Shisham	<i>Dalbergia sissoo</i>				
			Gulmohor	<i>Delonix regia</i>				
			Gamhar	<i>Gmelina arborea</i>				
			Bakain	<i>Melia azadirach</i>				
			Peepal	<i>Ficus religiosa</i>				
			Lambu	<i>Khaya anotheca</i>				
			Bottlebrush	<i>Callistemon pachyphyllus</i>				
			Mahogany	<i>Swietenia mahagoni</i>				
			Radhachura	<i>Peltophorm ferrugineum</i>				
			Arjun	<i>Terminalia arjuna</i>				
			Raintree	<i>Samanea saman</i>				
			Simal	<i>Bombax ceiba</i>				
Hara Simal	<i>Ceiba pentandra</i>							
Plantation near Langathu Infront Main office	23.87165	85.21577	Teak	<i>Tectona grandis</i>	The trees in this plantation plot are observed to have >95% of survivability	7-10	25-65	Both Block and Roadside Linear Plantation is audited. Karanj and Arjun were found to be most prevalent along with Neem, Chakundi.
			Arjun	<i>Terminalia arjuna</i>				
			Karanj	<i>Pongamia pinnata</i>				
			Chakundi	<i>Cassia siamea</i>				
			Peepal	<i>Ficus religiosa</i>				
			Kadam	<i>Anthocephalus cadamba</i>				
			Jacaranda	<i>Jacaranda mimosifolia</i>				
			Chatim	<i>Alstonia scholaris</i>				
			Neem	<i>Azadirachta indica</i>				
			Shisham	<i>Dalbergia sissoo</i>				
Bakain	<i>Melia azadirach</i>							

			Simal	<i>Bombax ceiba</i>				Some associate shrubs were observed in the ground floors of block plantation. The plantation was done at a 3m X 3m spacing.
			Gulmohar	<i>Delonix regia</i>				
			Chilbil	<i>Holoptelea integrifolia</i>				
			Gobla	<i>Ficus hispida</i>				
			Bargad	<i>Ficus benghalensis</i>				
			Foxtail Palm	<i>Wodyetia bifurcata</i>				
			Bottlebrush	<i>Callistemon pachyphyllus</i>				
Block Plantation at Gate 2	23.87215	85.21413	Karanj	<i>Pongamia pinnata</i>	The trees in this plantation plot are observed to have ~95% of survivability	6-12	20-50	Karanj was found to be dominant. However, problem of waterlogging was observed in this site.
			Chakundi	<i>Cassia siamea</i>				
			Arjun	<i>Terminalia arjuna</i>				
			Shisham	<i>Dalbergia sissoo</i>				
			Neem	<i>Azadirachta indica</i>				
			Chatin	<i>Alstonia scholaris</i>				
			Mahogany	<i>Swietenia mahagoni</i>				
Akashmoni	<i>Acacia auriculiformis</i>							
Sikri, Rajabagi	23.86368	85.18872	Mahogany	<i>Swietenia mahagoni</i>	The trees in this plantation plot are observed to have ~90% of survivability	4-6	15-25	Major dominancy was shown by Mahogny mixed with other species.
			Gamhar	<i>Gmelina arborea</i>				
			Peepal	<i>Ficus religiosa</i>				
			Poplar	<i>Populus deltoides</i>				
			Neem	<i>Azadirachta indica</i>				
			Gulmohor	<i>Delonix regia</i>				
	23.8665	85.18405	Lambu	<i>Khaya anthotheca</i>		10-15	25-45	

Sikri Township NTPC Mining limited			Karanj	<i>Pongamia pinnata</i>	The trees in this plantation plot are observed to have >95% of survivability			Lambu and Arjun is predominant. Some waterlogged conditions were observed, although the species are well defined for such conditions. This block is protected with border-barbed wire and iron-angles.
			Chatin	<i>Alstonia scholaris</i>				
			Gamhar	<i>Gmelina arborea</i>				
			Kadam	<i>Anthocephalus cadamba</i>				
			Jamun	<i>Syzygium cumini</i>				
			Radhachura	<i>Peltophorm ferrugineum</i>				
			Gulmohor	<i>Delonix regia</i>				
			Neem	<i>Azadirachta indica</i>				
			Arjun	<i>Terminalia arjuna</i>				
			Amaltas	<i>Cassia fistula</i>				
			Teak	<i>Tectona grandis</i>				
Chakundi	<i>Cassia siamea</i>							
Arahara Block Plantation	23.87732	85.21989	Chakundi	<i>Cassia siamea</i>	The trees in this plantation plot are observed to have >95% of survivability	10-20	20-50	Spacing of this block plantation is 4.5m X 4.5m. Very optimum site for block plantation.
			Jamun	<i>Syzygium cumini</i>				
			Arjun	<i>Terminalia arjuna</i>				
			Shisham	<i>Dalbergia sissoo</i>				
			Siris	<i>Albizia lebbek</i>				
			Karanj	<i>Pongamia pinnata</i>				
			Amrudh	<i>Psidium guajava</i>				
			Kathal	<i>Artocarpus heterophyllus</i>				
			Palash	<i>Butea monosperma</i>				
Aonla	<i>Embllica officinalis</i>							

			Rain Tree	<i>Samanea saman</i>				
			Neem	<i>Azadirachta indica</i>				
			Radhachura	<i>Peltophorm ferrugineum</i>				
			Akashmoni	<i>Acacia auriculiformis</i>				
R&R Colony Plantation	23.84588	85.22865	Gulmohor	<i>Delonix regia</i>	The trees in this plantation plot are observed to have >90% of survivability	3-15	10-30	Both block and roadside linear plantation is observed.
			Amaltas	<i>Cassia fistula</i>				
			Jacaranda	<i>Jacaranda mimosifolia</i>				
			Melaleuca	<i>Melaleuca quinquenervia</i>				
			Aonla	<i>Emblica officinalis</i>				
			Shisham	<i>Dalbergia sissoo</i>				
			Jamun	<i>Syzygium cumini</i>				
			Gamhar	<i>Gmelina arborea</i>				
			Chakundi	<i>Cassia siamea</i>				
			Mango	<i>Mangifera indica</i>				
			Raintree	<i>Samanea saman</i>				
			Peacock Flower	<i>Caesalpinia pulcherrima</i>				
			Kanail	<i>Cascabela thevetia</i>				
			Mulberry	<i>Morus alba</i>				
Sarifa	<i>Annona squamosa</i>							
Raintree	<i>Samanea saman</i>							
Bakain	<i>Melia azadirach</i>							
CISF Camp Plantation	23.84988	85.23045	Shisham	<i>Dalbergia sissoo</i>	The trees in this plantation plot are observed to	5-10	10-35	This block plantation (2016-17) was followed by
			Arjun	<i>Terminallia arjuna</i>				
			Amaltas	<i>Cassia fistula</i>				
			Subabul	<i>Leucaena leucocephala</i>				

			Simal	<i>Bombax ceiba</i>	have ~70-75% of survivability		This block plantation was managed in consistent manner comprising some tree species along with fresh planation of some horticultural species, however gap-filling activity may be taken up in due course to maintain the sustainability and consistency of this plantation. However, a nearby block was planted in 2024 during several occasion days with fruit
			Karanj	<i>Pongamia pinnata</i>			
			Neem	<i>Azadirachta indica</i>			
			Gulmohor	<i>Delonix regia</i>			
			Radhachura	<i>Peltophorm ferrugineum</i>			
			Jacaranda	<i>Jacaranda mimosifolia</i>			
			Akashmoni	<i>Acacia auriculiformis</i>			
			Ber	<i>Ziziphus mauritiana</i>			
			Kumkum	<i>Mallotus philippensis</i>			
			Raintree	<i>Samanea saman</i>			
			Kanail	<i>Cascabela thevetia</i>			
			Gulmohor	<i>Delonix regia</i>			

								species like Mango, Naspati, Litchi, Guava, Sarifa, Jamun
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								as corrective measures.
Sewage Treatment Plant Block Plantation	23.84665	85.22942	Mango	<i>Mangifera indica</i>	The trees in this plantation plot are observed to have ~95% of survivability	10-20	20-45	This block plantation is a well established Mango orchard.
Dump D	23.88307	85.23258	Mango	<i>Mangifera indica</i>	Could not been measured	4-7	10-25	The DUMP D Plantation is a self-burning dump and hence mortality is high. Plantation works have been retried on the foothills for Sustainability.
			Radhachura	<i>Peltophorm ferrugineum</i>				
			Shisham	<i>Dalbergia sissoo</i>				
			Gulmohor	<i>Delonix regia</i>				
			Bakain	<i>Melia azadirach</i>				
			Babul	<i>Acacia nilotica</i>				
			Karanj	<i>Pongamia pinnata</i>				
			Simal	<i>Bombax ceiba</i>				
			Arjun	<i>Terminalia arjuna</i>				
Neem	<i>Azadirachta indica</i>							
Plantation Near Conveyer Belt	23.88111	85.23338	Mango	<i>Mangifera indica</i>	The trees in this plantation plot are observed to have ~80% of survivability	5-10	15-25	Both block and linear plantation was observed. Some protected plantation were observed.
			Radhachura	<i>Peltophorm ferrugineum</i>				
			Shisham	<i>Dalbergia sissoo</i>				
			Gulmohor	<i>Delonix regia</i>				
			Bakain	<i>Melia azadirach</i>				
			Babul	<i>Acacia nilotica</i>				
			Karanj	<i>Pongamia pinnata</i>				
Simal	<i>Bombax ceiba</i>							

			Arjun	<i>Terminalia arjuna</i>				
			Neem	<i>Azadirachta indica</i>				
			Radhachura	<i>Peltophorm ferrugineum</i>				
			Peepal	<i>Ficus religiosa</i>				
			Mahogny	<i>Swietenia mahagoni</i>				
			Gulmohor	<i>Delonix regia</i>				
			Chakundi	<i>Cassia siamea</i>				
Block Plantation near Main Office	23.87016	86.21568	Neem	<i>Azadirachta indica</i>	The trees in this plantation plot are observed to have ~90% of survivability	7-15	25-45	This block is predominant by Gamhar and protected by barbed fence.
			Kadam	<i>Anthocephalus cadamba</i>				
			Gamhar	<i>Gmelina arborea</i>				
			Shisham	<i>Dalbergia sissoo</i>				
			Ber	<i>Ziziphus mauritiana</i>				

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Table 5 enumerates the calculations of species composition in the plantation audited. Figure 4 graphically describes the species composition through enumeration of IVI, Shanon-Weiner diversity and Piebu's Evenness Index for top 25 species found in 43 quadrats laid and transects during the audit at the plantation sites.

Table 5: Calculation of IVI, Shanon-Weiner diversity and Piebu's Evenness Index for top 25 species								
Sl. No.	Common Name	Scientific Name	Relative Frequency	Relative Density	Relative Dominance	IVI	Shannon-Weiner diversity Index	Piebu's Evenness Index
1	Chakundi	<i>Cassia siamea</i>	5.8360	6.1118	5.2469	17.1947	0.1708	0.0424
2	Karanj	<i>Pongamia pinnata</i>	5.3628	5.4616	4.4753	15.2997	0.1588	0.0356
3	Shisham	<i>Dalbergia sissoo</i>	4.4164	4.4863	4.6296	13.5324	0.1393	0.0398
4	Arjun	<i>Terminalia arjuna</i>	4.4164	4.3563	4.6296	13.4023	0.1365	0.0493
5	Neem	<i>Azadirachta indica</i>	4.4164	5.0715	3.8580	13.3459	0.1512	0.0375
6	Chatim	<i>Alstonia scholaris</i>	3.9432	4.0962	4.4753	12.5148	0.1309	0.0393
7	Radhachura	<i>Peltophorum ferrugineum</i>	4.2587	4.0312	4.0123	12.3022	0.1294	0.0433
8	Babul	<i>Acacia nilotica</i>	3.4700	4.1612	4.6296	12.2609	0.1323	0.0356
9	Simal	<i>Bombax ceiba</i>	4.5741	3.3810	4.1667	12.1218	0.1145	0.0531
10	Gulmohar	<i>Delonix regia</i>	4.5741	4.2913	3.2407	12.1062	0.1351	0.0411
11	Lambu	<i>Khaya anthotheca</i>	3.7855	3.9662	4.3210	12.0727	0.1280	0.0316

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12	Subabul	<i>Leucaena leucocephala</i>	3.7855	3.8362	4.3210	11.9426	0.1251	0.0470
13	Jacaranda	<i>Jacaranda mimosifolia</i>	4.2587	4.2263	3.3951	11.8800	0.1337	0.0351
14	Akashmani	<i>Acacia auriculiformis</i>	3.7855	4.0312	3.5494	11.3661	0.1294	0.0389
15	Mahogany	<i>Swietenia mahagoni</i>	4.1009	3.3810	3.8580	11.3400	0.1145	0.0402
16	Amaltas	<i>Cassia fistula</i>	3.7855	3.7061	3.7037	11.1953	0.1221	0.0420
17	Aonla	<i>Emblica officinalis</i>	4.1009	3.3160	3.7037	11.1206	0.1130	0.0379
18	Jamun	<i>Syzygium cumini</i>	4.2587	3.9662	2.7778	11.0026	0.1280	0.0370
19	Mango	<i>Mangifera indica</i>	3.1546	3.1860	4.6296	10.9702	0.1098	0.0402
20	Hara Simal	<i>Ceiba pentandra</i>	3.4700	3.3810	4.0123	10.8634	0.1145	0.0341
21	Bakain	<i>Melia azadirach</i>	3.4700	3.6411	3.5494	10.6605	0.1206	0.0356
22	Siris	<i>Albizia lebbek</i>	3.1546	2.8609	4.4753	10.4907	0.1017	0.0407
23	Kanail	<i>Cascabela thevetia</i>	3.3123	3.9012	3.2407	10.4542	0.1265	0.0398
24	Gamhar	<i>Gmelina arborea</i>	3.1546	3.5761	3.7037	10.4344	0.1191	0.0415
25	Raintree	<i>Samanea saman</i>	3.1546	3.5761	3.3951	10.1257	0.1191	0.0370
	TOTAL		100	100	100	300	3.2041	0.9954

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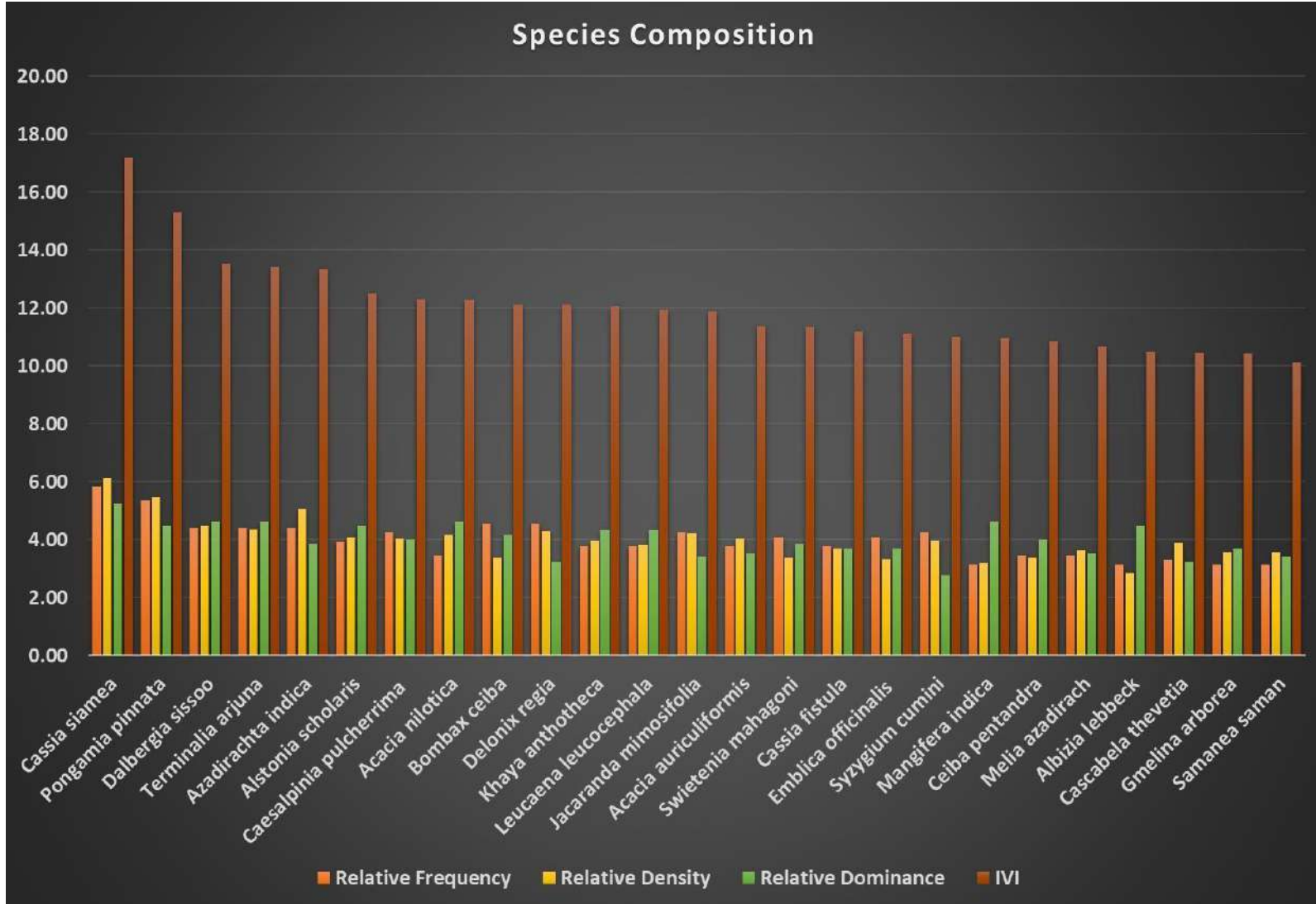


Figure 4: Species composition through IVI, Shannon-Weiner diversity and Piebu's Evenness Index for top 25 species

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The plantation efforts at the Pakri Barwadih Coal Mining Project (PBCMP) demonstrate a diverse approach to reforestation, as evidenced by the list of 59 unique species identified during the audit in the sample plots. This synopsis provides an overview of the species composition and its ecological implications.

1. Diversity: The list showcases a rich variety of plant species, including both native and introduced varieties, indicating a conscious effort to create a diverse ecosystem.
2. Functional Groups: The species represent various functional groups:
 - Timber species: Teak (*Tectona grandis*), Sisham (*Dalbergia sissoo*), Mahogany (*Swietenia mahagoni*)
 - Fruit-bearing trees: Mango (*Mangifera indica*), Jamun (*Syzygium cumini*), Aonla (*Embllica officinalis*)
 - Ornamental species: Gulmohar (*Delonix regia*), Jacaranda (*Jacaranda mimosifolia*)
 - Native medicinal plants: Neem (*Azadirachta indica*), Arjun (*Terminalia arjuna*)
3. Ecological Adaptability: The list includes species adapted to various environmental conditions:
 - Drought-resistant: Babul (*Acacia nilotica*), Neem (*Azadirachta indica*), Chakundi (*Cassia siamea*)
 - Fast-growing: Eucalyptus spp., Poplar (*Populus deltoides*)
 - Nitrogen-fixing: Subabul (*Leucaena leucocephala*), Siris (*Albizia lebbek*)
4. Conservation Value: Inclusion of species like Mahua (*Madhuca indica*) and Palash (*Butea monosperma*) supports local biodiversity and potentially provides resources for wildlife.
5. Local Context: The presence of culturally significant species such as Peepal (*Ficus religiosa*) and Bargad (*Ficus benghalensis*) shows consideration for local cultural values.
6. Soil Conservation: Species like Bamboo (*Bambusa* spp.) and Vetiver (as Kaash Gras - *Saccharum spontaneum*) are excellent for soil stabilization and erosion control.
7. Multi-purpose Species: Many species serve multiple functions, such as Karanj (*Pongamia pinnata*), which is used for biodiesel production and has medicinal properties.

8. Exotic vs. Native Balance: While the list includes some exotic species like Eucalyptus, there's a strong representation of native Indian species, supporting local ecosystem restoration.

The analysis of species composition in the audited plantation reveals a diverse ecological structure in the plantation. The Importance Value Index (IVI), Shannon-Wiener Diversity Index, and Pielou's Evenness Index were calculated for the top 25 species to provide a comprehensive understanding of the plantation's biodiversity.

The IVI, which integrates relative frequency, density, and dominance, indicates the ecological significance of each species within the community. *Cassia siamea* emerges as the most ecologically important species with an IVI of 17.1947, followed by *Pongamia pinnata* (15.2997) and *Dalbergia sissoo* (13.5324). This distribution suggests a balanced community structure without overwhelming dominance by a single species.

The Shannon-Wiener Diversity Index, a measure of species richness and evenness, yields a total value of 3.2041 for the plantation. This moderately high value indicates substantial biodiversity within the surveyed area. Pielou's Evenness Index, which quantifies the equitability of species distribution, demonstrates a remarkably high value of 0.9954 for the entire community. This near-perfect evenness suggests that individuals are distributed highly uniformly among the various species, contributing to the overall stability and resilience of the plantation ecosystem.

It is noteworthy that the top five species by IVI (*Cassia siamea*, *Pongamia pinnata*, *Dalbergia sissoo*, *Terminalia arjuna*, and *Azadirachta indica*) represent a mix of native and introduced species commonly employed in Indian forestry and agroforestry practices. This composition reflects a deliberate selection of species that likely serves multiple ecological and economic functions within the plantation system.

This quantitative analysis of species composition reveals a plantation characterized by high biodiversity, significant evenness, and a balanced distribution of ecological importance among species. The diverse species selection reflects a holistic approach to reforestation, balancing ecological restoration, economic value, and community benefits. The mix of fast-growing species with slower-growing, long-lived trees suggest a strategy for both short-term green cover and long-term forest establishment. However, monitoring the interaction between native and exotic species will be crucial for long-term ecosystem health and biodiversity conservation.

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The performance audit of plantations at the Pakri Barwadih Coal Mining Project (PBCMP), managed by NTPC Mining Limited, presents a detailed picture of plantation performance, highlighting encouraging trends in terms of survival rates, species diversity, growth patterns, and ongoing challenges. Across various plantation sites—spanning block plantations, linear roadside plantations, and embankments—the survival rate consistently falls within the 85% to 95% range, with several sites exceeding 90% survivability. This high rate indicates that the plantation strategy has been effective, particularly in promoting species that are well-suited to the local environment. Prominent species include Karanj (*Pongamia pinnata*), Chakundi (*Cassia siamea*), Neem (*Azadirachta indica*), Shisham (*Dalbergia sissoo*), Gulmohar (*Delonix regia*) etc. The plantations emphasize frequent use of native species highlights a deliberate attempt to foster biodiversity while aligning with local ecological conditions.

Growth metrics across various plantations are promising. Tree heights generally range between 3 to 12 feet, and girth sizes (GBH) span from 15 to 50 cm, reflecting healthy development and adaptation. Notable examples include the Miyayaki plantation, which reports over 90% survival with a well-balanced species mix, and the Sikri Township of NTPC Mining Limited, where Lambu (*Khaya anthotheca*) and Arjun (*Terminalia arjuna*) thrive despite occasional waterlogged conditions. The sewage treatment plant block plantation, featuring mango orchards, also stands out with a remarkable survival rate of 95%, demonstrating the success of fruit-tree cultivation in these settings. Additionally, linear roadside plantations near Gate 3 and along office roads, often protected by barbed wire fencing, show promising growth despite some setbacks due to waterlogging and mortality.

The audit identifies several recurring challenges, particularly in low-lying or vulnerable areas. Waterlogging emerges as a key issue at sites such as the block plantation near Gate 2, where excessive moisture has affected tree health. Similarly, the CISF Camp plantation, established in 2016-17, leading to a reduced survival rate of 70-75%. In these areas, protective measures such as barbed wire fencing and prompt replanting efforts are recommended to restore tree density and to mitigate further losses.

The audit further points out that areas like Dump D, a self-burning site, pose considerable difficulties for sustaining plantation efforts due to high mortality despite replantation attempts. As a corrective strategy, the plantation activities in this zone have been shifted to the foothills of the dump, where trees are more likely to thrive under stable conditions. In contrast,

plantations along roadsides demonstrate adaptability with mixed planting of timber and ornamental species.

The plantations display a conscious effort to enhance biodiversity, as evidenced by the presence of diverse ground flora, shrubs, and grass species in several plots. The 90-meter plantation plot, for example, includes various grass species that indicate healthy biodiversity and ecological functioning. Mixed plantations with fruit-bearing trees, such as mango, Guava (*Psidium guajava*), and Aonla (*Embllica officinalis*), have also been introduced in several plots to enhance biodiversity while aligning with community needs. Similarly, ornamental species such as Jacaranda (*Jacaranda mimosifolia*) and Radhachura (*Caesalpinia pulcherrima*) contribute to aesthetic value along roadsides and office road-spaces.

The audit highlights the strategic use of resilient species such as Chakundi (*Cassia siamea*), Babul (*Acacia nilotica*), and Subabul (*Leucaena leucocephala*) in challenging environments. These species have demonstrated survival rates above 85%, reinforcing the value of selecting species adapted to local conditions. Additionally, the plantations along conveyer belts and linear stretches, though exposed to environmental stress, continue to thrive with species like Peepal (*Ficus religiosa*) and Gulmohar (*Delonix regia*) protected by fencing. Expansion efforts of plantation are also underway in several plots, with seedlings of Karanj, Gulmohar, and Arjun being planted to further diversify and stabilize these ecosystems.

Overall, the audit emphasizes the need for continuous site-specific adjustments, such as improving drainage to counter waterlogging and reinforcing protective measures against grazing and tree felling. Despite minor setbacks, the trend indicates a positive trajectory, with plantations not only surviving but also thriving in the varied ecological settings of the project area. The efforts to blend environmental restoration with species diversity and sustainability mark significant progress in the plantation initiatives under NTPC's stewardship. In conclusion, the audit underscores the progress made by NTPC Mining Limited and its MDO M/s Thriveni Sainik Mining Private Limited in implementing effective plantation strategies despite environmental challenges.

7. CONCLUSIVE REMARKS & SUGGESTIONS:

The Pakri-Barwadih Coal Mining Project (PBCMP) plantation audit indicates that M/s NTPC Mining Limited and its Mine Developer Cum Operator, M/s Thriveni Sainik Mining Private Limited, have implemented reforestation initiatives that have been primarily successful. The plantation initiatives have achieved substantial success in the establishment and maintenance of vegetation cover, as evidenced by their consistent survival rates of 85% to 95% across a variety of sites. The planted species' healthy development and adaptation are suggested by the high survival rate and optimistic growth metrics of tree heights.

The utilisation of a variety of indigenous species, such as timber, fruit-bearing, and ornamental trees, has a beneficial impact on the restoration of the local ecosystem and biodiversity. An adaptive strategy to site-specific conditions is demonstrated by this approach, in conjunction with the strategic use of resilient species in challenging environments. The inclusion of fruit-bearing trees also implies a consideration for community requirements, which has the potential to cultivate positive relationships with local populations.

The audit identified numerous challenges, notably in low-lying areas that are susceptible to waterlogging and instances of human interference, despite the overall success. These concerns underscore the necessity for enhancements in future plantation endeavours. The findings emphasise the importance of ongoing monitoring, site-specific adjustments, and prompt remedial actions to resolve these challenges and further improve the success of the plantations. NTPC's dedication to sustainable mining practices and environmental stewardship is evident in the extensive plantation efforts, which span 135 hectares. Although there is room for development in the way site-specific challenges are addressed, the overall initiative at PBCMP serves as a successful model of environmental restoration in mining areas. In the future, it will be essential to concentrate on the refinement of plantation techniques, the improvement of protection measures, and the ongoing adaptation to local conditions.

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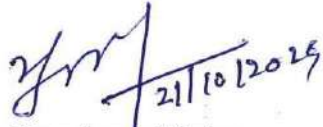
The following measures are suggested by ICFRE-IFP for betterment of the plantation:

1. Fix board with passport data (GPS coordinates, Total area, Date of plantation, Number of Species)
2. Use indigenous species and avoid exotic species in future plantations.
3. Specifically, in Dump C plantation, we found Chakundi to be the Dominant species. Although it provides lush green canopy, we suggest to reduce the density of this species in future to include other indigenous species.
4. Record growth data (Quarterly, Half yearly and Annually)
5. Make mount in water logging area during Plantation period.
6. Planting fruits bearing species for increasing faunal diversity.
7. Planting avenue tree in road side plantation.
8. Planting religious important species (Pepal, Bargad, Neem, Mango etc.) near residential area.
9. Planting livelihood support species like Mahua, Karanj, Imli, Ber, Jamun, Awla, Neem etc.
10. Soil Moisture Conservation (SMC) efforts should be adopted to recharge the groundwater level of the surrounding areas.
11. Under Miyawaki Plantation -

- Classifications of the tree species on the basis of their growth.

Classification	Species
Dominant	Sal, Teak, Semal, Sirish, Kadam, Arjun etc.
Co-Dominant	Karaj, Jamun, Kathal, Kachnar, Neem, Mahogani etc.
Dominated	Awala, Gulmohar, Jacaranda, Chakundi etc.
Intermediate	Bamboo, Amrud, Ber, Medicinal plants etc.
Suppressed	Grasses, Bhiringraj, Kalmegh, Brahmni, Mandukparni etc.

- 3-5 plant per sq. mt.
- Organic fertilizers are to be used.
- Maintenance work to be carried out for two years.


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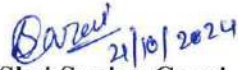
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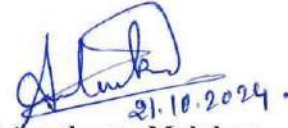
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Recorded Different Tree Species Count Using the Grid Based Survey (10*10m, 3*3m)



Recorded Different Tree Species Count Using the Grid Based Survey (10*10m, 3*3m)

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Taking the DBH and GPS Coordinate of the Different Tree Species



Taking the DBH and GPS Coordinate of the Different Tree Species

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Recorded the Different Tree Species Count Using the Transect Line (100m) Based



Recorded the Different Tree Species Count Using the Transect Line (100m) Based



Road Side Plantation Site at Sikri



Road Side Plantation Site at Sikri

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Plantation Site at Khora Nala



Overburden Dumping Plantation Site - A

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Pakri Barwadih Miyawaki Plantation Site



Pakri Barwadih Miyawaki Plantation Site

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Observing the Plantation Among the Tall Grass (*Saccharum spontaneum*) at 90 mt. Site



Recording the planation data at 90 mt. site

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Seed Sowing at 90 mt. Plantation Site



Seed Sowing at 90 mt. Plantation Site



Embankment in Year 2017



Embankment in Year 2023

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Drone View of Overburden Dumping Plantation Site

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एनटीपीसी
NTPC

कोयला खनन परियोजनाएँ

सिकरी साईट कार्यालय

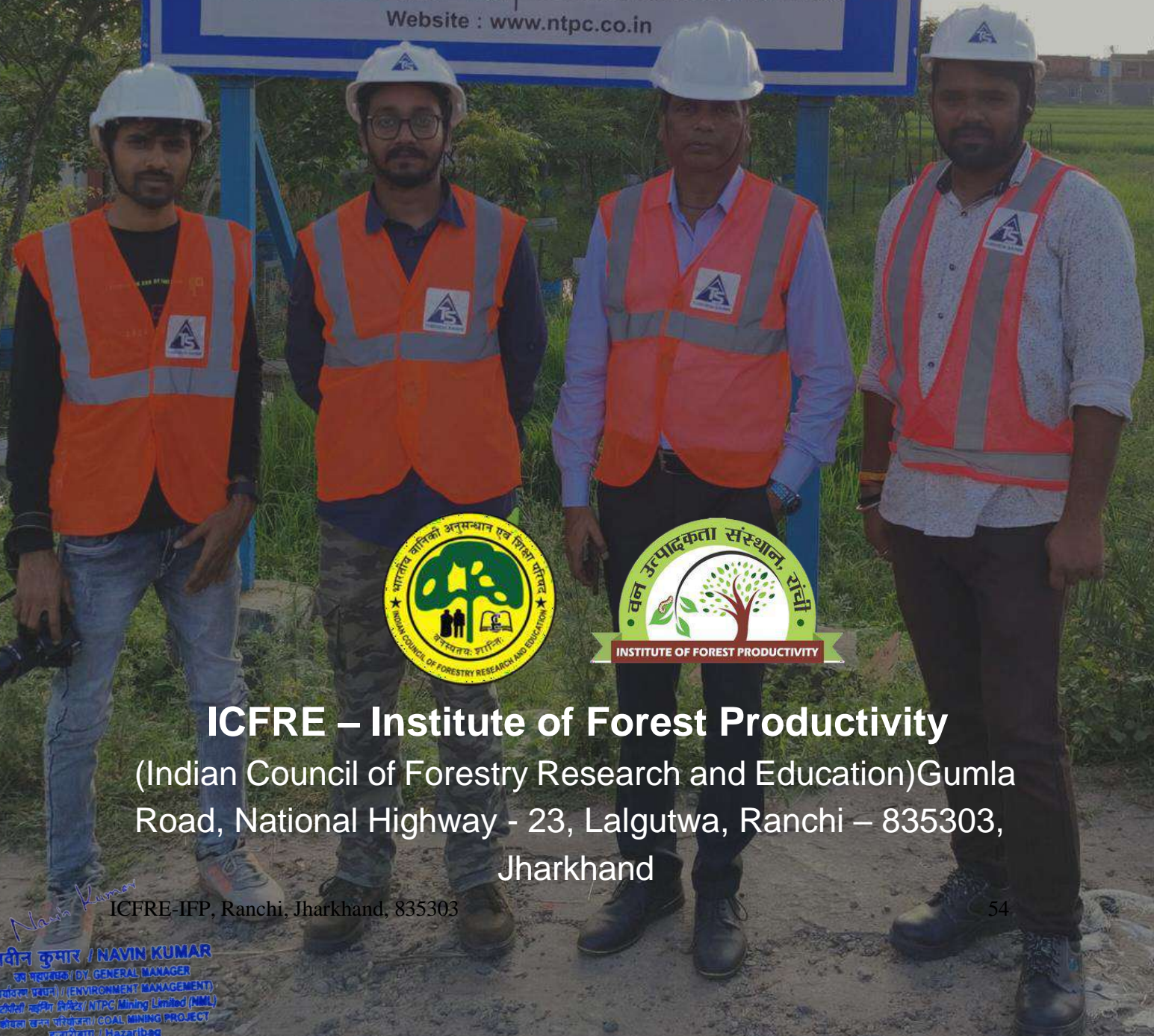
पकरी बरवाडीह, चट्टी बरियातु, बादम एवं केरेडारी
कोयला खनन परियोजनाएँ, बड़कागाँव, हजारीबाग – 825311

SIKRI SITE OFFICE

PAKRI BARWADIH, CHATTI BARIATU, BADAM & KERANDARI
COAL MINING PROJECTS, BARKAGAON, HAZARIBAG – 825311

<p>कैन्द्रीय कार्यालय</p> <p>एनटीपीसी भवन, कोर - 7, स्कोप कॉम्प्लेक्स, 7 इंस्टिटयूशनल एरिया, लोधी रोड, नई दिल्ली 110003</p>	<p>CORPORATE OFFICE</p> <p>NTPC Bhawan, Core-7, Scope Complex, 7 Institutional Area, Lodi Road, New Delhi - 110003</p>
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Website : www.ntpc.co.in



ICFRE – Institute of Forest Productivity
(Indian Council of Forestry Research and Education) Gumla
Road, National Highway - 23, Lalgutwa, Ranchi – 835303,
Jharkhand

ICFRE-IFP, Ranchi, Jharkhand, 835303

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प्रबन्धकी बर्मीग रिपेट / NTPC Mining Limited (NML)
कोयला खनन परियोजना / COAL MINING PROJECT
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Action Taken Report (ATR)- Site inspection/ Monitoring report of Pakri Barwadih Coal Mine Project (18 MTPA) of M/s National Thermal Power Corporation Limited (NTPC) Ltd.

From NAVIN KUMAR <env-pb@nml.co.in>

Date Mon 26/08/2024 18:29

To ro.ranchi-mef@gov.in <ro.ranchi-mef@gov.in>


Cc TSPAKRI <tspakri@ntpc.co.in>; Upendra Kumar Pandit <UPENDRAKUMARPANDIT@NTPC.CO.IN>; NAVIN <NAVINKUMAR03@NTPC.CO.IN>; Birendra Kumar <BIRENDRAKUMAR01@NTPC.CO.IN>; Faiz Taiyab <FAIZTAIYAB@NTPC.CO.IN>

 2 attachments (25 MB)

D. no. 144 Dated 26.08.2024_compressed.pdf; 10th EC amendment.pdf;

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 [1. CCR Dtd 19.06.2024 1.pdf](#)

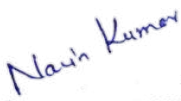
Respected Sir,

With reference to specific condition no. 1.2 of EC amendment dated 16.07.2024, I hereby submit Action Taken Report (ATR) on the partially complied / not complied conditions noted vide CCR letter no. 103-425/376 Dated 19.06.2024 w.r.t. Pakri Barwadih Coal Mining Project (18 MTPA) of NTPC Mining Limited.

Submitted for your kind consideration please.

Thanking You.

सादर / Warm regards,
नवीन कुमार / Navin Kumar
DGM (Mining), Environment Mgmt.
एनटीपीसी माइनिंग लिमिटेड / NTPC Mining Ltd.
Pakri Barwadih Coal Mining Project,
Sikri Site Office, Barkagaon,
Hazaribagh 825301 (Jharkhand)
मोबाइल / Mobile 9470197223 / 7004012892


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