



सत्यमेव जयते

**Ministry of Environment & Forests (MOEF)**

No.J-11015/133/2007-IA.II(M)

Paryavaran Bhawan,  
C.G.O.Complex,  
New Delhi -110510.

To  
Shri M.H. Rao,  
General Manager,  
**M/s National Thermal Power Corporation,**  
Engineering Office Complex,  
A-8A, Sector 24, NOIDA – 201301

Dated: 31<sup>st</sup> March 2010

**Sub: Kerendari 'A' Coal Mine Block (6 MTPA in a project area of 1173 ha) of M/s National Thermal Power Corporation Ltd., located in North Karanpura Coalfields in Dist. Hazaribagh, Jharkhand - Environmental Clearance- reg.**

Sir,

This is with reference to letter No. CC:ESE:7012:2007:GEN: dated 07.02.2007 and subsequent letters dated 09.03.2007, 30.03.2007, and 25.09.2007 for Terms of Reference (TOR) and this Ministry's grant of TOR vide letter dated 24.04.2007 and modification thereto vide letter dated 20.11.2007 and application for environmental clearance dated 28.05.2009, and subsequent letters dated 27.10.2009, 05.11.2009, 17.02.2010 and 22.03.2010 and letter No. 174/Misc./08-09/446 dated 26.06.2009 of the Principal Chief Conservator of Forests, Conservation of Biodiversity and Chief Wildlife Warden, Government of Jharkhand on the above-mentioned subject. The Ministry of Environment & Forests has considered the application. It is noted that the project is for opening a new **Kerendari Opencast Coal Mine Project of 6 million tonnes per annum (MTPA) in a total project area of 1173 ha of which the total ML area is 654 ha**, for captive consumption of their Barh Super Thermal Power Plant Stage-2 (2x 660 MW) and Tanda TPP. The grade of coal is mainly E-F.

The project involves a total project area of **1173 ha**, 169.35 ha is forestland, 938.62 ha is agricultural land, 32.70 ha is water body and the balance ha is others. There are no National Parks, Wildlife Sanctuary, Biosphere Reserves found in the 15 km buffer zone. However there are a number of reserved and protected forests in the study area. Of the total forestland requirement of 169.35 ha, 53.19 ha is within ML, and of the balance 116.16 ha, 74 ha is for CHP and railway corridor and 42.16 ha for external OB dump. Forestry clearance has been applied for. There are a number of Schedule-I and II fauna such as the Indian Elephant, Sloth Bear, Indian Wolf, Spotted Deer, Sambar, Leopard, Indian Monitor Lizard found in the study area. A Wildlife Conservation Plan has been prepared and the approval of the State Government has been obtained. The drainage of the block is controlled by Basaria nala and Baldeori nala which flow along the eastern boundary and central part of the block respectively and are tributaries of Hahoro River which joins River Damodar. It is proposed to modify the existing drainage by diversion of the Baldeori nala to the boundary and to construct an embankment of 3m height and 30m width at the bottom all along the Basaria nala. Presently there are no industries in the 10 km buffer zone. No new roads or diversion of existing roads is planned. Transportation of 20,000 TPD of coal from the mine to CHP would be by dumpers and from CHP by overhead closed conveyors to Railway siding at village Khadamdari and thereafter by rail to the linked Tanda/Barh STPP. The conveyor-cum-rail corridor consists of a stretch of 13.1km of rail and 10.5 km of overhead closed conveyors in the 74 ha of forestland to enable movement of wild animals, extending upto unloading part at the Railway Siding with Silo Loading facilities. The approach roads

to the mine would be strengthened. A common township of 10.65 ha for Chhattibaritu and Kerandari with 633 dwelling units is planned at a distance of 5km from the coalmine.

The project is opencast by mechanised method involving shovel-and-dumper. **The rated capacity of the mine is 6 MTPA of coal production.** Of the total project area of 1173 ha, 470.18 ha is for quarry area, 130 ha is for external OB dump, 7.58 ha is for green belt, 27.06 ha is for infrastructure, 14 ha is for roads and nala diversion, 13 ha is for embankment and 122.18 ha is for unutilised area and safety zone. Ultimate working depth of the mine is 395m below ground level (bgl). Water table is in the range of 2.07-12.25m bgl during pre-monsoon and 0.7-6.8m bgl during post-monsoon. Average water requirement is 2509 m<sup>3</sup>/d, which would be initially met from bore well water and after intersection of water table, will be met from mine pit water for the mine operations and bore well water (832 m<sup>3</sup>/d) for domestic consumption. Peak mine water discharge is estimated as 7,15,000 m<sup>3</sup>/d. Of an estimated 621.22 Mm<sup>3</sup> of waste generated over the life of mine, 84.14 Mm<sup>3</sup> of OB would be dumped in external OB dump in an area of 130 ha and of a max. height of 120m, and 210 Mm<sup>3</sup> of OB would be stored temporarily in an area of 250 ha in Chhattibariatu (S) Coal Block and the balance 327.07 Mm<sup>3</sup> of OB would be backfilled into the decoaled void of Kerandari coalmine. Of the total 380ha required for external dumping of OB, 250 ha of area would be in the adjoining Chhattibariatu (South) Coalmine Block of M/s NTPC proposed to be mined at a later stage, which would temporarily store the OB in its mineralised area and the entire OB would be rehandled at the end of mine life into the decoaled voids of the Kerandari Coalmine. Backfilling will begin from the 6<sup>th</sup> year and continue till end of mine life. Plantation at the post mining stage would cover an area of 470.18 ha. Project involves R&R of 7 villages – Tarhesa, Pandu, Pagar, Kabed, Baledori, Basaria and Lochar comprising about 1453 PAFs and land losers. Anticipated life of mine at the rated capacity of 6 MTPA is 25 years. Public Hearing was held on 09.01.2009. Mining Plan was approved by Ministry of Coal on 04.08.2008. Capital cost of the Coalmine project is **Rs. 89947.21 lakhs.**

2. The Ministry of Environment & Forests hereby accords environmental clearance for the above-mentioned **Kerandari Opencast Coal Mine Project of M/s National Thermal Power Corporation Ltd. for production of coal at 6 MTPA annual rated capacity in a total project area of 1173 ha** under the Environmental Impact Assessment Notification, 2006 and subsequent amendments thereto and Circulars thereto subject to the compliance of the terms and conditions mentioned below:

**A. Specific Conditions**

- (i) Mining shall not be carried out in 169.35 ha of forestland until prior forestry clearance is obtained under FC Act 1980.
- (ii) Prior approval of the Flood & Irrigation dept, shall be obtained for the proposed route for diversion of Baldeori nala, design of the embankment and realignment of the diverted nala along the fault lines. A minimum safe distance of 60m shall be maintained between the realigned nala and embankment. The embankment shall be a minimum 3 m higher than the HFL and 30m wide at the bottom. The slope of the embankment shall be at least 2:1 towards the ML, compacted and stone pitching done towards the river and shall be stabilised with plantation. Materials such as OB shall be tested for strength before using for construction of embankment.
- (iii) Topsoil shall be stacked properly within the earmarked area for one topsoil dump of a max. height of 15m with proper slope at earmarked site(s) and shall be used concurrently for reclamation and development of green belt.
- (iv) Of the estimated total 621.22Mm<sup>3</sup> of OB generated to stored in external OB dumps, 84.14 Mm<sup>3</sup> of OB shall be stacked at earmarked external OB dumpsite of an area of 130 ha and shall not exceed a height of 120m consisting of 4 benches of 30m each. The ultimate slope of the dump shall not exceed 28°. Reclamation of the external OB dump shall be done using native species and species of economic importance. Monitoring and management of reclaimed dumpsites shall continue until the vegetation becomes self-sustaining. Compliance status shall

be submitted to the Ministry of Environment & Forests and its Regional office located at Bhubaneswar on yearly basis. The balance 210 Mm<sup>3</sup> of OB to be temporarily stored in an external OB dump of an area of 250ha in the mineralised area of the adjoining Chhattabariatu (South) Coalmine Block of M/s NTPC shall be entirely rehandled at the end of mine life into the decoaled voids of the Kerendari Coalmine and the backfilled area biologically reclaimed.

- (v) The design of the dumps shall be done incorporating the specific recommendations of the Slope Stability study for the internal and external dumps keeping in view the rainfall (peak), soil characteristics, proposed dump stabilisation measures, etc.,. Regular monitoring of dump slope stability shall be also carried out. These modifications shall also be appropriately reflected in the Mining Plan.
- (vi) A thick 3-tier plantation shall be developed between quarry, external OB dump and habitation using native species and species of economic importance.
- (vii) Catch drains and siltation ponds of appropriate size shall be constructed to arrest silt and sediment flows from soil, OB and mineral dumps. The water so collected shall be utilised for watering the mine area, roads, green belt development, etc. The drains shall be regularly desilted and maintained properly.  
Garland drains (size, gradient and length) and sump capacity shall 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 shall also provided adequate retention period to allow proper settling of silt material.
- (viii) Dimension of the retaining wall at the toe of the dumps and OB benches within the mine to check run-off and siltation shall be based on the rainfall data.
- (ix) Drills shall be wet operated.
- (x) Controlled blasting shall be practiced only during daytime with use of delay detonators. The mitigative measures for control of ground vibrations and to arrest the fly rocks and boulders shall be implemented.
- (xi) Raw coal from CHP shall be transported by closed conveyors to the railway siding proposed at village Khadamdari and thereafter by rail to the linked Tanda/Barh STPP. The conveyor-cum-rail corridor consisting of a stretch of 13.1km of rail and 10.5km of overhead closed conveyors and extend upto unloading part at the Railway Siding with Silo Loading facilities and from there to linked Barh STPS/Tanda by rail. There shall be no road transportation of coal.
- (xii) All approach roads shall be black topped and internal roads shall be black topped or concreted. The roads shall be regularly cleaned with mechanical sweepers. A 3-tier avenue plantation using local species shall be developed along the main roads, and approach roads to the mine and at Railway Siding. Green belt shall be developed using local species all along the periphery of the site, along the areas such as infrastructure, and at Railway Siding.
- (xiii) Crushers at the CHP shall be operated with high efficiency bag filters, water sprinkling system shall be provided to check fugitive emissions from crushing operations, conveyor system, haulage roads, transfer points, etc. Hoppers of the coal crushing unit shall be fitted with high efficiency bag filters and mist spray water sprinkling system shall be installed and operated effectively at all times of operation to check fugitive emissions from crushing operations, transfer points of and from transportation roads and at Railway Siding.
- (xiv) Company's Railway siding at village Khadambari shall be established within 3 years from date of grant of environmental clearance.
- (xv) No fly ash from the TPP shall be used in backfilling of the void without undertaking an environmental feasibility study and without prior approval of this Ministry.

- (xvi) Regular monitoring of groundwater level and quality shall be carried out by establishing a network of existing wells and construction of new piezometers. The monitoring for quantity shall be carried out four times a year in pre-monsoon (May), monsoon (August), post-monsoon (November) and winter (January) seasons and for quality in May and in monsoon in the villages in core and buffer zone. Data thus collected shall be submitted to the Ministry of Environment & Forests and to the Central Pollution Control Board quarterly within one month of monitoring.
- (xvii) The levels of fluoride and TDS in drinking water shall be regularly monitored and records thereon maintained. In case the levels are found to be higher than the prescribed limits in the groundwater and mine discharge water, the project authorities shall provide drinking water to the affected villages in the impact zone.
- (xviii) The Company shall put up artificial groundwater recharge measures including rainwater harvesting structures for augmentation of groundwater resource in case monitoring indicates decline in water table. The project authorities shall meet water requirement of nearby village(s) in case the village wells go dry due to dewatering of mine.
- (xix) ETP shall also be provided for workshop, and CHP. Effluents shall be treated to conform to prescribed standards, particularly for pH and TSS in case of discharge into any watercourse within or outside the lease. Mine water discharge and run off from external dumps shall be treated to prescribed norms and monitored at all the outlet points before discharge into natural water courses or onto land.
- (xx) An STP shall be provided for the township/colony to treat the domestic effluents to prescribed standards and for green belt development or reuse in project activities.
- (xxi) Any additional water requirement envisaged shall be obtained by recycle/reuse to the maximum extent and from rainwater harvesting measures. Recycled water shall be used for development and maintenance of green belt and in the Plant Operations.
- (xxii) Industrial wastewater shall be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19<sup>th</sup> May 1993 and 31<sup>st</sup> December 1993 or as amended from time to time before discharge. Oil and grease trap shall be installed for treatment of workshop effluents.
- (xxiii) Area brought under afforestation shall not be less than 472.29 ha which includes reclaimed external OB dump (130 ha), backfilled area (332.71 ha), along ML boundary (7.58 ha), along roads, infrastructure (2 ha), in undisturbed areas, infrastructure and in colony by planting native species in consultation with the local DFO/Agriculture Department. The density of the trees shall be around 2500 plants per ha.
- (xxiv) A Progressive Closure Plan shall be implemented by reclamation of quarry area of 470.18 ha of which 332.17 ha shall be backfilled and afforested by planting native plant species in consultation with the local DFO/Agriculture Department. The density of the trees shall be around 2500 plants per ha. The balance 137.47 ha of decoladed area being converted into a water reservoir and gently sloped along the upper benches and stabilised and reclaimed with plantation.
- (xxv) A Conservation Plan (in-situ and ex-situ) for endangered Schedule-I and II faunal species reported in the study area and for the medicinal plants found in and around the project area shall be prepared and implemented in consultation with the State Forest and Wildlife Departments. The implementation of the various activities there under and the status thereof shall be regularly reported to this Ministry and the MOEF Regional Office, Bhubaneswar and uploaded on the company's website. The proponent shall also participate in the Regional Wildlife Conservation Plan to be prepared by the State Wildlife Dept. and shall also contribute financially for implementation of the RAP.

- (xxvi) An amount not less than a capital expenditure of Rs 2102.62 lakhs and a revenue expenditure of Rs 497.85 lakhs (which shall be up scaled after adjusting for depreciation of the rupee) shall be earmarked and utilised for environmental protection measures, the status of which shall be uploaded regularly on the company website and also furnished as part of the Monitoring report.
- (xxvii) A detailed project specific R&R Plan shall be prepared for the 7 villages – Tarhesa, Pandu, Pagar, Kabed, Baledeori, Basaria and Lochar comprising about 1453 PAFs and land losers and implemented in consultation with the stakeholders. R&R shall be based on norms laid down/approval by the State Government and shall not be inferior than that in the National R&R Policy and shall be completed within a specified time-frame. R&R shall include specific income generation schemes. A Corpus Fund of Rs 5 crores shall be created for maintenance of the R&R colony. Annuities shall be provided for the vulnerable sections of the displaced population. Alternate livelihood schemes shall be implemented for the persons not being absorbed for employment.
- (xxviii) The proponent shall provide a minimum Rs. 5 per tonne of coal as supporting revenue expenditure (which shall be up scaled after adjusting for depreciation of the rupee) towards activities undertaken under CSR. The details of the activities and expenditure made thereon shall be displayed on the company's website and updated at least once in six months.
- (xxix) For monitoring land use pattern and for post mining land use, a time series of landuse maps, based on satellite imagery (on a scale of 1: 5000) of the core zone and buffer zone, from the start of the project until end of mine life shall be prepared once in 3 years (for any one particular season which is consistent in the time series), and the report submitted to MOEF and its Regional office at Bhubaneshwar.
- (xxx) A Final Mine Closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment & Forests for approval 5 years in advance of final mine closure for approval and for Habitat Restoration by using a mix of native species found during pre-mining stage.

## **B. General Conditions**

- (i) No change in technology and scope of working shall be made without prior approval of the Ministry of Environment and Forests.
- (ii) No change in the calendar plan including quantum of mineral coal and waste being produced shall be made.
- (iii) Four ambient air quality monitoring stations shall be established in the core zone as well as in the buffer zone for monitoring 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. Monitoring of heavy metals such as Hg, As, Ni, Cd, Cr, in particulates shall be carried out at least once in six months.
- (iv) Data on ambient air quality (PM10, PM 2.5, SO2 and NOx and heavy metals such as Hg, As, Ni, Cr, etc) and other monitoring data shall be regularly submitted to the Ministry including its Regional Office at Bhubaneshwar and to the State Pollution Control Board and the Central Pollution Control Board once in six months. Random verification of samples through analysis from independent laboratories recognised under the EP Rules, 1986 shall be furnished as part of the compliance report.

- (v) Adequate measures shall be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in blasting and drilling operations, operation of HEMM, etc shall be provided with ear plugs/muffs.
- (vi) Industrial wastewater (workshop and wastewater from the mine) shall be properly collected, and treated so as to conform to the standards including for heavy metals before discharge prescribed under GSR 422 (E) dated 19<sup>th</sup> May 1993 and 31<sup>st</sup> December 1993 or as amended from time to time. Oil and grease trap shall be installed before discharge of workshop effluents.
- (vii) Vehicular emissions shall be kept under control and regularly monitored. Vehicles used for transportation of the mineral shall be covered with tarpaulins and optimally loaded.
- (viii) Monitoring of environmental quality parameters shall be carried out through establishment of adequate number and type of pollution monitoring and analysis equipment in consultation with the State Pollution Control Board and data got analysed through a laboratory recognised under EP Rules, 1986.
- (ix) Personnel working in dusty areas shall wear protective respiratory devices and they shall also be provided with adequate training and information on safety and health aspects.  
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.
- (x) 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.
- (xi) The funds earmarked for environmental protection measures shall be kept in separate account and shall not be diverted for other purpose. Year-wise expenditure shall be reported to this Ministry and its Regional Office at Bhubaneswar.
- (xii) 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>
- (xiii) A copy of the environmental clearance letter shall be marked to concerned Panchayat/Zila Parishad, Municipal Corporation or Urban Local Body and local NGO, if any, from whom any suggestion/representation has been received while processing the proposal. A copy of the clearance letter shall also be displayed on the company's website.
- (xiv) A copy of the clearance letter shall be displayed on the website of the concerned State Pollution Control Board. The EC letter shall also be displayed at the Regional Office, District Industry Centre and Collector's Office/Tehsildar's Office for 30 days.
- (xv) The clearance letter shall be uploaded on the company's website. The compliance status of the stipulated EC conditions shall also be uploaded by the project authorities on their website and updated at least once every six months so as to bring the same in the public domain. The monitoring data of environmental quality parameters (air, water, noise and soil) and critical pollutants such as PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub> and NO<sub>x</sub> (ambient and stack if any) and critical sectoral parameters shall also be displayed at the entrance of the project premises and mines office and in corporate office and on the company's website.

- (xvi) The project proponent shall submit six monthly reports on the status of compliance of the stipulated environmental clearance conditions (both in hard copy and in e-mail) to the respective Regional Office of the MOEF, the respective Zonal offices of CPCB and the SPCB.
- (xvii) The Regional Office of this Ministry located at Bhubaneswar shall monitor compliance of the stipulated conditions. The Project authorities shall extend full cooperation to the office(s) of the Regional Office by furnishing the requisite data/ information/monitoring reports.
- (xviii) The environmental statement for each financial year ending 31<sup>st</sup> March in Form-V is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be uploaded on the company's website along with the status of compliance of EC conditions and shall be sent to the respective Regional Offices of the MOEF by E-mail.
3. The Ministry or any other competent authority may stipulate any further 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.
5. The above conditions will be enforced *inter-alia*, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and Rules. The proponent shall ensure to undertake and provide for the costs incurred for taking up remedial measures in case of soil contamination, contamination of groundwater and surface water, and occupational and other diseases due to the mining operations.



(Dr.T.Chandini)  
Director

**Copy to:**

1. Secretary, Ministry of Coal, Shastri Bhawan, New Delhi.
2. DG (F) and Special Secretary, MOEF, New Delhi.
3. Principal Chief Conservator of Forests, Biodiversity Conservation and Chief Wildlife Warden, Govt. of Jharkhand, Ranchi w.r.t. Special Condition No. (xxiii) and (xxv)
4. Secretary, Department of Environment & Forests, Government of Jharkhand, Secretariat, Ranchi.
5. Chief Conservator of Forests, Regional office (EZ), Ministry of Environment & Forests, A/3 Chandrashekarapur, Bhubaneswar – 751023.
6. Chairman, Jharkhand State Pollution Control Board, TA Building, HEC Complex, PO Dhurwa, Ranchi.
7. Chairman, Central Pollution Control Board, CBD-cum-Office Complex, East Arjun Nagar, New Delhi -110032.
8. Member-Secretary, Central Ground Water Authority, Ministry of Water Resources, Curzon Road Barracks, A-2, W-3 Kasturba Gandhi Marg, New Delhi.
9. District Collector, Hazaribagh, Government of Jharkhand.
10. Monitoring File 11. Guard File 12. Record File.