BHARAT COKING COAL LIMITED
(A subsidiary of Coal India Limited)
Koyla Bhawan, Dhanbad-826005
CIN No. U10101JH1972GOI000918

Office of the General Manager
Bastacolla Area (Area –IX)
Vikas Bhawan, Dhanbad -828111

Ref. No: BCCL/BA/IX/GM/EC Compliance/2019/ 195

Date: 16.12.2019
17

To,
The Regional Director,
Ministry of Environment, Forest & Climate Change,
Regional Office, ECZ
Bunglow No. A-2, Shyamli Colony
Ranchi – 834002.

Subject: Six Monthly report on Compliance of Environmental Conditions for the period of April 2019 to September 2019 in respect of Cluster VIII Coal Mining Project of BCCL.

Ref.: EC Order No. J-11015/298/2010-IA.(M) Dated15.02.2013 later amended on 15.06.2018

Dear Sir,

Please find enclosed herewith six monthly report on compliance conditions laid down in Environmental Clearance for the period from April 2019 to September 2019 in respect of Cluster VIII group of mines of BCCL.

Thanking you.

Yours' faithfully,

General Manager
Bastacolla Area

Encl: As above

Copy to:

1. The Director I A, Monitoring Cell, Paryavaran Bhawan, CGO Complex, New Delhi-110003.
2. Member Secretary, Jharkhand State Pollution Control Board, Ranchi
3. Scientist "E" /In-Charge, Zonal Officer Kolkata, Central Pollution Control Board, Kolkata

<table>
<tr><th colspan="3">A. Specific Conditions</th></tr>
<tr><th>Sl. No.</th><th>Condition</th><th>Compliance/ Action Taken Report</th></tr>
<tr><td>i</td><td>The Maximum production shall not exceed beyond that for which environmental clearance has been granted.</td><td>It is being complied. The production from the cluster is within the limit for which environmental clearance has been granted. Month wise production of six months is enclosed as Annexure-I.
<table>
<tr><th>Year</th><th>Peak Production Capacity (MTPA)</th><th>Actual Production (MTPA)</th></tr>
<tr><td>2017-18</td><td>5.603</td><td>4.02</td></tr>
<tr><td>2018-19</td><td>5.603</td><td>2.44</td></tr>
<tr><td>2019-20*</td><td>5.603</td><td>0.77</td></tr>
</table></td></tr>
<tr><td>ii</td><td>The road transportation of coal during Phase-I should be by mechanically covered trucks. The road used for coal transportation should be developed with avenue plantation on both sides.</td><td>It is being complied.
Presently coal transportation has been done by trucks with tarpaulin cover. Covering of truck has been made mandatory in the transportation contract.
Avenue Plantation has been done along the roads and it is being continuously carried out as per availability of space.</td></tr>
<tr><td>iii</td><td>The company must give priority to capacity building both within the company and to the local youth, who are motivated to carry out the work in future.</td><td>It is being complied.
Company is organizing training on regular basis through Vocational Training Centre and Human Resource Department.</td></tr>
<tr><td>iv</td><td>Details of transportation, CSR, R&R and implementation of environmental action plan for each of the 17 clusters should be brought out in a booklet form.</td><td>It is being complied.
Details of Transportation, CSR, R&R and Implementation of Environmental Action Plan is being sent on Annual Basis i.e., Compliance Report of 2nd Half Year Ending in March.</td></tr>
<tr><td>v</td><td>A study should be initiated to analyse extent of reduction in pollution load every year by reducing road transport.</td><td>Complied.
The study has been completed by the CMPDIL to analyse the extent of reduction in pollution load every year by reducing road transport. Enclosed as Annexure II.</td></tr>
<tr><td>vi</td><td>The expertise available internationally should be utilized for control of fire in Jharia Coalfields and for their reclamation and to further minimize time for fire and subsidence control.</td><td>It is under process.
Global Expression of Interest had been opened for the international experts/ firms/ consultants/ agencies to deal with coal mine fire in Jharia Coalfield with vision of reclamation, further minimization of spread of fire & subsidence control for which no bidder has qualified to take up the work. Enclosed as Annexure-III.</td></tr>
<tr><td>vii</td><td>The abandoned pits and voids should be backfilled with OB and reclaimed with plantation and or may be used for pisciculture.</td><td>It is being complied.
Backfilling process in abandoned pits and voids are continuously carried out along with the mining operation.
Ecological restoration and Plantation is being carried out at the stable OB dumps.
Abandoned Pits will be utilized for Pisciculture in Post Mining Phase.</td></tr>
</table>

viii	BCCL may consider setting up a separate management structure for implementing environment policy and socio-economic issues and the capacity building required in this regard.	**Complied.** ▪ A full-fledged Environment Department, headed by a Dy.GM (Environment) along with a suitable qualified multi-disciplinary team of executives have been established at Company Headquarters for implementation of Environment Policy of the company. ▪ One Executive in each area has also been nominated as Nodal Officer (Environment) for looking after routine environment related jobs alongwith an Environment Management Cell at Area Level. ▪ For implementing and look after Socio-Economic Issues, an executive of Community Development Cadre is also posted at area level.
ix	The locations of monitoring stations in the Jharia Coalfields should be finalized in consultation with the Jharkhand State Pollution Control Board.	**Complied.** ▪ The optimum location of monitoring stations in Jharia Coal Field has been finalized with the approval of Jharkhand State Pollution Control Board. **Enclosed as Annexure IV.**
x	The smoke / dust emission vary from source to source (fuel wood, coal, fly ash from TPPs, silica from natural dust, etc.) and a source Apportionment Study should be got carried out for the entire Jharia Coalfields.	**It is under compliance**. ▪ NEERI, Nagpur has already initiated Source Apportionment Study. NEERI Nagpur has completed the data collection for Summer Season and submitted its first progress report. Enclosed as **Annexure V**.
xi	Mineralogical composition study should be undertaken on the composition of the suspended particulate matter (PM_{10} and $PM_{2.5}$) in Jharia Coalfields and also quantified. These studies would help ascertain source and extent of the air pollution, based on which appropriate mitigative measures could be taken.	**It is under compliance**. ▪ Mineralogical Composition Study is also a part of Source Apportionment Study as mentioned above.
xii	The proponent shall prepare time-series maps of the Jharia Coalfields through NRSA to monitor and prevent fire problems in the Jharia Coalfields by Isothermal mapping/imaging and monitoring temperatures of the coal seams (whether they are close to spontaneous ignition temperatures) and based on which, areas with potential fire problems shall be identified.	**It has been complied.** ▪ NRSC has been engaged for preparation of time series maps to monitor and prevent fire problems of Jharia Coalfield by Isothermal mapping/imaging and monitoring temperatures of the coal seams. ▪ NRSC has delineated surface fire and associated land subsidence in Jharia Coalfield using satellite based remote sensing techniques. Latest Report of Jan'2018 by NRSC is enclosed. Enclosed as **Annexure VI.**
xiii	Measures to prevent ingress of air (Ventilation) in such areas, to prevent restart fresh/spread fires in other areas including in mines of cluster VIII shall be undertaken.	**It is being complied.** ▪ Action is being taken as per Jharia Master Plan approved by GOI and State Govt. of Jharkhand. Excavation/ Open Cast mining is being done in the fire/subsidence affected mines to dig out

		combustible materials to save the coal from burning and to prevent further spread of the fire. ▪ Old UG Workings have been sealed off to prevent ingress of Air in other areas.
xiv	Underground mining should be taken up after completion of reclamation of Opencast mine area after 15 years.	**It shall be complied.** ▪ Underground Mining will be done after extraction of upper seams and beneath backfilled and reclaimed area.
xv	No mining shall be undertaken where underground fires continue. Measure shall be taken to prevent/check such fire including in old OB dump areas where the fire could start due to presence of coal/shale with sufficient carbon content.	**It is being complied.** ▪ Mining is being carried out by OC Method where UG fire is present with due permission from DGMS. ▪ Action is being taken to control, mine fires including old OB dump & areas as specified in Jharia Master Plan.
xvi	The rejects of washeries in Cluster –VII should be send to FBC based plant.	**Not applicable.** ▪ Coal washery does not exist in this cluster.
xvii	There shall be no external OB dumps. At the end of the mining there shall be no void and the entire mined out area shall be re-vegetated. Areas where opencast mining was carried out and completed shall be reclaimed immediately thereafter.	**It shall be complied.** ▪ Progressive mine closure activities are being carried out as per approved Mine Closure Plan. ▪ At the end of the mining, there shall be no void and area will be re-vegetated and reclaimed with the proper reclamation techniques as per approved Mine Closure Plan.
xviii	A detailed calendar plan of production with plan for OB dumping and backfilling (for OC mines) and reclamation and final mine closure plan for each mine of cluster-VIII shall be drawn up and implemented.	**It is being complied.** ▪ Mining operation is being done as per approved Calendar Plan. ▪ Mine closure plan as per the guidelines of Ministry of Coal has been prepared by Central Mine Planning and Design Institute (CMPDI). ▪ Progressive mine closure activities is being implemented regularly as per approved Mine Closure Plan considering present geomining conditions.
xix	The void shall be converted into a water reservoir of a maximum depth of 15-20 m and shall be gently sloped and the upper benches of the reservoir shall be stabilized with plantation and the periphery of the reservoir fenced. The abandoned pits and voids should be backfilled with OB and biologically reclaimed with plantation and or may be used for pisciculture.	**It is being complied.** ▪ Abandoned pits are regularly filled with Over burden. ▪ Plantation has been done on periphery of voids converted into reservoir. ▪ Old quarries where coal is already extracted is converted into water reservoir. Water from these old quarries/water reservoir is being used by local community. ▪ Abandoned Pits/Voids will be utilized for Pisciculture in Post Mining Phase.

xx	Mining shall be carried out as per statute from the streams/Nalas flowing within the lease and maintaining a safe distance from the Nalas flowing along the lease boundary. A safety barrier of a minimum 60m width shall be maintained along the Nalas/water bodies. The small water bodies in OC shall be protected to the extent feasible and the embankment proposed long water body shall be strengthened with stone pitching.	**It is being complied.** ▪ Mining is being done as per the guidelines and permissions of Directorate General of Mines Safety (DGMS) in accordance with Coal Mines Regulation, 2017. ▪ Embankment has been constructed in some areas and further embankment and stone pitching work will be carried out.   
xxi	Active OB dumps near water bodies and rivers should be rehandled for backfilling of abandoned mine voids. However, those which have been biologically reclaimed need not be disturbed.	**It is being complied.** ▪ Active OB dumps near water bodies and rivers shall be rehandled for backfilling of abandoned mine voids as per approved Mine Closure Plan. ▪ The OB dumps created earlier near water body are already stabilized and biologically reclaimed.

<table>
<tr>
<td>xxii</td>
<td>Thick green belt shall be developed along undisturbed areas, mine boundary and in mine reclamation. During post mining stage, a total of 704.48 Ha area would be reclaimed. The total additional area under plantation would be 345.06ha (67.79 Ha abandoned quarry area, 277.27 Ha active quarry area, 48.55 ha OB dump outside quarry area, 6.30 ha service building/mine infrastructure area/coal dump etc, 108.26 ha green belt around OCP, 196.31 ha barren area), by planting 1761200 plants in 704.48 ha at a total cost Rs. 7202.46 lakhs.</td>
<td>It is being complied.
▪ Plantation has been regularly done on mined out areas, OB dumps in scientific manner.
▪ Presently Bastacolla area is carrying out the ecological restoration i.e. Three-Tier Plantation in an area of 24.65 Ha.
▪ Action Plan for Plantation:
<table>
<tr><th>Year</th><th>Area (In Ha.) (Tentative)</th></tr>
<tr><td>2020-21</td><td>4.50</td></tr>
<tr><td>2021-22</td><td>8.00</td></tr>
<tr><td>2022-23</td><td>12.00</td></tr>
</table>
</td>
</tr>
<tr>
<td>xxiii</td>
<td>The road should be provided with avenue plantation on both side as trees act as sink of carbon and other pollutant.</td>
<td>It shall be complied.
▪ Avenue plantation has been partly done in non-coal bearing areas as well as in colonies.
▪ Action Plan for Avenue Plantation:
<table>
<tr><th>Year</th><th>No of Plants to be Planted (Tentative)</th></tr>
<tr><td>2020-21</td><td>3000</td></tr>
<tr><td>2021-22</td><td>3000</td></tr>
<tr><td>2022-23</td><td>3000</td></tr>
</table>
</td>
</tr>
<tr>
<td>xxiv</td>
<td>Specific mitigative measured identified for Jharia Coalfields in the Environmental Action plan prepared for Dhanbad as a Critically polluted are and relevant for Cluster VIII shall be implemented.</td>
<td>It is being complied.
Action Plan has been prepared in consultation with Jharkhand Pollution Control Board for entire BCCL and not on cluster basis. It is being implemented comprehensively. Some of the salient actions of this cluster are as under:
1. Covered Truck Transport
2. Construction of Pucca Road wherever feasible.
3. Construction/Maintenance of water reservoir for mine water utilization
4. Plantation. Etc.</td>
</tr>
<tr>
<td>xxv</td>
<td>The locations of monitoring stations in the Jharia Coalfields should be finalized in consultation with the Jharkhand State Pollution Control Board. The Committee stated that smoke/dust emission vary from source to source (fuel wood, coal, fly ash from TPPs, silica from natural dust, etc) and a Source Apportionment Study should be got carried out the entire Jharia Coalfields. Mineralogical composition study should be undertaken on the composition for the suspended particulate matter (PM10 and PM2.5) in Jharia Coalfields and also quantified. These studies would help ascertain source and extent of the air pollution, based on which appropriate mitigative measures could be taken.</td>
<td>It is being complied.
▪ Establishment of ambient environment quality monitoring stations has been finalized in consultation with Jharkhand State Pollution Control Board.
▪ NEERI, Nagpur has already initiated Source Apportionment Study. NEERI Nagpur has completed the data collection for Summer Season and submitted its first progress report. Enclosed as Annexure V.
▪ Mineralogical Composition Study is also part of Source Apportionment Study.</td>
</tr>
</table>

xxvi	No groundwater shall be used for the mining activities. Additional water required, if any, shall be met from mine water or by recycling/reuse of the water from the existing activities and from rainwater harvesting measures. The project authorities shall meet water requirement of nearby village(s) in case the village wells go dry to dewatering of mine.	**It is being complied.** ▪ Mine water is being used for the industrial as well as domestic purpose. Mine water is also supplied to colonies and community after filtration through pressure filters, slow sand filters and rapid sand filters. ▪ An MoU has been signed between Coal India Ltd. & Govt. of Jharkhand for providing mine water to nearby villages. A copy of MoU has been enclosed as **Annexure VII.**
xxvii	Regular monitoring of groundwater level and quality of the study area shall be carried out by establishing a network of existing wells and construction of new peizometers. The monitoring for quantity shall be done four times a year in pre-monsoon (May), monsoon (August), Post-monsoon (November) and Winter (January) seasons and for quality including Arsenic and Fluoride during the month of May. Data, thus collected shall be submitted to the Ministry of Environment & Forest and to the Central Pollution Control Board/SPCB quarterly within one month of monitoring. Rainwater harvesting measures shall be undertaken in case monitoring of water table indicates a declining trend.	**Compliance under progress.** ▪ For Construction of Piezometers, tender has been cancelled thrice. The estimate is being revised in association with CMPDI for re-tendering for aforesaid work. ▪ CMPDI is regularly conducting study of groundwater level and quality of areas within Cluster VIII. Groundwater monitoring data has been enclosed as **Annexure VIII.**
xxviii	Mine discharge water shall be treated to meet standards prescribed standards before discharge into natural water courses/agriculture. The quality of the water discharged shall be monitored at the outlet points and proper records maintained thereof and uploaded regularly on the company website.	**It is being complied.** ▪ Mine discharge water is being allowed to settle down in the mine sumps before filtration through various types of filter viz. Pressure Filter, Slow Sand Filter & Rapid Sand Filter. ▪ The monitoring of water quality parameters is regularly carried out by CMPDIL. Mine water quality data has been enclosed as **Annexure XV.**
xxix	ETP shall also be provided for workshop, and CHP, if any. Effluents shall be treated to confirm to prescribe standards in case discharge into the natural water course.	**Compliance under progress.** ▪ Effluent Treatment Plant for HEMM Workshop is proposed in FY 2019-20. Proposal has been forwarded to HQ for competent Approval.
xxx	Regular monitoring of subsidence movement on the surface over and around the working area and impact on natural drainage pattern, water bodies, vegetation, structure, roads, and surroundings shall be continued till movement ceases completely. In case of observation of any high rate of subsidence movement, appropriate effective corrective measures shall be taken to avoid loss of life and material. Cracks shall be effectively plugged with ballast and clayey soil/suitable material.	**It is being complied.** ▪ Regular subsidence monitoring is being done at underground mines. In cluster VIII, presently subsidence monitoring has been done at Bastacolla Colliery.

xxxi	Sufficient coal pillars shall be left unextracted around the air shaft (within the subsidence influence area) to protect from any damage from subsidence, if any.	**It is being complied**. ▪ Sufficient coal pillars have been left around air shafts as per Coal Mines Regulations 2017 and DGMS Orders.
xxxii	High root density tree species shall be selected and planted over areas likely to be affected by subsidence.	**It is being complied.** ▪ Planation is regularly done in leasehold area of Cluster VIII. High root density plants are regularly planted as per the roadmap prepared by Forest Research Institute, Dehradun.
xxxiii	Depression due to subsidence resulting in water accumulating within the low lying areas shall be filled up or drained out by cutting drains.	**It is being complied.** ▪ Time to time depression created by the mining operations have been filled by the locally available material and over burden.
xxxiv	Solid barriers shall be left below the roads falling within the blocks to avoid any damage to the roads.	**It is being followed.** ▪ Sufficient barriers are left for saving the surface installation and infra structures as per Coal Mines regulation 2017 and DGMS Orders.
xxxv	No depillaring operation shall be carried out below the township/colony.	**It is being complied.** ▪ Prior permission is always obtained from DGMS for depillaring.
xxxvi	The Transportation Plan for conveyor-cum-rail for Cluster-VIII should be dovetailed with Jharia Action Plan. Road transportation of coal during Phase-I should be by mechanically covered trucks, which should be introduced at the earliest. The Plan for conveyor-cum-rail for Cluster-VII should be dovetailed with Jharia Action Plan. The road transpiration of coal during phase-I should be by mechanically covered trucks.	**It shall be complied.** ▪ Action has been taken for the transportation plan for conveyor cum rail system of dispatch. CMPDIL, RI-II has been requested to conduct study and prepare the plan in this regard. ▪ Transportation is being done by covering vehicle with tarpaulin cover and it is made mandatory in Transportation Contracts. **Annexure IX.**
xxxvii	A study should be initiated to analyze extent of reduction in pollution load every year by reducing road transport.	**Complied.** ▪ The study has been completed by the CMPDIL to analyse the extent of reduction in pollution load every year by reducing road transport. **Enclosed as Annexure II.**
xxxviii	R&R of 4959 nos of PAF's involved. They should be rehabilitated at cost of shifting to safe areas at the cost of Rs 29948 Lakhs as per the approved Jharia Action Plan.	**It is being complied.** ▪ Implementation of master plan has already been started through Jharia Rehabilitation and Development Authority (JRDA), Dhanbad PAFs (Non-BCCL) have been rehabilitated at well-established Jharia Vihar Township located at Belgoria and other places. Till date 1192 Nos of PAFs have been rehabilitated. **Enclosed as Annexure X.**

xxxix	A detailed CSR Action Plan shall be prepared for Cluster VIII croup of mines. Specific activities shall be identified for CSR the budget of Rs. 215.5 Lakhs per year@ Rs. 5/T of coal as recurring expenditure. The 265.25 ha of area within Cluster VIIII ML existing as waste land and not being acquired shall be put to productive use under CSR and developed with fruit bearing and other useful species for the local communities. In addition to afforesting 250.57 ha of area at the post-mining stage, the waste land/barren land within Cluster VIII ML shall be rehabilitated/reclaimed as forest/agricultural land under CSR Plan in consultation with local communities. Third party evaluation shall be got carried out regularly for the proper implementation of activities undertaken in the project area under CSR. Issue raised in the Public Hearing shall also be integrated with activities being taken up under CSR. The details of CSR undertaken along with budgetary provisions for the village-wise various activities and expenditure thereon shall be uploaded on the company website every year. The company must give priority to capacity building both within the company and to the local youth, who are motivated to carry out the work in future.	**It is being complied.** ▪ BCCL is implementing CSR activities at various scale. A separate CSR committee has been formed at area level, which is looking after the works being executed under CSR. Bastacolla area is constructing 238 Nos. of toilets under CSR activity in different schools in Simdega district of Jharkhand under flagship program (Swachch Bharat Abhiyan) initiated by Hon'ble Prime Minister of India.
xL	For monitoring land use pattern and for post mining land use, a time series of land-use maps, based on satellite imagery (on a scale of 1:5000) of the core zone and buffer zone, from the start of the project until end of mine life shall be prepared once in 3 years (for any one particular season which is consistent in the time series), and the report submitted to MOEF and its Regional office at Bhubaneswar.	**It is being complied.** ▪ Land Use Map of Cluster VIII has been prepared by CMPDIL using remote sensing data for monitoring of land use pattern and for post mining land use. **Enclosed as Annexure XI.**
xLi	A Final Mine Closure Plan along with details of Corpus Fund shall be submitted to the Ministry of Environment & Forests five year before mine closure for approval. Habitat Restoration Plan of the mine area shall be carried out using a mix of native species found in the original ecosystem, which were conserved in-situ and ex-situ in an identified area within the lease for reintroduction in the mine during mine reclamation and at the post mining stage for habitat restoration.	**It shall be complied.** ▪ CMPDI has prepared "Mine Closure Plan" for all the mines of Cluster VIII. ▪ In order to restore the original ecological system, Bastacolla Area has initiated ecological restoration at various sites having area of 24.65 Ha as per roadmap prepared by Forest Research Institute. Native species of flora and fauna can be seen on these sites.

xLii	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 for implementing environment policy and socio-economic issues and the capacity building required in this regard.	**Complied.** ▪ A full-fledged Environment Department, headed by a Dy.GM (Environment) along with a suitable qualified multi-disciplinary team of executives have been established at Company Headquarters for implementation of Environment Policy of the company. ▪ One Executive in each area has also been nominated as Nodal Officer (Environment) for looking after routine environment related jobs alongwith an Environment Management Cell at Area Level. ▪ For implementing and look after Socio-Economic Issues, an executive of Community Development Cadre is also posted at area level.
xLiii	Implementation of final mine closure plan for Cluster VIII, subject to obtaining prior approval of the DGMS in regard to mine safety issues.	**It shall be complied.** ▪ Mine Closure Plan, has been prepared for each Mine in this cluster. Progressive mine closure has been implemented regularly as per the approved Mine Closure Plan prepared by CMPDIL. ▪ Prior approval from DGMS will be obtained before final mine closure with due regard to mine safety issues.
xLiv	Corporate Environment Responsibility: - a) The Company shall have a well laid down Environment Policy approved by the Board of Directors. b) The Environment Policy shall prescribe for standard operating process/procedures to bring into focus any infringements/ deviation/ violation of the environmental or forest norms/ conditions. c) The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions shall be furnished. d) To have proper checks and balances, the company shall have a well laid down system of reporting of non-compliances/violations of environmental norms to the Board of Directors of the company and/or shareholders or stakeholders at large.	A well-defined Corporate Environment Policy has already been laid down and approved by the Board of Directors. This is also uploaded on company's website. **Enclosed as Annexure XII.** **It is being complied.** A hierarchical system of the company to deal with environmental issues from corporate level to mine level already exists. **It is being complied**.

B. General Conditions:		
i	No change in mining technology and scope of working shall be made without prior approval of the Ministry of Environment and Forests.	**It shall be complied.**
ii	No change in the calendar plan of production for quantum of mineral coal shall be made.	**It shall be complied.** ▪ Production is being done as per the approved calendar programme/ MoU target.
iii	Four ambient air quality monitoring stations shall be established in the core zone as well as in the buffer zone for PM_{10}, $PM_{2.5}$, SO_2 and NOx monitoring. Location of the stations shall be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the state Pollution Control Board. Monitoring of heavy metals such as Hg, As, Ni, Cd, Cr, etc carried out at least once in six months.	**It has been complied**. ▪ The optimum location of monitoring stations in Jharia Coal Field has been finalized with the approval of Jharkhand State Pollution Control Board. **Enclosed as Annexure IV.** ▪ Air quality Monitoring report has been enclosed as **Annexure XIII**.
iv	Data on ambient air quality (PM_{10}, $PM_{2.5}$, SO_2 and NOx) and heavy metals such as Hg, As, Ni, Cd, Cr and other monitoring data 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. Random verification of samples through analysis from independent laboratories recognized under the EPA rules, 1986 shall be furnished as part of compliance report.	**It is being complied.** ▪ Data is regularly submitted to ministry along with 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.	**It is being complied.** ▪ Personnel operating HEMMs, drilling machine and other machines comply with safety regulation and are equipped with Personal Protective Equipment. Noise monitoring data has been enclosed as **Annexure XIV**.
vi	Industrial wastewater (workshop and wastewater from the mine) shall be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19th May 1993 and 31st December 1993 or as amended from time to time before discharge. Oil and grease trap shall be installed before discharge of workshop effluents.	**It is being complied.** ▪ Effluents discharge standards are regularly monitored by CMPDIL for cluster VIII group of mines. Mine water is being treated using filter plants (Pressure, Sand filters etc.) for its further use in industrial purpose and supply to the community. Mine water monitoring report has been enclosed as **Annexure XV.**

vii	Vehicular emissions shall be kept under control and regularly monitored. Vehicles used for transporting the mineral shall be covered with tarpaulins and optimally loaded.	**It is being complied.** ▪ Vehicles used for transportation of coal are always covered by tarpaulin and being monitored for the vehicular emission by the transporter and BCCL. ▪ Copy of some Emission Under Control/Fitness Certificate has been enclosed as **Annexure XVI**.
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 recognized under EPA Rules, 1986.	**It is being complied.** ▪ Ambient environmental monitoring is being done by CMPDIL. Monitoring data have been enclosed as Annexures.
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.	**It is being complied.** ▪ A separate full-fledged Human Resource Development Department is conducting regular training progr amme on these issues. ▪ Apart from this Vocational Training Centers are existing in all the Areas of BCCL, which provides periodical training on the safety and occupational health issue to the workers working in the mines. Enclosed as **Annexure XVII.**
x	Occupational health surveillance programme of the workers shall be undertaken periodically to observe any contractions due to exposure to dust and to take corrective measures, if needed and records maintained thereof. The quality of environment due to outsourcing and the health and safety issues of the outsourced manpower should be addressed by the company while outsourcing.	**It is being Complied.** ▪ Periodical medical Examination (PME) of all the mining and other personnel is being carried out regularly at Area Hospital, Tisra as per the Coal Mines Regulation 2017 and Director General of Mines Safety (DGMS) guidelines. Enclosed as **Annexure XVIII.**
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.	**Complied.** ▪ A full-fledged Environment Department, headed by a Dy.GM (Environment) along with a suitable qualified multi-disciplinary team of executives have been established at Company Headquarters for implementation of Environment Policy of the company. ▪ One Executive in each area has also been nominated as Nodal Officer (Environment) for looking after routine environment related jobs alongwith an Environment Management Cell at Area Level. ▪ For implementing and look after Socio-Economic Issues, an executive of Community Development Cadre is also posted at area level.

xii	The funds earmarked for environmental protection measures shall be kept in separate account and shall not be diverted for other purpose. Year-wise expenditure shall be reported to this Ministry and its Regional Office at Bhubaneswar.	**It is being compiled.** ▪ Funds for environmental protection measures area kept in separate head which is only used in environmental management activities.
xiii	The Project authorities shall advertise at least in two local newspapers widely circulated around the project, one of which shall be in the vernacular language of the locality concerned within seven days of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and may also be seen at the website of the Ministry of Environment & Forests at http://envfor.nic.in.	**It has been complied.** ▪ Advertisement in local newspaper has also been done. Enclosed as **Annexure XIX.**
xiv	A copy of the environmental clearance letter shall be marked to concern Panchayat/Zila Parishad, Municipal Corporation or Urban local body and local NGO, if any, from whom any suggestion/representation has been received while processing the proposal. A copy of the clearance letter shall also be displayed on company's website.	**It has been complied.** Enclosed as **Annexure XX.**
xv	A copy of the environmental clearance letter shall also be displayed on the website of the concerned State Pollution Control Board. The EC letter shall also be displayed at the Regional Office, District Industry Sector and Collector's Office/Tehsildar's Office for 30 days.	**It has been complied.**
xvi	The clearance letter shall be uploaded on the company's website. The compliance status of the stipulated environmental clearance 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 public domain. The monitoring data of environmental quality parameter (air, water, noise and soil) and critical pollutant such as PM_{10}, $PM_{2.5}$, SO_2 and NOx (ambient) and critical sectoral parameters shall also be displayed at the entrance of the project premises and mine office and in corporate office and on company's website.	**It is being complied.** ▪ Environmental clearance and six monthly compliance of the EC conditions of the cluster have been uploaded on the company's website (www.bcclweb.in).

xvii	The project proponent shall submit six monthly compliance reports on status of compliance of the stipulated environmental clearance conditions (both in hard copy and in e-mail) to the respective Regional Office of the Ministry, respective Zonal Offices of CPCB and the SPCB.	**It is being complied.** ▪ Six monthly compliance report is regularly send to (twice in a year) the Regional Office of MoEFCC, Ranchi along with required data and information.
xviii	The Regional Office of this Ministry located at Bhubaneswar shall monitor compliance of the stipulated conditions. The Project authorities shall extend full cooperation to the office(s) of the Regional Office by furnishing the requisite data/ information/ monitoring reports.	**Agreed.**
xix	The Environment statement for each financial year ending 31 March in Form-V is mandated to be submitted by the project proponent for the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be uploaded on the company's website along with the status of compliance of EC conditions and shall be sent to the respective Regional Offices of the MoEF by E-mail.	**It is being complied.** ▪ It is being submitted for all the mines of cluster VIII to Head Office of Jharkhand State Pollution Control Board for every Financial Year ending on 31st March.
C. Other Conditions by MOEF		
i	The Ministry or any other Competent Authority may stipulate any further condition(s) for environmental protection.	**Agree**
ii	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.	**Agree**
iii	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.	**Agree**

iv	The Environmental Clearance is subject to the outcome of the Writ Petition filed by M/S Bharat Coking Coal Limited (BCCL) in response to the closure orders issued by the Jharkhand State Pollution Control Board which is pending in the Jharkhand High Court.	**Agree.**

Project Officer
Bastacolla Colliery

Project Officer
Bera Colliery

Project Officer
Dobari Colliery

Project Officer
Kuya Colliery

Project Officer
Ghanoodih Colliery

Project Officer
Kujama Colliery

Annexure- I

Coal Production from Cluster VIII (April'2019 to Sept'2019)

Month	Production (In Tonnes)
Bastacolla Colliery	67638.00
Bera Colliery	0.00
Dobari Colliery	0.00
Ghanoodih Colliery	0.00
Kuya Colliery	703600.00
Kujama Colliery	0.00
Total	771238.00

Annexure-II

Study to Analyze the Extent of Pollution Reduction

सेन्ट्रल माईन प्लानिंग एण्ड डिजाइन इन्स्टीच्यूट लिमिटेड
(कोल इण्डिया लिमिटेड की अनुषंगी कम्पनी / भारत सरकार का एक लघु रत्न उपक्रम)
गोंडवाना प्लेस, कांके रोड, रांची - 834 031, झारखण्ड (भारत)
Central Mine Planning & Design Institute Limited
(A Subsidiary of Coal India Limited / Govt. of India Public Sector Undertaking)
Gondwana Place, Kanke Road, Ranchi - 834 031, Jharkhand (INDIA)
CORPORATE IDENTITY NUMBER - U14292JH1975GOI001223

Letter No.: पर्यावरण/ 8/BCCL/ E-196651 Dated: 20/07/2018

सेवा में,

उप महाप्रबन्धक (पर्यावरण)
बी. सी. सी. एल.
कोयला भवन
धनबाद-826005

विषय: **Study to analyze the Extent of Reduction of Pollution Load every year by reducing coal transportation by Road (Job No.-094214112).**
(BCCL/Dy.GM(Env.)/F-/14/713 dated 21/23.08.2014)

महोदय,

Please find attached soft copy of the report on "Study to analyze the Extent of reduction of pollution load every year by reducing coal transportation by Road" for the **cluster VII and Cluster-VIII:**

Sl. No.	Name of the Cluster	Peak Production (MTY)
1.	Cluster –VII	8.161
2.	Cluster –VIII	5.603

The above report has been prepared based on the data provided by BCCL and meeting held in the first week of November 2018 at BCCL (HQ) Dhanbad.
You are requested to provide data of remaining clusters (CLUSTER WISE) at the earliest to enable us to submit the remaining reports.

धन्यवाद,

संलग्नक: यथोक्त

भवदीय
(पुष्कर) 20.7.18
महाप्रबन्धक (पर्यावरण)

प्रतिलिपि:

1. क्षेत्रीय निदेशक, आर.आई- II, कोयला भवन, धनबाद- For Kind information.

फोन नम्बर /Phone No. : +91 651 2233055 फैक्स नम्बर / Fax No. : +91 651 2231447
ई-मेल /e-mail: gmenv.cmpdi@coalindia.in, gmenv.cmpdi@gmail.com
वेबसाईट / Website Address: www.cmpdi.co.in

Annexure-III

Global Expression of Interest (EoI)

For

Dealing with coal mine fires in lease hold of BCCL in Jharia Coalfield, Dhanbad, Jharkhand, India. Detailed scope of work as given in the document.

LAST DATE OF SUBMISSION : 28.04.2014

1. BHARAT COKING COAL LIMITED: A PROFILE

Bharat Coking Coal Limited incorporated in January, 1972 is a fully owned subsidiary of Coal India Limited a 'Maharatna' Public Sector Undertaking under the Ministry of Coal, Government of India. Being the sole repository of prime coking coal in the country, BCCL, at present operates 66 coal mines spread over in Jharia Coalfield and part of Raniganj Coalfield apart from 6 coking coal washeries & 2 non-coking coal washeries. The mines are grouped under 12 areas for administrative convenience. BCCL has some unique inherent and perennial characteristics which are adversely affect the normal operation of the Company. Difficult geo-mining conditions involving large number of overlaying coal seams, preponderance of old workings, high degree of gassiness, coal fires affecting working seams, water logged upper seams above current places of working, etc, restricts coal production and productivity. Besides, high density of population in the coal bearing areas limits the equipment size of opencast operations apart from being an impediment to acquisition of land for uninterrupted operations. In the year 2012-13, the company achieved a coal production of 31.21 million tone and offtake of 32.99 million tone thereby registering the highest ever the Turnover and Profitability (PAT) of Rs 10176.62 Cr. and Rs 1709.06 respectively. A brief description of the organizational structure and the detailed activities of Bharat Coking Coal Limited can be viewed in the website http://www.bccl.gov.in.

The mission is to produce planned quantity of coal efficiently and economically in an Eco-friendly manner with due regard to Safety, Conservation & Quality. The company strives to meet the growing demand of thermal as well as metallurgical coal in the country in a environmentally and socially sustainable manner.

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2.2. Bidder's Credential Requirement

i) The bidder(s) must have successfully dealt with mine fire in at least two coal mines, one open cast and one underground mine. The annual capacity of opencast and underground mines should be at least 2 Mt and 0.5 Mt respectively during last seven years of last financial year. The documentary proof of successful dealing with fire shall be submitted along with the bid.

ii) The bidders in their name must have achieved a minimum average annual financial turnover of INR One Hundred Million or equivalent USD during last 3 years ending 31st March of previous financial year. The documentary evidence to this effect would be copies of audited Balance Sheet and Profit & Loss A/c duly countersigned by the authorized representative of bidding company and a declaration to the above affect duly signed by the authorized representative of bidding company & counter signed by a Chartered Accountant or equivalent.

iii) The bidder must possess "key personnel" (minimum number) of the following categories with requisite qualification and experience :-

Sl. No	Skill of key personnel	Requisite Qualification	Minimum Experience	Minimum Nos. for eligibility
1.	Technical Expert (Mining/ Fire dealing/ Mine Rescue)	B.E /B.Tech (Mining) or equivalent	10 years.	10
2.	Technical Expert (Geology/Remote Sensing)	M. Sc (Geology) or equivalent	10 years	2
3	Technical expert (Environment)	B. Tech/BE/M.Sc.(Envr) or equivalent	10 years	1
4.	Technical Expert (Infrastructure)	B.E /B.Tech (Mechanical / Electrical / Civil) or equivalent	10 years	3
5.	IT Expert	B.E /B.Tech/ M.Sc (Computer) or equivalent	10 years	1
6.	Financial Expert	MBA(Finance)/Chartered Accountant/ICWA or equivalent	10 years	1

Note :- The bidder shall designate one of the team members as the team leader.

The documentary evidence to this effect would be self-attested CVs including necessary competency certificate for working in Indian mines duly countersigned by the authorized representative of bidding company.

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iv) Copy of PAN (Permanent Account Number) with Income Tax Authority in India for bidder(s) from India.
v) Copy of PAN Based Service Tax Registration Number in India for bidder (s) from India.

3.0 Availability of details for EOI :

Details for EOI including Terms and Conditions of EOI can be collected from the following place during the period as stated below:

Date: From **27.01.2014 to 26.02.2014.**

Time: **10.00 AM to 1.00 PM** (on all working days)

Office of the GM (CMC)
Contract Management Cell, BCCL
Level-V, Koyla Bhawan,
Dhanbad - 826005

Details for EOI including Terms and Conditions of EOI can also be downloaded directly from the BCCL web-site http://www.bccl.gov.in and NIC Portal, website http://www.tenders.gov.in during the period as mentioned above.

4.0 Pre - EOI submission meeting :
Pre - EOI submission meeting will be held on **14.02.2014 at 11:00AM** in the office of GM (CMC), BCCL, Level-V, Koyla Bhawan, Dhanbad for clarifications and discussion.

5.0 GENERAL INSTRUCTIONS FOR SUBMISSION OF EOI :

Expression of Interest (EOI) shall be submitted by the Consultants / agencies / firms / organizations in a sealed envelope superscribed with "**EOI for Dealing with coal mine fires in lease hold of BCCL in Jharia Coalfield, Dhanbad, Jharkhand, India. Detailed scope of work as given in the document.**" giving EOI reference no. with date and full postal address & telephone nos. on the envelope.

6.0 RECEIPT OF EOI

EOI will be received in sealed envelopes up to **28.04.2014** at the following address only:

Office of the GM (CMC)
Contract Management Cell, BCCL
Level-V, Koyla Bhawan,
Dhanbad - 826005

The offers may be submitted through post also. BCCL takes no responsibility for delay, loss or non receipt of the offers send by post. Fax offers or offers sent through e-mail shall not be accepted.

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7.0 OPENING OF THE EOI :

EOI shall be opened **on 29.04.2014 at 04.00 PM** in the office of the GM (CMC), BCCL, Level-V, Koyla Bhawan, Dhanbad-826005.

8.0 Bidders are requested to go through the details of EOI document & enclose all the required documents along with the proposal. Each page of the proposal shall be signed with seal.

9.0 Prospective parties may note that mere submission of EOI and / or submission of additional information do not automatically entitle them to claim for pre-qualification. BCCL reserves the right to seek for any other information during the process of evaluation, if required.

10.0 BCCL reserves the right to reject any / all the applications to EOI without assigning any reason(s) whatsoever thereof.

Sd/-
General Manager
(Contract Management Cell)

Distribution :

1. PRO – With a request to publish the abridged EOI as enclosed in local as well as National dailies as per norms of the Company and also arrange to send the paper cutting of publication to the Contract Management Cell.
2. D(T)OP / D(T)P&P / D(F) / D(P) / CVO.
3. GM(Co-ordn) / GM(S&M) / GM(F)I/C / GM(M&M) / GM(E&M) / GM(Excv) / GM(P&P) / GM(IE) / GM(System) / Dy. GM (Envt.), BCCL
4. Sr.ES to CMD - for kind information of CMD.
5. HOD (Admn) with a request to display this EOI in Koyla Bhawan Notice Boards.
6. All CGMs/GMs of the Areas including Washery Zones for wide circulation through display in the Notice Boards.
7. Inspector, CISF- with a request to deploy security personnel at the office of GM (CMC), Level-V, Koyla Bhawan on 28.04.2014 from 9:30A.M to 4:00P.M and on 29.04.2014 from 3:30 PM till completion of the meeting.
8. Desk In-Charge, BCCL, M M Division, 4th floor, 6, Lyons Range, Kolkata.
9. CGM / GM (Contract Management Cell), WCL/SECL/NCL/MCL/ECL/CCL & CIL
10. Sri R.K. Choubey, Sr.DEO / Sri B N Banerjee, DEO, CMC Deptt. - to upload this EOI in BCCL Website and forward soft copy of NIC format to GM (System) for uploading the same at NIC portal website (soft copy of the same is enclosed for needful).

Sd/-
General Manager
(Contract Management Cell)

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Annexure-IV

(7)

Ph: 0326-2204933

झारखण्ड राज्य प्रदूषण नियंत्रण पर्षद्
Jharkhand State Pollution Control Board
HIG-1, Housing Colony, Dhanbad-826001

Letter No.... 2650 Dated ..... 6/7/13 .....

From,

Regional Officer,
Dhanbad

To,

HOD (Envt.),
M/s. B.C.C.L.,
Koyla Bhawan, Koyla Nagar,
Dhanbad.

Sub: **Fixing up monitoring station/Sampling location of Air, Water & Noise.**

Sir,

With reference to you letter no. GM(Env.)/F-JSPCB/2013/783, dt. 06.07.2013 We have approved Air, Water & Noise monitoring Station/Sampling location after verification and return a copy of the map.

Encl-A/a.

Your's faithfully,

6/7/13

(Dinesh Prasad Singh)
Regional Officer.

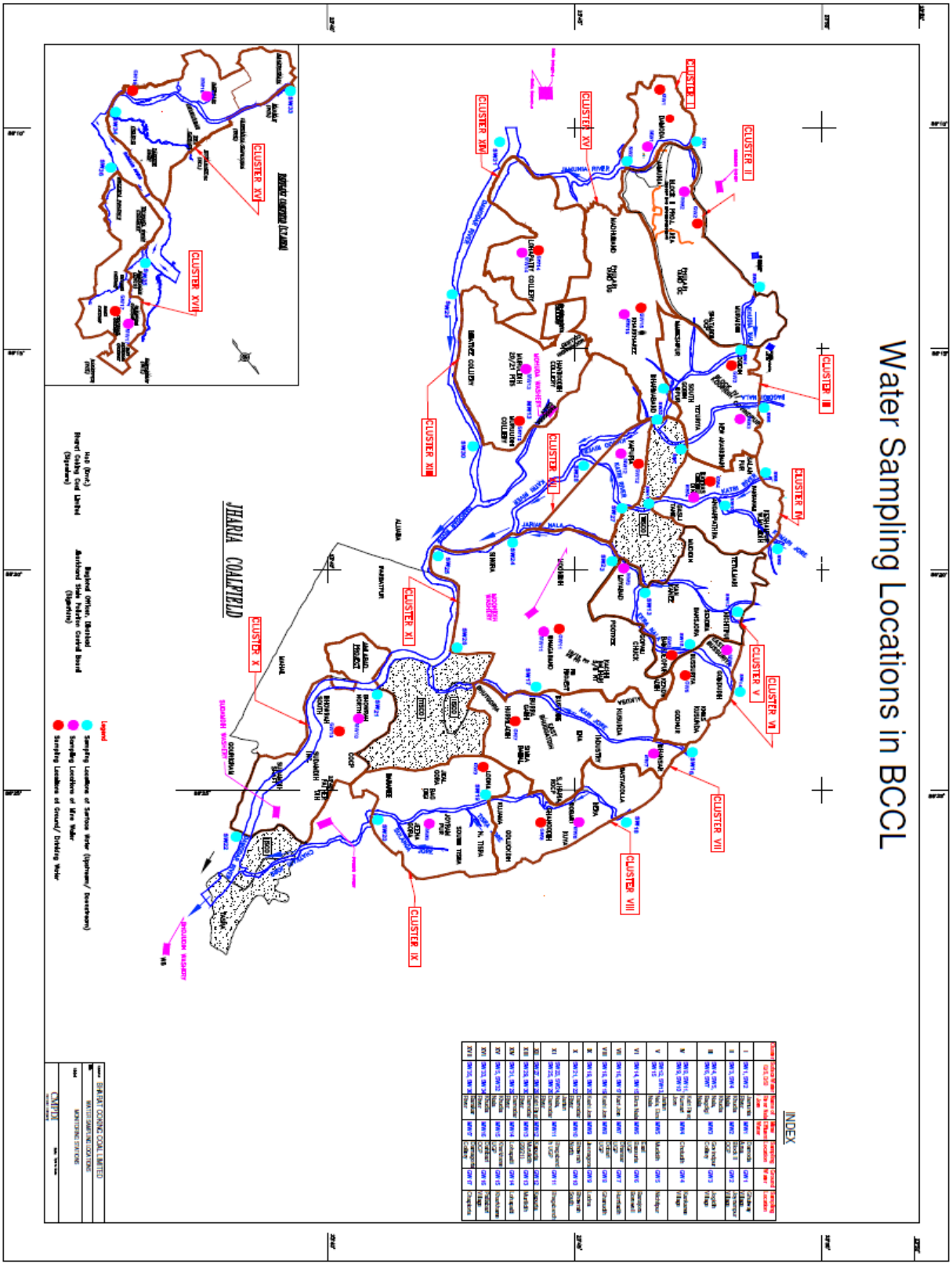
Memo..... Dhanbad, dated.....

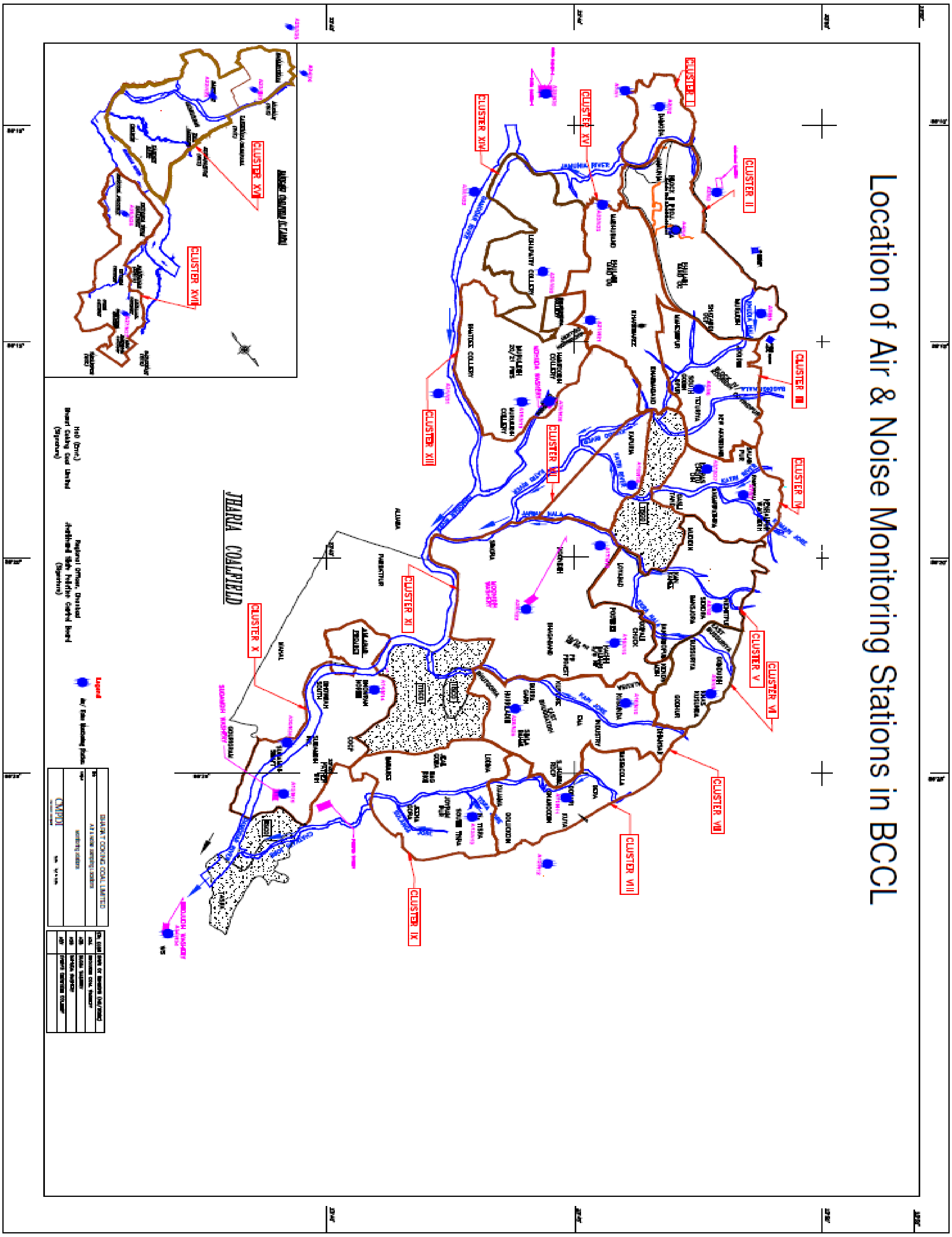
Copy to: The Member Secretary, Jharkhand State Pollution Control Board for information & enclose a copy of the map for necessary action.

Encl-A/a.

(Dinesh Pd. Singh)
Regional Officer.

Printed by Sandip


Water Sampling Locations in BCCL
JHARIA COALFIELD
CLUSTER I
CLUSTER II
CLUSTER III
CLUSTER IV
CLUSTER V
CLUSTER VI
CLUSTER VII
CLUSTER VIII
CLUSTER IX
CLUSTER X
CLUSTER XI
CLUSTER XII
CLUSTER XIII
CLUSTER XIV
CLUSTER XV
CLUSTER XVI
CLUSTER XVII
INDEX


Location of Air & Noise Monitoring Stations in BCCL
JHARIA COALFIELD

Annexure-V

COAL INDIA LIMITED
कोल इण्डिया लिमिटेड
ENVIRONMENT DIVISION
पर्यावरण बिभाग
Corporate Identity Number: L23109WB1973GOI028844
COAL BHAWAN, Premises No -04MAR Plot no - AF-III, Action Area- IA
RAJARHAT , NEW TOWN KOLKATA - 700156,
E-mail: cgmenv.cil@gov.in, Web:www.coalindia.in
TEL: 033-23246638 / FAX: 033-23244232

CIL/ENV/2015-16/ 7000

09//12/2015

प्रति,
General Manager(Environment)/ HOD (Environment),
ECL,BCCL,CCL,NCL,SECL,WCL,CMPDIL,NEC,MCL,

Sub: MoU between Coal India Ltd.& NEERI for "Sustainable Coal Mining in Coal India Ltd."

महोदय,

In view of the directive of 321 th CIL Board held on 15 th October 2015 pertaining to enter into a long tern. MoU between CIL and CSIR -NEERI for identification of environmental issues through assessment of monitoring data of CIL and preparing an action plan for implementing the same in coal mining, MoU has been signed between Coal India Ltd and National Environmental Engineering Research Institute Ranchi, on 3/12/2015.
Copy of the MoU is enclosed herewith for your information.

9/11/2015
मुख्यप्रबंधक /पर्यावरण
सी. आई. एल.,

संलग्न : उपर्युक्त

भारत कोकिंग कोल लिमिटेड
एक मिनी रत्न कम्पनी
(कोल इंडिया लिमिटेड का एक अंग)
उप महाप्रबंधक (पर्यावरण) का कार्यालय
कोयला भवन,कोयला नगर, धनबाद–826005

Bharat Coking Coal Limited
A Mini Ratna Company
(A Subsidiary of Coal India Limited)
Office of the Dy. GM (Environment)
Koyla Bhawan, Koyla Nagar, Dhanbad -826005

CIN : U10101JH1972GOI000918

पत्र संख्या :भाकोकोलि/उपमहाप्रबंधक)पर्या/(SOURCE APPORTIONMENT (MoU) /NEERI /2018/
दिनांक:12.05.2018

To,
The Director,
CSIR-NEERI,
Nehru Marg,
Nagpur– 440020
Maharashtra

Sub.: Work Order for the Project "Source Apportionment of ambient air particulate matter in Jharia coalfields region, Jharkhand".

Ref: **(i)Memorandum of Understanding between CIL & NEERI dated 03.12.2015**
(ii)your proposal vide email dated 12.09.2016 and subsequent amendment including GST rates
(iii) "Terms of reference for the Project "Source Apportionment of ambient air particulate matter in Jharia coalfields region, Jharkhand" dated 09.03.2018.
(iv) NEERI's acceptance of "TOR" vide email dated 08.05.2018

Dear Sir,
This has reference to proposal **"Source Apportionment of ambient air particulate matter in Jharia coalfields region, Jharkhand" vide email** dated 12.09.2016. The Competent Authority has approved the award of work to NEERI namely **"Source Apportionment of ambient air particulate matter in Jharia coalfields region, Jharkhand" for One Crore forty one Lakh and sixty thousand only inclusive of GST(Rs. 1,41,60,000/-)** for a period of Twelve(12) months under the MOU dated 03.12.2015 between CIL & NEERI, extended to all subsidiaries of CIL & the terms of reference. The Project-in-charge will be HOD(Environment) or any of his authorized representative.

You are required to comply the scope, objective & terms and conditions in respect of above mentioned work as agreed in the "Terms of Reference" as given below.

1. Scope of the Work:

- To conduct Source Apportionment Study for varying sources of gasses/smoke/dust emission from source to source (fuel wood, coal, fly-ash, TPPs, coke plants, traffic, silica from natural dust etc., but not limited to this) for the entire Jharia Coalfields (within and up to 10 Km from the periphery / boundary of BCCL mines)

- Study of Mineralogical composition of the suspended particulate matter (PM10 and PM2.5) with their characterization and quantification.
- Ascertaining sources(fuel wood, coal, fly-ash, TPPs, coke plants, traffic, silica from natural dust etc., but not limited to this) and extent of the air pollution of Jharia coalfield with suggesting cluster-wise appropriate techno-economically viable, mitigation management plan including action plan for the control of pollution level.
- The Environment Clearance has been granted to mines of BCCL on Cluster Basis, the final report must be submitted to BCCL on Cluster Basis. JCF has been divided into Clusters. The study to include the entire Jharia Coalfield along with area up to 10 Km from the periphery / boundary of BCCL mines (Key Plan showing Clusters in Jharia Coalfield enclosed)
- Two Presentations to be made by NEERI- One to BCCL Management before submission of Final report & another to the various stake holders including regulatory agencies after submission of the report.
- The dispersion Model should be on GIS platform
- The Hotspots/bottleneck points to be identified where there is increased pollution on GIS platform.
- Skill transfer and capacity building training for BCCL personnel.
- Accomodation , travel , local transport, other incidental cost and anciallary expenditures to be borne by NEERI.

2. Objectives of the study:

The major objective of the study is to assess the current ambient air quality, sources of air pollution and propose the priorities for the actions for improvement of air quality. The study to include the entire Jharia Coalfield along with area up to 10 Km from the periphery / boundary of BCCL mines. The detailed objectives are as following;

A) Ambient Air Monitoring related

- Monitoring of ambient air quality at selected receptor locations for pollutants including PM10, PM 2.5(limited), SO2, NOx, PAHs to establish the current status of the air quality in Jharia Coalfields along with area up to 10 K.M from the periphery / boundary of BCCL mines. Also review of the available air quality monitoring data from Central Pollution Control Board(CPCB) /Jharkhand State Pollution Control Board(JSPCB) .
- To calibrate dispersion modelling predictions using measured air quality parameters
- To draw supportive data through specific site related monitoring regarding impact causing sources such as kerbside monitoring.
- To establish the impact of meteorological conditions on a few select indicator pollutants in different micro meteorological conditions of the Jharia Coalfileds.

B) Emission Inventory related of Jharia Coalfields along with area up to 10 Km from the periphery / boundary of BCCL mines

- To identify the pollution load grid wise for point, line and area source
- To establish possibilities of receptor level concentrations of air pollutants by matching dispersion modelling and air quality monitoring data.

C) Source apportionment related

- To identify and apportion the pollution load at receptor level to various sources in the Jharia Coalfields along with area up to 10 Km from the periphery / boundary of BCCL mines.
- To carry out the source apportionment using molecular markers for a limited number of samples through a time resolved sample collection at various period of the day and day-of-the-week.

D) Any other item in consensus between both BCCL/CIL & NEERI evolved during the study

3. TERMS & CONDITIONS:

- You would assist BCCL in clarifying/defending/justifying data of report submitted to regulatory authority or information under RTI, Act or reply of parliamentary Questions or any other litigations if required by Dy. GM (Env).

- CSIR-National Environmental Engineering Research Institute (NEERI) shall associate BCCL in projecting the reports/findings at various national & international forums, Conferences, Seminars, CSIR-National Environmental Engineering Research Institute (NEERI) newsletters & annual reports, meetings of regulatory authorities etc.

- All the materials required with regard to monitoring/analysis, videography, photography and presentation for the work shall be arranged by NEERI at its own cost and shall be of appropriate quality.

- The responsibility for the arrangement of the all equipment tools and plants etc. required for monitoring/analysis, videography, photography and presentation for the work lies on NEERI.

- GST and cess as applicable shall be paid as per rule. The Duration of the project is 12 Months.

- The progress report of the work should be submitted every 3 months. These reports shall be in the form of a booklet and soft copies along with videography and photography. Reports should be in line with the scope of work.

- BCCL shall not have any liability in case of any accident etc. towards CSIR-National Environmental Engineering Research Institute (NEERI)'s personnel/ staffs during filed visits

- Child labour is prohibited under Mines Act, therefore, NEERI Nagpur shall not deploy any child labour in the aforesaid work.

- Reports /findings shall be sole property of BCCL and hence the publishing of the reports /findings in any forum (i.e. hard copy / electronic or in any other form) shall be done only with prior permission of BCCL and shall acknowledge BCCL in all such activities.

- Matter relating to any dispute or difference arising out of this work order and subsequent contract awarded based on this work order shall be subject to the jurisdiction of Dhanbad court only

- All other terms and conditions of the MoU executed between CIL and CSIR-National Environmental Engineering Research Institute (NEERI) on 03.12.2015 and extended to its subsidiaries shall be applicable.

4. **ARBITRATION:**

Disputes between the parties arising from this agreement shall be settled amicably through negotiations in good faith. Failing the above, the dispute shall be referred to arbitration of three arbitrators one each to be appointed by each party and the two arbitrator shall appoint *a* third arbitrator in accordance with the provisions of Arbitration and Conciliation Act, 1996 or any subsequent *amendment* thereof. The decision of the three arbitrators shall be final and binding on the parties hereto. The place of arbitration shall be at Nagpur and shall be conducted in English language

5. FORCE MAJEURE :

Force majeure is herein defined as any cause which is beyond the reasonable control of BCCL or CSIR/NEERl as the case may be, which with a reasonable amount of diligence could not have been foreseen and which substantially affects the performance of the respective obligations of the parties, such as but not limited to :

- Act of God such as flood, drought cyclone, lighting, earthquake, etc.
- Rebellion, civil mutiny, commotion, riot, accident by fire, explosion, epidemic, or any other cause beyond the control of parties.
- Acts of any Government including but not limited to war, declared or undeclared priorities, quarantines.
- Any direction, order of any court or Authority adversely affecting the enforcement of this agreement in any manner.
- Strikes and Lockouts for a continuous period of 30 days

Provided that either party shall within 7 days from the occurrence or cessation of such a cause notify the other in writing of the same.

In the event Force Majeure event continue for more than 30 days, the parties shall mutually discuss and decide the future course of action. If not mutually agreed, the parties shall have the right to terminate this agreement.

BCCL or NEERI shall not be liable for non-performance of their respective obligations or delays in respect thereof as a result of force majeure as referred to and / or defined above

6. INDEMNITY

- BCCL shall-indemnify and keep indemnified CSIR/NEERI from and against any and all loss damage or liability (whether criminal or civil) suffered and legal fees and costs incurred by CSIR/NEERI resulting from a breach of any of this agreement between BCCL and its licensors/consultants/contractors or any other third party.
- Notwithstanding anything in this agreement, in the event of any liability, claim or damage arising out of this agreement, the liability of CSIR/NEERI to BCCL shall under any circumstance exceed the amount received by CSIR-NEERI

7. CONFIDENTIALITY

The Parties, to the extent of their respective rights to do so, shall exchange such technical information and data as is reasonably required of each Party to perform its responsibilities under this agreement. Each Party agrees to keep in confidence and to use the same degree of care as it uses with respect to its own proprietary data to prevent the disclosure to third Parties of all technical information, data and confidential business information (hereinafter referred to as "Consolidated Data"). Exchange, use and maintenance of Confidential Data shall be mutually discussed and agreed to by the parties. The preceding provisions of confidentiality and restriction on use of Consolidated Data shall not apply to

- Information in the public domain or information, which subsequently enter into public domain without committing breach of this Article.
- Information in possession of the Party at the time of disclosure and was not acquired, directly or indirectly, from the other Party.
- Information, which a Party requires to disclose under law, rules or regulations or court orders.
- Information provided to Consultants / advisors, provided they, in turn, sign undertaking of confidentiality

8. OWNERSHIP OF INTLECTUAL PROPERTY -

- Any intellectual property rights obtained by the respective parties hereto pertaining to the PROJECT prior to signing of the agreement shall remain the property of the respective organizations. On mutual consent foreground IP shall be deployed for the project purpose.
- The intellectual property that is generated in the PROJECT shall be owned by BCCL.
- If an IP is generated the relevant IP clause shall be built in a project specific agreement mutually, as the, case arises.
- In the case of Intellectual Property developed independently by CSIR/NEERI in which BCCL has an interest, CSIR/NEERI shall grant to BCCL/CIL a non-exclusive license to manufacture and sell the product, and CSIR/NEERI reserves the right to grant similar license at its discretion to others.
- During the work as envisaged under this agreement in the event of CSIR/NEERI scientists exploring, inventing, or discovering results other than the specific objectives of the Project, CSIR/NEERI shall retain absolute rights on such results. CSIR/NEERI shall first offer such results to BCCL on negotiated terms by entering into a separate Agreement. In case BCCL does not accept the offer, CSIR/NEERI shall be free to negotiate the release of such results to other parties without any obligations to CIL.

- In case BCCL intends to renounce its interest in the Project, it shall give notice to NEERI of its intention upon receipt of which notice NEERI shall be free to work further on its own on such Projects and or enter into a licensing or joint development Agreement with any other interested third party.

9. Deliverables:

- Emission Inventory and Dispersion Modeling
- Source apportionment for identification of sources impact and prioritization of actions.
- Time-bound action plan guidelines for implementing measures for improving air quality
- 2 copies of Draft Report
- 15 copies of Final Report- Since the Environment Clearance has been granted to mines of BCCL on Cluster Basis, the final reports must be submitted to BCCL on Cluster Basis.

10. TERMS OF PAYMENT

Project Cost	**Rs. 120 Lakhs (Rupees One Crore Twenty Lakhs Only)**
GST @18%	**Rs. 21.6 Lakhs (Rupees Twenty One Lakhs Sixty Thousand Only)**
Total Cost (including GST)	**Rs. 141.6 Lakhs (Rupees One Crore Forty One Lakhs Sixty Thousand Only)**
Payment Terms	1st Installment: 50% + GST + All applicable Cess & surcharges – (After identification of stations in Jharia Coalfield and submission of its report) 2nd Installment: 30% + GST + All applicable Cess & surcharges – (After completion of field data collection) 3rd & Final Installment: 20% + GST + All applicable Cess & surcharges – (After submission of final report and its acceptance by BCCL.)
Project Duration	12 months

- All the payment will be made by ELECTRONIC MODE through bank. The CSIR-National Environmental Engineering Research Institute (NEERI) must furnish the details in the proforma as given in the Annexure-3.

11. PERFORMANCE SECURITY/SECURITY DEPOSIT

11.1 Security Deposit shall consist of two parts:

a) Performance Security to be submitted at award of work and

b) Retention Money to be recovered from running bills.

The security deposit shall bear no interest.

11.2 Performance Security should be 5% of annualized value of contract amount and should be submitted within 28 days of issue of this term of reference by NEERI in any of the form given below

- A Bank Guarantee in the form given in the bid document from any scheduled Bank payable at its Branch at Dhanbad.
- Govt. Securities, FDR (Scheduled Bank) or any other form of deposit stipulated by the owner.
- Demand Draft drawn in favour of Bharat Coking Coal Limited on any Scheduled Bank payable at its Branch at Dhanbad.

If performance security is provided by NEERI in the form of bank guarantee it shall be issued either –

(a) at Bidder's option by a Scheduled Bank payable at its branch at Dhanbad, or
(b) by a foreign bank located in India and acceptable to the employer.

(c) the validity of the Bank Guarantee shall be for a period of one year or ninety days beyond the period of contract or extended period of contract (if any), whichever is more.

Failure on the part of NEERI to comply with the requirement as above shall constitute sufficient ground for cancellation of this agreement.

11.3 All bills shall be paid at 95%. The balance 5% shall be treated as retention Money and will be second part of security deposit.

11.4 Refund of Security Deposit:

The refund of security deposit shall be subject to company's right to deduct/appropriate its dues against the NEERI under this terms of reference/any other works. On completion of the work and certified as such by the Project-in-Charge *i.e* HOD(Env) or his authorized representative, the security deposit remaining with the company shall be refunded as below:

- Performance Security (1st part of security deposit) shall be refunded within 60 days of the submission of final report and its acceptance by BCCL management (As certified by the Project-in-charge *i.e* HOD(Env) or his authorized representative)
- Retention Money (2nd part of security deposit) shall be refunded after 180 days of the submission of final report and its acceptance by BCCL management (As certified by the Project-in-charge *i.e* HOD(Env) or his authorized representative.)

You are advised to furnish Performance Security/Security Deposit in the Office of HoD (Env), BCCL in the form detailed as under within 28 (twenty eight) days from the date of receipt of this terms of reference to enable the HoD (Env), BCCL to issue a formal work order to you and sign the contract/agreement executed between the company and you (NEERI, Nagpur) with the terms and conditions including, Integrity Pact, etc.

You have to sign the Integrity Pact. This is as per the CVC guidelines. Name, address & contact No. of the Independent External Monitor(s) for this purpose is as given below:

1. Name: Prof (Dr.) L.C. Singhi, IAS (Retd.)
Address: L-31, Third Floor, Kailash Colony, New Delhi-110048
2. Name: Shri Pramod Deepak Sudhakar, IAS (Retd.)
Address: A-002, Stellar Park Apartments, C-58/24 Sector-62, Noida-201301

This terms of reference is given to you in duplicate. You are advised to submit your consent by returning second copy of the terms of referenceduly signed by you as a token of acceptance of the award within 7(seven) days from the date of receipt of this letter.

Failure to comply with the requirement as above shall constitute sufficient ground for cancellation of the award.

Enclosed:

1. Annexure-1 (Proforma of bank guarantee for performance security)
2. Annexure-2 FORMAT FOR CONTRACT AGREEMENT
3. Annexure -3 (Proforma for collecting payment through electronic mode including electronic fund transfer (ETF) & electronic clearing system (ECS))
4. Annexure -4 INTEGRITY PACT

Yours faithfully,

Dy. GM (Env.)

Copy to:

1) TS to D (T) OP/ D (F)/ D (T) P&P ..... for kind information
2) ES to CVO, BCCL ..... for kind information
3) TS to CMD, BCCL ..... for kind information
4) GM (Finance) I/C, BCCL, Koyla Bhawan
5) HOD(Fin)Pay.
6) GM(Env.), CIL ..... for kind information
7) Prof (Dr.) L.C Singhi, IAS (Retd.), L-31 Third Floor, Kailash Colony, New Delhi-1100481. Address: L-31, Third Floor, Kailash Colony, New Delhi-110048.
8) Concerned Fille.

भारत कोकिंग कोल लिमिटेड
एक मिनीरत्न कंपनी
(कोल इंडिया लिमिटेड का एक अंग)
पंजीकृत कार्यालय कोयला भवन ,कोयला नगर ,
(धनबाद)झारखंड826005(
CIN:U10101JH1972GOI000918
Tele: 0326 2230174 FAX: 0326 2230176
ईमेल :cgmsafety@bccl.gov.in

Bharat Coking Coal Limited
A Miniratna Company
(A subsidiary of Coal India Ltd)
Office of GM I/C(S&R)
Koyla Bhawan, Koyla Nagar,
Dhanbad, Jharkhand-826005
CIN:U10101JH1972GOI000918
Tele: 0326 2230174 FAX: 0326 2230176 Email: cgmsafety@bccl.gov.in

पत्र संख्या भाकोकोलि/उप महाप्रबंधक(एस&आर)I/C/संचिका-MP/17 323 दिनांक-:07.04.2017

To,
Dr, Vinod Kumar,
Group Head, Geosciences group
National Remote Sensing Center
India Space Research Organization
Dept of Space, Govt of India,
Balanagar, Hyderabad - 500037

Sub:- Work –Order for " Delineation of Surface Coal Fire and associated Land Subsidence in Jharia Coalfield, Jharkhand using satellite based remote – sensing techniques"

Dear Sir,

Consequent upon competent approval of proposal on aforesaid subject and subsequent signing o MOU between BCCL and NRSC, the aforesaid work is awarded to NRSC for Rs.18,10500/- (Eighteen lac ten thousand five hundred) only, against 100% payment in advance subject to terms and conditions listed in MOU. As per agreed payment terms and Demand Note No. 07/2016-17,

You are therefore requested to initiate all necessary activities for commencing the subject work as early as possible.

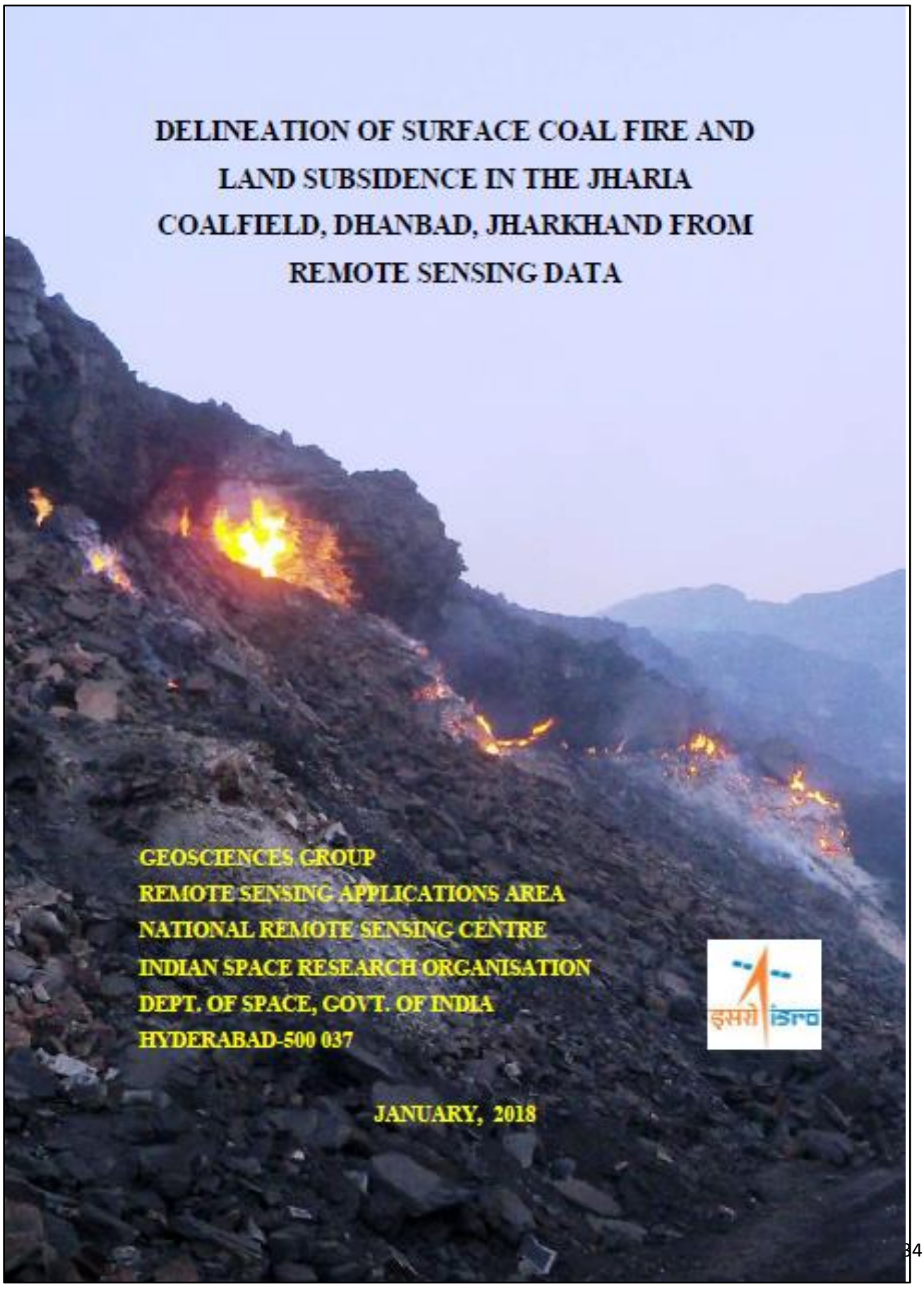
Thanking you,

Yours faithfully,

7/4/17

General Manager I/C (S & R)

Cc to :
1. Director (T) P&P, BCCL- for kind information.
2. TS to CMD, BCCL – for kind information.
3. Sri Mithilesh Kumar, Sr.Mgr.(M),Safety.Deptt., KoylaBhawan


DELINEATION OF SURFACE COAL FIRE AND
LAND SUBSIDENCE IN THE JHARIA
COALFIELD, DHANBAD, JHARKHAND FROM
REMOTE SENSING DATA
GEOSCIENCES GROUP
REMOTE SENSING APPLICATIONS AREA
NATIONAL REMOTE SENSING CENTRE
INDIAN SPACE RESEARCH ORGANISATION
DEPT. OF SPACE, GOVT. OF INDIA
HYDERABAD-500 037
JANUARY, 2018
इसरो
ISRO

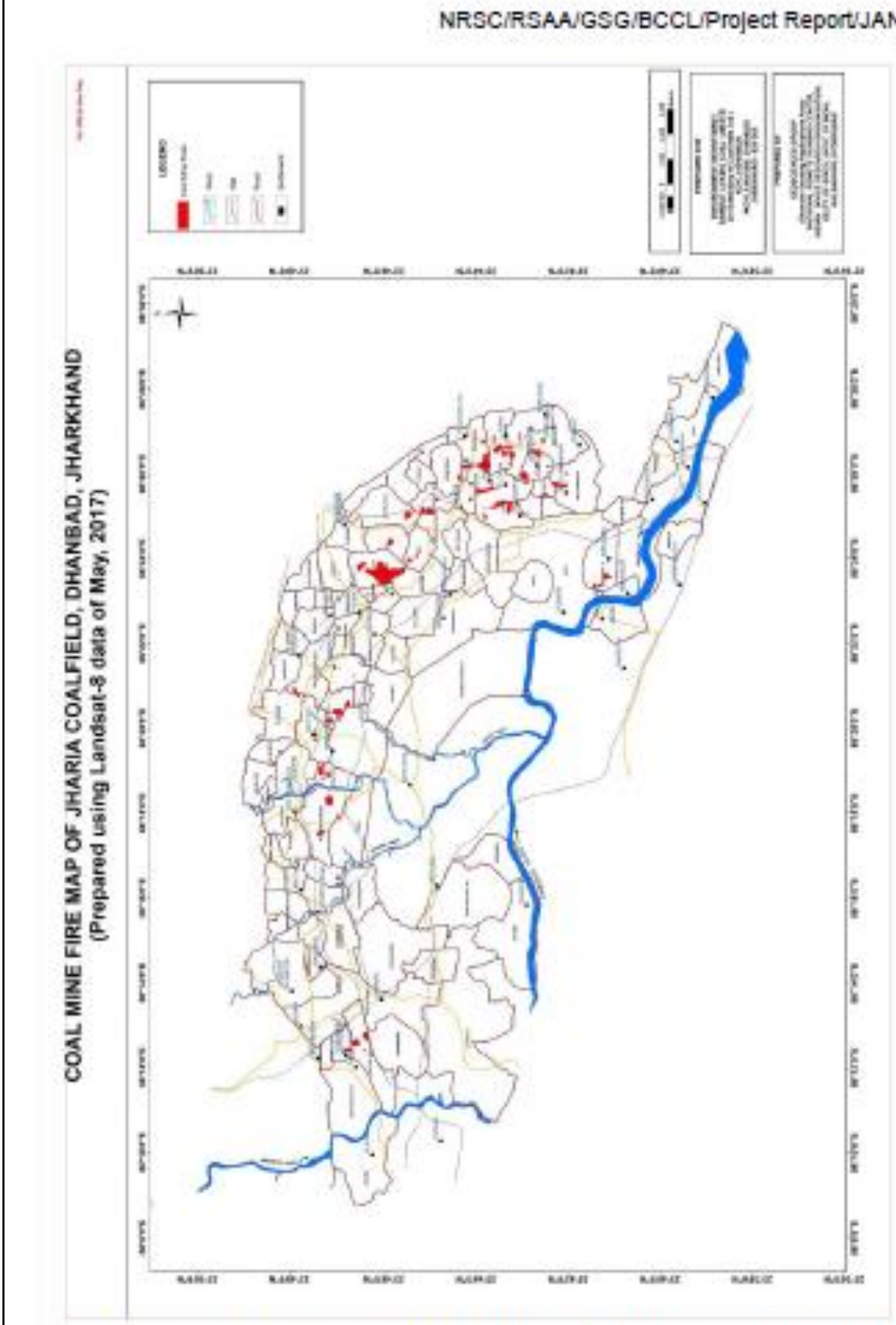


Figure 5: Coal mine fire map (May, 2017) of Jharia coal field, Dhanbad. The fire areas shown in this map have been verified in the field as per field points in figure 13.

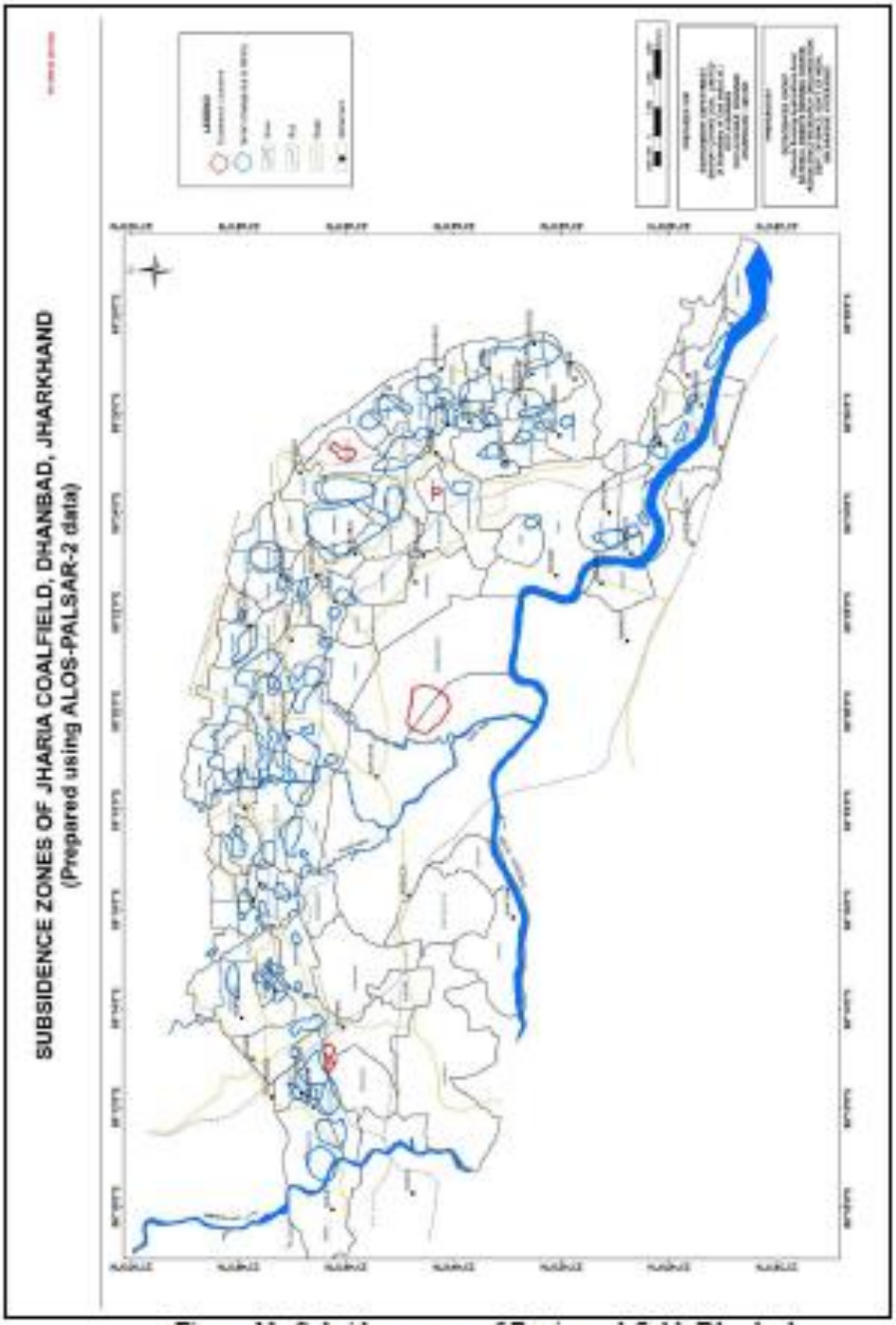


Figure 11: Subsidence map of Jharia coal field, Dhanbad.

Note: Estimations of fire extent (in terms of sq.km.) both in 2012 and in the present 2017 study are pixel based. They do not represent the actual ground area under fire. These estimations are made for comparative purpose only, to indicate the increase or decrease of areal disposition of fire. Hence, they should not be quoted as fire area on the ground.

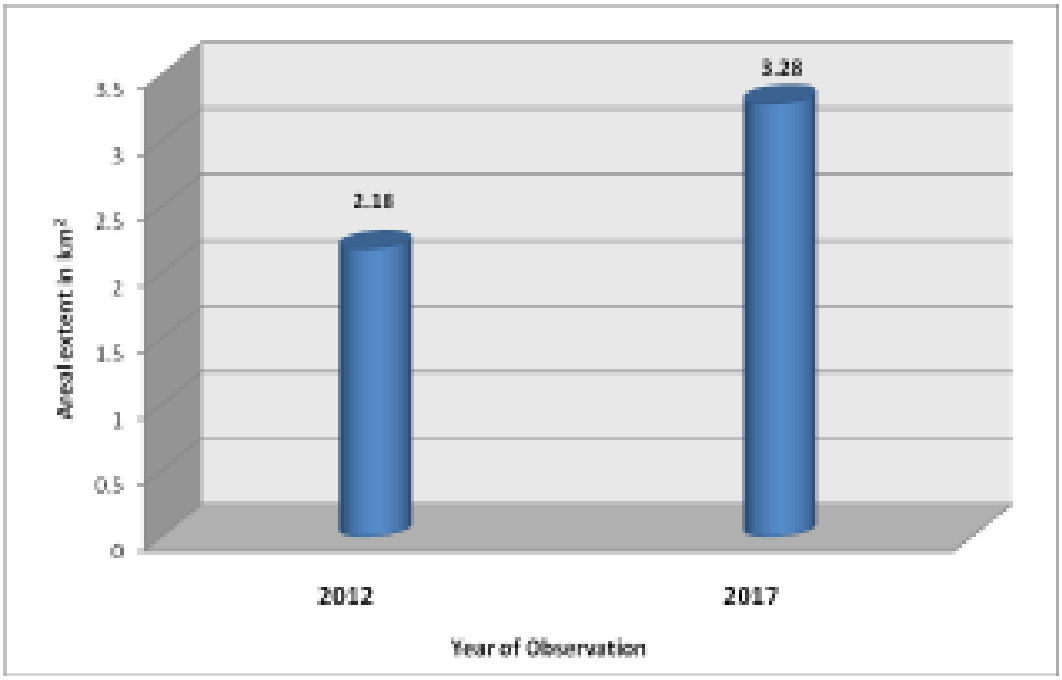


Figure 12: Total fire area statistics

Annexure-VII

Memorandum of Understanding

for

Utilization of mine water by villages situated near mines of CIL in command area of Central Coalfields Limited, Bharat Coking Coal Limited and Eastern Coalfields Limited in the State of Jharkhand

This Memorandum of Understanding "MoU" ("Agreement") is made on **30th day of October 2017** at Ranchi

By and Between

Government of Jharkhand (hereinafter referred to as "GoJ"), represented through Department of Industries, Mines & Geology and Department of Drinking Water & Sanitation, Government of Jharkhand having its office at Ranchi which expression shall, unless the context otherwise requires, includes its successors and assignees of the FIRST PART;

And

Coal India Limited (hereinafter referred to as "CIL"),a Government of India Enterprise having its Registered Office at Coal Bhawan, Premise No-04 MAR, Plot No- AF-III, Action Area- 1A, Newtown, Rajarhat, Kolkata-700156 and represented by General Manager, Corporate Social Responsibility, which expression shall, unless repugnant to the context or meaning thereof, be deemed to include its successors, and permitted assignees of the SECOND PART;

The expressions GoJ and CIL shall hereinafter, as the context may admit or require, be individually referred to as the 'The Party' and collectively as 'the Parties'.

Whereas:

A. The Government of Jharkhand (GoJ) and Coal India Limited (CIL), both parties have agreed in principle to the objective of achieving the common goal of providing surplus water from suitable mines for use by habitations, located in the command area of subsidiaries of CIL in the state of Jharkhand for their various needs. These subsidiaries are Central Coalfields Limited (CCL), Bharat Coking Coal Limited (BCCL) and Eastern Coalfields Limited (ECL).

B. Mine wateravailable in mine voids and from mine discharge in Central Coalfields Limited (CCL), Bharat Coking Coal Limited (BCCL) and Eastern Coalfields Limited (ECL), subsidiaries of CIL, are presently supplied to several colonies of these subsidiary companies of CIL. At some places mine water is drawn by Department of Drinking Water & Sanitation and other agencies/ organizations of Government of Jharkhand.Surplus mine water available at other mines can be used by surrounding habitations for their various needs.

C. Presently, about 25250 million gallon of water is estimated to be available in 88 opencast mine voids of CCL, and about 31million gallon/ day of water is estimated to be available as surplus/excess mine water discharge at 23 mine sites of BCCL and 07mine sites of ECL in State of Jharkhand . The list ofmines where water is available in mine voids in CCL and in mine water discharge in BCCL and ECLare enclosed at **Annexure I, Annexure II, and Annexure III respectively.**

D. The Parties hereby agree, undertake and affirm as under:-

i. That sampling and analysis of quality of water available at variousmine sites(voids ormine discharge), to assess the suitability for potability, agricultural or other uses will be done by a third party having a recognized environmental laboratory andthe party will be selected by mutual consent between CIL(represented by its subsidiaries - CCL, BCCL and ECL) and GoJ.

ii. The report of analysis of quality of water of various mine sites will be submitted by the selected third party to GoJ and CIL (represented by its subsidiaries - CCL, BCCL and ECL).

iii. That cost of sampling and analysis of quality of water of various mine sites will be borne by CIL (represented by its subsidiaries - CCL, BCCL and ECL).

iv. That CIL (represented by its subsidiaries CCL, BCCL and ECL) shall bear all initial cost for construction of civil works like foundation, platform and shed for installation of motor and pumps for drawal of water at identified mine sites.

v. That Government of Jharkhand shall bear the cost of pumps, motors, associated power supply, pipelines and their installation at identified mine sitesfrom where water is to be drawn. The cost of running these facilities would be borne byGovernment of Jharkhand or community benefitted.

vi. The construction, operation and maintenance cost for treatment and distribution facilities of water from identified mine sites will be borne by GoJ.

vii. The list of mine sites where water is available in voids or as mine discharge are placed at **Annexure I, Annexure II, and Annexure III for CCL, BCCL, and ECL** respectively. The number of mine sites may increase / decrease in future. So modalities for pumping water from the additional sites will be same as laid down at serial no D (i) to D (vi).

viii. In case of dispute, the matter shall be mutually resolved and either party will not be held responsible for non discharge of responsibility under this agreement.

ix. In case of force majeure or an Act of God, preventing the parties from fulfilling part or all the obligations, both parties shall be exonerated from carrying out further action as per MoU until the force majeure no longer exists.

x. The MoU will be in force for 30 (thirty) years.The MoU may be renewed as mutually agreed upon by CIL (represented by its subsidiaries CCL, BCCL and ECL) and GoJ beyond the mentioned period of MoU.

Provided further that in case dewatering is required to start coal production in national interest from these mines then the parties will sit together and mutually decide modalities for the same.

xi. The sustainability of mine sites in respect of future availability of water will be assessed/ studied by CIL.

xii. This MoU shall be in accordance with applicable Acts, Rules and Guidelines for coal mining including mine closure guidelines and shall not be in contravention with provisions made therein.

IN WITNESS THEREOF, both parties hereto have signed this MoU in two original copies in English on the date indicated above.

For Coal India Limited

1. Siddh Nath Singh, General Manager, CSR, Coal India Limited

(.....)

For Government of Jharkhand

Department of Industries, Mines & Geology

1. Aboobacker Siddique P., I.A.S. Mines Commissioner, Mines & Geology Department, Government of Jharkhand.

(.....)

Drinking Water & Sanitation Department

2. Ramesh Kumar, Engineer in Chief, Drinking Water & Sanitation Department, Government of Jharkhand.

(.....)

Witness 1 (Soumitra Singh)

Witness 2

Witness 1 30/10/19 (Ajay Nath Jha)

Witness 2

Annexure-VIII

STRICTLY RESTRICTED
FOR COMPANY USE ONLY

RESTRICTED

The information given in this report is not to be communicated either directly or indirectly to the press or to any person not holding an official position in the CIL/

GROUNDWATER LEVEL & QUALITY REPORT

FOR CLUSTER OF MINES, BCCL

(Assessment year – 2018-19)

[CLUSTER – I, II, III, IV, V, VI, VII, VIII, IX, X, XI, XIII, XIV, XV & XVI of Mines, BCCL]

JHARIA COALFIELD AND RANIGANJ COALFIELD (PART)

For

(BHARAT COKING COAL LIMITED)

(A Subsidiary of Coal India Limited)

KOYLA BHAWAN (DHANBAD)

Prepared by

Hydrogeology Department

Exploration Division

CMPDI (HQ), Ranchi

MARCH – 2019

CMPDI

3.3 H Monitoring of Ground Water Levels of Cluster-VIII

Cluster-VIII consists of ten mines namely; Bastacolla mixed mines (OC & UG), Bera mixed mines (OC & UG), Dobari UG, Kuya mixed (OC & UG), proposed Goluckdih (NC) OC, Ghanoodih OC and Kujama OC under the administrative control of Bastacolla Area of BCCL. This Cluster of mines is located in eastern part of Jharia Coalfield in Dhanbad district of Jharkhand.

The present leasehold area of Cluster-VIII is 1200.41 Ha. The area has a general undulating topography with general slope towards south and south-west. The ground elevation in the area ranges from 175 m to 221 m AMSL. Chatkari Jore, Tisra Jore and its tributaries controlling the drainage pattern of the area. The area comes under the watershed of Chatkari Jore.

4 hydrograph stations (**D-8, D-43, D-49 and D-51**) are located in the core zone of the mine area. Water level monitoring in these monitoring stations has been done in the months of February, April, August & November'2018 and the Ground water level data is enclosed in the table below:

Sl No.	Well No.	Location	Water level (bgl in meters)			
			Feb'18	Apr'18	Aug'18	Nov'18
1	D-8	Alokdiha	3.20	5.65	1.65	1.85
2	D-43	Alagdih	3.05	7.15	2.90	3.45
3	D-49	Galucdih	1.98	3.45	1.45	2.45
4	D-51	Chankuiya	8.26	10.93	4.80	7.10
Average WL (bgl)			4.12	6.80	2.70	3.71

Ground Water Level (in bgl) varies from 1.98 to 8.26 m during February, 3.45 to 10.93 m during April, 1.45 to 4.80 m during August and 1.85 to 7.10 m during November within the Core Zone of Cluster-VIII area.

4.0 GROUNDWATER LEVEL SCENARIO

During the month of February'2018 the depth to water level (in bgl) within 15 nos Cluster of mines varies from 0.50 m to 11.68 m with an average varies from of 1.55 m to 5.39 m. During the month of April'2018 the depth to water level varies from 1.20 m to 14.58 m with an average varies from 3.12 m to 8.50 m. During the month of August'2018 the depth to water level varies from 0.80 m to 6.47 m with an average varies from 0.80 m to 3.73 m. During the month of November'2018 the depth to water level varies from 0.40 m to 7.17 m with an average varies from 1.75 m to 4.26 m. The summarized water level data of all clusters are given in **Table No – 4**.

Depth to water level (in bgl) values described that water level goes down to maximum 14.58 m during pre-monsoon'2018 and maximum upto 8.50 m during post-monsoon'2018. Un-confined aquifer is affected around 20 m to 30 m maximum close to active opencast mining areas, showing steep gradient towards mine void. Other than that, there is no mining effect in the water level within JCF area and RCF area (part). Historical water level data and hydrograph of permanent observation stations from CGWB shown in **Annexure–III**.

Monitoring groundwater (quantity & quality) to assess the present condition and resource has been done regularly in the coalfield areas. Well hydrographs (**Annexure–III and VI**) are prepared and studied to identify potentially adverse trends so that appropriate action can be taken to protect groundwater resource. According to the hydrograph trend analysis of CGWB monitoring wells and CMPDI observation wells, there are decline trends in both Pre and Post-monsoon GW level trends (max. upto 0.50 cm/year in Patherdih/D-35) but no significant decline trend (>1.0 m/year) of water level is noticed in any particular area for the last 10 years within the coalfield area. Regarding quality monitoring, the water sample location map (**Figure No–2**) with collection points details (dug wells) are given in **Annexure–IV** and Quality is given in **Annexure–V**.

Table No–4: Groundwater level data Cluster-wise

Sl. No.	Cluster of BCCL	No. of Monitoring Wells	Water level fluctuation Below ground level (Feb, Apr, Aug & Nov'18)	Formation
1	I	4 nos.	0.75 to 9.65 m	Barakar
2	II	5 nos.	0.90 to 13.68 m	Barakar
3	III	5 nos.	0.40 to 6.63 m	Barakar
4	IV	4 nos.	0.55 to 10.03 m	Barakar
5	V	4 nos.	0.37 to 4.40 m	Barakar
6	VI	2 nos.	0.50 to 4.58 m	Barakar
7	VII	7 nos.	0.45 to 9.35 m	Barakar
8	VIII	4 nos.	1.45 to 10.93 m	Barakar
9	IX	6 nos.	1.08 to 8.60 m	Barakar
10	X	4 nos.	0.45 to 8.40 m	Barakar
11	XI	5 nos.	1.0 to 3.65 m	Barakar & Barren Measure
12	XIII	6 nos.	1.10 to 11.15 m	Raniganj
13	XIV	3 nos.	1.74 to 9.55 m	Raniganj
14	XV	3 nos.	1.27 to 14.58 m	Barakar & Barren Measure
15	XVI	4 nos.	1.20 to 8.70 m	Barakar

Table No–6: Cluster-wise Groundwater development scenario

Cluster/ Area	Adminis-trative Blocks/Stage Of GW Develo-Pment (SOD)	Total Water demand (Lakh cum/year)				Avg. GW level (bgl in m) 2018		GW level declining trend 2005-2018		Quantity Recharge/ future use (Lakh Cum/ Year)
		Mine Discharge (GW + Rainwater)	Surface Water Source	Total Use (Domestic + Industrial)	Excess Or other use	Pre-monsoon	Post-monsoon	Pre-monsoon	Post-monsoon	
Cluster-I	Bermo (SOD: Over-exploited)	9.56	NIL	7.42	2.14	5.11	1.84	YES	YES	NIL
Cluster-II	Baghmara (SOD: Critical)	170.17	Jamunia river	22.55	23.83	6.57	2.84	YES	NO	123.75
Cluster-III		58.18	NIL	2.58	12.65	6.64	2.64	NO	YES	42.95
Cluster-IV		68.84	MADA (Damodar river)	18.47	12.31	5.64	2.66	NO	NO	38.06
Cluster-V		127.29	MADA	77.92	31.02	3.22	2.13	YES	YES	18.35
Cluster-VI	Dhanbad (SOD: Over-exploited)	3.86	MADA (Damodar river)	3.69	0.0	3.60	1.75	YES	YES	NIL (loss due to FF)
Cluster-VII		93.33	MADA	27.70	6.87	4.87	2.50	YES	NO	58.76
Cluster-VIII	Jharia (SOD: Over-exploited)	29.27	MADA	24.04	1.18	6.80	3.71	NO	NO	4.05
Cluster-IX		310.34	MADA	160.28	45.05	5.43	3.33	NO	NO	105.01
Cluster-X		59.38	Damodar river	11.47	0.0	5.36	3.18	YES	NO	47.91
Cluster-XI	Dhanbad (SOD: Over-exploited)	249.67	MADA & DVC	19.86	43.92	3.20	2.16	YES	YES	185.89
Cluster-XIII	Baghmara (SOD: Critical)	64.61	Damodar river	10.09	9.86	6.88	3.97	YES	YES	44.66
Cluster-XIV		NA	NA	NA	NA	8.49	3.49	NO	NO	NA
Cluster-XV		5.11	Jamunia river	0.0	5.11	7.97	4.27	NO	YES	0.0
Cluster-XVI	Nirsa (SOD:Safe)	29.78	DVC (Barakar river)	14.60	6.57	4.34	2.75	NO	NO	8.61

Annexure-IX

Transportation Plan for Conveyor

सेंट्रल माईन प्लानिंग एण्ड डिज़ाइन इंस्टीच्यूट लिमिटेड
(कोल इंडिया लिमिटेड की अनुषंगी कम्पनी / भारत सरकार की एक लोक उपक्रम)
पंजीकृत कार्यालय : गोन्दवाना प्लेस , काँके रोड , राँची - 834031 (झारखण्ड) भारत
क्षेत्रीय संस्थान-2, पत्रा. बीसीसीएल टाउनशीप, कोयला नगर, धनबाद 826005 (झारखण्ड) भारत
Central Mine Planning & Design Institute Limited
(A Subsidiary of Coal India Limited / Govt. of India Public Sector Undertaking)
Registered Office : Gondwana Place, Kanke Road, Ranchi –834031(Jharkhand)
Regional Institute-II, P.O. BCCL Township, Koylanagar, Dhanbad 826005(Jharkhand) India
Corporate Identity No. U14292JH1975GOI001223

cmpdi
A Mini Ratna Company

पत्रांक: आर.आई.-2/पर्यावरण/एम-30/1150 दिनांक: 20.06.2015

सेवा में,
उप महाप्रबंधक (पर्यावरण)
बी. सी. सी. एल.
कोयला भवन
धनबाद ।

विषय: Study of installation of Rail-cum-Conveyor System in BCCL for transportation of coal.

महोदय,

This has reference to your letter no. BCCL/GM(Env.)/F-EC/13/622, dated 25.05.2013 for conducting the study and preparation of plan for installation of Rail-cum-Conveyor System for coal transportation in BCCL as a part of compliance of environmental clearance (EC) conditions stipulated by MoEF & CC in EC orders of different clusters. In this regard, we would like to inform you the following:

a. As per EC clearance order transportation plan for Rail-cum-Conveyor system should dovetailed with Jharia Action Plan (Master Plan). The system of transportation is required to be installed in 2nd phase of EC implementation i.e. after completion of Master Plan (10 years) and 5 years of gestation period.

b. JRDA has issued direction to RITES for traffic survey and data collection to initiate feasibility study regarding Diversion of Railway lines from fire affected and subsidence prone areas

c. Coal transportation route / conveyor installation layout will be finalized after liquidation of coal mine fire, rehabilitation of 595 unstable sites, road and rail route alignment and location of Rly. Sidings of BCCL.

CMPDI will be able to submit the plan / study for installation of Rail-cum-Conveyor System in BCCL for transportation of coal only after diversions and re-alignments of roads and railway lines and relocation of railway sidings

This is for your kind information.

भवदीय

(वि. कु. सिन्हा)
क्षेत्रीय निदेशक

Sri Amarlendu Sb.
For compliance purpose.
23/6/15

दूरभाष : (+91) 0326-2230850 फैक्स / Fax : (+91) 0326-2230500
वेब साइट / Website : www.cmpdi.co.in
ईमेल / Email : ri2@cmpdi.co.in

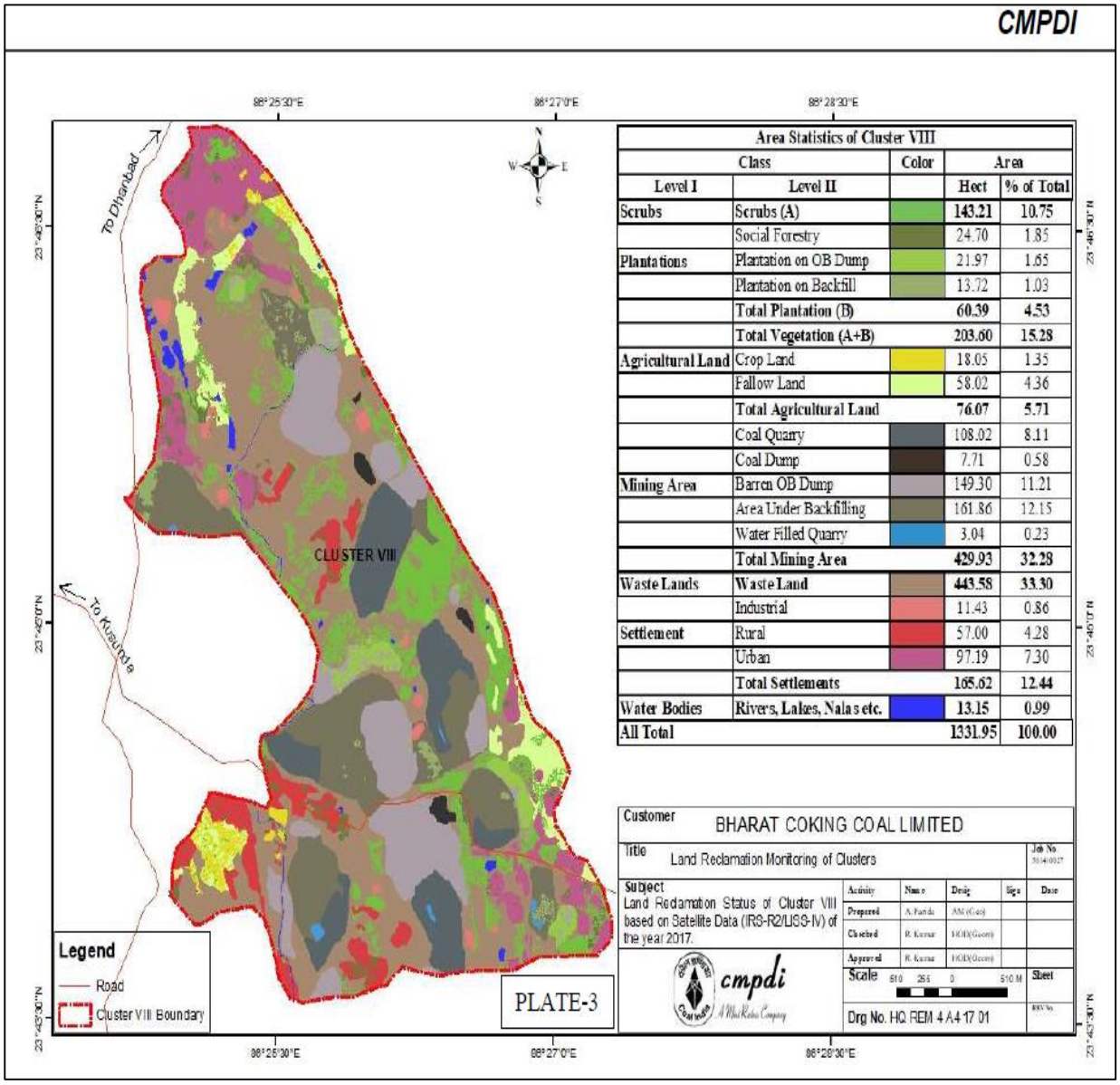
Annexure-X

R&R of PAFs

Sl. No.	Name of Colliery	No of PAFs Rehabilitated/Shifted till date
1	Bastacolla Colliery	Nil
2	Bera Colliery	Nil
3	Dobari Colliery	122
4	Ghanoodih Colliery	572
5	Kuya Colliery	308
6	Kujama Colliery	190
Total		**1192**

Annexure-XI

Landuse Map generated from Remote Sensing Data



Area Statistics of Cluster VIII				
Class		Color	Area	
Level I	Level II		Hect	% of Total
Scrubs	Scrubs (A)		143.21	10.75
	Social Forestry		24.70	1.85
Plantations	Plantation on OB Dump		21.97	1.65
	Plantation on Backfill		13.72	1.03
	Total Plantation (B)		**60.39**	**4.53**
	Total Vegetation (A+B)		**203.60**	**15.28**
Agricultural Land	Crop Land		18.05	1.35
	Fallow Land		58.02	4.36
	Total Agricultural Land		**76.07**	**5.71**
	Coal Quarry		108.02	8.11
	Coal Dump		7.71	0.58
Mining Area	Barren OB Dump		149.30	11.21
	Area Under Backfilling		161.86	12.15
	Water Filled Quarry		3.04	0.23
	Total Mining Area		**429.93**	**32.28**
Waste Lands	**Waste Land**		**443.58**	**33.30**
	Industrial		11.43	0.86
Settlement	Rural		57.00	4.28
	Urban		97.19	7.30
	Total Settlements		**165.62**	**12.44**
Water Bodies	Rivers, Lakes, Nala s etc.		13.15	0.99
All Total			**1331.95**	**100.00**

Customer: BHARAT COKING COAL LIMITED
Title: Land Reclamation Monitoring of Clusters
Subject: Land Reclamation Status of Cluster VIII based on Satellite Data (IRS-R2/LISS-IV) of the year 2017.
Activity | Name | Desig | Sign | Date
Prepared | A. Parida | AM (Geol)
Checked | R. Kumar | HOD(Geom)
Approved | R. Kumar | HOD(Geom)
Scale 510 255 0 510 M
Sheet
Drg No. HQ REM 4 A4 17 01
cmpdi A Mini Ratna Company

Annexure-XII

Corporate Environmental Policy (http://www.bcclweb.in/environment/CEP_04.11.2019.pdf)

Item No. 351.3D

Quarterly Review for the Quarter October to December, 2018 & January to March, 2019 on Safety, Environment & Quality as per the directive of MoC letter no. 23/3/2015-ASO/BA dated 26.04.2017.

Board reviewed the quarterly report of **October to December 2018** and **January to March 2019** on Safety, Environment & Quality as per the directive of MoC letter no. 23/3/2015-ASO/BA dated 26.04.2017.

Item No. 351.4G
Corporate Environment Policy (CEP) of Bharat Coking Coal Limited.

Background

Coal India Ltd. had brought out its Corporate Environment Policy (CEP) in 2012 Based on CIL Environment Policy 2012, incorporating the Jharia Master Plan, CEP of BCCL was approved by 285th BCCL board on 21.04.2012 (ANNEXURE C of the agenda note). As per the provisions of the policy, it is to be revised every 05 years as per which the policy would have been revised in 2017. However, there was delay in revising the policy at CIL's end due to which there is a delay in revising BCCL's CEP. CIL has revised its Corporate Environment Policy and approved in its 377th CIL Board Meeting dated 20th Dec., 2018(ANNEXURE D of the agenda note).

The CAG during its exit meeting held on 16.11.2018 also pointed out for the need of revising BCCL's Corporate Environment Policy adopted in 2012(ANNEXURE E of the agenda note). Modifying CIL's CEP to suit BCCL's prevailing conditions, the Corporate Environment Policy of BCCL has been revised.

Two versions of Policy was attached herewith out of which any one may be approved as deemed suitable by the Board.

a. An abridged version of the policy as adopted earlier by BCCL in 2012. (ANNEXURE A of the agenda note)
b. A detailed version of the policy similar to the CEP, 2018 of CIL with modifications suited to BCCL's condition. (ANNEXURE B of the agenda note)

Decision:
After detailed deliberation the Corporate Environment Policy, 2018 of CIL was approved by the Board.

Board further directed that the Policy as adopted above to suit the conditions in BCCL should be modified with information to Coal India.

Certified to be True Copy

B. K. Parui
Company Secretary
Bharat Coking Coal Limited
Koyla Bhawan
[illegible]6095

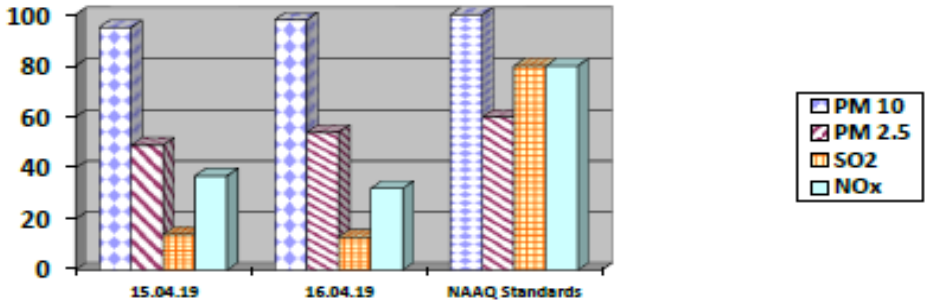
Annexure-XIII

Air Quality Data

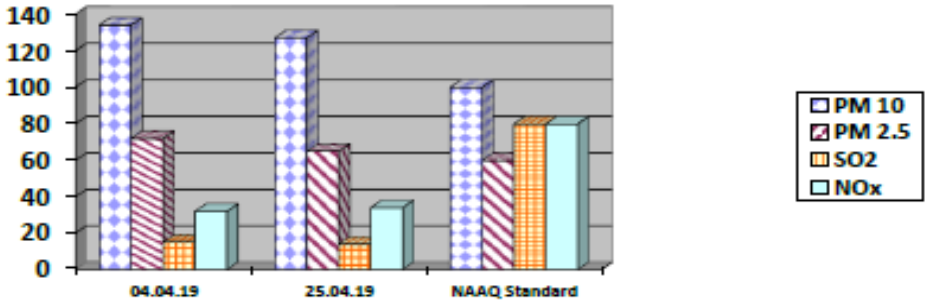
AMBIENT AIR QUALITY DATA

Cluster–VIII, Bharat Coking Coal limited Month: APRIL ,2019 Year: 2019-20.

Station Name: Dobari UGP (A11)		Zone: Core		Category: Industrial[1]	
Sl. No.	Dates of sampling	PM 10	PM 2.5	SO2	NOx
1	15.04.19	95	49	14	37
2	16.04.19	98	54	13	32
	NAAQ Standards	100	60	80	80



Station Name: A13 – Jeenagora		Zone: Buffer		Category: Industrial	
Sl. No.	Dates of sampling	PM 10	PM 2.5	SO_2	NO_x
1	04.04.19	134	72	15	32
2	25.04.19	127	65	14	34
	NAAQ Standard	100	60	80	80



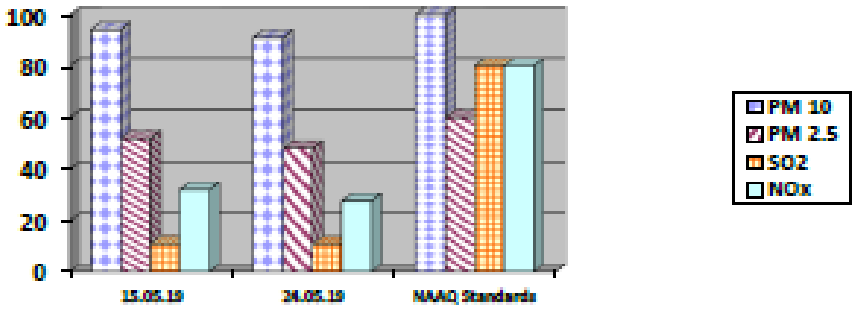
[1] AUTHORISED FOR RELEASE BY HOD (ENV), CMPDI, RL-2, DHANBAD, DATED 22.06.19

JOB NO. 200316028 Cluster –VIII, BCCL Environmental Monitoring Report

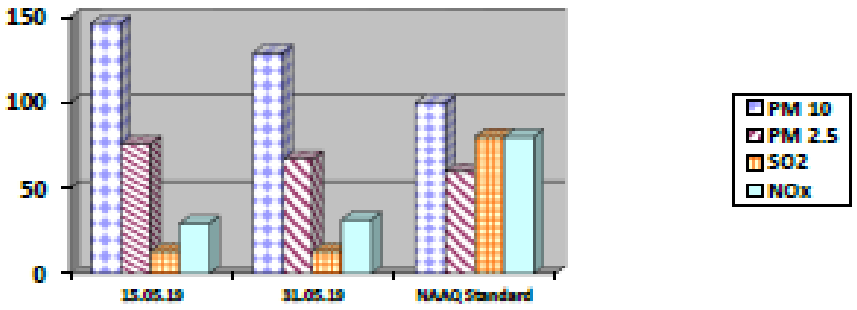
AMBIENT AIR QUALITY DATA

Cluster–VIII, Bharat Coking Coal limited Month: MAY ,2019 Year: 2019-20.

Station Name: Dobari UGP (A11)		Zone: Core		Category: Industrial[1]	
Sl. No.	Dates of sampling	PM 10	PM 2.5	SO2	NOx
1	15.05.19	94	52	11.07	31.90
2	24.05.19	91	48	10.94	27.59
	NAAQ Standards	100	60	80	80



Station Name: A13 – Jeenagora		Zone: Buffer		Category: Industrial	
Sl. No.	Dates of sampling	PM 10	PM 2.5	SO_2	NO_x
1	15.05.19	146	76	13.32	29.64
2	31.05.19	129	67	13.39	31.90
	NAAQ Standard	100	60	80	80

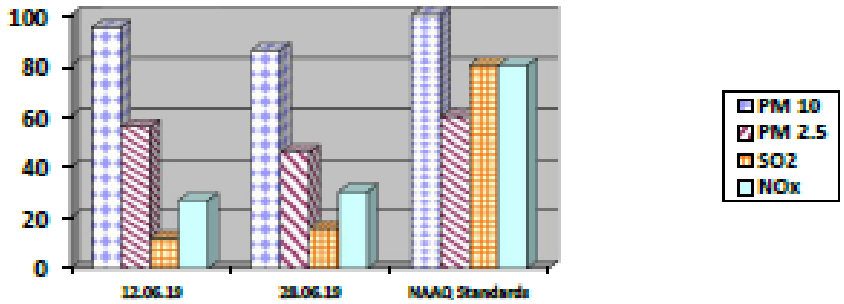


[1] AUTHORISED FOR RELEASE BY HOD (ENV), CMPDI, RL-2, DHANBAD, DATED 29.07.19

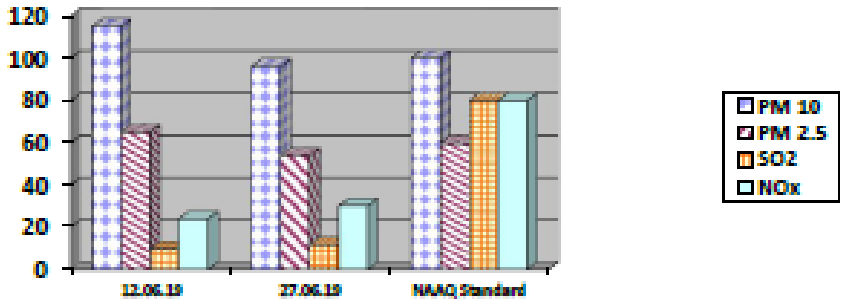
AMBIENT AIR QUALITY DATA

Cluster–VIII, Bharat Coking Coal limited Month: JUNE ,2019 Year: 2019-20.

Station Name: Dobari UGP (A11)		Zone: Core		Category: Industrial[1]	
Sl. No.	Dates of sampling	PM 10	PM 2.5	SO2	NOx
1	12.06.19	95	56	11.82	26.98
2	28.06.19	86	46	15.67	30.42
	NAAQ Standards	100	60	80	80



Station Name: A13 – Jeenagora		Zone: Buffer		Category: Industrial	
Sl. No.	Dates of sampling	PM 10	PM 2.5	SO_2	NO_X
1	12.06.19	115	65	9.83	24.03
2	27.06.19	96	54	11.84	30.06
	NAAQ Standard	100	60	80	80

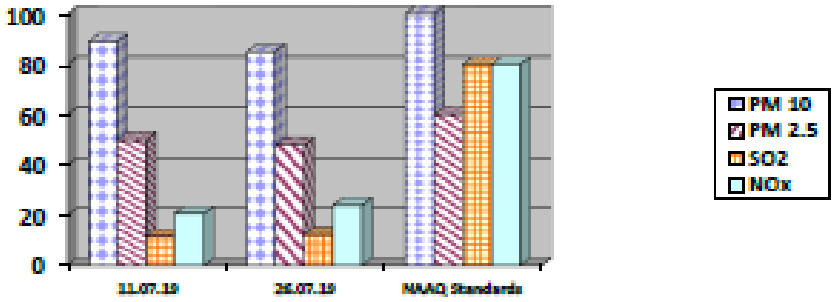


[1] AUTHORISED FOR RELEASE BY HOD (ENV), CMPDI, RL-2, DHANBAD, DATED 20.08.19

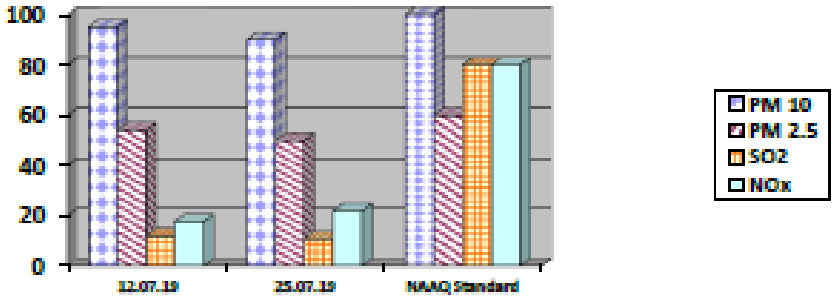
AMBIENT AIR QUALITY DATA

Cluster–VIII, Bharat Coking Coal limited Month: JULY ,2019 Year: 2019-20.

Station Name: Dobari UGP (A11)		Zone: Core		Category: Industrial[1]	
Sl. No.	Dates of sampling	PM 10	PM 2.5	SO2	NOx
1	11.07.19	89	50	11.62	20.66
2	26.07.19	85	48	12.30	24.02
	NAAQ Standards	100	60	80	80



Station Name: A13 – Jeenagora		Zone: Buffer		Category: Industrial	
Sl. No.	Dates of sampling	PM 10	PM 2.5	SO_2	NO_X
1	12.07.19	95	54	12.06	17.75
2	25.07.19	90	50	10.87	21.89
	NAAQ Standard	100	60	80	80



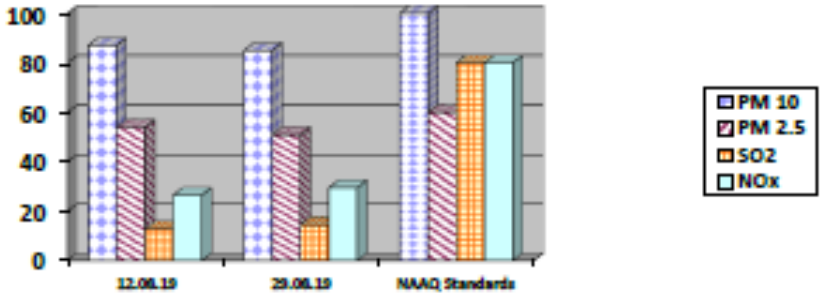
[1] AUTHORISED FOR RELEASE BY HOD (ENV), CMPDI, RI-2, DHANBAD, DATED 28.09.19

8

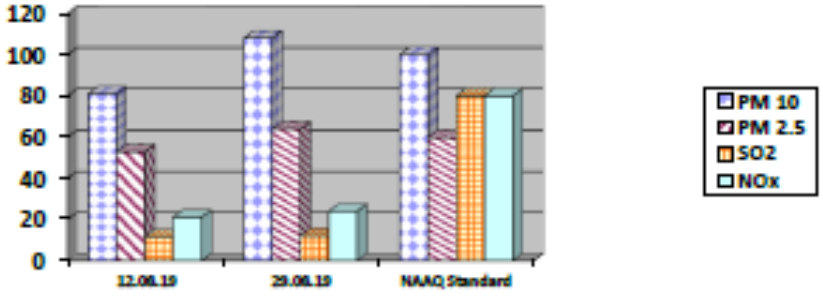
AMBIENT AIR QUALITY DATA

Cluster–VIII, Bharat Coking Coal limited Month: AUG. 2019 Year: 2019-20.

Station Name: Dobari UGP (A11)		Zone: Core		Category: Industrial	
Sl. No.	Dates of sampling	PM 10	PM 2.5	SO2	NOx
1	12.08.19	87	54	12.89	26.56
2	29.08.19	85	51	14.70	29.59
	NAAQ Standards	100	60	80	80



Station Name: A13 – Jeenagora		Zone: Buffer		Category: Industrial	
Sl. No.	Dates of sampling	PM 10	PM 2.5	SO_2	NO_x
1	12.08.19	81	53	11.61	21.11
2	29.08.19	108	64	12.10	24.09
	NAAQ Standard	100	60	80	80



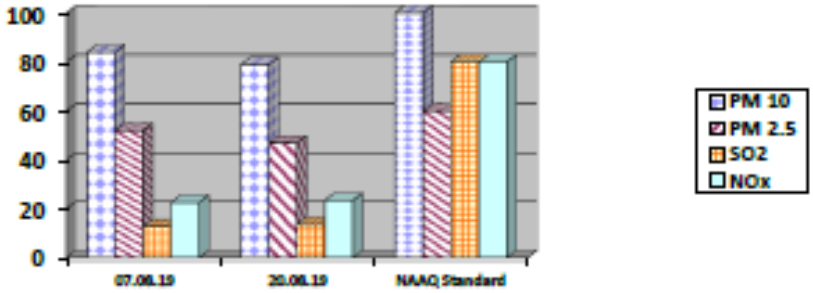
Analysed By
JSA/SA/SSA

Checked By
Lab In Charge
RI-2, CMPDI, Dhanbad

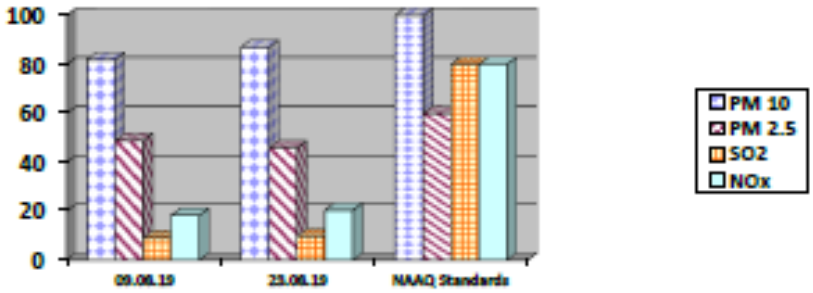
Approved By
HOD(Mining/Environment)
RI-2, CMPDI, Dhanbad

JOB NO. 200316028 Cluster –VIII, BCCL Environmental Monitoring Report

Station Name: Hurriladih UGP (A28)		Zone: Buffer		Category: Industrial	
Sl. No.	Dates of sampling	PM 10	PM 2.5	SO_2	NO_x
1	07.08.19	84	52	12.67	22.6
2	20.08.19	79	47	13.62	23.51
	NAAQ Standard	100	60	80	80



StationName:A12 Kusmatand Village		Zone: Buffer		Category: Residential	
Sl. No.	Dates of sampling	PM 10	PM 2.5	SO2	NOx
1	09.08.19	82	49	9.07	18.26
2	23.08.19	87	46	9.82	20.48
	NAAQ Standards	100	60	80	80



- *All values are expressed in microgram per cubic meter.*
- *24 hours duration*

Analysed By
JSA/SA/SSA

Checked By
Lab In Charge
RI-2, CMPDI, Dhanbad

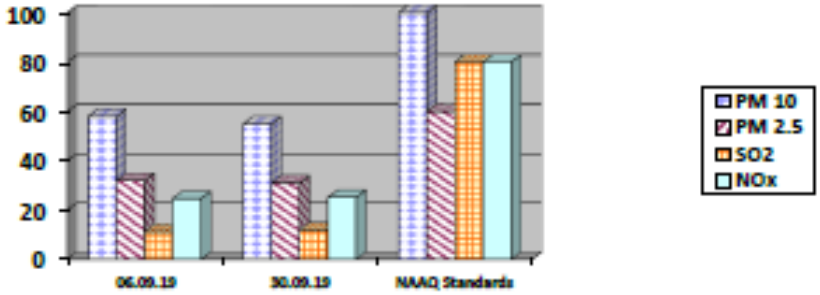
Approved By
HOD(Mining/Environment)
RI-2, CMPDI, Dhanbad

8

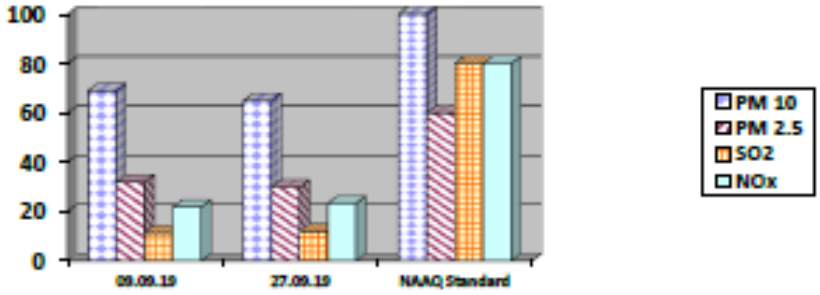
AMBIENT AIR QUALITY DATA

Cluster–VIII, Bharat Coking Coal limited Month: SEPT.2019 Year: 2019-20.

Station Name: Dobari UGP (A11)		Zone: Core		Category: Industrial	
Sl. No.	Dates of sampling	PM 10	PM 2.5	SO2	NOx
1	06.09.19	58	32	11.34	24.71
2	30.09.19	55	31	12.02	25.18
	NAAQ Standards	100	60	80	80



Station Name: A13 – Jeenagora		Zone: Buffer		Category: Industrial	
Sl. No.	Dates of sampling	PM 10	PM 2.5	SO_2	NO_x
1	09.09.19	69	32	11.34	21.79
2	27.09.19	65	30	12.10	23.40
	NAAQ Standard	100	60	80	80



Analysed By
JSA/SA/SSA

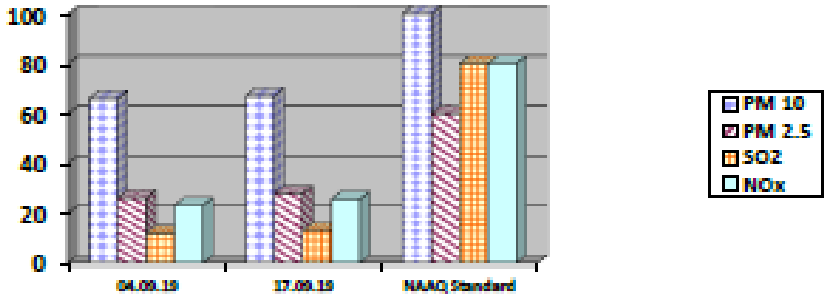
Checked By
Lab In Charge
RI-2, CMPDI, Dhanbad

Approved By
HOD(Mining/Environment)
RI-2, CMPDI, Dhanbad

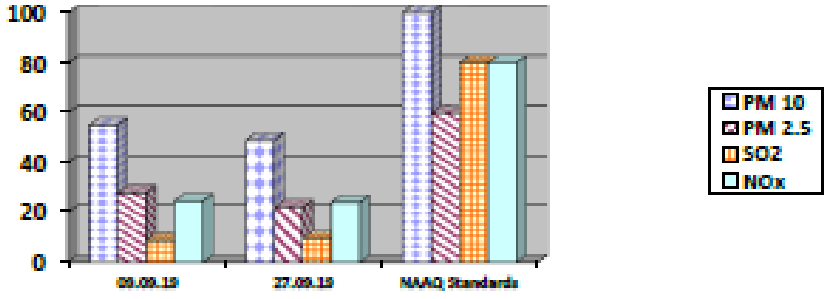
JOB NO. 200316028 Cluster –VIII, BCCL Environmental Monitoring Report

9

Station Name: Hurriladih UGP (A28)		Zone: Buffer		Category: Industrial	
Sl. No.	Dates of sampling	PM 10	PM 2.5	SO_2	NO_x
1	04.09.19	66	26	12.02	23.20
2	17.09.19	67	28	13.12	25.65
	NAAQ Standard	100	60	80	80



StationName:A12 Kusmatand Village		Zone: Buffer		Category: Residential	
Sl. No.	Dates of sampling	PM 10	PM 2.5	SO2	NOx
1	09.09.19	55	28	8.79	24.65
2	27.09.19	49	22	9.66	24.02
	NAAQ Standards	100	60	80	80



- *All values are expressed in microgram per cubic meter.*
- *24 hours duration*

Analysed By
JSA/SA/SSA

Checked By
Lab In Charge
RI-2, CMPDI, Dhanbad

Approved By
HOD(Mining/Environment)
RI-2, CMPDI, Dhanbad

Ambient Air Quality Standards for Jharia Coal Field
As per the Environment (Protection) Amendment Rules, 2000 notified vide notification G.S.R. 742(E), dated 25.9.2000.

Category	Pollutant	Time weighted average	Concentration in Ambient Air	Method of Measurement
1	2	3	4	5
III Coal mines located in the coal fields of • Jharia • Raniganj • Bokaro	Suspended Particulate Matter (SPM)	Annual Average * 24 hours **	500 µg/m^3 700 µg/m^3	- High Volume Sampling (Average flow rate not less than 1.1
	Respirable Particulate Matter (size less than 10 µm) (RPM)	Annual Average * 24 hours **	250 µg/m^3 300 µg/m^3	Respirable Particulate Matter sampling and analysis
	Sulphur Dioxide (SO_2)	Annual Average * 24 hours **	80 µg/m^3 120 µg/m^3	1.Improvedwest and Gaeke method 2.Ultraviolet fluorescene
	Oxide of Nitrogen as NO_2	Annual Average * 24 hours **	80 µg/m^3 120 µg/m^3	1. Jacob & Hochheiser Modified (Na-Arsenic) Method 2. Gas phase Chemilumine-scence

Note:

* Annual Arithmetic mean for the measurements taken in a year, following the guidelines for frequency of sampling laid down in clause2.

** 24hourly/8hourlyvaluesshallbemet92%ofthetimeinayear.However,8% of the time it may exceed but not on two consecutivedays.

Annexure-XIV

Noise Monitoring Data

NOISE LEVEL QUALITY MONITORING

4.1Location of sampling sites

1. **Dobari UGP (N11)**
2. **Jeenagora (N13)**
3. **Hurriladih UGP (N28)**
4. **Kusmatand Village (N12)**

Methodology of sampling and analysis

Noise level measurements in form of 'Leq' were taken using Integrated Data Logging Sound Level Meter (NL-52 OF RION CO. Ltd. Make) during day time. Noise levels were measured for about one hour time in day time. Noise levels were measured in Decibels, 'A' weighted average, i.e. dB (A).

4.2Results & Interpretations

Ambient noise levels were recorded during day time and the observed values were compared with standards prescribed by MoEF&CC. The results of Noise levels recorded during day time on fortnightly basis are presented in tabular form along with the applicable standard permissible limits. The observed values in terms of L_{eq} are presented. The observed values at all the monitoring locations are found to be within permissible limits.

NOISE LEVEL DATA

Name of the Project: Cluster -VIII			Month: APRIL, 2019[4]		
Sl. No.	**Station Name/Code**	**Category of area**	**Date**	**Noise level dB(A)LEQ**	***Permissible Limit of Noise level in dB(A)***
1	Dobari UGP (N11)	Industrial area	15.04.19	59.7	75
2	Dobari UGP (N11)	Industrial area	16.04.19	59.7	75
3	Kusmatand Village (N12)	Residential area	04.04.19	54.3	55
4	Kusmatand Village (N12)	Residential area	25.04.19	53.2	55
5	Jeenagora (N13)	Industrial area	04.04.19	60.1	75
6	Jeenagora (N13)	Industrial area	25.04.19	62.3	75
7	Hurriladih UGP (N28)	Industrial area	10.04.19	60.2	75
8	Hurriladih UGP (N28)	Industrial area	19.04.19	59.7	75

Permissible limits of Noise Level as per MOEF Gazette Notification No. GSR 742(E) dt. 25.09.2000 Standards for Coal Mines and Noise Pollution (Regulation and Control) Rules, 2000.
*** Day Time: 6.00 AM to 10.00 PM,**

[4] AUTHORISED FOR RELEASE BY HOD (ENV), CMPDI, RL-2, DHANBAD, DATED 22.06.19

NOISE LEVEL QUALITY MONITORING

4.1Location of sampling sites

1. Dobari UGP (N11)
2. Jeenagora (N13)
3. Hurriladih UGP (N28)
4. Kusmatand Village (N12)

Methodology of sampling and analysis

Noise level measurements in form of 'Leq' were taken using Integrated Data Logging Sound Level Meter (NL-52 OF RION CO. Ltd. Make) during day time. Noise levels were measured for about one hour time in day time. Noise levels were measured in Decibels, 'A' weighted average, i.e. dB (A).

4.2 Results & Interpretations

Ambient noise levels were recorded during day time and the observed values were compared with standards prescribed by MoEF&CC. The results of Noise levels recorded during day time on fortnightly basis are presented in tabular form along with the applicable standard permissible limits. The observed values in terms of L_{eq} are presented. The observed values at all the monitoring locations are found to be within permissible limits.

NOISE LEVEL DATA

Name of the Project: Cluster -VIII			Month: MAY, 2019[4]		
Sl. No.	Station Name/Code	Category of area	Date	Noise level dB(A)LEQ	*Permissible Limit of Noise level in dB(A)
1	Dobari UGP (N11)	Industrial area	15.05.19	59.8	75
2	Dobari UGP (N11)	Industrial area	24.05.19	58.8	75
3	Kusmatand Village (N12)	Residential area	14.05.19	53.5	55
4	Kusmatand Village (N12)	Residential area	31.05.19	54.6	55
5	Jeenagora (N13)	Industrial area	15.05.19	64.8	75
6	Jeenagora (N13)	Industrial area	31.05.19	59.1	75
7	Hurriladih UGP (N28)	Industrial area	07.05.19	57.2	75
8	Hurriladih UGP (N28)	Industrial area	17.05.19	57.3	75

Permissible limits of Noise Level as per MOEF Gazette Notification No. GSR 742(E) dt. 25.09.2000 Standards for Coal Mines and Noise Pollution (Regulation and Control) Rules, 2000.
* Day Time: 6.00 AM to 10.00 PM,

[4] AUTHORISED FOR RELEASE BY HOD (ENV), CMPDI, RL-2, DHANBAD, DATED 29.07.19

NOISE LEVEL QUALITY MONITORING

4.1Location of sampling sites

1. Dobari UGP (N11)
2. Jeenagora (N13)
3. Hurriladih UGP (N28)
4. Kusmatand Village (N12)

Methodology of sampling and analysis

Noise level measurements in form of 'Leq' were taken using Integrated Data Logging Sound Level Meter (NL-52 OF RION CO. Ltd. Make) during day time. Noise levels were measured for about one hour time in day time. Noise levels were measured in Decibels, 'A' weighted average, i.e. dB (A).

4.2Results & Interpretations

Ambient noise levels were recorded during day time and the observed values were compared with standards prescribed by MoEF&CC. The results of Noise levels recorded during day time on fortnightly basis are presented in tabular form along with the applicable standard permissible limits. The observed values in terms of L_{eq} are presented. The observed values at all the monitoring locations are found to be within permissible limits.

NOISE LEVEL DATA

Name of the Project: Cluster -VIII			Month: JUNE, 2019[4]		
Sl. No.	Station Name/Code	Category of area	Date	Noise level dB(A)LEQ	*Permissible Limit of Noise level in dB(A)
1	Dobari UGP (N11)	Industrial area	12.06.19	58.4	75
2	Dobari UGP (N11)	Industrial area	28.06.19	57.2	75
3	Kusmatand Village (N12)	Residential area	12.06.19	48.1	55
4	Kusmatand Village (N12)	Residential area	27.06.19	50.3	55
5	Jeenagora (N13)	Industrial area	12.06.19	62.7	75
6	Jeenagora (N13)	Industrial area	27.06.19	61.6	75
7	Hurriladih UGP (N28)	Industrial area	07.06.19	62.8	75
8	Hurriladih UGP (N28)	Industrial area	20.06.19	56.9	75

**Permissible limits of Noise Level as per MOEF Gazette Notification No. GSR 742(E) dt. 25.09.2000 Standards for Coal Mines and Noise Pollution (Regulation and Control) Rules, 2000.*
*** Day Time: 6.00 AM to 10.00 PM,**

[4] AUTHORISED FOR RELEASE BY HOD (ENV), CMPDI, RL-2, DHANBAD, DATED 20.08.19

NOISE LEVEL QUALITY MONITORING

4.1Location of sampling sites

1. Dobari UGP (N11)
2. Jeenagora (N13)
3. Hurriladih UGP (N28)
4. Kusmatand Village (N12)

Methodology of sampling and analysis

Noise level measurements in form of 'L$_{EQ}$' were taken using Integrated Data Logging Sound Level Meter (NL-52 OF RION CO. Ltd. Make) during day time. Noise levels were measured for about one hour time in day time. Noise levels were measured in Decibels, 'A' weighted average, i.e. dB (A).

4.2Results & Interpretations

Ambient noise levels were recorded during day time and the observed values were compared with standards prescribed by MoEF&CC. The results of Noise levels recorded during day time on fortnightly basis are presented in tabular form along with the applicable standard permissible limits. The observed values in terms of L_{EQ} are presented. The observed values at all the monitoring locations are found to be within permissible limits.

NOISE LEVEL DATA

Name of the Project: Cluster -VIII			Month: JULY, 2019[4]		
Sl. No.	**Station Name/Code**	**Category of area**	**Date**	**Noise level dB(A)LEQ**	***Permissible Limit of Noise level in dB(A)***
1	Dobari UGP (N11)	Industrial area	11.07.19	56.2	75
2	Dobari UGP (N11)	Industrial area	26.07.19	70.6	75
3	Kusmatand Village (N12)	Residential area	12.07.19	50.1	55
4	Kusmatand Village (N12)	Residential area	25.07.19	52.1	55
5	Jeenagora (N13)	Industrial area	12.07.19	60.5	75
6	Jeenagora (N13)	Industrial area	25.07.19	68.5	75
7	Hurriladih UGP (N28)	Industrial area	04.07.19	57.4	75
8	Hurriladih UGP (N28)	Industrial area	19.07.19	58.2	75

Permissible limits of Noise Level as per MOEF Gazette Notification No. GSR 742(E) dt. 25.09.2000 Standards for Coal Mines and Noise Pollution (Regulation and Control) Rules, 2000.
*** Day Time: 6.00 AM to 10.00 PM,**

[4] AUTHORISED FOR RELEASE BY HOD (ENV), CMPDI, RI-2, DHANBAD, DATED 28.09.19

NOISE LEVEL QUALITY MONITORING

4.1Location of sampling sites

1. Dobari UGP (N11)
2. Jeenagora (N13)
3. Hurriladih UGP (N28)
4. Kusmatand Village (N12)

Methodology of sampling and analysis

Noise level measurements in form of 'L$_{eq}$' were taken using Integrated Data Logging Sound Level Meter (NL-52 OF RION CO. Ltd. Make) during day time. Noise levels were measured for about one hour time in day time. Noise levels were measured in Decibels, 'A' weighted average, i.e. dB (A).

4.2Results & Interpretations

Ambient noise levels were recorded during day time and the observed values were compared with standards prescribed by MoEF&CC. The results of Noise levels recorded during day time on fortnightly basis are presented in tabular form along with the applicable standard permissible limits. The observed values in terms of L_{eq} are presented. The observed values at all the monitoring locations are found to be within permissible limits.

NOISE LEVEL DATA

Name of the Project: Cluster -VIII			Month: AUG. 2019		
Sl. No.	Station Name/Code	Category of area	Date	Noise level dB(A)LEQ	*Permissible Limit of Noise level in dB(A)
1	Dobari UGP (N11)	Industrial area	12.08.19	56.5	75
2	Dobari UGP (N11)	Industrial area	29.08.19	57.7	75
3	Kusmatand Village (N12)	Residential area	09.08.19	50.7	55
4	Kusmatand Village (N12)	Residential area	23.08.19	51.4	55
5	Jeenagora (N13)	Industrial area	12.08.19	58.3	75
6	Jeenagora (N13)	Industrial area	29.08.19	61.3	75
7	Hurriladih UGP (N28)	Industrial area	07.08.19	46.1	75
8	Hurriladih UGP (N28)	Industrial area	20.08.19	65.8	75

**Permissible limits of Noise Level as per MOEF Gazette Notification No. GSR 742(E) dt. 25.09.2000 Standards for Coal Mines and Noise Pollution (Regulation and Control) Rules, 2000.*
*** Day Time: 6.00 AM to 10.00 PM.**

Analysed By
JSA/SA/SSA

Checked By
Lab In Charge
RI-2, CMPDI, Dhanbad

Approved By
HOD(Mining/Environment)
RI-2, CMPDI, Dhanbad

NOISE LEVEL QUALITY MONITORING

4.1Location of sampling sites

1. Dobari UGP (N11)
2. Jeenagora (N13)
3. Hurriladih UGP (N28)
4. Kusmatand Village (N12)

Methodology of sampling and analysis

Noise level measurements in form of 'Leq' were taken using Integrated Data Logging Sound Level Meter (NL-52 OF RION CO. Ltd. Make) during day time. Noise levels were measured for about one hour time in day time. Noise levels were measured in Decibels, 'A' weighted average, i.e. dB (A).

4.2Results & Interpretations

Ambient noise levels were recorded during day time and the observed values were compared with standards prescribed by MoEF&CC. The results of Noise levels recorded during day time on fortnightly basis are presented in tabular form along with the applicable standard permissible limits. The observed values in terms of L_{eq} are presented. The observed values at all the monitoring locations are found to be within permissible limits.

NOISE LEVEL DATA

Name of the Project: Cluster -VIII			Month: SEPT.2019		
Sl. No.	Station Name/Code	Category of area	Date	Noise level dB(A)LEQ	*Permissible Limit of Noise level in dB(A)
1	Dobari UGP (N11)	Industrial area	06.09.19	52.4	75
2	Dobari UGP (N11)	Industrial area	30.09.19	59.8	75
3	Kusmatand Village (N12)	Residential area	09.09.19	48.2	55
4	Kusmatand Village (N12)	Residential area	27.09.19	51.2	55
5	Jeenagora (N13)	Industrial area	09.09.19	57.6	75
6	Jeenagora (N13)	Industrial area	27.09.19	66.1	75
7	Hurriladih UGP (N28)	Industrial area	04.09.19	45.5	75
8	Hurriladih UGP (N28)	Industrial area	17.09.19	61.5	75

**Permissible limits of Noise Level as per MOEF Gazette Notification No. GSR 742(E) dt. 25.09.2000 Standards for Coal Mines and Noise Pollution (Regulation and Control) Rules, 2000.*
* Day Time: 8.00 AM to 10.00 PM,

Analysed By
JSA/SA/SSA

Checked By
Lab In Charge
RI-2, CMPDI, Dhanbad

Approved By
HOD(Mining/Environment)
RI-2, CMPDI, Dhanbad

Annexure-XV

Water Quality Data

WATER QUALITY MONITORING

3.1 Location of sampling sites

(Refer **Plate No. – II**)

i) **Mine Discharge of Dobari UGP (MW8)**

A sampling point is fixed to assess the effluent quality of Mine discharge. This location is selected to monitor effluent discharge in to Kashi jore.

3.2 Methodology of sampling and analysis

Water samples were collected as per standard practice. The effluent samples were collected and analyzed for four parameters on fortnightly basis at the Environmental Laboratory of CMPDI RI-II, Dhanbad.

3.3 Results & Interpretations

The results are given in tabular form along with the applicable standards. Results are compared with Schedule - VI, effluent prescribed by MoEF&CC. Results show that most of the parameters are within the permissible limits.

WATER QUALITY DATA

(EFFLUENT WATER- FOUR PARAMETERS)

Name of the Cluster: **Cluster -VIII**		Month: **APRIL, 2019**	Name of the Station: **Mine Discharge of Dobari UGP**[3]	
Sl. No.	**Parameters**	**MW8** First Fortnight	**MW8** Second Fortnight	**As per MOEF General Standards for schedule VI**
		15.04.19	17.04.19	
1	Total Suspended Solids	30	40	*100 (Max)*
2	pH	8.1	8.02	*5.5 - 9.0*
3	Oil & Grease	<2.0	<2.0	*10 (Max)*
4	COD	36	40	*250 (Max)*

All values are expressed in mg/lt except pH.

[3] AUTHORISED FOR RELEASE BY HOD (ENV), CMPDI, RL-2, DHANBAD, DATED 22.06.19

WATER QUALITY MONITORING

3.1 Location of sampling sites

(Refer Plate No. – II)

i) **Mine Discharge of Dobari UGP (MW8)**

A sampling point is fixed to assess the effluent quality of Mine discharge. This location is selected to monitor effluent discharge in to Kashi jore.

3.2 Methodology of sampling and analysis

Water samples were collected as per standard practice. The effluent samples were collected and analyzed for four parameters on fortnightly basis at the Environmental Laboratory of CMPDI RI-II, Dhanbad.

3.3 Results & Interpretations

The results are given in tabular form along with the applicable standards. Results are compared with Schedule - VI, effluent prescribed by MoEF&CC. Results show that most of the parameters are within the permissible limits.

WATER QUALITY DATA

(EFFLUENT WATER- FOUR PARAMETERS)

Name of the Cluster: Cluster -VIII		Month: MAY, 2019	Name of the Station: Mine Discharge of Dobari UGP[3]	
Sl. No.	Parameters	MW8 First Fortnight	MW8 Second Fortnight	As per MOEF General Standards for schedule VI
		15.05.19	24.05.19	
1	Total Suspended Solids	24	20	*100 (Max)*
2	pH	7.78	7.83	*5.5 - 9.0*
3	Oil & Grease	<2.0	<2.0	*10 (Max)*
4	COD	36	48	*250 (Max)*

All values are expressed in mg/lt except pH.

[3] AUTHORISED FOR RELEASE BY HOD (ENV), CMPDI, RL-2, DHANBAD, DATED 29.07.19

WATER QUALITY MONITORING

3.1 Location of sampling sites

(Refer **Plate No. – II**)

i) **Mine Discharge of Dobari UGP (MW8)**

A sampling point is fixed to assess the effluent quality of Mine discharge. This location is selected to monitor effluent discharge in to Kashi jore.

3.2 Methodology of sampling and analysis

Water samples were collected as per standard practice. The effluent samples were collected and analyzed for four parameters on fortnightly basis at the Environmental Laboratory of CMPDI RI-II, Dhanbad.

3.3 Results & Interpretations

The results are given in tabular form along with the applicable standards. Results are compared with Schedule - VI, effluent prescribed by MoEF&CC. Results show that most of the parameters are within the permissible limits.

WATER QUALITY DATA

(EFFLUENT WATER- FOUR PARAMETERS)

Name of the Cluster: **Cluster -VIII**		Month: **JUNE, 2019**	Name of the Station: **Mine Discharge of Dobari UGP**[3]	
Sl. No.	**Parameters**	**MW8** First Fortnight 14.06.2019	**MW8** Second Fortnight 28.06.2019	**As per MOEF General Standards for schedule VI**
1	Total Suspended Solids	36	42	*100 (Max)*
2	pH	8.16	7.92	*5.5 - 9.0*
3	Oil & Grease	<2.0	<2.0	*10 (Max)*
4	COD	28	40	*250 (Max)*

All values are expressed in mg/lit except pH.

[3] AUTHORISED FOR RELEASE BY HOD (ENV), CMPDI, RL-2, DHANBAD, DATED 20.08.19

WATER QUALITY MONITORING

3.1 Location of sampling sites

(Refer **Plate No. – II**)

i) **Mine Discharge of Dobari UGP (MW8)**

A sampling point is fixed to assess the effluent quality of Mine discharge. This location is selected to monitor effluent discharge in to Kashi jore.

3.2 Methodology of sampling and analysis

Water samples were collected as per standard practice. The effluent samples were collected and analyzed for four parameters on fortnightly basis at the Environmental Laboratory of CMPDI RI-II, Dhanbad.

3.3 Results & Interpretations

The results are given in tabular form along with the applicable standards. Results are compared with Schedule - VI, effluent prescribed by MoEF&CC. Results show that most of the parameters are within the permissible limits.

WATER QUALITY DATA

(EFFLUENT WATER- FOUR PARAMETERS)

Name of the Cluster: **Cluster -VIII**		Month: **JULY, 2019**	Name of the Station: **Mine Discharge of Dobari UGP**[3]	
Sl. No.	**Parameters**	**MW8** First Fortnight	**MW8** Second Fortnight	**As per MOEF General Standards for schedule VI**
		13.07.2019	26.07.2019	
1	Total Suspended Solids	23	30	*100 (Max)*
2	pH	8.18	7.85	*5.5 - 9.0*
3	Oil & Grease	<2.0	<2.0	*10 (Max)*
4	COD	44	32	*250 (Max)*

All values are expressed in mg/lt except pH.

[3] AUTHORISED FOR RELEASE BY HOD (ENV), CMPDI, RI-2, DHANBAD, DATED 28.09.19

WATER QUALITY MONITORING

3.1 Location of sampling sites

(Refer Plate No. – II)

i) **Mine Discharge of Dobari UGP (MW8)**

A sampling point is fixed to assess the effluent quality of Mine discharge. This location is selected to monitor effluent discharge in to Kashi jore.

3.2 Methodology of sampling and analysis

Water samples were collected as per standard practice. The effluent samples were collected and analyzed for four parameters on fortnightly basis at the Environmental Laboratory of CMPDI RI-II, Dhanbad.

3.3 Results & Interpretations

The results are given in tabular form along with the applicable standards. Results are compared with Schedule - VI, effluent prescribed by MoEF&CC. Results show that most of the parameters are within the permissible limits.

WATER QUALITY DATA

(EFFLUENT WATER- FOUR PARAMETERS)

Name of the Cluster: Cluster -VIII		Month: AUG. 2019	Name of the Station: Mine Discharge of Dobari UGP	
Sl. No.	**Parameters**	**MW8** First Fortnight 16.08.2019	**MW8** Second Fortnight 30.08.2019	**As per MOEF General Standards for schedule VI**
1	Total Suspended Solids	49	56	*100 (Max)*
2	pH	8.15	7.89	*5.5 - 9.0*
3	Oil & Grease	<2.0	<2.0	*10 (Max)*
4	COD	40	28	*250 (Max)*

All values are expressed in mg/lit except pH.

Analysed By
JSA/SA/SSA

Checked By
Lab In Charge
RI-2, CMPDI, Dhanbad

Approved By
HOD(Mining/Environment)
RI-2, CMPDI, Dhanbad

WATER QUALITY MONITORING

3.1 Location of sampling sites

(Refer Plate No. – II)

i) **Mine Discharge of Dobari UGP (MW8)**

A sampling point is fixed to assess the effluent quality of Mine discharge. This location is selected to monitor effluent discharge in to Kashi jore.

3.2 Methodology of sampling and analysis

Water samples were collected as per standard practice. The effluent samples were collected and analyzed for four parameters on fortnightly basis at the Environmental Laboratory of CMPDI RI-II, Dhanbad.

3.3 Results & Interpretations

The results are given in tabular form along with the applicable standards. Results are compared with Schedule - VI, effluent prescribed by MoEF&CC. Results show that most of the parameters are within the permissible limits.

WATER QUALITY DATA

(EFFLUENT WATER- FOUR PARAMETERS)

Name of the Cluster: Cluster -VIII		Month: SEPT.2019	Name of the Station: Mine Discharge of Dobari UGP	
Sl. No.	Parameters	MW8 First Fortnight 06.09.2019	MW8 Second Fortnight 30.09.2019	As per MOEF General Standards for schedule VI
1	Total Suspended Solids	47	54	*100 (Max)*
2	pH	7.92	7.77	*5.5 - 9.0*
3	Oil & Grease	<2.0	<2.0	*10 (Max)*
4	COD	36	28	*250 (Max)*

All values are expressed in mg/lit except pH.

Analysed By
JSA/SA/SSA

Checked By
Lab In Charge
RI-2, CMPDI, Dhanbad

Approved By
HOD(Mining/Environment)
RI-2, CMPDI, Dhanbad

Annexure-XVI

PUC AND FITNESS CERTIFICATES OF VEHICLES ENGAGED IN COAL TRANSPORTATION

4291

FORM 38

[See Rule 62 (1)]

CERTIFICATE OF FITNESS

(Applicable in the case of Transport Vehicles only)

Vehicle No. WB-37B-9754 TIPPER is certified as complying with provision of sec 56 of the Moter Vehicles Act. 1988 and the rules made there under.

The Certificate will expire on 16.01.2020

Dated : 17.01.2019

17/1/19

Inspecting Authority
Environmental & Motor Vehicles
Authorised Testing Station, Dhanbad

Signature and designation of inspecting authority or Signature of the holder of the letter of authority of the authorised testing station.

ENVIRONMENTAL & MOTOR VEHICLES AUTHORISED TESTING STATION
DHANBAD
LIC NO. 4/91

The Certificate of fitness is hereby renewed :-

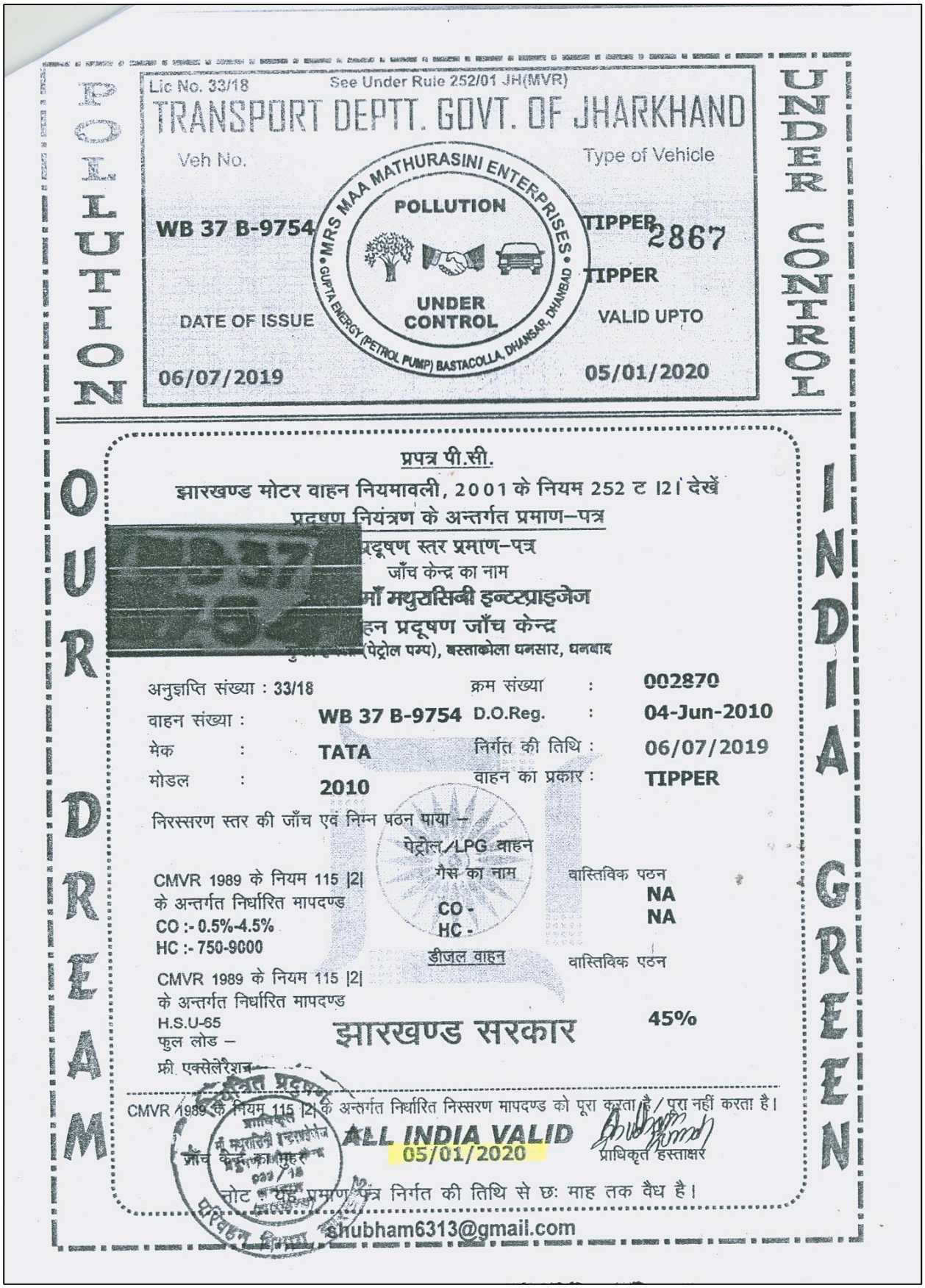
From:

C. S.

Inspector of Motor Vehicle
Dhanbad, Jharkhand

To:

Signature and designation of inspecting authority or Signature of the holder of the letter of uthority of the authorised testing station.



POLLUTION UNDER CONTROL

Lic No. 33/18 See Under Rule 252/01 JH(MVR)

TRANSPORT DEPTT. GOVT. OF JHARKHAND

Veh No. WB 37 B-9754 Type of Vehicle TIPPER 2867

MRS MAA MATHURASINI ENTERPRISES • GUPTA ENERGY (PETROL PUMP) BASTACOLLA, DHANSAR, DHANBAD • POLLUTION UNDER CONTROL

DATE OF ISSUE 06/07/2019 VALID UPTO 05/01/2020

TIPPER

OUR DREAM INDIA GREEN

प्रपत्र पी.सी.

झारखण्ड मोटर वाहन नियमावली, 2001 के नियम 252 ट (2) देखें

प्रदूषण नियंत्रण के अन्तर्गत प्रमाण–पत्र

प्रदूषण स्तर प्रमाण–पत्र

जाँच केन्द्र का नाम

माँ मथुरासिनी इन्टरप्राइजेज

वाहन प्रदूषण जाँच केन्द्र

(पेट्रोल पम्प), बस्ताकोला धनसार, धनबाद

अनुज्ञप्ति संख्या : 33/18		क्रम संख्या :	002870
वाहन संख्या :	WB 37 B-9754	D.O.Reg. :	04-Jun-2010
मेक :	TATA	निर्गत की तिथि :	06/07/2019
मोडल :	2010	वाहन का प्रकार :	TIPPER

निरस्सरण स्तर की जाँच एवं निम्न पठन पाया –

पेट्रोल/LPG वाहन

	गैस का नाम	वास्तविक पठन
CMVR 1989 के नियम 115 (2) के अन्तर्गत निर्धारित मापदण्ड CO :- 0.5%-4.5% HC :- 750-9000	CO -	NA
	HC -	NA

डीजल वाहन

		वास्तविक पठन
CMVR 1989 के नियम 115 (2) के अन्तर्गत निर्धारित मापदण्ड H.S.U-65 फुल लोड – फ्री एक्सेलेरेशन		45%

झारखण्ड सरकार

CMVR 1989 के नियम 115 (2) के अन्तर्गत निर्धारित निस्सरण मापदण्ड को पूरा करता है / पूरा नहीं करता है।

ALL INDIA VALID 05/01/2020

प्राधिकृत हस्ताक्षर

नोट : यह प्रमाण पत्र निर्गत की तिथि से छः माह तक वैध है।

shubham6313@gmail.com

/17/2018

झारखण्ड सरकार

GOVERNMENT OF JHARKHAND

State Transport Department
DHANBAD
FORM 38
[See Rule 62(1)]

CERTIFICATE OF FITNESS

(Applicable in the case of transport vehicles only)

Vehicle No: JH10M7062 (Goods Carrier) is certified as complying with the provisions of the Motor vehicles Act, 1988 and the rules made there under.

Certificate will expire on	: 16-Dec-2019		
Next Inspection Due Date	: 17-Nov-2019		
Inspection Fee Receipt No	: JH10R18120002303		
Application No	: JH18121081323422		
Receipt Date	: 10-Dec-2018		
Chassis No	: 396522BSZ205193		
Engine No	: 70B62548936		
Seating Capacity	: 2 (Including Driver)		
Type of Body	: TIPPER		
Registration No	: JH10M7062	Manufacturing Year	: 2007
Category of Vehicle	: HGV	Inspected on	: 17-Dec-2018
Inspected by		: MVI DHANBAD	

Printed on: 17-Dec-2018 22:37:24

17/12/18

Signature of Inspecting Authority
DHANBAD
Inspector of Motor Vehicle
Dhanbad, Jharkhand

POLLUTION UNDER CONTROL CERTIFICATE

Govt. Of jharkhand Transport Dep.

Computerized Emission Test Certificate
(Rule 163E (6) of BMV Rule 1992)

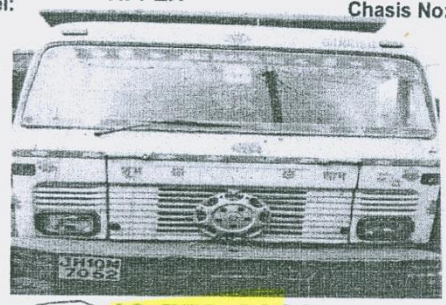
Licence No.: 590/ 2017
ALL INDIA VALID

RUDRA ENTERPRISES

A-590/20170002646 AMUATAND, HIRAK ROAD, BAGHMARA, DHANBAD(JH)

19-AUG-2019
00:00:00

Puccno:	JH 10M 7062	Reg. Year :	2007	Test Date :	
Reg No.:	TATA	Fuel :	DIESEL	Test Time :	GOODS CARRIER (HGV)
Make:	TIPPER	Eng. No.:	NA	Category :	
Model:		Chasis No:	NA		



FLUSH	CYCLE			
		AVERAGE		
	RPM Min	RPM Max	Oil Temp	
	910	4910	78	
		DETAILS		
RPM Min	RPM Max	Temp	HSU	K Value
870	4880	9	52.93	1.75
940	4890	65	57.08	1.97
920	4890	69	50.63	1.64
MEAN			53.66	1.78
RESULT				

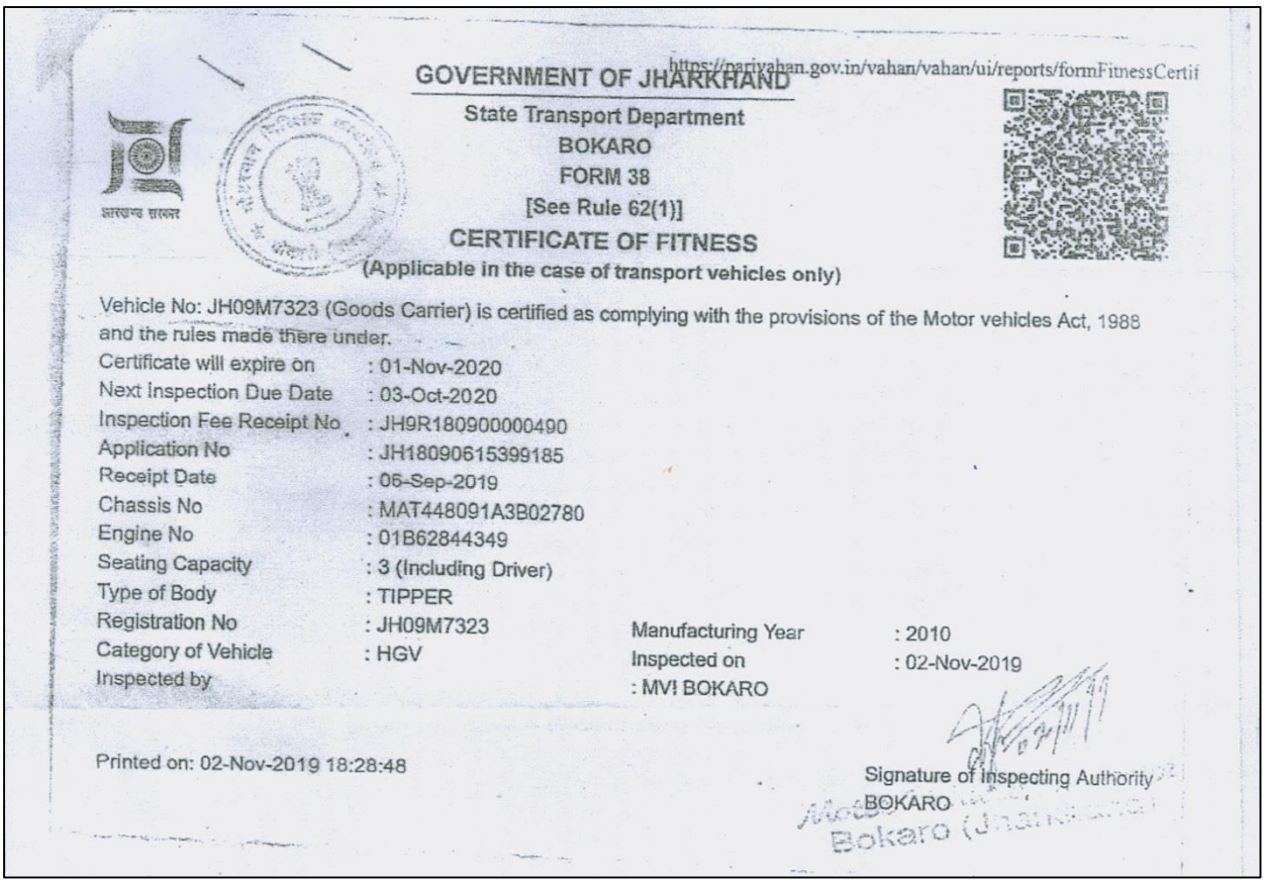
18-FEB-2020

Valid upto
This vehicle meets the standard prescribed by rule 115 (2) of central Motor Vehicle Rule 1989.
This Cetificate is valid for six Months only.

Seals of Testing Centre

Test Station Code : 590/2017

Authorized Signatory



https://parivahan.gov.in/vahan/vahan/ui/reports/formFitnessCertif

झारखण्ड सरकार

GOVERNMENT OF JHARKHAND

State Transport Department

BOKARO

FORM 38

[See Rule 62(1)]

CERTIFICATE OF FITNESS

(Applicable in the case of transport vehicles only)

Vehicle No: JH09M7323 (Goods Carrier) is certified as complying with the provisions of the Motor vehicles Act, 1988 and the rules made there under.

Certificate will expire on	: 01-Nov-2020		
Next Inspection Due Date	: 03-Oct-2020		
Inspection Fee Receipt No	: JH9R180900000490		
Application No	: JH18090615399185		
Receipt Date	: 06-Sep-2019		
Chassis No	: MAT448091A3B02780		
Engine No	: 01B62844349		
Seating Capacity	: 3 (Including Driver)		
Type of Body	: TIPPER		
Registration No	: JH09M7323	Manufacturing Year	: 2010
Category of Vehicle	: HGV	Inspected on	: 02-Nov-2019
Inspected by		: MVI BOKARO	

Printed on: 02-Nov-2019 18:28:48

Signature of Inspecting Authority
BOKARO

Bokaro (Jharkhand)

Lic No. 3114/04

TRANSPORT DEPTT. GOVT. OF JHARKHAND

Veh. No.: JH 09M 7323

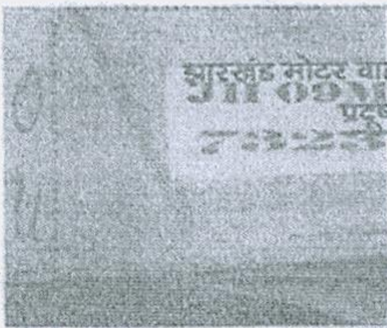
Type of Vehicle: TIPPER

G.K.&GROUPS (A FRIEND OF ENVIRONMENT) BASTACOLA, JHARIA, DHANBAD

POLLUTION PUC UNDER CONTROL

DATE OF ISSUE: 08-AUG-2019

VALID UPTO: 07-FEB-2020



प्रपत्र पी.सी.

झारखंड मोटर वाहन नियमावली, 2001 के नियम 252 ट |2| देखें

प्रदूषण नियंत्रण के अन्तर्गत प्रमाण पत्र

प्रदूषण स्तर प्रमाण–पत्र

जाँच केन्द्र का नाम

G.K. & Groups

(A Friend of Enironment)

Vehicle Pollution Testing Centre, Bastacolia, Jharia, Dhanbad

BC-36676/18

12 APR 2010

अनुज्ञप्ति संख्या : 3114/04		क्रम संख्या	
वाहन संख्या :	JH 09M 7323	D.O.Reg. :	08-AUG-2019
मेक		निर्गत की तिथि :	
मोडल :	TMTLD	वाहन का प्रकार :	TIPPER
	2010		

निस्सरण स्तर की जाँच एवं निम्न पठन पाया –

पेट्रोल/LPG वाहन

CMVR 1986 के नियम 115 2 के अन्तर्गत निर्धारित मापदण्ड
CO : 0.5%- 4.5%
HC : 750-9000

गैस का नाम: CO : HC — वास्तविक पठन: NA

डीजल वाहन

CMVR 1986 के नियम 115 2 के अन्तर्गत निर्धारित मापदण्ड
H.S.U-65
फ्री स्मोक
फ्री एक्सलिरेशन — वास्तविक पठन: 51%

CMVR 1989 के नियम 115 |2| के अन्तर्गत निर्धारित निस्सरण मापदण्ड को पूरा करता है/पूरा नहीं करता है।

ALL INDIA VALID

जाँच केन्द्र की मुहर — प्राधिकृत हस्ताक्षर

07-FEB-2020

नोट :- यह प्रमाण पत्र निर्गत की तिथि से छः माह तक वैध है।

gkgroups@rocketmail.com

POLLUTION CHECKED — INDIA GREEN

Annexure-XVII

Training

Sl. No.	Month	Refresher Training	Initial Training	Contractual Worker Training	Change of Job Training	Special Training
Cluster VIII						
1	April	42	0	0	1	0
2	May	53	0	0	0	0
3	June	56	1	0	1	0
4	July	108	1	0	0	0
5	August	88	1	0	0	19
6	September	63	0	0	0	0
Total		**410**	**3**	**0**	**2**	**19**

Annexure-XVIII

PME

Sl. No.	Name of Mine	Apr	May	Jun	July	Aug	Sep
1.	Bastacolla Colliery	30	18	16	87	65	24
2.	Bera Colliery	4	3	9	29	12	17
3.	Kuya Colliery	37	6	21	50	31	1
4.	Ghanoodih Colliery	16	0	13	20	15	1
5.	Dobari Colliery	0	0	11	68	11	0
6.	Kujama Colliery	0	0	3	5	3	9
Total		87	27	73	259	137	52

Annexure-XIX

भारत कोकिंग कोल लिमिटेड

(एक मिनीरत्न कम्पनी)

(कोल इण्डिया लिमिटेड का एक अंग)

पर्यावरण विभाग

यह सभी संबंधित लोगो के ध्यान में लाना है कि :

(1) पत्रांक सं. जे-11015/01/2011-IA.II(M) दिनांक 11 फरवरी, 2013 द्वारा जिला धनबाद, झारखण्ड में भारत कोकिंग कोल लिमिटेड के कलस्टर -V में प्रदान की गई पर्यावरण मंजूरी पर्यावरण, वन और जलवायु प मंत्रालय के स्वीकृत आदेश सं. जे- 11015/01/2011-IA.II(एम), दिनांक 30 मई, 2018 द्वारा निम्नलिखित लिए संशोधित किया गया है।

खान का नाम	खान के प्रकार	पीक उत्पादन क्षमता (एमटीवाइ)	लीज होल्ड एरिया (एच ए.)
सेन्द्रा बांसजोड़ा	ओसीपी	2.34	249.63
कनकनी	ओसीपी युजी अनुभाग	1.19	258.12

(2) पत्रांक सं जे-11015/298/2010-IA.II(एम) दिनांक 15 फरवरी, 2013 द्वारा जिला धनबाद, झारखण्ड में भारत कोकिंग कोल लिमिडेड के कलस्टर -VIII में प्रदान की गई पर्यावरण मंजूरी पर्यावरण, वन और जलवायु प मंत्रालय के स्वीकृत आदेश सं. जे-11015/298/2010-IA.II(एम), दिनांक 15 जून, 2018 द्वारा निम्नलिखित लिए संशोधित किया गया है।

खान का नाम	खान के प्रकार	पीक उत्पादन क्षमता (एमटीवाइ)	लीज होल्ड एरिया (एच ए.)
दोबारी कोलियरी	ओसी	3.86	146.90
कुंया कोलियरी	ओसी	2.60	324.01 (340.50-

पर्यावरण मंजूरी पर्यावरण एवं वन मंत्रालय की वेबसाइट http://envfor.nic.in पर और भारत कोकिंग कोल लि की कार्यालय वेबसाइट http://www.bcclweb.in पर भी देखा जा सकता है।

Annexure-XX

Bharat Coking Coal Limited
(A Miniratna Company)
A Subsidiary of Coal India Limited

Office of the General Manager,
Bastacolla Area,
Dhanbad-828111
Fax/Tel. No. 0326-2291238,
Email: cgmbastacolla@bccl.gov.in

पर्यावरण विभाग
बस्ताकोला क्षेत्र

भारत कोकिंग कोल लिमिटेड
(एक मिनीरत्न कंपनी)
कोल इंडिया लिमिटेड का एक अंग

महाप्रबंधक का कार्यालय
बस्ताकोला क्षेत्र
धनबाद-८२८१११

Ref. No./पत्रांक: BCCL:BA:IX:GM:EC:19:124 Date/दिनांक: 17.01.2019

To
The Municipal Comissioner
Dhanbad Municipal Corporation
Dhanbad

Subject :- Regarding Environmental Clearance of Cluster VIII Coal Mining Project of M/s Bharat Coking Coal Limited.

Dear Sir,

The Ministry of Environment, Forests & Climate Change has granted Environmental Clearance to Cluster VIII group of mines vide EC No: J-11015/ 298/ 2010-IA.II(M) dated 15.02.2013 subsequently due to change in geo-mining conditions EC has been amended on 15.06.2018. Please find enclosed herewith a copy of Environmental Clearance granted to Cluster VIII Coal Mining Project.

This is for your kind information.

Yours Sincerely

Encl: As above

General Manager
Bastacolla Area

General Manager
Bastacolla Area IX

Copt to -
Dy. GM (Env), BCCL – For information (by e-mail)

कार्यालय नगर निगम
प्राप्ति तिथि 18/1/19

STRICTLY RESTRICTED
FOR COMPANY USE ONLY
RESTRICTED
The information given in this report is not to be communicated either directly or indirectly to the press or to any person not holding an official position in the CIL/Government.

Study to Analyze the Extent of Reduction of Pollution Load Every Year by reducing Coal Transportation by Road

CLUSTER VIII GROUP OF MINES

(Bastacolla OCP, Bastacolla UG, Bera OCP, Bera UG, Dobari Colliery (UG), Kuya OCP, Kuya UG, Goluckdih (NC) OCP (Proposed), Ghanoodih Colliery (OCP), Kujama Colliery (OCP))

Normative Production :4.31 MTPA
Peak Production : 5.603 MTPA
Lease Hold Area : 1200.41 Ha

Bharat Coking Coal Limited

(July 2018)

Prepared by

Environment Division

Central Mine Planning & Design Institute Limited

CMPDI (HQ)

Gondwana Place

Kanke Road, Ranchi-834008

CONTENTS

Chapter – I

Introduction

1.1 Genesis:

MOEF provided Environmental Clearance to the various mines of the Cluster J-l1015/298/2010-IA.II (M) dated 15 Feb 2013.

As per the Environmental Clearance Conditions given by the Ministry of Environment & Forest "A study should be initiated to analyse extent of reduction in pollution load every year by reducing road transport of coal". Therefore the present study has been carried out to quantify the pollution load due to coal transportation.

1.2 Methodology:

In order to find out the pollution load due to coal transportation a Questionnaire was developed by the Environment Division of CMPDI Headquarter and Regional Institute –II, Dhanbad. The Questionnaire was circulated to the various mines of BCCL for collection of the requisite inputs for this study. The quantification of pollution load for PM-10 has been carried out on the basis of the field visit, data provided by BCCL officials and interaction with them.

1.3 General Information about the Cluster:

1.3.1 Brief Description:

Cluster VIII mines of BCCL is an existing group of mines consisting of 10 mines within mining lease hold. The mine under the cluster are **Bastacolla OCP, Bastacolla UG, Bera OCP, Bera UG, Dobari Colliery (UG), Kuya OCP, Kuya UG, Goluckdih (NC) OCP (Proposed), Ghanoodih Colliery (OCP), Kujama Colliery (OCP)).**

Cluster VIII mines of BCCL is administratively under Bastacolla Area of Bharat Coking Coal Limited. Geologically it is of Barakar formation in Jharia Coalfield in Dhanbad District of Jharkhand.

Cluster VIII mines of BCCL is administratively under Bastacolla Area of Bharat Coking Coal Limited. Geologically it is of Barakar formation in Jharia Coalfield in Dhanbad District of Jharkhand. These mines are taken over by BCCL from private mine owners after nationalization through Coal Mines Nationalization Act, 1972-73. The Murulidih 20/21 pit mine is operating since pre-nationalisation period. BCCL is the proponent of the cluster and it is under the administrative control of Coal India Limited.

1.3.2 Nature and Size of the Cluster:

Cluster VIII mines of BCCL is an existing group of mines consisting of 10 mines within mining lease hold. The existing mines within the Cluster have a long history of mining activities commencing prior to nationalization of coal mines. Name of the mines within the Cluster, their production capacity, lease hold area and life are given below: in Table no. 1.1.

Table 1.1: Details of the Mines of Cluster –VIII

Sl No	Name of Mines	Production Capacity (MTY)	
		Normative	Peak
1	Bastacolla OCP	0.10	0.130
2	Bastacolla UG	0.33	0.429
3	Bera OCP	0.15	0.195
4	Bera UG	0.19	0.247
5	Dobari Colliery (UG)	0.24	0.312
6	Kuya OCP	0.60	0.780
7	Kuya UG	0.10	0.130

Sl No	Name of Mines	Production Capacity (MTY)	
		Normative	Peak
8	Goluckdih (NC) OCP (Proposed) (Proposed OCP will commence after the closure of existing Kuya OCP)	1.2	1.560
9	Ghanoodih Colliery (OCP)	1.40	1.820
10	Kujama Colliery (OCP)	0.60	0.780
	Total	4.31	5.603

1.3.3 Impact of Fire Control on Ambient Air Quality:

Due to unscientific mining prior to nationalization there are unstable sites identified in the BCCL. The mines in the cluster have been severely affected by fire and subsidence mainly due to unscientific mining prior to nationalization. Out of 595 unstable sites identified in the Master Plan, this cluster has 22 sites consisting of 4959 no. of houses are affected. The affected families will be rehabilitated in adjacent non-coal bearing area at a cost of Rs. 15064.58 lakhs.

1.3.4Impact of Resettlement on Ambient Air Quality:

As per Jharia Action Plan (JAP) household will be shifted for implementation of master plan. The reduction in number of households within the leasehold area of Cluster will lead to reduction in generation of air pollutants due to reduction in movement of man & materials apart from decrease in consumption of coal as a domestic fuel. As per Jharia Action Plan (JAP) household will be shifted as per for implementation.

1.4 Meteorological Data

A meteorological data generated during 1st January 16 to 31st March 2016 has been presented in this report .The micro meteorological set up was established at

the roof of BCCL Dugda Guest house and parameters like temperature, relative humidity, wind speed and directions, cloud cover and rainfall were recorded. The data were collected on hourly basis during the entire study period.

Generally, moderate winds prevailed throughout the study period. The wind velocity ranged between ≤ 0.5 m/s to 13.2 m/s. The seasonal average wind speed was observed to be 0.69 m/s. Wind-roses were made by using latest WRPLOT View of Lakes Environmental Software.

The analysis of wind pattern during the season showed that the predominant wind directions were from North-West & West followed by North-East having frequencies 15.71%, 11.45% & 4.67% respectively. The receptors located in the Downwind directions i.e. SE and East from the dust generating sources are likely to be affected. The dispersion of air borne dust during calm period (45% of time) will be very poor and buildup of pollutant concentration during this period will occur.

The maximum temperature recorded was 39.3^{0}C and the minimum was 6.2^{0}C. The daily average relative humidity values were in the range of 32.2 to 65.0%. The sky was mostly clear during the study period. The average atmospheric pressure value has been found to be around 732.3 mm Hg. Total 94.5mm rainfall was recorded during the study period. The average rainfall during the season was found to be 1.04 mm.

Table 1.2: SEASONAL WIND DISTRIBUTION

Period: 01st JAN.'2016 – 31stMAR.'2016

Wind Direction	Wind Velocity (m/s) & Duration (%)				
	< 0.5	0.6 -1.5	1.6 -3.5	>3.5	Total
N		1.61	0.78	0.00	2.38
NNE		0.83	0.37	0.00	1.19
NE		3.17	1.47	0.05	4.67
ENE		0.41	0.14	0.00	0.55
E		1.10	0.69	0.00	1.79
ESE		0.50	0.37	0.00	0.87

Wind Direction	Wind Velocity (m/s) & Duration (%)				
	< 0.5	0.6 -1.5	1.6 -3.5	>3.5	Total
SE		1.28	0.41	0.05	1.74
SSE		0.64	0.18	0.00	0.82
S		0.41	0.09	0.00	0.50
SSW		0.28	0.05	0.00	0.32
SW		2.29	0.60	0.00	2.88
WSW		1.06	0.41	0.00	1.47
W		8.99	2.48	0.00	11.45
WNW		1.24	1.01	0.00	2.24
NW		11.47	4.22	0.05	15.71
NNW		2.11	3.59	0.00	2.84
CALM	44.97	-	-	-	44.97
Total	44.97	37.32	17.56	0.15	100

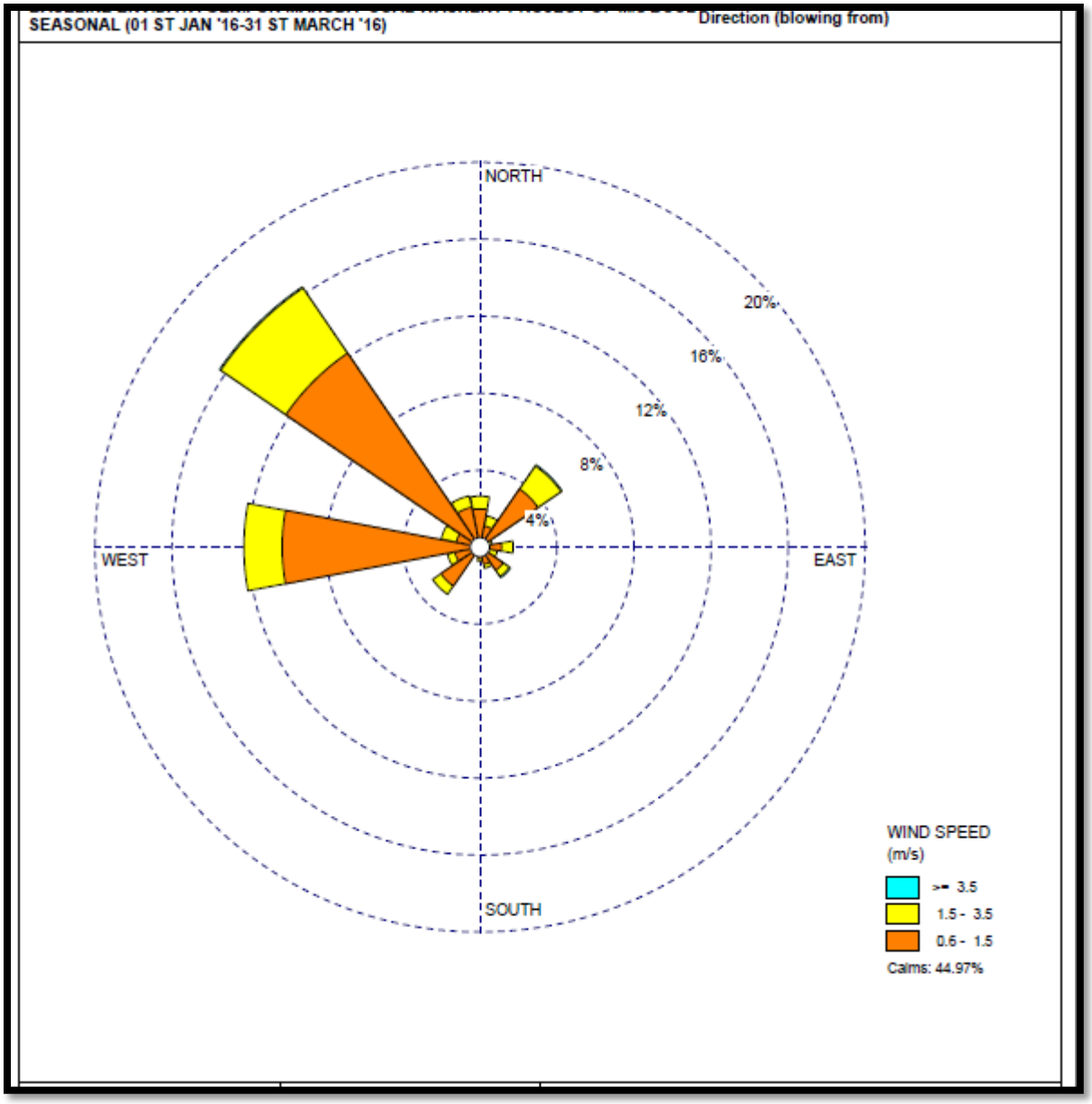


Figure No.-1.1 Wind Rose diagram for the period 1St Jan to 31St March 2016

Chapter – II

Fugitive Dust Generation Due To Movement of Coal

2.1 Introduction

The coal produced moves to the consumers via Road & Rail. Coal from the mine face is brought to the surface dumps and bulk of it goes to the nearby railway sidingsfor further movement to the consumer- end through rail. The journey from the mine face to the railway siding is covered by road. A portion of the coal produced by the mine directly goes to the consumers via road. Transportation of coal by rail is an environmentally better option than the road transportation. Road Transportation results in generation of fugitive dust from road surface apart from other pollutants released due to consumption of Diesel.

The fugitive dust generated due to coal transportation through road depend upon the following factors:

1. Speed and Weight of the moving vehicles.
2. Silt Content of the Road Dust (Particles less than 200 mesh size is considered as silt)
3. Silt loading of the road dust (Kg/m^2).
4. Moisture Content of the dust lying on the road surface.
5. Ambient Temperature, Humidity & wind velocity.

The dust generation will be lower if the quantity of dust (silt loading) lying on the road surface is minimum and the moisture content of the loose material lying on the road surface is high.

2.2 Movement of Coal

Distance travelled by coal and subsequent release of fugitive dust during its journey towards the consumer end has been describedand dust load has been worked out for the year 2013-14, 2014-15 and 2015-16.

2.2.1 Cluster Mines :

Table: 2.1 Dust Generation (Kg/day)

Name of the Mine	Year	Location	Distance from Face to Siding (Km)	Coal Transferred (Te)	Daily Coal Production (Te/Day)	Capacity of the Dumper	Vehicle Kilometer Travelled	Emission Rate for PM 10 (kg/VKT)	Pollution Load * Dust Generated Per Day (Kg/day)	Dust generated Kg/per tonne
Bastacolla Colliery	13-14	CK Siding	7.50	88043	267.00	18.00	222.50	0.53	117.925	
	13-14	Burragarh Siding	7.50	48545	147.00	18.00	122.50	0.53	64.925	
		Total for 13-14			**414.00**				**182.850**	0.44
	14-15	CK Siding	7.50	76974	233.00	18.00	194.17	0.53	102.908	
	14-15	Burragarh Siding	7.50	32508	99.00	18.00	82.50	0.53	43.725	
		Total for 14-15			**332.00**				**146.633**	0.44
	15-16	CK Siding	7.50	105913	321.00	18.00	267.50	0.53	141.775	
	15-16	Burragarh Siding	7.50	20256	61.00	18.00	50.83	0.53	26.942	
		Total for 15-16			**382.00**				**168.717**	0.44
Bera Colliery (Mixed)	13-14	CK Siding	5.50	119261	361.00	20.00	198.55	0.53	105.232	
	13-14	MPL (Dist>25 Kms)	10.00	52083	158.00	20.00	158.00	0.53	83.740	
		Total for 13-14			**519.00**				**188.972**	0.36
	14-15	CK Siding	5.50	220257	667.00	20.00	366.85	0.53	194.431	
		Total for 14-15			**667.00**				**194.431**	0.29
	15-16	CK Siding	5.50	161102	488.00	20.00	268.40	0.53	142.252	
		Total for 15-16			**488.00**				**142.252**	0.29
ba ri Co	13-14	CK Siding	6.00	76735	233.00	15.00	186.40	0.53	98.792	

Name of the Mine	Year	Location	Distance from Face to Siding (Km)	Coal Transferred (Te)	Daily Coal Production (Te/Day)	Capacity of the Dumper	Vehicle Kilometer Travelled	Emission Rate for PM 10 (kg/VKT)	Pollution Load * Dust Generated Per Day (Kg/day)	Dust generated Kg/per tonne
	13-14	Industries (Road Sales) [Dist>25 Km]	10.00	120695	366.00	15.00	488.00	0.53	258.640	
		Total for 13-14			**599.00**				357.432	0.60
	14-15	CK Siding	6.00	28874	87.00	15.00	69.60	0.53	36.888	
	14-15	Industries (Road Sales) [Dist>25 Km]	10.00	90021	273.00	15.00	364.00	0.53	192.920	
		Total for 14-15			**360.00**				229.808	0.64
	15-16	CK Siding (W)	6.00	286979	870.00	15.00	696.00	0.53	368.880	
	15-16	Industries (Road Sales) [Dist>25 Km]	10.00	178068	540.00	15.00	720.00	0.53	381.600	
	15-16	BNR Siding	9.00	1109034	3361.00	15.00	4033.20	0.53	2137.596	
		Total for 15-16			**4771.00**				**2888.076**	0.61
Kuya Colliery (Kuya UG + NC Kuya OCP+ Patch [H])	13-14	CK Siding	3.07	902070	2734.00	20.00	839.34	0.53	444.849	
	13-14	BNR Siding	13.00	484230	1467.00	20.00	1907.10	0.53	1010.763	
	13-14	MPL (Dist>20 Kms)	10.00	63657	193.00	20.00	193.00	0.53	102.290	
		Total for 13-14			**4394.00**				**1557.902**	0.35
	14-15	CK Siding	3.07	698820	2118.00	20.00	650.23	0.53	344.620	
	14-15	BNR Siding	13.00	793212	2404.00	20.00	3125.20	0.53	1656.356	
	14-15	MPL (Dist>20 Kms)	10.00	310157	940.00	20.00	940.00	0.53	498.200	
		Total for 14-15			**5462.00**				**2499.176**	0.46
	15-16	CK Siding	3.07	969029	2936.00	20.00	901.35	0.53	477.717	

Name of the Mine	Year	Location	Distance from Face to Siding (Km)	Coal Transferred (Te)	Daily Coal Production (Te/Day)	Capacity of the Dumper	Vehicle Kilometer Travelled	Emission Rate for PM 10 (kg/VKT)	Pollution Load * Dust Generated Per Day (Kg/day)	Dust generated Kg/per tonne
	15-16	BNR Siding	13.00	626023	1897.00	20.00	2466.10	0.53	1307.033	
	15-16	MPL (Dist>20 Kms)	10.00	203373	616.00	20.00	616.00	0.53	326.480	
		Total for 15-16			**5449.00**				**2111.230**	0.39
Ghanoodih Colliery	13-14	CK Siding (W)	3.00	175227	531.00	20.00	159.30	0.53	84.429	
	13-14	BNR Siding	10.00	261996	794.00	20.00	794.00	0.53	420.820	
		Total for 13-14			**1325.00**				**505.249**	0.38
	14-15	CK Siding (W)	3.00	197002	597.00	20.00	179.10	0.53	94.923	
	14-15	BNR Siding	10.00	175484	532.00	20.00	532.00	0.53	281.960	
		Total for 14-15			**1129.00**				**376.883**	0.33
	15-16	CK Siding (W)	3.00	188347	571.00	20.00	171.30	0.53	90.789	
	15-16	BNR Siding	10.00	11166	34.00	20.00	34.00	0.53	18.020	
		Total for 15-16			**605.00**				**108.809**	0.18
Kujama Colliery	13-14	CK Siding	1.00	233777	708.00	14.00	101.14	0.53	53.606	
	13-14	Different Consumers (SAIL Chasnala, TATA Digwadih, TATA Bhelatand, TATA Bokaro, Sudamdih Washery) [Dist>10 Kms]	10.00	225528	683.00	14.00	975.71	0.53	517.129	
		Total for 13-14			**1391.00**				**570.734**	0.41

Name of the Mine	Year	Location	Distance from Face to Siding (Km)	Coal Transferred (Te)	Daily Coal Production (Te/Day)	Capacity of the Dumper	Vehicle Kilometer Travelled	Emission Rate for PM 10 (kg/VKT)	Pollution Load * Dust Generated Per Day (Kg/day)	Dust generated Kg/per tonne
	14-15	CK Siding	1.00	8412	25.00	18.00	2.78	0.53	1.472	
	14-15	Different Consumers (SAIL Chasnala, TATA Jamadoba, TATA Bhelatand) [Dist>10 Kms]	10.00	231494	701.00	18.00	778.89	0.53	412.811	
		Total for 14-15			**726.00**				**414.283**	0.57
	15-16	CK Siding	1.00	5235	16.00	18.00	1.78	0.53	0.942	
	15-16	Different Consumers (SAIL Chasnala, TATA Jamadoba, TATA Bhelatand) [Dist>10 Kms]	10.00	106607	323.00	18.00	358.89	0.53	190.211	
		Total for 15-16			**339.00**				**191.153**	**0.56**

* In terms of PM 10 expressed as kg/day, ** Average distance has been considered, *** Capacities of Dumpers used in transportation of coal from face to siding taken as 30Te, to Washery 20Te, and Outside Transport 15 Te. ..## Emission rate for PM_{10} has been taken from the S&T work (funded by MoC) carried out by CMPDI during 2002-2007.

2.3 Optimum Coal Transportation scheme in the Present Scenario:

Phase – I (for 10 + 05 Years)

As suggested by the Environmental Appraisal Committee, it is proposed to continue the existing Road–Rail transport network system in view of the implementation of the Jharia Action Plan(JAP) for 10 years and another 05 years gestation period after the completion of the JAP for consolidation of the backfilled dug out fire areas and unstable areas is required. Thus the period of 15 years, make the Phase – I. All mitigation measures like covered trucks, green belting on either side of the road, enhanced water sprinkling, proper maintenance of roads, removal of spilled materials etc shall be adopted for 15 years with the existing road – rails transport system.

2.4 Conceptual Plan of Proposed Integrated Coal Transportation Network forthe Cluster:

Phase – II (after 15 Years):

As suggested by the EAC Members, BCCL shall implement conveyor –cum-rail transport to avoid movement of trucks within the cluster for coal transportation in Phase –II. Loading of coal by pay–loaders shall be discontinued.

During 2015-16, the combined daily coal production of the Cluster was 12034.00 tones resulting in 5610.24 kg of daily fugitive dust generation. The dust (PM-10) generation rate at present is 2.47 kg/te.

As a result of replacement of existing road transportation of coal by Conveyor to railway siding will result in reduction of fugitive dust generation to the extent of 41932.22 kg/day for daily coal production of 16979 tonnes (5.603 MTY) during Phase –II.

Table 2.2: Proposed Infrastructure for Coal Transportation (phase – II)

Cluster	Production Capacity (MTY)	Proposed Transport Infrastructure in Phase – II
VIII	5.603	**Coal transport by Conveyor to Railway Siding**
	5.603 MTY= 16979 tonnes /Day	

2.5 Conclusion:

On the basis of the study undertaken to assess the impact of coal transportation on pollution load, the followings may be concluded:

Phase – I :(2013-14 to 2028 -29) :

1. During Phase – I, business as usual (BAU) scenario will prevail and the existing road cum rail transport network system will be used for coal dispatch to the consumers. During 2015-16, the combined daily coal production of the Cluster was 12034.00 tones resulting in 5610.24 kg of daily fugitive dust generation. The dust (PM-10) generation rate at present is 2.47 kg/te.
2. The generation of fugitive dust due to transportation of coal by road can be further reduced by enforcing covering of loaded trucks, periodical removal of loose materials lying on the road surface and black topping of coal transportation roads.
3. Avenue plantation, effective wetting of the road surface and proper maintenance of roads will further result in mitigation of the impact of road generated dust on ambient air quality.
4. Better road condition, by the use of Mechanical Sweeper or vacuum cleaner dust generation may be minimized.

Phase – II :(From 2029-30 Onwards):

As a result of replacement of existing road transportation of coal by Conveyor to railway siding will result in reduction of fugitive dust generation to the extent of

41932.22 kg/day for daily coal production of 16969 tonnes (5.603 MTY) during Phase –II.

1. During Phase –II, dust load will further reduce due to quenching of mine fire and domestic coal consumption after resettlement of general population dwelling within the command area of cluster, as a result of implementation of Jharia Action Plan. It will result in significant improvement in ambient air quality.

2. **Coal Production Vs. Dust Generation due to Road Transportation is presented below:**

Table2.3: Coal Production Vs. Dust Generation due to Road Transportation

Year	Coal Production (Te/day)	Dust Generation(Kg/Day)
2015-16 (By Road transportation)	12034	5610
2029-30 (Considering peak production and all the coal transported through Road)	16979	41932
2029-30(By Conveyor Transportation)	16979	0

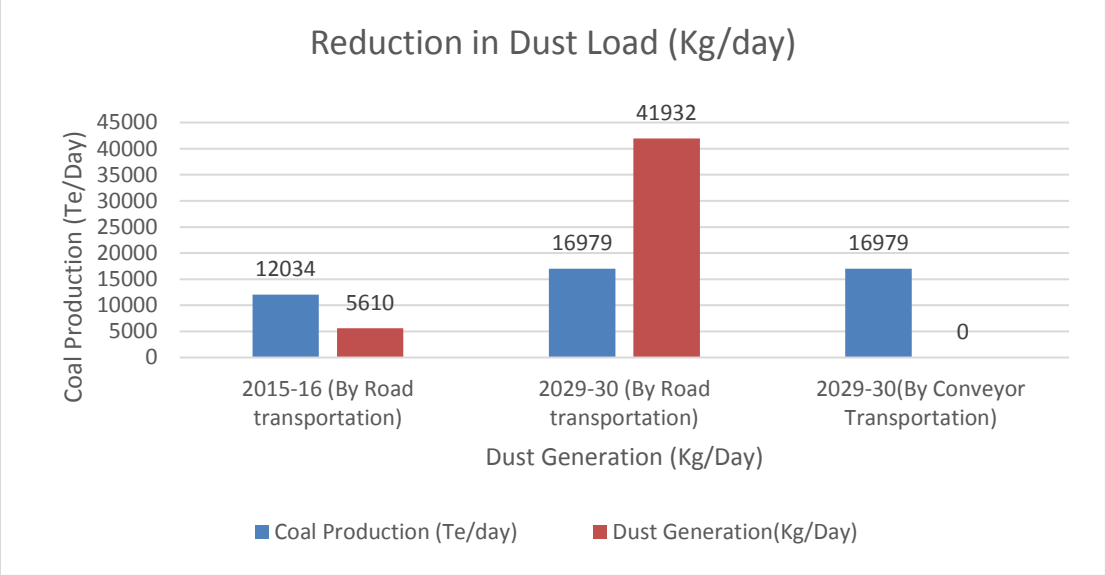


Figure 2.1: Presentation of reduction in dust generation due to replacement of Road transportation by Conveyor system.

Progress Report

1st Phase Air Monitoring report for

"Source apportionment of ambient air particulate matter in Jharia coalfields region, Jharkhand"

Sponsor

Bharat Coking Coal Limited (BCCL)

CSIR-National Environmental Engineering Research Institute, Nagpur

2019

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1. Introduction

1.1 Project Background

Bharat Coking Coal Limited, a subsidiary of Coal India Limited, has been operating the majority of the coal mines in the Jharia coal field regions since its inception in 1972. Jharia coal mines are special for its low ash content and high calorific value coals. Therefore, they are often used directly in iron and steel plants for metal oxide reduction after washing. Although these coal mines are highly priced for their high quality coal, they are notorious for their mine fires, which causes lot of fugitive gaseous and PM emissions. Hence, Jharia region has been under scrutiny by various public authorities and common public with a vision to improve the ambient air quality.

Various sources contribute to high particular matter concentration in the Jharia region: vehicles, mining activities, re-suspended dusts, fugitive emissions, fuel oils, household LPGs, etc. The percentage contribution of these factors in the ambient depends exclusively on the economic activities of that particular region. In order to improve the existing ambient air quality, the major sources of PM emissions first need to be identified. Hence, the environmental clearance committee of MoEF has directed BCCL to conduct a source apportionment study for particulate matter. In this context, BCCL has approached CSIR-NEERI to conduct a source apportionment study of ambient air particulate matter in Jharia coalfields region in order to quantify the various sources PM emissions and suggest an effective environmental management plan.

1.2 Project objectives

The major objective of the study is to assess the current ambient air quality, sources of air pollution and propose the priorities for the actions for improvement of air quality. The study to include the entire Jharia Coalfield along with area up to 10 Km from the periphery / boundary of BCCL mines.

The detailed objectives are as following:

i. Ambient Air Monitoring

- ✓ Monitoring of ambient air quality at selected receptor locations for pollutants including PM10, PM 2.5(limited), SO2, NOx, PAHs to establish the status of the air quality in Jharia Coalfields along with area up to 10 K.M from the periphery/boundary of BCCL mines. Also, review of the available air quality monitoring data from Central Pollution Control Board (CPCB) /Jharkhand State Pollution Control Board (JSPCB).

- ✓ To calibrate dispersion modelling predictions using measured air quality parameters.

- ✓ To draw supportive data through specific site related monitoring regarding impact causing sources such as kerbside monitoring.
- ✓ To establish the impact of meteorological conditions on a few select indicator pollutants in different micro meteorological conditions of the Jharia Coalfields.

ii. Emission Inventory related of Jharia Coalfields along with area up to 10 Km from the periphery / boundary of BCCL mines.

- ✓ To identify the pollution load grid wise for point, line and area source
- ✓ To establish possibilities of receptor level concentrations of air pollutants by matching dispersion modelling and air quality-monitoring data.

iii. Source apportionment related

- ✓ To identify and apportion the pollution load at receptor level to various sources in the Jharia Coalfields along with area up to 10 Km from the periphery / boundary of BCCL mines.
- ✓ To carry out the source apportionment using molecular markers for a limited number of samples through a time resolved sample collection at various period of the day and day-of-the-week.

iv. Any other item in consensus between both BCCL/CIL & NEERI evolved during the study.

2. Field visit

In connection with the above objectives, the NEERI's team and BCCL's team visited BCCL's Jharia coal filed for 3 days from 23 September to 27 September 2018. The team covered the entire Jharia coalfield, which spans roughly 30km in length and 22 km wide in three days with the following purpose.

To identified the location for air monitoring station in entire Jharia Coal Field region.

2.1 Jharia coalfield maps:

BCCL environmental department provided the map of the Jharia region. The site visit was carried out with assistance from BCCL's team. The 15 Jharia mines coal fields were segregated into three parts and details of the visit along with mine cluster names are given in Table 2.1.

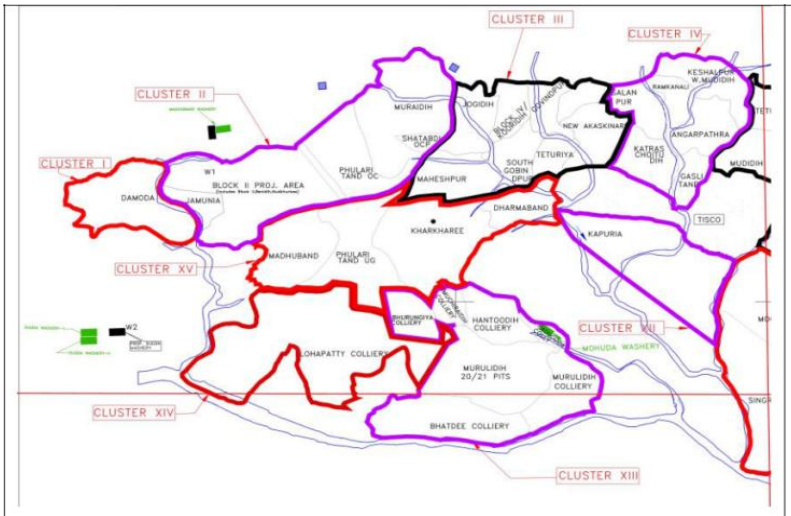
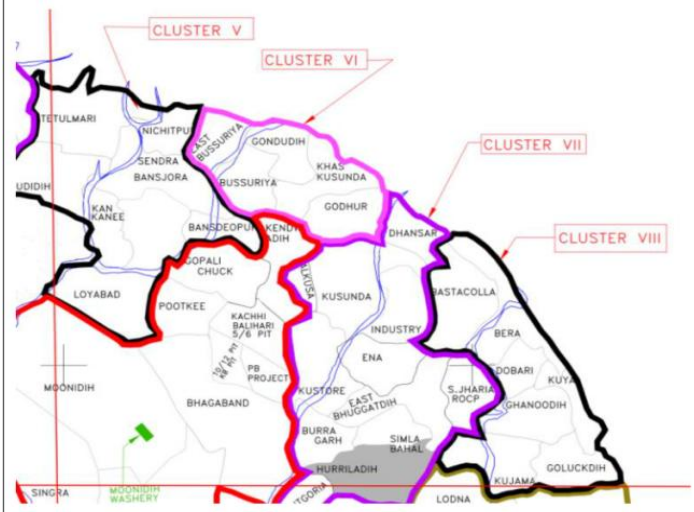
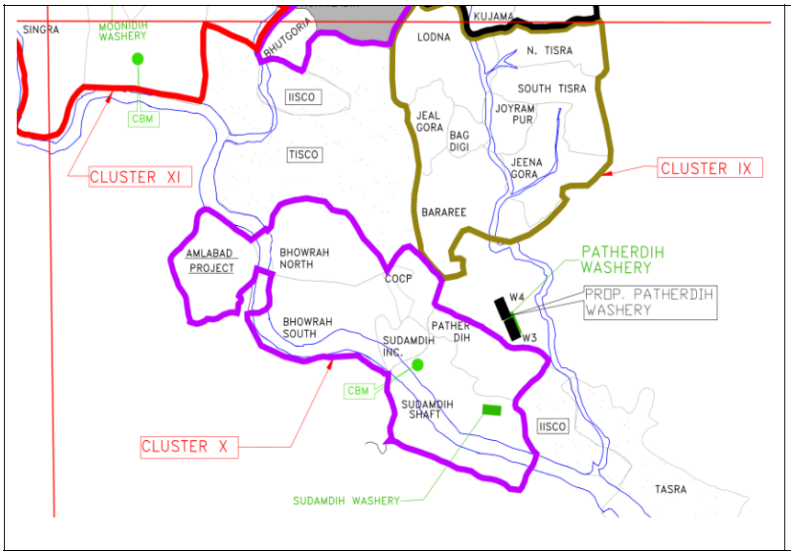
	**Part 1:** Cluster VI, VII, VIII, and X
	**Part 2:** I, II,III, IV, V, XI, XII, XIII, and XV
	**Part 3:** Cluster IX

Table 2.1 Jharia coalfields Site visit on cluster-base

Based on the objectives and outcomes envisaged, the various mine areas were visited to identify sources of emissions such dumpsite emissions, fugitive emissions, blasting emissions. Furthermore, the already existing PM monitoring sites of BCCL were also visited to explore of possibility of installing NEERI's PM monitoring stations.

2.2 Site Identification:

The Entire Jharia Coal Field (JCF) is divided into 16 clusters. Both opencast and underground mines are operational in JCF. Standard mining operations like drilling, blasting, hauling, accumulation, and transfer are the major sources of emissions and air pollution. Apart from that, a typical emission source, mine fire, is prevailing at JCF. Besides, JCF encompasses large non-mining regions, which have their own emission sources like vehicular emission in congested traffics, road dust, Power Plant emission, other industrial emissions (coke oven plants, brick kilns, stone crushers, etc.), crematoria, domestic burning, open burning etc.

Based on the preliminary field visit by CSIR-NEERI Scientists along with BCCL staffs, the following locations are selected for the establishment of Air Quality Monitoring Stations for source apportionment study;

Core Zone

1. Cluster XIV (Lohapatty) – nearby sources: Chandrapura Thermal Power Plant
2. Cluster VII (Mine rescue station)- nearby sources: Coal Mine, Industry
3. Cluster IV or Cluster V – Banssuriya or Katras
4. Cluster IX (Lodhna)
5. Cluster XI (Moonidih)
6. Cluster X (Patherdih): nearby sources: Coal Mine, Steel Industry
7. Cluster VIII (Bastacola)

Buffer Zone

8. Bank More
9. Harina
10. Bhuli
11. Sindri
12. Parbatpur Electrosteel/ Bhaga

13. Background site (Upwind & away from sources) and also secondary Data from DVC, CCL mines Sail Bokaro and Jharkhand pollution Control Board will be obtained.

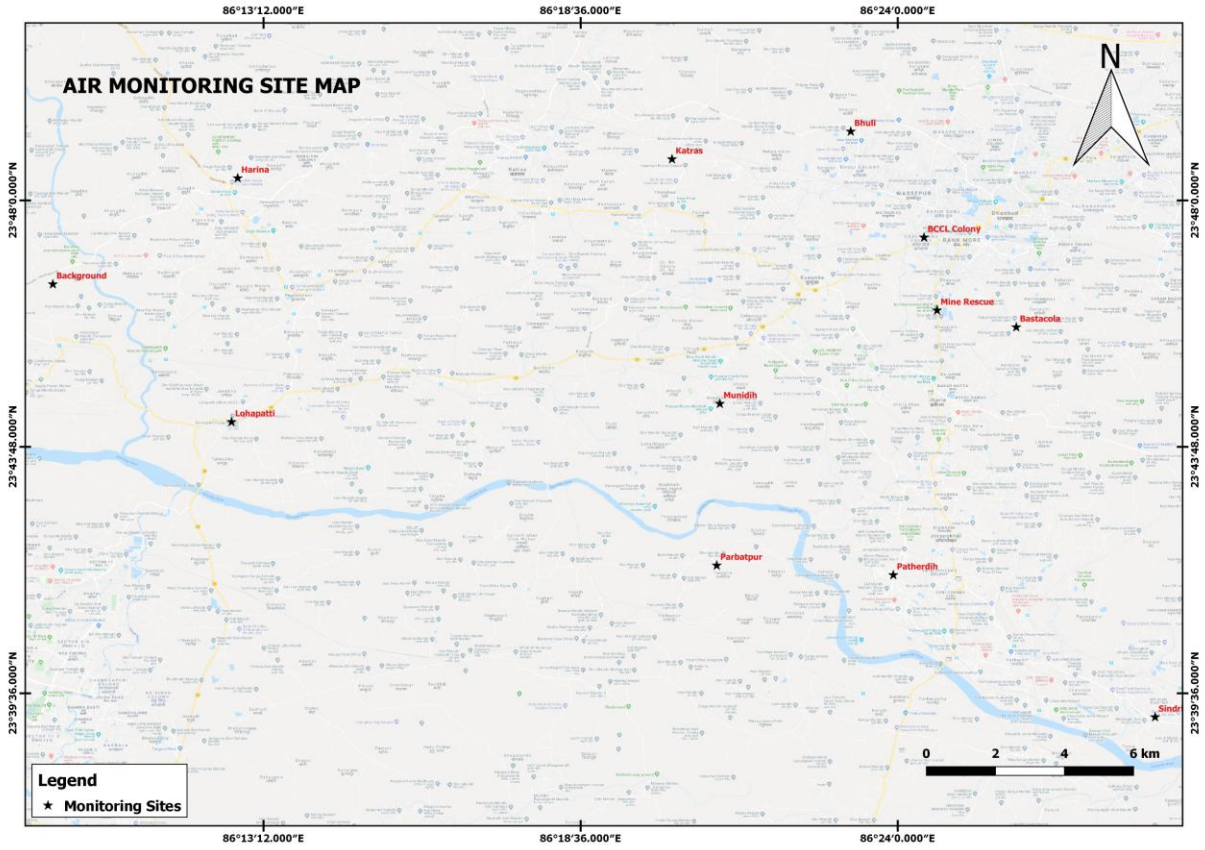


Figure2.1 Identified air monitoring station in Jharia Coalfield

3. Sampler Selection and Procurement

Standard equipment were catered for the parameter required towards ambient air particulate characterization and gaseous sampling in the initial phase of the project.

Table 3.1 Samplers Procured for Monitoring

Sampler	**Brief Description of operating conditions**
Fine Dust Sampler	Sampling Inlets- $PM_{2.5}$, PM_{10} and TSP Flow rate-16.7LPM
FRM Sampler	Versatile inlet configurations for $PM_{2.5}$, PM_{10}, or TSP sampling FRM quality 24-hour sampling at 16.7 LPM
Gaseous Sampler	Sampling Rate-0.5-1.0 LPM Operation time-8 hours

4. Monitoring parameters

Parameters of monitoring were decided based on the objectives of air pollution and source apportionment study. The source apportionment analysis required air monitoring for particulate matter ($PM_{2.5}$ and PM_{10}) and its chemical speciation to develop signature profiles of pollution sources that can be used in chemical mass balance models. The analysis data could also be used to interpret the overall loading of different chemicals contributed varied sources. Monitoring included air quality attributes such as Particulate matter, Sulphur Dioxide (SO_2) and Oxides of Nitrogen as NO_2, to understand not only the regulatory compliance but also their inter-correlations with other species such as Heavy metals, EC, OC etc. Since the objective of source apportionment study is to determine the contributions from various sources such as industries, vehicular and other area sources additional parameters were also monitored such as Polycyclic Aromatic Hydrocarbons (PAHs). List of all parameters, sampling flow rate and analytical methods are provided in Table 4.1

Table 4.1 Ambient Air Quality Sampling/Analysis Methodology for Target Pollutants

Particulars	Parameters			
	PM_{10}	$PM_{2.5}$	NO_2	SO_2
Sampling Instrument	Fine Dust Sampler & FRM Sampler	Fine Dust Sampler & FRM Sampler	APM sampler	APM sampler
Sampling Principle	Cyclonic Flow Technique	Cyclonic Flow Technique/ WINS Impactor	Chemical absorption in suitable media	Chemical absorption in suitable media
Flow rate	16.7 LPM	16.7 LPM	0.5 LPM	0.5 LPM
Sampling Period	24 hourly	24 hourly	8 hourly	8 hourly
Sampling Frequency	10 days continuous, Teflon and quartz on alternate days	10 days continuous, Teflon and quartz on alternate days	10 days continuous	10 days continuous

Analytical Instrument	Electronic Micro Balance	Electronic Micro Balance	Spectrophoto-meter	Spectrophoto-meter
Analytical Method	Gravimetric	Gravimetric	Colorimetric Improved West & Gaeke Method	Colorimetric Improved West & Gaeke Method
Minimum reportable value	5 µg/m^3	5 µg/m^3	9 µg/m^3	4 µg/m^3

4.1 Monitoring Frequency

All pollutants exhibit diurnal and seasonal variations, which have been taken into account while determining the frequency of the sampling. In order to assess the impact of the diurnal variations in source contributions for a given meteorology of the day, 24 hourly monitoring plan was envisaged (8 hourly sampling for gaseous pollutants and 24 hourly sampling for particulate matter). The field study was planned for a period of 10 days at each monitoring site for the season to represent variation in air quality. The sampling frequency details are presented in Table 4.1.

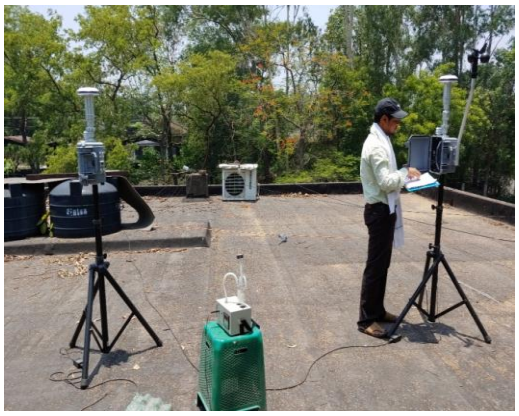
Table 4.1.1 Frequency of Air pollutants sampling in Jharia Coalfield

Parameter	Number of Days	Change of Filter/ absorbing media	Reporting
PM_{10}	10	24 hourly, Teflon: 05 days Quartz: 05 days	24 hourly
$PM_{2.5}$	10	24 hourly Teflon: 05 days Quartz: 05 days	24 hourly
NO_2	10	8 hourly	8 hourly
SO_2	10	8 hourly	8 hourly

The glimpses of air monitoring of some locations are shown in Figure 4.1.

Kataras

Lodhana



Moonidih

Patherdiha

Bastacola

Sindri

Figure 4.1 Glimpses of air monitoring of some locations

4.2 Filter handling and Weighing:

Teflon-membrane and quartz-fibre filter are most commonly used for chemical analysis. Each filter was individually examined prior to labelling for discoloration, pinholes, creases, separation of ring, chaff or flashing, loose material, or other defects.

Gravimetry measured the net mass on a filter by weighing the filter before and after sampling with balance in temperature and relative humidity controlled environment. To minimize particle volatilization and aerosol liquid water bias, $PM_{2.5}$ Filters were equilibrated for 24 hours at a constant (within ±5%) relative humidity between 30% and 40% at a constant (within ±2°C) temperature between 20°C and 23°C. PM_{10} filters were equilibrated at 20% to 45% relative humidity (±5%) and 15°C to 30°C temperature (±3°C).

Methods of Chemical characterization:

Sulphur dioxide (SO_2)	: Modified West and Gaeke method
Nitrogen dioxide (NO_2)	: Sodium Arsenite method
Suspended Particulate Matter (SPM)	: High Volume method (Gravimetric method)
Respirable suspended Particulate Matter (RSPM)	: Gravimetrically with GFA/EPM 2000 filter paper using respirable dust sampler (Cyclonic Flow Technique)

5. Ambient Air Quality Monitoring

Core Zone

Site 1: Cluster XIV (Lohapatty)

The samplers were installed on the roof of area office of Lohapatty (Latitude 23.737066 and Longitude 86.210894). It was located near residential colony. Coal mine was 1 km away from the sampling site. Coal has been transported through railway line which is 1.5 km away on a daily basis and also through trucks. NH-32 construction was going on 500 m away from the site. The major fuel used for cooking is coal in the study area.

Site 2: Cluster VII Mine rescue Station

Monitoring station was positioned in Mine rescue station, Dhansar on the roof of office building (Latitude 23.768746 and Longitude 86.411141). Mine rescue station is next to

the state highway 12 where continuous movement of heavy vehicles takes place. Mining activities were also observed nearby the location.

Site 3: Cluster V Katras

In Katras, samplers were installed at Expert hostel (Latitude 23.811692 and Longitude 86.335910). There was a settlement residential area nearby. Mining activities was in progress within 500m area. Railway track was nearly at 150m distance from the site. Coal was used for cooking. Many other activities were observed during sampling in the nearby area which may contribute. 'Mela' and continuous 'Hawan' were going on within 100m area. Also road construction was in progress near 7km.

Site 4: Cluster IX (Lodhana)

Samplers were installed at office in Lodhna (Latitude 23.721713 and Longitude 86.410260). Near Lodhna, colliery was 2 km away from the site. Nearest Railway track was 1.5 km away. Coal was mostly used for cooling.

Site 5: Cluster XI (Moonidih)

Moonidih mine is one of the underground mine of BCCL. Sampler was stationed in Area office of Moonidih mine (Latitude 23.742228 and Longitude 86.349494). Since monitoring location was 250-300m from the mine, movement of heavy vehicles was continuous. There is washery also at distance of 500m where trucks and conveyor were used for transportation of coal. So the mining activities nearby contributes to particulate matter emission.

Site 6: Cluster X (Patherdih)

Samplers were stationed in guest house of BCCL in Patherdih area (Latitude 23.693577 and Longitude 86.398728). It is situated beside highway where continuous movement of heavy vehicles observed. TATA steel coal mine is situated 1km away from the location where continuous mining activities takes place. Transportation of coal through railway wagons in same area also contributes to particulate matter emission.

Site 7: Cluster VIII (Bastacola)

The samplers were positioned in area office of Bastacola mine (Latitude 23.763966 and Longitude 86.433635). Here also, coal was used as a cooking media. Railway track was

at Jodaphata which was 3-4 km away from the site. Residential area was nearly 0.5-1km. Mine was situated 3km from the site but no Mining activity was observed during monitoring.

Buffer zone

Site 8: Bank More (BCCL Colony)

Sampling station was installed in BCCL colony, Jawahar Nagar on the roof of a resident (Latitude 23.789463 and Longitude 86.407448). No mining activities were observed but the colony was beside the NH 18 highway so it may contribute to particulate matter emission.

Site 9: Harina

At Harina, the site chosen for air sampling was BCCL colony (Latitude 23.806308 and Longitude 86.212641). Since it was BCCL residential area, fuel used for cooking purpose was LPG. Settlement residential area was observed nearby where coal was used as a media for cooking. Colliery and Railway track were 3km and 2 km away from the site respectively. Highway was 1km away from the site and Coal washery at distance of 4.5km.

Site 10: Bhuli

The samplers were installed on the roof of Saraswati Vidya Mandir, Bhuli (Latitude 23.819554 and Longitude 86.386647). The location was in residential area. Mining activity was going at a distance of 8-10km. A closed Brick factory was located in the nearby area. Fuel used for cooking was mostly coal. Railway track used for coal transportation was 4km from the site. Construction of highway was also going on within 1.5km area during the monitoring.

Site 11: Sindri

Air samplers were installed at BIT Sindri college campus (Latitude 23.653214 and Longitude 86.473022). Transportation of coal was done by railway wagons at distance of 2km from monitoring site. LPG was mostly used for cooking rather than coal. A construction activity was going on nearby. The site was near the highway at a distance of <100m.

Site 12: Parbatpur

The sampling station was installed on roof of a house (Latitude 23.696296 and Longitude 86.348609). Mining activity was no longer going nearby. Coal was primarily used for cooking.

Site 13: Background

The air monitoring samplers were installed on roof of resident's house which was near to the highway at a distance of less than 1 km (Latitude 23.776180 Longitude 86.160177). Construction activities were going on nearby the location. Heavy rainfall also occurred during monitoring period. Mine activities were also observed in radius of 2-3km. Settlement resident's uses coal for cooking purposes.

Sample collection Transportation and Preservation

Ambient $PM_{2.5}$ and PM_{10} samples were collected using suitable sampler at a desired flow rate. Filters were wrapped carefully with aluminium foil and stored in re-sealable plastic bags. At sampling site, the filter that collected the particle sample on the previous day was taken out of the filter holder and immediately wrapped with aluminium foil and sealed. The sample filers were transported back to the laboratory in an isolated cooler container with ice and then frozen at -10°C until analysis.

Table 5. 1 Physical and Chemical components for characterization of Particulate matter

Components	**Filter Matrix**	**Analytical Methods**
PM10/ PM2.5	Teflon/Quartz filter paper	Gravimetric
Elements (Na, Mg, Al, Si, P, S, Cl, Ca, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Ga, As, Se, Br, Rb, Sr, Y, Zr, Mo, Pd, Ag, Cr, Cd, In, Sn, Sb, Ba, La, Hg, Ti, and Pb)	Teflon/Quartz filter paper	ICP-OES
Ions ($NO2^-$, $NO3^-$, SO_4^{-2}, K+, NH^{4+}, Na^+)	Teflon/Quartz filter paper	Ion chromatography with conductivity detector
Carbon Analysis (OC, EC)	Quartz filter paper	TOR/TOT method
PAHs	Teflon/Quartz filter paper	Extraction followed by GC-MS analysis with and without derivatization