BHARAT COKING COAL LTD.
A Mini Ratna Company
(A Subsidiary of Coal India Ltd.)
REGD.Office: Koyla Bhawan, Koyla Nagar, Dhanbad-826005
CIN No.U10101JH1972GO1000918
OFFICE OF THE GENERAL MANAGER
BARORA AREA

Ref No.GM/AR-1/SURVEY/ 363 /2016 Dated: 09.05.2016
11

To
The Director
Ministry of Environment,Forest & CC
Regional Office(ECZ), Bungalow No.-2
Shyamali Colony
Ranchi- 834002

Sub: **Six monthly reports on implementation of Environmental measures for the period from October'2015 to March' 16 in respect of Cluster –XVgroup of mines.**

Ref:-EC Order No. J-11015/100/2011-IA.II (M)

Dear Sir,

Kindly find enclosed herewith the Six monthly report on implementation of Environmental measures for the period from October'2015 to March' 16 in respect of Cluster –XV group of mines.

Hope you will find the same in order.

Yours faithfully,
9/5/16
General Manager
Barora Area

Encl: as above
C.C to
1. The Director, 1A monitoring cell
   Paryavaran Bhawan CGO Complex, New Delhi-110003
2. G.M(Env.) BCCL Koyla Bhawan, Dhanbad.
3. Nodal incharge(Env.) Barora Area.
4. Nodal incharge (Env.) Govindpur Area.

## ENVIRONMENTAL CLEARANCE COMPLIANCE OF CLUSTER-XV

**(GRANTED VIDE J-11015/100/2011-IA.II (M) Dated 16.12.2013)**
**From October'2015 to March' 16**

# Action Plan for compliance of EC conditions

| SN | A. Specific Conditions by MOEF: | Compliance |
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| i | The maximum production in the cluster shall not exceed beyond that for which environmental clearance has been granted for Cluster –XV as per given below: | The production from the cluster is within the limit for which Environmental clearance has been granted. |

| Sl. No. | Name of Mines | Production capacity (MTY) | | Lease hold area (Ha.) |
|---|---|---|---|---|
| | | Normative | Peak | |
| 1 | Kharkharee Coll. | 0.092 | 0.12 | 584.00 |
| 2 | Madhuband coll. | 0.113 | 0.147 | 393.77 |
| 3 | Phularitand coll. | 0.120 | 0.156 | 340.88 |
| 4 | Dharmabandh coll(Closed for production) | 0 | 0 | 377.90 |
| | Total | 0.325 | 0.423 | 1696.55 |

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| ii | **The proponent shall prepare a contingency plan for subsidence.** | It is being complied as per the guidelines of DGMS. |
| iii | **Keeping in view the pattern of the subsidence in the area, no depillaring should be carried out until the rehabilitation of the affected families and shifting of infrastructure.** | It shall be complied. No depillaring is being carried out at present. |
| iv | **The channels adjoining the ML area leading to Jamunia river should not be disturbed and be regularly desilted.** | It is being complied. |
| v | **The quality of the Jamunia river water should be continuously monitored and in order to prevent silting, a series of check dams should be constructed using boulders. This will help in recharging the ground water.** | It is being complied. |
| vi | **The coal from the mines will be transported by mechanically covered trucks within two months.** | Conversion of existing truck into mechanically covered trucks in a phased manner has been taken up. Presently, transportation is being done by covering vehicle with tarpaulin. |
| vii | **In underground mining there is presence of organic gases. These gases are volatile in nature. Due to transmission of air, fire takes place. The routine mining engineering will not serve the purpose. Therefore, proper studies are carried out to understand underground seams and how these fire areas could be sealed from further spreading.** | All the statutory provisions under mines act 1952 and CMR 1957 along with statutes constituted under Mines act are fully complied to prevent any occurrence of fire. Regular monitoring and inspection is done by DGMS. |
| viii | **Cumulative impact of fire and gases for all the clusters of coal mines in Jharia Coal field is carried out.** | It is being complied. Presently Master Plan approved by Govt. of India is under |

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| | | implementation for this purpose. Fire control in Jharia and its periphery is being done with the recommendation received from CIMFR. An international expression of interest had been invited by BCCL and two bidders submitted their proposals, work shall be awarded as per the recommendation of tender committee. |
| IX | **National Remote Sensing Agency (NRSA) should be contacted for thermal imaging techniques which are being utilized for assessing the extent of impact of underground of fire. BCCL should consider for an MOU with NRSA for short and long term studies so as to obtain detailed information on Satellite imagery, thermal imagery, subsidence prediction and surface features of the mining area.** | A Global EOI was floated to control fire in Jharia Coalfield. None of the bidder qualified. CIMFR, Dhanbad has been requested to take up the study. NRSA has also been contacted to prepapre time-series map for monitoring of fire. NRSA will soon start the work.<br><br>Fire affected area has been reduced from 9.00 $KM^2$ to 2.18 $KM^2$. For further dealing of fire and subsidence action has been taken and working as per the strategic plan of digging out of fiery coal followed by reclamation. |
| X | **The Project proponent should monitor the water quality of the Jamunia river as per the standards prescribed by the JSPCB/CPCB to maintain the required BOD in the river water.** | Work of monitoring ambient environment including water quality of the Jamunia river is being done by CMPDIL, Ranchi. |
| XI | **The nullah as adjacent to the river should not be disturbed.** | It is being complied. |
| XII | **The open cast quarries of the abandoned mines should be backfilled to the ground level and restored with native species.** | It is being complied. |
| XIII | **All coal from the smaller U/G mines should be transported by high capacity and mechanically covered trucks/tippers.** | It shall be complied. Coal transportation is being done by Tarpaulin covered trucks. |
| XIV | **Green belts shall be developed on both sides of the roads.** | Due to absence of permanent roads in the coalfield, avenue plantation could not be done but trees were planted near permanent structures to minimize the pollution. |
| XV | **Action plan for quenching of fires and rehabilitation along with the details of muster plan be submitted to MOEF for monitoring purpose.** | It is being complied. The approved master plan is uploaded on BCCL website (www.bccl.gov.in/PDFs/MPLANBCCL-2008.pdf) and regular monthly progress report is being sent to ministry. |
| XVI | **Presently coal of Munidih washery from other mines of the cluster is taking place through NH. An alternate route for coal transportation may be explored.** | Jharia Coalfield is a densely and highly populated region. Alternative route will further add pollution and rehabilitation problems. It may be explored only after the shifting of population, living in coalfield region. |
| XVII | **For understanding the composition of emissions from coal mine fires, BCCL may initiate action as proposed in the visit report of the EAC to Dhanbad.** | BCCL has initiated the process to conduct source apportionment study for entire region of JCF. A work has been awarded to CMPDIL, Ranchi. |
| XVIII | **The approved mining plan is submitted to the MOEF.** | Most of the BCCL mines are taken over mines from the erstwhile private owners who were |

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| | | operating mines without mine plans at the time of nationalization and now are being operated as amalgamated collieries/quarries as per the guide lines of DGMS. |
| XIX | **The measure to identify in the Environmental Plan for Cluster- XV groups of mine and the conditions given in this environmental clearance letter shall be dovetailed to the implementation of the Jharia Action Plan.** | it is being complied. |
| XX | **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. Measures to prevent ingress of air (Ventilation) in such areas, to prevent restart fresh/spread fires in other areas including in mines of cluster XV shall be undertaken. Expertise available internationally could also be utilized for control of fire in Jharia Coalfields and for their reclamation and to further minimize time for fire and subsidence control. Isothermal mapping using thermal imaging has been got done by NRSA. Measures would be taken prevent ingress of air (Ventilation) in such areas, which may restart fresh fires.** | A Global EOI was floated to control fire in Jharia Coalfield. None of the bidder qualified. CIMFR, Dhanbad has been requested to take up the study. NRSA has also been contacted to prepapre time-series map for monitoring of fire. NRSA will soon start the work.<br><br>Fire affected area has been reduced from 9.00 $KM^2$ to 2.18 $KM^2$.For further dealing of fire and subsidence action has been taken and working as per the strategic plan of digging out of fiery coal followed by reclamation.<br>Action is being taken as specified in EC and as per Jharia Master Plan. Further fire patches are under operation to dig out the fiery coal and combustible materials to save the coal from burning and to stop further spread of the fire. Once the fiery coal is dug-out/excavated there will be no more chance of re-starting of fresh/spreading of fire into other areas. |
| XXI | **The embankment constructed along the river boundary shall be of suitable dimensions and critical patches shall be strengthened by stone pitching on the river front side and stabilized with plantation so as to withstand the peak water flow and prevent mine inundation.** | It is being complied. |
| XXII | **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. Action is being taken to control, mine fires including old OB dump areas as specified in Jharia Master Plan and the mining is being done as per the guidelines and permissions of Directorate General of Mines Safety (DGMS). |
| XXIII | **Mining shall be carried out as per statuette 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.** | It is being complied. Mining is being carried out as per the guidelines of DGMS. |
| XXIV | **Total afforestation plan shall be implemented covering an area of 621.28 Ha. (Additional) at the end of mining which will include, Green belt over an area of 229.12 Ha., density of tree plantation** | It shall be complied. In 2013, around 2.50 Ha of land taken up for eco restoration of degraded land in Phularitand colliery. |

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| | **2500/ Ha. Of plants.** | |
| XXV | **Details of transportation, CSR,R&R and implementation of environmental action plan for the clusters XV should be brought out in a booklet from within a year and regularly updated.** | It is being followed. CSR dept has been established at area level. This year BCCL has constructed over 3500 toilets under "Swacch Bharat Abhiyan". |
| XXVI | **Specific mitigative measures identified for the Jharia Coalfields in the Environmental Action Plan prepared for Dhanbad as a critically polluted are and relevant for Cluster- XV shall be implemented** | Dhanbad Action Plan has been prepared in consultation with Jharkhand Pollution Control Board for entire BCCL. It is being implemented comprehensively for all the mines of BCCL. Some of the salient actions of this cluster are as under:<br>1. Construction of pucca road.<br>2. Construction of water reservoir for mine water utilization<br>3. Plantation.<br>4. Covered transportation. |
| XXVII | **The locations of monitoring stations in the Jharia coalfield should be finalized in consultation with Jharkhand State Pollution Control Board. 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 for the entire Jharia Coalfields. 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.** | Establishment of ambient environment quality monitoring stations has been finalized with the consultation of Jharkhand State Pollution Control Board.<br>The work of monitoring of ambient environment was done by Central Institute of Mining & Fuel Research (CIMFR), Dhanbad which is a CSIR laboratory recognized under the EP Rules. Now the monitoring work has been taken up by CMPDIL, Ranchi.<br>Tender for source apportionment study has been cancelled 2 times as no bidder has qualify for the same. Now Proposal is being made for the same study by any government institution |
| XVIII | **The proponent will continue the existing Road-Rail transport network system in view of the implementation of the Master Plan (For 10 years) and another 5 Years gestation period after the completion of Master Plan for consolidation of the backfilled dug out fire areas and unstable areas is required. All mitigation measures (like covered trucks, green belting on either sides of the roads, enhanced water sprinkling, strengthening and maintaining the roads etc.) shall be adopted up to 15 years (phase-I) with the existing Road- Rail transport system. In phase –II, BCCL shall implement conveyor-cum-rail transport to avoid movement of trucks within the cluster for coal transportation in phase-II which shall start after 15 years. Transportation of coal shall be by Rail and Conveyor belt, minimizing the existing road transport system in all the mines of the cluster and** | At present we are exploring the technology to cover existing trucks mechanically by local technicians and no OEM is available for covered trucks in Indian market until the coal production is being done by tarpaulin covered trucks. |

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| | **shall continue after 15 years. Loading of coal by pay loaders shall be discontinued. Adequate number suitably designed off-take points shall be provided.** | |
| XXIX | **1537 nos. of PAFs should be rehabilitated at cost of Rs.140.03 crores as per the approved Jharia Action Plan.** | It is being complied as per approved Jharia Action Plan. |
| 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 shall be complied .No depillaring is being carried out at present. |
| XXXI | **Coal Extraction shall also be optimized in areas where agricultural production is continuing. Some pillars shall be left below the agricultural land. No depillaring & coal extraction should be carried out below habitation, H.T Lines & beneath road, water bodies.** | It is being complied. |
| XXXII | **Subsidence shall be monitored closely and if subsidence is found exceeding the permitted limits, then the land owners shall be adequately compensated with mutual agreement with the land owners.** | No depillaring is being carried out at present. |
| XXXIII | **3-tiers plantation should be developed 2KM stretch of road from the mine using native species.** | It is being complied. |
| XXXIV | **Water sprinkling system shall be provided to check fugitive emission from loading operations, conveyor system, haulage roads, transfer points, etc. Major approach roads shall be black topped and properly maintained.** | It is being complied. |
| XXXV | **A progressive afforestation plan shall be prepared and implemented over the mine lease area acquired and shall include areas under green belt development, areas along roads infrastructure, along ML boundary and township etc, by planting native species in consultation with the local DFO/Agricultural Department.** | It is being complied. In 2013, around 2.50 Ha of land taken up for eco restoration of degraded land in Phularitand colliery. |
| XXXVI | **Acid water Treatment Plant, volume of water to be treated and disposal of brine should be provided.** | Shall be complied. |
| XXXVII | **Mine discharge water outside the ML shall be monitored, particularly for TDS and treated to confirm prescribed levels before discharge into the natural environment.** | Mine discharge water is being allowed to settle down in the mine sumps before disposal into storage reservoirs. The monitoring of water quality parameters is being done through CMPDIL, Ranchi and parameters are well within the prescribed limit provided by CPCB. |
| XXXVIII | **The Company shall put up artificial groundwater recharge measures for augmentation of ground water resource, incase water table shows a declining trend. The project authorities shall meet water** | Presently water is not being discharged outside the ML. Excess mine water is being stored at old quarries and ponds for community use. This will help to recharge the ground water. |

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| | **requirement of nearby village(s) in case the village wells go dry due to dewatering of mines.** | |
| XXXIX | **Besides carrying out regular periodic health check up of their workers, 10% of the workers identified from workforce engaged in active mining operations shall be subjected to health check up for occupational disease and hearing impairment, if any, through an agency such as NIOH, Ahemdabad within a period of one year and the results reported to this Ministry and to DGMS.** | Work has been awarded to NIOH to conduct study and will be started shortly. |
| xl | **The mining in the existing mines would be phased out after expiry of the current mining lease and after reclamation of mined over area. The operating mines may be analyzed and monitored for compliance of conditions, having bearing with movement of wild life until such time they are closed/phased out.** | Shall be complied. |
| xli | **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. |
| xlii | **High root density tree species shall be selected and planted over likely areas to be affected by subsidence.** | It is being complied. |
| xliii | **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. |
| xliv | **Solid barriers shall be left below the roads falling within the blocks to avoid any damage to the roads.** | It is being complied. |
| xlv | **The CSR Action Plan shall consist of need-based CSR Action Plan, CSR Auditing and monitoring mechanism etc. The proponent will spend 5% of the retained earnings of the previous year subject to a minimum of Rs.5/- per tonne of coal production which should be adjusted as per the annual inflation. The progress made there on shall be uploaded on the company website. Monitoring of the impact of the activities under CSR shall be carried out periodically** | It is being complied. |
| xlvi | **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. The gap/space available between the entire mine area should be suitably planted with native species.** | BCCL is implementing CSR activities. A separate CSR committee has been formed at area level of Barora, who will look after the works being executed under CSR.<br>CSR dept is established at the Headquarter level and area level for Executing the CSR Activities.<br><br>All welfare/ CSR activities are also uploaded in Company web site.<br><br>TISS has conducted survey to frame CSR policy |

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| | **Plantation should also be made in vacant area and along the road side so as to reduce dust pollution.** | for better implementation and monitoring of the CSR activities. |
| xlvii | **Central recreation park with herbal garden should be developed for use of all inhabitants.** | It shall be complied. |
| xlviii | **The mine water should be treated properly before supply to the villager.** | It is being complied. |
| xlix | **Mine discharge water shall be treated to meet standards prescribed standards before discharge into natural water courses/agriculture. The quality of water discharge shall be monitored at the outlet and proper records maintained thereof and uploaded regularly on the company website.** | A work order has been issued to CMPDIL, Ranchi. Regular monitoring of Water Quality Parameters is being carried out by CMPDIL. |
| l | **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 reclaimed with plantation and or may be used for pisciculture.** | It shall be complied. |
| li | **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 dome 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.** | Groundwater level and quality is being regularly monitored by CMPDIL. The Location and design of Piezometers to be installed have been finalized by CMPDIL. A proposal for award of work of construction of new piezometers has been prepared and scheme has been approved by competent authority. The work will soon be tendered and will start shortly |
| lii | **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.** | Construction of ETP/Oil grease Trap will be taken-up |
| liii | **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.** | Being complied .Presently a time series map of vegetation cover in the Jharia Coal Field is being carried out through CMPDIL, Ranchi using satellite imagery for every 3 years the last map of the year 2010-11 has been uploaded on the official website of company.<br>Further CMPDIL has been requested to prepare "Time series of land use maps based on satellite imagery of the core zone and buffer zone in the scale 1:5000. |

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| 1 | **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. The mining plan and post –mining plan, closure plan should be prepared and submitted to the Ministry.** | CMPDIL, Ranchi has prepared "Final Mine Closure Plan along with a Plan for Habitat Restoration and with details of Corpus Fund". |
| 1v | **A separate management structure for implementing environment policy and socio-economic issues and the capacity building required in this regard.** | A full-fledged Environment Department, headed by a HoD (Environment) along with a suitable qualified multidisciplinary team of executives (15 nos.) which includes Environment, Mining, Excavation, Civil, Survey,Electrical & mechanical, Forestry disciplines executives and technicians (4 nos.) has been established in Headquarters. They are also trained in ecological restoration, sustainable development, rainwater harvesting methods etc. At the project level, one Executive in each area has also been nominated as Project Nodal Officer (Environment) and is also entrusted with the responsibility of compliance and observance of the environmental Acts/Laws including environment protection measures.The activities are monitored on regular basis at Area and at Head quarters levels. GM (Environment) at head quarter level, co-ordinates with all the Areas and reports to the Director (Technical) and in turn he reports to the CMD of the company.<br>The team is multidisciplinary and very much motivated under the guidance of company's Director (Technical) and CMD. Further capacity building at both corporate and operating level is being done. |
| 1vi | **Corporate Environment Responsibility:**<br>**a) The Company shall have a well laid down Environment Policy approved by the Board of Directors.**<br><br>**b) The Environment Policy shall prescribe for** | A well defined Corporate Environment Policy has already been laid down and approved by Board of Directors. This is also posted on BCCL website.<br>Complied. |

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| | **standard operating process/procedures to bring into focus any infringements/deviation/violation of the environmental or forest norms/conditions.** | A hierarchical system of the company to deal with environmental issues from corporate level already exists. |
| | **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** | Being complied. |
| | **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 sharcholders or stakcholders at large.** | Being complied. |
| B | General Conditions by MOEF: | |
| i | **No change in mining technology and scope of working shall be made without prior approval of the Ministry of Environment and Forests.** | Being complied. |
| ii | **No change in the calendar plan of production for quantum of mineral coal shall be made.** | Being complied. |
| 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.** | The location of monitoring stations in Jharia Coal Field has been finalized in consultation with the Jharkhand State Pollution Control Board. Ambient air quality is regularly monitored by CMPDIL, Ranchi |
| iv | Data on ambient air quality ($PM_{10}$, $PM_{2.5}$, $SO_2$ and NO, 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 shall be complied. |
| 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 | It is being Complied in mines and also the Noise levels are below the Ambient Noise Standard (Day time 75 dB & Night Time (70 dB for Industrial Area). |

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| | **with ear plugs/muffs.** | |
| 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.** | The work of monitoring of ambient environment is being done through CMPDIL, Ranchi which is having laboratory recognized under the EP Rules. |
| 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.** | Being done. Transporting of coal is being done covered with tarpaulins and optimally loaded. |
| viii | **Monitoring of environmental quality parameters shall be carried out through establishment of adequate number and type of pollution monitoring and analysis equipment in consultation with the State Pollution Control Board and data got analyzed through a laboratory recognized under EPA Rules, 1986.** | The work of monitoring of environment quality parameters has been awarded to CMPDIL, Ranchi. They have started the work in full fledge. |
| 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 programme 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 each of the workers working in the mines. |
| x | **Occupational health surveillance programme of the workers shall be undertaken periodically to observe any contractions due to exposure to dust and to take corrective measures, if needed and records maintained thereof. The quality of environment due to outsourcing and the health and safety issues of the outsourced manpower should be addressed by the company while outsourcing.** | Initial Medical Examination (IME) and Periodical Medical Examination (PME) of all the personnel is carried out as per the Statutes and Director General of Mines Safety (DGMS) guideline |
| xi | **A separate environmental management cell with suitable qualified personnel shall be set up under the control of a Senior Executive, who will report directly to the Head of the company.** | A full-fledged Environment Department, headed by a HoD (Environment) along with a suitable qualified multidisciplinary team of executives (15 nos.) which includes Environment, Mining, Excavation, Civil, Survey, Electrical & mechanical, Forestry disciplines executives and technicians (4 nos.) has been established in Headquarters. They are also trained in ecological restoration, sustainable development, rainwater harvesting methods etc. At the project level, one Executive in each area has also been nominated as Project Nodal Officer (Environment) and is |

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| | **pollutant such as $PM_{10}$, $PM_{2.5}$, $SO_2$ and $NO_x$ (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.** | |
| 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 Office s of CPCB and the SPCB. | Being complied. |
| xviii | **The Regional Office of this Ministry located at Bhubaneswar shall monitor compliance of the stipulated conditions. The project authorities shall extend fill cooperation to the office(s) of the Regional Office by furnishing the requisite data/information/monitoring reports.** | Project authority is ready to extend its full cooperation for any kind of visit and inspection conducted by Regional Office in connection with EC Conditions Compliance. |
| xix | **The Environmental statement for each financial year ending 31 March in Form-V is mandated to be submitted by the project proponent for the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be uploaded on company's website along with the status of compliance of Environment condition and shall be sent to the respective Regional Offices of the MOEF by e-mail.** | Environmental Statement (Form-V) has been regularly submitted for each financial year to Jharkhand State Pollution Control Board. |

9/05/16

Nodal Officer (Env.)
Barora Area

9/05/16

Nodal Officer (Env.)
Govindpur Area

9/5/16

General Manager
Barora Area

# ENVIRONMENTAL MONITORING REPORT OF BHARAT COKING COAL LIMITED, CLUSTER – XV

**(FOR THE Q.E. MARCH, 2016)**

**E. C. no. J-11015/100/2011-IA.II (M) dated 16.12.2013.**

**June, 2016**

**CMPDI**
ISO 9001 Company
**Regional Institute-II**
**Dhanbad, Jharkhand**

# CHAPTER - I

# INTRODUCTION

1.0 Any industry and development activities including coal mining is bound to affect environmental attributes. There are positive as well as negative impacts of such operations. For controlling the adverse impacts a regular monitoring is essential. The environmental monitoring is being done as per the guide-lines stipulated by Ministry of Environment, Forest and Climate Change (MoEFCC), Govt. of India.

The very purpose of environmental monitoring is to assess the quality of various attributes which affects the environment. As per quality of these attributes appropriate strategy is to be developed to control the pollution level within the permissible limits. The three major attributes are air, water and noise level.

Bharat Coking Coal Limited (BCCL), a subsidiary company of Coal India Limited (CIL) is operating UG Mines and Opencast Mines in Jharia Coalfield (JCF). The Jharia Coalfield (JCF) having an area of 450 Sq.KM.

Bharat Coking Coal has awarded Environmental Monitoring work of all Projects, Cluster wise, to Central Mine Planning & Design Institute Limited (CMPDIL). The environmental monitoring has been carried out as per conditions laid down by MoEFCC while granting environmental clearance to different projects. CMPDI has trained manpower and well equipped laboratory to carry out monitoring, analysis and R&D work in the field of environment.

1.1 The Cluster-XV is in the Western part of the Jharia coalfield. It includes a group of 4 Mines (viz. Kharkharee, Madhuband, Phularitand & Dharmaband). The Cluster – XV is situated about 25 - 30 kms from Dhanbad Railway Station. The mines of this Cluster – XV are operating since pre nationalization period (prior to 1972-73). It is connected by both Railway and Road. The drainage of the area is governed by Khudia Nala.

1.2 The Cluster-XV is designed to produce 0.325 MTPA (normative) and 0.423 MTPA (peak) capacity of coal.

The Project has Environmental Clearance from Ministry of Environment, Forest and Climate Change (MoEFCC) for a rated capacity 0.325 MTPA (normative) and 0.423 MTPA (peak) capacity of coal production vide letter no. J-11015/100/2011-IA.II (M) dated 16th December, 2013.

Ministry of Environment, Forest and Climate Change while granting environmental clearance has given one of the General conditions that " Four ambient air quality monitoring stations should be established in the core zone as well as in the buffer zone for $PM_{10}$, $PM_{2.5}$, $SO_2$, NOx monitoring. Location of the stations should be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets in consultation with the State Pollution Control Board." And other conditions regarding water / effluent and noise level monitoring.

# CHAPTER-II

# AMBIENT AIR QUALITY MONITORING

## 2.1 Location of sampling station and their rationale:

*(as per G.S.R. 742 (E) dt. 25th December,2000)*

### 2.1.1 Ambient Air Quality Sampling Locations

**I. CORE ZONE Monitoring Location**

**i) Kharkharee CISF Office (A21): Industrial Area**

The location of the sampling station is 23°48.249'N 086°14.717'E. The sampler was placed at Ground level of Project Office.

**ii) Madhuband UGP Office (A33): Industrial Area**

The location of the sampling station is 23°45'24.48" N 086°11'59.44"E. The sampler was placed at Ground level of Project Office.

**II. BUFFER ZONE Monitoring Location**

**i) Block IV Kooridih OCP (A6): Industrial Area**

The location of the sampling station is 23°47'21.717" N 086°13'37.75"E. The sampler was placed at Ground level of Safety Office.

**ii) Lohapatti (A20): Industrial Area**

The location of the sampling station is 23°44'18.93" N & 086°13'37.75"E. The sampler was placed at Ground level of Safety Office.

## 2.2 Methodology of sampling and analysis

Parameters chosen for assessment of ambient air quality were Particulate Matter ($PM_{10}$), Particulate Matter ($PM_{2.5}$), Sulphur di-oxide ($SO_2$) and Nitrogen oxides ($NO_x$). Respirable Dust Samplers (RDS) & fine particulates for $PM_{2.5}$ sampler were used for sampling $PM_{10}$ & $PM_{2.5}$ respectively at 24 hours interval once in a fortnight and the same for the gaseous pollutants. The samples were analysed in Environmental Laboratory of CMPDI, RI-I, Asansol.

## 2.3 Results & Interpretations

The results of Ambient Air Quality are presented in tabular form along with Bar chart for each monitoring station. The interpretations of different parameters are given below:

### 2.3.1 Ambient air quality

**Particulate Matter $PM_{10}$**

In **core zone** under **Industrial area** varies from 68 to 91 $\mu/m^3$
In **buffer zone** in **Industrial area** varies from 94 to 66 $\mu/m^3$

**Particulate Matter $PM_{2.5}$**

In **core zone** under **Industrial area** varies from 34 to 47 $\mu/m^3$
In **buffer zone** in **Industrial area** varies from 31 to 48 $\mu/m^3$

**Sulphur Dioxide:**

In **core zone** under **Industrial area** varies from 10 to 12 $\mu/m^3$
In **buffer zone** in **Industrial area** varies from 10 to 12 $\mu/m^3$

**Oxides of Nitrogen:**

In **core zone** under **Industrial area** varies from 18 to 27 $\mu/m^3$
In **buffer zone** in **Industrial area** varies from 19 to 27 $\mu/m^3$

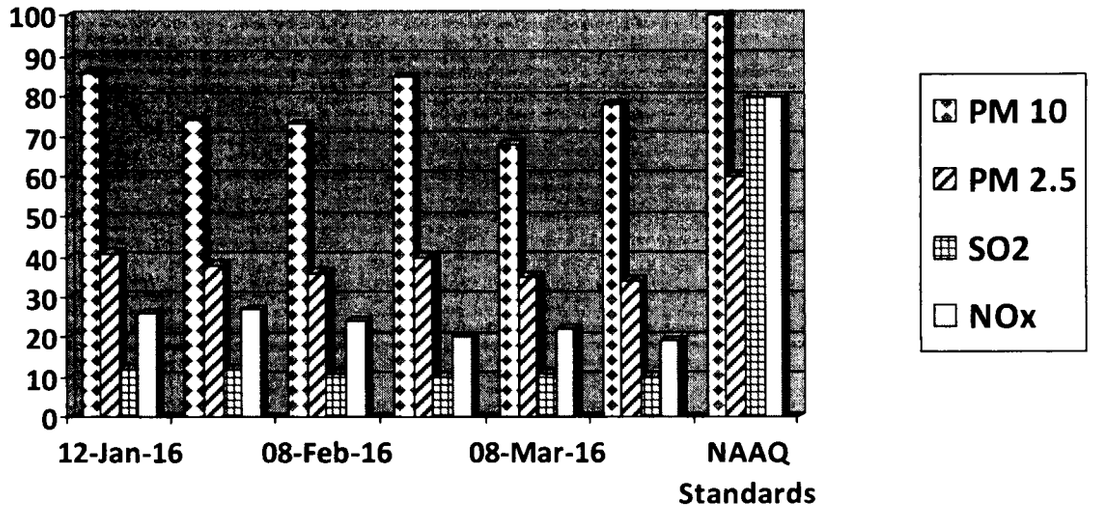
# AMBIENT AIR QUALITY DATA

Name of the Company: **Bharat Coking Coal limited** Year : **2015-16.**
Name of the Cluster : **Cluster – XV** Q.E.: **March 2016**

**Station Code/Name: (a) A21 Kharkharee CISF Office** **Category:**
**(b) A33 Madhuband UGP Office** **Industrial[1].**
**ZONE: Core**

**(a). Station Code/Name: A21- Kharkharee CISF Office Category: Industrial.**

| Sl. No. | Dates of sampling | PM 10 | PM 2.5 | SO2 | NOx |
|---|---|---|---|---|---|
| 1 | 12 - Jan - 16 | 86 | 41 | 12 | 26 |
| 2 | 27 - Jan - 16 | 74 | 38 | 12 | 27 |
| 3 | 08 - Feb - 16 | 73 | 36 | 11 | 24 |
| 4 | 26 - Feb - 16 | 85 | 40 | <10.0 | 20 |
| 5 | 08 - Mar - 16 | 68 | 35 | 11 | 22 |
| 6 | 16 - Mar - 16 | 78 | 34 | <10.0 | 19 |
| NAAQ Standards | | 100 | 60 | 80 | 80 |




## Trace Metal analysis report of Ambient Air Quality

| Parameters | Arsenic (As) | Cadmium (Cd) | Chromium (Cr) | Mercury (Hg) | Nickel (Ni) | Lead (Pb) |
|---|---|---|---|---|---|---|
| Concentration($\mu g/m^3$) | <0.005 | <0.001 | <0.01 | <0.001 | <0.01 | <0.005 |

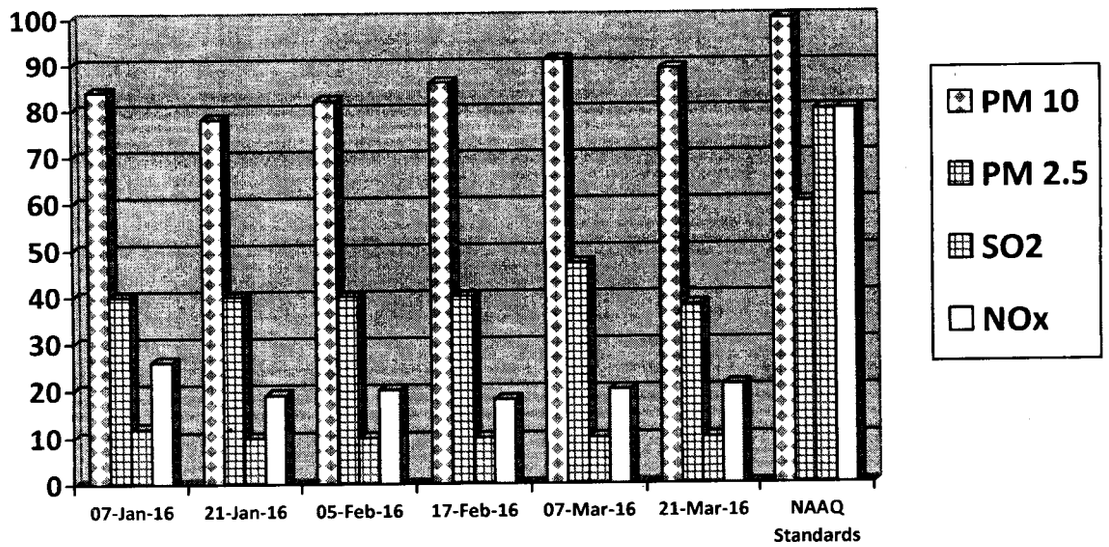
**Note:**

- *All values are expressed in microgram per cubic meter*

[1] Report released by Shri Indranil De, Manager (Env), CMPDI, RI-1, Asansol, Signed..... .....Dated 28.05.2016. Job No. 110310

**(b). Station Code/Name: A33- Madhuband UGP Office Category: Industrial[2].**

| Sl. No. | Dates of sampling | PM 10 | PM 2.5 | SO2 | NOx |
|---|---|---|---|---|---|
| 1 | 07 - Jan -16 | 84 | 40 | 12 | 26 |
| 2 | 21 - Jan - 16 | 78 | 40 | <10.0 | 19 |
| 3 | 05 - Feb -16 | 82 | 40 | <10.0 | 20 |
| 4 | 17 - Feb - 16 | 86 | 40 | <10.0 | 18 |
| 5 | 07 - Mar - 16 | 91 | 47 | <10.0 | 20 |
| 6 | 21 - Mar - 16 | 89 | 38 | <10.0 | 21 |
| NAAQ Standards | | 100 | 60 | 80 | 80 |




## Trace Metal analysis report of Ambient Air Quality

| Parameters | Arsenic (As) | Cadmium (Cd) | Chromium (Cr) | Mercury (Hg) | Nickel (Ni) | Lead (Pb) |
|---|---|---|---|---|---|---|
| Concentration($\mu g/m^3$) | <0.005 | <0.001 | <0.01 | <0.001 | <0.01 | <0.00 |

**Note:**

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

[2] Report released by Shri Indranil De, Manager (Env), CMPDI, RI-1, Asansol, Signed..... .....Dated 28.05.2016. Job No. 110310

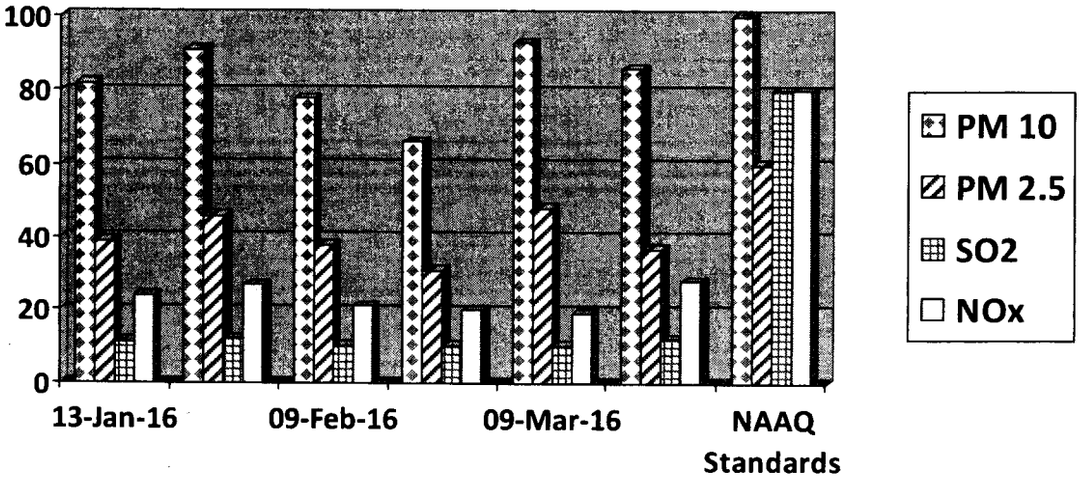
# AMBIENT AIR QUALITY DATA

Name of the Company: **Bharat Coking Coal limited** Year : **2015-16.**
Name of the Cluster : **Cluster – XV** Q.E.: **March 2016**

**Station Code/Name: (a) A6 Block IV Kooridih OCP** **Category: Industrial[3].**
**(b) A20 Lohapatti**
**ZONE: BUFFER**

**(a). Station Code/Name: A6 – Block IV Kooridih OCP, Category: Industrial.**

| Sl. No. | Dates of sampling | PM 10 | PM 2.5 | $SO_2$ | $NO_x$ |
|---|---|---|---|---|---|
| 1 | 13 - Jan -16 | 82 | 39 | 11 | 24 |
| 2 | 28 - Jan - 16 | 91 | 46 | 12 | 27 |
| 3 | 09 - Feb -16 | 78 | 38 | <10.0 | 21 |
| 4 | 19 - Feb - 16 | 66 | 31 | <10.0 | 20 |
| 5 | 09 - Mar - 16 | 93 | 48 | <10.0 | 19 |
| 6 | 30 - Mar - 16 | 86 | 37 | 12 | 28 |
| | NAAQ Standards | 100 | 60 | 80 | 80 |




## Trace Metal analysis report of Ambient Air Quality

| Parameters | Arsenic (As) | Cadmium (Cd) | Chromium (Cr) | Mercury (Hg) | Nickel (Ni) | Lead (Pb) |
|---|---|---|---|---|---|---|
| Concentration($\mu g/m^3$) | <0.005 | <0.001 | <0.01 | <0.001 | <0.01 | <0.005 |

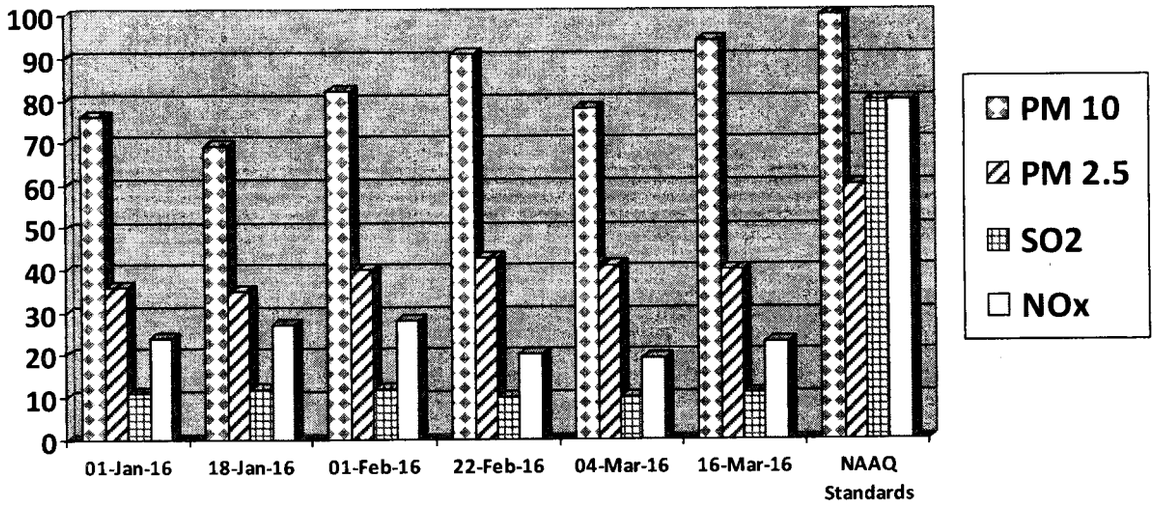
**Note:**

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

[3] Report released by Shri Indranil De, Manager (Env), CMPDI, RI-1, Asansol, Signed..... .....Dated 28.05.2016. Job No. 110310

**(b). Station Code/Name: A20- Lohapatti, Category: Industrial[4].**

| Sl. No. | Dates of sampling | PM 10 | PM 2.5 | $SO_2$ | $NO_x$ |
|---|---|---|---|---|---|
| 1 | 01 - Jan -16 | 76 | 36 | 11 | 24 |
| 2 | 18 - Jan - 16 | 69 | 35 | 12 | 27 |
| 3 | 01 - Feb -16 | 82 | 40 | 12 | 28 |
| 4 | 22 - Feb - 16 | 91 | 43 | <10.0 | 20 |
| 5 | 04 - Mar - 16 | 78 | 41 | <10.0 | 19 |
| 6 | 16 - Mar - 16 | 94 | 40 | 11 | 23 |
| | NAAQ Standards | 100 | 60 | 80 | 80 |




## Trace Metal analysis report of Ambient Air Quality

| Parameters | Arsenic (As) | Cadmium (Cd) | Chromium (Cr) | Mercury (Hg) | Nickel (Ni) | Lea (Pb |
|---|---|---|---|---|---|---|
| Concentration($\mu g/m^3$) | <0.005 | <0.001 | <0.01 | <0.001 | <0.01 | <0.0( |

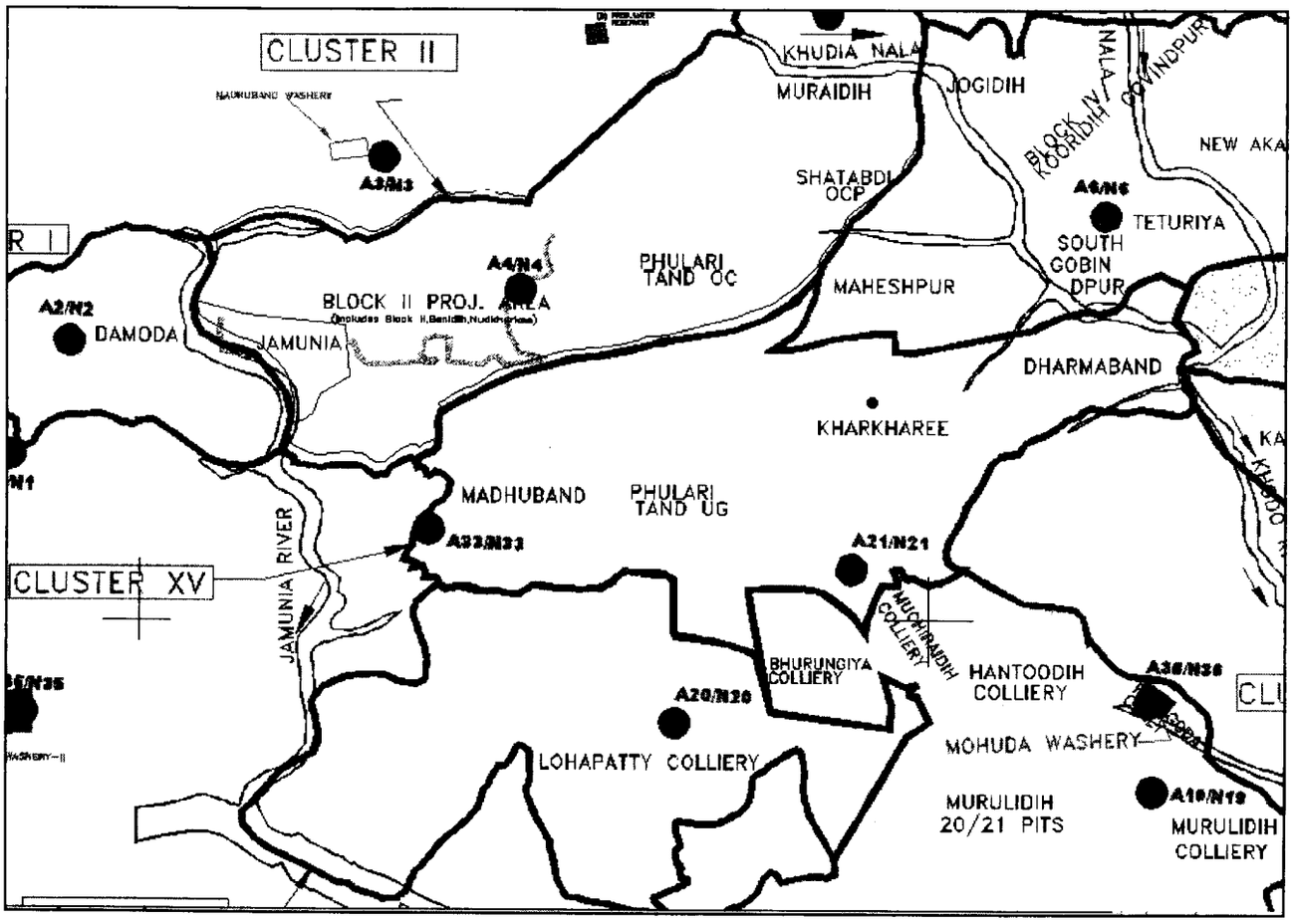
**Note:**

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

[4] Report released by Shri Indranil De, Manager (Env), CMPDI, RI-1, Asansol, Signed..... .....Dated 28.05.2016. Job No. 110310

| $NO_x$ |
|---|
| 24 |
| 27 |
| 28 |
| 20 |
| 19 |
| 23 |
| 80 |

## Ambient Air Monitoring Stations in Cluster- XV in Core & Buffer Zones




| el ) | Lead (Pb) |
|---|---|
| 1 | <0.00 |

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# CHAPTER – III

# WATER QUALITY MONITORING

## 3.1 Location of sampling sites

(Refer **Plate No. - II**)

i) **Mine Discharge of Kharkharee UGP (MW15)**
A sampling point is fixed to assess the effluent quality of Mine discharge. This location is selected to monitor effluent discharge in to Khudia Nala.

ii) Drinking Water quality at **Kharkharee (DW15)**

iii) Surface Water quality at **U/S of Khudia Nala (SW5)**

iv) Surface Water quality at **D/S of Khudia Nala (SW32)**

## 3.2 Methodology of sampling and analysis

Water samples were collected as per standard practice. The effluent samples were collected and analysed for four parameters on fortnightly basis. Effluent samples were also analysed for 27 parameters on half-yearly basis. The drinking and Surface water samples were collected and analysed for 25 and 17 parameters respectively, on quarterly basis. Thereafter the samples were preserved and analysed at the Environmental Laboratory at CMPDI (HQ), Ranchi.

## 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 parmeters are within the permissible limits.

# WATER QUALITY DATA

## *(EFFLUENT WATER FOUR PARAMETERS)*

Name of the Company: **Bharat Coking Coal Limited** Year : **2015-16.**

Name of the Project: **Cluster - XV** Month: **January, 2016.**

Name of the Stations & Code : **1. MW15- Mine Discharge of Kharkharee**

**First Fortnight**

| Sl. No. | Parameters | MW15 (Mine Discharge ) 08.01.2016 | As per MOEF General Standards for schedule VI |
|---|---|---|---|
| 1 | Total Suspended Solids | 44 | *100 (Max)* |
| 2 | pH | 7.89 | *5.5 - 9.0* |
| 3 | Oil & Grease | <2.0 | *10 (Max)* |
| 4 | COD | 32 | *250 (Max)* |

**Second Fortnight**

| Sl. No. | Parameters | MW15 (Mine Discharge ) 25.01.2016 | As per MOEF General Standards for schedule VI |
|---|---|---|---|
| 1 | Total Suspended Solids | 48 | *100 (Max)* |
| 2 | pH | 7.78 | *5.5 - 9.0* |
| 3 | Oil & Grease | <2.0 | *10 (Max)* |
| 4 | COD | 32 | *250 (Max)* |

All values are expressed in mg/lit unless specified.

Analysed By

Dy Technical Manager
Env. Lab, CMPDI(HQ)
(Authorized Signatory)

# WATER QUALITY DATA

## *(EFFLUENT WATER FOUR PARAMETERS)*

Name of the Company: **Bharat Coking Coal Limited** Year : **2015-16.**

Name of the Project: **Cluster - XV** Month: **February, 2016.**

Name of the Stations & Code : **1. MW15- Mine Discharge of Kharkharee**

**First Fortnight**

| Sl. No. | Parameters | MW15 (Mine Discharge ) 09.02.2016 | As per MOEF General Standards for schedule VI |
|---|---|---|---|
| 1 | Total Suspended Solids | 52 | *100 (Max)* |
| 2 | pH | 8.09 | *5.5 - 9.0* |
| 3 | Oil & Grease | <2.0 | *10 (Max)* |
| 4 | COD | 40 | *250 (Max)* |

**Second Fortnight**

| Sl. No. | Parameters | MW15 (Mine Discharge ) 20.02.2016 | As per MOEF General Standards for schedule VI |
|---|---|---|---|
| 1 | Total Suspended Solids | 42 | *100 (Max)* |
| 2 | pH | 7.78 | *5.5 - 9.0* |
| 3 | Oil & Grease | <2.0 | *10 (Max)* |
| 4 | COD | 40 | *250 (Max)* |

All values are expressed in mg/lit unless specified.

Analysed By

Dy. Technical Manager
Env. Lab. CMPDI(HQ)
(Authorized Signatory)

# WATER QUALITY DATA

## *(EFFLUENT WATER FOUR PARAMETERS)*

Name of the Company: **Bharat Coking Coal Limited** Year : **2015-16.**

Name of the Project: **Cluster - XV** Month: **March, 2016.**

Name of the Stations & Code : **1. MW15- Mine Discharge of Kharkharee**

**First Fortnight**

| Sl. No. | Parameters | MW15 (Mine Discharge ) 08.03.2016 | As per MOEF General Standards for schedule VI |
|---|---|---|---|
| 1 | Total Suspended Solids | 38 | *100 (Max)* |
| 2 | pH | 8.34 | *5.5 - 9.0* |
| 3 | Oil & Grease | <2.0 | *10 (Max)* |
| 4 | COD | 24 | *250 (Max)* |

**Second Fortnight**

| Sl. No. | Parameters | MW15 (Mine Discharge ) 16.03.2016 | As per MOEF General Standards for schedule VI |
|---|---|---|---|
| 1 | Total Suspended Solids | 56 | *100 (Max)* |
| 2 | pH | 8.05 | *5.5 - 9.0* |
| 3 | Oil & Grease | <2.0 | *10 (Max)* |
| 4 | COD | 44 | *250 (Max)* |

All values are expressed in mg/lit unless specified.

Analysed By

Dy.Technical Manager
Env. Lab. CMPDI(HQ)
(Authorized Signatory)

# WATER QUALITY

## *(EFFLUENT WATER- ALL PARAMETERS)*

Name of the Company: **Bharat Coking Coal Limited** Year : **2015-16.**

Name of the Project: **Cluster - XV** Period: **H. E. March, 2016.**

**Area :** **Kharkharee UGP** **Project:** **Cluster XV Kharkharee UGP**

**Stations:** **Date of Sampling:**

1. Mine Water Discharge Kharkharee UGP MW-15 16/03/2016

| Sl.No. | Parameter | Sampling Stations | | | Detection Limit | MOEF -SCH-VI STANDARDS Class 'A' | BIS Standard & Method |
|---|---|---|---|---|---|---|---|
| | | MW-15 | 2 | 3 | | | |
| 1 | Ammonical Nitrogen, mg/l, Max | 0.45 | | | 0.02 | 50.0 | IS 3025/34:1988, R : 2009, Nessler's |
| 2 | Arsenic (as As), mg/l, *Max* | <0.002 | | | 0.002 | 0.2 | IS 3025/37:1988 R : 2003, AAS-VGA |
| 3 | B.O.D (3 days 27°C), mg/l, Max | <2.00 | | | 2.00 | 30.0 | IS 3025 /44:1993,R:2003 3 day incubation at 27°C |
| 4 | COD, mg/l, Max | 44 | | | 4.00 | 250.0 | APHA, 22nd Edition, Closed Reflux, Titrimetric |
| 5 | Colour | colourless | | | Qualitative | Qualitative | Physical/Qualitative |
| 6 | Copper (as Cu), mg/l, *Max* | <0.03 | | | 0.03 | 3.0 | IS 3025/42: 1992 R : 2009, AAS-Flame |
| 7 | Dissolved Phosphate, mg/l, Max | <0.3 | | | 0.30 | 5.0 | APHA, 22nd Edition Molybdovanadate |
| 8 | Fluoride (as F) mg/l, *Max* | 1.0 | | | 0.02 | 2.0 | APHA, 22nd Edition, SPADNS |
| 9 | Free Ammonia, mg/l, Max | <0.01 | | | 0.01 | 5.0 | IS:3025/34:1988, Nesseler's |
| 10 | Hexavalent Chromium, mg/l, Max | <0.01 | | | 0.01 | 0.1 | APHA, 22nd Edition, Diphenylcarbohydrazide |
| 11 | Iron (as Fe), mg/l, *Max* | <0.06 | | | 0.06 | 3.0 | IS 3025 /53 : 2003, R : 2009 , AAS-Flame |
| 12 | Lead (as Pb), mg/l, *Max* | <0.005 | | | 0.005 | 0.1 | APHA, 22nd Edition, AAS-GTA |
| 13 | Manganese(as Mn), mg/l, Max | <0.02 | | | 0.02 | 2.0 | IS-3025/59:2006, AAS-Flame |
| 14 | Nickel (as Ni), mg/l, *Max* | <0.10 | | | 0.10 | 3.0 | IS-3025/54:2003, AAS-Flame |
| 15 | Nitrate Nitrogen, mg/l, *Max* | <0.50 | | | 0.50 | 10.0 | APHA, 22nd Edition, UV-Spectrphotometric |
| 16 | Oil & Grease, mg/l, Max | <2.00 | | | 2.00 | 10.0 | IS 3025/39:1991, R : 2003, Partition Gravimetric |
| 17 | Odour | Agreeable | | | Agreeable | Qualitative | Is-3015/5:1983/R:2012/Qualitative |
| 18 | pH value | 8.05 | | | 2.5 | 5.5 to 9.0 | IS-3025/11:1983, R-1996, Electrometric |
| 19 | Phenolic compounds (as $C_6H_5OH$),mg/l, *Max* | <0.002 | | | 0.002 | 1.0 | APHA, 22nd Edition 4-Amino Antipyrine |
| 20 | Selenium (as Se), mg/l, *Max* | <0.002 | | | 0.002 | 0.05 | APHA, 22nd Edition, AAS-GTA |
| 21 | Sulphide (as $SO_3$), mg/l, Max | <0.005 | | | 0.005 | 2.0 | APHA, 22nd Edition Methylene Blue |
| 22 | Temperature (°C ) | 36.3 | | | Shall not exceed 5° C above the receiving temp. | | IS-3025/09:1984, Thermometeric |
| 23 | Total Chromium (as Cr), mg/l, *Max* | <0.04 | | | 0.04 | 2.0 | IS-3025/52:2003, AAS-Flame |
| 24 | Total Kjeldahl Nitrogen, mg/l, Max | 1.4 | | | 1.00 | 100.0 | IS:3025/34:1988, Nesseler's |
| 25 | Total Residual Chlorine, mg/l, Max | 0.04 | | | 0.02 | 1.0 | APHA, 22nd Edition, DPD |
| 26 | Total Suspended Solids, mg/l, Max | 56 | | | 10.00 | 100.0 | IS 3025/17:1984, R :1996, Gravimetric |
| 27 | Zinc (as Zn), mg/l, *Max* | <0.01 | | | 0.01 | 5.0 | IS 3025 /49 : 1994, R : 2009, AAS-Flame |

Analysed By

Dy. Technical Manager
Env. Lab, CMPDI(HQ)
(Authorized Signatory)

# WATER QUALITY

## *(SURFACE WATER- ALL PARAMETERS)*

Name of the Company: **Bharat Coking Coal Limited** Year : **2015-16.**

Name of the Project: **Cluster - XV** Period: **Q. E. March, 2016.**

**Area :** **Kharkharee UGP** **Project:** **Cluster XV Kharkharee UGP**

**Stations:** **Date of Sampling:** 15/03/2016

1. Upstream in Khudia Nala SW-5
2. Downstream in Khudia Nala SW-32

| Sl. No | Parameter | Sampling Stations | | | | Detection Limit | BIS Standard & Method |
|---|---|---|---|---|---|---|---|
| | | SW-5 | SW-32 | 3 | 4 | | |
| 1 | Arsenic (as As), mg/l, Max | <0.002 | <0.002 | | | 0.002 | IS 3025/37:1988 R : 2003, AAS-VGA |
| 2 | BOD (3 days 27°C), mg/l, Max | 2.6 | 2.8 | | | 2.00 | IS 3025 /44: 1993, R : 2003 3 day incubation at 27°C |
| 3 | Colour ( Hazen Unit) | colourless | colourless | | | Qualitative | Physical/Qualitative |
| 4 | Chlorides (as Cl), mg/l, Max | 64 | 94 | | | 2.00 | IS-3025/32:1988, R-2007, Argentometric |
| 5 | Copper (as Cu), mg/l, Max | <0.03 | <0.03 | | | 0.03 | IS 3025 /42 : 1992 R : 2009, AAS-Flame |
| 6 | Disolved Oxygen, min. | 4.10 | 3.9 | | | 0.10 | IS 3025/381989, R : 2003, Winkler Azide |
| 7 | Fluoride (as F) mg/l, Max | 1.24 | 1.29 | | | 0.02 | APHA, 22nd Edition SPADNS |
| 8 | Hexavalent Chromium, mg/l, Max | <0.01 | <0.01 | | | 0.01 | APHA, 22nd Edition, 1,5 - Diphenylcarbohydrazide |
| 9 | Iron (as Fe), mg/l, Max | <0.06 | <0.06 | | | 0.06 | IS 3025 /53 : 2003, R : 2009 , AAS-Flame |
| 10 | Lead (as Pb), mg/l, Max | <0.005 | <0.005 | | | 0.005 | APHA, 22nd Edition AAS-GTA |
| 11 | Nitrate (as $NO_3$), mg/l, Max | 15.51 | 16.83 | | | 0.50 | APHA, 22nd Edition, UV-Spectrphotometric |
| 12 | pH value | 7.62 | 7.52 | | | 2.5 | IS-3025/11:1983, R-1996, Electrometric |
| 13 | Phenolic compounds (as $C_6H_5OH$), mg/l, Max | <0.002 | <0.002 | | | 0.002 | APHA, 22nd Edition 4-Amino Antipyrine |
| 14 | Selenium (as Se), mg/l, Max | <0.002 | <0.002 | | | 0.002 | APHA, 22nd Edition AAS-GTA |
| 15 | Sulphate (as $SO_4$) mg/l, Max | 90 | 130 | | | 2.00 | APHA, 22nd Edition Turbidity |
| 16 | Total Dissolved Solids, mg/l, Max | 342 | 364 | | | 25.00 | IS 3025 /16:1984 R : 2006, Gravimetric |
| 17 | Zinc (as Zn), mg/l, Max | 0.021 | <0.01 | | | 0.01 | IS 3025 /49 : 1994, R : 2009, AAS-Flame |

Analysed By

Dy.Technical Manager
Env. Lab. CMPDI(HQ)
(Authorized Signatory)

| Sl. No |
|---|
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| 24 |

# WATER QUALITY

## *(DRINKING WATER- ALL PARAMETERS)*

Name of the Company: **Bharat Coking Coal Limited** Year : **2015-16.**

Name of the Project: **Cluster - XV** Period: **Q. E. March, 2016.**

**Area :** **Kharkharee UGP** **Project:** **Cluster XV Kharkharee UGP**

**Stations:** **Date of Sampling:**

1. Drinking Water from Kharkharee DW-15 09/03/2016

| Sl. No | Parameter | Sampling Stations | | | Detection Limit | IS:10500 Drinking Water Standards | Standard / Test Method |
|---|---|---|---|---|---|---|---|
| | | DW-15 | 2 | 3 | | | |
| 1 | Boron (as B), mg/l, Max | <0.20 | | | 0.20 | 0.5 | APHA, 22nd Edition ,Carmine |
| 2 | Colour,in Hazen Units | 3 | | | 1 | 5 | APHA, 22nd Edition ,Pt.-Co. Method |
| 3 | Calcium (as Ca), mg/l, Max | 74 | | | 1.60 | 75 | IS-3025/40:1991, EDTA |
| 4 | Chloride (as Cl), mg/l, Max | 152 | | | 2.00 | 250 | IS-3025/32:1988, R-2007, Argentometric |
| 5 | Copper (as Cu), mg/l, Max | <0.03 | | | 0.03 | 0.05 | IS 3025/42 : 1992 R : 2009, AAS-Flame |
| 6 | Fluoride (as F) mg/l, Max | 0.32 | | | 0.02 | 1.0 | APHA, 22nd Edition , SPADNS |
| 7 | Free Residual Chlorine, mg/l, Min | 0.02 | | | 0.02 | 0.2 | APHA, 22nd Edition, DPD |
| 8 | Iron (as Fe), mg/l, Max | <0.06 | | | 0.06 | 0.3 | IS 3025 /53 : 2003, R : 2009 , AAS-Flame |
| 9 | Lead (as Pb), mg/l, Max | <0.005 | | | 0.005 | 0.01 | APHA, 22nd Edition, AAS-GTA |
| 10 | Manganese (as Mn), mg/l, Max | <0.02 | | | 0.02 | 0.1 | IS-3025/59:2006, AAS-Flame |
| 11 | Nitrate (as $NO_3$), mg/l, Max | 15 | | | 0.5 | 45 | APHA, 22nd Edition, UV-Spectrphotometric |
| 12 | Odour | Agreeable | | | Qualitative | Agreeable | IS 3025 /05:1983, R-2012, Qualitative |
| 13 | pH value | 8.18 | | | 2.5 | 6.5 to 8.5 | IS-3025/11:1983, R-1996, Electrometric |
| 14 | Phenolic compounds (as $C_6H_5OH$), mg/l, Max | <0.001 | | | 0.001 | 0.001 | APHA, 22nd Edition,4-Amino Autipyrine |
| 15 | Selenium (as Se), mg/l, Max | <0.002 | | | 0.002 | 0.01 | APHA, 22nd Edition, AAS-GTA |
| 16 | Sulphate (as $SO_4$) mg/l, Max | 56 | | | 2.00 | 200 | APHA, 22nd Edition. Turbidity |
| 17 | Taste | Acceptable | | | Qualitative | Acceptable | APHA, 22nd Edition. Taste |
| 18 | Total Alkalinity ($c_ac_o3$),, mg/l, Max | 240 | | | 4.00 | 200 | IS-3025/23:1986, Titration |
| 19 | Total Arsenic (as As), mg/l, Max | <0.002 | | | 0.002 | 0.01 | IS 3025/ 37:1988 R : 2003, AAS-VGA |
| 20 | Total Chromium (as Cr), mg/l, Max | <0.04 | | | 0.04 | 0.05 | IS-3025/52:2003, AAS-Flame |
| 21 | Total Dissolved Solids, mg/l, Max | 840 | | | 25.00 | 500 | IS 3025 /16:1984 R : 2006, Gravimetric |
| 22 | Total Hardness ($c_ac_o3$), mg/l, Max | 572 | | | 4.00 | 200 | IS-3025/21:1983, R-2002, EDTA |
| 23 | Turbidity, NTU, Max | 3 | | | 1.0 | 1 | IS-3025/10:1984 R-1996, Nephelometric |
| 24 | Zinc (as Zn), mg/l, Max | 0.015 | | | 0.01 | 5.0 | IS 3025/ 49 : 1994, R : 2009, AAS-Flame |

Analysed By

Dy.Technical Manager
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(Authorized Signatory)

# WATER QUALITY

## *(GROUND WATER- ALL PARAMETERS)*

Name of the Company: **Bharat Coking Coal Limited** Year : **2015-16.**

Name of the Project: **Cluster - XV** Period: **Q. E. March, 2016.**

**Area :** **Kharkharee UGP** **Project:** **Cluster XV Kharkharee UGP**

**Stations:** **Date of Sampling:**

1. Ground Water from Madhuband Village GW-15 28/02/2016

| Sl. No | Parameter | Sampling Stations | | | Detection Limit | IS:10500 Drinking Water Standards | Standard / Test Method |
|---|---|---|---|---|---|---|---|
| | | GW-15 | 2 | 3 | | | |
| 1 | Boron (as B), mg/l, Max | <0.20 | | | 0.20 | 0.5 | APHA, 22nd Edition ,Carmine |
| 2 | Colour,in Hazen Units | 3 | | | 1 | 5 | APHA, 22nd Edition ,Pt.-Co. Method |
| 3 | Calcium (as Ca), mg/l, Max | 53 | | | 1.60 | 75 | IS-3025/40:1991, EDTA |
| 4 | Chloride (as Cl), mg/l, Max | 58 | | | 2.00 | 250 | IS-3025/32:1988, R-2007, Argentometric |
| 5 | Copper (as Cu), mg/l, Max | <0.03 | | | 0.03 | 0.05 | IS 3025/42 : 1992 R : 2009, AAS-Flame |
| 6 | Fluoride (as F) mg/l, Max | 0.58 | | | 0.02 | 1.0 | APHA, 22nd Edition , SPADNS |
| 7 | Free Residual Chlorine, mg/l, Min | 0.03 | | | 0.02 | 0.2 | APHA, 22nd Edition, DPD |
| 8 | Iron (as Fe), mg/l, Max | <0.06 | | | 0.06 | 0.3 | IS 3025 /53 : 2003, R : 2009 , AAS-Flame |
| 9 | Lead (as Pb), mg/l, Max | <0.005 | | | 0.005 | 0.01 | APHA, 22nd Edition, AAS-GTA |
| 10 | Manganese (as Mn), mg/l, Max | <0.02 | | | 0.02 | 0.1 | IS-3025/59:2006, AAS-Flame |
| 11 | Nitrate (as $NO_3$), mg/l, Max | 2 | | | 0.5 | 45 | APHA, 22nd Edition, UV-Spectrphotometric |
| 12 | Odour | Agreeable | | | Qualitative | Agreeable | IS 3025 /05:1983, R-2012, Qualitative |
| 13 | pH value | 8.20 | | | 0.20 | 6.5 to 8.5 | IS-3025/11:1983, R-1996, Electrometric |
| 14 | Phenolic compounds (as $C_6H_5OH$), mg/l, Max | <0.001 | | | 0.001 | 0.001 | APHA, 22nd Edition,4-Amino Autipyrine |
| 15 | Selenium (as Se), mg/l, Max | <0.002 | | | 0.002 | 0.01 | APHA, 22nd Edition, AAS-GTA |
| 16 | Sulphate (as $SO_4$) mg/l, Max | 75 | | | 2.00 | 200 | APHA, 22nd Edition. Turbidity |
| 17 | Taste | Acceptable | | | Qualitative | Acceptable | APHA, 22nd Edition. Taste |
| 18 | Total Alkalinity ($c_ac_{03}$),, mg/l, Max | 332 | | | 4.00 | 200 | IS-3025/23:1986, Titration |
| 19 | Total Arsenic (as As), mg/l, Max | <0.002 | | | 0.002 | 0.01 | IS 3025/ 37:1988 R : 2003, AAS-VGA |
| 20 | Total Chromium (as Cr), mg/l, Max | <0.04 | | | 0.04 | 0.05 | IS-3025/52:2003, AAS-Flame |
| 21 | Total Dissolved Solids, mg/l, Max | 540 | | | 25.00 | 500 | IS 3025 /16:1984 R : 2006, Gravimetric |
| 22 | Total Hardness ($c_ac_{03}$), mg/l, Max | 348 | | | 4.00 | 200 | IS-3025/21:1983, R-2002, EDTA |
| 23 | Turbidity, NTU, Max | 4 | | | 1.0 | 1 | IS-3025/10:1984 R-1996, Nephelometric |
| 24 | Zinc (as Zn), mg/l, Max | 0.01 | | | 0.01 | 5.0 | IS 3025/ 49 : 1994, R : 2009, AAS-Flame |

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# CHAPTER - IV

# NOISE LEVEL QUALITY MONITORING

## 4.1 Location of sampling sites and their rationale

i) **Kharkharee CISF Office (N21)**

To assess the noise level in mine site, the noise levels were recorded in the mine area where all mining activities are in progress.

ii) **Madhuband UGP Office (N33)**

To assess the noise level in mine site, the noise levels were recorded in the mine area where all mining activities are in progress.

iii) **Block IV Kooridih OCP (N6)**

To assess the noise level in mine site, the noise levels were recorded in the mine area where all mining activities are in progress.

iv) **Lohapatti (N20)**

To assess the noise level in mine site, the noise levels were recorded in the mine area where all mining activities are in progress.

## 4.2 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).

## 4.3 Results & Interpretations

Ambient noise levels were recorded during day and night time and the observed values were compared with standards prescribed by MoEFCC.

The results of Noise levels recorded during day and night time on fortnightly basis are presented in tabular form along with the applicable standard permissible limits. The observed values in terms of LEQ are presented.

The observed values at all the monitoring locations are found to be within permissible limits.

# NOISE LEVEL DATA

Name of the Company: **Bharat Coking Coal Limited** Year : **2015-16.**

Name of the Project: **Cluster -XV** Month: **January, 2016.**

Name of the Stations & Code :

1. **Kharkharee CISF Office(N21)**
2. **Madhuband UGP Office (N33)**
3. **Block IV Kooridih OCP (N6)**
4. **Lohapatti (N20)**[1]

**(a) First Fortnight**

| Sl. No. | Station Name/Code | Category of area | Date | Noise level dB(A)LEQ | *Permissible Li of Noise level dB(A) |
|---|---|---|---|---|---|
| 1 | Kharkharee CISF Office (N21) | Industrial area | 12.01.2016 | 63.8 | 75 |
| 2 | Madhuband UGP Office (N33) | Industrial area | 07.01.2016 | 63.8 | 75 |
| 3 | Block IV Kooridih OCP (N6) | Industrial area | 13.01.2016 | 55.7 | 75 |
| 4 | Lohapatti (N20) | Industrial area | 01.01.2016 | 60.8 | 75 |

**(b) Second Fortnight**

| Sl. No. | Station Name/Code | Category of area | Date | Noise level dB(A)LEQ | *Permissible Li of Noise level dB(A) |
|---|---|---|---|---|---|
| 1 | Kharkharee CISF Office (N21) | Industrial area | 27.01.2016 | 61.2 | 75 |
| 2 | Madhuband UGP Office (N33) | Industrial area | 21.01.2016 | 59.7 | 75 |
| 3 | Block IV Kooridih OCP (N6) | Industrial area | 28.01.2016 | 58.3 | 75 |
| 4 | Lohapatti (N20) | Industrial area | 18.01.2016 | 53.7 | 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, +Night Time: 10.00 PM to 6.00 AM.**

[1] Report released by Shri Indranil De, Manager (Env), CMPDI, RI-1, Asansol, Signed.....KD.....Dated 28.05.2016. Job No. 110310

# NOISE LEVEL DATA

Name of the Company: **Bharat Coking Coal Limited** Year : **2015-16.**

Name of the Project: **Cluster -XV** Month: **February, 2016.**

Name of the Stations & Code :

1. **Kharkharee CISF Office(N21)**
2. **Madhuband UGP Office (N33)**
3. **Block IV Kooridih OCP (N6)**
4. **Lohapatti (N20)**[2]

**a. First Fortnight**

| Sl. No. | Station Name/Code | Category of area | Date | Noise level dB(A)LEQ | *Permissible Limit of Noise level in dB(A) |
|---|---|---|---|---|---|
| 1 | Kharkharee CISF Office (N21) | Industrial area | 08.02.2016 | 58.7 | 75 |
| 2 | Madhuband UGP Office (N33) | Industrial area | 05.02.2016 | 63.6 | 75 |
| 3 | Block IV Kooridih OCP (N6) | Industrial area | 09.02.2016 | 57.6 | 75 |
| 4 | Lohapatti (N20) | Industrial area | 01.02.2016 | 64.8 | 75 |

**b. Second Fortnight**

| Sl. No. | Station Name/Code | Category of area | Date | Noise level dB(A)LEQ | *Permissible Limit of Noise level in dB(A) |
|---|---|---|---|---|---|
| 1 | Kharkharee CISF Office (N21) | Industrial area | 26.02.2016 | 54.9 | 75 |
| 2 | Madhuband UGP Office (N33) | Industrial area | 17.02.2016 | 61.8 | 75 |
| 3 | Block IV Kooridih OCP (N6) | Industrial area | 19.02.2016 | 59.8 | 75 |
| 4 | Lohapatti (N20) | Industrial area | 22.02.2016 | 61.8 | 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, +Night Time: 10.00 PM to 6.00 AM.**

[2] Report released by Shri Indranil De, Manager (Env), CMPDI, RI-1, Asansol, Signed.....Dated 28.05.2016. Job No. 110310

# NOISE LEVEL DATA

Name of the Company: **Bharat Coking Coal Limited**

Year : **2015-16.**

Name of the Project: **Cluster -XV**

Month: **March, 2016.**

Name of the Stations & Code :

1. **Kharkharee CISF Office(N21)**
2. **Madhuband UGP Office (N33)**
3. **Block IV Kooridih OCP (N6)**
4. **Lohapatti (N20)**[3]

**a. First Fortnight data**

| Sl. No. | Station Name/Code | Category of area | Date | Noise level dB(A)LEQ | *Permissible Li of Noise level dB(A) |
|---|---|---|---|---|---|
| 1 | Kharkharee CISF Office (N21) | Industrial area | 08.03.2016 | 61.2 | 75 |
| 2 | Madhuband UGP Office (N33) | Industrial area | 07.03.2016 | 62.7 | 75 |
| 3 | Block IV Kooridih OCP (N6) | Industrial area | 09.03.2016 | 57.6 | 75 |
| 4 | Lohapatti (N20) | Industrial area | 04.03.2016 | 55.2 | 75 |

**b. Second Fortnight data**

| Sl. No. | Station Name/Code | Category of area | Date | Noise level dB(A)LEQ | *Permissible Li of Noise level dB(A) |
|---|---|---|---|---|---|
| 1 | Kharkharee CISF Office (N21) | Industrial area | 16.03.2016 | 59.8 | 75 |
| 2 | Madhuband UGP Office (N33) | Industrial area | 21.03.2016 | 60.6 | 75 |
| 3 | Block IV Kooridih OCP (N6) | Industrial area | 30.03.2016 | 62.3 | 75 |
| 4 | Lohapatti (N20) | Industrial area | 16.03.2016 | 63.6 | 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, +Night Time: 10.00 PM to 6.00 AM.**

[3] Report released by Shri Indranil De, Manager (Env), CMPDI, RI-1, Asansol, Signed..... .....Dated 28.05.2016. Job No. 110310

## Noise Level Monitoring Location of Cluster XV